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Memorandum

To	Paul Wybrew	From	Aurecon C/o Jane Stark
Copy		Reference	225678
Date	18 April 2012	Pages (including this page)	10
Subject	Roma Ecological Assessment – Lot 94 WV456, Lot 96 WV457 and Lot 11 WV1759		

Mr Wybrew,

This memorandum documents the results of an ecological investigation of proposed spoil areas and power pole locations, herein referred to as the proposed development area, on Lot 94 WV456, Lot 96 WV457 and Lot 11 WV1759. Ecological investigations of the area were conducted on the 8th March 2012 by two (2) Aurecon ecologists (Leesa Leathbridge and Cassandra Arkinstall).

A report specific to additional proposed development areas within Lot 94 WV456, Lot 96 WV457 and Lot 11 WV1759 has been previously prepared and submitted to Santos (Ecological Assessment Report – Lot 94 WV456 and Lot 96 WV457; Document Reference 0020-GLNG-4-1.3-0022; Ecological Assessment Lot 94 WV456 and Lot 96 WV457 – Addendum memo; Document Reference 0020-GLNG-4-1.3-0086, Ecological Assessment Report - Roma Lot 11 on WV1759 Rev 2; Document Reference 0020-GLNG-4-1.3-0078 and Ecological Assessment Memo - Roma Lot WV1758 & Lot 11 1759 Fibre Optic Cable; Document Reference - 0020-GLNG-4-1.3-0079).

This memorandum should be treated as an addendum to the reports listed above. This memorandum is specific to the ecology of the proposed development areas illustrated in Figure 1, Figure 2 and the single power pole location described on Lot 11 WV1759.

Ecological Assessment

General

The proposed development areas are situated in a highly modified and disturbed environment with the areas historically cleared and managed for agricultural and grazing activities. Mature woody vegetation is largely limited to the road reserve which segregates Lot 94 WV456 and Lot 96 WV457; and to riparian areas associated with the defined watercourses (refer to Figure 1 and Figure 2).

The proposed development areas are mapped as non-remnant vegetation. Furthermore, no Environmentally Sensitive Areas (ESA) are mapped across the area. An 'Of Concern' Regional Ecosystem (RE 11.3.25/11.3.2) which is classified as a Category C ESA, is situated approximately 400 m east of the proposed development area.

A stream order 1 and stream order 2 watercourse, as defined by the Department of Environment and Resource Management (DERM), intersects the proposed development area. A dam has been constructed in association with the stream order 1 watercourse and forms part of the assessment area (refer Figure 1).

The ecological assessment area also included an assessment of a proposed power pole location (E 702552 N 7072269) on Lot 11 WV1759. The assessment area was defined by a 12 m radius of the pole location.

