Origin Energy

DA1656

Ecological Assessment Report

December 2014

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1. Introduction

This report provides a description of the ecological values within five lots (Disturbance Approval (DA) 1656), herein referred to as 'the Site'. The results are based on an initial desktop assessment followed by a field survey to confirm the vegetation communities, flora and fauna species, habitat values and areas of disturbance.

The field surveys and reporting were undertaken by Peter Moonie and Courtenay Mills, GHD. Both ecologists were approved to undertake ecological surveys by Commonwealth Department of Environment (DoE) (formerly the Department of Sustainability, Environment, Water, Population and Communities) in writing on 15 March 2012. The field survey was undertaken from 11 to 21 November 2014.

1.1 Scope of Works

An ecological assessment was required within five lot plans, described as:

- Lot 10 RP896637
- Lot 20 RP896637
- Lot 21 RP896637
- Lot 1 SP184934
- Lot 2 SP184934

The assessment required a 'whole-of-property' approach, investigating all areas within the petroleum lease boundary and adjacent road reserves. The survey extent is shown in Appendix A, with these figures displaying vegetation assessment sites and fauna habitat assessment sites. As shown in Appendix A, areas within a 600 m radius around homesteads were excluded from the surveyed area, together with a portion of lot 21 RP896637 that is not encompassed by the petroleum lease.

1.2 Definition and abbreviations

1.2.1 Definitions

Descriptions of key terms are detailed in Table 1.

Table 1 Definitions

Term	Definition
Site	The full extent of land within the property boundaries of lots 10 RP896637, 20 RP 896637, 21 RP896637, 1 SP184934 and 2 SP184934.
Study Area	Area surveyed as a part of the ecological assessment incorporating the area within the property boundaries of lots 10 RP896637, 20 RP 896637, 21 RP896637, 1 SP184934 and 2 SP184934. Areas within a 600 m radius around homesteads were excluded from the Study Area, together with a portion of lot 21 RP896637 that is not encompassed by the petroleum lease.
Ramsar	Convention on Wetlands of International Importance (the Ramsar Convention) was signed in Ramsar, Iran on 2 February 1971. The

Term	Definition
	Ramsar Convention aims to halt the worldwide loss of wetlands and to conserve, through wise use and management, those that remain. The Convention encourages member countries to nominate sites containing representative, rare or unique wetlands, or that are important for conserving biological diversity, to the List of Wetlands of International Importance (Ramsar sites).
Remnant vegetation	Woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy.
Trimble	Trimble integrates positioning technologies such as GPS, laser and optical with application software, wireless communications and services to provide innovative positioning solutions for applications such as surveying, construction and engineering. Solutions include GPS/GNSS, optical total stations, 3D laser scanners, machine guidance systems, construction lasers and software

1.2.2 Abbreviations

Abbreviations used through the report are explained in Table 2

Table 2 Abbreviations

Abbreviation	Description
Australia Pacific LNG	Australia Pacific LNG Pty Limited
BoM	Bureau of Meteorology
Cth	Commonwealth Legislation
DA	Disturbance Approval
DEHP	Department of Environment and Heritage Protection
DoE	Department of Environment
DNRM	Department of Natural Resources and Mines (Qld)
DSITIA	Department of Science, Information Technology, Innovation and the Arts (Qld)
E	Endangered status under the EPBC Act and/or NC Act
EP Act	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environment Protection Biodiversity and Conservation Act 1999* (Cth)
ESA	Environmentally Sensitive Area
GPS	Global positioning system
I	Introduced

Abbreviation	Description
km	Kilometres
LC	Least concern
LNG	Liquefied Natural Gas
LP Act	*Land Protection (Pest and Stock Route Management) Act 2002* (Qld)
Ma	Marine status under the EPBC Act
Mi	Migratory status under the EPBC Act
MNES	Matters of National Environmental Significance
NC Act	*Nature Conservation Act 1992* (Qld)
NC Reg	*Nature Conservation (Wildlife) Regulation 2006 (Qld)*
NT	Near threatened under the NC Act
OC	Of concern under the EP Act
Qld	Queensland
RE	Regional Ecosystem
SLC	Special Least Concern under the NC Act
TEC	Threatened Ecological Community
V	Vulnerable status under the EPBC Act and/or NC Act
WoNS	Weed of National Significance

1.2.3 Document revision table

Revisions of the document are outlined in Table 3.

Table 3 Revision History

Revision	Date	Description

1.2.4 Document references

Documents referenced in developing this report are identified in Table 4. Some documents were not referred to in the report, but were used nevertheless as reference text for species identifications and/or desktop assessments.

Table 4 Associated document references

Document number	Title
Q-LNG01-15-MP-0109	Australian Pacific LNG (2011), *Environmental Constraints Planning and Field Development Protocol.*
	BOM (2012), *Bureau of Meteorology - Climate statistics for Australian Locations*. Australian Government. http://www.bom.gov.au/climate/data/index.shtml?bookmark=201 Accessed: 24 November 2014
	DEHP (2014a), *Map of Referable Wetlands, Wetland Protection Areas/Wetland Management Areas. Map Request Form - Referable Wetlands.* Department of Environment and Heritage Protection, Queensland Government, Brisbane. https://www.ehp.qld.gov.au/ecosystems/wetlands/referable-wetlands-form.php Accessed: 7 November 2014.
	DEHP (2014b), *Environmentally Sensitive Areas – Chapter 5A activities (EP Act) Map. Regional Ecosystem Maps/ Regrowth Vegetation Maps and PMAVs.* Department of Environment and Heritage Protection, Queensland Government, Brisbane. https://www.ehp.qld.gov.au/licences-permits/maps_of_environmentally_sensitive_areas.php Accessed: 7 November 2014.
	DEHP (2014c) *Protected Plants Flora Survey Trigger Map*. Department of Environment and Heritage Protection, Brisbane. https://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php. Accessed: 7 November 2014
	DEHP (2014d) *Regional Ecosystem Description Database* (REDD V8.0) Department of Environment and Heritage Protection, Brisbane. http://www.ehp.qld.gov.au/ecosystems/biodiversity/regional-ecosystems/index.php Accessed: 7 November 2014.
	DNRM (2014a) Mines Online Maps. Department of Natural Resources and Mines, Queensland Government, Brisbane. http://www.dnrm.qld.gov.au/mapping-data/maps/minesonlinemaps. Accessed: 7 November 2014.
	DNRM (2014b), *Vegetation Map Request*. Department of Natural Resources and Mines, Queensland Government, Brisbane. http://www.dnrm.qld.gov.au/forms/land-property/vegetation-map-request Accessed: 7 November 2014.
	DoE, (2013), *Significant Impact Guidelines 1.1: Matters of National*

	Environmental Significance. Department of the Environment, Canberra. Available from: http://www.environment.gov.au/epbc/publications/nes-guidelines.html Accessed 7 November 2014
	DoE (2014a) *Species Profile and Threats Database* (EPBC Act List of Threatened Ecological Communities and Species). Department of the Environment, Canberra. Accessed: 7 November 2014.
	DSITIA (2014), *Wildlife Online*. Department of Science, Information Technology, Innovation and the Arts, Queensland Government, Brisbane. https://environment.ehp.qld.gov.au/report-request/species-list/
	DME (2008) *Queensland Geological Mapping* (polygonised vector) Data: Regional & 1:10000 Sheet Areas (DVD) Department of Mines and Energy, Queensland
	Eyre TJ, Ferguson DJ, Hourigan CL, Smith GC, Mathieson MT, Kelly, AL, Venz MF and Hogan, LD. (2012). *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland*. Department of Science, Information Technology, Innovation and the Arts, Queensland Government, Brisbane.
	Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2012). *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland. Version 3.2.* Updated August 2012. Queensland Herbarium, Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane. 124 pp.
	Pizzey, G, and Knight, F. (2007), *The Field Guide to the Birds of Australia.* Eight Edition. Harper Collins Publishers. Sydney.
	Sattler, P and Williams, R, (1999), *The Conservation Status of Queensland's Bioregional Ecosystems*. Environmental Protection Agency, Brisbane.
	Threatened Species Scientific Committee (TSSC). (2008), Commonwealth Conservation Advice on threatened species. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl Accessed 7 November 2014
	Tyler, M and Knight, F, (2011), *Field Guide to the Frogs of Australia*: revised edition. CSIRO Publishing, Collingwood, Victoria, Australia.
	Wilson, S, (2005), *A Field Guide to the Reptiles of Queensland,* New Holland Publishers Australia Pty Ltd, Sydney.
	Western Downs Regional Council (WDRC) (2011) *Western Downs Regional Council Pest Management Plan 2011-2015*.

2. Site context

Information on the Site context and current land use is detailed in Table 5.

Table 5 Site context

Bioregion	The Site is located in the Taroom Downs province, near the border with the Southern Downs province, within the Brigalow Belt South bioregion. The Taroom Downs province is bordered in the northwest by Expedition National Park and extends southeast to Barakula State Forest. The province consists of undulating plains on argillaceous sediments of the Injune Downs Group of the Great Artesian Basin (Sattler and Williams, 1999). Vegetation within the province is dominated by Brigalow (*Acacia harpophylla*), with areas of vine thicket and bluegrass (*Dichanthium sericeum*) downs (Sattler and Williams, 1999).
Current land use	The Site is largely cleared with cattle grazing occurring across most of the property. The north-east corner of Lot10 RP896637 is currently utilised for cultivation.
Soils and geology	Department of Natural Resources and Mines (DNRM) Online Maps (DNRM, 2014a) identifies the Site as overlying three mapped geological units including: • The Gubberamunda Sandstone rock unit, which is a Jurassic aged geological unit is characterised by sandstone, minor conglomerate and siltstone. • The Injune Creek geological unit, which is a middle to upper Jurassic aged formation. In particular the site is mapped as within an area of mudstone, labile sandstone, siltstone and coal within this geological unit. • The Orallo formation, a middle to upper Jurassic aged formation consisting of sandstone, siltstone, mudstone, conglomerate and coal. The Site inspection confirmed the presence of the following two landzones: • Undulating plains and low hills with fine textured clay or clay-loam surface soils (landzone 9). This unit was present across the majority of the Site. • Alluvial plains with clay loam or sandy loam surface soils (landzone 3). This unit was observed in association with tributary drainage intersecting the Site.
Climate	The nearest weather station at Taroom Post Office (Bureau of Meteorology (BoM) Station ID 035070), located approximately 66 km northeast of the Site has an annual rainfall of 674 mm, with most rain falling between December and February, and August being the driest month. Average daily maximum temperatures range between 33.7 °C in January to 21.1 °C in July. A total of 22.8 mm of rain was recorded at Taroom in the month preceding the survey (BoM, 2014). During the survey, daily maximum temperatures ranged between 34.0 °C and 41.0 °C and overnight minimum temperatures ranged between 19.2 °C and 24.9 °C.

3. Methodology

The methodology used to compile this Ecological Assessment Report consisted of:

- A desktop and literature review of ecological databases and literature sources as direct references for the survey undertaken; and
- A field survey of the Site to ground-truth environmental attributes and current Site conditions within the Study Area between 10 and 21 November 2014.

An explanation of these activities is outlined in this section.

3.1 Desktop and literature review

Sources utilised in the desktop and literature review are listed in Table 6. As detailed in the table, searches were conducted using either the Site's Lot on Plan number or a 10 km buffer around a coordinate that corresponds to the approximate centre point of the Site.

Table 6 Desktop and literature review sources

Database	Coordinates of search area (latitude, longitude)	Date of search	Appendix
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) Protected Matters Search Tool	Latitude -26.1456; Longitude 149.4647	17/11/2014	Appendix B: Results of EPBC protected Matters Search Tool
Nature Conservation Act 1992 (NC Act) Protected Species Lists Wildlife Online Database	Latitude -26.1456; Longitude 149.4647	17/11/2014	Appendix C: Wildlife Online Database Search Results
DNRM Vegetation Management Map	Individual Lot on Plans	29/10/2014 and 30/10/2014	Appendix D: DNRM Mapped Regional Ecosystems
DEHP Map of Environmentally Sensitive Areas – Chapter 5A activities (EP Act)	Latitude -26.1456; Longitude 149.4647	17/11/14	Appendix E: DEHP Mapping of ESA's and other environmental values on Site
DEHP Map of Referrable Wetlands and Wetland Protection Areas	Individual Lot on Plans	29/10/2014 and 30/10/2014	Appendix F: DEHP Map of Referrable Wetlands and Wetland Protection Areas
DEHP Protected Plants Flora Survey Trigger Map	Individual Lot on Plans	29/10/2014 and 30/10/2014	Appendix G: Protected Plants Flora Survey Trigger Map

3.2 Field survey

Ecological surveys were conducted in accordance with:

- The *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al*., 2012)
- The methodology described in the Environmental Constraints Planning and Field Development Protocol (Q-LNG01-15-MP-0109, Australia Pacific LNG 2011).

Field surveys were undertaken between 10 and 21 November 2014.

3.2.1 Vegetation community survey

Baseline vegetation community surveys were undertaken to describe dominant flora and vegetation community structure within the Study Area. Vegetation community surveys were consistent with the data collection protocols described in Neldner *et al.* (2012).

The vegetation community surveys were undertaken within 50 m x 10 m plots for the purpose of typifying the vegetation community under assessment. A total of 37 formal vegetation community surveys were undertaken within the Study Area (refer Appendix A: Figure 1). These survey sites have been recorded as 'Vegetation Structure Points' within the accompanying spatial data.

Ground-truthing of DNRM Regional Ecosystem (RE) designations (DNRM, 2014b) within the Study Area was undertaken via Quaternary level and random meander transect assessments, as described by Neldner *et al.* (2012). Sites for Quaternary assessments were chosen based on DNRM's regulated vegetation management mapping version 8.0 and an analysis of aerial photo patterns, with the objective of providing representative coverage across the Site.

