

Appendix O

Ecology Assessment



Scenic Rim Agricultural Industrial Precinct

Ecological Assessment Report



20 February 2020

Report prepared on behalf of Kalfresh Pty Ltd

Table of Contents

1	Introduction.....	1
1.1	Background.....	1
1.2	The Proposed Development.....	2
1.2.1	Planning Context.....	2
1.2.2	Key Aspects of the SRAIP.....	3
1.3	Project Site and Project Footprint.....	4
1.4	Purpose of this Ecological Assessment Report.....	4
1.5	Scope of Work.....	4
1.6	Amendments to address CG and Referral Agency Feedback.....	9
2	The Project Site and Surrounding Area.....	12
2.1	Sub-regional Context and Locality.....	12
2.2	Project Site Characteristics.....	13
2.3	Current Water Management on the Project Site.....	14
2.4	Landscape Connectivity / Corridor Values.....	14
3	Desktop Assessment - Identifying Matters for Consideration.....	15
3.1	Previous Surveys.....	15
3.2	Environment Protection and Biodiversity Conservation Act 1999.....	15
3.3	Matters of State Interest.....	16
3.3.1	Nature Conservation Act 1992.....	16
3.3.2	State Planning Policy.....	16
3.3.3	State Codes and other State Interests.....	17
3.4	The Draft Planning Scheme.....	19
3.4.1	Strategic Framework.....	19
3.4.2	Environmental Significance Overlay Code and Map.....	20
3.5	The Current Planning Scheme.....	21
4	Ecological Assessment Methods.....	22

4.1	Implications of Previous Surveys	22
4.2	Flora Survey.....	23
4.3	Fauna Survey.....	24
5	Flora Survey Results.....	28
5.1	Vegetation Community Descriptions	28
5.1.1	Cultivation Areas.....	28
5.1.2	Drainage Channel and Basin.....	28
5.1.3	Grazed Paddocks with Scattered Mature Trees	29
5.1.4	Brush Box Open Forest	29
5.1.5	Narrow-leaved Ironbark Open Forest.....	30
5.2	Species and Features of Conservation Significance	30
6	Fauna Habitat Assessment Results	32
6.1	Likelihood of Occurrence.....	32
6.2	Amphibians	34
6.3	Reptiles	34
6.4	Birds.....	35
6.5	Mammals	37
6.6	Koala and Koala Habitat.....	37
6.7	Koala Population.....	39
7	Potential Impacts and Proposed Mitigation Measures	40
7.1	Impact Avoidance	40
7.2	Residual Impacts	40
7.2.1	Vegetation	40
7.2.2	Fauna	41
7.2.3	Prescribed Matters.....	45
7.3	Proposed Mitigation	45
7.4	Offsets.....	46

8	Compliance with Relevant State and Local Requirements	47
8.1	State Planning Policy.....	47
8.2	State Code 16.....	49
8.3	Nature Conservation Act 1992	52
8.4	Operational Works – Waterway Barrier Works and Riverine Protection Permits.....	52
8.5	Draft Planning Scheme Strategic Framework.....	53
8.6	Current Draft Planning Scheme Codes.....	59
8.7	Current Draft Planning Scheme Codes.....	68
9	Conclusion	71
10	References	72

Acronyms and Abbreviations

28 South – 28 South Environmental (ecological consultant for the Applicant)

Applicant – Kalfresh Pty Ltd

DA – Development Application

DAFF - Department of Agriculture, Fisheries and Forestry

DES – (Queensland) Department of Environment and Science

DoEE - (Commonwealth) Department of the Environment and Energy

DNRME – (Queensland) Department of Natural Resources, Mines and Energy

Draft IAR – Draft Impact Assessment Report

Draft Planning Scheme – *Draft Scenic Rim Planning Scheme*

EAR – (This) ecological assessment report

EcoSM – Ecological Survey & Management Pty Ltd

EP Act – *Environmental Protection Act 1994* (Qld)

EPBC Act – *Environment Protection and Biodiversity Conservation Act 1999* (Cth)

ERA – Environmentally Relevant Activity

EVNT – Endangered, Vulnerable and Near Threatened species listed under the NCWR

Fauna MNES - Fauna species listed under the EPBC Act

Fauna MSES – Fauna species listed as Endangered, Vulnerable and Near Threatened under the NCWR

Fauna MLES - Fauna listed as Priority Species of the Scenic Rim Region, as defined by Appendix F of *Planning Scheme Policy 5 – Ecological Assessments* within the Draft Planning Scheme

Flora MNES - Threatened Ecological Communities and flora species listed as MNES under the EPBC Act

Flora MSES - Flora species listed as Endangered, Vulnerable and Near Threatened under the NCWR

Flora MLES - Flora listed as Priority Species of the Scenic Rim Region, as defined by Appendix F of *Planning Scheme Policy 5 – Ecological Assessments* within the Draft Planning Scheme

FMP – Fauna Management Plan

Habitat trees – a native tree which contains conspicuous hollows and provides important wildlife habitat (in the absence of a definition for “habitat trees” within the *Draft Scenic Rim Planning Scheme*, this definition has been adopted for this report).

IAS – Initial Advice Statement (*Initial Advice Statement for Scenic Rim Agricultural Industrial Precinct, April 2019*)

KADA – Koala Assessable Development Area

Koala Conservation Plan – Nature Conservation (Koala) Conservation Plan (2017)

Koala – *Phascolarctos cinereus* (koala) (combined populations of Qld, NSW and the ACT)

Koala Habitat Tree – defined by the *Planning Regulation 2017* (Qld) as: (a) a food tree of the *Corymbia*, or *Melaleuca*, or *Lophostemon* or *Eucalyptus* genera; or (b) a preferred shelter species such as *Angophora* genera.