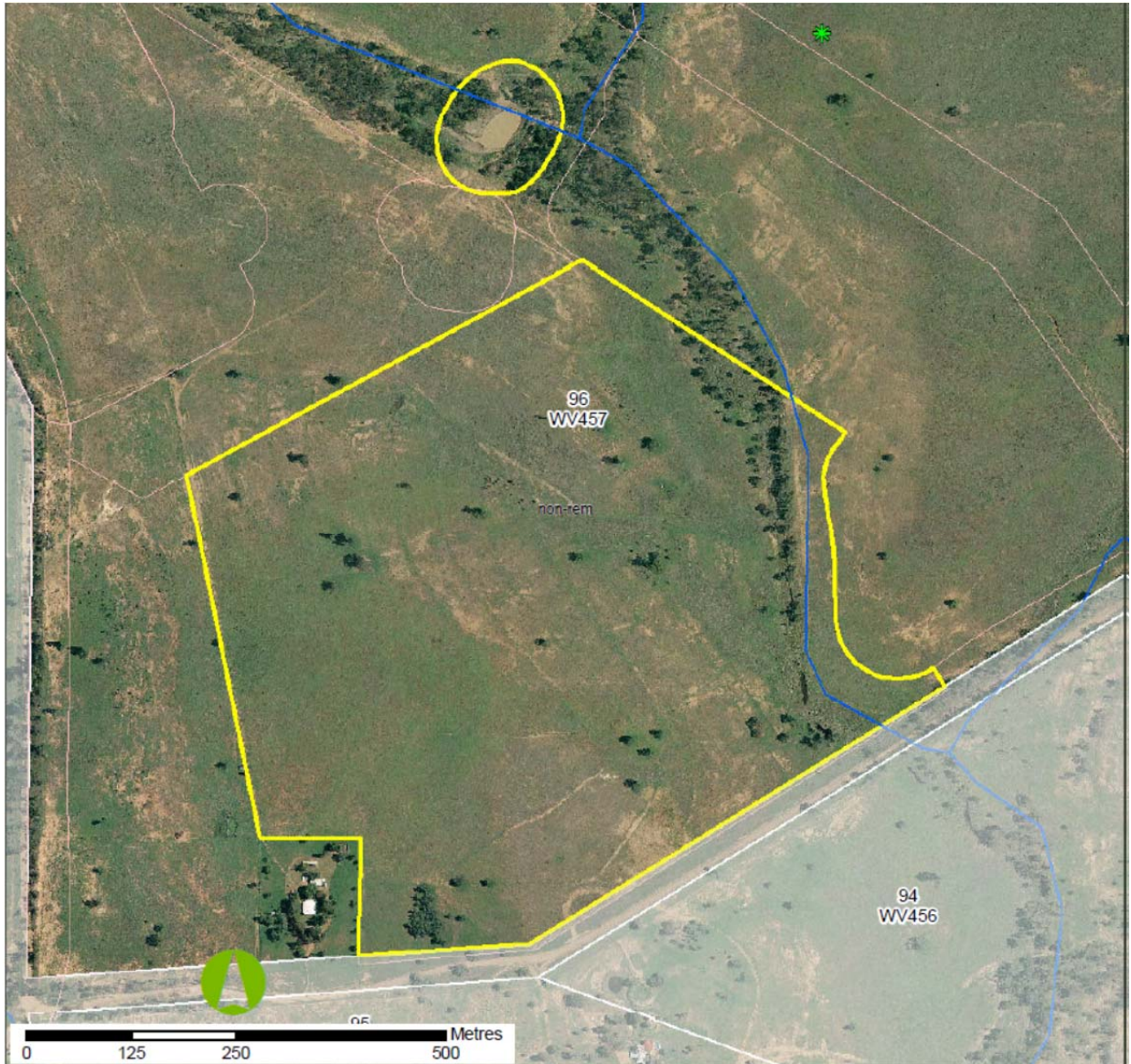


Figure 1 – Lot 96 WV457 Assessment Area

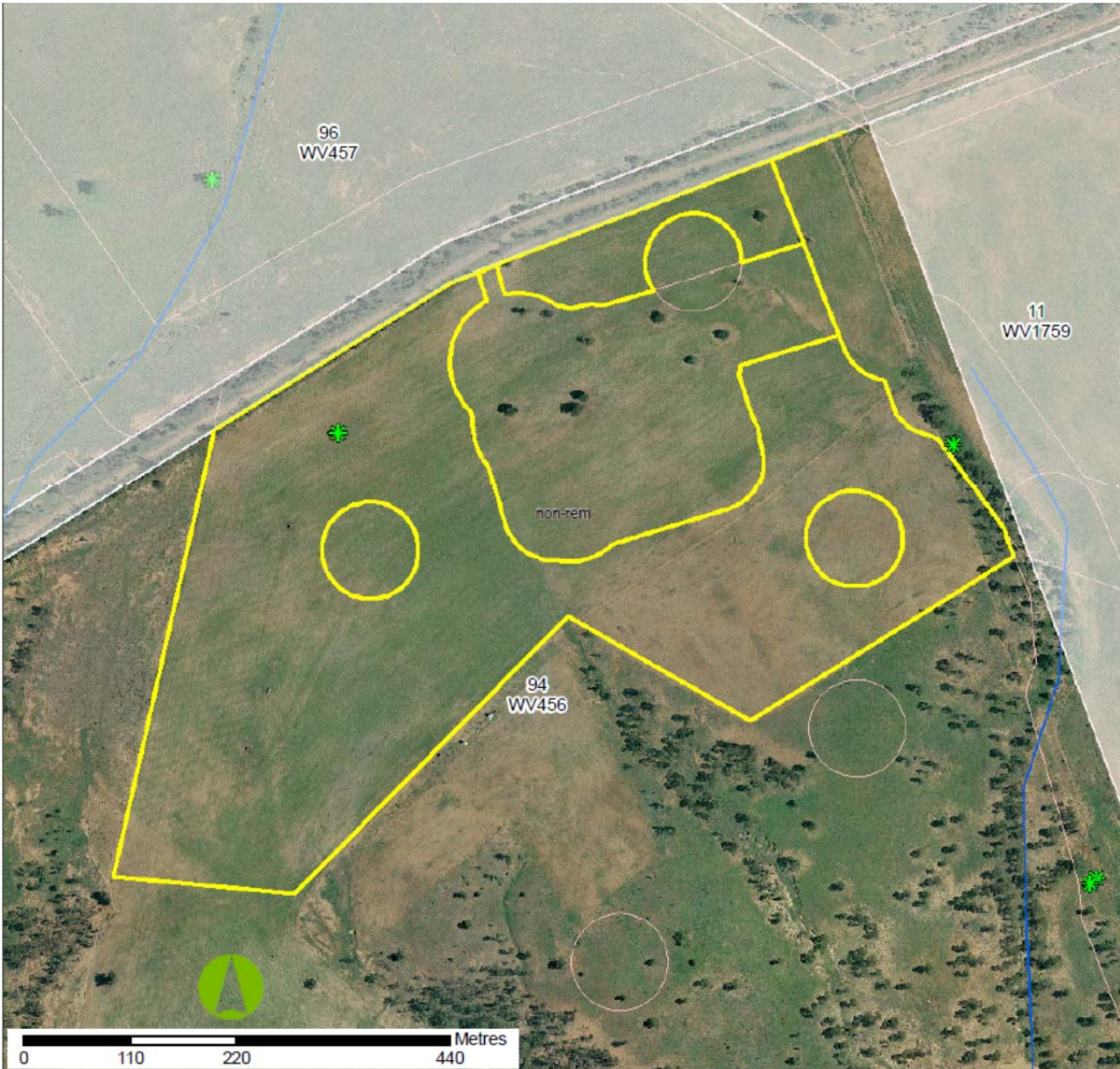


Figure 2 – Lot 94 WV456 Assessment Area

Floristics

The majority of the proposed development areas have been extensively cleared for agriculture and are dominated by *Pennisetum ciliare* (Buffel Grass). Other species present include *Aristida caput-medusae* (Many-headed Wire Grass), *Panicum simile* (Hairy Panic), *Solanum esuriale* (Brown Potato Bush) and *Verbena tenuisecta* (Mayne's Curse) (refer to Photo 1).

The road reserve area which divides Lot 94 WV456 and Lot 96 WV457 is defined by regrowth, woody vegetation dominated by *Eucalyptus populnea* (Poplar Box) at an average height of 10 m . The shrub layer supported *Eremophila mitchellii* (False Sandalwood) and *Geijera parviflora* (Wilga) at an average height of 5 m (refer to Photo 2).

Two Type A restricted plant species, *Brachychiton rupestris* (Narrow-leaved bottle-tree) and *Brachychiton populneus* (Kurrajong), have been previously recorded in the area (refer to Table 1). No other flora species of conservation significance or threatened ecological communities as protected under the provisions of the EPBC Act or the NC Act were recorded within the proposed development area.