Vegetation community data was entered into the data fields provided by the Trimble data capture system. Representative photos of vegetation communities were also recorded using the Trimble unit.

Vegetation community polygons were confirmed, mapped and identified in accordance with Queensland RE (biodiversity status) and EPBC Act threatened ecological community (TEC) criteria. The collection of all data was in accordance with *Q-LNG01-15-MP-0109 Australia Pacific LNG (2011) Environmental Constraints Planning and Field Development Protocols*.

3.2.2 Habitat surveys

Habitat surveys were undertaken in conjunction with vegetation community surveys. A total of 46 formal ecological habitat surveys were undertaken across the Study Area (refer Appendix A: Figure 2). These survey sites have been recorded as 'Habitat Site Points' within the accompanying spatial data.

Within each habitat survey, a range of habitat features were recorded on the relevant Trimble data form, including:

- Rocks and boulders (estimated per cent cover)
- Rocky outcrops
- Logs (abundance)
- Trees with hollows (abundance)
- Presence of senescent (old) or dead trees (stags)
- Trees and/or logs with loose bark (abundance)
- Shrub layer (estimated per cent cover)

- Ground cover (estimated per cent cover)
- Leaf litter (per cent cover)
- Termite mounds (abundance)
- Mistletoe (abundance)
- Caves/ledges (abundance)
- Any additional fauna habitat features

Where deemed appropriate, representative photos were taken of the given habitat patch via the Trimble data capture system. Photo aspect data was entered into the relevant data sheet within the Trimble unit. The collection of this data was in accordance with *Q-LNG01-15-MP-0109 Australia Pacific LNG (2011) Environmental Constraints Planning and Field Development Protocols*.

3.2.3 Threatened flora and fauna survey

Threatened species are those listed under the EPBC Act 1999 and the *Nature Conservation (Wildlife) Regulation 2006* (NC Reg).

Targeted flora and fauna searches were undertaken for threatened species identified as potentially occurring within the Site by the database and literature review. Search effort targeted areas of potentially suitable habitat for particular threatened species. Opportunistic searches were also undertaken to locate threatened flora and fauna species during the course of other flora and fauna surveys.

Any observations of threatened flora or fauna species were recorded using the Trimble data capture system. Where practicable, photos were taken of the subject threatened species. Any flora specimens deemed as potential threatened species were sent to the Queensland Herbarium for verification.

3.2.4 Exotic flora and fauna survey

Declared flora and fauna defined under the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act) encountered opportunistically during field surveys were entered into the Trimble unit. Location data was intermittently recorded to provide a general indication of spatial distribution across the Site, with results presented in Section 4.1.2 of this report.

3.2.5 Disturbance survey

Evidence of existing disturbances on the Site was opportunistically recorded during the field survey. For each disturbance, the location, type, severity and estimated age of the disturbance was noted.

3.2.6 Watercourses survey

Watercourse assessments were undertaken along the length of all mapped stream orders within the Site. The thalweg of each mapped waterway was traversed by the field team to determine if these mapped features satisfy the watercourse definition requirements of the *Water Act 2000*, or are considered to be drainage features in accordance with the *Water Act 2000*. Where the definition of a watercourse under the *Water Act 2000* was satisfied, GPS points of the high banks were also marked periodically along the watercourse.

Under the *Water Act 2000*, a watercourse is defined as a river, creek or other stream, including a stream in the form of an anabranch or a tributary, in which water flows permanently or intermittently, regardless of the frequency of flow events—

(a) in a natural channel, whether artificially modified or not; or

(b) in an artificial channel that has changed the course of the stream.

A watercourse also includes in-stream islands, benches and bars, but does not include drainage features.

Drainage features are defined under the *Water Act 2000* as natural landscape features, including a gully, drain, drainage depression or other erosion feature that—

(a) is formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately after rainfall events; and

(b) flows for only a short duration after a rainfall event, regardless of the frequency of flow vents; and

(c) commonly, does not have enough continuing flow to create a riverine environment.

Where present, wetlands were assessed for the ecological character to confirm the integrity of the wetland. The definition of a wetland included in the Wetland Mapping and Classification Methodology (EPA, 2005) has been used in this assessment, which states:

Areas of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 m. To be a wetland the area must have one or more of the following attributes:

- at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or
- the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or
- the substratum is not soil and is saturated with water, or covered by water at some time."

3.2.7 Survey limitations

A number of factors are likely to influence the survey results for particular species or species groups. These factors comprise:

- Timing (seasons) and duration of the survey period
- Weather conditions in the preceding seasons, and immediately prior to the survey
- Restricted spatial area of the habitats within the Site

The surveys represent a single, rapid assessment of local flora and fauna communities in one point in time. Fauna and to a lesser extent flora community composition vary through time in response to daily, seasonal and annual changes in environmental conditions and species movements and migrations.

Dry conditions during the survey are likely to have reduced the abundance and diversity of amphibian species encountered. A number of seasonal migrant birds are likely to be absent from the region at the time of survey. The field surveys were restricted to passive techniques (i.e. no live trapping). Additional survey effort would be required to provide a more comprehensive inventory of species.

Sustained grazing pressures and prolonged dry conditions preceding the survey are likely to have resulted in an under-representation of forbs and grasses expected to be present during

more favourable growing conditions. Additionally, some flora taxa were unable to be identified due to the lack of reproductive material or foliage.

4. Results and discussions

This section includes the results of the desktop and field survey. Further information and mapping is contained in the Appendices and spatial data accompanying this report.

Desktop and literature review

Results of the desktop and literature review can be found in Appendix B to Appendix G, as listed in Table 6.

4.1 Field survey

The results of the survey are detailed in the following sections. A comprehensive list of flora and fauna species identified during the field survey is included in Appendix H.

4.1.1 Commonwealth environmental matters

Field survey results for Commonwealth environmental matters (Matters of National Environmental Significance (MNES), TECs, threat-listed species) are outlined in Table 7. The locations of EPBC Act threat-listed species are provided in Appendix K.

4.1.2 Queensland environmental matters

Field survey results

Field survey results for Matters of State Environmental Significance, including REs as listed under the *Environmental Protection Act 1994* (EP Act) and species listed under the NC Act are outlined in Table 8. The locations of NC Act threat-listed species are also provided in Appendix K.

Ground-truthed regional ecosystems and regrowth vegetation

DNRM mapping (DNRM, 2014b) identified six RE types within the Study Area. This mapping was ground-truthed as partially correct and results of the field survey are presented in Table 9. Ground-truthed REs are mapped in Appendix I.

Table 7 Commonwealth environmental values – field survey results

Description	Status*	Location	Condition
Threatened Ecological Communities			
None present	N/A	N/A	N/A
EPBC Act listed flora			
None present	N/A	Suitable potential habitat for EPBC Act listed flora is not present within the Study Area	N/A
EPBC Act listed fauna			
None present	N/A	Suitable potential habitat for EPBC Act listed fauna is not present within the Study Area	N/A
Migratory species			
Cuculus saturatus oriental cuckoo	Mi	This species was observed from one location within the northern portion of Lot 10RP896637. The species is likely to occur within areas of dense remnant vegetation within the Site.	This species migrates to northern and eastern parts of Queensland between spring and autumn and is generally uncommon in its range.
Merops ornatus rainbow bee-eater	Mi	This species was observed and heard calling at three locations within Lot 10RP896637 and Lot 20RP896637. The species is likely to occur across the Site and may nest in arboreal termite mounds and hollow-bearing trees.	This species is regionally common in Queensland and has the potential to occur in woodland habitats across the state.
Myiagra cyanoleuca satin flycatcher	Mi	This species was observed from one location within the northern portion of Lot 10RP896637. This species is likely to occur within areas of remnant vegetation and vegetation drainage features and watercourses within the Site.	This species migrates to northern and eastern parts of Queensland between spring and autumn and is generally uncommon in its range.
Marine species			
Anthus novaeseelandiae Australasian pipit	Ma	This species was recorded at several locations across the Site.	This species is regionally common in Queensland and has the potential to occur in open pasture and woodland habitats across the state.
Pelecanus conspicillatus Australian pelican	Ma	This species was recorded at a farm dam within the Site.	This species is regionally common in Queensland and has the potential to occur in bodies of water throughout the state.
Coracina novaehollandiae	Ma	This species was recorded at several locations	This species is regionally common in Queensland and has the potential to occur in woodland habitats

Description	Status*	Location	Condition
black-faced cuckoo-shrike		across the Site.	across the state.
Himantopus himantopus black-winged stilt	Ma	This species was recorded at two farm dams within the Site.	This species is regionally common in Queensland and has the potential to occur in bodies of water throughout the state.
Chalcites basalis Horsfield's bronze cuckoo	Ma	This species was recorded at several locations across the Site.	This species is regionally common in Queensland and has the potential to occur in woodland habitats across the state.
Falco cenchroides nankeen kestrel	Ma	This species was recorded at several locations across the Site.	This species is regionally common in Queensland and has the potential to occur in open grasslands and plains across the state.
Cuculus saturatus oriental cuckoo	Mi	This species was observed from one location within the northern portion of Lot 10RP896637.	This species migrates to northern and eastern parts of Queensland between spring and autumn and is generally uncommon in its range.
Merops ornatus rainbow bee-eater	Ma	This species was observed and heard calling at three locations within Lot 10RP896637 and Lot 20RP896637.	This species is regionally common in Queensland and has the potential to occur in woodland habitats across the state.
Myiagra cyanoleuca satin flycatcher	Mi	This species was observed from one location within the northern portion of Lot 10RP896637.	This species migrates to northern and eastern parts of Queensland between spring and autumn and is generally uncommon in its range.
Hirundo neoxena welcome swallow	Ma	This species was recorded at one location within the northern portion of Lot 10RP896637.	This species is regionally common in Queensland and has the potential to occur in open woodland and grassland habitats across the state.

*EPBC Act status: E – endangered, V – vulnerable, Mi – migratory, Ma - marine

Table 8 State environmental matters – field survey results

Description	Status*	Location	Condition
Endangered REs			
11.9.5	E	Patches of RE 11.9.5 were confirmed as present along the northern perimeter of the Site and in association with watercourses within the southern half of Lots 20 and 21 on RP896637.	Homogenous patches of RE 11.9.5 were found to be mapped correctly by DNRM, although boundaries were amended during the field survey to reflect actual extents on Site. An additional patch of unmapped RE 11.9.5 was identified adjacent to the western perimeter of the central portion of Lot 1 on SP184934. The predominant canopy within vegetation patches containing RE 11.9.5 was typically dominated by *Acacia harpophylla* and/or *Casuarina cristata* and when compared to relevant biocondition benchmark data (Queensland Herbarium 2014), met the 50% cover and 70% height criteria for woody dominated vegetation as described in Neldner *et al.* 2012. Species composition within other strata was also consistent with the RE 11.9.5 description provided in the REDD database (Queensland Herbarium 2014). Perennial exotic weed cover comprised greater than 50% of the ground layer in all patches verified as RE 11.9.5.
11.9.10	E	Patches of RE 11.9.10 were confirmed as present along the northern perimeter of the Site and in association with drainage tracts in the eastern and western portions of the Site.	Patches of RE 11.9.10 were found to be mapped correctly by DNRM, although boundaries were amended during the field survey to reflect actual extents on Site. DNRM had also mapped RE 11.9.10 as a heterogenous polygon in association with RE 11.3.2 and this was separated into homogenous RE 11.9.5 during the field survey. The predominant canopy within vegetation patches containing RE 11.9.10 was typically dominated by *Eucalyptus populnea* with *Acacia harpophylla* and/or *Casuarina cristata* dominating the lower tree layer. When compared to relevant biocondition benchmark data (Queensland Herbarium 2014), these patches met the 50% cover and 70% height criteria for woody dominated vegetation as described in Neldner *et al.* 2012. Species composition within other strata was also consistent with the RE 11.9.10 description provided in the REDD database (Queensland Herbarium 2014).

