Appendix K

Report:
"Environmental Assessment Report"

ENVIRONMENTAL ASSESSMENT REPORT

BARCALDINE REGIONAL COUNCIL WASTE MANAGEMENT FACILITY

MARCH 2017

GBA CONSULTING ENGINEERS

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Contact for enquiries and proposed changes

If you have any questions regarding this document or if you have a suggestion for improvements, please contact:

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APPENDICES

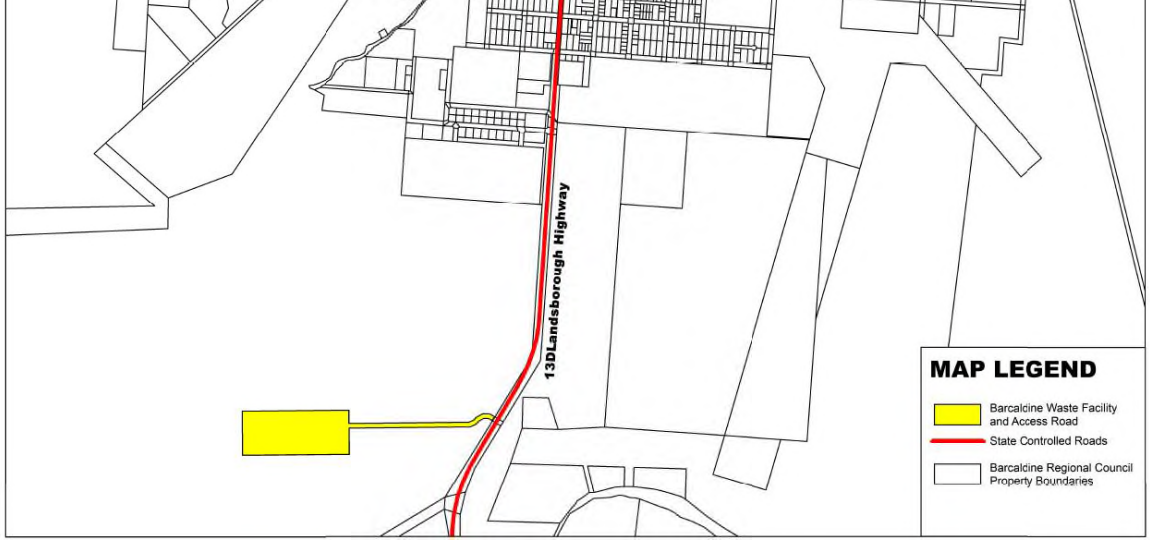


Figure 1 – Map of the Proposed Site Location.

2.0 METHODOLOGY

George Bourne and Associates (GBA) to undertake an Environmental Assessment for addressing the following:

- A general site description;
- An assessment of Regional Ecosystems (REs) found within the proposed pit area;
- General geographical information;
- A fauna and flora assessment;
- An assessment of geology and soils
- An assessment of surface and groundwater values
- A tabulation of statutory requirements and the administrating authorities including permits required.

Taking this into account, George Bourne and Associates has prepared this EAR with the following key objectives:

- To place the proposed work site in a local and regional environmental context;

A summary of environmental legislation/policy potentially relevant to the proposed are listed in Table 1 below.

Table 1: Summary of relevant environmental legislation / policy

Legislation / Policy	Responsible Government / Agency	Aspect
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Department of Environment, Water, Heritage and the Arts (DEWHA)	Protection of EPBC listed significant flora, fauna and ecological communities.
Queensland Legislation		
Nature Conservation Act 1992	Department of Environment & Resource Management (DERM)	All native species are protected by this act from unlawful "taking" (which includes killing, injury or harm, but not by habitat loss) and any member of the public can take an offender to Court to restrain the taking.
Environmental Protection Act 1994	DERM	General environmental duty of care is a legal obligation requiring all individuals to exercise reasonable care when doing something that might possibly harm other people, property or the environment.
Vegetation Management Act 1999	DERM	If a proponent wants to clear native vegetation regulated under the vegetation management framework, the clearing must either qualify for an exemption, be conducted in accordance with the regrowth vegetation code or a permit must be obtained. The department assesses applications against regional vegetation management codes.
Vegetation Management Act 1999	DERM	Queensland's vegetation management framework regulates the clearing of certain regrowth vegetation and its high biodiversity values mapped as HVR. All native woody regrowth vegetation within 50 metres of a regrowth watercourse is regulated in the priority Great Barrier Reef catchments of Burdekin, Mackay Whitsunday and Wet Tropics. Exemptions are available including for clearing areas of regulated regrowth vegetation for extractive

Management Act 1999 and the *Land Act 1994* and to minimize the impact of construction activities on the flora and fauna within development site. All project stakeholders are required to take all due care not to harm native Flora and Fauna.

A desktop analysis and a field survey of the proposed development site have been assessed by GBA environmental staff. This area has been mapped as Least Concern regional ecosystems, category B (remnant vegetation) on the Regulated Vegetation Map (refer to Appendix A).

The field survey of the area identified that the vegetation was consistent with that shown on the vegetation maps, being Corymbia open woodland on sand plains, with the dominant canopy species being Corymbia dallachiana.

The field survey of the area did not identify any active breeding places within the area to be cleared in the first stages of the project. Although the risk of disturbance on fauna habitat is low, an EPBC Protected Matters Report on-line database search for the project site and including a 1km buffer area indicated that there is the potential for endangered and vulnerable species to be present in the area. Due to the possibility of these rare fauna species residing in the area work crews must take care not to cause unnecessary disturbance during the entirety of the project. A summary of report projections for EPBC listed species are presented in Appendix B.

4.2 Topography Geology and Soils

Disturbance to the proposed site will not impact significantly on any geological features. Given the relatively flat topography (Refer to Appendix C, Contour Map) shallow excavations will have minor impacts by creating depressions within the terrain and subsequently altering the flow and potentiality trapping runoff if not re-contoured.

The soil types in the proposed pit areas do however have the potential to be impacted by a number of factors, these factors are briefly discussed below.

Wind erosion

Soils with sandy or loamy topsoil are susceptible to wind erosion. Wind erosion has the potential to contribute to reduced air quality during extraction activities through dust suspension and to the loss of topsoil.

are a series of flood channels forming a wetland habitat, mapped as RE 1-50% wetland (mosaic units), the landfill site will be approximately 750m from the edge of the mapped wetland areas.

The site is located approximately 1.5 km from the two nearby watercourses; the vegetation community running adjacent to the Alice River has been mapped as Riverine RE. Refer to Appendix E for Biodiversity Planning Assessments and Aquatic Conservation Assessments.

The site is located within the Great Artesian Basin resource area, a resource of great importance to the communities in this area.

Potential Impacts Surface Water

The proposed development activity has the potential to cause disturbance to water resources and aquatic values in the following ways.

- Minor alteration of localised stormwater flow patterns due to design structures such as stormwater diversions and leachate evaporation ponds. The impact on stormwater flows is expected to be minor due to the relatively small scale of the project compared to the whole of the catchment.
- The potential exists for the reduction in surface water runoff quality due to contamination from waste. The likelihood of offsite contamination of water has been greatly reduced through the design of the facility ensuring all water that falls onsite is captured and treated, avoiding any contamination offsite.
- Flood events increase the likelihood of contamination of aquatic habitats in the local area due to an increase in the volume of water in the proximity of the proposed landfill development. The likelihood of flood water entering the waste facility are highly unlikely as the boundary of the facility sits well outside of both the 1 in 100 year flood level and the modelled 1 in 500 year flood level. Flood level maps for the Barcaldine area can be seen in Appendix D.
- Pooling in and around excavations, which may lead to the growth of weedy vegetation; and
- Sedimentation in downstream areas due to increased soil erosion.

Environmental nuisance: Noise Vibration Dust and Odour

The proposed development is not expected to cause environmental nuisance to sensitive receptors. The location of the activities will be more than 1km from the closest receptor. A map is attached in Appendix F identifying all sensitive receptors within a 2km radius of the proposed development.

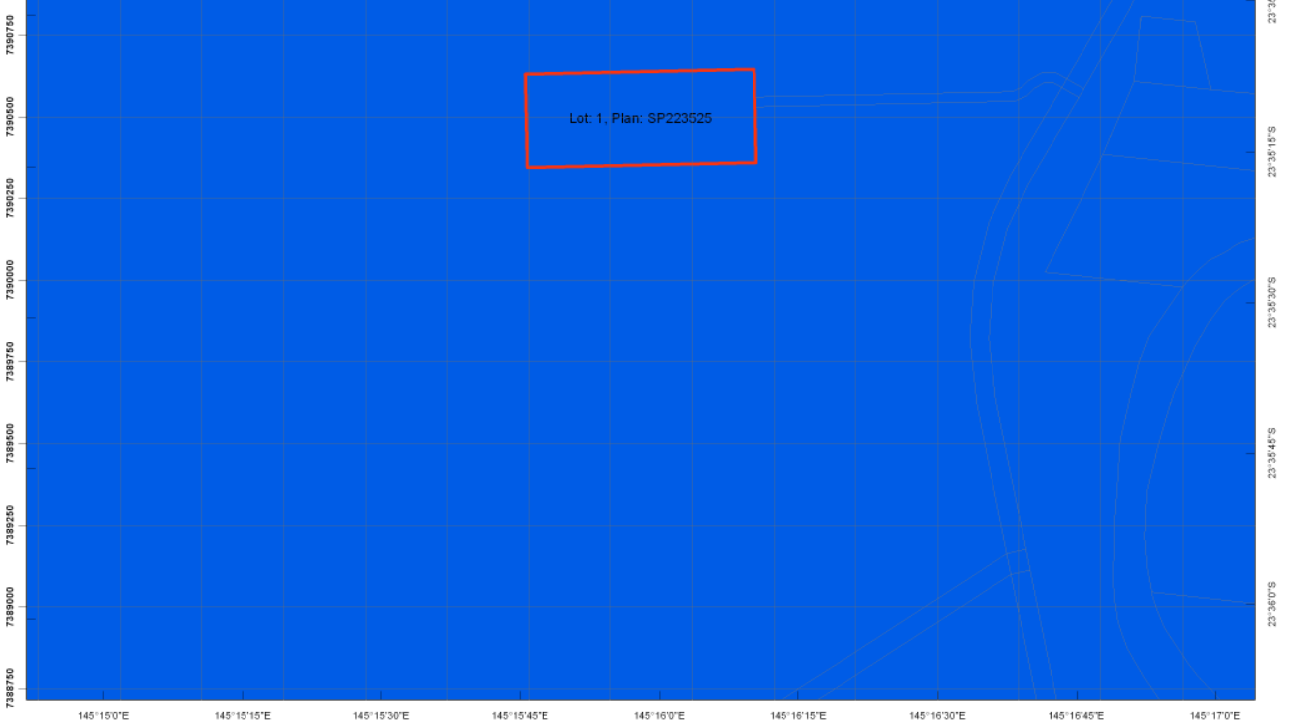
Although the risk of causing nuisance to sensitive receptor is low potential cases have been identified and are outlined below:

- Dust, noise and vibration generation affecting sensitive receptors are potentially possible through machinery activity working on the site.
- Odour generation is possible due to the decomposition of putrescible materials from the facility.

Management practices for the generation of environmental nuisances are detailed in the Barcaldine Regional Council Landfill Management Plan.

Appendix A

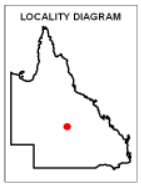
Vegetation Management Map



Regulated Vegetation Management Map

Legend

- Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Cadastral line
- Property boundaries shown are provided as a locational aid only



N

0 200 400 600 800 1,000 m

This product is projected into:
GDA 1994 MGA Zone 55

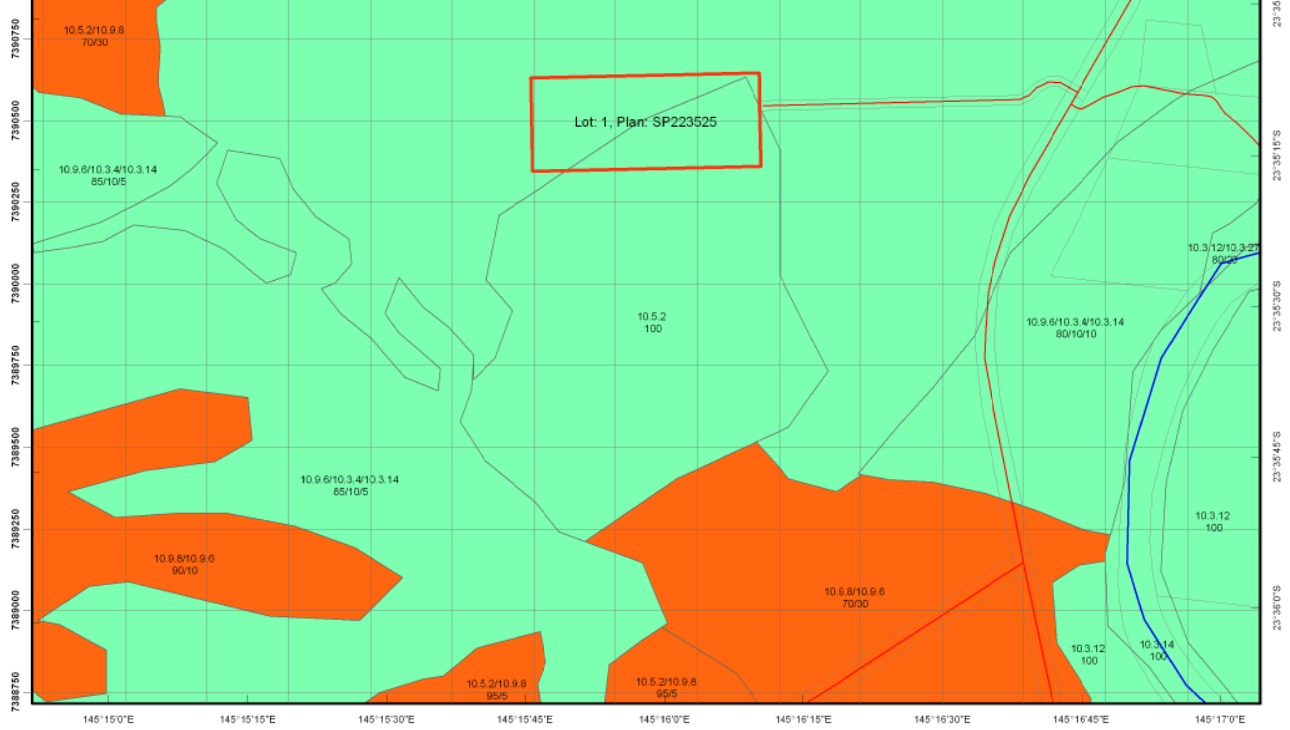
Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incurr as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.dnrm.qld.gov.au or contact the Department of Natural Resources and Mines.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