A flora species list for the proposed development area is provided in Table 3.

Table 1 Type A restricted plant species previously recorded within the proposed development area

Species	Easting (GDA 94, Zone 55S)	Northing (GDA 94, Zone 55S)
<i>Brachychiton rupestris</i>	702330.79 m E	707 1674.85 m S
<i>Brachychiton populneus</i>	702936.70 m E	7031694.24 m S



Photo 1 Typical floristic structure of the proposed development areas



Photo 2 Typical floristic structure of road reserve areas

Habitat value

The proposed development areas contain limited woody vegetation and have been disturbed as a result of previous vegetation clearing for agricultural purposes. Habitat features present within the area include dense groundcover vegetation (ie grassy tussocks) and canopy vegetation within the road reserve areas and riparian zone of defined watercourses. These features may provide shelter and foraging value for avian and arboreal species. The habitat value of proposed development areas is considered low overall.

Accordingly, the species utilising resources in the proposed development areas are most likely to be limited to common, generalist species that are able to adapt to significant habitat disturbances. Common birds of prey and grassland species are also expected to utilise this site and the surrounding areas for foraging purposes.

Incidental fauna species recorded within the proposed development areas during the field investigations are listed in Table 2. No conservation significant fauna species (ie EVNT species listed under the provisions of the EPBC Act and/or the NC Act) were recorded during the field investigations.

Table 2 Incidental fauna species recorded within the proposed development areas

Family	Species Name	
	Scientific Name	Common Name
Acanthizidae	<i>Smicromnis brevirostris</i>	Weebill
Artamidae	<i>Cracticus nigrogularis</i>	Pied butcherbird
Artamidae	<i>Cracticus torquatus</i>	Grey butcherbird
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu
Columbidae	<i>Ocyphaps lophotes</i>	Crested pigeon
Corcoracidae	<i>Struthidea cinerea</i>	Apostlebird
Cracticidae	<i>Cracticus tibicen</i>	Australian magpie
Locustellidae	<i>Megalurus timoriensis</i>	Tawny grass bird
Macropodidae	<i>Macropus giganteus</i>	Eastern grey kangaroo
Macropodidae	<i>Macropus rufogriseus</i>	Red-necked wallaby
Maluridae	<i>Malurus melanocephalus</i>	Red backed fairy wren
Meliphagidae	<i>Manorina melanocephala</i>	Noisy miner bird
Motacillidae	<i>Anthus novaeseelandiae</i>	Australian pipit
Pardalotidae	<i>Pardalotus striatus</i>	Striated pardalote
Phasianidae	<i>Coturnix ypsilophora</i>	Brown quail

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Table 3 Flora Species List

Family	Species Name	
	Scientific Name	Common Name
Amaranthaceae	<i>Alternanthera pungens</i>	Kaki burr
Amaranthaceae	<i>Gomphrena celosioides</i>	Gomphrena weed
Apocynaceae	<i>Alstonia constricta</i>	Bitter bark
Asteraceae	<i>Bidens pilosa</i>	Cobblers pegs
Asteraceae	<i>Calocephalus platycephalus</i>	Billy buttons
Asteraceae	<i>Calotis cuneifolia</i>	Purple burr daisy
Asteraceae	<i>Calotis lappulacea</i>	Yellow burr daisy
Asteraceae	<i>Calotis multicaulis</i>	Woolly head burr daisy
Asteraceae	<i>Chrysocephalum apiculatum</i>	Yellow buttons
Asteraceae	<i>Cirsium vulgare</i>	Spear thistle
Asteraceae	<i>Conyza bonariensis</i>	Fleabane
Asteraceae	<i>Sonchus oleraceus</i>	Sow thistle
Asteraceae	<i>Tagetes minuta</i>	Stinking rodger
Asteraceae	<i>Xerochrysum bracteatum</i>	Everlasting daisy
Asteraceae	<i>Xanthium occidentale</i>	Noogoora burr
Brassicaceae	<i>Lepidium sagittulatum</i>	Pepper cress
Cactaceae	<i>Opuntia stricta</i> [^]	Prickly pear
Cactaceae	<i>Opuntia tomentosa</i> [^]	Velvety tree pear
Campanulaceae	<i>Wahlenbergia communis</i>	Large bluebells
Campanulaceae	<i>Wahlenbergia gracilis</i>	Sprawling bluebell
Capparaceae	<i>Capparis lasiantha</i>	Nipan
Casuarinaceae	<i>Allocasuarina luehmannii</i>	Bull oak
Chenopodiaceae	<i>Chenopodium carinatum</i>	Keeled goosefoot