Koala mapping – Koala habitat mapping supporting the Planning Regulation

LGA – Local Government Area

Lot 1 – Lot 1 on RP216694 (a small lot comprising some of the Applicant's existing facilities and with access to the Cunningham Highway)

Lot 2RP – Lot 2 on RP20974 (the northernmost lot within the Project Site, which extends a considerable way in the north-west and contains the only regulated vegetation within the Project Site – a large distance from the proposed development)

Lot 2SP – Lot 2 on SP192221 (a relatively small lot containing some of the Applicant's existing facilities and with access to the Cunningham Highway)

Lot 3 - Lot 3 on SP192221 (the southernmost lot within the Project Site)

Lot 4 – Lot 4 on SP192221 (the central lot within the Project Site)

MCU – Material Change of Use

MLES – Matter(s) of Local Environmental Significance

MNES – Matter(s) of National Environmental Significance

MSES – Matter(s) of State Environmental Significance

NCWR – *Nature Conservation (Wildlife) Regulation 2009* (Qld)

NJKHT – Non-juvenile koala habitat tree (defined by the Planning Regulation as a koala habitat tree with: (a) a height of more than four metres; or (b) a trunk with a circumference of more than 31.5 cm at 1.3 m above the ground)

OCG – Office of the Coordinator-General

Planning Act – *Planning Act 2016* (Qld)

Planning Regulation - *Planning Regulation 2017* (Qld)

Planning Scheme – Boonah Shire Planning Scheme 2006

PMAV – Property Map of Assessable Vegetation

Project Footprint – The proposed physical extent of the SRAIP (refer **Figure 3**), within the wider Project Site

Project Site – Lot 1 on RP216694, Lot 2 on SP192221, Lot 2 on RP20974, Lot 3 on SP192221 and Lot 4 on SP192221 (Refer **Figure 2**)

RoL – Reconfiguring a Lot

RE – Regional Ecosystem

RVMM – Regulated Vegetation Management Map

SARA – State Assessment and Referral Agency

SAT – Spot Assessment Technique (Phillips and Callaghan 2011)

Scope of Work – The OCG's *Scope of work for a draft impact assessment report: Scenic Rim Agricultural Industrial Precinct* – 19 August 2019

SDPWO Act – (Queensland) *State Development and Public Works Organisation Act 1971*

SEQ – South East Queensland

ShapingSEQ – ShapingSEQ - South East Queensland Regional Plan 2017

SRAIP – Scenic Rim Agricultural Industrial Precinct

SRRC – Scenic Rim Regional Council (the local government authority)

VM Act – *Vegetation Management Act 1999 (Qld)*

VMP – Vegetation Management Plan

1 Introduction

1.1 Background

28 South Environmental Pty Ltd (**28 South**) has been engaged by Kalfresh Pty Ltd (the **Applicant**) to prepare an Ecological Assessment Report (**EAR**) for the proposed Scenic Rim Agricultural Industrial Precinct (**SRAIP**) to form the ecological components of the Draft Impact Assessment Report (**Draft IAR**) in response to the Queensland Government's *Scope of work for a draft impact assessment report – Scenic Rim Agricultural Industrial Precinct project* (**Scope of Work**). The SRAIP is a proposed hub for fresh and frozen food production (a Rural Enterprise Precinct) that expands on existing agricultural production uses on the Applicant's land in Kalbar; Lot 1 on RP216694 (**Lot 1**), Lot 2 on SP192221 (**Lot 2SP**), Lot 2 on RP20974 (**Lot 2RP**), Lot 2 on RP44024 (**Lot 2RP4**); Lot 3 on SP192221 (**Lot 3**) and Lot 4 on SP192221 (**Lot 4**). Collectively, these properties are referred to in this EAR as the '**Project Site**'.

The Project Site is in Kalbar, within the Scenic Rim Regional Council (**SRRC**) local government area (**LGA**) in South East Queensland (**SEQ**). **Figure 1** shows the Project Site's sub-regional context. **Figure 2** shows the Project Site's boundaries, relationship to adjoining lands and characteristics. **Figure 3** shows the proposed physical extent of the SRAIP (the **Project Footprint**), which covers only a portion of the Project Site and is largely limited to land adjoining the Cunningham Highway. Further description is provided in **Section 2**.

The Applicant seeks to establish the SRAIP in the eastern parts of the Project Site, adjoining the Cunningham Highway, while leaving the balance of the Project Site as rural land. **Attachment 1** shows the proposed development (also Appendix A and B of the draft IAR package). Further detail is provided in **Section 1.2**.

Following consideration of the Applicant's Initial Advice Statement (**IAS**), the SRAIP was declared a Coordinated Project for which an Impact Assessment Report is required under Part 4 of the *State Development and Public Works Organisation Act 1971* (**SDWPO Act**) by the Coordinator-General on 31 May 2019.

1.2 The Proposed Development

1.2.1 Planning Context

The Draft IAR should provide the Office of the Coordinator-General (**OCG**) with sufficient information to allow assessment of the SRAIP against primary approval requirements including:

- (i) a Material Change of Use (**MCU**) – variation approval to vary the effect of the local planning instrument under the *Planning Act 2016*; and
- (ii) an Environmental Authority for Environmentally Relevant Activities (**ERAs**) under the *Environmental Protection Act 1994 (EP Act)*, including:
 - a. ERA 63 – Sewerage treatment;
 - b. ERA 64 – Water treatment;
 - c. ERA 53A – Organic material processing (by composting the organic material);
 - d. ERA 53B – Organic material processing (by anaerobic digestion);
 - e. ERA 15 – Fuel burning; and
 - f. ERA 14 – Power generator.