Queensland Government



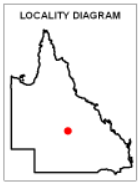
Vegetation Management Supporting Map

Legend

- Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area containing remnant vegetation
- Category A or B area under Section 20AH
  These areas are edged in yellow and filled with the remnant RE Status
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Category C area containing high value regrowth vegetation
- Category C area under Section 20AI
  These areas are edged in purple and filled with the remnant RE Status
- Non Remnant
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourse on the vegetation management watercourse and drainage feature map
  (Stream order shown as black number against stream where available)
- Roads
- National Parks, State Forest and other reserves
- Cadastral line
  Property boundaries shown are
  provided as a locational aid only

Queensland Government

LOCALITY DIAGRAM



N

0 150 300 450 600 750 m

This product is projected into:
GDA 1994 MGA Zone 55

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
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Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.dnrm.qld.gov.au or contact the Department of Natural Resources and Mines.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Species Information

(no results)

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Regional Ecosystems Information

(no results)

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Species Information

(no results)

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Regional Ecosystems Information

(no results)

Essential habitat in Category C (High value regrowth vegetation) areas:1100m Species Information

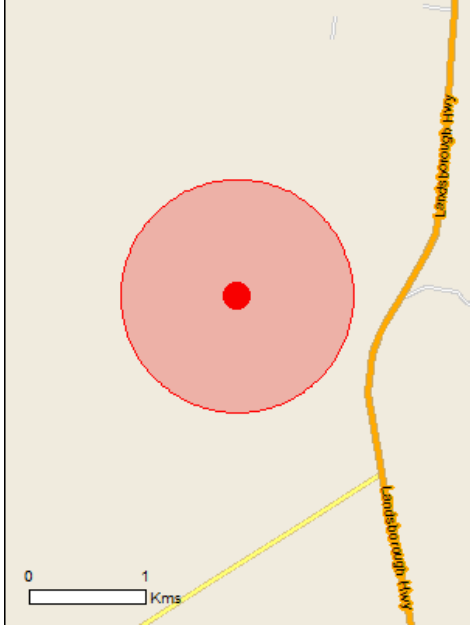
(no results)

Essential habitat in Category C (High value regrowth vegetation) areas:1100m Regional Ecosystems Information

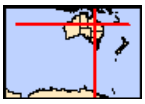
(no results)

Appendix B

EPBC Act Protected Matters Report



Coordinates
Buffer: 1.0Km



Listed Threatened Species:	11
Listed Migratory Species:	4

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. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

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.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

		may occur within area
Geophaps scripta scripta		
Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta		
Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Neochmia ruficauda ruficauda		
Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Poephila cincta cincta		
Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
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 likely to occur within area
Sminthopsis douglasi		
Julia Creek Dunnart [305]	Endangered	Species or species habitat may occur within area
Reptiles		
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

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
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	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
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

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
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		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
Feral deer Feral deer species in Australia [85733]		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
Sus scrofa Pig [6]		Species or species habitat likely to occur

Bean [12301]	likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]	Species or species habitat likely to occur within area
Vachellia nilotica Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]	Species or species habitat likely to occur within area

habitat studies. Where appropriate, core breeding, foraging and resting 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.

Coordinates

-23.586192 145.266323

-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
Forestry Corporation, 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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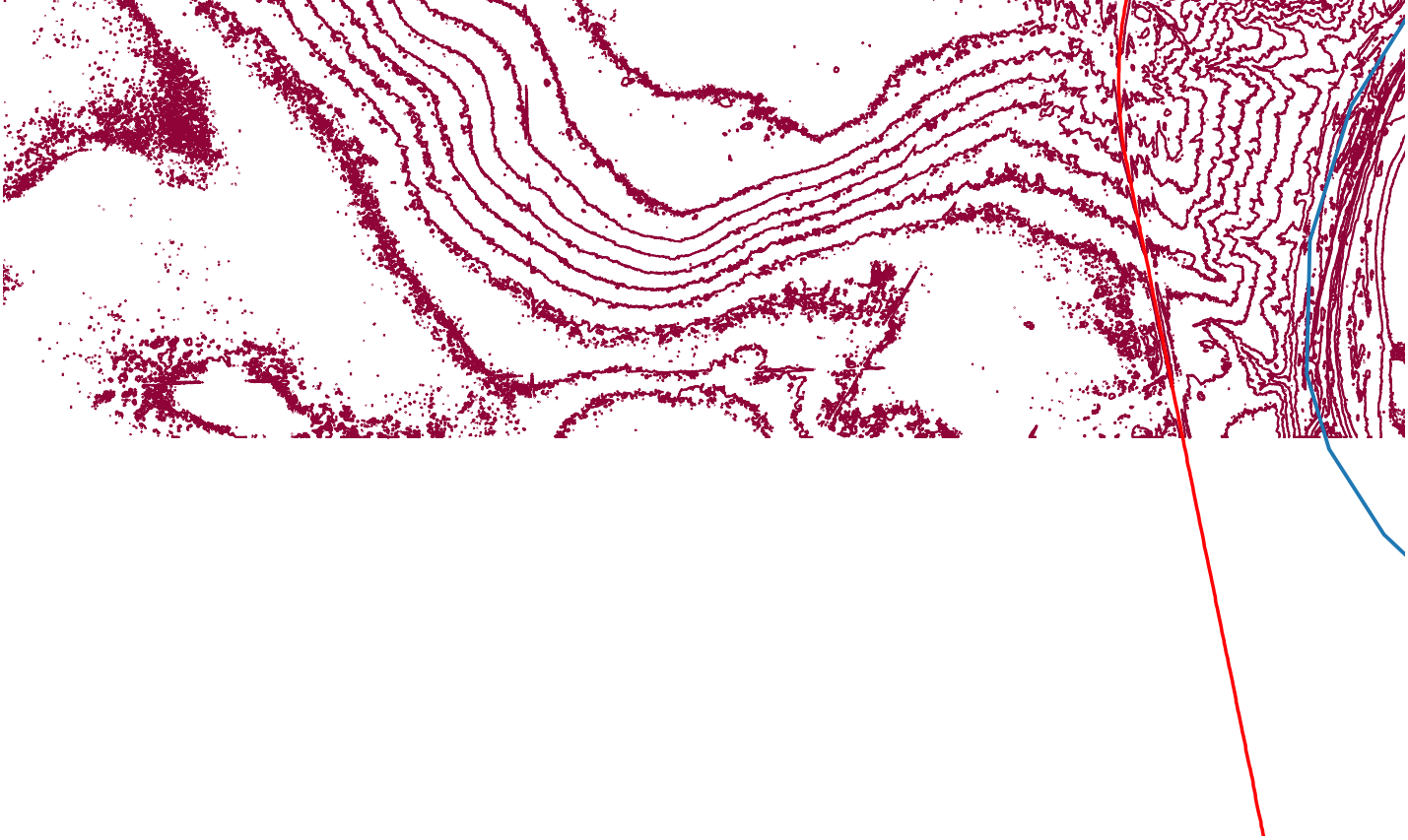
Appendix C

Site Contour Map



Legend

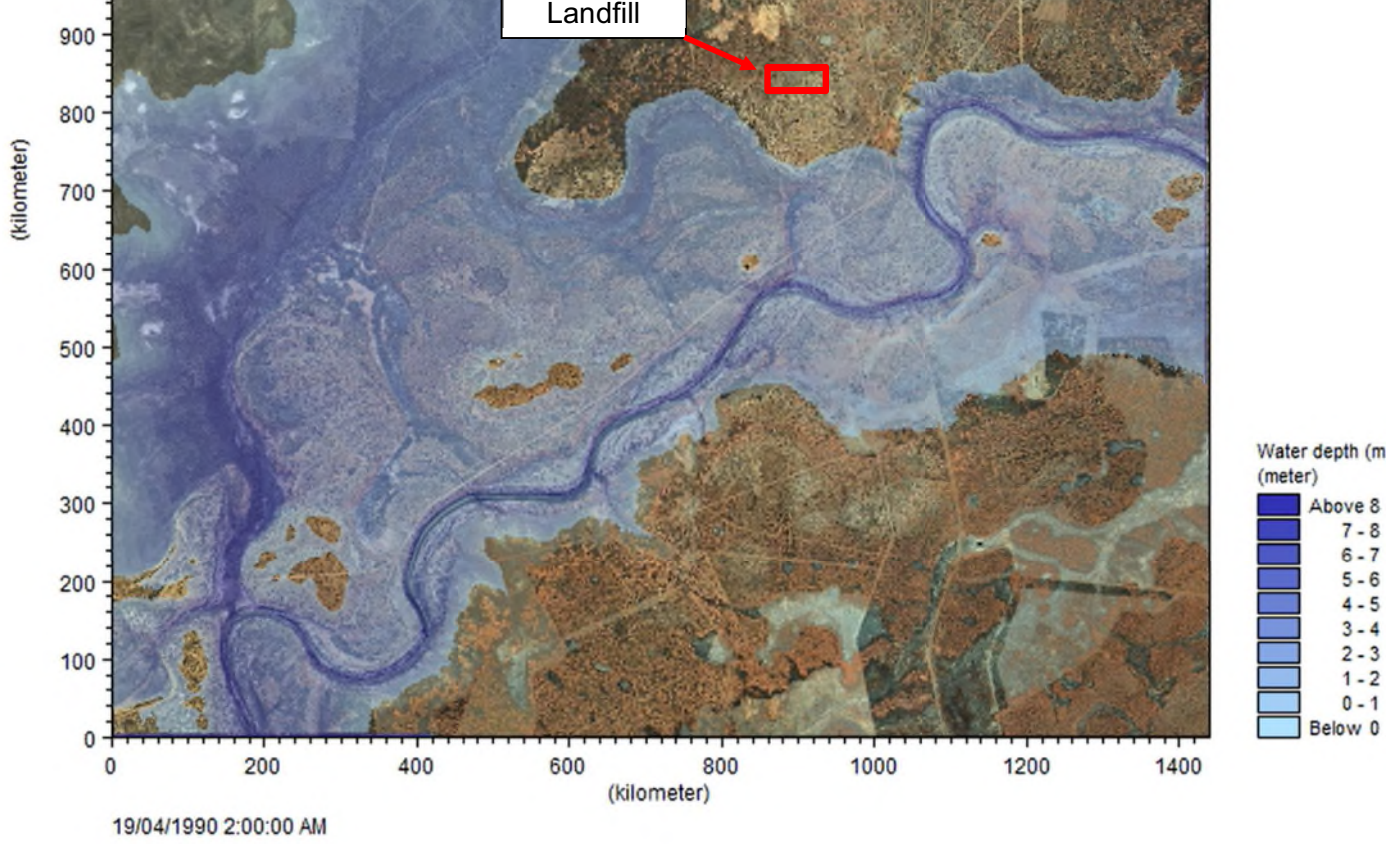
- Water Course
- State controlled Roads
- Development Site
- 1m Contours

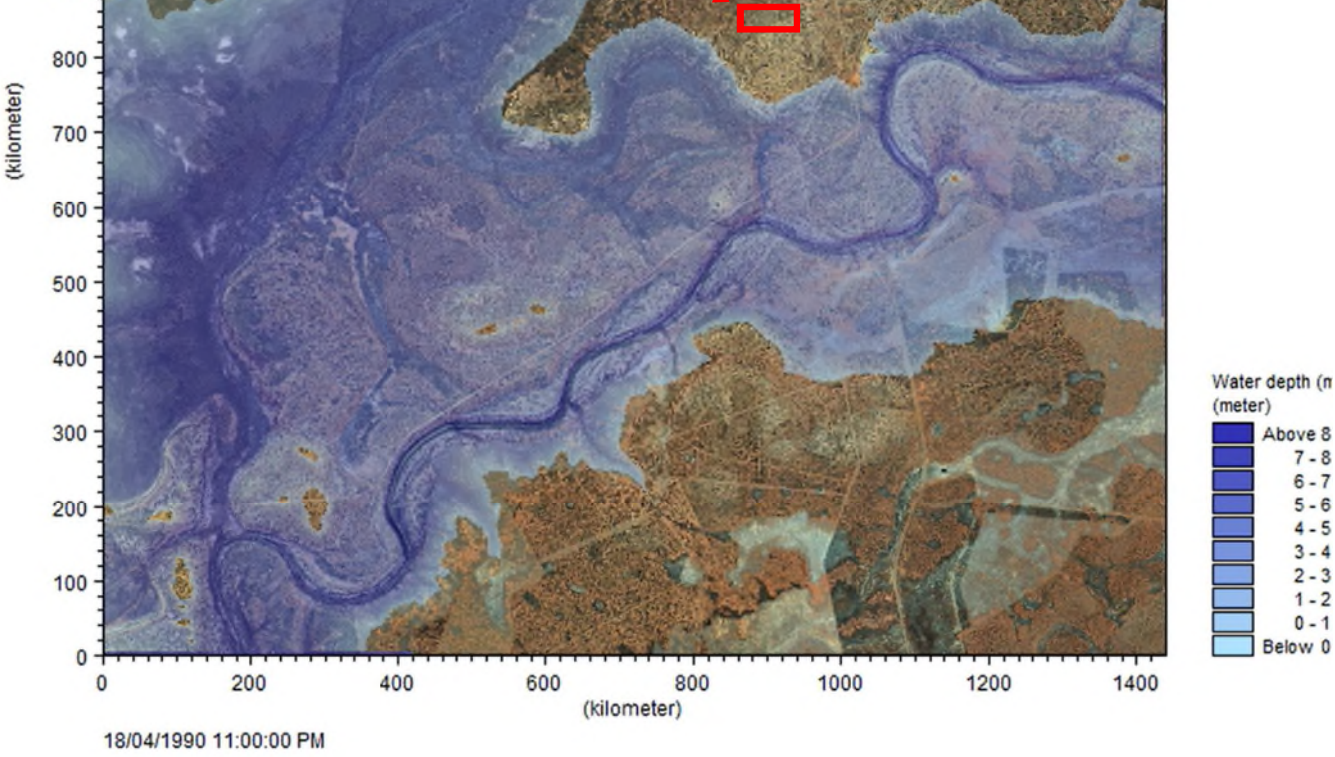
0 250 500 750 m

CONTOUR MAP: BARCALDINE REGIONAL COUNCIL WASTE MANAGMENT FACILITY

Appendix D

Flood Mapping


Landfill
(kilometer)
0
100
200
300
400
500
600
700
800
900
0
200
400
600
800
1000
1200
1400
(kilometer)
19/04/1990 2:00:00 AM
Water depth (m
(meter)
Above 8
7 - 8
6 - 7
5 - 6
4 - 5
3 - 4
2 - 3
1 - 2
0 - 1
Below 0



The State of Queensland acting through Queensland Reconstruction Authority undertook a program in 2012 to implement the Queensland Flood Commission Inquiry recommendations: to provide flood information across Queensland; and provide flood hazard mapping as part of this program. The data presented above forms part of this program relating to the Barcaldine Township.