Family	Species Name	
	Scientific Name	Common Name
Chenopodiaceae	<i>Enchylaena tomentosa</i>	Ruby saltbush
Chenopodiaceae	<i>Maireana microphylla</i>	Small-leaf bluebush
Chenopodiaceae	<i>Sclerolaena birchii</i>	Galvanised burr
Chenopodiaceae	<i>Sclerolaena muricata</i>	Black roly-polly
Convolvulaceae	<i>Evolvulus alsinoides</i>	Speed well
Cupressaceae	<i>Callitris endlicheri</i>	Black cypress pine
Cupressaceae	<i>Callitris glaucophylla</i>	White cypress pine
Cyperaceae	<i>Cyperus bifax</i>	Star sedge
Cyperaceae	<i>Cyperus difformis</i>	Dirty dora
Cyperaceae	<i>Cyperus gracilis</i>	Bunchy sedge
Cyperaceae	<i>Fimbristylis dichotoma</i>	Fimbristylis
Euphorbiaceae	<i>Chamaesyce drummondii</i>	Caustic weed
Fabaceae	<i>Senna artemisioides</i>	Senna
Fabaceae	<i>Glycine tabacina</i>	Variable glycine
Fabaceae	<i>Glycine tomentella</i>	Hairy glycine
Fabaceae	<i>Neptunia gracilis</i>	Native sensitive weed
Goodeniaceae	<i>Goodenia fascicularis</i>	Goodenia
Goodeniaceae	<i>Scaevola parvibarbata</i>	Purple flower scaevola
Hemerocallidaceae	<i>Dianella caerulea</i>	Blue flax-lily
Juncaceae	<i>Juncus usitatus</i>	Juncus
Lamiaceae	<i>Spartothamnella juncea</i>	Native broom
Laxmanniaceae	<i>Lomandra multiflora</i>	Lomandra
Malvaceae	<i>Abutilon otocarpum</i>	Chinese lantern
Malvaceae	<i>Sida acuta</i>	Spiny-headed Sida
Malvaceae	<i>Sida rhombifolia</i>	Paddy's lucerne
Malvaceae	<i>Sida subspicata</i>	Queensland hemp

