

Flora Species List

The following list includes all species of vascular plants observed on site during fieldwork. It should be noted that such a list couldn't be considered comprehensive, but rather indicative of the flora present on the site. It can take many years of flora surveys to record all of the plant species occurring within any area, especially plant species that are only apparent in some seasons such as Orchids.

A number of species cannot always be accurately identified during a brief survey, generally due to a lack of suitable flowering and/or fruiting material. Any such species are identified as accurately as possible, and are indicated in the list as indicated:

- specimens that could only be identified to genus level are indicated by the generic name followed by the abbreviation "sp.", indicating an unidentified species of that genus;
- specimens for which identification of the genus was uncertain are indicated by a question mark ("?",) placed in front of the generic, which is followed by the abbreviation "sp." and;
- specimens that could be accurately identified to genus level, but could be identified to species level with only a degree of certainty are indicated by a ("?",) placed in front of the epithet.

Authorities for the scientific names are not provided in the list. These follow the references outlined below.

Harden, G. (ed) (2000). *Flora of New South Wales, Volume 1*. Revised edition. UNSW, Kensington, NSW.

Harden, G. (ed) (2002). *Flora of New South Wales, Volume 2*. Revised edition. UNSW, Kensington, NSW.

Harden, G. (ed) (1992). *Flora of New South Wales, Volume 3*. UNSW, Kensington, NSW.

Harden, G. (ed) (1993). *Flora of New South Wales, Volume 4*. UNSW, Kensington, NSW.

Names of families and higher taxa follow a modified Cronquist System (1981).

Introduced species are indicated by an asterisk "*".

Threatened species listed under the Threatened Species Conservation Act 1995 (TSC Act 1995) or the Environmental Protection of Biodiversity and Conservation (EPBC Act 1999) and / or Rare or Threatened Australian Plant (ROTAP) listed species are indicated in **bold font** and marked as:

(V) = Vulnerable Species listed under the TSC Act

(E) = Endangered Species listed under the TSC Act

(EE) = Species listed under the Commonwealth EPBC Act 1999 as Endangered

(EV) = Species listed under the Commonwealth EPBC Act 1999 as Vulnerable

(R) = ROTAP as per Briggs and Leigh (1996)

The following standard abbreviations are used to indicate subspecific taxa:

ssp. - subspecies

var. - variety

agg. aggregate

× - hybrid between the two indicated species

	Community Represented
1	Coastal Plains Smooth-barked Apple Forest
2	Coastal Sheltered Apple – Peppermint Forest
3	Narrabeen Foreshore Redgum Forest
4	Swamp Oak – Rushland Forest (EEC – Swamp Oak Floodplain Forest)
5	Swamp Mahogany – Paperbark Forest (EEC – Swamp Sclerophyll Forest)
6	Narrabeen Wallarah Sheltered Grassy Forest

Scientific Name	Common Name	1	2	3	4	5	6
<u>CLASS FILICOPSIDA (FERNS)</u>							
ADIANTACEAE							
<i>Adiantum aethiopicum</i>	Common Maidenhair Fern		X	X		X	X
BLECHNACEAE							
<i>Blechnum indicum</i>	Swamp Water Fern		X				
DAVALLIACEAE							
<i>*Nephrolepis cordifolia</i>	Fishbone Fern		X				
DENNSTAEDTIACEAE							
<i>Pteridium esculentum</i>	Bracken Fern		X	X			X
LINDSAEACEAE							
<i>Lindsaea linearis</i>	Screw Fern	X					X
<i>Lindsaea microphylla</i>	Lacy Wedge-fern	X					X
<u>CLASS CYCADOPSIDA (CYCADS)</u>							
ZAMIACEAE							
<i>Macrozamia communis</i>	Burrawang	X	X				
<u>CLASS MAGNOLIOPSIDA (FLOWERING PLANTS)</u>							
<u>SUBCLASS MAGNOLIIDAE (Dicotyledons)</u>							
ACANTHACEAE							
<i>Pseuderanthemum variable</i>	Pastel Flower		X	X			
<i>*Thunbergia alata</i>	Black-eyed Susan		X				
AIZOACEAE							
<i>Carpobrotus glaucescens</i>	Pig Face				X		
ALLIACEAE							
<i>Nothoscordum borbonicum</i>	Onion weed		X				
APIACEAE							
<i>Centella asiatica</i>	Swamp Pennywort	X	X	X		X	X
<i>*Hydrocotyle bonariensis</i>	Kurnell Curse	X			X		
<i>Hydrocotyle geraniifolia</i>	Forest Pennywort					X	
<i>Hydrocotyle peduncularis</i>						X	X
<i>Xanthosia tridentata</i>	Rock Xanthosia		X				

Scientific Name	Common Name	1	2	3	4	5	6
APOCYNACEAE							
<i>Parsonsia straminea</i> var. <i>straminea</i>	Monkey Rope		X	X		X	
ARALIACEAE							
<i>Polyscias sambucifolia</i>	Elderberry Panax		X			X	X
ASCLEPIADACEAE							
<i>Marsdenia suaveolens</i>	Scented Marsdenia			X		X	
ASTERACEAE							
* <i>Bidens pilosa</i>	Cobbler's Pegs		X				
* <i>Chrysanthemoides monilifera</i> ssp. <i>rotundata</i>	Bitou Bush	X	X	X	X	X	X
* <i>Conyza albida</i>	Tall Fleabane		X				
* <i>Gnaphalium sphaericatum</i>	Cudweed		X	X			
* <i>Hypochoeris microcephala</i>	White Flatweed		X				
* <i>Hypochoeris radicata</i>	Cat's Ear	X	X	X			X
<i>Lagenifera stipitata</i>			X				X
* <i>Senecio madagascariensis</i>	Fireweed		X				X
* <i>Soliva sessilis</i>	Bindi		X				
* <i>Taraxacum officinale</i>	Dandelion		X				
<i>Ozothamnus diosmifolium</i>	Everlasting			X			
<i>Vernonia cinerea</i>			X				X
AVICENNIACEAE							
<i>Avicenia marina</i> var. <i>australasica</i>	Grey Mangrove				X		
BIGNONIACEAE							
<i>Pandorea pandorana</i>	Wonga Wonga Vine		X	X			X
CAESALPINIOIDEAE							
* <i>Senna pendula</i> var. <i>glabrata</i>	Winter Senna		x				
CASUARINACEAE							
<i>Allocasuarina littoralis</i>	Black She-oak	X	X	X			X
<i>Allocasuarina torulosa</i>	Forest Oak		X			X	X
<i>Casuarina glauca</i>	Swamp She-oak				X	X	
CHENOPODIACEAE							
<i>Suaeda australis</i>	Austral Seablite				X		
CONVOLVULACEAE							
<i>Dichondra repens</i>	Kidney Weed		X	X		X	
<i>Polymeria calycina</i>	Swamp Bindweed		X			X	X
CUNONIACEAE							
<i>Ceratopetalum gummiferum</i>	New South Wales Christmas Bush		X				
DILLENIACEAE							
<i>Hibbertia aspera</i>	Rough Guinea Flower		X				X
<i>Hibbertia dentata</i>	Twining Guinea Flower		X				X
<i>Hibbertia empetrifolia</i>	Trailing Guinea Flower		X				X
<i>Hibbertia pedunculata</i>	-		X				
DROSERACEAE							
<i>Drosera peltata</i>	Sundew	X	X				

Scientific Name	Common Name	1	2	3	4	5	6
EPACRIDACEAE							
<i>Acrotriche divaricata</i>	-	X	X	X			X
<i>Epacris pulchella</i>	NSW Coral Heath	X	X				X
<i>Leucopogon juniperinus</i>	Bearded Heath		X				
<i>Leucopogon lanceolatus</i>	Lance Beard-heath		X				
<i>Melichrus procumbens</i>	Jam Tarts			X			
<i>Monotoca scoparia</i>			X				
EUPHORBIACEAE							
<i>Breynia oblongifolia</i>	Coffee Bush		X				X
<i>Glochidion ferdinandi</i>	Cheese Tree	X	X	X		X	X
<i>Phyllanthus hirtellus</i>	Thyme Spurge		X				
<i>Poranthera microphylla</i>	Small Poranthera			X			
FABOIDEAE							
<i>Daviesia ulicifolia</i>	Gorse Bitter-pea	X	X				X
<i>Desmodium rhytidophyllum</i>			X	X			X
<i>Desmodium varians</i>			X				X
<i>Dillwynia retorta</i>	Heathy Parrot Pea	X	X				
* <i>Erythrina x sykesii</i>	Coral Tree		X				
<i>Glycine clandestina</i>	Love Creeper		X	X			
<i>Glycine tabacina</i>	Love Creeper		X	X			
<i>Gompholobium latifolium</i>	Broad-leaf Wedge-pea		X				
<i>Hardenbergia violacea</i>	False Sarsaparilla	X	X	X			X
<i>Hovea linearis</i>		X	X				
<i>Kennedia rubicunda</i>	Dusky Coral Pea					X	
<i>Mirbelia rubifolia</i>		X					
<i>Podolobium ilicifolium</i>	Native Holly	X	X				X
<i>Podolobium scandens</i>			X	X			X
<i>Pultenaea daphnoides</i>			X				X
<i>Pultenaea paleacea</i>		X	X				
<i>Pultenaea retusa</i>			X				
<i>Pultenaea villosa</i>		X	X				
* <i>Trifolium repens</i>	White Clover		X				X
* <i>Trifolium dubium</i>	Yellow Suckling Clover		X				
GERANIACEAE							
<i>Geranium homeanum</i>	Cranesbill					X	
GOODENIACEAE							
<i>Damperia stricta</i>	-						X
<i>Goodenia hederacea</i>	Violet-leaved Goodenia						X
<i>Goodenia heterophylla</i>	Variable-leaved Goodenia	X	X				X
<i>Goodenia ovata</i>	Hop Goodenia				X	X	
HALORAGACEAE							
<i>Gonocarpus teucrioides</i>	Germander Raspswort						X
LAURACEAE							
<i>Cassytha pubescens</i>	Common Devil's Twine		X	X	X		X
* <i>Cinnamomum camphora</i>	Camphor Laurel		X				
<i>Cryptocarya microneura</i>	Murrogun					X	
LOBELIACEAE							
<i>Pratia purpurascens</i>	White Root	X	X	X			X