Appendix E

Biodiversity Planning Assessments and Aquatic Conservation Assessments

Area of Interest: Lot: 1 Plan: SP223525

values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and field survey may be required to validate values on the ground.

Please direct queries about these reports to: biodiversity.planning@ehp.qld.gov.au

Disclaimer

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Catchment(s)	Cooper Creek

The following table identifies available Biodiversity Planning Assessments (BPAs) and Aquatic Conservation Assessments (ACAs) with respect to the AOI.

Table 2: Available Biodiversity Planning and Aquatic Conservation Assessments

Assessment Type	Assessment Area and Version
Biodiversity Planning Assessment(s)	Desert Uplands v1.3
Aquatic Conservation Assessment(s) (riverine)	Lake Eyre and Bulloo Basins v1.1
Aquatic Conservation Assessment(s) (non-riverine)	Lake Eyre and Bulloo Basins v1.1

Table 3: Remnant regional ecosystems within the AOI as per the Qld Herbarium's 'biodiversity status'

Biodiversity Status	Area (Ha)	% of AOI
Endangered	0.0	0.0%
Of Concern	0.0	0.0%
No concern at present	20.0	100.0%

The following table identifies the extent and proportion of the user specified area of interest (AOI) which is mapped as being of "State", "Regional" or "Local" significance via application of the Queensland Department of Environment and Heritage Protection's *Biodiversity Assessment and Mapping Methodology* (BAMM).

Table 4: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	0.0	0.0%
State	0.0	0.0%
Regional	0.0	0.0%
Local or Other Values	20.0	100.0%

Table 5: Non-riverine wetlands intersecting the AOI

The following two tables identify the extent and proportion of the user specified AOI which is mapped as being of "Very High", "High", "Medium", "Low", or "Very Low" aquatic conservation value for riverine and non-riverine wetlands via application of the Queensland Department of Environment and Heritage Protection's *Aquatic Biodiversity Assessment and Mapping Method* (AquaBAMM).

Table 7: Summary table, aquatic conservation significance (riverine)

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	0.0	0.0%
High	0.0	0.0%
Medium	20.0	100.0%
Low	0.0	0.0%
Very Low	0.0	0.0%

Table 8: Summary table, aquatic conservation significance (non-riverine)

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
(No Records)	None	None

recognised by the EHP.

Biodiversity Planning Assessments (BPAs) assign three levels of overall biodiversity significance.

- **State significance** - areas assessed as being significant for biodiversity at the bioregional or state scales. They also include areas assessed by other studies/processes as being significant at national or international scales. In addition, areas flagged as being of State significance due to the presence of endangered, vulnerable and/or near threatened taxa, are identified as "State Habitat for EVNT taxa".
- **Regional significance** - areas assessed as being significant for biodiversity at the subregional scale. These areas have lower significance for biodiversity than areas assessed as being of State significance.
- **Local significance and/or other values** - areas assessed as not being significant for biodiversity at state or regional scales. Local values are of significance at the local government scale.

For further information on released BPAs and a copy of the underlying methodology, go to:

http://www.qld.gov.au/environment/plants-animals/biodiversity/planning/

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

The following table identifies the extent and proportion of the user specified AOI which is mapped as being of "State", "Regional" or "Local" significance via application of the BAMM.

Table 9: Summary table, biodiversity significance

Biodiversity significance	Area (Ha)	% of AOI
State Habitat for EVNT taxa	0.0	0.0%
State	0.0	0.0%
Regional	0.0	0.0%
Local or Other Values	20.0	100.0%

Refer to **Map 2** for further information.

Diagnostic Criteria

Diagnostic criteria are based on existing data which is reliable and uniformly available across a bioregion. These criteria are diagnostic in that they are used to filter the available data and provide a "first-cut" or initial determination of biodiversity significance. This initial assessment is then combined through a second group of other essential criteria.

A description of the individual diagnostic criteria is provided in the following sections.

Criteria A. Habitat for EVNT taxa: Classifies areas according to their significance based on the presence of endangered, vulnerable and/or rare (EVNT) taxa. EVNT taxa are those scheduled under the *Nature Conservation Act 1992* and/or the *Environment Protection and Biodiversity Conservation Act 1999*. It excludes highly mobile fauna taxa which are instead

ecosystem because they are more representative of the biodiversity values particular to the regional ecosystem, are more resilient to the effects of disturbance, and constitute a significant proportion of the total area of the regional ecosystem.

Criteria F. Ecosystem diversity: Is an indicator of the number of regional ecosystems occurring within an area. An area with high ecosystem diversity will have many regional ecosystems and ecotones relative to other areas within the bioregion.

Criteria G. Context and connection: Represents the extent to which a remnant unit incorporates, borders or buffers areas such as significant wetlands, endangered ecosystems; and the degree to which it is connected to other vegetation.

A summary of the biodiversity status based upon the diagnostic criteria is provided in the following table.

A: Habitat for EVNT Taxa	None	None	None	None	None	None	20.0	100.0
B1: Ecosystem Value (Bioregion)	None	None	None	None	20.0	100.0	None	None
B2: Ecosystem Value (Subregion)	None	None	None	None	20.0	100.0	None	None
C: Tract Size	20.0	100.0	None	None	None	None	None	None
D1: Relative RE Size (Bioregion)	None	None	None	None	None	None	20.0	100.0
D2: Relative RE Size (Subregion)	None	None	None	None	None	None	20.0	100.0
F: Ecosystem Diversity	None	None	20.0	100.0	None	None	None	None
G: Context and Connection	9.5	47.5	10.5	52.5	None	None	None	None

Other Essential Criteria

Other essential criteria (also known as expert panel criteria) are based on non-uniform information sources and which may rely more upon expert opinion than on quantitative data. These criteria are used to provide a "second-cut" determination of biodiversity significance, which is then combined with the diagnostic criteria for an overall assessment of relative biodiversity significance. A summary of the biodiversity status based upon the other essential criteria is provided in the following table.

Table 12: Summary of biodiversity significance based upon other essential criteria with respect to the AOI

A description of each of the other essential criteria and associated assessment in regards to the AOI is provided in the following sections.

Criteria H. Essential and general habitat for priority taxa: Priority taxa are those which are at risk or of management concern, taxa of scientific interest as relictual (ancient or primitive), endemic taxa or locally significant populations (such as a flying fox camp or heronry), highly specialised taxa whose habitat requirements are complex and distributions are not well

• Ic - areas with concentrations of disjunct populations.

• Id - areas with concentrations of taxa at the limits of their geographic ranges.

• Ie - areas with high species richness.

• If - areas with concentrations of relictual populations (ancient and primitive taxa).

• Ig - areas containing REs with distinct variation in species composition associated with geomorphology and other environmental variables.

• Ih - an artificial waterbody or managed/manipulated wetland considered by the panel/s to be of ecological significance.

• Ii - areas with a high density of hollow-bearing trees that provide habitat for animals.

• Ij - breeding or roosting sites used by a significant number of individuals.

The following table identifies the value and extent area of the Other Essential Criteria H and I within the AOI.

Table 13: Relative importance of expert panel criteria (H and I) used to access overall biodiversity significance with respect to the AOI

Expert Panel	Very High Rating - Area (Ha)	Very High Rating - % of AOI	High Rating - Area (Ha)	High Rating - % of AOI	Medium Rating - Area (Ha)	Medium Rating - % of AOI	Low Rating - Area (Ha)	Low Rating - % of AOI
H: Core Habitat Priority Taxa	None	None	None	None	None	None	None	None
Ia: Centres of Endemism	None	None	None	None	None	None	None	None
Ib: Wildlife Refugia	None	None	None	None	None	None	None	None
Ic: Disjunct Populations	None	None	None	None	None	None	None	None
Id: Limits of Geographic Ranges	None	None	None	None	None	None	None	None
Ie: High Species Richness	None	None	None	None	None	None	None	None
If: Relictual Populations	None	None	None	None	None	None	None	None
Ig: Variation in Species Composition	None	None	None	None	None	None	None	None

NB. Whilst biodiversity values associated with Criteria I may be present within the site (refer to tables 12 and 15), for the New England Tableland and Central Queensland Coast BPAs, area and % area figures associated with Criteria Ia through to Ij cannot be listed in the table above (due to slight variations in data formats between BPAs).

Criteria J. Corridors: areas identified under this criterion qualify either because they are existing vegetated corridors important for contiguity, or cleared areas that could serve this purpose if revegetated. Some examples of corridors include riparian habitats, transport corridors and "stepping stones".

Bioregional and subregional conservation corridors have been identified in the more developed bioregions of Queensland through the BPAs, using an intensive process involving expert panels. Map 3 displays the location of corridors as identified under the Statewide Corridor network. The Statewide Corridor network incorporates BPA derived corridors and for bioregions where no BPA has been assessed yet, corridors derived under other planning processes. *Note: as a result of updating and developing a statewide network, the alignment of corridors may differ slightly in some instances when compared to those used in individual BPAs.*

The functions of these corridors are:

- **Terrestrial** Bioregional corridors, in conjunction with large tracts of remnant vegetation, maintain ecological and evolutionary processes at a landscape scale, by:

  • Maintaining long term evolutionary/genetic processes that allow the natural change in distributions of species and connectivity between populations of species over long periods of time;

  • Maintaining landscape/ecosystems processes associated with geological, altitudinal and climatic gradients, to allow for ecological responses to climate change;

  • Maintaining large scale seasonal/migratory species processes and movement of fauna;

  • Maximising connectivity between large tracts/patches of remnant vegetation;

  • Identifying key areas for rehabilitation and offsets; and

- **Riparian** Bioregional Corridors also maintain and encourage connectivity of riparian and associated ecosystems.

The location of the corridors is determined by the following principles:

- Terrestrial

  • Complement riparian landscape corridors (i.e. minimise overlap and maximise connectivity);

  • Follow major watershed/catchment and/or coastal boundaries;

  • Incorporate major altitudinal/geological/climatic gradients;

  • Include and maximise connectivity between large tracts/patches of remnant vegetation;

  • Include and maximise connectivity between remnant vegetation in good condition; and

- Riparian

  • Located on the major river or creek systems within the bioregion in question.

The total extent of remnant vegetation triggered as being of "State", "Regional" or "Local" significance due to the presence of an overlying BPA derived terrestrial or riparian corridor within the AOI, is provided in the following table. For further information on how remnant vegetation is triggered due to the presence of an overlying BPA derived corridor, refer to the relevant landscape BPA expert panel report(s).

Threatening process/condition (Criteria K) - areas identified by experts under this criterion may be used to amend (upgrade or downgrade) biodiversity significance arising from the "first-cut" analysis. The condition of remnant vegetation is affected by threatening processes such as weeds, ferals, grazing and burning regime, selective timber harvesting/removal, salinity, soil erosion, and climate change.

Assessment of Criteria K with respect to the AOI is not currently included in the "Biodiversity and Conservation Values" report, as it has not been applied to the majority of Queensland due to data/information limitations and availability.

Special Area Decisions

Expert panel derived "Special Area Decisions" are used to assign values to Other Essential Criteria. The specific decisions which relate to the AOI in question are listed in the table below.

Table 15: Expert panel decisions for assigning levels of biodiversity significance with respect to the AOI

Decision Number	Description	Panel Recommended Significance	Criteria Values
(No Records)	None	None	None

Expert panel decision descriptions:

(No Records) None

information system (GIS).

Where they have been conducted, ACAs can provide a source of baseline wetland conservation/ecological information to support natural resource management and planning processes. They are useful as an independent product or as an important foundation upon which a variety of additional environmental and socio-economic elements can be added and considered (i.e. an early input to broader 'triple-bottom-line' decision-making processes). An ACA can have application in:

- determining priorities for protection, regulation or rehabilitation of wetlands and other aquatic ecosystems
- on-ground investment in wetlands and other aquatic ecosystems
- contributing to impact assessment of large-scale development (e.g. dams)
- water resource and strategic regional planning prcesses

For a detailed explanation of the methodology please refer to the summary and expert panel reports relevant to the ACA utilised in this assessment. These reports can be accessed at Wetland*Info*:

http://wetlandinfo.ehp.qld.gov.au/wetlands/assessment/assessment-methods/aca

The GIS results can be downloaded from the Queensland Spatial Catalogue at:

http://qspatial.information.qld.gov.au/geoportal/

Explanation of Criteria

Under the AquaBAMM, eight criteria are assessed to derive an overall conservation value. Similar to the Biodiversity Assessment and Mapping Methodology, the criteria may be primarily diagnostic (quantitative) or primarily expert opinion (qualitative) in nature. The following sections provide a brief description of each of the 8 criteria.

Criteria 1. Naturalness - Aquatic: This attribute reflects the extent to which a wetland's (riverine, non-riverine, estuarine) aquatic state of naturalness is affected through relevant influencing indicators which include: presence of exotic flora and fauna; presence of aquatic communities; degree of habitat modification and degree of hydrological modification.

Criteria 2. Naturalness - Catchment: The naturalness of the terrestrial systems of a catchment can have an influence on many wetland characteristics including: natural ecological processes e.g. nutrient cycling, riparian vegetation, water chemistry, and flow. The indicators utilised to assess this criterion include: presence of exotic flora and/or fauna; riparian, catchment and flow modification.

Criteria 3. Naturalness - Diversity and Richness: This criterion is common to many ecological assessment methods and can include both physical and biological features. It includes such indicators as species richness, riparian ecosystem richness and geomorphological diversity.

Criteria 4. Threatened Species and Ecosystems: This criterion evaluates ecological rarity characteristics of a wetland. This includes both species rarity and rarity of communities / assemblages. The communities and assemblages are best represented by regional ecosystems. Species rarity is determined by NCA and EPBC status with Endangered, Vulnerable or Near-threatened species being included in the evaluation. Ecosystem rarity is determined by regional ecosystem biodiversity status i.e. Endangered, Of Concern, or Not of Concern.

Criteria 5. Priority Species and Ecosystems: Priority flora and fauna species lists are expert panel derived. These are aquatic, semi-aquatic and riparian species which exhibit at least 1 particular trait in order to be eligible for consideration. For flora species the traits included:

area/catchment.

- It is currently a small population and threatened by loss of habitat.
- It is a significant disjunct population.
- It is a migratory species (other than birds).
- A significant proportion of the breeding population (>one per cent for waterbirds, >75 per cent other species) occurs in the waterbody (see Ramsar criterion 6 for waterbirds).
- Limit of species range.

See the individual expert panel reports for the priority species traits specific to an ACA.