Other operational works approvals for the SRAIP will also likely be required prior to works commencing.

Upon the SRAIP's assessment by the OCG and granting of an approval with development conditions under the SDWPO Act, it is expected that the SRRC will pass on this approval with conditions to the Applicant for formality under the Boonah Shire Planning Scheme 2006 (**Planning Scheme**), or under the Scenic Rim Planning Scheme should the current Draft Scenic Rim Planning Scheme (**Draft Planning Scheme**) be in operation at this point.

1.2.2 Key Aspects of the SRAIP

A full description of the SRAIP is provided within the Draft IAR. Key elements of the proposed development include:

- 35 ha of developable land for industrial allotments ranging from 0.5 ha to over 3 ha;
- Internal roads (2.5 ha), project office areas and perimeter fence;
- Construction of access point/s to the Cunningham Highway;
- Onsite sewerage and wastewater treatment;
- Engineered overland flow path for stormwater;
- Connection to power, telecommunications and water utilities;
- A 2 MW bioenergy facility with anaerobic digester for the processing of food and urban waste to produce baseload power to supply the SRAIP;
- Digestate storage in a series of tanks;
- A composting area consisting of 29 x 75 m windrows, a demountable office and weighbridge;
- A proposed dam/leachate pond associated with the composting area;
- Effluent pivot irrigation area (2 ha); and
- Digestate pivot irrigation area (18 ha).

A fundamental part of the SRAIP is the concept of a circular agricultural economy, utilising wastes from one process as inputs for another. Greywater and waste products from the processing of crops will form inputs to the anaerobic digester as part of the bioenergy facility. Waste (digestate) from the bioenergy facility will be disposed of through pivot irrigation methods in the west of the Project Site (see **Attachment 1**). Refer to detailed information provided in Appendix D of the draft IAR package.

The SRAIP will focus development on land adjoining the Cunningham Highway and surrounding the Applicant's existing operations within the Project Site (see **Attachment 1**).

1.3 Project Site and Project Footprint

For the purposes of this EAR, it is critical to differentiate the "Project Site" and the "Project Footprint".

- The Project Site comprises the entirety of the six subject lots; a total of 248.718 ha.
- The Project Footprint comprises the extent of the physical SRAIP development described in **Section 1.2**; a total of 97.36ha (see **Figure 3**).

1.4 Purpose of this Ecological Assessment Report

The purpose of this EAR is to respond to the ecological elements of the Scope of Work (sections 2.1.3 (1) to (3)):

- (i) describe the ecological values of the Project Site and its role/function in the surrounding landscape;
- (ii) describe how the SRAIP responds to the identified ecological values;
- (iii) identify potential development impacts on these ecological values, and propose effective mitigation;
- (iv) provide a Vegetation Management Plan (**VMP**) and a Fauna Management Plan (**FMP**) for the SRAIP; and
- (v) assess compliance with relevant Federal, State and local environmental planning requirements, including the Draft Planning Scheme.

1.5 Scope of Work

Table 1 provides a cross-referencing tool for the elements of the Scope of Work relevant to this EAR and the corresponding sections of this EAR that address these elements.

Table 1: Scope of Work Element and Corresponding EAR Section

Scope of Work	EAR Section Reference
Section 2.1.3 – Ecology and Natural Resources – 1. Ecological Assessment	
Submit an Ecological Assessment, prepared by a suitably qualified person, which addresses the following:	This EAR is prepared by suitably qualified persons and a Certified Environmental Practitioner (CEnvP).
a) Includes a Vegetation Management Plan (VMP) and a Fauna Management Plan (FMP)	Attachment 2
b) Provides details of existing vegetation and proposed / future vegetation removal including regional ecosystem (RE) type, extent and location as well as methods of removal	Attachment 2 Section 5.1
c) Describe how the VMP and FMP incorporates a proactive approach to minimise the effects of development on the flora and fauna. Avoidance, mitigation, restoration and management measures are to be included for both the construction and operational phases of development.	Attachment 2 Section 7.1 (Impact Avoidance)
d) Provide an assessment against the Environmental Significance Overlay Code within the new Draft Scenic Rim Planning Scheme	Section 8.6
e) Identification as to whether the project is likely to trigger assessment under the <i>Planning Act 2016</i> , <i>Nature Conservation Act 1994</i> and the <i>Water Act 2000</i>	Section 3.3
f) Provide details of the presence or otherwise of water features including rivers and streams and freshwater wetlands and the potential impacts on the ecology of waters from the project.	Section 2.3 Section 3.3
g) Provide details of works/development in or near waters, aquatic fauna and flora, and rehabilitation measures	Section 6.2
h) Coordination of the recommendations of the Ecological Assessment with those of the SMP	SMP provided under separate cover