Description	Status*	Location	Condition
			Perennial exotic weed cover comprised greater than 50% of the ground layer in all patches verified as containing RE 11.9.10. Although the *Eucalyptus populnea* layer was discontinuous at times within this vegetation unit, patches dominated by the lower tree layer (*Acacia harpophylla* and/or *Casuarina cristata*) were not of sufficient size (>5 ha) to be mapped as separate polygons of RE 11.9.5.
Of concern REs			
11.3.2	OC	Patches of RE 11.3.2 were confirmed as present along drainage tracts within the central and eastern portions of the Site.	This RE occurred as a component of heterogeneous units in association with RE 11.3.25. Boundaries of these areas were amended during the field survey to reflect actual extents on Site. These heterogeneous units mapped on the property occurred as a true mosaic within one landzone. This mosaic is largely a result of the reticulated and at times disintegrated drainage patterns associated with the shallow ephemeral flow lines present, and as such could not be separated into homogenous polygons.
11.3.25	OC	Patches of RE 11.3.25 were confirmed as present along a drainage tract within the central portion of the Site.	This RE occurred as a component of heterogeneous units in association with RE 11.3.2. Boundaries of these areas were amended during the field survey to reflect actual extents on Site. These heterogeneous units mapped on the property occurred as a true mosaic within one landzone. This mosaic is largely a result of the reticulated and at times disconnected drainage patterns associated with the shallow ephemeral flow lines present, and as such could not be separated into homogenous polygons.
NC Act listed flora			
Brachychiton populneus kurrajong	SLC	Numerous locations across the Site.	Scattered mature individuals were observed in low densities, primarily on low hills present.
Brachychiton rupestris Queensland bottle tree	SLC	Numerous locations across the Site.	Numerous mature individuals were observed in low densities throughout the Site, particularly on low hills and alluvial flats adjacent to drainage lines.
Brachychiton australis	SLC	One location on low hill within central west portion of 1SP184934.	One individual observed on low hill dominated by

Description	Status*	Location	Condition
broad-leaved bottle tree			*Brachychiton rupestris*.
Cymbidium canaliculatum black orchid	SLC	Numerous locations across the Site.	Numerous individuals were observed in low densities throughout the Site.
Santalum lanceolatum northern sandalwood	SLC	Numerous locations across the Site.	Numerous individuals were observed in low densities throughout the Site.
NC Act listed fauna			
Falco hypoleucos grey falcon	NT	Recorded at one location in the northern portion of Lot 1 SP184934 within cleared grazing paddocks.	Suitable habitat for the species is widely distributed across the Site within the cleared areas and woodlands.
Tachyglossus aculeatus short-beaked echidna	SLC	Scats found at one location within Lot 21 RP896637	Suitable habitat for the species is widely distributed across the Site.
Essential habitat			
None present	N/A	N/A	N/A
*NC Act status: E – endangered, V – vulnerable, NT – near threatened, SLC – special least concern			

Table 9 Ground-truthed regional ecosystems and regrowth vegetation

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
11.9.5 (remnant)	Endangered	*Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks	11.9.5 (remnant)	Endangered	*Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks	Woodland on undulating plain. Canopy typically dominated by *Acacia harpophylla* and *Casuarina cristata* (10-13 m). Sub-canopy dominated by *Eremophila mitchellii* and *Lysiphyllum carronii* (4-7 m). Shrub layer species included *Geijera parviflora, E. mitchellii, Apophyllum anomalum* and *Capparis lasiantha*. *Cenchrus ciliaris* dominated the ground layer. Perennial exotic weed cover comprised greater than 50% of the ground layer in all patches verified as RE 11.9.5. This is applicable to four polygons within the Study Area. Ground-truthing confirmed that this mapped vegetation unit met the criteria to be considered as remnant vegetation (i.e. woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy).
11.9.5 (mature regrowth)	Endangered	Mature regrowth of *Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks	11.9.5 (remnant)	Endangered	*Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks	Remnant woodland on alluvial plain and adjacent undulating plain. Canopy typically dominated by *Eucalyptus populnea, Casuarina cristata, Callitris endlicheri* and *E. crebra (*12–16 m). Sub-canopy dominated by *Acacia harpophylla, Notelaea microcarpa* var. *velutina* and *Geijera parviflora* (5-8 m). Shrub layer

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
						species included *Alectryon diversifolius*, *Carissa ovata* and *Notelaea microcarpa* var. *velutina. Cenchrus ciliaris* and *Austrostipa ramosissima* dominated the ground layer. Perennial exotic weed cover comprised greater than 50% of the ground layer. One polygon was mapped within the Study Area by the State mapped RE layer as mature regrowth RE 11.9.5. Ground-truthing identified that this mapped vegetation unit met the criteria to be considered as remnant vegetation (i.e. woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy).
11.9.10 (remnant)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	11.9.10 (remnant)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	Remnant woodland on undulating plains and flats. Canopy typically dominated by *Eucalyptus populnea* and *Acacia harpophylla* (10-14 m). Sub-canopy dominated by *Acacia excelsa subsp. excelsa, Citrus glauca* and *Eremophila mitchellii* (5-7 m). Shrub species included *Apophyllum anomalum*, *Capparis lasiantha,* and *C. mitchellii. Cenchrus ciliaris* dominated the ground layer. This is applicable to five polygons within the Study Area. Ground-truthing confirmed that this mapped vegetation

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
						unit met the criteria to be considered as remnant vegetation (i.e. woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy).
11.9.10 (mature regrowth)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	11.9.10 (remnant)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	Canopy typically dominated by *Eucalyptus populnea* and *Acacia harpophylla*. Sub-canopy dominated by *Acacia excelsa subsp. excelsa, Citrus glauca* and *Eremophila mitchellii*. Shrub species included *Apophyllum anomalum*, *Capparis lasiantha,* and *C. mitchellii. Cenchrus ciliaris* dominated the ground layer. One polygon was mapped within the Study Area by the State mapped RE layer as regrowth vegetation containing RE 11.9.10. Ground-truthing identified that this mapped vegetation unit met the criteria to be considered as remnant vegetation (i.e. woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy).

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
11.5.1 (remnant)	No concern at present	*Eucalyptus crebra* and/or *E. populnea, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces.	Non-remnant	N/A	N/A	Woodland on low hill dominated by *Acacia harpophylla* and *Casuarina cristata* (10-13 m). Species composition consistent with RE 11.9.5 rather than 11.5.1 but patch size and width not sufficient to be designated as an RE. This is applicable to one polygon within the Study Area. Ground-truthing identified that this mapped polygon was non-remnant vegetation.
11.3.25/11.3.2 (90/10) (remnant)	Of concern	11.3.25: *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines 11.3.2: *Eucalyptus populnea* woodland on alluvial plains	11.3.2/11.3.25 (70/30) (remnant)	Of concern	11.3.25: *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines 11.3.2: *Eucalyptus populnea* woodland on alluvial plains	Woodland of *Eucalyptus populnea*, *E. tereticornis subsp. tereticornis* and *Casuarina cristata* (13-18 m). Sub-canopy dominated by *Eremophila mitchellii*, *Acacia excelsa subsp. excelsa* and *Geijera parviflora* (4-9 m). Shrub layer species included *Citrus glauca*, *Capparis mitchellii*, *Apophyllum anomalum* and *Capparis lasiantha. Cenchrus ciliaris* and *Enteropogon ramosus* dominated the ground layer. A patch dominated by *Acacia pendula* was observed during the field survey within this broader unit. The estimated ratio of REs comprising the heterogeneous polygon (11.3.2/11.3.25) was 70/30. These heterogeneous units mapped on the property occurred as a true mosaic within one landzone. This mosaic is largely a result of the reticulated and at times disintegrated drainage patterns associated with the shallow ephemeral flow lines present, and as such could not be separated into homogenous

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
						polygons. This is applicable to four polygons within the Study Area.
11.3.25/11.3.2 (90/10) (remnant)	Of concern	11.3.25: *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines 11.3.2: *Eucalyptus populnea* woodland on alluvial plains	11.9.5 (remnant)	Endangered	*Acacia harpophylla and/or Casuarina cristata open forest on fine-grained sedimentary rocks*	Woodland on undulating plain. Canopy typically dominated by *Acacia harpophylla* and *Casuarina cristata* (10-13 m). Sub-canopy dominated by *Eremophila mitchellii* and *Lysiphyllum carronii* (4-7 m). Shrub layer species included *Geijera parviflora, E. mitchellii, Apophyllum anomalum* and *Capparis lasiantha*. *Cenchrus ciliaris* dominated the ground layer. This is applicable to one polygon within the Study Area.
11.3.25/11.3.2 (90/10) (remnant)	Of concern	11.3.25: *Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines 11.3.2: *Eucalyptus populnea* woodland on alluvial plains	11.9.10 (remnant)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	Woodland on alluvial flats. Canopy typically dominated by *Eucalyptus populnea* and *Acacia harpophylla* (10-14 m). Sub-canopy dominated by *Acacia excelsa subsp. excelsa, Citrus glauca* and *Eremophila mitchellii* (5-7 m). Shrub species included *Apophyllum anomalum*, *Capparis lasiantha,* and *C. mitchellii. Cenchrus ciliaris* dominated the ground layer. This is applicable to one polygon within the Study Area.
11. 9.10/11.3.2 (60/40) (remnant)	Endangered	11.3.2: *Eucalyptus populnea* woodland on alluvial plains	11.3.2 (remnant)	Of concern	*Eucalyptus populnea* woodland on alluvial plains	The State mapped heterogeneous polygon RE 11.3.2/11.9.10 was verified in the field as comprising two distinct homogenous units, namely 11.3.2 and 11.9.10. The ground-truthed 11.3.2

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
						homogeneous unit is described as follows: Remnant woodland of *Eucalyptus populnea, E. tereticornis subsp. tereticornis*, *Acacia harpophylla* and *E. melanophloia* (14-18 m). Sub-canopy dominated by *Geijera parviflora* and *Eremophila mitchellii* (6-9 m). Shrub layer species included *Alectryon diversifolius*, *Carissa ovata* and *Notelaea microcarpa* var. *velutina. Cenchrus ciliaris* and *Enteropogon ramosus* dominated the ground layer. This is applicable to two polygons within the Study Area. The ground-truthed 11.9.10 homogeneous unit comprising the remainder of the State mapped heterogeneous polygon RE 11.3.2/11.9.10 is described below.
11. 9.10/11.3.2 (60/40) (remnant)	Endangered	11.9.10: *Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	11.9.10 (remnant)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	The State mapped heterogeneous polygon RE 11.3.2/11.9.10 was verified in the field as comprising two distinct homogenous units, namely 11.3.2 and 11.9.10. The ground-truthed 11.9.10 homogeneous unit is described as follows: Woodland of *Eucalyptus populnea, Acacia harpophylla* and *Casuarina cristata* (10-14 m). Sub-canopy dominated by *Acacia excelsa subsp. excelsa,* and *Eremophila mitchellii* (5-7 m). Shrub species included *Alectryon diversifolius,*

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
						Apophyllum anomalum, *Capparis lasiantha,* and *C. mitchellii. Cenchrus ciliaris* dominated the ground layer. This is applicable to one polygon within the Study Area.
11.9.10/11.3.2 (mature regrowth)	Endangered	Mature regrowth of 11.3.2: *Eucalyptus populnea* woodland on alluvial plains 11.9.10: *Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	11.3.2 (remnant)	Of concern	*Eucalyptus populnea* woodland on alluvial plains	The State mapped heterogeneous polygon RE 11.9.10/11.3.2 (regrowth) was verified in the field as comprising two distinct homogenous units, namely RE 11.3.2 and 11.9.10. Both units met the criteria to be considered as remnant vegetation (i.e. woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy). The ground-truthed 11.3.2 homogeneous unit is described as follows: Remnant woodland of *Eucalyptus populnea, Casuarina cristata, Callitris endlicheri*, *Acacia harpophylla* and *E. melanophloia*. Sub-canopy dominated by *Geijera parviflora* and *E. populnea*. Shrub layer species included *Alectryon diversifolius*, *Hovea longipes*, *Carissa ovata* and *Notelaea microcarpa* var. *velutina. Cenchrus ciliaris* dominated the ground layer. The ground-truthed 11.9.10 homogeneous unit comprising the remainder of the State mapped

State mapped RE*	Biodiversity status	Short description^	Ground-truthed RE	Biodiversity status	Short description^	Ground-truthed description
						heterogeneous polygon RE 11.9.10/11.3.2 (regrowth) is described below.
11.9.10/11.3.2 (mature regrowth)	Endangered	Mature regrowth of 11.3.2: *Eucalyptus populnea* woodland on alluvial plains 11.9.10: *Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	11.9.10 (remnant)	Endangered	*Eucalyptus populnea* open forest with a secondary tree layer of *Acacia harpophylla* and sometimes *Casuarina cristata* on fine-grained sedimentary rocks	The State mapped heterogeneous polygon RE 11.9.10/11.3.2 (regrowth) was verified in the field as comprising two distinct homogenous units, namely RE 11.3.2 and 11.9.10. Both units met the criteria to be considered as remnant vegetation (i.e. woody vegetation within the Ecologically Dominant Layer comprising > 70% of the height and > 50% of the cover relative to the undisturbed height and cover of that stratum and is dominated by species characteristic of the vegetation's undisturbed canopy). The ground-truthed 11.9.102 homogeneous unit is described as follows: Remnant woodland of *Eucalyptus populnea, Casuarina cristata, Callitris endlicheri*, *Acacia harpophylla* and *E. melanophloia*. Sub-canopy dominated by *Geijera parviflora* and *E. populnea*. Shrub layer species included *Alectryon diversifolius*, *Hovea longipes*, *Carissa ovata* and *Notelaea microcarpa* var. *velutina. Cenchrus ciliaris* dominated the ground layer.
*Source: DNRM Regulated Vegetation Management Mapping						

Other environmental values

One patch of remnant vegetation comprising RE 11.9.5 was identified as occurring within the Site during the field survey that was not previously mapped on DNRM certified RE mapping. This patch occurs adjacent to the western perimeter of the central portion of Lot 1 on SP184934 and is shown in ground-truthed RE mapping within the spatial data accompanying this report.

The three patches of state mapped mature regrowth (containing endangered RE) within the Study Area were all verified in the field as meeting the height, cover and species composition criteria to be considered as remnant vegetation.

A patch of vegetation dominated by *Acacia pendula* occurs within one of the heterogeneous polygons containing REs 11.3.2/11.3.25 within Lot 1 on SP184934. Whilst this patch does not meet the condition threshold criteria for the EPBC Act listed Weeping Myall TEC, communities dominated by *Acacia pendula* are poorly represented within the Brigalow Belt South bioregion and should be retained where practicable.

In general, habitats within areas of remnant vegetation had low to moderate structural complexity at ground, shrub and canopy levels. These areas provided isolated resources and microhabitat features that would be utilised by birds, mammals, reptiles and amphibians. Habitat present within the cleared areas of the Site had a low structural complexity, generally with shrub and canopy layers very sparse to absent. Limited variability of groundcover species was observed and microhabitat features such as tree hollows, woody debris and rocks were observed to be very sparsely distributed or absent.