Scientific Name	Common Name	1	2	3	4	5	6
LOGANIACEAE							
<i>Logania albiflora</i>	Logania		X				X
MALVACEAE							
* <i>Modiola caroliniana</i>	Red-flowered Mallow		X				
* <i>Sida rhombifolia</i>	Paddy's Lucerne		X				
MENISPERMACEAE							
<i>Sarcopetalum harveyanum</i>	Pearl Vine					X	
<i>Stephania japonica</i> var. <i>discolor</i>	Snake Vine			X		X	
MIMOSOIDEAE							
<i>Acacia elongata</i>	Swamp Wattle	X					
<i>Acacia falcata</i>	Falcate Wattle		X	X			
<i>Acacia floribunda</i>	White Sally		X	X			
<i>Acacia implexa</i>	Hickory		X				X
<i>Acacia irrorata</i> ssp. <i>irrorata</i>		X		X			
<i>Acacia longifolia</i> var. <i>longifolia</i>	Sydney Golden Wattle	X	X	X		X	X
<i>Acacia longifolia</i> var. <i>sophorae</i>	Coastal Wattle				X		
<i>Acacia myrtifolia</i>	Myrtle Wattle	X	X				X
* <i>Acacia podalyriifolia</i>	QLD Silver Wattle		X				
<i>Acacia suaveolens</i>	Sweet-scented Wattle	X					X
<i>Acacia terminalis</i> subsp. <i>angustifolia</i>	Sunshine Wattle	X	X			X	
<i>Acacia ulicifolia</i>	Prickly Moses	X					
MYRSINACEAE							
<i>Rapanea variabilis</i>	Mutton Wood			X		X	
MYRTACEAE							
<i>Acmena smithii</i>	Lilly Pilly					X	
<i>Angophora costata</i>	Smooth-barked Apple	X	X	X		X	X
<i>Callistemon salignus</i>	Willow Bottlebrush		X	X		X	X
<i>Corymbia gummifera</i>	Red Bloodwood	X		X			
<i>Eucalyptus capitellata</i>	Brown Stringybark	X					
<i>Eucalyptus globoidea</i>	White Stringybark		X				X
<i>Eucalyptus paniculata</i> ssp. <i>paniculata</i>	Grey Ironbark			X			X
<i>Eucalyptus piperita</i>	Sydney Peppermint		X	X		X	X
<i>Eucalyptus punctata</i>	Grey Gum		X				X
<i>Eucalyptus racemosa</i>	Snappy Gum		X				X
<i>Eucalyptus resinifera</i> ssp. <i>resinifera</i>	Red Mahogany		X				X
<i>Eucalyptus robusta</i>	Swamp Mahogany					X	
<i>Eucalyptus signata</i>	Scribbly Gum	X	X				X
<i>Eucalyptus tereticornis</i>	Forest Red Gum			X			
<i>Eucalyptus umbra</i> ssp. <i>umbra</i>	Broad-leaved White Mahogany	X	X				X
<i>Leptospermum polygalifolium</i>	Lemon-scented Tea-Tree	X	X				X
<i>Leptospermum trinervium</i>	Paperbark Tea-tree	X	X				X
<i>Melaleuca linearifolia</i>	Snow-in-summer				X	X	
<i>Melaleuca nodosa</i>	Ball Honeymyrtle					X	
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark					X	
<i>Syncarpia glomulifera</i>	Turpentine						X
OCHNACEAE							
* <i>Ochna serrulata</i>	Ochna		X	X		X	
OLEACEAE							
<i>Notelaea longifolia</i>	Mock Olive		X	X		X	

Scientific Name	Common Name	1	2	3	4	5	6
OXALIDACEAE							
<i>Oxalis perennans</i>		X	X	X			X
PASSIFLORACEAE							
<i>Passiflora herbertiana</i>	Native Passionfruit		X	X			
PITTOSPORACEAE							
<i>Billardiera scandens</i>	Apple Berry		X	X			X
<i>Bursaria spinosa</i>	Blackthorn		X	X			X
<i>Pittosporum undulatum</i>	Sweet Pittosporum		X				
PLANTAGINACEAE							
* <i>Plantago lanceolata</i>	Lamb's Tongues		X			X	X
POLYGALACEAE							
<i>Comesperma ericinum</i>	Matchheads		X				
* <i>Polygala myrtifolia</i>	Butterfly Bush		X				
PRIMULACEAE							
* <i>Anagallis arvensis</i>	Scarlet Pimpernel		X				
PROTEACEAE							
<i>Banksia spinulosa</i> var. <i>collina</i>	Hair-pin Banksia	X	X				
<i>Grevillea sericea</i>	Pink Spider Flower	X	X				
<i>Lambertia formosa</i>	Mountain Devils	X	X				
<i>Lomatia silaifolia</i>	Crinkle Bush		X				
<i>Persoonia levis</i>	Smooth Geebung	X	X	X			X
<i>Persoonia linearis</i>	Narrow-leaved Geebung		X				X
RANUNCULACEAE							
<i>Clematis glycinoides</i>	Forest Clematis			X			
RHAMNACEAE							
<i>Alphitonia excelsa</i>	Red Ash					X	
ROSACEAE							
<i>Rubus hillii</i>	Broad-leaved Bramble			X		X	
<i>Rubus parvifolius</i>	Native Raspberry			X			
* <i>Rubus ulmifolius</i>	Blackberry					X	
RUBIACEAE							
* <i>Richardia brasiliensis</i>	Mexican Clover			X			
RUTACEAE							
<i>Correa reflexa</i>	Common Correa		X				
SANTALACEAE							
<i>Exocarpus cupressiformis</i>	Cherry Ballart		X	X			
SAPINDACEAE							
<i>Dodonaea triquetra</i>	Common Bush	X	X	X		X	X
SCROPHULARIACEAE							
<i>Veronica plebeia</i>	Speedwell		X				

Scientific Name	Common Name	1	2	3	4	5	6
SOLANACEAE							
* <i>Solanum mauritanum</i>	Wild Tobacco		X				
* <i>Solanum nigrum</i>	Black Nightshade		X	X	X		
THYMELAEACEAE							
<i>Pimelea linifolia</i> ssp. <i>linifolia</i>	Slender Rice Flower	X	X				X
TREMANDRACEAE							
<i>Tetradlea juncea</i> (V) (EV)	Black-eyed Susan	X					
ULMACEAE							
<i>Trema tomentosa</i>	Native Peach					X	
VERBENACEAE							
<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum		X	X			
* <i>Lantana camara</i>	Lantana	X	X	X		X	X
* <i>Verbena bonariensis</i>	Purple-Top	X	X				X
VIOLACEAE							
<i>Viola betonicifolia</i>	Purple Violet		X				
<i>Viola hederacea</i>	Native Violet					X	
VITACEAE							
<i>Cayratia clematidea</i>	Slender Grape			X			
<i>Cissus hypoglauca</i>	Water Vine			X		X	X
SUBCLASS LILIIDAE (Monocotyledons)							
ARECACEAE							
<i>Livistonia australis</i>	Cabbage-tree Palm		X			X	X
ASPARAGACEAE							
* <i>Protasparagus aethiopicus</i>	Asparagus Fern		X	X			
COMMELINACEAE							
<i>Commelina cyanea</i>	Hairy Wandering Jew	X	X	X			
CYPERACEAE							
<i>Baumea juncea</i>	Slender Twig Rush				X		
<i>Carex appressa</i>	Tall Sedge					X	
<i>Gahnia clarkei</i>		X	X	X		X	X
<i>Gahnia melanocarpa</i>				X	X	X	
<i>Isolepis nodosa</i>	Knobby Club-rush				X		
<i>Lepidosperma laterale</i>	Variable Sword-sedge	X	X	X			X
<i>Ptilothrix deusta</i>		X	X				
<i>Schoenus melanostachys</i>		X	X				X
DIOSCORACEAE							
<i>Dioscoria transversa</i>	Pencil Yam		X			X	
HAEMODORACEAE							
<i>Haemodorum planifolium</i>	Blood Root		X				
IRIDACEAE							
<i>Patersonia sericea</i>	Silky Purple Flag	X	X				X