Family	Species Name	
	Scientific Name	Common Name
Mimosaceae	<i>Acacia decora</i>	Pretty wattle
Mimosaceae	<i>Acacia excelsa</i>	Iron wood
Mimosaceae	<i>Acacia farnesiana</i>	Prickly mimosa
Mimosaceae	<i>Acacia harpophylla</i>	Brigalow
Mimosaceae	<i>Acacia salicina</i>	Sally wattle
Myoporaceae	<i>Eremophila debilis</i>	Winter apple
Myoporaceae	<i>Eremophila mitchellii</i>	False sandalwood
Myrsinaceae	<i>Anagallis arvensis</i>	Scarlet pimpernel
Myrtaceae	<i>Corymbia tessellaris</i>	Moreton bay ash
Myrtaceae	<i>Eucalyptus camaldulensis</i>	River red gum
Myrtaceae	<i>Eucalyptus melanophloia</i>	Silver leaved ironbark
Myrtaceae	<i>Eucalyptus populnea</i>	Poplar box
Oxalidaceae	<i>Oxalis stricta</i>	Yellow wood sorrel
Pittosporaceae	<i>Pittosporum spinescens</i>	Wallaby apple
Poaceae	<i>Aristida caput-medusae</i>	Many-headed wire grass
Poaceae	<i>Aristida jerichoensis</i>	Jericho wire grass
Poaceae	<i>Austrostipa verticillata</i>	Slender bamboo grass
Poaceae	<i>Bothriochloa bladhii</i>	Forest blue grass
Poaceae	<i>Bothriochloa decipiens var. decipiens</i>	Pitted bluegrass
Poaceae	<i>Chloris gayana</i>	Rhodes grass
Poaceae	<i>Chloris pectinata</i>	Comb chloris
Poaceae	<i>Chloris truncata</i>	Windmill grass
Poaceae	<i>Chloris virgata</i>	Silky topped rhodes grass
Poaceae	<i>Cymbopogon refractus</i>	Barbwire grass
Poaceae	<i>Cynodon dactylon</i>	Green couch
Poaceae	<i>Dactyloctenium radulans</i>	Button grass

Family	Species Name	
	Scientific Name	Common Name
Poaceae	<i>Dichanthium sericeum</i>	Queensland blue grass
Poaceae	<i>Eragrostis fallax</i>	Tall lovegrass
Poaceae	<i>Eriochloa crebra</i>	Tall cupgrass
Poaceae	<i>Heteropogon contortus</i>	Black spear grass
Poaceae	<i>Melinis repens</i>	Red natal grass
Poaceae	<i>Panicum decompositum</i>	Hairy panic
Poaceae	<i>Panicum effusum</i>	Inquisitive grass
Poaceae	<i>Panicum maximum</i>	Green panic
Poaceae	<i>Panicum simile</i>	Two-coloured panic
Poaceae	<i>Paspalidium caespitosum</i>	Brigalow grass
Poaceae	<i>Pennisetum ciliare</i>	Buffel grass
Poaceae	<i>Sporobolus caroli</i>	Desert sporobolus
Poaceae	<i>Sporobolus creber</i>	Western rats tail grass
Poaceae	<i>Themeda avenacea</i>	Wild oats grass
Poaceae	<i>Themeda triandra</i>	Kangaroo grass
Poaceae	<i>Thyridolepis mitchelliana</i>	Mulga mitchell grass
Poaceae	<i>Urochloa mosambicensis</i>	Urochloa
Portulacaceae	<i>Portulaca pilosa</i>	Hairy pigweed
Proteaceae	<i>Grevillea striata</i>	Beefwood
Proteaceae	<i>Hakea lorea</i>	Bootlace oak
Rubiaceae	<i>Canthium oleifolium</i>	Wild lemon
Rutaceae	<i>Geijera parviflora</i>	Wilga
Sapindaceae	<i>Alectryon diversifolius</i>	Scrub boonaree
Sapindaceae	<i>Atalaya hemiglauca</i>	Whitewood
Solanaceae	<i>Solanum esuriale</i>	Brown potato bush
Solanaceae	<i>Solanum nigrum</i>	Black nightshade

Family	Species Name	
	Scientific Name	Common Name
Sterculiaceae	<i>Brachychiton populneus</i> *	Kurrajong
Sterculiaceae	<i>Brachychiton rupestris</i> *	Narrow-leaved bottle-tree
Verbenaceae	<i>Verbena litoralis</i>	Tall verbena
Verbenaceae	<i>Verbena tenuisecta</i>	Mayne's curse

Table Notes ^ Class 2 declared weed listed under the *Land Protection (Pest and Stock Route Management) Act 2002*

 * Type A restricted plant species listed under the *Nature Conservation Act 1992*