Numerous mapped stream order 1 and 2 waterways occur across the Site. At the time of survey none of these were observed as flowing, while ephemeral pools of water were observed along some of these water features. Vegetation associated with these features provide habitat for amphibians and birds. These areas also act as movement corridors for fauna species within the Site and linkages to larger habitat patches within the surrounding area. Cane toads were observed within watercourses and drainage lines and are likely to compete for forage and habitat resources with native fauna species.

Numerous constructed farm dams are located throughout the Site. These features provide watering points for grazing livestock present within the Site but also act as important water sources for native fauna such as birds and mammals.

Pest flora and fauna

Weeds of National Significance (WoNS), Class 1, 2 and 3 species declared under the LP Act, and pest flora and fauna of importance, as stated in the Western Downs Regional Council Pest Management Plan (WDRC, 2011), were recorded on Site. The distribution of pests observed in the field assessment is shown in Appendix J. Details of these significant pest flora and fauna encountered during the field survey are listed in Table 10.

Table 10 Pest flora and fauna species recorded from field surveys

Scientific name	WoNS	LP Act Status	Western Downs Regional Council Pest Management Plan priority	Area of occurrence
Flora				
Opuntia tomentosa velvety tree pear	Yes	Class 2	Medium	Mature and juvenile individuals present in low densities throughout the Site
Opuntia stricta prickly pear	Yes	Class 2	Low	Mature and juvenile individuals present in low densities throughout the Site
Fauna				
Canis lupus familiaris dog	n/a	Class 2	Very high	One individual was observed in the southern portion of Lot 20RP896637. It is likely this species is also present throughout the rest of the Site.
Felis catus cat	n/a	Class 2	Medium	Two individuals were observed in the northern portion of the Site. It is likely this species is also present throughout the rest of the Site.
Oryctolagus cuniculus rabbit	n/a	Class 2	Very high	Rabbit individuals and scats were seen at numerous locations throughout the site.
Sus scrofa pig	n/a	Class 2	High	Pig individuals and scats were seen at numerous locations throughout the Site.

4.1.3 Disturbance

The Site largely comprises non-remnant vegetation across its area with isolated small patches of remnant vegetation present generally in association with watercourses and drainage features. In addition to historic broad scale clearing to support the current pastoral land use of the Site, the following disturbances were also observed:

- Land under cultivation within the north-east corner of Lot 10 on RP896637.
- Agricultural infrastructure (dams, sheds, stockyards, tracks, watering points)
- Airstrip within Lot 10 on RP896637
- Deep bank and gully erosion is present in localised areas associated with watercourses within the Site. Erosion was most severe along watercourses in the western portion of the Site.

4.1.4 Watercourses

Mapped stream orders

The following waterways are mapped over the Site:

- Thirty four first order streams
- Seven second order streams
- Two third order streams

Each mapped stream order was traversed by the field team using the methodology described in Section 3.2.6. Results of the field survey found that the following stream orders met the definition of a drainage feature under the *Water Act 2000*:

- Thirty two first order streams
- Six second order streams

These drainage features were categorised as meeting the definition provided in Section 3.2.6 due to the lack of defined bed or banks, absence of riparian vegetation and are considered unlikely to support more than short term flows of water immediately following rainfall. These features are likely to represent a temporary drainage feature across the landscape. A number of farm dams were present along the length of these drainage features stemming the flow path of these features.

The following stream orders were found to meet the definition of a watercourse under the *Water Act 2000*:

- Two first order streams (Lot 10RP896637)
- One second order stream (Lot 10RP896637)
- Two third order streams

These stream orders were categorised as meeting the definition of a watercourse under the Act due to either the stream order being defined as a creek or being associated as a tributary of these higher order watercourses, in which water flows permanently or intermittently, regardless of the frequency of flow events within a defined bed and bank system. Furthermore, a number of the stream order categorised as watercourses were found to have riparian or floodplain vegetation typical of a watercourse. The majority of stream orders assessed during the field survey were not flowing at the time of survey.

Refer to Appendix L for a representation of ground truthed water features across the Site.

Wetlands

DEHP's *Map of Referable Wetlands – Wetland Protection Areas* does not identify any Wetland Protection Areas within the Site.

DEHP's *Map of Referable Wetlands for the EP Act* identified wetlands of general ecological significance within lots 1 SP184934 and 20 RP 896637 in association with a watercourse (refer Appendix F). The field survey did not identify any wetland characteristics to be present at these locations at the time of the survey.

5. Conclusions

A 'whole of property' ecological assessment was undertaken across the Site from 11 to 21 November, 2014. The Site was predominantly covered by non-remnant vegetation, and is within a landscape that has been extensively cleared for pastoral cattle grazing. Ecological features present within the Site include:

- No TECs or threatened species listed under the EPBC Act or NC Act were found on Site
- Three Migratory species listed under the EPBC Act (*Cuculus saturatus, Merops ornatus* and *Myiagra cyanoleuca*) and 10 Marine bird species listed under the EPBC Act (*Anthus novaeseelandiae, Pelecanus conspicillatus, Coracina novaehollandiae*, *Himantopus himantopus, Chalcites basalis*, *Falco cenchroides, Cuculus saturatus, Merops ornatus, Myiagra cyanoleuca, and Hirundo neoxena*) were found at numerous locations across the Site
- Five special least concern flora species listed under the NC Act were observed within Site in relatively low densities, namely *Brachychiton australis, Brachychiton populneus, Brachychiton rupestris Cymbidium canaliculatum* and *Santalum lanceolatum*
- Evidence of one near threatened fauna species, *Falco hypoleucos*, and one special least concern fauna species, *Tachyglossus aculeatus,* listed under the NC Act was observed on the Site
- Two endangered REs (11.9.5 and 11.9.10) and two of concern REs (11.3.2 and 11.3.25) were confirmed as present within the Study Area through field surveys. Patches containing these REs were largely mapped correctly in existing DNRM certified RE mapping although boundaries were amended to reflect actual extents on Site. One patch of remnant vegetation comprising RE 11.9.5 was identified as occurring within the Site during the field survey that was not previously present on DNRM mapping. This patch occurs adjacent to the western perimeter of the central portion of Lot 1 on SP184934.
- One no concern at present RE depicted in DNRM mapping within the south east corner of Lot 2 on SP184934 was incorrectly mapped. The structure and species composition of this patch was consistent with RE 11.9.5 rather than RE 11.5.1 but the size and width of the patch was not sufficient to be designated as an RE.
- The three patches of state mapped endangered mature regrowth within the Study Area were all verified as meeting the height, cover and species composition criteria to be considered remnant vegetation.
- Thirty eight drainage features were identified as intersecting the Site, and included first and second order streams. Five watercourses intersecting the Site were categorised as consisting of either first, second or third order streams. No referable wetlands mapped by DEHP were observed as occurring within the Site.
- Two Class 2 declared weed species listed under the LP Act, *Opuntia tomentosa* and *Opuntia stricta*, were recorded during the field survey. Both taxa are also listed as a WoNS
- Four Class 2 declared pest fauna species listed under the LP Act, *Canis lupus familiaris, Felis catus, Oryctolagus cuniculus* and *Sus scrofa* were recorded at numerous locations across the Site.

Within remnant vegetation patches, the Site has low to moderate ecological values, providing habitat and resources for common, least concern species. Within cleared areas, the Site has low ecological value with limited habitat and resources available. The findings of this report

should be considered during detailed development planning such that disturbance to the ecological values of the Site and locality may be avoided wherever practical.

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The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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Appendices

Appendix A – Ecology Survey Location

740,000 742,000 744,000 746,000 748,000 750,000 752,000 754,000

7,110,000 7,108,000 7,106,000 7,104,000 7,102,000 7,100,000

Bundi Clifford Road

10RP896637

1SP184934

20RP896637

21RP896637

2SP184934

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Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Vegetation Survey Site
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer

Origin Energy
Ecological Assessment Report

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Terrestrial Flora Survey Sites

Figure 1

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Data source: DNRM: Physical Roads, 2010; Petroleum Lease, 2014; Origin Energy: Imagery, Cadastre 2014; GHD: Survey Area, Vegetation Survey Site, 2014. Created by: RB

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740,000 742,000 744,000 746,000 748,000 750,000 752,000 754,000

7,110,000 7,108,000 7,106,000 7,104,000 7,102,000 7,100,000

Bundi Clifford Road

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0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Watercourse assessment sites
- Habitat Survey Site
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer

Origin Energy
Ecological Assessment Report

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Terrestrial Fauna Survey Sites Figure 2

G:\41\28330\GIS\Maps\MXD\41_28330_034_Usher_Sur_rev_0.mxd

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Data source: DNRM: Physical Roads, 2010; Petroleum Lease, 2014; Origin Energy: Imagery, Cadastre 2014; GHD: Survey Area, Habitat Survey Site, 2014. Created by: RB

145 Ann Street Brisbane QLD 4000 Australia **T** 61 7 3316 3000 **F** 61 7 3316 3333 **E** bnemail@ghd.com **W** www.ghd.com

Appendix B – EPBC Protected Matters Search Tool results

Australian Government
Department of the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

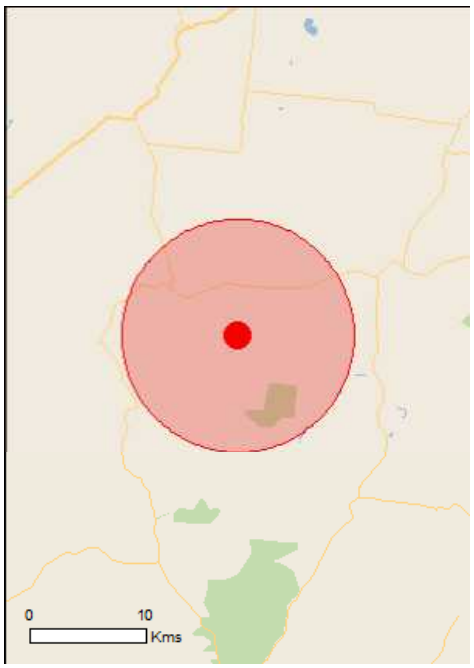
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/11/14 15:21:47

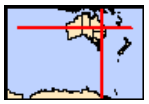
Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 10.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	14
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	9
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	None
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	14
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll [331]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni South-eastern Long-eared Bat [83395]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Plants		
Cadellia pentastylis		
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Tylophora linearis		
[55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Delma torquata		
Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Denisonia maculata		
Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa		
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli		
Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Rheodytes leukops		
Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sus scrofa		
Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica		
Prickly Acacia [6196]		Species or species habitat may occur within area
Lantana camara		
Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area

Coordinates

-26.1456 149.4647

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Geoscience Australia
-CSIRO
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Department of the Environment
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Appendix C – Wildlife Online database search results

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -26.1456
Longitude: 149.4647
Distance: 10
Email: john.vanosta@ghd.com
Date submitted: Monday 17 Nov 2014 14:20:30
Date extracted: Monday 17 Nov 2014 14:30:07

The number of records retrieved = 35

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Acanthizidae	*Gerygone albogularis*	white-throated gerygone		C		1
animals	birds	Acanthizidae	*Acanthiza apicalis*	inland thornbill		C		1
animals	birds	Acanthizidae	*Chthonicola sagittata*	speckled warbler		C		1
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		1
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		1
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		3
animals	birds	Campephagidae	*Coracina maxima*	ground cuckoo-shrike		C		1
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		1
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		1
animals	birds	Falconidae	*Falco cenchroides*	Nankeen kestrel		C		1
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		1
animals	birds	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		SL		2
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		1
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		1
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		1
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		1
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		1
animals	birds	Psittacidae	*Aprosmictus erythropterus*	red-winged parrot		C		1
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		1
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		1
animals	reptiles	Varanidae	*Varanus panoptes*	yellow-spotted monitor		C		1
plants	higher dicots	Apocynaceae	*Carissa ovata*	currantbush		C		1/1
plants	higher dicots	Asteraceae	*Gamochaeta calviceps*		Y			1/1
plants	higher dicots	Asteraceae	*Cotula australis*	common cotula		C		1/1
plants	higher dicots	Caesalpiniaceae	*Senna coronilloides*			C		1/1
plants	higher dicots	Elatinaceae	*Elatine gratioloides*	waterwort		C		1/1
plants	higher dicots	Fabaceae	*Zornia dyctiocarpa var. filifolia*			C		1/1
plants	higher dicots	Fabaceae	*Zornia muriculata*			C		1/1
plants	higher dicots	Haloragaceae	*Myriophyllum striatum*			C		2/2
plants	lower dicots	Ranunculaceae	*Ranunculus sessiliflorus var. sessiliflorus*			C		1/1
plants	monocots	Poaceae	*Sporobolus actinocladus*	katoora grass		C		1/1
plants	monocots	Poaceae	*Sporobolus*			C		1/1
plants		Linderniaceae	*Lindernia*			C		1/1
plants		Phrymaceae	*Mimulus*			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix D – DNRM Regulated Vegetation Mapping

Bundi Clifford Road

10RP896637

1SP184934

20RP896637

21RP896637

2SP184934

Based on or contains data provided by the State of QLD (DNRM) [2014]. In consideration of the State permitting use of this data you acknowledge and agree that the State gives no warranty in relation to the data (including accuracy, reliability, completeness, currency or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use of the data. Data must not be used for marketing or be used in breach of the privacy laws.

Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Local road
- Unconstructed road
- Ordered streams: 1, 2, 3, 4
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer
- Remnant Vegetation
  - Endangered RE
  - Of Concern RE
- No Concern at Present
- Regrowth Vegetation
  - Contains Endangered RE
  - Contains Of Concern RE
  - Not of Concern RE

Origin Energy
Ecological Assessment Report

DNRM Certified Regional Ecosystem Mapping & Regrowth Mapping

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Figure 3

G:\41\28330\GIS\Maps\MXD\41_28330_035_Usher_Sur_rev_a.mxd

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Data source: DNRM: Ordered Drainage, Physical Roads, 2010; Petroleum Lease, 2014; Origin Energy: Imagery, Regional Ecosystem, Cadastre 2014; GHD: Survey Area, Survey Sites, 2014. Created by: RB

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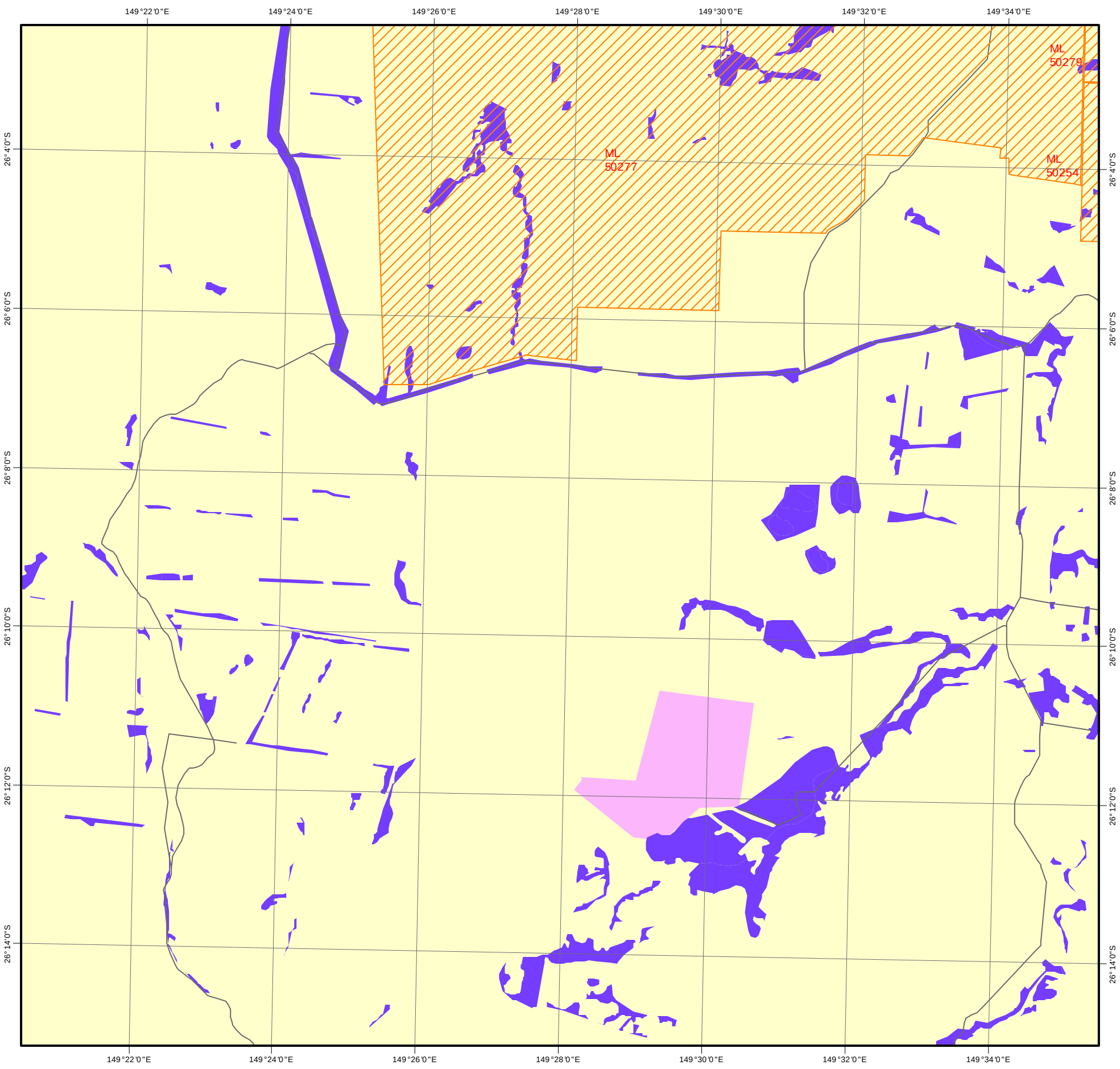
Appendix E – DEHP Mapped Environmentally Sensitive Areas



ENVIRONMENTALLY SENSITIVE AREAS - Mining Activities

Requested By: JOHN.VANOSTA@GHD.COM
Date: 17 Nov 14 Time: 14.21.23

Centred on point position:
Latitude: -26.1456 Longitude: 149.4647
(decimal degrees)

Mining Leases

CATEGORY A
- National Parks
- Regional Parks (general)
- Forest Reserves
- Wet Tropics World Heritage Area
- Great Barrier Reef Marine Park Area
- Marine Parks other than General Use Zones

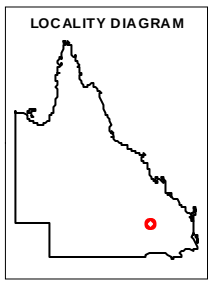
CATEGORY B
- World Heritage Areas
- Queensland Heritage Register Places
- Ramsar Sites
- Cultural Heritage Registered Areas and DLA's other than Stanbroke
- Special Forestry Areas
- Fish Habitat Areas
- Koala Plan
- Coordinated Conservation Areas
- Endangered Regional Ecosystems (Biodiversity Status)
- Marine Parks other than General Use Zones
- Marine Plants

CATEGORY C
- Nature Refuges
- Regional Parks (resource use area)
- State Forests
- Timber Reserves
- Declared Catchment Areas
- Declared Irrigation Areas
- Drainage Areas
- River Improvement Areas
- Stanbroke DLA
- Coastal Management District
- Dams and Weirs

OTHERS
- Towns
- Roads
- © Pitney Bowes Software Pty Ltd 2014
- Wild River Nominated Waterways - Repealed
- Wild River High Preservation Areas - Repealed
- Wild River Preservation Areas - Repealed
- Mahogany Glider Habitat
- Directory of Important Wetlands
- Queensland

Queensland Government

LOCALITY DIAGRAM



N

0 1,300 2,600 3,900 5,200 6,500 m

This product is projected into GDA 1994 MGA Zone 55

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External contributors (non-government parties) of the data for this product are: Great Barrier Reef Marine Park Authority and Pitney Bowes Software

Regional ecosystem mapping (remnant biodiversity status) may incorporate amendments, resulting from property level assessments, to the release version of the mapping available on QGIS.

NOTE TO USER: Themes presented in this map are indicative only. Field survey may be required to verify the 'true' spatial extent and value. Not all environmentally sensitive areas are presented in this map. A user should refer to the particular circumstances relevant to their situation to assess the 'completeness' of themes provided.

The user should note that some boundaries and indicated values are ambient and may change over time (e.g. regional ecosystem boundaries and conservation status, watercourse mapping etc).

The user should be aware that due to multiple overlapping themes/ layers present, some themes/layers may be obscured by others. Ordering in the Legend does not accurately reflect the order by which themes/layers are displayed.

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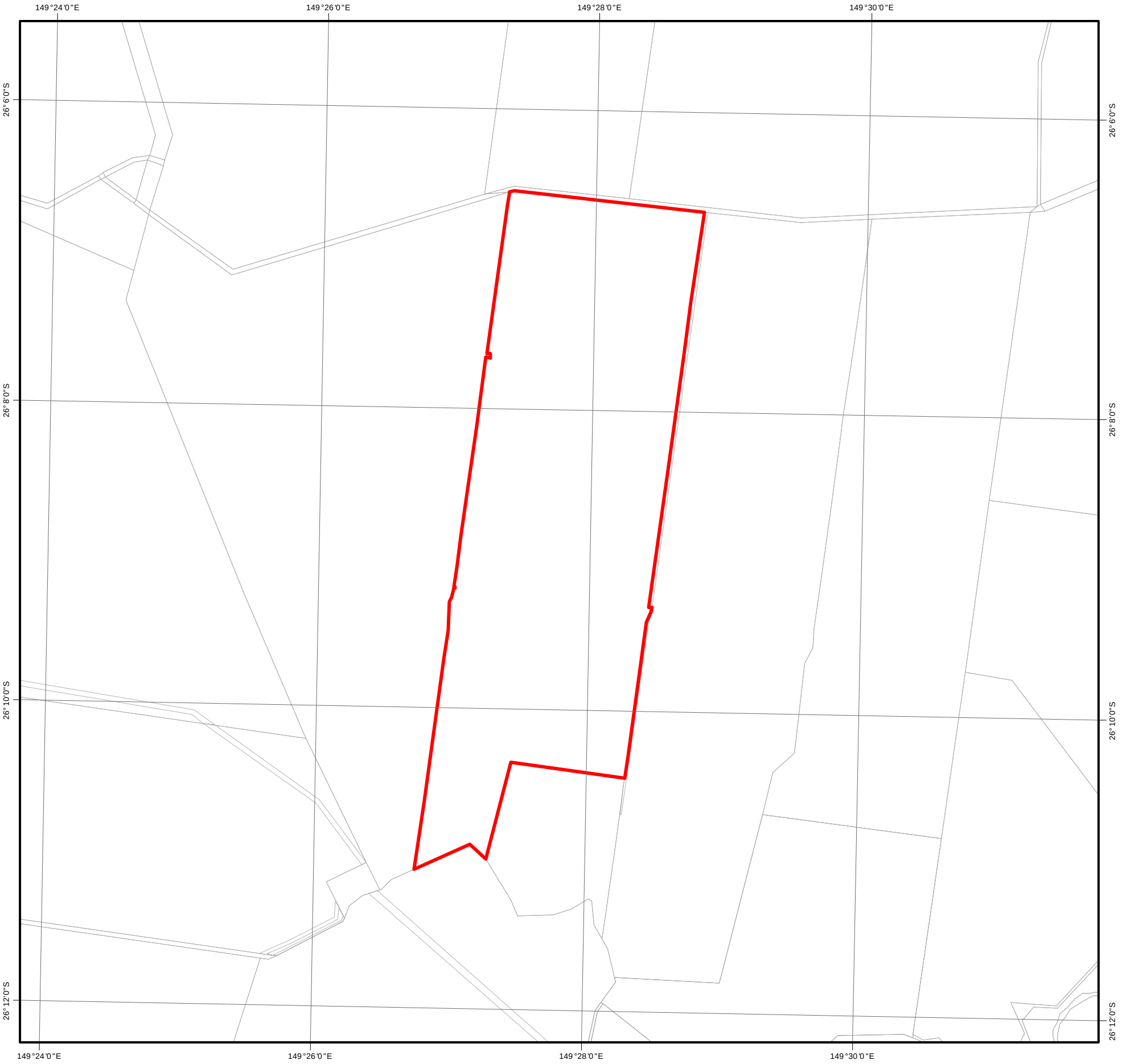
Appendix F – DEHP Map of Referrable Wetlands and Wetland Protection Areas



Map of Referable Wetlands
Wetland Protection Areas

Requested By: ROISIN.FEENEY@GHD.COM
Date: 30 Oct 14 Time: 15.50.00

Centred on Lot on Plan:
1 SP184934

Selected Land Parcel

Cadastral Boundary

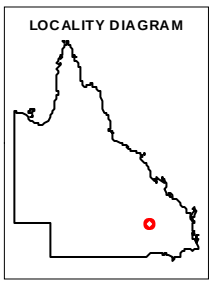
Wetland Protection Areas

Wetland

Trigger Area

Queensland Government

LOCALITY DIAGRAM



N

0 725 1450 2175 2900 3625 m

Note:
This map shows the location of wetland protection areas which are defined under the Environmental Protection Regulation 2008. Within wetland protection areas, certain types of development involving high impact earthworks are made assessable under Schedule 3 of the Sustainable Planning Regulation 2009.

The Department of State Development Infrastructure and Planning is the State Assessment Referral Agency (SARA) under Schedule 7 of the Sustainable Planning Regulation 2009 for assessable development involving high impact earthworks within wetland protection areas. The Department of Environment and Heritage Protection is a technical agency.

The policy outcome and assessment criteria for assessing these applications are described in the State Development Assessment Provisions (SDAP) *Module 11: Wetlands and wild rivers.*

This map is produced at a scale relevant to the size of the lot on plan identified and should be printed at A4 size in portrait orientation. Consideration of the effects of mapped scale is necessary when interpreting data at a large scale.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Heritage Protection at www.ehp.qld.gov.au or email planning.support@ehp.qld.gov.au.