Scientific Name	Common Name	1	2	3	4	5	6
JUNCACEAE							
<i>Juncus kraussii</i> ssp. <i>australiensis</i>	Sand Rush				X		
LOMANDRACEAE							
<i>Lomandra longifolia</i>	Spiny Mat Rush		X	X		X	X
<i>Lomandra multiflora</i>			X				X
<i>Lomandra obliqua</i>	Fish Bones	X	X				
LUZURIAGACEAE							
<i>Eustrephus latifolius</i>	Wombat Berry	X	X	X			X
<i>Geitonoplesium cymosum</i>	Scrambling Lily					X	
ORCHIDACEAE							
<i>Acianthus fornicatus</i>	Pixie Orchid	X	X	X			X
<i>Caladenia carnea</i>	Pink Fingers		X				
<i>Caladenia catenata</i>	White Fingers		X	X			X
<i>Calochilus robertsonii</i>	Purple Beard Orchid	X		X			
<i>Cryptostylis erecta</i>	Hooded Orchid	X					X
<i>Cryptostylis subulata</i>	Large Tounge Orchid		X	X			X
<i>Dendrobium aemulum</i>	Ironbark Orchid			X			
<i>Erythrorchis cassythoides</i>	Climbing Orchid	X		X			
<i>Lyperanthus suaveolens</i>	Brown Beaks	X					
<i>Pterostylis baptistii</i>	King Greenhood	X		X			
<i>Pterostylis nutans</i>	Nodding Greenhood	X		X			
PHORMIACEAE							
<i>Dianella caerulea</i> var. <i>caerulea</i>	Blue Flax Lily	X		X			
<i>Dianella caerulea</i> var. <i>producta</i>	Blue Flax Lily		X			X	X
<i>Dianella longifolia</i> var. <i>longifolia</i>	Flax Lily	X					X
POACEAE							
* <i>Andropogon virginicus</i>	Whisky Grass	X	X				
<i>Aristida vagans</i>	Three-awn Speargrass	X					X
<i>Austrodanthonia tenuior</i>	Wallaby Grass						X
* <i>Axonopus affinis</i>	Narrowleaf Carpet Grass	X					
* <i>Chloris gayana</i>	Rhodes Grass	X		X			
<i>Cynodon dactylon</i>	Common Couch		X				
<i>Dichelachne micrantha</i>	Plume Grass		X				
<i>Digitaria parviflora</i>	Smallflower Fingergrass		X	X			
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	Tufted Hedgehog Grass	X	X				X
* <i>Ehrharta erecta</i>	Panic Veldtgrass	X	X				
<i>Entolasia stricta</i>	Wiry Panic	X	X	X			X
<i>Entolasia marginata</i>	Bordered Panic					X	
<i>Eragrostis brownii</i>	Brown's Love Grass	X	X				
* <i>Hyparrhenia rufa</i>	Giant Coolatai Grass	X	X				X
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass		X	X			X
<i>Microlena stipoides</i>	Weeping Rice Grass						X
<i>Oplismenus aemulus</i>	Basket Grass		X			X	X
<i>Oplismenus imbecillus</i>	Basket Grass		X	X	X	X	
<i>Panicum simile</i>	Two Colour Panic	X	X				X
* <i>Paspalum dilatatum</i>	Paspalum		X				
* <i>Paspalum urvillei</i>	Vasey Grass	X	X				
* <i>Pennisetum clandestinum</i>	Kikuyu	X	X				
<i>Phragmites australis</i>	Native Reed				X		
<i>Poa labillardieri</i>	Tussock Grass	X	X				X
* <i>Setaria gracilis</i>	Slender Pigeon Grass	X					

Scientific Name	Common Name	1	2	3	4	5	6
<i>Sporobolus indicus</i> var. <i>capensis</i> .	Parramatta Grass	X	X	X			
* <i>Sporobolus elongatus</i>	Slender Rat's-tail Grass		X				
* <i>Stenotaphrum secundatum</i>	Buffalo Grass	X	X		X		
<i>Themeda australis</i>	Kangaroo Grass	X	X				X
RESTIONACEAE							
<i>Leptocarpus tenax</i>			X				X
SMILACACEAE							
<i>Smilax glycyphylla</i>	Native Sarsaparilla		X	X			X
XANTHORRHOEACEAE							
<i>Xanthorrhoea fulva</i>			X				
<i>Xanthorrhoea latifolia</i> ssp <i>latifolia</i>	Grass Tree	X	X				X

EXPECTED FAUNA SPECIES LIST

Below is a list of fauna species that could be *reasonably* expected to be found within the study area at some occurrence. Such an approach has been taken given the unlikelihood to record *all* potentially occurring species within an area during formal fauna surveys (due to seasonality, climatic limitations, crypticism etc).

Family sequencing and taxonomy follow for each fauna class:

Birds – Christidis and Boles (1994).

Herpetofauna - Cogger (1996).

Mammals - Strahan (ed) (1995) and Churchill (1998).

Known and Expected Bird List

Appendix Key:

✓ = Species Detected

* = Introduced species

(E) = Species listed under NSW TSC Act 1995 as Endangered.

(V) = Species listed under NSW TSC Act 1995 as Vulnerable.

(V*) = Species listed under the Commonwealth EPBC Act 1999 as Vulnerable

(E*) = Species listed under the Commonwealth EPBC Act 1999 as Endangered

(M*) = Species listed under the Commonwealth EPBC Act as Migratory

Species indicated in **BOLD** font are those threatened species known from within 10km of site (Atlas of NSW Wildlife 2010)

Data Source:

1 = Species recorded at Nord's Warf during this survey

Family Name	Scientific Name	Common Name	1
Phasianidae (True Quails, Pheasants and Fowls)	<i>Coturnix ypsilophora</i>	Brown Quail	✓
Pelecanidae (Pelicans)	<i>Pelicanus conspicillatus</i>	Australian Pelican	✓
Phalacrocoracidae (Cormorants)	<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant	
Anatidae (Swans, Geese and Ducks)	<i>Anas castanea</i>	Chestnut Teal	
	<i>Anas gracilis</i>	Grey Teal	
	<i>Anas superciliosa</i>	Pacific Black Duck	
	<i>Aythya australis</i>	Hardhead	
	<i>Chenonetta jubata</i>	Australian Wood Duck	✓
	<i>Oxyura australis</i>	Blue-billed Duck (V)	
	<i>Stictonetta naevosa</i>	Freckled Duck (V)	
Ardeidae (Herons, Bitterns and Egrets)	<i>Ardea alba</i>	Great Egret	
	<i>Ardea ibis</i>	Cattle Egret	
	<i>Ardea intermedia</i>	Intermediate Egret	
	<i>Ardea pacifica</i>	White-necked Heron	
	<i>Botaurus poiciloptilus</i>	Australasian Bittern (V)	
	<i>Butorides striatus</i>	Striated Heron	
	<i>Egretta garzetta</i>	Little Egret	
	<i>Egretta novaehollandiae</i>	White-faced Heron	
	<i>Ixobrychus flavicollis</i>	Black Bittern (V)	
	<i>Nycticorax caledonicus</i>	Nankeen Night Heron	



Plate 1 – Coastal Plains Smooth- barked Apple Woodland



Plate 2 – Coastal Sheltered Apple Peppermint Forest

Appendix 5

Qualifications of Personnel



Curriculum Vitae

MATTHEW DOHERTY

Manager - Ecology & GIS

Newcastle, NSW

Bachelor of Landscape Management and Conservation (Land & Water Conservation Major), University of Western Sydney, 2002

Bushland Regeneration Certificate II, Western Sydney Institute of TAFE, 1999

Spikeless Tree Climbing Techniques, Total Height Safety, 2004

OH&S Induction Training (Green Card)

NPWS Scientific Investigation Licence

NSW Animal Ethics Research Authority

Senior First Aid

AREAS OF EXPERTISE:

Matt has seven years experience in the environmental industry with key skills in project management, survey design, GIS and client relations. In his position as Ecology & GIS Manager, Matt manages environment department including the day to day running of projects, verification of reports and other outputs and ensures clients are well informed of project progress and key findings. Matthew's background in local government, state government and private consultancy gives him a high level of appreciation of the environmental and consultancy sector, thus allowing him to take a pragmatic approach to providing successful conservation and development outcomes whilst meeting the aims and objectives of clients and determining authorities.

SELECTED PROJECT EXPERIENCE:

Ecology and GIS

- **Various large-scale land development, mining, energy and infrastructure projects** – Matt has project managed and/or participated in numerous large-scale land development, mining, energy and infrastructure projects including Queensland Hunter Gas Pipeline (850km); Hunter Gas Pipeline; Rio Tinto Lower Hunter Lands Project; GIS biodiversity, large scale vegetation, habitat and predictive modelling mapping works; wind farms and coordination of environmental monitoring programs for mines

PREVIOUS EXPERIENCE:

Ecologist – Andrews Neil Pty Ltd

2004 - 2005

Duties included: preparation of Fee Proposals for Ecological Services; General and Targeted Flora and Fauna Surveys including Flora and Fauna Identification; Desktop Studies and Literature Searches; Interpretation and Application of Legislation; report preparation including Threatened Species Assessments (8 part test), Vegetation Management Plans (Riparian Restoration/ Rehabilitation, Bush Regeneration), Species Impact Statements, Weed Management Strategies, Habitat Management Strategies and Tree Assessments; GIS/ Spatial Analysis and Database Management; Liaison with Client, Stakeholder Groups, State and Local Governing Bodies; Site Supervision of Ecological Conditions; Tree Climbing for installation, maintenance and monitoring of nestboxes.

Project Officer / Horticultural Services – Gosford City Council

06/2003 – 05/2004

Comprehensively reviewed noxious weed management; performed vegetation surveys on GCC landfills to identify the presence of noxious weeds; quantify the extent of infestation of each noxious weeds species and map the



Curriculum Vitae

- CONTINUED -

affected areas; developed a management plan for the control of NW species identified in the survey in accordance with relevant legislation; maintained Japanese Gardens along with City Wide Gardens and Streetscapes.

