

13 March 2018

Our Reference: 14016-18-RESR-1RevB_180313

Ben Malseed
Environmental Advisor - Developments
Woodside Energy Ltd
Woodside Plaza
240 St Georges Terrace
Perth WA 6000

Dear Ben,

Re: Pluto Haul Road – Vegetation Assessment, March 2018

1 Introduction

Astron Environmental Services (Astron) was engaged by Woodside Energy Ltd (Woodside) as part of the Pluto Domestic Fuel Supply Project to conduct a vegetation assessment of the proposed weighbridge area along the Pluto Haul Road in the Burrup Peninsula region of the Pilbara, Western Australia. The assessment was conducted on the 7th of March 2018 by Vicki Long, (Astron) and Olivia McDonald (Woodside). The survey area included the previously disturbed Haul Road verges from the edge of the gravel to the existing two-wire fence.

2 Methods

The survey area extended from:

- South-west: 475237mE 7720746mN
- South-east: 475266mE 7720725mN
- North-west: 475419mE 7721060mN
- North-east: 475427mE 7721005mN

3 Results

3.1 Vegetation

The vegetation along the majority of both the east and western sides of the Haul Road consists of opportunistic native species and is dominated by *Acacia bivenosa* and *Triodia angusta*. This can be described as:

- *Acacia bivenosa* tall shrubland over *Triodia angusta* tall hummock grassland to closed tall hummock grassland. There are scattered *Eucalyptus victrix* also present. (Plates 1, 2 and 3).

There are shallow gullies intercepting the Haul Road, here the vegetation is described as:

- *Cyperus vaginatus* open sedgeland with *Stemodia grossa* open, sometimes scattered low shrubland and *Heliotropium curassavicum* open prostrate herbland. There are scattered *Eucalyptus victrix* (Plate 4 & Appendix 1).

The *Acacia bivenosa* shrubland/*Triodia angusta* vegetation type is typical of regrowth on disturbed sites and is well represented on such areas on the Burrup. The gully vegetation is also well represented within the Pluto Conservation Zone and the Burrup generally.



Plate 1: Straggly tall *Acacia bivenosa* over *Triodia angusta* hummock grassland.



Plate 2: Straggly tall *Acacia bivenosa* over *Tridodia angusta* hummock grassland.



Plate 3: Straggly tall *Acacia bivenosa* along road verge.



Plate 4: Gully vegetation of *Cyperus vaginatus*/*Stemodia grossa*.

3.2 Flora

A total of 30 flora species were recorded during the survey within the survey boundary, including one weed species (**Aerva javanica* (kapok bush)). A complete list of recorded flora species can be found in Table 1 below.

Family	Species
Amaranthaceae	<i>*Aerva javanica</i>
Asteraceae	<i>Streptoglossa decurrens</i>
Boraginaceae	<i>Ehretia saligna</i>
	<i>Heliotropium curassavicum</i>
	<i>Trichodesma zeylanicum</i>
Chenopodiaceae	<i>Rhagodia eremaea</i>
	<i>Trianthema turgidifolia</i>
Cleomaceae	<i>Cleome viscosa</i>
Convolvulaceae	<i>Ipomoea costata</i>
Cucurbitaceae	<i>Cucumis variabilis</i>
Cyperaceae	<i>Cyperus vaginatus</i>
Euphorbiaceae	<i>Adriana tomentosa</i>
Fabaceae	<i>Acacia bivenosa</i>
	<i>Acacia coriacea</i>
	<i>Tephrosia rosea</i> var. <i>clementii</i>
	<i>Canavalia rosea</i>
Lauraceae	<i>Cassytha capillaris</i>
Malvaceae	<i>Hibiscus sturtii</i>
	<i>Triumfetta appendiculata</i>
	<i>Triumfetta clementii</i>

Myrtaceae	<i>Eucalyptus victrix</i>
	<i>Corymbia hamersleyana</i>
Nyctaginaceae	<i>Boerhavia gardneri</i>
Phyllanthaceae	<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>
Plantaginaceae	<i>Stemodia grossa</i>
Poaceae	<i>Triodia angusta</i>
	<i>Triodia epactia</i>
	<i>Cymbopogon ambiguus</i>
	<i>Paspalidium tabulatum</i>
Solanaceae	<i>Solanum cleistogamum</i>

Table 1: Pluto haul road flora list.

During the survey it was noted that an additional two tree species were present east of the east fence line (immediately outside the proposed weighbridge disturbance area). These species are can be found in Table 2 below.

Family	Species
Combretaceae	<i>Terminalia supranitifolia</i> (P3)
Malvaceae	<i>Brachychiton acuminatus</i>

Table 2: Species recorded immediately outside the east fence.

3.3 Priority Flora

One Priority *Terminalia supranitifolia* P3 low tree was located on the eastern side of the Haul Road, at the base of a rockpile, immediately east of the fence line at GPS 475350mE 7720870mN. Its close proximity to the fence line is illustrated in Plate 5 and Attachment 1.



Plate 5: Priority *Terminalia supranitifolia* P3 immediately east of the fence line, on the east side of the Haul Road.

3.4 Tree Species

There are approximately 12 *Eucalyptus victrix* trees on the eastern side, and one on the western side of the Haul Road which may be removed for the project (Plate 6). These are well established to 2.5 m tall. Their presence indicates their ability to germinate and establish on disturbed sites. One *Corymbia hamersleyana* (bloodwood) and one *Ehretia saligna* (false cedar) will be removed within the weighbridge area. There are three large *Acacia coriacea* (dogwood) shrubs that may be removed (two on the east side and one on the west), their presence also indicates they can establish following disturbance. There are scattered trees of *Brachychiton acuminatus*, *Flueggea virosa*, *Corymbia hamersleyana* and *Ehretia saligna* which occur immediately outside the existing fence on the east side. None of these trees are species of conservation significance.



Plate 6: *Eucalyptus victrix* along road verge in weigh bridge area which will be removed.

4 Conclusions

The results outlined in this letter indicate that no new and unexpected species have been recorded within the Pluto Domestic Fuel Supply Haul Road weighbridge area and that the vegetation types present during the survey are well represented in the area's within and adjacent to the Pluto facility.

This letter has been prepared by Associate Environmental Scientist Vicki Long and Project Coordinator John Rouw. If you have any queries please contact myself or Project Coordinator John Rouw.

Yours sincerely
ASTRON ENVIRONMENTAL SERVICES

Dr Stuart Pearse
General Manager

Attachments

Attachment 1: Vegetation Communities



Attachment 1: Vegetation Communities



Woodside Energy Ltd
 Woodside Pluto Haul Road Vegetation Assessment
Figure A.1: Vegetation Communities



Author: V. Long	Date: 13-03-2018
Drawn: C. Dyde	Figure Ref: 14016-18-BIDR-1RevA_180313_FigA1

Coordinate System: GDA 1994 MGA Zone 50

0 10 20 30 40 50 Metres

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