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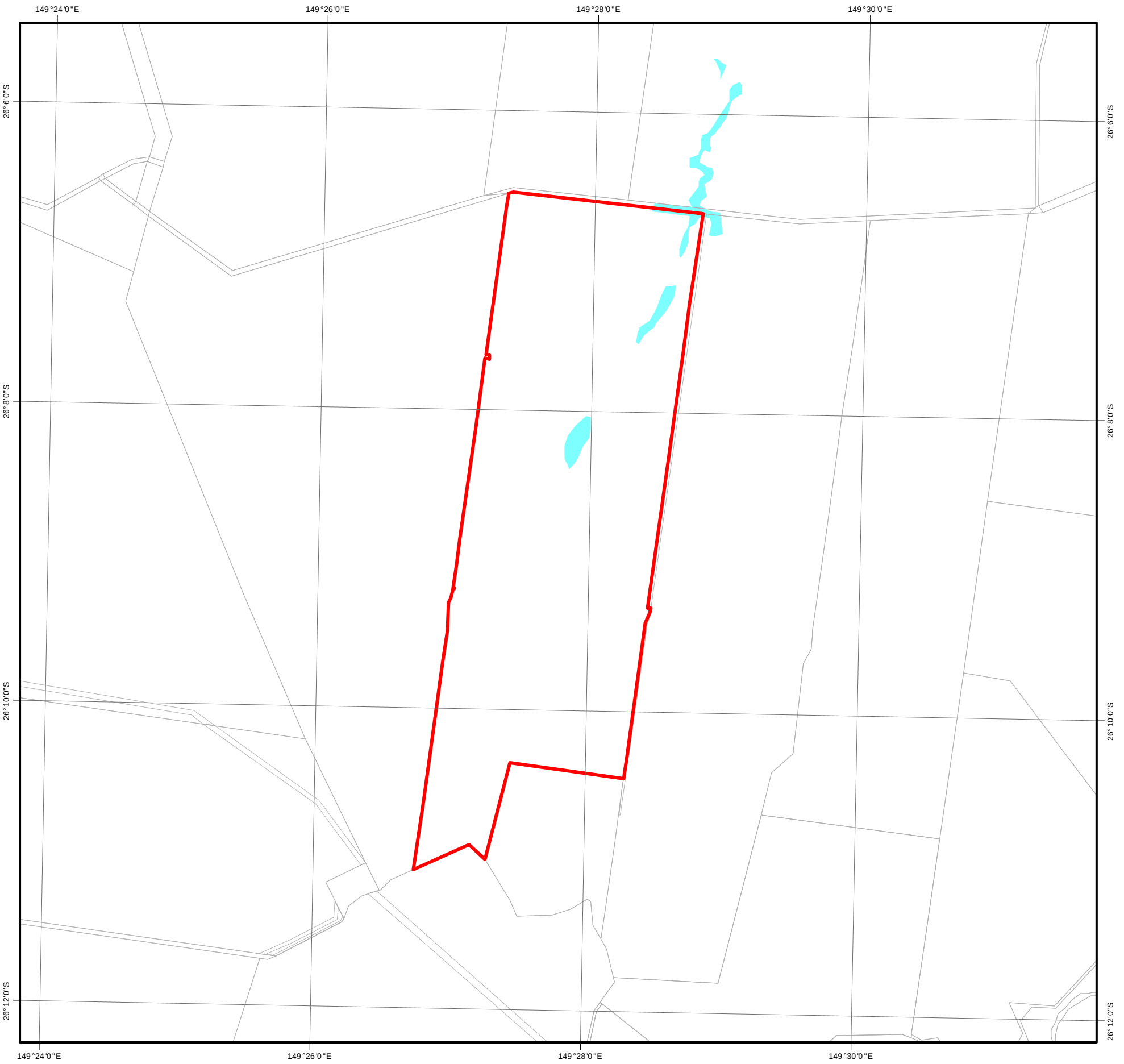
This product is projected into GDA 1994 MGA Zone 55



Map of Referable Wetlands for the Environmental Protection Act 1994

Requested By: ROISIN.FEENEY@GHD.COM
Date: 30 Oct 14 Time: 15.50.04

Centred on Lot on Plan:
1 SP184934

Selected Land Parcel

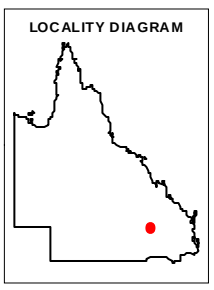
Cadastral Boundary

HES Wetland

GES Wetland

Queensland Government

LOCALITY DIAGRAM



N

0 725 1450 2175 2900 3625 m

Note:
This map shows the location of wetlands on the Map of Referable Wetlands which are defined under the Environmental Protection Regulation 2008.

Wetlands are assessed for ecological significance using the environmental values for wetlands in section 81A of the Environmental Protection Regulation 2008. Wetlands are considered either High Ecological Significance (HES) or of General Ecological Significance (GES) for the purposes of the environmental values.

This map is produced at a scale relevant to the size of the lot on plan identified and should be printed at A4 size in portrait orientation. Consideration of the effects of mapped scale is necessary when interpreting data at a large scale.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Heritage Protection at <www.ehp.qld.gov.au> or email <planning.support@ehp.qld.gov.au>

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This product is projected into GDA 1994 MGA Zone 55

Appendix G – DEHP Protected Plants Flora Survey Trigger Map

Protected Plants Flora Survey Trigger Map

Legend

- Lot and Plan
- High risk area
- Cadastral line
  Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets

Queensland Government

LOCALITY DIAGRAM

N

0 490 980 1,470 1,960 2,450 m

This product is projected into:
GDA 1994 Queensland Albers

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Heritage Protection at palm@ehp.qld.gov.au

Disclaimer:
While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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Appendix H – List of flora and fauna species identified on Site

Family	Species name	Common name	NC Act Status	EPBC Act Status
Birds				
Corcoracidae	*Struthidea cinerea*	apostlebird	LC	
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe	LC	
Motacillidae	*Anthus novaeseelandiae*	Australasian pipit	LC	Ma
Artamidae	*Cracticus tibicen*	Australian magpie	LC	
Pelecanidae	*Pelecanus conspicillatus*	Australian pelican	LC	Ma
Anatidae	*Chenonetta jubata*	Australian wood duck	LC	
Alcedinidae	*Ceyx azureus*	azure kingfisher	LC	
Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike	LC	Ma
Artamidae	*Artamus cinereus*	black-faced woodswallow	LC	
Recurvirostridae	*Himantopus himantopus*	black-winged stilt	LC	Ma
Psittacidae	*Northiella haematogaster*	blue bonnet	LC	
Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater	LC	
Meliphagidae	*Lichmera indistincta*	brown honeyeater	LC	
Phasianidae	*Coturnix ypsilophora*	brown quail	LC	
Cacatuidae	*Nymphicus hollandicus*	cockatiel	LC	
Columbidae	*Ocyphaps lophotes*	crested pigeon	LC	
Estrildidae	*Taeniopygia bichenovii*	double-barred finch	LC	
Cacatuidae	*Eolophus roseicapillus*	galah	LC	
Pachycephalidae	*Pachycephala pectoralis*	golden whistler	LC	
Artamidae	*Cracticus torquatus*	grey butcherbird	LC	
Falconidae	*Falco hypoleucos*	grey falcon	NT	
Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush	LC	
Anatidae	*Anas gracilis*	grey teal	LC	
Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler	LC	
Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo	LC	Ma
Passeridae	*Passer domesticus*	house sparrow	I	
Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra	LC	
Cacatuidae	*Cacatua sanguinea*	little corella	LC	
Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant	LC	
Monarchidae	*Grallina cyanoleuca*	magpie-lark	LC	
Charadriidae	*Vanellus miles*	masked lapwing	LC	
Artamidae	*Artamus personatus*	masked woodswallow	LC	
Falconidae	*Falco cenchroides*	nankeen kestrel	LC	Ma
Meliphagidae	*Philemon corniculatus*	noisy friarbird	LC	
Meliphagidae	*Manorina melanocephala*	noisy miner	LC	
Cuculidae	*Cuculus saturatus*	oriental cuckoo	SLC	Mi, Ma
Anatidae	*Anas superciliosa*	Pacific black duck	LC	
Psittacidae	*Platycercus adscitus*	pale-headed rosella	LC	
Artamidae	*Cracticus nigrogularis*	pied butcherbird	LC	
Artamidae	*Strepera graculina*	pied currawong	LC	
Meropidae	*Merops ornatus*	rainbow bee-eater	SLC	Mi, Ma

Family	Species name	Common name	NC Act Status	EPBC Act Status
Psittacidae	*Trichoglossus haematodus*	rainbow lorikeet	LC	
Maluridae	*Malurus melanocephalus*	red-backed fairy-wren	LC	
Halcyonidae	*Todiramphus pyrrhopygius*	red-backed kingfisher	LC	
Psittacidae	*Aprosmictus erythropterus*	red-winged parrot	LC	
Pachycephalidae	*Pachycephala rufiventris*	rufous whistler	LC	
Monarchidae	*Myiagra cyanoleuca*	satin flycatcher	SLC	Mi, Ma
Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater	LC	
Maluridae	*Malurus splendens*	splendid Fairy-wren	LC	
Pardalotidae	*Pardalotus striatus*	striated pardalote	LC	
Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo	LC	
Maluridae	Malurus cyaneus	superb Fairy-wren	LC	
Corvidae	*Corvus orru*	Torresian crow	LC	
Maluridae	*Malurus lamberti*	variegated fairy-wren	LC	
Accipitridae	*Aquila audax*	wedge-tailed eagle	LC	
Hirundinidae	*Hirundo neoxena*	welcome swallow	LC	Ma
Artamidae	*Artamus superciliosus*	white-browed woodswallow	LC	
Ardeidae	*Egretta novaehollandiae*	white-faced heron	LC	
Ardeidae	*Ardea pacifica*	white-necked heron	LC	
Climacteridae	*Cormobates leucophaea*	white-throated treecreeper	LC	
Campephagidae	*Lalage sueurii*	white-winged triller	LC	
Rhipiduridae	*Rhipidura leucophrys*	willie wagtail	LC	
Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill	LC	
Estrildidae	*Taeniopygia guttata*	zebra finch	LC	
Mammals				
Pteropodidae	*Pteropus alecto*	black flying-fox	LC	
Felidae	*Felis catus*	cat	I	
Canidae	*Canis lupus familiaris*	dog	I	
Macropodidae	*Macropus giganteus*	eastern grey kangaroo	LC	
Suidae	*Sus scrofa*	pig	I	
Leporidae	*Oryctolagus cuniculus*	rabbit	I	
Macropodidae	*Macropus rufus*	red kangaroo	LC	
Macropodidae	*Macropus dorsalis*	Black-striped wallaby	LC	
Potoroidae	*Aepyprymnus rufescens*	rufous bettong	LC	
Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna	SLC	
Reptiles				
Agamidae	*Pogona barbata*	bearded dragon	LC	
Cheluidae	*Chelodia longicollis*	eastern long-necked turtle	LC	
Elapidae	*Pseudonaja textilis*	eastern brown snake	LC	
Gekkonidae	*Gehyra dubia*		LC	
Gekkonidae	*Heteronotia binoei*	Bynoe's gecko	LC	
Scincidae	*Carlia pectoralis sensu lato*		LC	
Scincidae	*Carlia vivax*		LC	

Family	Species name	Common name	NC Act Status	EPBC Act Status
Scincidae	*Cryptoblepharus virgatus*	striped snake-eyed skink	LC	
Scincidae	*Morethia boulengeri*		LC	
Scincidae	*Tiliqua rugosa aspera*	shingle-back	LC	
Varanidae	*Varanus varius*	lace monitor	LC	
Amphibians				
Bufonidae	*Rhinella marina*	cane toad	I	

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
Aizoaceae	*Tetragonia tetragonoides*	New Zealand spinach	LC				X	X		X	
Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	LC					X			X
Amaranthaceae	*Ptilotus nobilis*		I				X	X			
Apiaceae	*Cyclospermum leptophyllum*	slender celery	I				X	X		X	
Apocynaceae	*Alstonia constricta*	bitterbark	LC				X	X	X	X	X
Apocynaceae	*Carissa ovata*	currantbush	LC				X	X	X	X	X
Apocynaceae	*Gomphocarpus physocarpus*	balloon cottonbush	I				X	X	X	X	X
Apocynaceae	*Parsonsia eucalyptophylla*	gargaloo	LC					X			
Asteraceae	*Aster subulatus*	wild aster	I				X	X			
Asteraceae	*Calotis cuneifolia*	burr daisy	LC				X	X			X
Asteraceae	*Calotis lappulacea*	yellow burr daisy	LC				X				
Asteraceae	*Centipeda cunninghamii*	common sneezeweed	LC					X		X	X
Asteraceae	*Chrysocephalum apiculatum*	yellow buttons	LC					X			X
Asteraceae	*Cirsium vulgare*	spear thistle	I				X	X	X	X	X
Asteraceae	*Conyza bonariensis*		I				X	X		X	
Asteraceae	*Coronidium oxylepis*		LC							X	
Asteraceae	*Lactuca serriola forma serriola*		LC					X		X	
Asteraceae	*Minuria integerrima*	smooth minuria	LC					X			
Asteraceae	*Peripleura hispidula*		LC				X				

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
Asteraceae	*Podolepis longipedata*	tall copper-wire daisy	LC							X	
Asteraceae	*Senecio brigalowensis*		LC					X		X	X
Asteraceae	*Sonchus asper*	rough sow thistle	I				X				
Asteraceae	*Sonchus oleraceus*	common sowthistle	I				X	X			
Asteraceae	*Tagetes minuta*	stinking roger						X			
Asteraceae	*Vittadinia dissecta* var. *hirta*		LC				X				
Asteraceae	*Xanthium occidentale*	noogoora burr	I					X			
Asteraceae	*Xanthium spinosum*	Bathurst burr	I				X				
Bignoniaceae	*Pandorea pandorana*	wonga wonga vine	LC				X	X		X	X
Brassica	*Brassica tournefortii*	wild turnip	I				X	X			
Brassicaceae	*Lepidium bonariense*	Argentine peppercress	I				X	X	X	X	X
Cactaceae	*Opuntia stricta*	prickly pear	I		Class 2	WONS	X	X	X	X	X
Cactaceae	*Opuntia tomentosa*	velvety tree pear	I		Class 2	WONS	X	X	X	X	X
Caesalpiniaceae	*Lysiphyllum carronii*	ebony tree	LC				X	X			X
Caesalpiniaceae	*Senna occidentalis*	coffee senna	I					X			
Campanulaceae	*Wahlenbergia queenslandica*		LC				X	X			
Capparaceae	*Apophyllum anomalum*	broom bush	LC				X	X	X	X	X
Capparaceae	*Capparis lasiantha*	nipan	LC				X	X	X	X	X
Capparaceae	*Capparis loranthifolia var. loranthifolia*	narrow-leaf bumble	LC				X	X	X	X	X
Capparaceae	*Capparis mitchellii*		LC				X	X	X	X	X
Casuarinaceae	*Casuarina cristata*	belah	LC				X	X	X	X	X
Celastraceae	*Elaeodendron australe*	red olive plum	LC					X		X	
Celastraceae	*Maytenus cunninghamii*	yellow berry bush	LC				X			X	X