Various Roles whilst at University

1997 - 2002

Environmental Officer - Dept of Land & Water Conservation, Newcastle

01/1999 – 12/1999

Liaised with relevant agency and stakeholder groups; researched and prepared an extensive literature review of issues pertaining to riparian vegetation; assessed current best practice for revegetation and rehabilitation of degraded sites; prepared a Riparian Revegetation Management Strategy

Volunteer – Maitland City Council

07/1999 – 12/1999

Assisted with Rivercare implementation throughout LGA. Utilised primary, secondary and field research to prepare a River Plan under 'Rivercare' guidelines.

Volunteer – Brisbane Waters & Gosford Lagoons Catchment Management Committee

03/1998 – 05/1998

Prepared Riparian Zone Rehabilitation Plan for Degraded Creek Management, Research and prepared a Riparian Zone Rehabilitation Project. Member on several Gosford City Council steering committees and working groups.

MEMBERSHIPS & ACHIEVEMENTS:

- Fire Protection Association Australia (FPAA)



Curriculum Vitae

CRAIG ANDERSON

Senior Ecologist – Senior Project Manager

Newcastle, NSW

Bachelor Applied Science (Environmental Assessment & Management), University of Newcastle, 1994

Graduate Diploma in Archaeological Heritage, UNE, Current

RFS/PIA NSW Consulting Planners Bushfire Training

AREAS OF EXPERTISE:

Craig has over 15 years experience in a wide range of environmental consulting. He has undertaken and managed commissions for a diverse range of projects within land development, energy, mining, infrastructure and conservation, including State Significant developments.

Craig has an extensive background in ecological field surveys, encompassing all aspects of flora and fauna identification, targeted surveying and mapping. He was involved in the initial formulation of an Association of Consulting Ecologists for NSW in 1998 and has acted as an expert witness in several Land and Environment Court matters relating to ecology and bushfire assessment. He is an experienced negotiator of ecological / development outcomes, and has a detailed understanding of legislation related to ecological matters.

Craig has been actively involved in representations to the Department of Environment on behalf of the NSW Urban Taskforce in regards to proposed changes to the NSW Threatened Species Conservation Act, and for the Urban Development Institute of Australia (UDIA) on matters relating to issues such as the proposed listing of endangered ecological communities, regional environmental biodiversity strategies, and the Native Vegetation Act and the operations of the Catchment Management Authority (CMA).

SELECTED PROJECT EXPERIENCE:

Ecology

- **Buttaba Hills (336 Lots) – Species Impact Statement**
- **Hunter Economic Zone (800+ ha industrial estate) – Species Impact Statement**
- **Pelaw Main By-Pass to Hunter Economic Zone – Species Impact Statement**
- **Residential development / Eco-Resort / Fauna Sanctuary at Paxton - Flora and Fauna Assessment incorporating Seven Part Tests of Significance of Impact under Threatened Species Legislation**
- **SEPP 5 Aged Care facilities, Kariong, Hawks Nest, Wallsend, Glenhaven - Flora and Fauna Assessment incorporating Seven Part Tests of Significance of Impact under Threatened Species Legislation**
- **Caravan Park extensions, Fern Bay - Flora and Fauna Assessment incorporating Seven Part Tests of Significance of Impact under Threatened Species Legislation**
- **Road & Rail Infrastructure for the Hunter Economic Zone - Flora and Fauna Assessment incorporating Seven Part Tests of Significance of Impact under Threatened Species Legislation**
- **Alignments for Hunter Gas Pipeline Infrastructure - Flora and Fauna Assessment incorporating Seven Part Tests of Significance of Impact under Threatened Species Legislation**
- **Landscape Concept Plan, rural subdivision at Oakhampton Heights - Vegetation Management Plan**
- **Creek Rehabilitation Plan, Warners Bay - Vegetation Management Plan**
- **Vegetation Management Plan for a retained creek line with Sugar Valley Golf Course, West Wallsend - Vegetation Management Plan**
- **Individual Koala Plan of Management under SEPP 44 at Hawks Nest – Management Plan**



Curriculum Vitae

- CONTINUED -

- **Ecological Constraints Management Plan, Hawks Nest North** - Management Plan
- **Management Plan for the Green & Golden Bell Frog at Culburra** - Management Plan
- **Fuel Management Plan over lots within a rural-residential estate at Glen Oak** - Management Plan
- **Ecological Constraints Master Plan for Hunter Economic Zone** - Management Plan
- **Environmental Plan of Management for Residential / Tourism Sanctuary Project at Paxton** - Management Plan
- **Green and Golden Bell Frog Survey and Management Plan, Gillieston Heights** - Targeted Species Study
- Targeted Species Studies as part of the Ecological Constraints Master Plan for the Hunter Economic Zone

PREVIOUS EXPERIENCE:

Senior Ecologist, Wildthing Environmental Consulting

1995 – 2000

Oversaw operations in NSW and Qld, and project managed and undertook numerous ecological and bushfire assessments for a diverse array of clients / projects.

Environmental Officer, Pulver Cooper & Blackley / Kel Nagle Cooper & Associates

1994 - 1995

Undertook a range of environmental, planning and survey investigations; fieldwork; reporting for a range of land development; and golf course development projects.

MEMBERSHIPS & ACHIEVEMENTS:

- Frog and Tadpole Study Group (FATS)
- Hunter Birds Observers Club (HBOC). Committee Member 2009. Records Appraisal Committee, 2008 – present
- Bird Observers Club of Australia (BOCA)
- Donaldson Conservation Trust. Board member (independent environmental expert). 2009 – present.



Curriculum Vitae

Name: Allan Richardson

Office: RPS Harper Somers O'Sullivan

Position in Company: Senior Ecologist

Qualifications / Awards

- B.Env.Sc. (Environmental Management)
- B.Env.Sc. (Hons) (Biology) – Migratory Wading Bird Study
- 2002 Hunter Environmental Institute Scholarship
- Waterways Authority Boating Licence
- OH&S Induction Training (Green Card)
- NSW Driver's Licence (Class C)
- NPWS Scientific Licence
- NSW Animal Ethics Research Authority
- St John Ambulance Senior First Aid Certificate

Memberships:

- Hunter Bird Observers Club
- Victorian Wader Study Group

Areas of Expertise:

- Ornithological Surveys and Research
- Targeted and general Terrestrial flora and fauna surveys
- Threatened Flora & Fauna Assessment, Reporting and Legislation
- GPS Survey and GIS Mapping Projects
- High Level Nature Photography
- Tertiary and General Ecological Tutoring, Demonstrating and Presenting

Recent Experience Includes:

Allan Richardson has broad range of Ecological Assessment reporting experience underpinned by over 27 years of ecological field experience. Over four and a half years of project experience has primarily included a range of flora and fauna assessment disciplines as required by a wide range of corporate and domestic client requirements. Allan has a strong grounding in threatened species ecology in both coastal and western NSW regional areas, with specialist migratory wader studies expertise in Central NSW and Roebuck Bay in North Western Australia.

Allan's wide ranging interest across different ecological disciplines, has been a central part of important threatened species projects, including, the Critically Endangered North Rothbury Persoonia, Hunter Estuary Green and Golden Bell Frog populations, Migratory Wader habitat usage surveys, seasonal Swift Parrot movements and specialised Avifauna Wind Farm Surveys on the east and west coast. Allan's broad ecological experience also represents an important part of RPS HSO's threatened flora and vegetation community mapping, targeted fauna survey works and threatened species habitat assessments over both small and large spatial areas for a range of client needs. His depth of experience and a strong knowledge of Australian fauna and regional vegetation contribute strongly to RPS HSO's ability to meet the consultation and regulatory needs of the development community.



Curriculum Vitae

SARAH JONES

Ecologist / Bushfire Planner

Newcastle, NSW

B. Env.Sc, University of Newcastle

G.Dip (Design for Bushfire Areas)

RFS / PIA NSW Consulting Planners Bushfire Training Course

AREAS OF EXPERTISE:

Sarah has over 10 years experience as an Ecologist, including over 8 years with RPS as the company's bushfire planning specialist. Sarah has gained extensive experience in Bushfire Threat Assessment & Management reporting, Bushfire Risk Management Plans, Fuel Management Plans, Bushfire Evacuation Plans, understanding of fire regimes upon flora and fauna, Vegetation Management Plans, Terrestrial flora and fauna surveys, Flora and Fauna Assessments, along with understanding of environmental legislation and threatened species issues.