Scope of Work	EAR Section Reference
i) Where habitat or vegetation is proposed to be damaged, management strategies to be included to ensure the protection and safety of wildlife and the protection of nearby habitat in areas identified as either Matters of State or Local Environmental Significance.	Attachment 2
Section 2.1.3 – Ecology and Natural Resources – 2. Flora and Fauna	
The Ecological Assessment must also address the following:	
a) Flora and Fauna – surveys i. describe flora and fauna surveys methodologies used to verify the presence of protected flora and fauna onsite and adjacent the site. Flora and fauna surveys must be completed as per guidelines referred to in the department's EIS Information Guideline-Flora and Fauna available at: https://www.qld.gov.au/environment/pollution/management/eis-process/about-the-eis-process/terms-of-reference ii. if a threatened species that could potentially occur within the survey area is not found during field surveys, then the desktop potential habitat assessment in conjunction with survey data could be used to estimate the likelihood of this species occurring at the site iii. where detailed surveys are not undertaken, threatened species and communities that are likely to occur in the survey area (based on the presence of suitable habitat) should be assumed to occur in the identified habitat.	Section 4
b) Flora and Fauna – protected plants framework i. describe the verified presence of any protected plants on site for which a clearing permit is required (following field verification) and include all information required for the department to determine whether a clearing permit could be approved.	Section 3.3 Section 5.2 Section 8.3
c) Flora and Fauna – koala i. carry out field surveys that meet best practice professional standards to identify koala habitat, including single koala habitat trees, within and adjacent to the project area ii. identify the local koala population, taking into account information on koala home range and movement patterns iii. identify any impacts or likely impacts including indirect and cumulative impacts on koalas and their habitat on the project site and surrounding environs iv. depending on the development type and koala habitat type, the project must demonstrate: v. avoiding, minimising or providing an offset for the clearing of non-juvenile koala habitat trees	Section 4 (survey methods) Section 6.6 (koala habitat) Section 6.7 (koala population) Section 7.1 (avoidance) Section 7.2.2 (impacts) Section 7.3 (mitigation) Section 7.4 (offsets)

Scope of Work	EAR Section Reference
vi. site design that provides safe koala movement opportunities appropriate to the development type and habitat connectivity values of the site vii. construction phases that do not increase the risk of death or injury to koalas viii. clearing of native vegetation, undertaken as sequential clearing ix. clearing of koala habitat trees, undertaken in the presence of a koala spotter. x. outline commitments and mitigation measures to ensure that the project will not have a permanent and irreversible impacts on the local koala population xi. propose offsets, where required, in accordance with Environmental Offsets Act 2014 and the department's significant residual impact available at: https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/significant-residual-impact-guide.pdf	
d) Flora and Fauna – listed threatened species (other than the koala) i. carry out field surveys to verify the presence (and/or habitat) of listed threatened species and communities within and adjacent to the project area ii. provide evidence as to why species and communities identified would not be found within and adjacent to the project area iii. provide options that show avoidance is incorporated and considered in all stages of the project. If avoidance is not possible, describe in detail the proposed mitigation and management measures that minimise impacts iv. if species and communities are found, undertake a significant impact assessment against the Significant residual impact guideline, available at: https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/significant-residual-impact-guide.pdf v. outline commitments and mitigation measures to ensure that the proposed project will not have permanent and irreversible impacts on the identified listed threatened species and communities.	Section 4 (survey methods) Section 7.1 (avoidance) Section 7.2 (impacts) Section 7.3 (mitigation) Section 7.4 (offsets)
e) Flora and Fauna – protected plants and essential wildlife habitat i. The location of all protect activities and infrastructure relative to the confirmed distribution of protected plants and essential wildlife habitat should be shown on suitably scaled and georeferenced maps in the draft IAR.	Figure 5
f) Flora and Fauna – impact assessment i. describe the assessment of potential impacts of the project activities on fauna that may be present on or adjacent the site, including the potential indirect impacts of increased traffic, light, air pollution, noise and odour. This includes the koala and other listed threatened species and communities ii. before assessing what impacts the project could have on terrestrial ecological values, the proponent must plan all stages of the operations (construction, operation and decommissioning) and	Section 7.1 (avoidance) Section 7.2 (impacts) Section 7.3 (mitigation)

Scope of Work		EAR Section Reference
design the infrastructure to avoid impacts. If avoidance is not possible, propose measures that would minimise and mitigate any unavoidable impacts, and assess the EIS on that basis iii. describe specific success criteria to assess the health and integrity of the natural environment impacted by project activities, in particular MSES, listed threatened species and communities, riparian vegetation and wetlands iv. outline commitments and mitigation measures to ensure that the proposed project will not have a permanent and irreversible impacts on the natural environment.		
g) Flora and Fauna – residual impact on prescribed matters i. describe, quantify, and assess the significance of any potential residual impacts on prescribed matters. Where a SRI results, calculate offsets required for the project as per the departments SRI guideline available at: https://environment.des.qld.gov.au/assets/documents/pollution/management/offsets/significant-residual-impact-guide.pdf ii. describe in detail how the offsets were determined or justify why no offsets are proposed. Calculate the required offset based on the habitat quality in the impact area and the proposed offset area.		Section 7.2.3
Section 2.1.3 – Ecology and Natural Resources – 3. Clearing Native Vegetation		
The Ecological Assessment must also address the following:		
a) identify any exempt clearing created by material change of use (MCU) variation request, MCU and/or reconfiguration of a lot (RoL) development approvals		Section 8.2
b) provide details on whether the intended clearing is exempt work or accepted development under the <i>Planning Regulation 2017</i>		Section 8.2
c) provide information to support any development application that will trigger assessment of native vegetation clearing, including: i. details on why the development cannot be located outside Category B areas ii. written confirmation from Department of Natural Resources, Mines and Energy (DNRME) that a development application (MCU or Operational Works) for clearing was for a relevant purpose under s22A of the Vegetation Management Act 1999 iii. a map/plan (together with a shapefile), illustrating the extent of clearing, including but not limited to: roads; the digestate disposal area and associated infrastructure; energy reticulation and associated infrastructure for supplying energy to the grid/end users iv. details of the development intent for Lot 2 on RP20974 and Lot 2 on RP44024		Section 8.2 (State Code 16) Attachment 1 (Project Footprint, Proposed Infrastructure) Section 7.4 (offsets)