Criteria 6. Special Features: Special features are areas identified by flora, fauna and ecology expert panels which exhibit characteristics beyond those identified in other criteria and which the expert panels consider to be of the highest ecological importance. Special feature traits can relate to, but are not solely restricted to geomorphic features, unique ecological processes, presence of unique or distinct habitat, presence of unique or special hydrological regimes e.g. spring-fed streams. Special features are rated on a 1 - 4 scale (4 being the highest).

Criteria 7. Connectivity: This criterion is based on the concept that appropriately connected aquatic ecosystems are healthy and resilient, with maximum potential biodiversity and delivery of ecosystem services.

Criteria 8. Representativeness: This criterion applies primarily to non-riverine assessments, evaluates the rarity and uniqueness of a wetland type in relation to specific geographic areas. Rarity is determined by the degree of wetland protection within "protected Areas" estate or within an area subject to the *Fisheries Act 1994*, *Coastal Protection and Management Act 1995*, or *Marine Parks Act 2004*. Wetland uniqueness evaluates the relative abundance and size of a wetland or wetland management group within geographic areas such as catchment and subcatchment.

Riverine Wetlands

Riverine wetlands are all wetlands and deepwater habitats within a channel. The channels are naturally or artificially created, periodically or continuously contain moving water, or connecting two bodies of standing water. AquaBAMM, when applied to riverine wetlands uses a discrete spatial unit termed subsections. A subsection can be considered as an area which encompasses discrete homogeneous stream sections in terms of their natural attributes (i.e. physical, chemical, biological and utilitarian values) and natural resources. Thus in an ACA, an aquatic conservation significance score is calculated for each subsection and applies to all streams within a subsection, rather than individual streams as such.

Please note, the area figures provided in Tables 16 and 17, are derived using the extent of riverine subsections within the AOI. Refer to **Map 5** for further information. A summary of the conservation significance of riverine wetlands within the AOI is provided in the following table.

Table 16: Overall level/s of riverine aquatic conservation significance

Aquatic conservation significance (riverine wetlands)	Area (Ha)	% of AOI
Very High	0.0	0.0%
High	0.0	0.0%

aquatic								
2. Naturalness catchment	None	None	None	None	None	None	20.0	100.0
3. Diversity and richness	20.0	100.0	None	None	None	None	None	None
4. Threatened species and ecosystems	20.0	100.0	None	None	None	None	None	None
5. Priority species and ecosystems	None	None	20.0	100.0	None	None	None	None
6. Special features	None	None	None	None	None	None	None	None
7. Connectivity	None	None	None	None	None	None	20.0	100.0

The table below lists and describes the relevant expert panel decisions used to assign conservation significance values to riverine wetlands within the AOI.

Table 18: Expert panel decisions for assigning overall levels of riverine aquatic conservation significance

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)	None	None	None	None

4 is the highest rating/value

Expert panel decision descriptions:

(No Records) None

Non-riverine Wetlands

Non-riverine wetlands include both lacustrine and palustrine wetlands, however, do not currently incorporate estuarine, marine or subterranean wetland types. A summary of the conservation significance of non-riverine wetlands within the AOI is provided in the following table. Refer to **Map 6** for further information.

Table 19: Overall level/s of non-riverine aquatic conservation significance

Aquatic conservation significance (non-riverine wetlands)	Area (Ha)	% of AOI
(No Records)	None	None

Table 21: Expert panel decisions for assigning overall levels of non-riverine aquatic conservation significance.

Decision number	Special feature	Catchment	Criteria/Indicator/Measure	Conservation rating (1-4)
(No Records)	None	None	None	None

4 is the highest rating/value

Expert panel decision descriptions:

(No Records) None

• Location - cross-check co-ordinates with location description,
• Taxon by location - requires good knowledge of the taxon and history of the record,
• Duplicate records - identify and remove,
• Expert panels - check records and provide new records,
• Flora cultivated records excluded,
• Use precise records less than or equal to 2000m,
• Use recent records greater than or equal to 1975 animals, greater than or equal to 1950 plants.

Threatened Species

Threatened species are those species classified as "Endangered" or "Vulnerable" under the *Environment Protection and Biodiversity Conservation Act 1999* or "Endangered", "Vulnerable" or "Near threatened" under the *Nature Conservation Act 1992*.

The following threatened species have been recorded on, or within approximately 4km of the AOI.

Table 22: Threatened species recorded on, or within 4km of the AOI

(no results)

NB. Please note that the threatened species listed in this section are based upon the most recently compiled DEHP internal state-wide threatened species dataset. This dataset may contain additional records that were not originally available for inclusion in the relevant individual BPAs and ACAs.

**JAMBA - Japan-Australia Migratory Bird Agreement; CAMBA - China-Australia Migratory Bird Agreement; ROKAMBA - Republic of Korea-Australia Migratory Bird Agreement; CMS - Convention on the Conservation of Migratory Species*.

***Y - wetland indicator species*.

BPA Priority Species

A list of BPA priority species that have been recorded on, or within approximately 4km of the AOI is contained in the following table.

Table 23: Priority species recorded on, or within 4km of the AOI

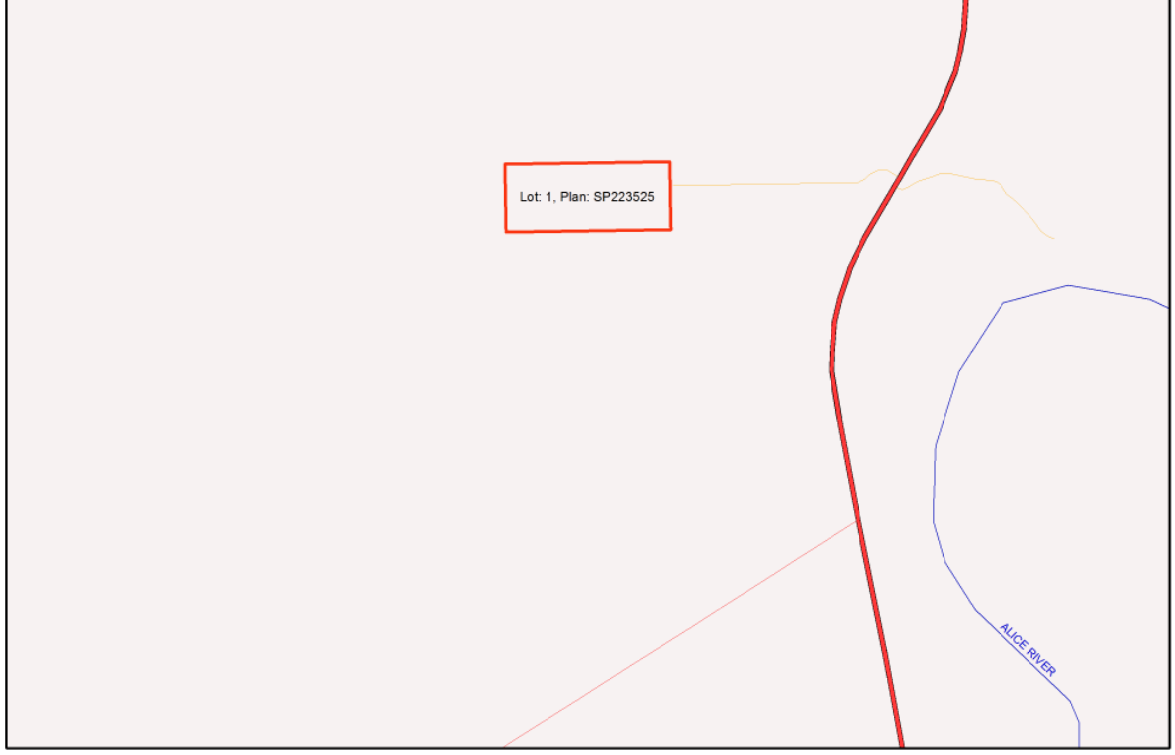
Species	Common name	Back on Track rank	Identified flora/fauna
Climacteris picumnus	brown treecreeper	Low	FA
Melanodryas cucullata	hooded robin	Low	FA
Petroica goodenovii	red-capped robin	Low	FA
Burhinus grallarius	bush stone-curlew	Low	FA

Glareola maldivarum	Oriental Pratincole	Low	FA

Table 25: Priority species recorded on, or within 4 km of the AOI - non-riverine

Species	Common name	Back on Track rank	Identified flora/fauna
Calidris ferruginea	Curlew Sandpiper	Low	FA
Gallinago hardwickii	Latham's Snipe	Low	FA
Glareola maldivarum	Oriental Pratincole	Low	FA

NB. Please note that the priority species records used in the above two tables are comprised of those adopted for the released individual ACAs. The ACA riverine and non-riverine priority species databases are updated from time to time to reflect new release of ACAs. At each update, the taxonomic details for all ACAs records are amended as necessary to reflect current taxonomic name and/or status changes.



Locality Map

Legend

- Lot and Plan
- Towns
- Highway
- Connector
- Street/Local Road
- National Park (Scientific)
- National Park
- National Park (CYPAL)
- Conservation Park
- Resources Reserve
- Forest Reserve
- State Forest
- Timber Reserve
- Nature Refuges
- Lakes and Reservoirs
- Major rivers/creeks
- Queensland

N

0 0.1 0.2 0.3 0.4 0.5 Kilometers

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GDA 1994 Queensland Albers

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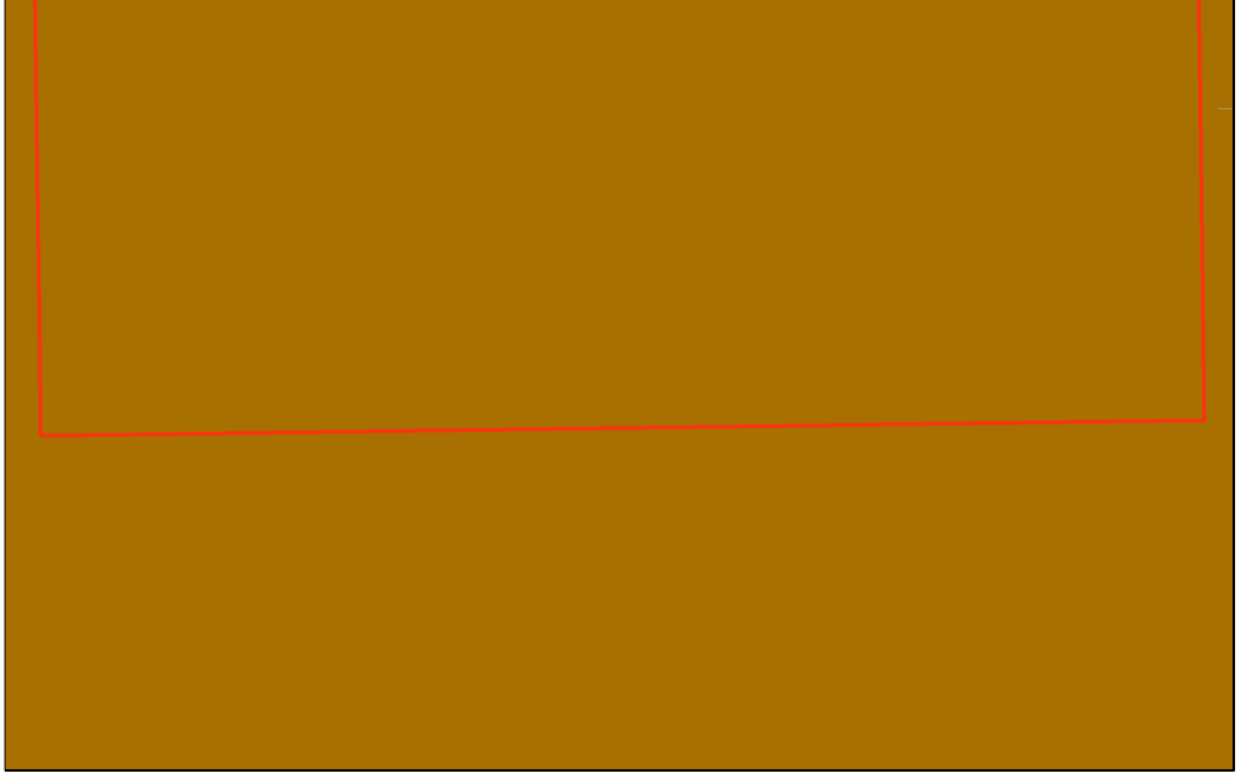

Biodiversity Planning Assessments

Legend

- Lot and Plan
- Towns
- Roads
- Major rivers/creeks
- Queensland

Biodiversity Planning Assessment

- State Habitat for EVNT taxa
- State
- Regional
- Local or Other Values
- Non Bioregion Ecosystem

LOCALITY DIAGRAM

N

0 0.025 0.05 0.075 0.1 0.125 Kilometers

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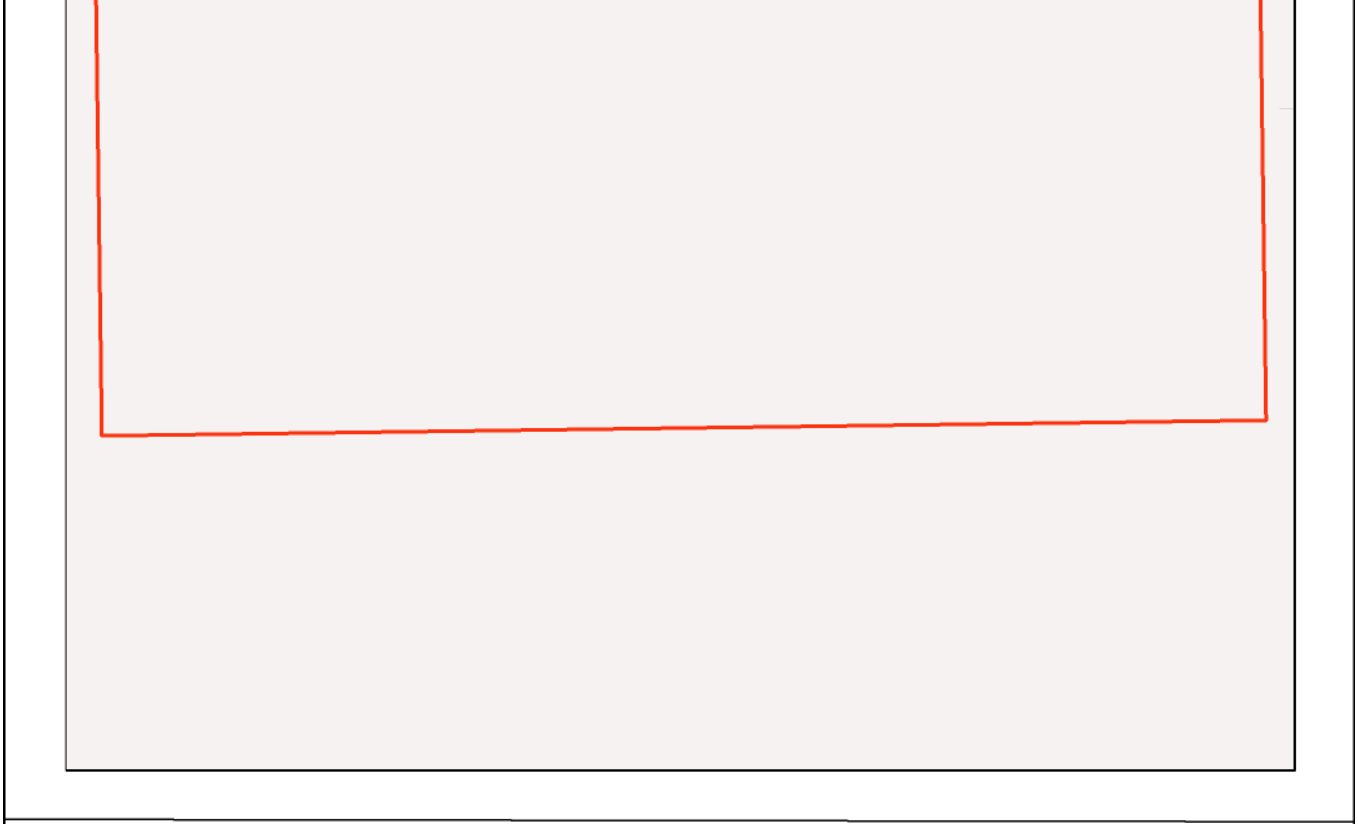