PREVIOUS EXPERIENCE:

Ecologist – Ecotone Environmental Consultants, Waratah, NSW

Jan 2001 – Nov 2001

**Volunteer Environmental Educator – Community Partnership,
Newcastle City Council**

Sept 2000 – Dec 2000

MEMBERSHIPS & ACHIEVEMENTS:

- Member of the Fire Protection Association Australia (FPA)
- Member of the Bushfire Planning and Design Special Interest Group (BPAD)
- NSW Driver's Licence (Class C)
- OH&S Induction Training (Green Card)
- NPWS Scientific Investigation Licence
- NSW Animal Ethics Research Authority



Curriculum Vitae

TOBY LAMBERT

Senior Ecologist / Senior Project Manager

Newcastle, NSW

Bachelor of Environmental Science, University of Newcastle, 1993 - 1996

Accredited BioBanking Assessor, Tafe NSW – Ryde, 2009

NSW Driver's Licence (Class C)

OH&S Induction Training (Green Card)

NPWS Scientific Investigation Licence and NSW Animal Ethics Research Authority

AREAS OF EXPERTISE:

Toby has over fourteen years experience in undertaking and managing a diverse array of ecological and environmental surveys and assessments. As a Senior Ecologist – Senior Project Manager, he supervises all facets of flora and fauna assessment and related reports: planning, supervision of field and reporting staff, project scheduling, budget management, liaising with clients and Government departments and providing advice of all kinds. He has also been called upon to prepare expert evidence for matters at the NSW Land and Environment Court. Toby has produced ecological and environmental documentation for private and public projects ranging in complexity. These include a number of wind farms throughout Australia and New Zealand, coal mines and a range of infrastructure projects within the Hunter region. Toby has also managed ecological master planning for residential projects in Sydney, the Central Coast and the Hunter. Toby's fields of expertise are Environmental Impact Assessment and mediation, flora, fauna and habitat survey method, design and identification, detailed understanding of legislation and threatened species issues, terrestrial fauna surveys and project management. He has experience in conducting comprehensive fauna surveys and preparing related documentation in a broad array of environments throughout New South Wales, with most projects located in the greater Sydney area, Blue Mountains, Central Coast, Hunter and Forster / Great Lakes regions. Toby has also undertaken ecological projects in Western Australia, Queensland, the ACT and New Zealand.

SELECTED PROJECT EXPERIENCE:

Ecology

- **Hunter Economic Zone Industrial Estate** - Project Manager for the environmental component of the development of the Hunter Economic Zone industrial estate at Kurri Kurri, to be the largest industrial estate in NSW.
- **Centennial Coal** - Environmental Project Manager for consultancy works to Centennial Coal covering a broad range of disciplines, but primarily focussed on ecological impact assessments, monitoring and management at six coal mines in the western Blue Mountains and Lake Macquarie NSW.
- **Peabody Energy Australia** - Senior Project Manager for project specific and ongoing monitoring requirements for Wambo Coal Mine at Warkworth in the Upper Hunter Valley. Toby liaises directly with the Environmental Manager of the mine in relation to requirements to fulfil consent conditions for the ongoing development and operation of the project.
- **Allco Wind Energy** - This involved undertaking fauna surveys for a 100 turbine wind farm on the North Island of New Zealand and coordinating other ecological specialists to prepare an ecological impact assessment for submission to Taranaki Council. Aspects included regular liaison with the Department of Conservation regarding issues of significance, survey methodology, and mitigation and management measures to protect significant ecological features. Local bird groups were also involved and Toby was involved in the public consultation sessions.



Curriculum Vitae

- CONTINUED -

- **Stockland Wallarah Peninsula** - This Lake Macquarie, NSW project required a multi-disciplinary approach to an innovative residential proposal on environmentally sensitive land. Project management of, and participation in, a large and diverse planning team were major features of this work. Toby was a pivotal member of the project management team that provided the detailed ecological input and advice that was required from the early stages of the planning process to the point of submission to determining authorities. The proposal required sophisticated and creative impact assessment and reporting. Toby made a major contribution to the production of a series of comprehensive ecological reports that ensured the ecological integrity of the site was maintained in the post-development landscape.

PREVIOUS EXPERIENCE:

Senior Project Manager - Cumberland Ecology, Epping **2005**

Duties included flora and fauna surveying and survey design; overseeing and contribution to the preparation of complex ecological and environmental reports for both small and large projects; flora and fauna surveying and survey design; liaison with both the private sector and federal, state and local government departments.

Principal Consultant / Co-Founder - Keystone Ecological, Kariong **2004 - 2005**

Preparation and development of Keystone Ecological Flora and Fauna Impact Assessment report format; development of client database, including organisation of promotional material, logo design and customer relations; administration including preparation of quotes and invoices and organising accounts and BAS statements; Flora and fauna surveying and survey design; along with Anabat II Data Analysis.

Project Manager - Ecology - Conacher Travers Environmental, Somersby **1998 - 2004**

Supervision of flora and fauna survey design; report quality control; production of technical reports such as Review of Environmental Factors, Flora & Fauna Assessments, Statement of Environmental Effects, Species Impact Statements and Plans of Management, Land and Environment Court Evidence preparation, EPBC Act Referrals and Preliminary Information preparation; Flora & fauna surveying; liaison with Department of Environment and Conservation, Department of Environment and Heritage, Department of Infrastructure, Planning and Natural Resources, Department of Agriculture, Local Governments and private clients; Anabat II Data Analysis; Water Testing; Data Recording and Statistical Analysis.

Volunteer for Green and Golden Bell Frog Survey - Australian Museum, North Avoca **1999 - 2001**

Survey and searches for the endangered species Green & Golden Bell Frog; assisting in weighing, measuring and micro-chipping frogs for on-going research purposes.

Environmental Scientist - Australian Defence Industries (ADI), St Marys **1998**

Bore Water Sampling; statistical analysis of test results; and report production.

Environmental Scientist - Anne Clements & Associates, North Sydney **1997**

Field Assistant to Botanist and data recording.

Research Assistant - University of Newcastle **1996**

Initiation of design of final year project for Biology Dept; research into fire regimes on species composition & regeneration in open woodland; use of advanced scientific equipment including infra red gas analyser in the field, and replication of experiments using computer database; theoretical knowledge on soils, nutrient cycles & vegetation types.

MEMBERSHIPS & ACHIEVEMENTS:

- Ecological Consultants Association of NSW (ECA) – Council Member
- Newcastle Green Drinks for Environmental Professionals organising committee

Curriculum Vitae

Name: Shaun Corry

Office: RPS Newcastle

Position in Company: Ecologist

Qualifications / Memberships: Dip Conservation and Land Mgt
NSW Driver's Licence (Class C)
Waterways Authority Boating Licence
OH&S Induction Training (Green Card)
NPWS Scientific Investigation Licence
NSW Animal Ethics Research Authority

Areas of Expertise:

- Flora and fauna identification and habitat assessment
- Targeted threatened flora and fauna surveys
- Delineation and mapping of vegetation communities
- Endangered Ecological Community (EEC) assessment
- Experience with GPS/GIS for project design and mapping
- Conducting Field Surveys for Flora, Fauna and Habitat Identification
- Report Preparation including Fauna & Flora Assessments
- Ecological Monitoring and Reporting
- Bushfire Threat Assessment & Management reporting
- Understanding of environmental legislation

Recent Experience Includes:

Shaun has a broad range of Ecological Assessment reporting experience and ecological field experience. Experience within the consulting industry has primarily included a wide range of flora assessment disciplines as required by a wide range of public and private clients. Shaun has a strong grounding in threatened flora species, endangered ecological communities and populations throughout NSW. Shaun has undertaken flora and fauna surveys including targeted surveys for threatened flora species within the Blue Mountains, Hunter, Central Coast, Mid North Coast and Southern Queensland.

Appendix 6

EPBC Act Approval



The Hon Peter Garrett AM MP

Minister for Environment Protection, Heritage and the Arts

B09/3401

Mr Keith Dedden
Project Director
Coal & Allied Operations Pty Ltd
Level 3, 410 Ann Street
BRISBANE QLD 4000

Dear Mr Dedden

23 MAR 2010

Decision on approval

Coal & Allied Southern Estates Residential Development - Gwandalan, Catherine Hill Bay and Nords Wharf, NSW

I refer to your proposal to subdivide and develop approximately 101 hectares of land owned by Coal & Allied Operations Pty Ltd on the Wallarah Peninsula, as described in the referral documentation submitted on 20 August 2008.

I have considered the proposal in accordance with Part 9 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and have decided to grant an approval to Coal & Allied Operations Pty Ltd. The details of my decision are attached. The proposal must be undertaken in accordance with the conditions specified in the approval.

Please note any plans required as conditions of approval will be regarded as public documents unless you provide sufficient justification to warrant commercial-in-confidence status.

It should also be noted that, although an approval has been granted under Part 9 of the EPBC Act, this approval does not relieve the person to whom it has been granted from an obligation to comply with any other law of the Commonwealth, state or territory that is applicable to the action, and to have any right, title or interest that is required to access land or waters and to do the action.

My Department has an active audit program for proposals that have been referred or approved under the EPBC Act. The audit program aims to ensure that proposals are implemented as planned and that there is a high degree of compliance with any associated conditions. You should be aware that your project may be selected for audit by the Department at any time and all related records and documents may be subject to scrutiny. Information about the Department's audit strategy is enclosed. In addition, a request for the person undertaking the action to undertake an independent audit of compliance with the conditions of approval may be made under Section 458 of the EPBC Act.

APPROVAL

Coal & Allied residential subdivision, Wallarah Peninsula NSW (EPBC 2008/4419)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed action

person to whom the approval is granted

Coal & Allied Operations Pty Ltd
ACN: 000 023 656

proposed action

The subdivision and residential development of approximately 101 hectares of land owned by Coal & Allied Operations Pty Ltd on the Wallarah Peninsula at Gwandalan, Catherine Hill Bay and Nords Wharf to create up to 935 dwellings and associated infrastructure. The dedication of approximately 849 hectares of land to the New South Wales Government for permanent conservation is included as part of the action, as described in the referral documentation submitted on 20 August 2008.