Scope of Work		EAR Section Reference
v.	maps showing all proposed infrastructure, labelled, to scale, and clearly identifiable to enable an accurate assessment of native vegetation clearing	
vi.	an assessment against SDAP State Code 16 for where clearing is for infrastructure activities, focussing on Table 16.2.2 PO1 to PO4, and Table 16.2.3 PO7, PO11, PO16, PO20, PO22 to PO24 and PO27	
vii.	confirmation of whether vegetation clearing offsets are required and, if so, how they will be provided.	
d)	Demonstrate that any clearing of Category C areas is either exempt in accordance with activities listed in schedule 21 of the Planning Regulation 2017, or that the clearing can occur in accordance with an Accepted Development Vegetation Clearing Code.	Section 8.2

1.6 Amendments to address CG and Referral Agency Feedback

It is understood that this draft EAR was submitted as part of the draft IAR to the OCG on the 20 December 2019. Feedback and comments were provided by the CG and relevant referral agencies for consideration in the overall SRAIP IAR in January 2020. **Table 2** below summarises the relevant ecological and environmental planning comment items raised by the CG and referral agencies and how they have been addressed as part of this amended EAR.

Table 2 – Summary Table of Responses

Agency	Comments	Response and Relevant Sections
CPD	<i>Detail of flora and fauna survey methodologies, including the timing of surveys undertaken, have not been included in the draft IAR. Please address this.</i>	As per Table 1 above, the original draft EAR that was included as supporting documentation for the draft IAR (dated 21 November 2019), included details regarding the extent of flora and fauna surveys undertaken, the methodologies adopted, the specific timeframes the surveys were undertaken and credentials of ecologists undertaking the survey. This information was provided in Section 4.2 and 4.3 of the draft EAR. See also Table 1 above outlining the ecological items called for in the Scope of Work and the corresponding section/s of this report that address/es these item/s.

		It is considered that the in-field assessment undertaken to date is sufficient and appropriate for the proposed MCU application for the SRAIP given the highly modified nature of the development footprint, being areas under heavy cropping and cattle grazing with highly scattered trees. Further the proposed development footprint and infrastructure has been situated to maximise the separation distance to those areas of higher ecological significance in the north western extent of the Site (remnant and high quality regrowth vegetation); which also occur on much higher topography to that of the proposed development area.
DAF	<i>Fisheries Queensland believes that the subject Site does contain waterway providing for fish passage, in accordance with the definition of waterways under the Fisheries Act 1994. Consequently, there is a requirement to assess ecological impacts to fish passage by the proposed development.</i> <i>Proponent to note that any works impacting waterways constitutes operation work (constructing or raising waterway barrier works) and requires assessment in accordance with the planning framework under the Planning Act 2016.</i>	It is understood that Cardno Pty Ltd has been engaged to undertake assessment and provide a response for these matters as part of the draft IAR.
DNRME	Ecological Assessment Report (EAR) – Native Vegetation Clearing Any lots containing Category B vegetation included in the proposed 'MCU Preliminary Approval: Variation Request' will trigger referral for native vegetation clearing (Schedule 10, Part	Whilst the proposed MCU application for the SRAIP encompasses the entirety of the Site bounds, no uses, works or infrastructures are proposed for approval in this application within or adjacent to any mapped areas of native vegetation regulated under the <i>Planning Act 2016</i> (Category B Regulated Vegetation and Category C High Value). This is illustrated on the proposed Masterplan (Attachment 1) through the

	<i>3, Division 4, Table 3 of the Planning Regulation 2017). If referral is triggered, the impact assessment must provide the information required by Section 2.1.3(3) of the SoW.</i> <i>In accordance with Section 2.1.1(5) of the SoW, ensure detail is provided on the area of land covered by the 'Preliminary Approval' application as well as the proposed zoning.</i> <i>Demonstrate that any clearing of Category C areas is either exempt in accordance with activities listed in Schedule 21 of the Planning Regulation 2017 or that the clearing can occur in accordance with an Accepted Development Vegetation Clearing Code.</i>	overlay of the Environmental Protection Area (EPA). This overlay covers the entirety of the mapped Category B and C areas. Further detail has been provided in Section 8.2 to specifically outline how the proposed MCU application appropriately avoids clearing or any indirect or theoretical impacts to this vegetation. The proposed Industrial precinct within the Site's south eastern extent is situated further than 700 m from the EPA overlay. Further, infrastructure (e.g. temporary demountable offices) associated with the proposed composting area centrally with the Site is situated more than 400 m from the EPA overlay. Should any future works be proposed within the EPA, they will be subject to significant approval frameworks and require further detailed assessment including flora and fauna surveys to meet the requirements of all relevant state assessment agencies, State Development Assessment Provisions and code requirements. It is also highlighted that the proposed Future Road Connection (Attachment 1) is illustrative only. This Future Road Connection is the subject of a separate application (Fraserview Quarry – MCU19/005 & RAL19/003). Should this separate application not be approved or approval not enacted, this road will not be constructed.
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2 The Project Site and Surrounding Area

2.1 Sub-regional Context and Locality

Figure 1 shows that the Project Site is located in the productive Fassifern Valley, one the western edge of a strip of croplands that follow the productive floodplain of Warrill Creek. The South East Queensland Regional Plan 2017 (**ShapingSEQ**) (DILGIP 2017) shows that the Project Site is located within the Regional Landscape and Rural Production Area, with areas of Regional Biodiversity Value mapped in Lot 2RP, Lot 4 and Lot 3 (*all beyond the Project Footprint*) (**Figure 1**).

