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To	<b>Andrew Stannard</b>	From	<b>Jane Stark c/o Aurecon</b>
Copy		Reference	<b>225678</b>
Date	<b>13 August 2012</b>	Pages (including this page)	<b>8</b>
Subject	<b>Roma Ecological Assessment Report – Addendum Lot 23, 24 on WV432</b>		

Mr Stannard

This memorandum documents the results of ecological investigations of three proposed development areas within Lot 23 and Lot 24 on WV432 (Figure 1.1). This memorandum documents the results of ecological investigations in the following areas:

- Area A along the northern property boundary of Lot 23 on WV432
- Area B within the R122 corridor on Lot 24 on WV432
- Area C adjacent to the R54 corridor on Lot 24 on WV432

Ecological investigations of the area were conducted on 14 June by two Aurecon ecologists (Cassandra Arkinstall and John Lynn).

A report specific to additional proposed development areas has been previously prepared and submitted to Santos (Ecological Assessment Report - Roma Lots 22, 23 and 24 on WV432, Document Reference 0020-GLNG-4-1.3-0062 and associate addendums).

This memorandum should be treated as an addendum to the report listed above. This memorandum is specific to the ecology of the proposed development areas illustrated in Figure 1.1.

## 1 General

The proposed development areas are located within a landscape which has been modified as a result of previous vegetation clearing and agricultural activities (eg grazing of livestock, construction activities).

Mature woody vegetation within the proposed development areas is relatively sparse and fragmented from surrounding 'remnant' vegetation. All of the proposed development areas are currently mapped as 'non-remnant' on the Department of Environment and Heritage Protection (DEHP) certified Regional Ecosystem (RE) mapping.

There are no Environmentally Sensitive Areas (ESAs) mapped within the proposed development area (closest occurs approximately 1.38 km to the south-east).

Two watercourses as mapped on the DEHP hydrology layer (V2.1, 2011) are located within the proposed development area:

- A 'stream order 2' 'watercourse' flowing north to south traverses the east of Area B
- A 'stream order 3' 'watercourse' flowing north to south traverses the middle of Area B

The above watercourses converge into a 'stream order 3' 'watercourse' approximately 180 m south of Area B.

The landforms of Area A, B and C are gently undulating and contained brown sandy/clayey loam soils.



**Legend**

- ☆ EVNT and Type A Species
- EVNT Region
- Additional Areas Assessed
- Corridors - Ground Truth
- Watercourse
  
- Amended Regional Ecosystem (Biodiversity Status)**
- Endangered - Dominant
- Endangered - Sub-dominant
- Of Concern - Dominant
- Of Concern - Sub-dominant
- Not of Concern
  
- ESA Mapping**
- Category A
- Category B
- Category C

Source:  
 Cadastre: DERM, 2011.  
 Regional Ecosystems: Version 6.1, The State of Queensland (Department of Environment and Resource Management), Sept 2011. As amended by Aurecon, 2011.  
 ESAs: Coordinator-General's Evaluation Report for an Environmental Impact Statement – Gladstone Liquefied Natural Gas GLNG Project (May 2010) and the Santos GLNG Project CSG Fields – Environmental Protocol for Constraints Planning and Field Development (September 2011). Note: No ESA buffers have been included on this figure.

Date: 01/08/2012

Version: 1

Map by: JPC P:\GIS\Projects\215648\_Fairview\_Eop\_Assessment\215648\_Fairview\_147.mxd 01/08/2012 09:47



A1 scale: 1:6,000  
 0 100 200 400 Meters

Job No: 225678  
 Coordinate system: GDA\_1994\_MGA\_Zone\_55

**Figure 1.1: Additional Development Areas on Lot 23, 24 on WV432**

## 2 Floristics

### 2.1 Area A

The proposed development area occurs along a fence line on the northern property border of Lot 23 on WV432. The landscape of Area A has been modified as a result of previous land management practices (ie clearing for livestock grazing). As a result the proposed development area was devoid of a canopy stratum and woody vegetation was limited to sparse sub-canopy and shrub strata.