Approval

relevant controlling provisions

The decision to approve has effect for:

- Listed threatened species and communities (sections 18 & 18A)

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

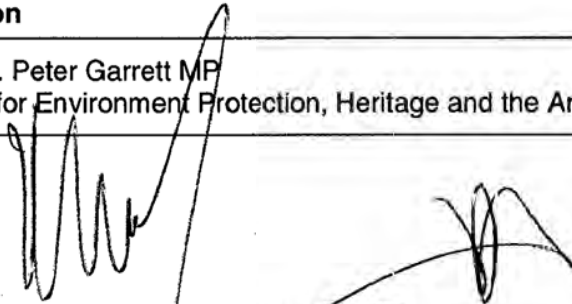
This approval has effect until 2039.

Person authorised to make decision

name and position

The Hon. Peter Garrett MP
Minister for Environment Protection, Heritage and the Arts

signature



date of decision

23rd March 2010

ANNEXURE 1

Conditions attached to the approval for Gwandalan developable area and conservation area.

- A1. The person taking the action must undertake the action in accordance with the conditions of this approval and as described in the referral documentation dated 20 August 2008. Where the referral documentation and these conditions are contradictory, these conditions shall prevail to the extent of the contradiction.
- A2. Prior to any commencement of works, the person taking the action must dedicate the approximate 206 ha of land identified as the Gwandalan conservation area to the NSW Government to be conserved in perpetuity.
- A3. The person taking the action must develop a management plan that:
- (a) ensures the long term management for conservation and viability of the *Angophora inopina* population in the northern section of the buffer zone on the eastern side of Kanangra Drive (refer to the map at Figure 2); and
 - (b) identifies actions for managing the long term impacts on the *A. inopina* population in the northern section of the buffer zone from the adjacent residential areas.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- A4. The person taking the action must develop a management plan that:
- (a) provides for monitoring of the impacts of mineral exploration and extraction on the viability of the *A. inopina* in the Gwandalan conservation area;
 - (b) identifies measures of viability that are critical thresholds which indicate a reduction in viability of the *A. inopina* in the Gwandalan conservation area which, once exceeded, will trigger a requirement for the person proposing to take the action to put in place management actions to address any reduction in viability; and
 - (c) identifies measures of viability that are critical thresholds which, once exceeded, will trigger a requirement for the person proposing take the action to source an additional area containing viable *A. inopina* to compensate for the impacts that the development in the Gwandalan developable area will have on *A. inopina*.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- A5. In order to minimise any potential impacts on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened species and suitable habitat that is known to, or likely to occur in the Gwandalan conservation area, a management and monitoring plan must be developed to address the following interface management issues between the Gwandalan developable area and the Gwandalan conservation area:
- (a) pedestrian access arrangements;
 - (b) edge effects due to disturbance of adjacent areas;
 - (c) procedures for identifying and conserving, hollow bearing and old growth habitat trees in the Gwandalan developable area;
 - (d) sediment and erosion control measures;
 - (e) water quality and quantity;
 - (f) domestic animals;
 - (g) spread of exotic and invasive species; and
 - (h) foreshore rehabilitation.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- A6. In order to minimise the potential impacts on the EPBC Act listed threatened species and suitable habitat that is known to, or likely to occur in the Gwandalan conservation area, the person proposing to take the action must develop a Stormwater Management Plan which ensures that stormwater discharged from the Gwandalan developable area meets the objective reductions set out in the October 2007 draft *Managing Urban Stormwater: environmental targets*, Department of Environment and Climate Change NSW.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- A7. Within ten calendar days of commencement of the works, the person taking the action must advise the Department in writing of the actual date of commencement.
- A8. Within three months of every 12 month anniversary of the commencement of the works, the person taking the action must submit to the Department an annual report addressing compliance with the conditions of this approval, including measures taken to implement the management plans required by this approval. Annual reports must be provided until the Minister is satisfied and the Department advises in writing that the proponent has complied with all conditions of the approval.
- A9. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, reports or strategies referred to in condition numbers A3, A4, A5 and A6 the person taking the action must submit for the Minister's approval a revised version of any such plan, report or strategy. If the Minister approves such a revised plan, report or strategy, that plan, report or strategy must be implemented in place of the plan, report or strategy originally approved.
- A10. If the Minister believes that it is necessary or desirable for the better protection of listed threatened species and communities to do so, the Minister may request that the person taking the action make specified revisions to the plans, reports or strategies approved pursuant to condition numbers A3, A4, A5 and A6 and submit the revised plan, report or strategy for the Minister's approval. The person taking the action must comply with any such request. The revised approved plan, report or strategy must be implemented.
- A11. If, at any time after 5 years from the date of this approval, the Minister notifies the person taking the action in writing that the Minister is not satisfied that there has been substantial commencement of the action, the action must not thereafter be commenced without the written agreement of the Minister.
- A12. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.

Definitions:

Commencement of works: Undertaking of any activity identified below under the definition of works.

Gwandalan conservation area: The area identified as conservation land (marked green) on the map at Figure 1.

Gwandalan developable area: The area identified as developable land (marked blue) on the map at Figure 1.

Department: The Australian Government Department responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Minister: The Minister responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Substantial commencement: the commencement of works.

Works: Includes any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy equipment for the purpose of breaking the ground for buildings or infrastructure. Works excludes any activity required to be undertaken to fulfil the requirements of condition numbers A2, A3, A4 and A5 above.

ANNEXURE 2

Conditions attached to the approval for Catherine Hill Bay developable area and conservation area.

- B1. The person taking the action must undertake the action in accordance with the conditions of this approval and as described in the referral documentation dated 20 August 2008. Where the referral documentation and these conditions are contradictory, these conditions shall prevail to the extent of the contradiction.
- B2. Prior to any commencement of works, the person taking the action must dedicate the approximate 527 ha of land identified as the Catherine Hill Bay conservation area to the NSW Government to be conserved in perpetuity.
- B3. In order to minimise any potential impacts on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened species and suitable habitat that is known to, or is likely to occur in the Catherine Hill Bay conservation area, a management and monitoring plan must be developed to address the following interface management issues between the Catherine Hill Bay developable area and the Catherine Hill Bay conservation area:
- (a) pedestrian access arrangements;
 - (b) edge effects due to disturbance of adjacent areas;
 - (c) procedures for identifying and conserving, hollow bearing and old growth habitat trees in the Catherine Hill Bay developable area;
 - (d) sediment and erosion control measures;
 - (e) water quality and quantity;
 - (f) domestic animals; and
 - (g) spread of exotic and invasive species.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- B4. In order to minimise the potential impacts on the EPBC Act listed threatened species and suitable habitat that is known to, or likely to occur in the Catherine Hill Bay Conservation area, the person proposing to take the action must prepare Stormwater Management Plans which ensure that stormwater discharged from the Catherine Hill Bay developable area meets the objective reductions set out in the October 2007 draft *Managing Urban Stormwater: environmental targets, Department of Environment and Climate Change NSW*.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented

- B5. Within ten calendar days of commencement of the works, the person taking the action must advise the Department in writing of the actual date of commencement.
- B6. Within three months of every 12 month anniversary of the commencement of the works, the person taking the action must submit to the Department an annual report addressing compliance with the conditions of this approval, including measures taken to implement the management plans required by this approval. Annual reports must be provided until the Minister is satisfied and the Department advises in writing that the proponent has complied with all conditions of the approval.
- B7. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, reports or strategies referred to in condition numbers B3 and B4 the person taking the action must submit for the Minister's approval a revised version of any such plan, report or strategy. If the Minister approves such a revised plan, report or strategy, that plan, report or strategy must be implemented in place of the plan, report or strategy originally approved.

- B8. If the Minister believes that it is necessary or desirable for the better protection of listed threatened species and communities to do so, the Minister may request that the person taking the action make specified revisions to the plans, reports or strategies approved pursuant to condition numbers B3 and B4 and submit the revised plan, report or strategy for the Minister's approval. The person taking the action must comply with any such request. The revised approved plan, report or strategy must be implemented.
- B9. If, at any time after 5 years from the date of this approval, the Minister notifies the person taking the action in writing that the Minister is not satisfied that there has been substantial commencement of the action, the action must not thereafter be commenced without the written agreement of the Minister.
- B10. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Departments website. The results of audits may also be publicised through the general media.

Definitions:

Catherine Hill Bay conservation area: The area identified as conservation land (marked green) on the map at Figure 3.

Catherine Hill Bay developable area: The area identified as developable land (marked blue) on the Map at Figure 3.

Commencement of works: Undertaking of any activity identified below under the definition of works.

Department: The Australian Government Department responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Minister: The Minister responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Substantial commencement: the commencement of works.

Works: Includes any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy equipment for the purpose of breaking the ground for buildings or infrastructure. Works excludes any activity required to be undertaken to fulfil the requirements of condition numbers B2, B3 and B4 above.

ANNEXURE 3

Conditions attached to the approval for Nords Wharf developable area and conservation area

- C1. The person taking the action must undertake the action in accordance with the conditions of this approval and as described in the referral documentation dated 20 August 2008. Where the referral documentation and these conditions are contradictory, these conditions shall prevail to the extent of the contradiction.
- C2. Prior to any commencement of works, the person taking the action must dedicate the approximate 116 ha of land identified as the Nords wharf conservation area to the NSW Government to be conserved in perpetuity.
- C3. In order to minimise any potential impacts on the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed threatened species and suitable habitat that is known to, or likely to occur in the Nords wharf conservation area, a management and monitoring plan must be developed to address the following interface issues between Nords Wharf developable area and Nords Wharf conservation area:
- (a) pedestrian access arrangements;
 - (b) edge effects due to disturbance of adjacent areas;
 - (c) procedures for identifying and conserving, hollow bearing and old growth habitat trees in the Nords Wharf developable area;
 - (d) sediment and erosion control measures;
 - (e) water quality and quantity;
 - (f) domestic animals; and
 - (g) spread of exotic and invasive species.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- C4. In order to minimise the potential impacts on the EPBC Act listed threatened species and suitable habitat that is known to, or likely to occur in the Nords Wharf conservation area, the person proposing to take the action must prepare Stormwater Management Plans which ensure that stormwater discharged from the Nords wharf developable area meets the objective reductions set out in the October 2007 draft *Managing Urban Stormwater: environmental targets*, Department of Environment and Climate Change NSW.