The Site's more immediate locality is depicted in **Figure 2**. The Project Site is largely cleared for agricultural purposes, with the north-western extent of Lot 2RP containing dense remnant vegetation that is connective with vegetation in adjoining lands to the east, north and west. A modified waterway which now occurs as a large bunded drainage channel (**Photo Plates 3-5, 16-17** and **Figure 2**) extends across the Project Site in a general south-west to north-east direction, to the rear of the existing cropping areas. This drainage channel, coupled with historical cropping and earthworks, has altered water drainage across the immediate locality, conveying all stormwater and greywater in channelised systems and table drains (refer **Section 2.3**) northward through grazing and cropping lands before it enters a more natural water system piped under the Cunningham Highway and draining into Warrill Creek some 1.5-2 km north of the Project Site (**Figure 1**). A lower plain within Lot 4 is constantly inundated with treated greywater from the existing Kalfresh operations (e.g. washing vegetables).

To the immediate north of the Project Site are quarrying operations on Lots 1 and 2 on SP121240. Also adjoining the Project Site in the north is a recently-approved quarry within Lot 9 on RP20973 that will also require a haul road connection to the Cunningham Highway through Lot 2SP¹. Quarrying activities also occur on land to the south-west of the Project Site on Lots 14 and 15 on SP229448. Elsewhere to the west of the Project Site, properties are

¹ This proposed quarry and surrounding area was subject to a detailed ecological assessment for the purposes of the development application by a member of the 28 South Environmental ecology team. The proposed haul road was assessed through this process (application no. MCU19/005 & RAL 19/003) and is therefore not subject to assessment as part of the SRAIP and associated Draft IAR.

generally used for grazing or cropping purposes. Immediately east of the Project Site is the Cunningham Highway. To the east of the highway is Warrill Creek and a vast band of irrigated cropland that follows this creek system to the west of the township of Kalbar (approximately 4 km east of the Project Site). The cropping lands between Warrill Creek and Cunningham Highway range between 400 and 900 m in width while the broader cropping areas bounding Warrill Creek (both east and west) along its fertile alluvial plains varies between c.2.5 km to c.6 km with native woody vegetation strictly limited to the immediate riparian corridor of Warrill Creek and Kent's Lagoon (both ranging between 20-50 m in width).

2.2 Project Site Characteristics

The Project Site is 248.7 ha in area and predominantly cleared of native vegetation (see **Photo Plates 1-20**). The Project Site has been largely modified for agricultural purposes (grazing in the north and west (c.150 ha), cropping in the south and east (c.38 ha). The agricultural processing facilities associated with the Applicant's existing operations are located in the south-eastern portion of the Project Site (c.4 ha), adjoining the Cunningham Highway.

Queensland Herbarium pre-clear Regional Ecosystem (**RE**) mapping shows that the Project Site was characterised by three main vegetation types:

- RE 12.3.3 and RE 12.3.7 in the Warrill Creek floodplain;
- RE 12.8.16 in the higher areas to the west and south-west; and
- RE 12.8.17 and 12.8.9 in the north and north-west.

The mapping and a description of these REs is provided in **Attachment 3**. Sequential historic aerial photography (**Attachment 4**) shows the Project Site's disturbance history. The earliest available aerial photography (1944) shows that the Project Site was largely cleared to its current extent, with cropping throughout the areas of lower elevation and much more extensive than the areas currently cropped. Thus, the Project Site is an area that has been highly modified for on-going intensive agricultural purposes for more than 75 years.

As shown by this analysis, floodplain woodland communities that historically occupied the lower portions of the Project Site were historically removed for intensive cropping pursuits in

the most productive areas of the Warrill Creek floodplain, significantly reducing ecological values of the locality and the Project Site alike. The Site's specific ecological values are discussed further in **Section 5** and **Section 6**.

2.3 Current Water Management on the Project Site

The following describes how water management processes currently operate within the Project Site:

1. The existing packing facility currently utilises water from local bores to wash and process produce.
2. This water is collected, treated and pumped to a high point west of the facility and drainage channel where it is discharged into a perched table drain (see **Figure 4a**).
3. The table drain has been cut into a contour of the hill to direct water around the hill to the northwest for polishing as overland flow through the centre of the Project Site.
4. This sheet flow of treated grey water disperses over a very broad and flat basin within the Project Site (see **Figure 2** and **Figure 4a**, and **Photo Plates 7-9, 14-15, 19**).
5. Sheet flow has created a broad, densely vegetated low plain completely dominated by exotic weed growth which is under constant graze from stocked cattle which in turn, impact the soil profile by trampling wet heavy clays.
6. The sheet flow is captured by the channelised drain and dispersed northwards with other captured stormwater from the larger catchments to the south and west.

2.4 Landscape Connectivity / Corridor Values

Maps supporting the Biodiversity Planning Assessment for the Southeast Queensland Bioregion (DEHP, 2016) shows that the Project Site is not within a State or Regional Biodiversity Corridor.

3 Desktop Assessment - Identifying Matters for Consideration

3.1 Previous Surveys

Part of the Project Site is subject to a recent development application for a proposed hard-rock (trachyandesite) quarry and haul road. The quarry is proposed on Lot 9 on RP20973 to the north of the Project Site, while the haul road is proposed within Lot 2. Importantly for the SRAIP, recent ecological surveys were conducted by Ecological Survey & Management Pty Ltd (**EcoSM**) and an Ecological Assessment Report prepared to identify the ecological characteristics of the two lots comprising the proposed quarry and haul road. The survey results from the EcoSM (2018)² report are referenced where appropriate and relevant throughout this EAR.

3.2 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides the legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places. These are defined under the Act as 'Matters of National Environmental Significance' (**MNES**).