The sub-canopy stratum within Area A was dominated by *Eucalyptus populnea* (Poplar Box) and the sub-canopy cover was less than 10%. The height range of the sub-canopy stratum was 4.5 to 8 m.

The species composition and vegetation structure of the shrub stratum within Area A were both typical of disturbed/modified landscapes in the region. The shrub stratum had a height range of between 1 to 4 m and covered approximately 20% of Area A. The shrub stratum contained low regrowth of typical canopy/sub-canopy species including *Callitris glaucophylla* (White Cypress Pine), *E. populnea* (Poplar Box) and *Eucalyptus melanophloia* (Silver Leaf Ironbark).

The ground stratum within Area A was relatively dense (90% cover) and was dominated by *Pennisetum ciliare* (Buffel Grass) which is an exotic pasture plant.

### 2.2 Area B

The landscape of the proposed development area has been modified as a result of previous clearing for agricultural purposes, road/pipeline construction and well-pad construction (refer Photo 2.1). The vegetation structure of the proposed development area was typical of landscapes that have been previously cleared and grazed by livestock. This was evident in the low quantities of mature tree species, the relatively depauperate species composition of the shrub stratum and the dominance of exotic pasture grass in the ground stratum.

The canopy stratum was sparse and was dominated by *Eucalyptus chloroclada* (Dirty Gum). The canopy cover was less than 5% and had a height range of 16 to 18 m.

The sub-canopy stratum was also sparse and covered between 5 to 10% of the proposed development area. The sub-canopy layer contained species commonly observed in the region including *Acacia macradenia* (Zigzag Wattle), *C. glaucophylla* (White Cypress Pine) and *E. populnea* (Poplar Box). This layer had a height range of 4.5 to 8 m. A number of small (less than 0.5 ha) regrowth patches of *A. harpophylla* (Brigalow) were observed within the proposed development area.

The shrub stratum contained regrowth of species that were recorded in the extant canopy/sub-canopy layers. The shrub stratum also contained species such as *Psydrax oleifolia* (Hat Stand) and *Carissa Ovata* (Currant Bush). The shrub layer covered between 10 to 15% of the proposed development area and had a height range of 1 to 4 m.

The ground stratum was relatively dense (approximately 85% cover) and was dominated by *P. ciliare* (Buffel Grass). The species composition of the ground stratum was typical of modified/disturbed landscapes in the region.



Photo 2.1 Landscape facing east in Area B depicting small patches of *Acacia harpophylla* (Brigalow) and clearing for road/pipeline construction in the background

### 2.3 Area C

The landscape of the proposed development area has been modified as a result of previous clearing for agricultural purposes (refer Photo 2.2). Area C is adjacent to a site that has been recently cleared for the construction of a well-pad.

Area C was devoid of any vegetation that would constitute a canopy stratum, although an intact canopy stratum was present directly adjacent to the proposed development area. Woody vegetation was restricted to the sub-canopy and shrub layers. The sub-canopy layer was sparse (less than 5%) and was dominated by *C. glaucophylla* (White Cypress Pine). The sub-canopy layer had a height range of between 4.5 to 8 m.

The shrub stratum was relatively sparse (approximately 20% cover) and contained species typical of the surrounding area including *A. macradenia* (Zigzag Wattle), *C. glaucophylla* (White Cypress Pine) and *E. chloroclada* (Dirty Gum). The shrub stratum had a height range of 1 to 4 m.

The species composition and vegetation structure of the ground stratum within Area C was analogous to the ground stratum recorded within Area B in terms of species diversity.



**Photo 2.2** Depiction of typical vegetation observed in Area C, showing adjacent extant canopy stratum. Photograph is facing west towards adjacent well-pad

### **2.3.1 Conservation Significant Flora**

No species of conservation significance (ie 'endangered', 'vulnerable' and 'near threatened' species as listed under the provisions of the Queensland *Nature Conservation Act 1992* [NC Act] or 'critically endangered', 'endangered' and 'vulnerable' listed as listed under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]) were recorded within Area A, B or C.