The plan must be approved in writing by the Minister prior to commencement of works. The approved plan must be implemented.

- C5. Within ten calendar days of commencement of the works, the person taking the action must advise the Department in writing of the actual date of commencement.
- C6. Within three months of every 12 month anniversary of the commencement of the works, the person taking the action must submit to the Department an annual report addressing compliance with the conditions of this approval, including measures taken to implement the management plans required by this approval. Annual reports must be provided until the Minister is satisfied and the Department advises in writing that the proponent has complied with all conditions of the approval.
- C7. If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans, reports or strategies referred to in condition numbers C3 and C4 the person taking the action must submit for the Minister's approval a revised version of any such plan, report or strategy. If the Minister approves such a revised plan, report or strategy, that plan, report or strategy must be implemented in place of the plan, report or strategy originally approved.

- C8. If the Minister believes that it is necessary or desirable for the better protection of listed threatened species and communities to do so, the Minister may request that the person taking the action make specified revisions to the plans, reports or strategies approved pursuant to condition numbers C3 and C4 and submit the revised plan, report or strategy for the Minister's approval. The person taking the action must comply with any such request. The revised approved plan, report or strategy must be implemented.
- C9. If, at any time after 5 years from the date of this approval, the Minister notifies the person taking the action in writing that the Minister is not satisfied that there has been substantial commencement of the action, the action must not thereafter be commenced without the written agreement of the Minister.
- C10. The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the above conditions of approval, including measures taken to implement the management plans required by this approval and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Departments website. The results of audits may also be publicised through the general media.

Definitions:

Commencement of works: Undertaking of any activity identified below under the definition of works.

Department: The Australian Government Department responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Minister: The Minister responsible for the *Environment Protection and Biodiversity Conservation Act 1999*.

Nords Wharf conservation area: The area identified as land (marked green) on the map at Figure 4.

Nords Wharf developable area: The area identified as developable land (marked blue) on the map at Figure 4.

Substantial commencement: the commencement of works.

Works: Includes any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy equipment for the purpose of breaking the ground for buildings or infrastructure. Works excludes any activity required to be undertaken to fulfil the requirements of condition numbers C2, C3 and C4.