Under the EPBC Act, a referral to the Department of the Environment and Energy (**DoEE**) is required if development could give rise to a Significant Impact on MNES. The determination of whether a Significant Impact will occur is made with reference to the Matters of National Environmental Significance Significant Impact Guidelines 1.1 (DoE 2013) and other EPBC Act policy statements³.

A search⁴ of the Protected Matters Search tool indicates the likely or potential occurrence of MNES in this locality (**Attachment 5**). The Wildlife Online database was searched to determine confirmed records of MNES within a 5 km radius of the Project Site. The search also identifies confirmed records of species listed as Endangered, Vulnerable or Near

² Ecological Survey & Management, 2018. *Frazerview Quarry – Ecological Assessment Report*, for Wagner Investments Pty Ltd, Brendale, Qld.

³ Including significant impact guidelines for individual threatened species, groups of species and threatened ecological communities (<http://www.environment.gov.au/epbc/publications/guidelines.html>)

⁴ A 5km radius around the point -27.32326 152.95597 was specified.

Threatened under the *Nature Conservation (Wildlife) Regulation 2009 (Qld)* (**NCWR**). Results are provided in **Attachment 6**.

3.3 Matters of State Interest

State-based ecological legislation and policies relevant to the assessment of the SRAIP against mapped and ground-truthed environmental values are described in the following sections.

3.3.1 Nature Conservation Act 1992

The *Nature Conservation Act 1992* (**NC Act**) establishes approval triggers and an assessment process for clearing protected plants. The Project Site is not located within a mapped “High Risk Trigger Area” (**Attachment 7**). Despite this, a detailed botanical survey was undertaken on 15 October 2019 to identify the presence of protected plants and/or suitable habitat within the Project Site. Surveys were taken generally in accordance with the Queensland Government’s *Flora Survey Guidelines - Protected Plants Version 2.01* which included a detailed time meander survey within the Project Site and on publicly accessible terrestrial lands immediately adjoining the Project Site.

The *Nature Conservation (Wildlife) Regulation 2006* (**NC Reg**) also lists Endangered, Vulnerable and Near Threatened (**EVNT**) fauna species. EVNT species are afforded special protection under the NC Act. An assessment of the SRAIP against the provisions of the NC Act is provided in **Section 8.3**.

3.3.2 State Planning Policy

The Queensland SPP clarifies matters of State interest in land use planning and development. The SPP contains 17 State interests, one of which is “Biodiversity” and of direct relevance to this EAR.

The SRAIP is assessed against the Biodiversity State Interest in **Section 8.1**.

3.3.3 State Codes and other State Interests

A number of other State interests are identified within the State Development Assessment Provisions (**SDAP**) State Codes. State Codes and interests of relevance to this EAR are listed in **Table 2**.

Table 3 – State Codes and Interests

State Interest	Comment	Further Assessment Required / Provided
State Code 12 – Declared Fish Habitat Areas	N/A	No – the Project Site is not within a Declared Fish Habitat Area.
State Code 16 – Native Vegetation Clearing	The Project Site is mapped to contain Category X, Category B and Category C Regulated Vegetation (see Attachment 7). The Project Footprint is considerably removed from the mapped Category B and Category C Regulated Vegetation (see Figure 6).	Yes. An assessment of the SRAIP's impacts on vegetation is provided in Section 7.2.1 . An assessment of the SRAIP against State Code 16 is provided in Section 8.2 .
State Code 18 – Constructing or Raising Waterway Barrier Works in Fish Habitats	The Project Site is mapped to contain two waterways for waterway barrier works; within Lot 4 and Lot 2RP (see Attachment 8). The waterway mapping is grossly inaccurate and does not reflect the heavily-altered nature of the Project Site's hydrological characteristics. It is noted that the channelised drain running in a generally north direction is not identified as a waterway for waterway barrier works and intersects the mapped waterway in a perpendicular manner.	No – further information to be provided at the Operational Works stage if required.
Koala Habitat Areas	The Project Site is <u>not</u> within a Koala Assessable Development Area (KADA) mapping under the <i>Planning Act 2016</i>. The Project Site is mapped to contain primarily "Suitable for Rehabilitation" koala habitat, with	No – No statutory assessment against the provisions of Schedule 10, Part 10 of the <i>Planning Regulation 2017</i> is required for the SRAIP as the Project Site is outside a KADA.

State Interest	Comment	Further Assessment Required / Provided
	“Bushland Habitat” also identified in patches (see Attachment 9). Mapped Bushland Habitat within and in proximity to the Project Footprint is clearly mapping error (refer to Section 5.2). This mapping is not statutory under the development assessment process, but was part of the 2009 South East Queensland Koala Habitat Values assessment mapping and is used for guidance in land use planning. It is further noted that <i>Nature Conservation (Koala) Conservation Plan 2017</i> has recently been adopted (7 February 2020). The Site is situated outside of a Priority Koala Area regulated under this legislation. The Site is mapped to contain Koala Habitat Area within the far northern and north western extent of the Site. The proposed development including infrastructure and proposed disturbance areas are well removed from this mapped koala habitat (more than ~400 m) and will not result in any direct or indirect impacts to koala habitat areas.	
Wetland Protection Area	N/A	No – no areas mapped.
Riverine Protection Permit	Riverine Protection Permits are required under the <i>Water Act 2000</i> for any proposed activity to excavate, place fill or destroy vegetation in a watercourse, lake or spring. A watercourse assessment undertaken by DAF on the Project Site (see Attachment 10) determined that no “watercourse” is present; however, the wetland to the rear of the development is classified as a “lake”. It must be noted that this wetland area is of anthropogenic origin and does not function as a natural lake or wetland due to its reliance on greywater from	Yes – an assessment of fish passage has been prepared under a separate cover (Cardno Pty Ltd)

State Interest	Comment	Further Assessment Required / Provided
	the existing Kalfresh operations (Section 2.3 and Figure 4a). This wetland is highly likely to dry out and be significantly altered through grazing if its greywater supply was removed. See Section 2.3 for further details. Consequently, the wetland feature cannot be a “lake” under the <i>Water Act 2000</i> as it is not identified as a “lake” on the Watercourse Identification Map and it is not a natural collection of water.	