No 'Type A restricted plant' species as listed under the provisions of the NC Act were recorded in the proposed development areas. There are, however, several *Brachychiton populneus* (Kurrajong) trees situated in close proximity to the proposed development areas, between Area B and Area C.

A list of flora species observed within the proposed development area is provided in Table 3.3.

### 3 Habitat Value

The range of habitat opportunities available for utilisation by fauna varied throughout Area A, B and C. A summary of the habitat opportunities is provided in Table 3.1.

Table 3.1 Summary of habitat opportunities throughout the proposed development areas and relative habitat ratings based on resource availability

Area / Habitat Opportunity	Canopy cover	Fissured tree bark	Dense groundcover	Woody debris	Leaf Litter	Relative Habitat Value
Area A	Limited	Absent	Present	Limited	Present	Low
Area B	Present	Present	Present	Present	Present	Medium
Area C	Limited	Absent	Present	Limited	Present	Low

The overall habitat value of the proposed development areas is considered to be low/medium due to the moderate amount of woody vegetation within Area B. Habitat opportunities throughout the proposed development area are reduced as a result of the disturbance from vegetation clearing and construction activities.

Incidental fauna species recorded within the proposed development areas during the field investigations are listed in Table 3.2. No species of conservation significance as listed under the provisions of the NC Act and/or the EPBC Act were recorded within Area A, B or C during site investigations.

Table 3.2 Fauna species recorded with the proposed development area

Class	Common Name	Scientific Name
Birds	Galah	<i>Eolophus roseicapilla</i>
	Magpie-Lark	<i>Grallina cyanoleuca</i>
	Nankeen Kestrel	<i>Falco cenchroides</i>
	Noisy Miner	<i>Manorina melanocephala</i>
	Pale-headed Rosella	<i>Platycercus adscitus</i>
	Striated Pardalote	<i>Pardalotus striatus</i>
	Weebill	<i>Smicromis brevirostris</i>
	Welcome Swallow	<i>Hirundo neoxena</i>
	White-faced Heron	<i>Egretta novaehollandiae</i>
	Willie Wagtail	<i>Rhipidura leucophrys</i>

Table 3.3 Flora species recorded within the proposed development area

Family	Scientific Name	Common Name	Notes
Adiantaceae	<i>Cheilanthes sieberi</i>	Mulga Fern	
Apocynaceae	<i>Carissa ovata</i>	Currant Bush	
Asteraceae	<i>Chrysocephalum apiculatum</i>	Yellow Buttons	
Asteraceae	<i>Conyza bonariensis</i>	Fleabane	Non-native
Asteraceae	<i>Xanthium occidentale</i>	Noogoora Burr	Non-native
Asteraceae	<i>Xerochrysum bracteatum</i>	Everlasting Daisy	