FIGURE 1

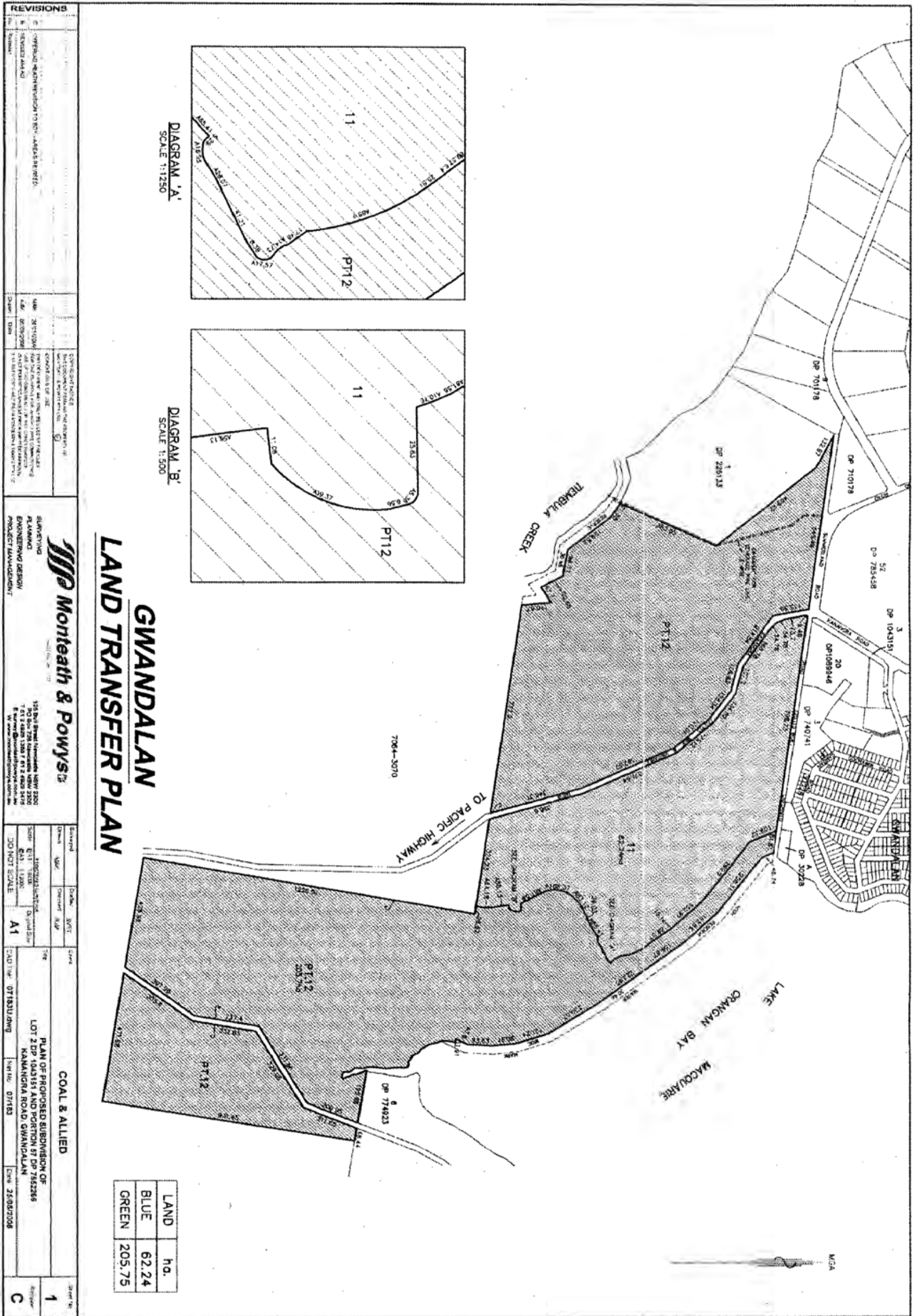


FIGURE 2

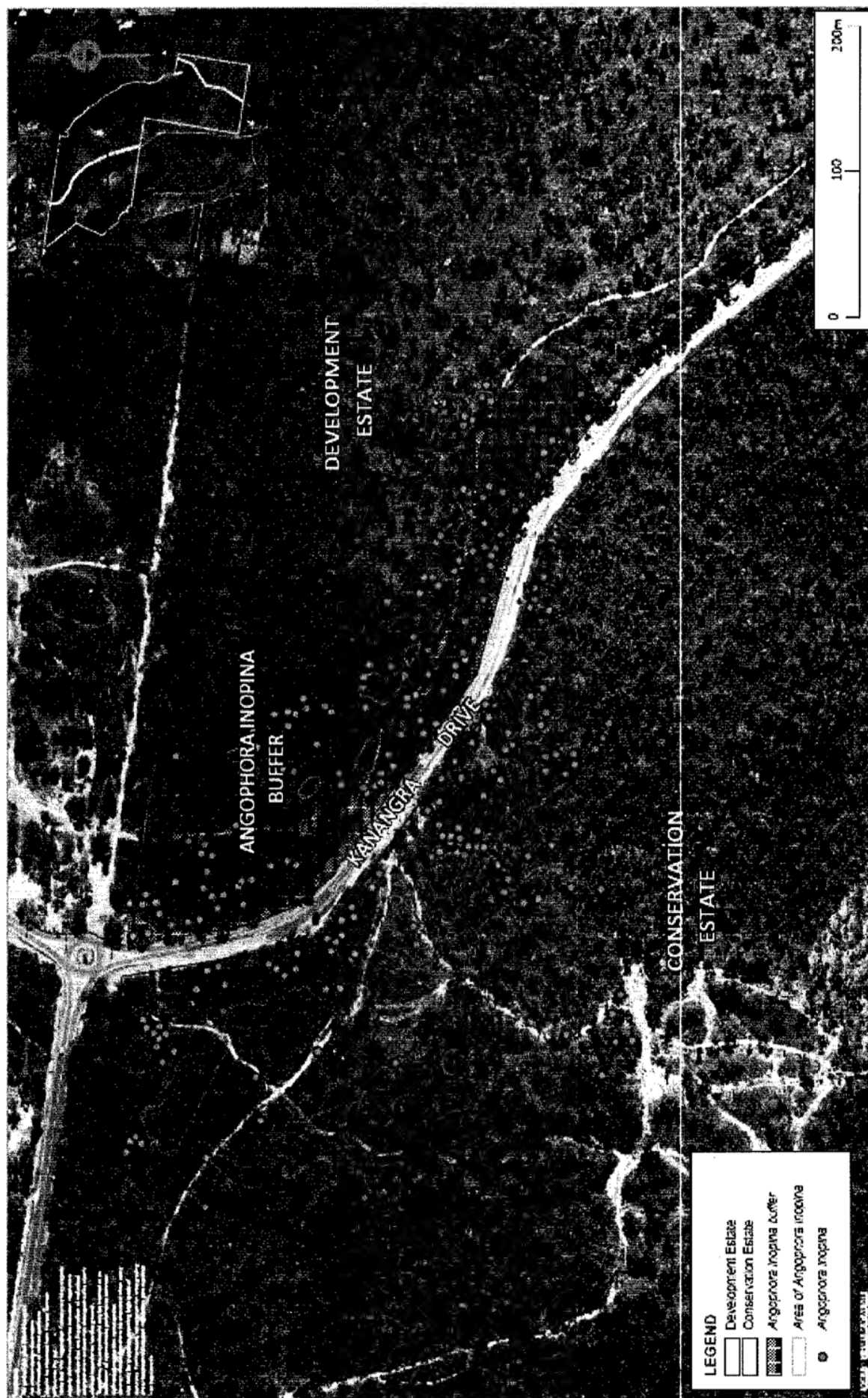


FIGURE 3

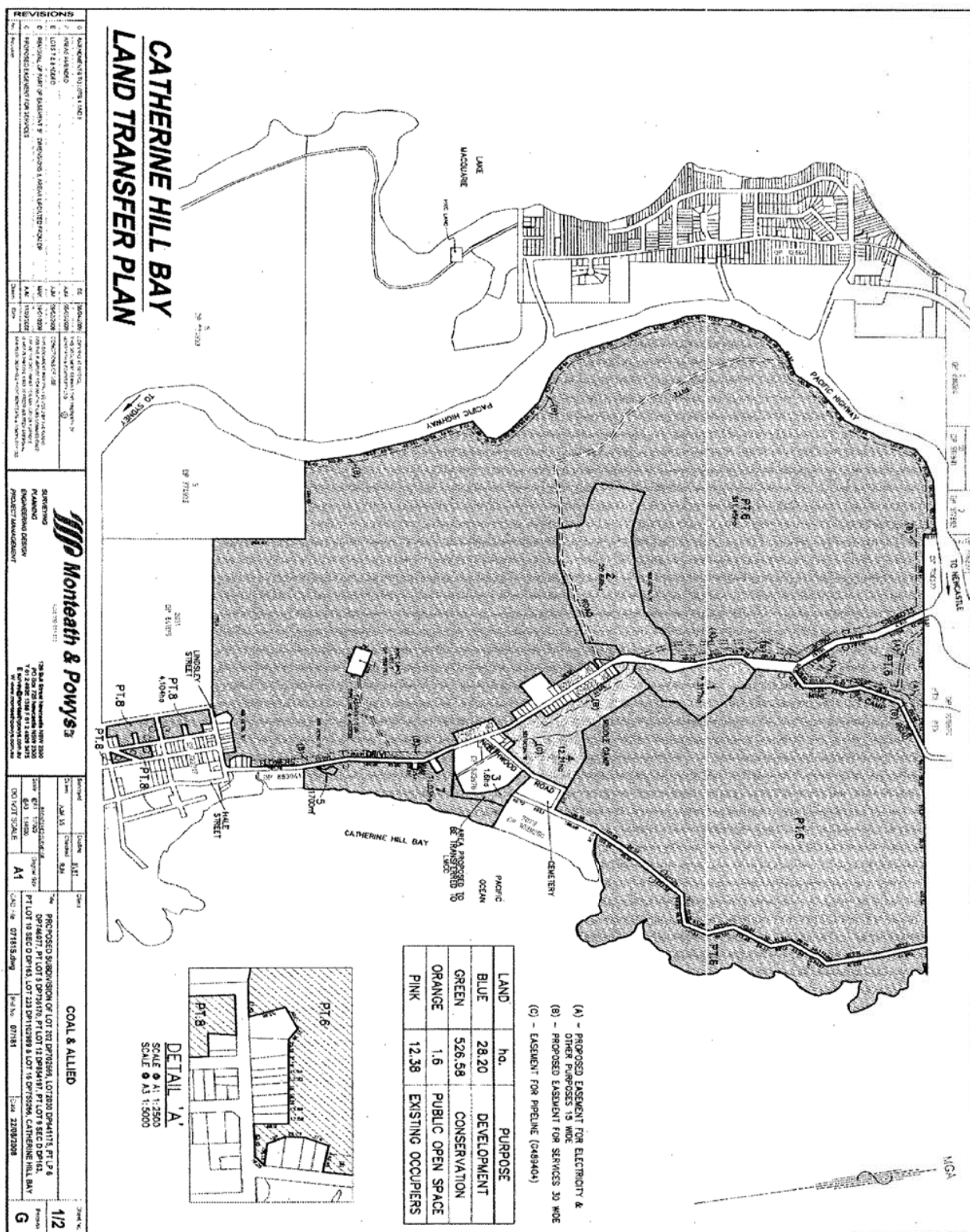
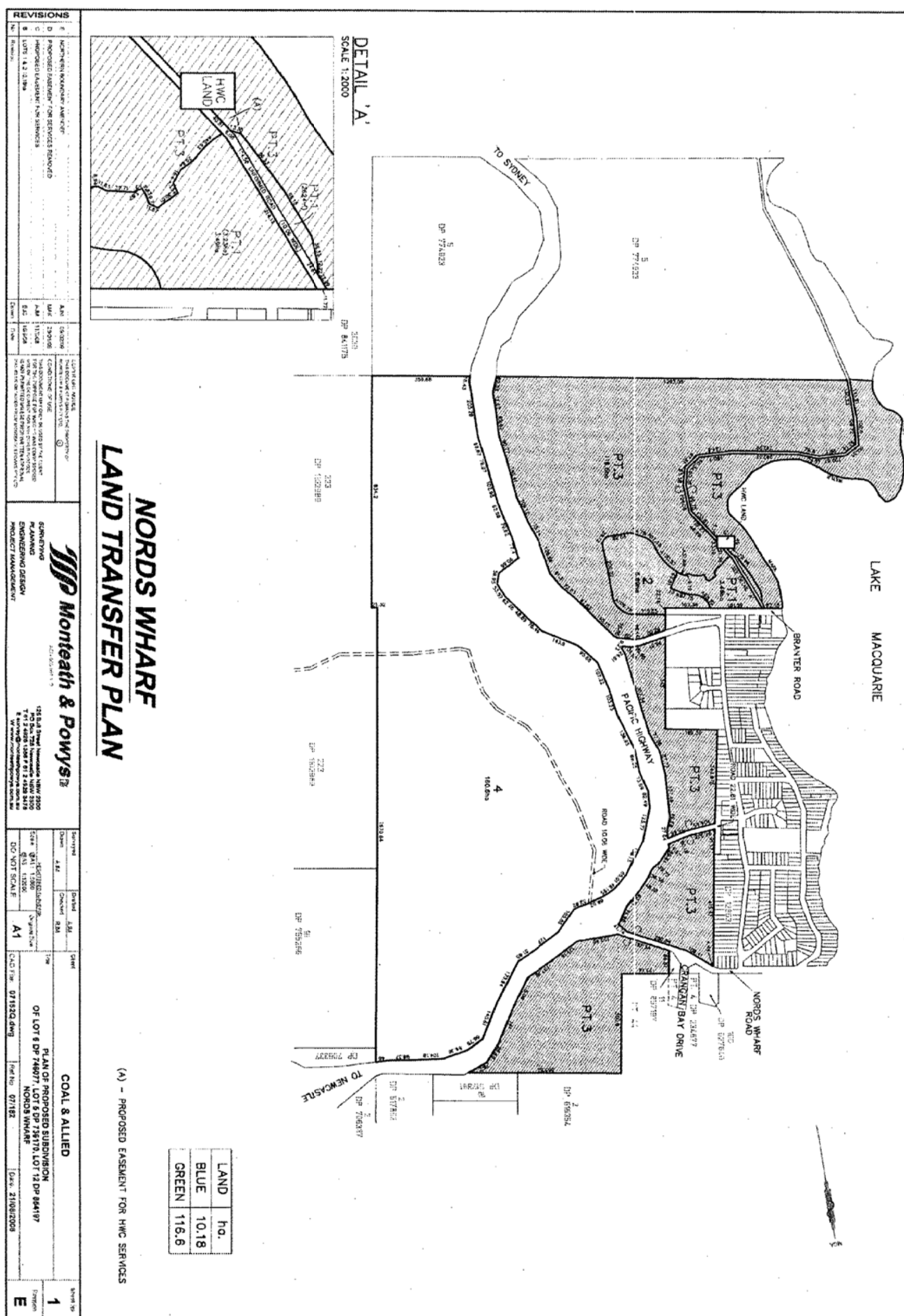


FIGURE 4



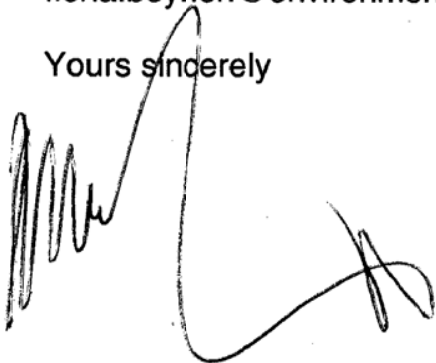
I have also written to the following parties to advise them of this decision:

State/territory
authority/authorities

Mr John Ross, Department of Planning

If you have any questions about this decision, please contact Ms Fiona Beynon, Director, SEQld/NSW Section, Environment Assessment Branch on 02 6275 9263 or fiona.beynon@environment.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to be 'Peter Garrett', with a large, sweeping flourish extending to the right.

Peter Garrett