Corridors

Legend

- Lot and Plan
- Towns
- Roads
- Major rivers/creeks
- Queensland

Corridors

- State
- Regional

Corridor Triggered Vegetation

- State
- Regional
- Local

N

0 0.025 0.05 0.075 0.1 0.125 Kilometers

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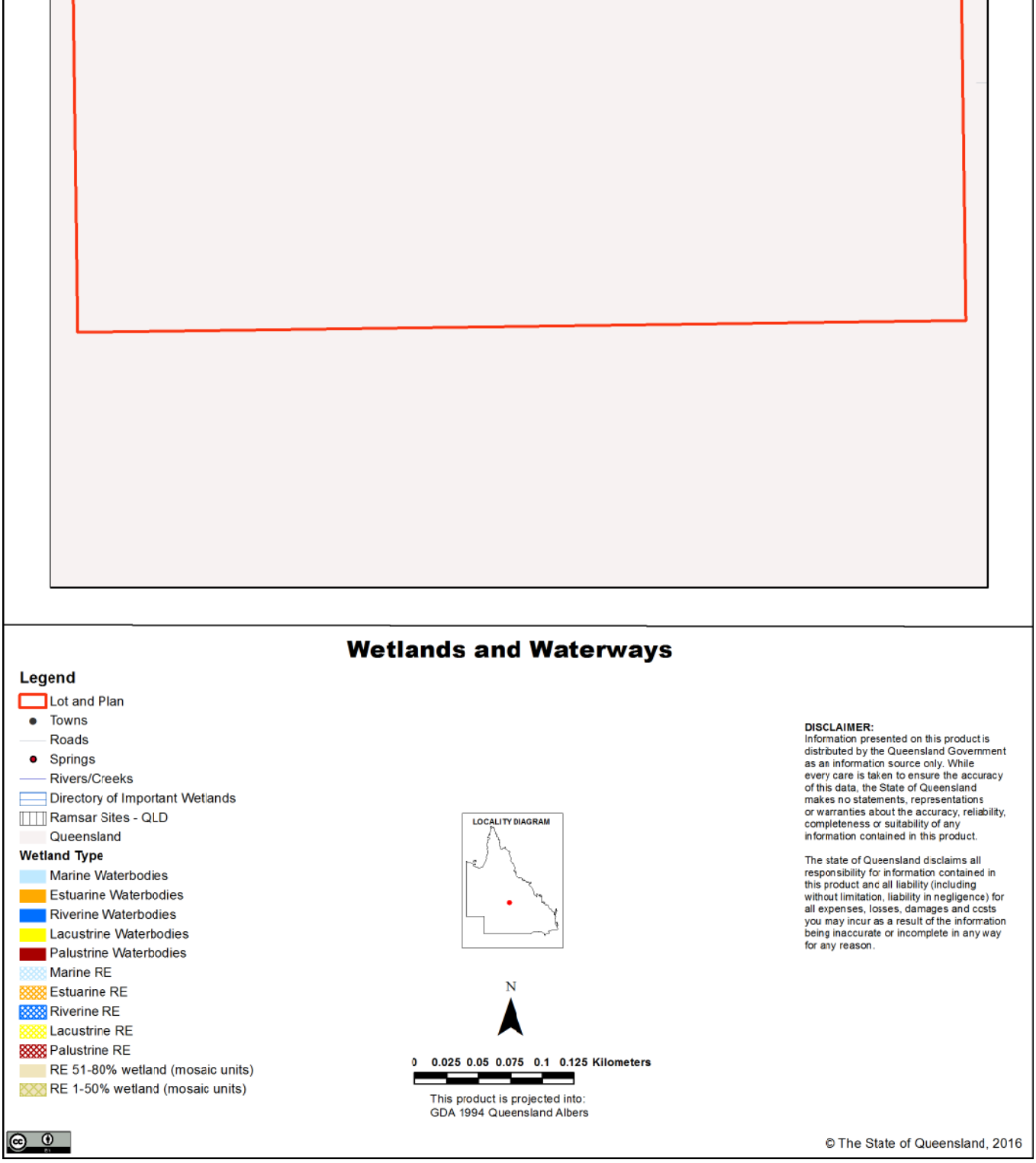

Wetlands and Waterways

Legend

- Lot and Plan
- Towns
- Roads
- Springs
- Rivers/Creeks
- Directory of Important Wetlands
- Ramsar Sites - QLD
- Queensland

Wetland Type

- Marine Waterbodies
- Estuarine Waterbodies
- Riverine Waterbodies
- Lacustrine Waterbodies
- Palustrine Waterbodies
- Marine RE
- Estuarine RE
- Riverine RE
- Lacustrine RE
- Palustrine RE
- RE 51-80% wetland (mosaic units)
- RE 1-50% wetland (mosaic units)

LOCALITY DIAGRAM

N

0 0.025 0.05 0.075 0.1 0.125 Kilometers

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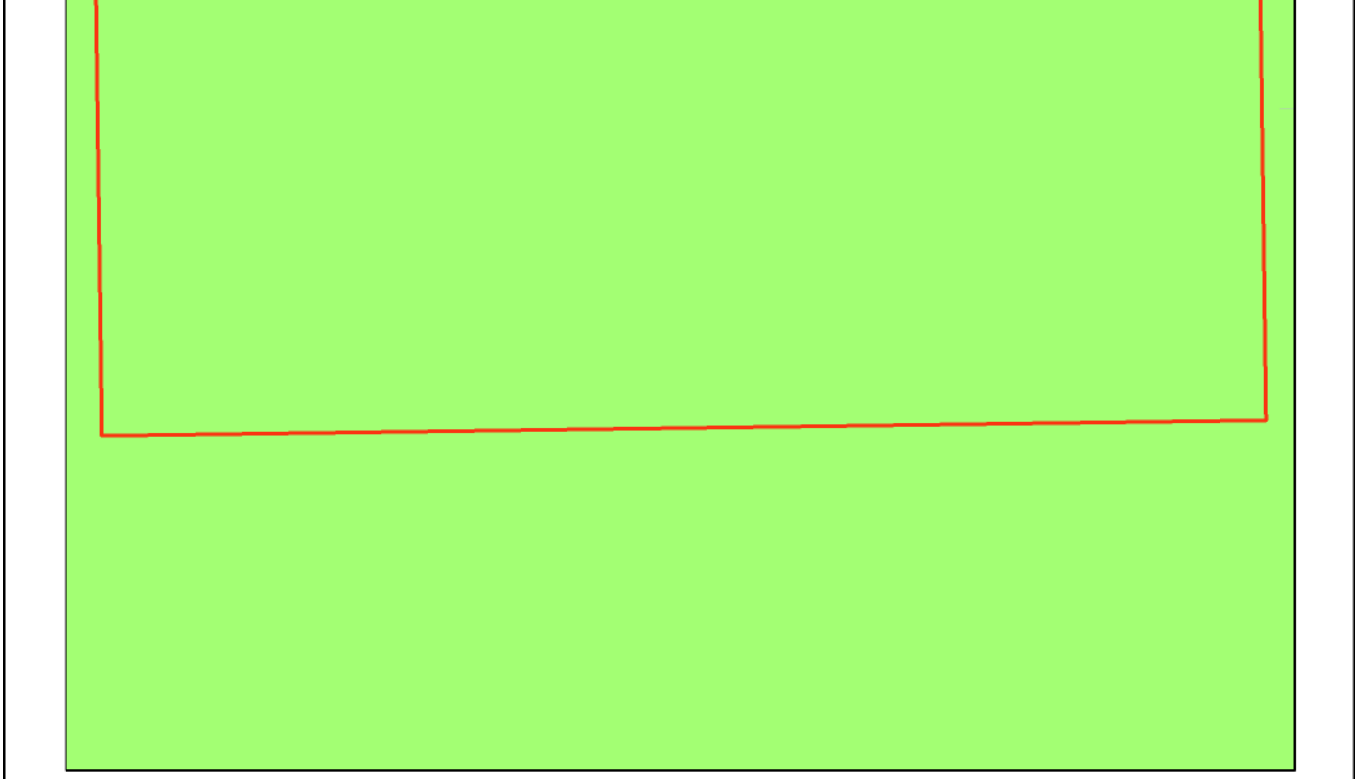

Aquatic Conservation Assessment (ACA) - riverine

Legend

- Lot and Plan
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Riverine - Subcatchment Significance

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM

N

0 0.025 0.05 0.075 0.1 0.125 Kilometers

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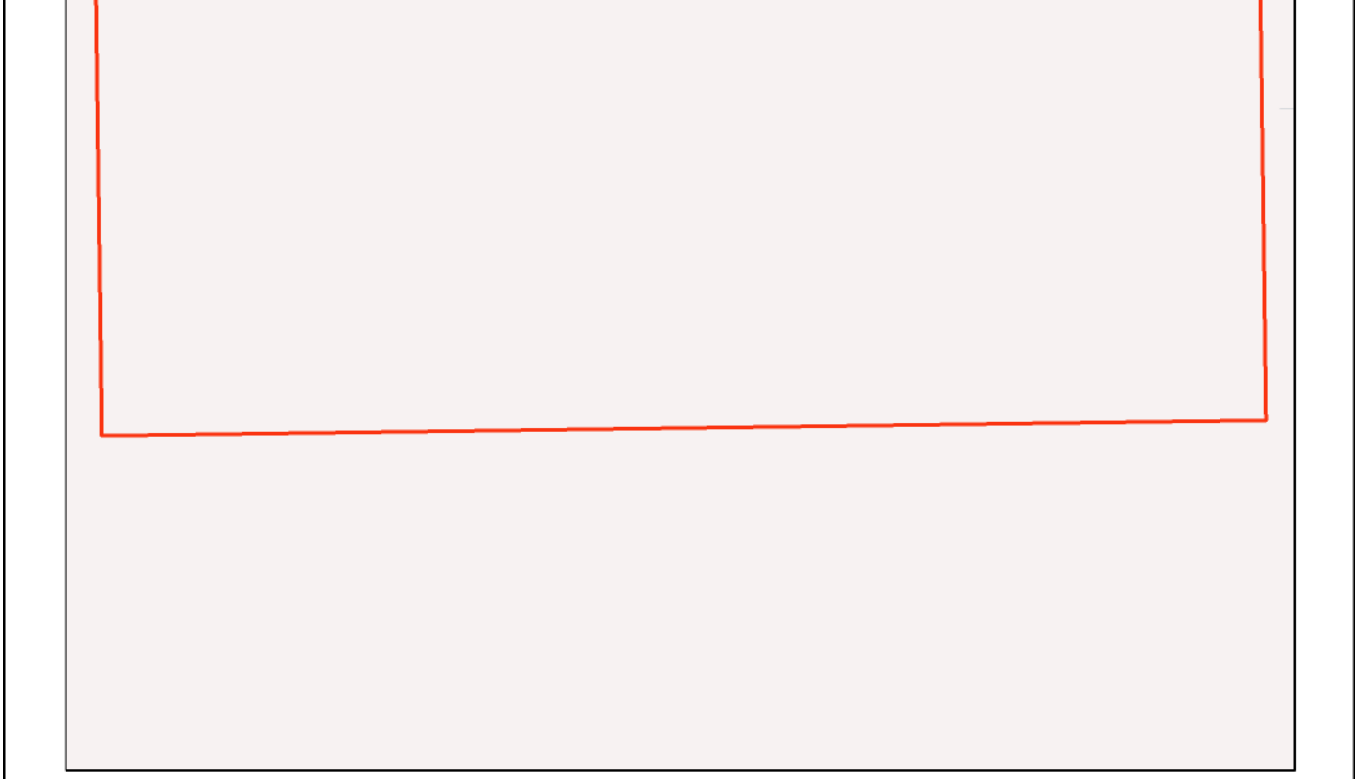

Aquatic Conservation Assessment (ACA) - nonriverine

Legend

- Lot and Plan
- Towns
- Roads
- Rivers/Creeks
- Queensland

ACA Non-riverine

- Very High
- High
- Medium
- Low
- Very Low

LOCALITY DIAGRAM

N

0 0.025 0.05 0.075 0.1 0.125 Kilometers

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BPA Priority Species	An internal DEHP database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.
ACA Priority Species	An internal DEHP database compiled from Wildnet, Herbrecs, Corveg, the QLD Museum, as well as other incidental sources.