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
Chamaesyce	*Chamaesyce australis*	Hairy Caustic Weed	LC				X	X			
Chenopodiaceae	*Atriplex muelleri*	lagoon saltbush	LC				X	X		X	
Chenopodiaceae	*Chenopodium* sp.		LC					X			
Chenopodiaceae	*Einadia hastata*		LC				X	X		X	X
Chenopodiaceae	*Einadia nutans* subsp. *linifolia*		LC				X	X			
Chenopodiaceae	*Enchylaena tomentosa*		LC					X			
Chenopodiaceae	*Maireana microphylla*		LC				X	X	X	X	X
Chenopodiaceae	*Salsola australis*		LC				X	X			X
Chenopodiaceae	*Sclerolaena birchii*	galvanised burr	LC					X	X		X
Chenopodiaceae	*Sclerolaena muricata*	black roly-poly						X			X
Convolvulaceae	*Convolvulus arvensis*	bindweed	I				X				
Crassulaceae	*Crassula* sp.		LC				X				
Cupressaceae	*Callitris glaucophylla*	white cypress pine	LC						X		X
Cupressaceae	*Callitris endlicheri*	black cypress pine	LC								
Cyperaceae	*Cyperus difformis*	rice sedge	LC				X				
Cyperaceae	*Gahnia aspera*		LC							X	
Erythroxylaceae	*Erythroxylum australe*	cocaine tree	LC						X		
Euphorbiaceae	*Croton insularis*		LC				X			X	X
Euphorbiaceae	*Croton phebalioides*	narrow-leaved croton	LC				X				
Fabaceae	*Hovea longipes*	brush hovea	LC				X	X	X	X	X
Fabaceae	*Indigofera brevidens*		LC				X		X		
Fabaceae	*Medicago minima* var. *minima*		I				X		X	X	
Gentianaceae	*Centaurium tenuiflorum*		I				X				
Hemerocallidaceae	*Dianella longifolia var. longifolia*		LC					X		X	

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
Juncaceae	*Juncus subsecundus*		LC				X	X		X	X
Lamiaceae	*Clerodendrum floribundum*	lolly bush	LC								X
Lamiaceae	*Salvia reflexa*		I								X
Lamiaceae	*Spartothamnella juncea*	native broom	LC				X				
Laxmanniaceae	*Lomandra longifolia*		LC							X	X
Loranthaceae	*Amyema cambagei*		LC				X				
Loranthaceae	*Amyema congener* subsp. *rotundifolia*		LC				X	X	X	X	X
Loranthaceae	*Lysiana exocarpi* subsp. *tenuis*		LC				X	X			
Malvaceae	*Abutilon oxycarpum* var. *oxycarpum*		LC						X		X
Malvaceae	*Hibiscus sturtii* var. *sturtii*		LC				X				X
Malvaceae	*Malva parviflora*	small-flowered mallow	I					X		X	
Malvaceae	*Malvastrum americanum* var. *americanum*		I				X	X	X	X	X
Malvaceae	*Malvastrum coromandelianum* subsp. *coromandelianum*	prickly malvastrum	I				X	X		X	
Malvaceae	*Sida cordifolia*		I				X	X			X
Malvaceae	*Sida filiformis*	fine sida									X
Malvaceae	*Sida hackettiana*		LC				X	X			
Malvaceae	*Sida rhombifolia*	common sida	I				X				
Malvaceae	*Sida spinosa*		LC					X			

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
Marsileaceae	*Marsilea hirsuta*	hairy nardoo	LC					X			
Meliaceae	*Owenia acidula*	emu apple	LC				X	X	X	X	X
Mimosaceae	*Acacia amblygona*	fan-leaf wattle	LC								X
Mimosaceae	*Acacia burrowii*	Burrow's wattle	LC				X	X	X		
Mimosaceae	*Acacia complanata*	flatstem wattle						X	X		
Mimosaceae	*Acacia decora*	pretty wattle	LC					X		X	X
Mimosaceae	*Acacia everistii*		LC								X
Mimosaceae	*Acacia excelsa* subsp. *excelsa*		LC				X	X		X	X
Mimosaceae	*Acacia harpophylla*	brigalow	LC				X	X	X	X	X
Mimosaceae	*Acacia jucunda*		LC				X				
Mimosaceae	*Acacia leiocalyx subsp. leiocalyx*	early black wattle	LC								X
Mimosaceae	*Acacia oswaldii*	miljee	LC					X			X
Mimosaceae	*Acacia podalyriifolia*	Queensland silver wattle	LC								X
Mimosaceae	*Acacia salicina*	doolan	LC				X	X		X	X
Mimosaceae	*Vachellia farnesiana*	mimosa bush	I				X	X		X	X
Molluginaceae	*Glinus lotoides*	hairy carpet weed	LC				X			X	
Myoporaceae	*Eremophila mitchellii*	false sandalwood	LC				X	X	X	X	X
Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash	LC								X
Myrtaceae	*Eucalyptus chloroclada*	Baradine red gum	LC					X		X	
Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark	LC				X			X	
Myrtaceae	*Eucalyptus fibrosa*		LC				X				
Myrtaceae	*Eucalyptus fibrosa* subsp. *nubila*		LC				X			X	
Myrtaceae	*Eucalyptus*	Silver-leaved ironbark	LC				X	X		X	X

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
	melanophloia										
Myrtaceae	*Eucalyptus orgadophila*	mountain coolibah	LC						X	X	
Myrtaceae	*Eucalyptus populnea*	poplar box	LC					X		X	X
Myrtaceae	*Eucalyptus tereticornis* subsp. *tereticornis*		LC				X	X		X	X
Myrtaceae	*Lysicarpus angustifolius*	budgeroo	LC								X
Oleaceae	*Jasminum didymum* subsp. *lineare*		LC				X			X	
Oleaceae	*Jasminum didymum* subsp. *racemosum*		LC				X				X
Oleaceae	*Jasminum simplicifolium* subsp. *australiense*		LC				X			X	X
Oleaceae	*Notelaea microcarpa* var. *velutina*		LC				X	X		X	X
Orchidaceae	*Cymbidium canaliculatum*		LC				X			X	
Papaveraceae	*Argemone ochroleuca subsp. ochroleuca*	Mexican poppy	I				X	X	X		X
Phyllanthaceae	*Breynia oblongifolia*		LC					X			
Phyllanthaceae	*Phyllanthus virgatus*		LC								
Picrodendraceae	*Petalostigma pubescens*	quinine tree	LC					X			
Pittosporaceae	*Auranticarpa rhombifolia*		LC				X				
Pittosporaceae	*Bursaria incana*	prickly pine	LC						X	X	X
Pittosporaceae	*Bursaria spinosa* subsp. *spinosa*	sweet bursaria	LC							X	X

Family	Scientific name	Common name	NC Act status	EPBC Act status	LP Act status	WONS	Property Lot No.				
							10P896637	1SP84934	2SP184934	20RP896637	21RP896637
Pittosporaceae	*Pittosporum spinescens*	wallaby apple	LC								X
Plantaginaceae	*Plantago debilis*	shade plantain	LC					X			X
Poaceae	*Ancistrachne uncinulata*	hooky grass	LC								X
Poaceae	*Aristida caput-medusae*	many headed wiregrass	LC					X			X
Poaceae	*Aristida ramosa*	purple wiregrass	LC				X	X		X	X
Poaceae	*Austrostipa ramosissima*	bamboo grass	LC								X
Poaceae	*Bothriochloa bladhii* subsp. *bladhii*		LC				X	X			
Poaceae	*Bothriochloa decipiens* var. *decipiens*		LC				X				
Poaceae	*Cenchrus ciliaris*		I				X	X	X	X	X
Poaceae	*Chloris gayana*	rhodes grass	I				X	X		X	X
Poaceae	*Cynodon dactylon*	couch	I				X	X	X	X	
Poaceae	*Echinochloa colona*	awnless barnyard grass, jungle rice	I				X	X			
Poaceae	*Enneapogon nigricans*		LC								X
Poaceae	*Enteropogon acicularis*	curly windmill grass	LC							X	X
Poaceae	*Enteropogon ramosus*		LC					X		X	X
Poaceae	*Eriochloa crebra*	spring grass	LC				X				
Poaceae	*Leptochloa digitata*		LC				X	X		X	
Poaceae	*Melinis repens*	Red Natal grass	I								X
Poaceae	*Panicum decompositum*	native millet	LC					X			
Poaceae	*Panicum sp.*						X				

Poaceae	*Paspalidium distans*	shotgrass	LC								
Poaceae	*Paspalum dilatatum*	paspalum	I				X				
Poaceae	*Sporobolus actinocladus*	katoora grass	LC				X				
Poaceae	*Sporobolus caroli*	fairy grass	LC				X	X			
Poaceae	*Sporobolus creber*		LC								
Poaceae	*Sporobolus elongatus*		LC				X				
Poaceae	*Themeda triandra*	kangaroo grass	LC								X
Poaceae	*Urochloa mutica*	para grass	I				X				
Polygonaceae	*Persicaria orientalis*	princes feathers	LC				X				
Portulacaceae	*Portulaca australis*		LC								
Portulacaceae	*Portulaca oleracea*	pigweed	I				X				
Portulacaceae	*Portulaca pilosa* subsp. *pilosa*		LC								
Proteaceae	*Grevillea striata*	beefwood	LC				X			X	X
Proteaceae	*Hakea lorea subsp. lorea*	bootlace hakea	LC					X		X	
Rhamnaceae	*Alphitonia excelsa*	soap tree	LC				X	X	X		X
Rhamnaceae	*Ventilago viminalis*	supplejack	LC								
Rubiaceae	*Psydrax johnsonii*		LC				X				X
Rubiaceae	*Psydrax longipes*		LC				X				X
Rubiaceae	*Psydrax odorata* forma *subnitida*		LC								
Rubiaceae	*Psydrax oleifolium*	myrtle tree	LC								X
Rutaceae	*Citrus glauca*	desert lime	LC				X	X	X	X	X
Rutaceae	*Flindersia collina*		LC					X			
Rutaceae	*Geijera parviflora*	wilga	LC				X	X		X	X
Santalaceae	*Santalum lanceolatum*	sandalwood	LC					X			
Sapindaceae	*Alectryon diversifolius*	scrub boonaree	LC				X	X	X	X	X

Sapindaceae	*Alectryon oleifolius* subsp. *elongatus*		LC				X	X		X	X
Sapindaceae	*Atalaya hemiglauca*		LC				X	X	X	X	X
Scrophulariaceae	*Eremophila deserti*		LC					X			
Scrophulariaceae	*Eremophila mitchellii*		LC					X		X	X
Solanaceae	*Datura* sp.	thornapple	I				X	X	X	X	
Solanaceae	*Solanum americanum*		I				X	X		X	
Solanaceae	*Solanum esuriale*	quena	LC							X	X
Solanaceae	*Solanum parvifolium subsp. parvifolium*		LC								X
Solanaceae	*Solanum semiarmatum*	ginger's whiskers, prickly nightshade	LC								X
Sterculiaceae	*Brachychiton australis*	broad-leaved bottle tree	LC					X			
Sterculiaceae	*Brachychiton populneus*	kurrajong	LC								X
Sterculiaceae	*Brachychiton rupestris*	Queensland bottle tree	LC				X	X		X	X
Typhaceae	*Typha orientalis*	broad-leaved cumbungi	LC				X				
Verbenaceae	*Glandularia aristigera*		I				X	X	X	X	X
Verbenaceae	*Phyla nodiflora*	carpetweed	I					X			
Verbenaceae	*Verbena officinalis*	common Verbena	I				X	X			
Zygophyllaceae	*Roepera apiculata*		LC								X
Zygophyllaceae	*Tribulus terrestris*	caltrop	I					X			

Appendix I – Ground-truthed Regional Ecosystems and Regrowth

740,000 742,000 744,000 746,000 748,000 750,000 752,000 754,000

7,110,000 7,108,000 7,106,000 7,104,000 7,102,000 7,100,000

Bundi Clifford Road

11.9.5 100
11.9.10 100
11.3.2/11.3.25 70/30
11.9.5a 100
11.3.2 100

10RP896637
1SP184934
20RP896637
21RP896637
2SP184934

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Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer
- Remnant Vegetation
  - Endangered RE
  - Of Concern RE

Origin Energy
Ecological Assessment Report

Field Verified Regional Ecosystem and Regrowth Mapping

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Figure 4

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Data source: DNRM: Physical Roads, 2010; Petroleum Lease, 2014; Origin Energy: Imagery, Regional Ecosystem, Cadastre 2014; GHD: Survey Area, Field Verified Regional Ecosystem, Survey Sites, 2014. Created by: RB