Family	Scientific Name	Common Name	Notes
Capparaceae	<i>Capparis lasiantha</i>	Nipan,	
Capparaceae	<i>Capparis loranthifolia</i>	Narrow-leaf Bumble Fruit	
Celastraceae	<i>Maytenus cunninghamii</i>	Yellow Berry Bush	
Chenopodiaceae	<i>Maireana microphylla</i>	Small-leaf Bluebush	
Chenopodiaceae	<i>Sclerolaena birchii</i>	Galvanised Burr	
Convolvulaceae	<i>Evolvulus alsinoides</i>	Speed Well	
Cupressaceae	<i>Callitris glaucophylla</i>	White Cypress Pine	
Cyperaceae	<i>Fimbristylis dichotoma</i>	Fimbristylis	
Erythroxylaceae	<i>Erythroxylum australe</i>	Cocaine Tree	
Juncaceae	<i>Juncus usitatus</i>	Juncus	
Laxmanniaceae	<i>Lomandra leucocephala</i>	Lomandra	
Laxmanniaceae	<i>Lomandra longifolia</i>	Lomandra	
Loranthaceae	<i>Amyema sp</i>	Mistletoe	
Malvaceae	<i>Abutilon sp</i>	Abutilon	
Malvaceae	<i>Malva parviflora</i>	Small-flowered Mallow	Non-native
Malvaceae	<i>Malvastrum americanum</i>	Spiny Malvastrum	Non-native
Malvaceae	<i>Sida hackettiana</i>	Spiny-headed Sida	
Malvaceae	<i>Sida subspicata</i>	Queensland Hemp	
Meliaceae	<i>Owenia acidula</i>	Emu Apple	
Mimosaceae	<i>Acacia excelsa</i>	Ironwood	
Mimosaceae	<i>Acacia harpophylla</i>	Brigalow	
Mimosaceae	<i>Acacia leiocalyx</i>	Black Wattle	
Mimosaceae	<i>Acacia macradenia</i>	Zigzag Wattle	
Myoporaceae	<i>Eremophila deserti</i>	Turkeybush	
Myoporaceae	<i>Eremophila mitchellii</i>	False Sandalwood	
Myrtaceae	<i>Corymbia sp (juvenile)</i>		
Myrtaceae	<i>Eucalyptus chloroclada</i>	Dirty Gum	
Myrtaceae	<i>Eucalyptus melanophloia</i>	Silver Leaved Ironbark	
Myrtaceae	<i>Eucalyptus populnea</i>	Poplar Box	
Oleaceae	<i>Jasminum didymum</i>	Native Jasmine	
Plantaginaceae	<i>Plantago cunninghamii</i>		
Poaceae	<i>Aristida caput-medusae</i>	Curly Head Wire Grass	
Poaceae	<i>Aristida holathera</i>	Tall Wire Grass	
Poaceae	<i>Austrostipa verticillata</i>	Slender Bamboo Grass	
Poaceae	<i>Bothriochloa bladhii</i>	Forest Blue Grass	
Poaceae	<i>Chloris truncata</i>	Windmill Grass	
Poaceae	<i>Chloris virgata</i>	Silky Topped Rhodes Grass	
Poaceae	<i>Cymbopogon refractus</i>	Barbwire Grass	

Family	Scientific Name	Common Name	Notes
Poaceae	<i>Digitaria ammophila</i>	Digitaria	
Poaceae	<i>Eragrostis brownii</i>	Browns Lovegrass	
Poaceae	<i>Eragrostis fallax</i>	Tall Lovegrass	
Poaceae	<i>Eragrostis sororia</i>	Blue Eragrostis	
Poaceae	<i>Heteropogon contortus</i>	Black Spear Grass	
Poaceae	<i>Megathyrsus maximus</i>	Green Panic	Non-native
Poaceae	<i>Panicum decompositum</i>	Hairy Panic	
Poaceae	<i>Panicum effusum</i>	Inquisitive Grass	
Poaceae	<i>Pennisetum ciliare</i>	Buffel Grass	Non-native
Poaceae	<i>Perotis rara</i>	Comet Grass	
Poaceae	<i>Sporobolus creber</i>	Western Rat's Tail Grass	
Poaceae	<i>Themeda avenacea</i>	Wild Oats Grass	
Poaceae	<i>Themeda triandra</i>	Kangaroo Grass	
Poaceae	<i>Urochloa mosambicensis</i>	Sabi Grass	Non-native
Proteaceae	<i>Grevillea striata</i>	Beefwood	
Proteaceae	<i>Hakea lorea</i>	Bootlace Oak	
Rubiaceae	<i>Psyrax oleifolia</i>	Hat stand	
Rutaceae	<i>Geijera parviflora</i>	Wilga	
Sapindaceae	<i>Alectryon diversifolius</i>	Scrub Boonaree	
Sapindaceae	<i>Atalaya hemiglauca</i>	Whitewood	
Sapindaceae	<i>Dodonaea viscosa</i>	Sticky Hopbush	
Solanaceae	<i>Solanum stelligerum</i>	Devil's Needles	
Verbenaceae	<i>Verbena litoralis</i>	Tall Verbena	Non-native
Verbenaceae	<i>Verbena officinalis</i>	Native Verbena	
Verbenaceae	<i>Verbena tenuisecta</i>	Mayne's Curse	Non-native