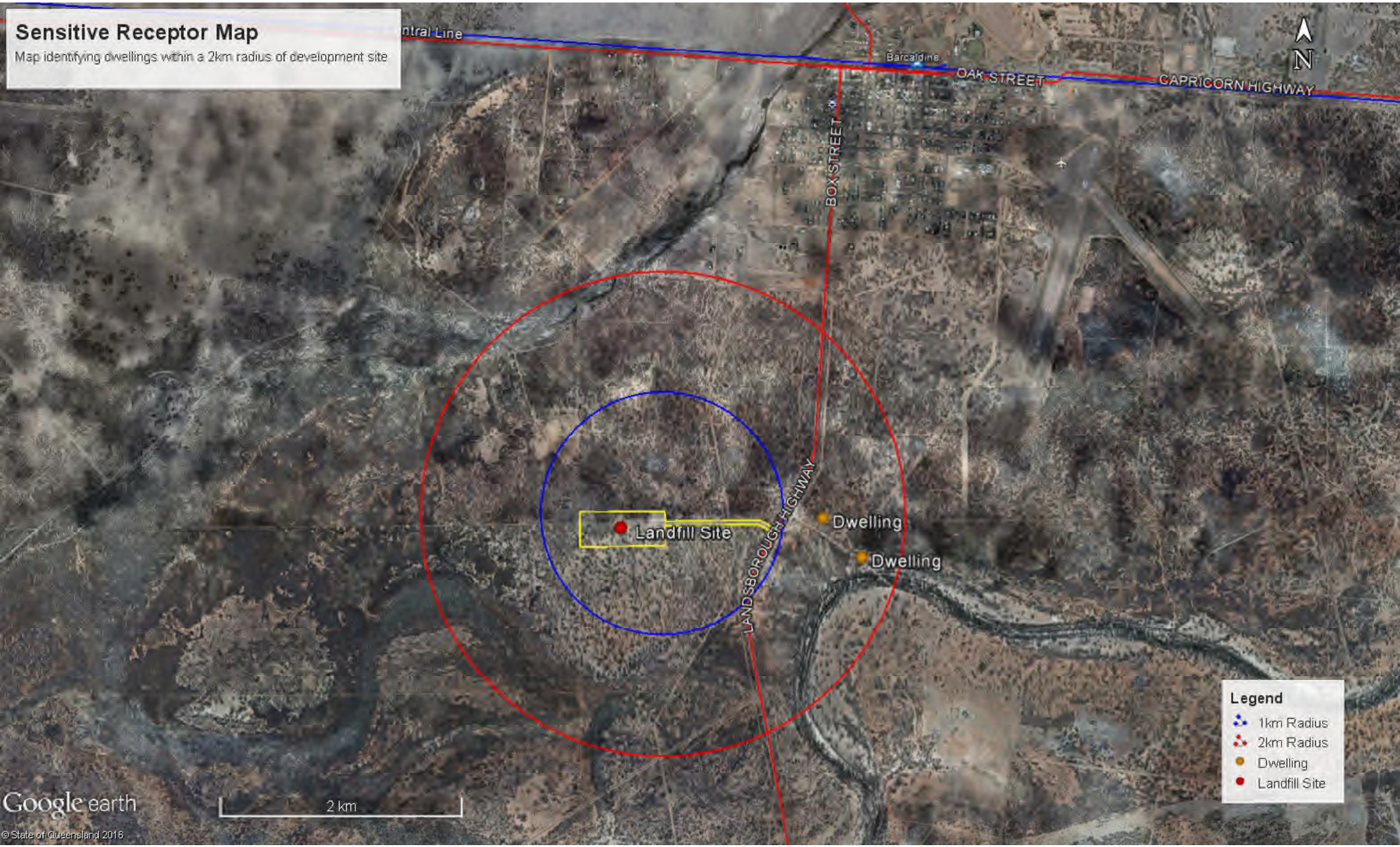
***These datasets are available at:**

http://dds.information.qld.gov.au/DDS

EVNT	- Endangered, Vulnerable, Near Threatened
GDA94	- Geocentric Datum of Australia 1994
GIS	- Geographic Information System
JAMBA	- Japan-Australia Migratory Bird Agreement
NCA	-
RE	- Regional Ecosystem
REDD	- Regional Ecosystem Description Database
ROKAMBA	- Republic of Korea-Australia Migratory Bird Agreement

Appendix F

Sensitive Receptor Map


Sensitive Receptor Map
Map identifying dwellings within a 2km radius of development site
ntral Line
Barcaldine
OAK STREET
CAPRICORN HIGHWAY
BOX STREET
N
Landfill Site
LANDSBOROUGH HIGHWAY
Dwelling
Dwelling
Legend
1km Radius
2km Radius
Dwelling
Landfill Site
Google earth
2 km
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Appendix L

Report:
"Vegetation Management Plan"

71 Ash Street
(PO Box 191)
BARCALDINE QLD 4725

VEGETATION MANAGEMENT PLAN

BARCALDINE REGIONAL COUNCIL WASTE MANAGEMENT FACILITY

April 2017

Version History

Date	Name	Position	Action required *(Review/Endorse/Approve)*
December 2016	W. Green	Environmental Engineer	Review
25/01/2017	W. Green	Environmental Engineer	Review
13/04/2017	W. Green	Environmental Engineer	Issue

Prepared by William Green
Title Environmental Engineer
Location 67 Elm Street, Barcaldine, Qld 4725
Version no. 1.0
Version date 13 April 2017
Status Report
File/Doc no. 140010

Contact for enquiries and proposed changes

If you have any questions regarding this document or if you have a suggestion for improvements, please contact:

Project Managers William Green
Phone (07) 4651 2177

CONTENTS

APPENDICES

GLOSSARY

DNRM: Department of Natural Resources and Mines
SP Act: Sustainable Planning Act
SP Reg: Sustainable Planning Regulation
IDAS: Integrated Development Assessment System
VM Act: Vegetation Management Act

1. Introduction

The proposed Development is a new Waste Management Facility located on Yellowjack Drive approximately 4km South of Barcaldine off the Landsborough Highway.
This Development requires the clearing of Category B Remnant Vegetation in accordance with the Department of Natural Resources and Mines, (DNRM) Vegetation Mapping Database. Authorisation for the clearing of the development site requires that the clearing aligns with vegetation management regulations for the state of QLD.

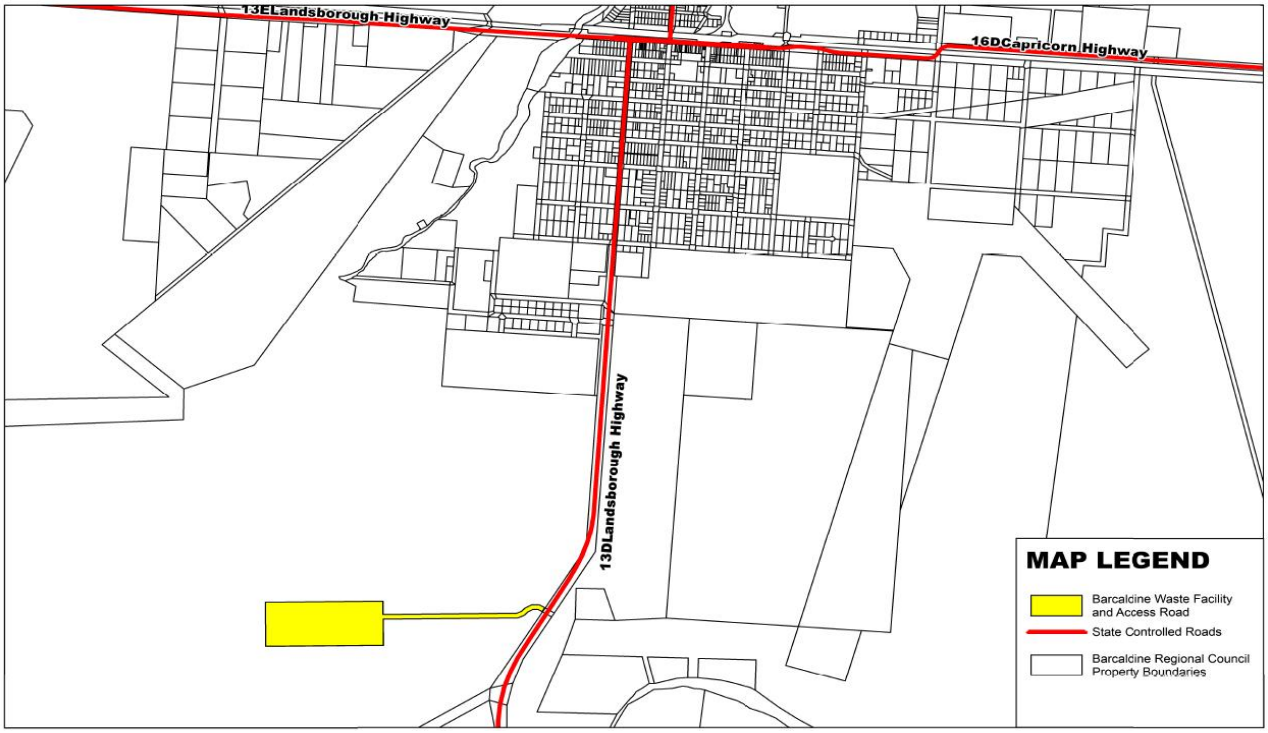


Figure 1– Map of the Proposed Site Location.

2. Scope

This document has been developed to address the matters prescribed under Section 11 of the Vegetation Management Regulation. The document outlines the proposed actions, the locations and extent of clearing as well as mitigation and management measures.
The objective of the document is to provide the assessment manager of the DNRM, as the referral entity, with the information required to address matters of state environmental significance for the operational works proposed for development.

3. Relevant Legislation

3.1. Overview

Queensland's vegetation management framework contains levels of regulatory instruments:

Legislation – Vegetation management is regulated through the Vegetation Management Act, Sustainable Planning Act (SP Act), and associated regulations;
State Planning Policy – Documents the Queensland Government's policy and describes the outcomes for vegetation management and the actions proposed to achieve those outcomes;
State Development Assessment Provisions (Module 8) – Used to assess applications to clear vegetation based on the relevant bioregional area.

3.2. Sustainable Planning Act 2009

The SP Act is Queensland's principal planning legislation and it provides a complete planning framework and development assessment system for Queensland. This system is a common assessment process to be used when assessing developments. The *Sustainable Planning Regulation 2009* (SP Reg) complements the SP Act and prescribes certain matters for the Integrated Development Assessment System (IDAS) and the SP Act generally. Schedule 3 of the SP Reg lists assessable development, self-assessable development and the appropriate levels of assessment. Under Schedule 3, the proposed activity triggers an operational works development application for vegetation clearing.

3.3. Vegetation Management Act 1999

The *Vegetation Management Act 1999 (VM Act)* regulates activities that are considered assessable development under the SP Act. This includes activities that require the clearing of vegetation. The definition of vegetation under the VM Act includes:
"a native tree or plant other than the following:
(a) grass or non-woody herbage;
(b) a plant within a grassland regional ecosystem prescribed under a regulation;
(c) a mangrove".
The VM Act regulates the conservation and management of vegetation communities and provides protection for regional ecosystems classified as 'endangered', 'of concern' or 'least concern' under the VM Act.

4. Ecological Values

4.1. Regional Context

The area of concern is located within the Jericho subregion of the Desert Uplands Bioregion. The Jericho subregion covers an area of approximately 14,869 km^2. Vegetation is generally characterised by open eucalypt woodlands on gently undulating plains on sandy or loamy soils.

4.2. Flora values

The proposed development is located on category B Remnant Vegetation, Least concern Regional Ecosystem 10.5.12 and 10.5.2a in accordance with The DNRM Mapping Database (Refer to Appendix A).
Regional Ecosystem 10.5.12 is described in the Regional Ecosystem Description database as; Eucalyptus populnea open woodland on sand plains where Eucalyptus Populnea dominates a sparse tree layer with a sparse ground layer of Triodia pungens and other Tussock grasses. A sparse low tree layer often consists of Archidendropsis basaltica and/or Eremophila mitchellii species and Lysiphyllum carronii, Acacia excelsa, Ventilago viminalis, Geijera parviflora, Grevillea striata and Acacia sericophylla are frequently present.
Regional Ecosystem 10.5.2a is described as Corymbia dominant woodland with C. dallachiana and C. plena dominating a sparse canopy forming open woodland on sand plains. A lower tree or shrub layer of scattered plants is often present, including Acacia sericophylla and Petalostigma pubescens.

5. Vegetation Clearing

5.1. Operational Areas

The areas to be cleared include:

i. the road access area to the site
ii. the operational areas of the site associated with waste management activities
iii. fire and safety buffers.

Vegetation clearing will be conducted in stages; the site has 2 planned stages of operation. The first stage will include the clearing of all necessary infrastructure and buffers for the operation of the site, the initial stages of operation will not require the entire 9.76 ha allocated to stage 1 to be cleared, clearing will be done progressively as new landfill cells are constructed and old cells are rehabilitated. Clearing stages are detailed in the Vegetation Management Design Drawing (Appendix B) and summarised in table 1 below. The staging of clearing activities ensures that unnecessary clearing of vegetation does not occur until additional space is required.

Table 1. Clearing stages, extent and proposed life span.

Stage	Extent ha	Estimated Life Span (yrs)
Road Access	3.33	Ongoing
Fire Breaks	5.55	Ongoing
Stage 1	9.76	1-20
Stage 2	4.69	20-50

5.2. Fire breaks

Fire and safety buffers will be required to reduce the risk of fire from entering facility. The width of the fire buffers have been determined by conducting a survey of canopy species present along the site perimeter. A buffer width of 30m has been determined by identifying the height of the larger trees in the surrounding vegetation and multiplying the length by 1.5. The results of the vegetation height survey can be seen in Appendix C.

5.3. Potential Impacts

The construction of the proposed development will require the clearing of vegetation in stages. This area contains REs listed as 'Least Concern' under the Vegetation Management Act.

The most obvious and direct impact on ecological values is the clearing of native vegetation. Impacts associated with clearing of vegetation on the project site may include:

i. Loss of native vegetation and flora species including REs; and

ii. Direct mortality of fauna during clearing activities

iii. The loss of habitat as a direct result of clearing

iv. The introduction of pest species from outside areas

Careful consideration of these potential direct and indirect impacts has been undertaken in the design phase, to avoid or minimise impacts where possible. In the planning phase of this project the proposed site was selected as a suitable

location as it did not interfere with identified essential habitat, aquatic ecosystems or Endangered/Of Concern Regional Ecosystems.