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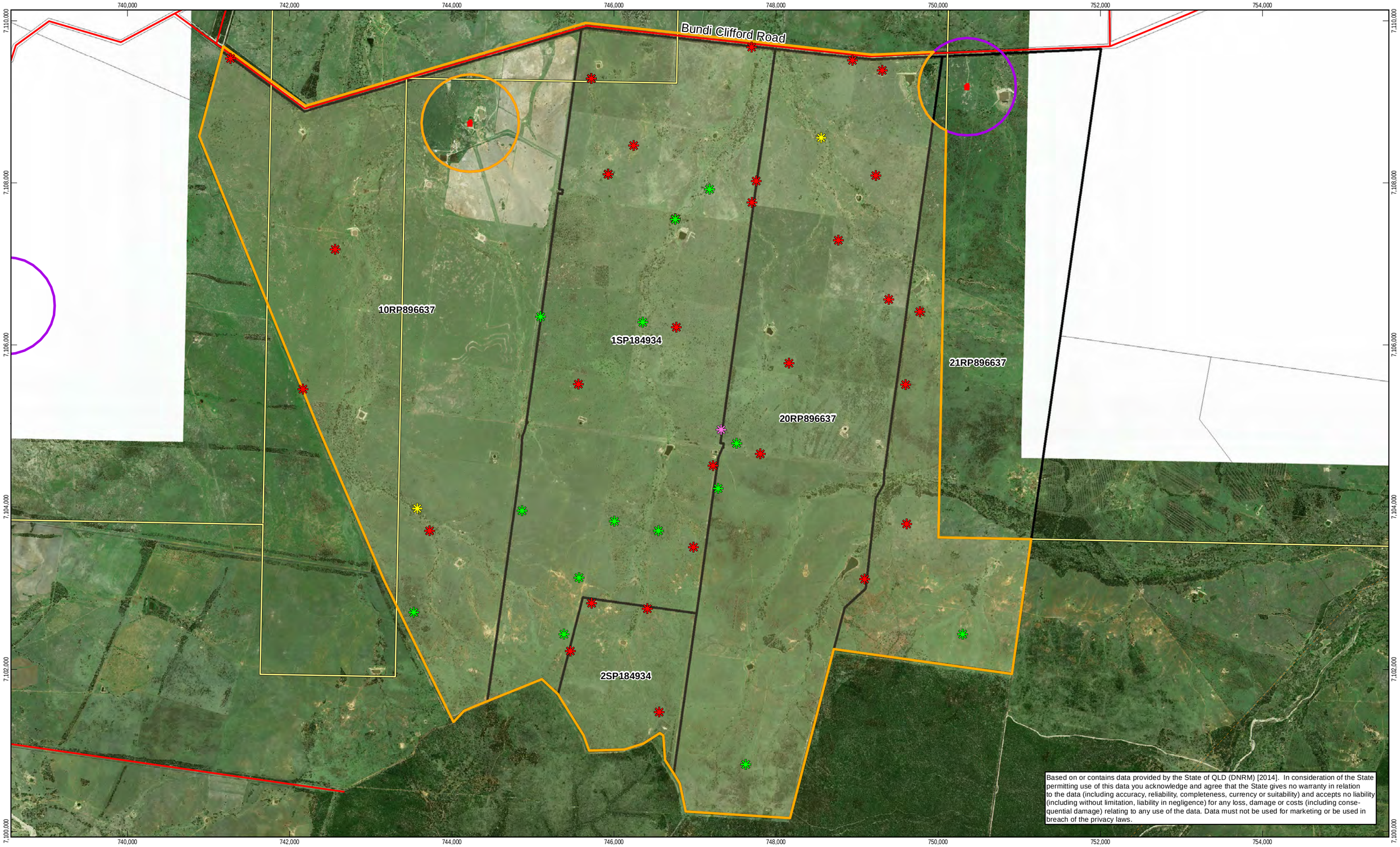
Appendix J – Ground-truthed pest flora and fauna present on Site



Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer

Pest_Fauna_Species

- *Canis lupus familiaris* (dog)
- *Felis catus* (cat)

Pest FIora Species

- *Opuntia stricta* (prickly pear)
- *Opuntia tomentosa* (velvety tree pear)

Origin Energy
Ecological Assessment Report

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Location of Pest Species

Figure 5

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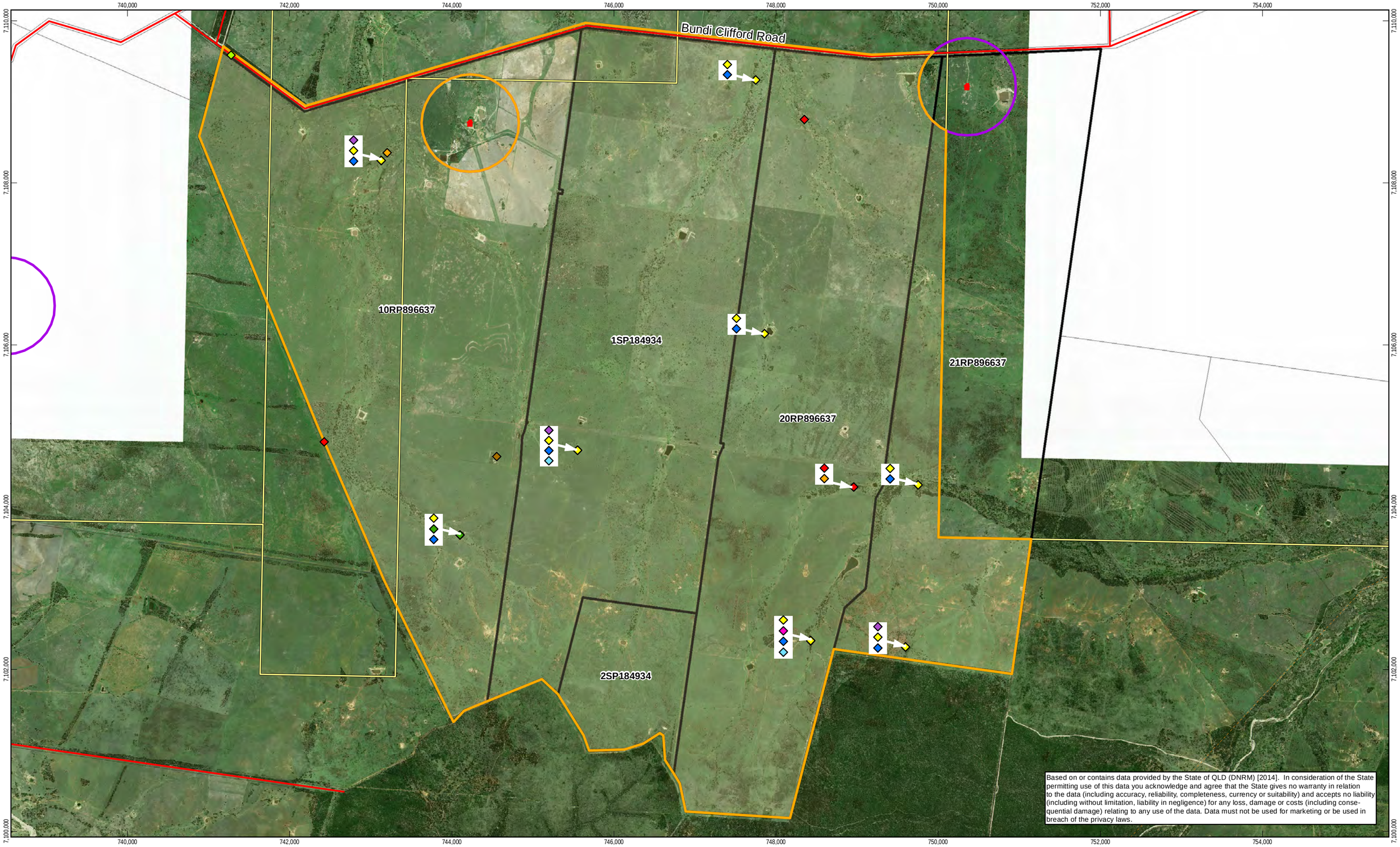
Appendix K Ground-truthed conservation significant species present on Site



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Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer

Migratory/Marine Species

- Rainbow Bee-Eater
- Horsfield's Bronze-Cuckoo
- Black-Faced Cuckoo-Shrike
- Nankeen Kestrel
- Cuckoo Oriental
- Satin flycatcher
- Australian pelican
- Australasian pipit
- Black-winged stilt
- Welcome swallow

Origin Energy
Ecological Assessment Report

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Locations of EPBC Act threat-listed species

Figure 6a

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Data source: DNRM: Physical Roads, 2010; Petroleum Lease, 2014; Origin Energy: Imagery, Cadastre 2014; GHD: Survey Area, Survey Sites, 2014. Created by: RB

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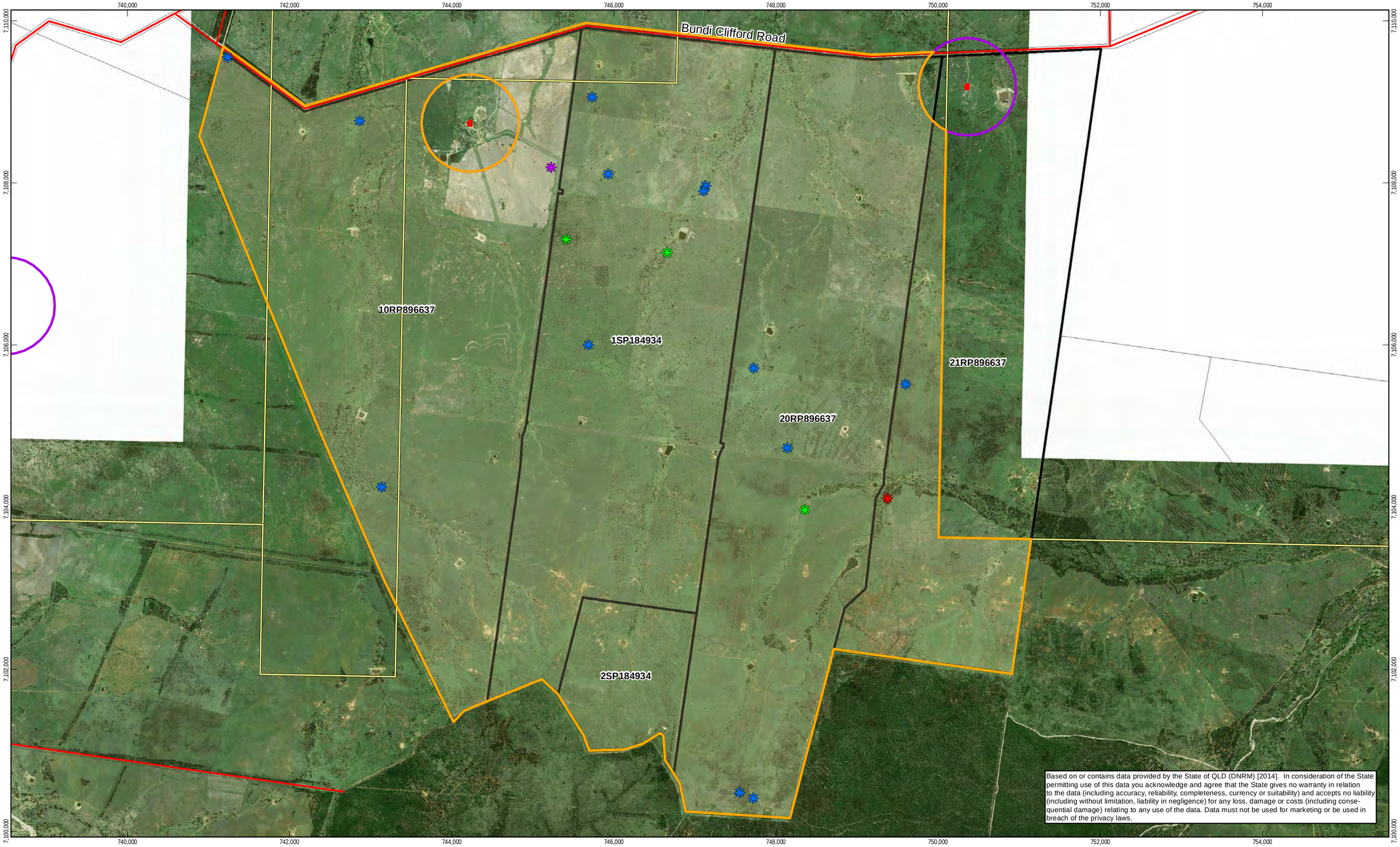

Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer

Special Least Concern Species

- *Brachychiton rupestris* (Queensland bottle tree)
- *Cymbidium canaliculatum* (black orchid)
- *Tachyglossus aculeatus* (short-beaked echidna)

Near Threatened Species

- *Falco hypoleucos* (grey falcon)

Origin Energy
Ecological Assessment Report

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Locations of NC Act threat-listed species

Figure 6b

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Data source: DNRM: Physical Roads, 2010; Petroleum Lease, 2014; Origin Energy: Imagery, Cadastre 2014; GHD: Survey Area, Survey Sites, 2014. Created by: RB

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Appendix L – Ground-truthed watercourses on Site

740,000 742,000 744,000 746,000 748,000 750,000 752,000 754,000

7,110,000 7,108,000 7,106,000 7,104,000 7,102,000 7,100,000

Bundi Clifford Road

10RP896637

1SP184934

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20RP896637

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Paper Size A3

0 500 1,000 2,000

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

LEGEND

- Homestead
- Watercourse assessment sites
- Local road
- Unconstructed road
- Lot Boundaries Within Study Area
- Lot Boundaries Outside Study Area
- Survey Area
- Petroleum Lease
- Homestead 600m Buffer
- Drainage feature
- Watercourse

Origin Energy
Ecological Assessment Report

Job Number	41-28330
Revision	0
Date	22 Dec 2014

Ground - truthed waterways and watercourses on site

Figure 7

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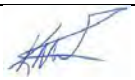
A	P. Moonie C. Mills L. Muller	M. Ward	Draft	J. Corfield	Draft	02/12/2014
0	P. Moonie L. Muller P. Wagner	K. Neil		K. Neil		22/12/2014

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