6. Environmental Management Measures

6.1. Management Measures

The amount of vegetation to be cleared will be reduced through optimising the use of space through planning the site layout. Proposed management strategies have been developed to ensure that impacts associated with construction and operation of the Project are minimised. Mitigation strategies have been developed based on the following criteria:

i. Avoid potential impacts where possible
ii. Minimise the severity and/or duration of the impact; and
iii. Implement rehabilitation activities directly after landfill cell completion

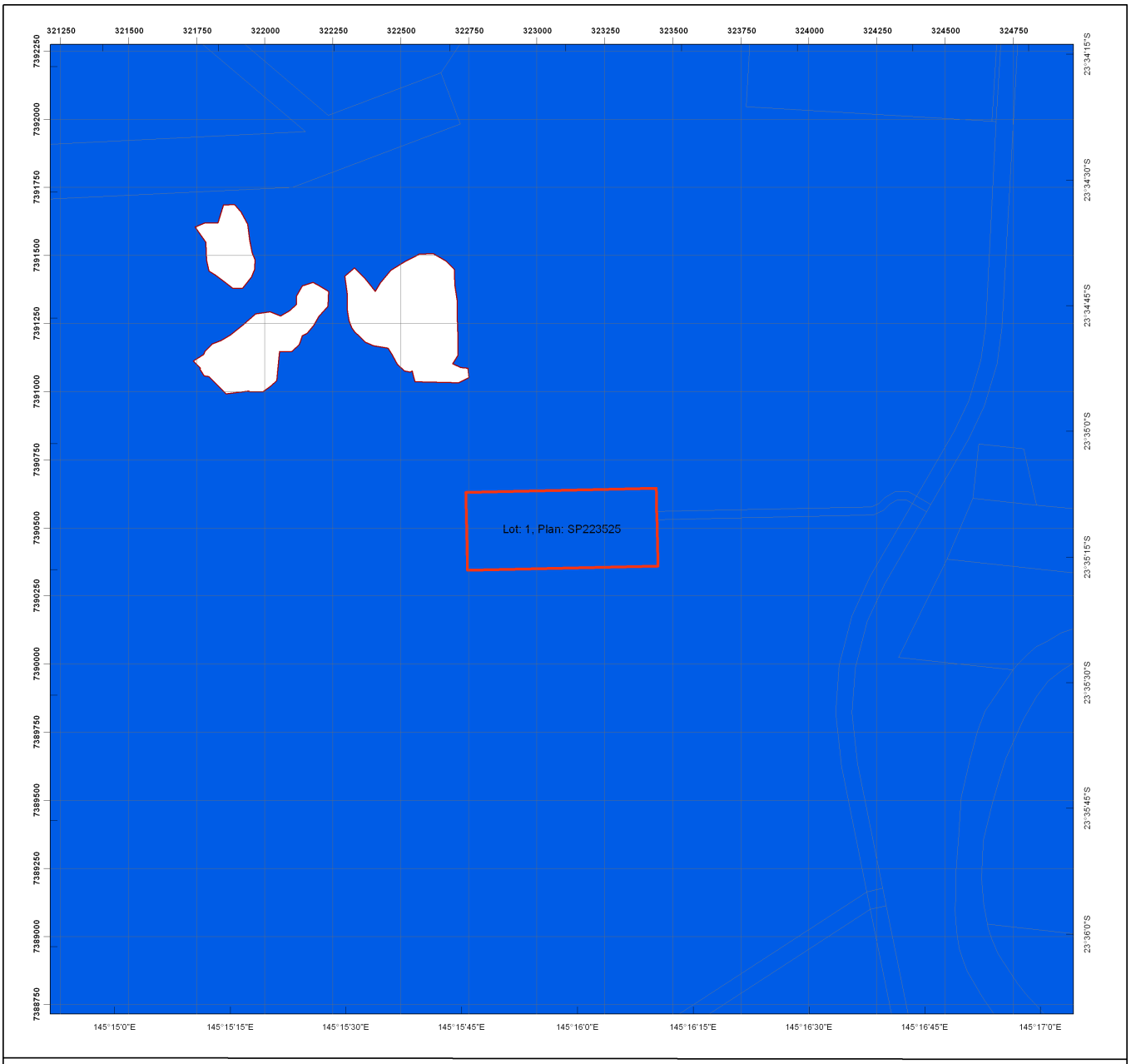
Table 2 provides details of objectives, performance criteria and procedures for management of terrestrial flora and fauna during the proposed clearing.

Table 2: Flora and Fauna Objectives, Performance Criteria, Control Strategies and Monitoring Plan

Project Objective	i. To minimise disturbance and adverse impacts on native fauna and flora from the proposed clearing.
Performance Criteria	i. No injury or death to native fauna ii. No vegetation to be disturbed outside of areas designated for clearing iii. No new weed introductions to the project area iv. Vehicles are certified as 'clean' of soil or vegetation from other sites before entering the clearing areas.
Control Strategy	i. The clearing footprint will be designated to minimise the clearing of remnant vegetation, only clearing areas necessary for the upcoming stages of production ii. The extent of vegetation clearing shall be clearly identified on plans to ensure the minimum amount of vegetation is removed, avoiding unnecessary disturbance to remnant vegetation iii. Clearing of vegetation will be undertaken in a manner allowing more mobile, non-flying fauna to move away from the disturbance area unhindered iv. Pre-clearing surveys will identify and mark large and small tree hollows that may provide daytime shelter for fauna species. Hollows will be saved and used for habitat in non-disturbed areas in the Project surrounds v. Any native fauna injured as a result of construction will be transported to a native animal hospital/refuge vi. Weed hygiene declaration forms to accompany plant and machinery being brought to site.

Appendix A

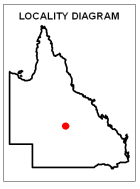
DNRM Regulated Vegetation Management Report



Regulated Vegetation Management Map

Legend

- Lot and Plan
- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt on Freehold, Indigenous and Leasehold land)
- Water
- Area not categorised
- Cadastral line
  Property boundaries shown are provided as a locational aid only



N

0 200 400 600 800 1,000 m

This product is projected into:
GDA 1994 MGA Zone 55

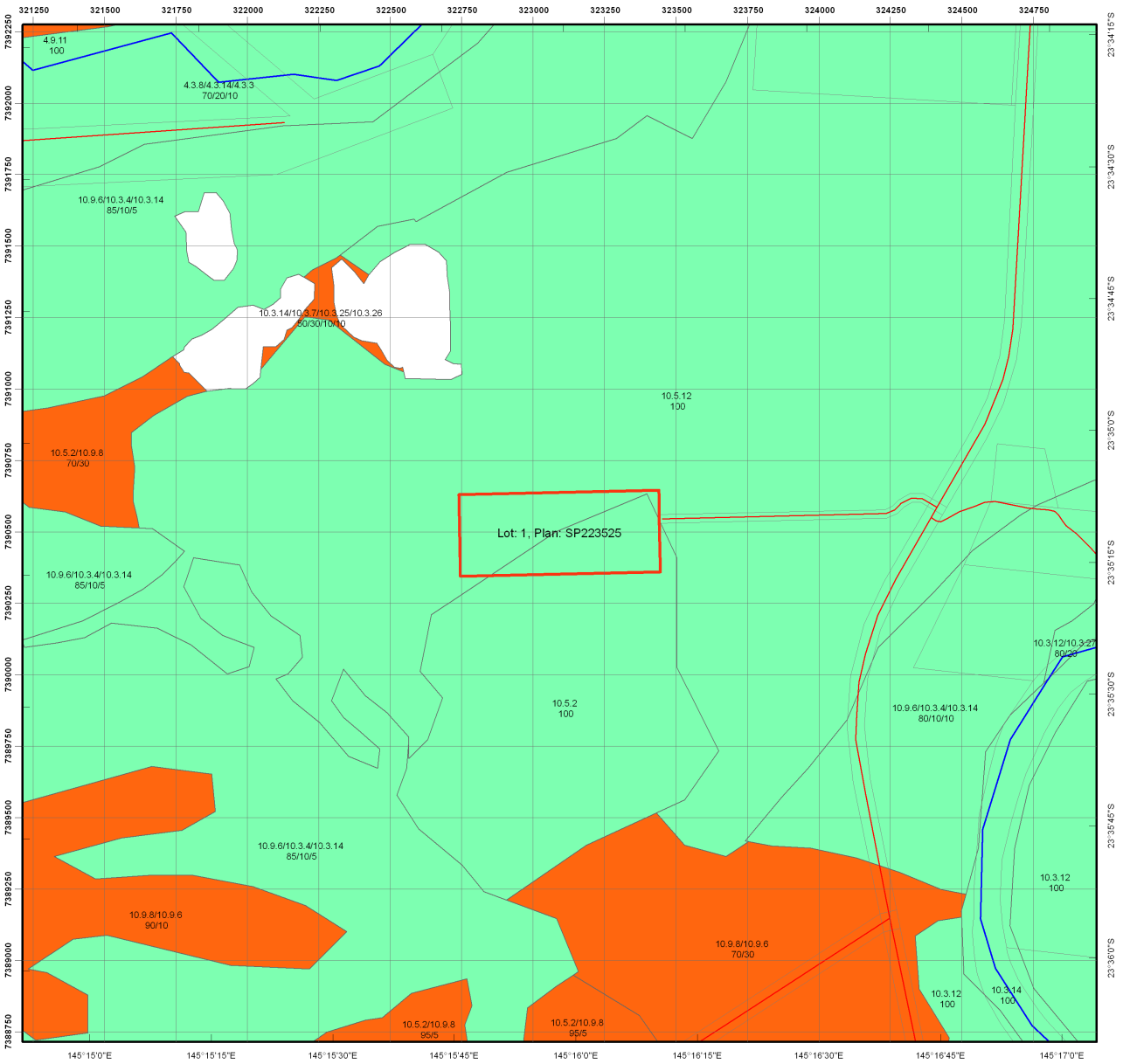
Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.dnrm.qld.gov.au or contact the Department of Natural Resources and Mines.

Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

Queensland Government



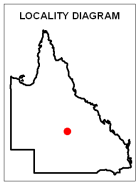
Vegetation Management Supporting Map

Legend

- Lot and Plan
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category A or B area containing remnant vegetation
- Category A or B area under Section 20AH
  These areas are edged in yellow and filled with the remnant RE Status
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Category C area containing high value regrowth vegetation
- Category C area under Section 20AI
  These areas are edged in purple and filled with the remnant RE Status
- Non Remnant
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourse on the vegetation management watercourse and drainage feature map
  (Stream order shown as black number against stream where available)
- Roads
- National Parks, State Forest and other reserves
- Cadastral line
  Property boundaries shown are
  provided as a locational aid only

Queensland Government

LOCALITY DIAGRAM



N

0 150 300 450 600 750 m

This product is projected into:
GDA 1994 MGA Zone 55

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

Disclaimer:
While every care is taken to ensure the accuracy of this product, the Department of Natural Resources and Mines makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incurr as a result of the product being inaccurate or incomplete in any way and for any reason.

Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.dnrm.qld.gov.au or contact the Department of Natural Resources and Mines.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.information.qld.gov.au/

Vegetation Management Act 1999 - Extract from the essential habitat database

Essential habitat is required for assessment under the:

- State Development Assessment Provisions - Module 8: Native vegetation clearing which sets out the matters of interest to the state for development assessment under the *Sustainable Planning Act 2009*; and
- Self-assessable vegetation clearing codes made under the *Vegetation Management Act 1999*

Essential habitat for one or more of the following species is found on and within 1.1 km of the identified subject lot/s or on and within 2.2 km of an identified coordinate on the accompanying essential habitat map.

This report identifies essential habitat in Category A, B and Category C areas.

The numeric labels on the essential habitat map can be cross referenced with the database below to determine which essential habitat factors might exist for a particular species.

Essential habitat is compiled from a combination of species habitat models and buffered species records.

The Department of Natural Resources and Mines website (http://www.dnrm.qld.gov.au) has more information on how the layer is applied under the State Development Assessment Provisions - Module 8: Native vegetation clearing and the *Vegetation Management Act 1999*.

Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated.

Essential habitat, for protected wildlife, means a category A area, a category B area or category C area shown on the regulated vegetation management map-

1) (a) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database; or
2) (b) in which the protected wildlife, at any stage of its life cycle, is located.

Essential habitat identifies endangered or vulnerable native wildlife prescribed under the *Nature Conservation Act 1994*.

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Species Information

(no results)

Essential habitat in Category A and B (Remnant vegetation species record) areas:1100m Regional Ecosystems Information

(no results)

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Species Information

(no results)

Essential habitat in Category A and B (Remnant vegetation) areas:1100m Regional Ecosystems Information

(no results)

Essential habitat in Category C (High value regrowth vegetation) areas:1100m Species Information

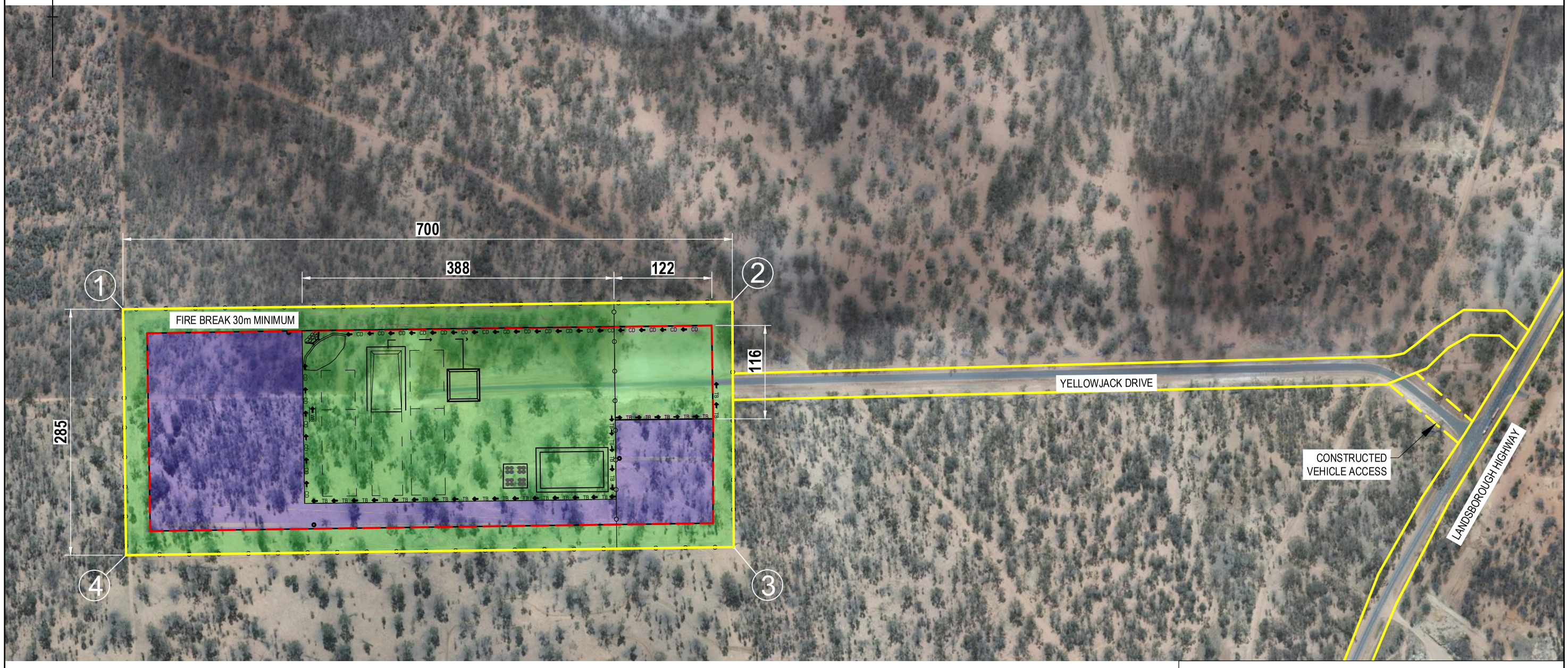
(no results)

Essential habitat in Category C (High value regrowth vegetation) areas:1100m Regional Ecosystems Information

(no results)

Appendix B

Vegetation Management Design Drawing



COORDINATE BASE POINTS FOR VEGETATION CLEARING

ID	LATITUDE	LONGITUDE	GRID REFERENCE
1	-23d35'06.42"	145d15'46.52"	MGA-55
2	-23d35'06.21"	145d16'11.22"	MGA-55
3	-23d35'15.49"	145d16'11.31"	MGA-55
4	-23d35'15.71"	145d15'46.62"	MGA-55

LEGEND:

- STAGE 1 VEGETATION CLEARING (1-20yrs)
- STAGE 2 FUTURE VEGETATION CLEARING (+20yrs)
- LOT BOUNDARY
- CONSTRUCTED VEHICLE ACCESS BOUNDARY
- FIRE BREAK
- EXISTING FENCE LINE

NOTES:

ALL DIMENSIONS IN METRES UNLESS NOTED OTHERWISE

Date Printed: 07/04/2017 13:52:08

Rev.	Revision Description	By	Date
C	Town Planner Revisions	BD	07/04/2017
B	Added 30m perimeter fire break to drawing	BD	15/02/2017
A	Original issue	DW	12/01/2016

GBA CONSULTING ENGINEERS

George Bourne and Associates
67 Elm Street (PO Box 169) Barcaldine Qld 4725
Phone: 07 4651 2177 Fax: 07 4651 1587
Email: admin@gbassoc.com.au

All dimensions shown in metres unless otherwise specified.

Drawn: DW

Checked: SB

Approved: SLJ Bourne (RPEQ 1513)

Client: BARCALDINE REGIONAL COUNCIL

Project: WASTE MANAGEMENT FACILITY

Title: WASTE FACILITY VEGETATION MANAGEMENT PLAN
DOC ID 245004
APPENDIX B

Category: ENGINEERING

Drawing No. 140010-3/01

Rev. C

Scale: 1:5000

Size: A3

Appendix C

Tree Height Survey

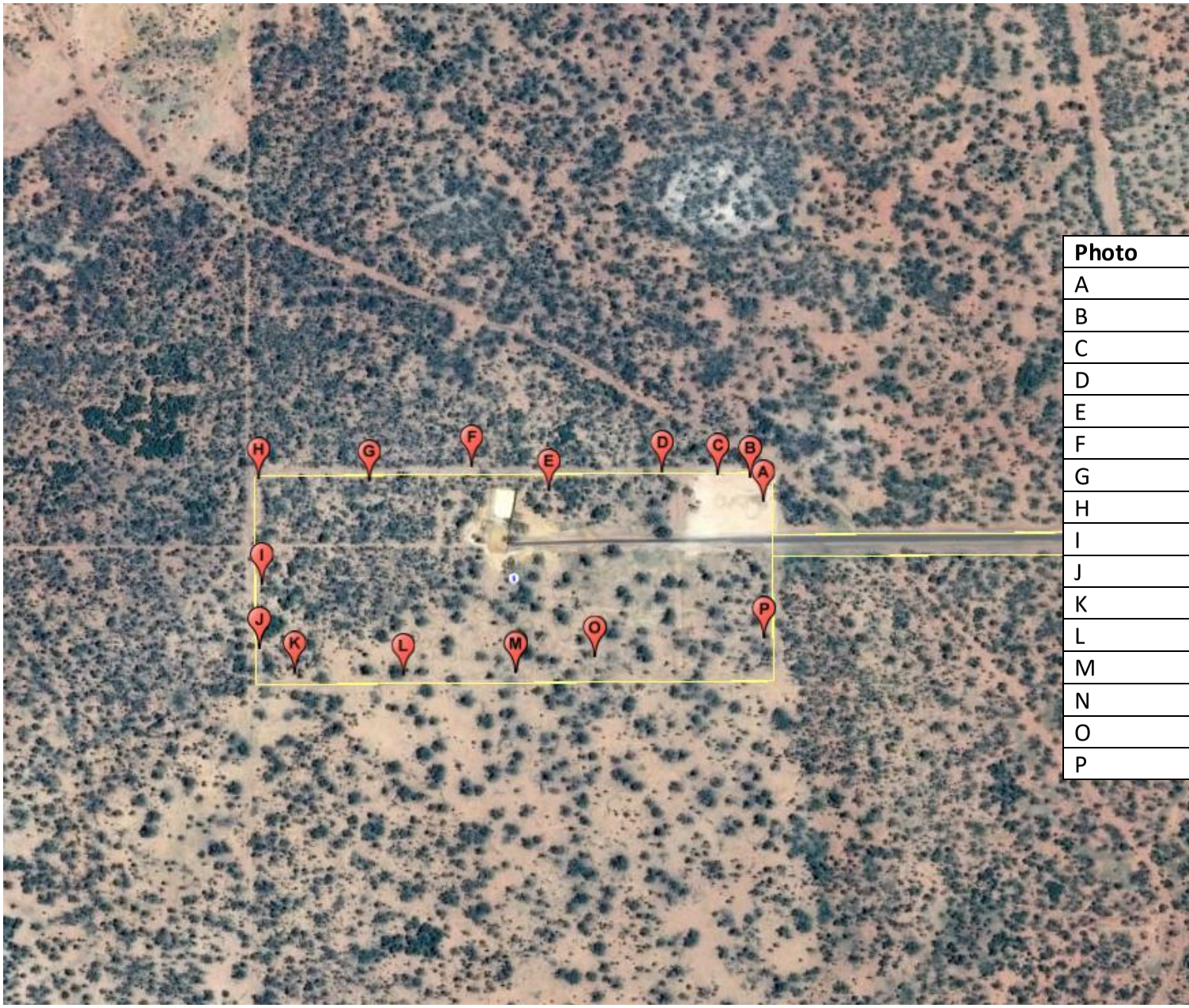


Photo
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

Photo. A **Coordinates:** -23°35'7.49", 145°16'10.78'' **Height:** 9.91m

Photo. B **Coordinates:** -23°35'6.42", 145°16'10.15'' **Height:** 16.82m

Photo. C **Coordinates:** -23°35'6.31", 145°16'8.60'' **Height:** 20.52m

Photo. D **Coordinates:** -23°35'6.18", 145°16'5.94'' **Height:** 21.19m

Photo. E **Coordinates:** -23°35'7.02", 145°16'0.55'' **Height:** 13.46m

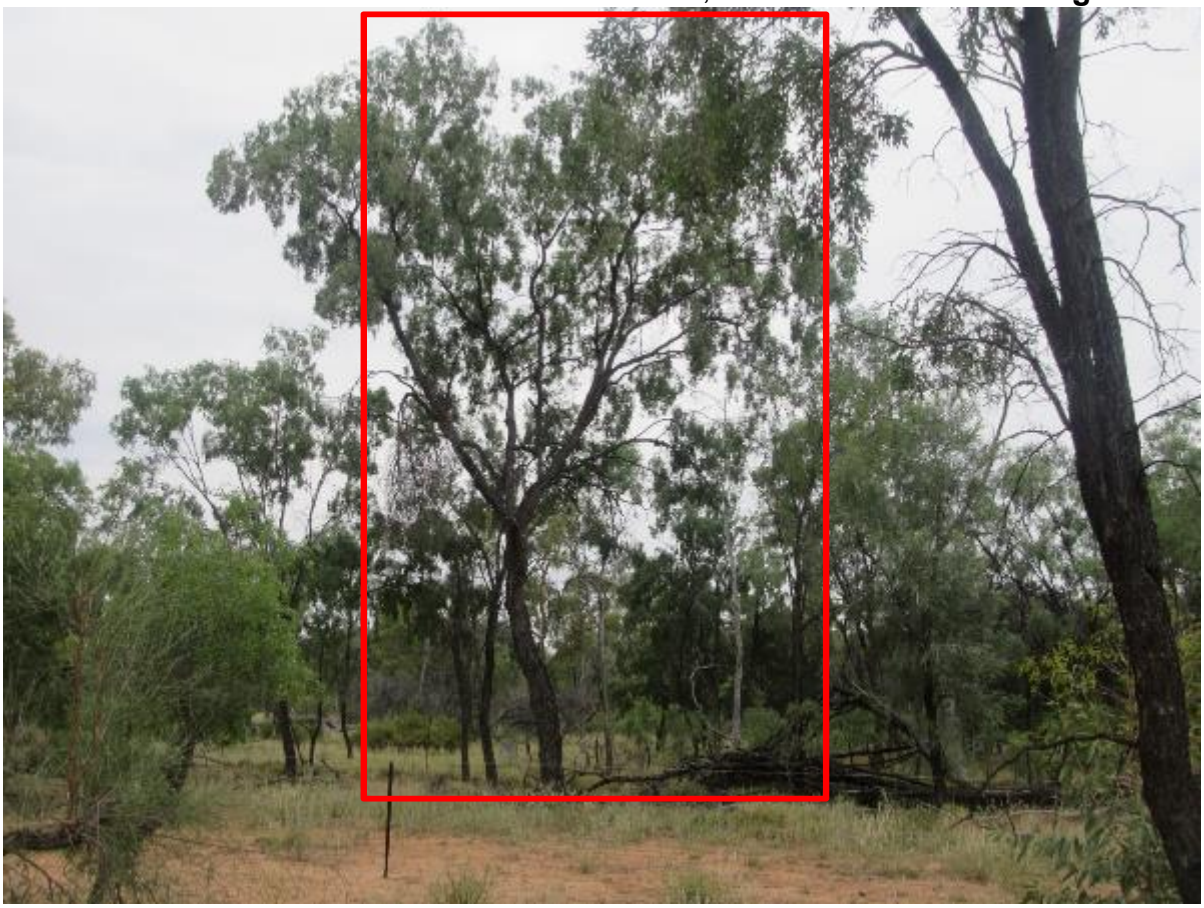


Photo. F **Coordinates:** -23°35'5.96", 145°15'56.86'' **Height:** 12.96m

Photo. G **Coordinates:** -23°35'6.64", 145°15'51.98'' **Height:** 15.31m

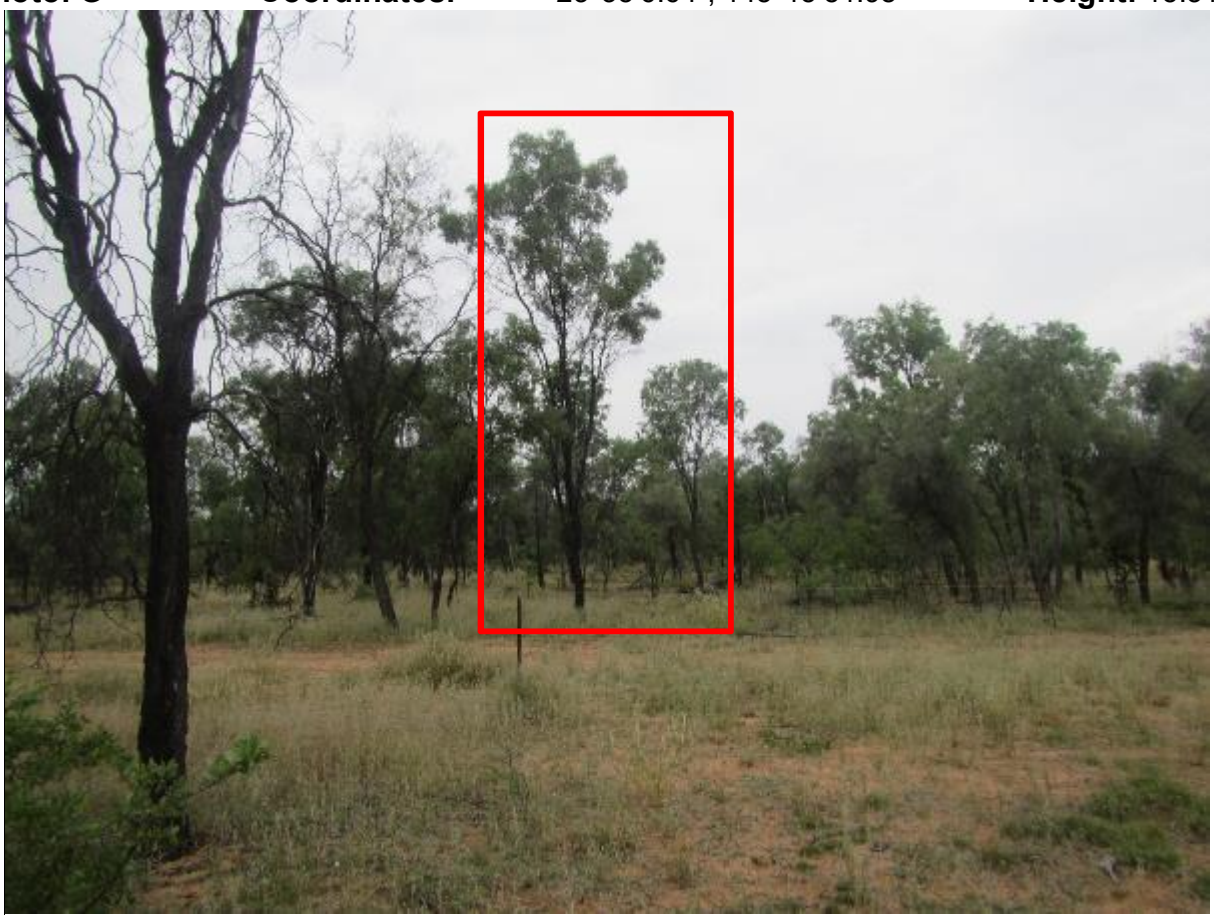


Photo. H **Coordinates:** -23°35'6.54", 145°15'46.70'' **Height:** 19.25m

Photo. I **Coordinates:** -23°35'11.23", 145°15'46.88'' **Height:** 17.70m

Photo. J **Coordinates:** -23°35'14.09", 145°15'46.78'' **Height:** 21.50m

Photo. K **Coordinates:** -23°35'15.17", 145°15'48.46'' **Height:** 15.18m

Photo. L **Coordinates:** -23°35'15.26", 145°15'53.64'' **Height:** 21.11m

Photo. M **Coordinates:** -23°35'15.16", 145°15'59.00'' **Height:** 19.87m

Photo. N **Coordinates:** -23°35'15.10", 145°15'59.02'' **Height:** 21.20m

Photo. O **Coordinates:** -23°35'14.44", 145°16'02.77'' **Height:** 17.55m

Photo. P **Coordinates:** -23°35'13.57", 145°16'10.83'' **Height:** 19.64m