3.4 The Draft Planning Scheme

The Project Site is zoned as Rural under the Draft Planning Scheme (see **Attachment 11**).

3.4.1 Strategic Framework

The Strategic Framework in Part 3 of the Draft Planning Scheme sets out the strategy for the future settlement pattern and location of economic activity of the region, the associated infrastructure required to enable development and service communities, and for the protection and enhancement of the region’s environmental values. This strategy is expressed through the themes, strategic intent, and strategic outcomes that will guide development of the region to 2041.

There are three maps illustrating the themes at a regional scale (see **Attachment 12**). The Project Site is identified as a Rural Area within the Communities and Character Map.

Within the Growing Economy Map (**Attachment 12**), the Project Site and surrounding areas are located within Key Resource Area (**KRA**) 141 owing to the presence of quarry rock resources (see **Attachment 13**).

Of relevance to this EAR, section 3.6 of the Strategic Framework describes the future management of environmental values within the Scenic Rim Region, through a Strategic Intent and associated Strategic Outcomes.

Compliance with Strategic Outcome 3.6.2 of the Draft Planning Scheme is discussed in **Section 8.5**.

3.4.2 Environmental Significance Overlay Code and Map

The Environmental Significance Overlay Code within the Draft Planning Scheme is intended to apply to development within the Environmental Significance Overlay, to ensure that matters of environmental significance are protected and enhanced, that biodiversity values of the Scenic Rim are protected, and that connectedness and condition of ecological systems are enhanced.

The Environmental Significance Overlay Map series (**Attachment 14**) within the Draft Planning Scheme shows that the Project Site is mapped to contain:

- Regulated vegetation within the Biodiversity Map (OM-04-A.1);
- No Core Corridors, Node Corridors, Stepping Stones or Critical Linkages identified as MLES within the Local Biodiversity Map (OM-04-B.1);
- No recognised habitat for MSES (State Significant Species) or MLES (koalas) within the Priority Species Map (OM-04-C.1);
- No recognised MSES waterways and wetlands within the Wetlands and Waterways Map (OM-04-D.1); and
- MLES Local Watercourses (Stream Orders 2 and 3, and associated Watercourse Buffer Areas A and B) within the Local Watercourses Map (OM-04-E.1).

Compliance of the SRAIP with the relevant provisions of the Environmental Significance Overlay Code within the Draft Planning Scheme is discussed in **Section 8.6**.

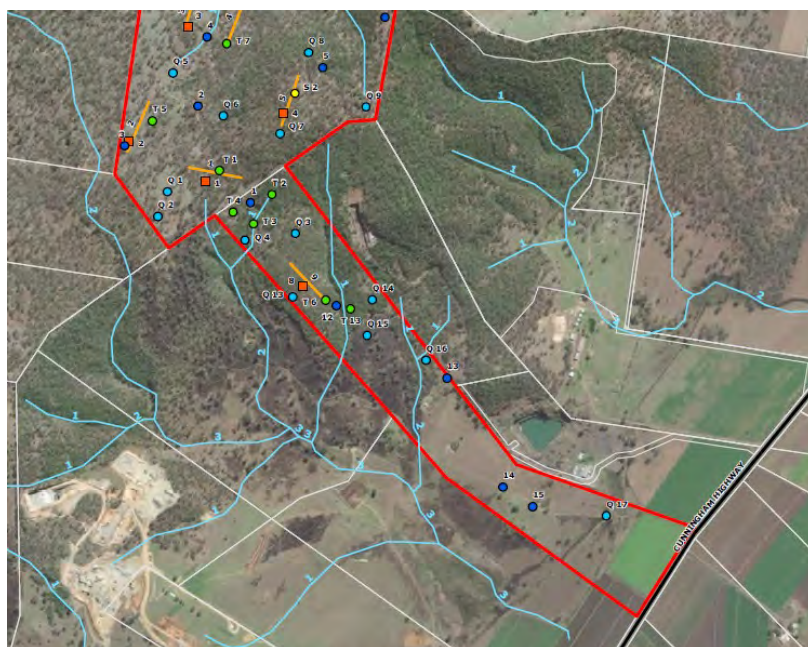
3.5 The Current Planning Scheme

The Project Site is zoned as Rural under the current Planning Scheme. The Project Site is also mapped to contain ecological features within the Natural Features Overlay (Map 2A) under the Planning Scheme. For completeness, compliance of the SRAIP with the relevant provisions of the Natural Features Overlay Code is discussed in **Section 8.7**.

4 Ecological Assessment Methods

4.1 Implications of Previous Surveys

The Scope of Work listed substantial ecological survey requirements for the Draft IAR within the Project Site, including areas significantly removed from the Project Footprint and at a much higher elevation⁵ such as Lot 2RP and its associated remnant Regulated Vegetation in the Project Site's north-west (a minimum of 500 m distance from any earthworks or infrastructure)⁶. Importantly, the EcoSM (2018) survey for the Frazerview Quarry included 6 Quaternary Assessment Sites, 1 koala Sport Assessment Technique (**SAT**) survey site and 1 koala transect within Lot 2RP as illustrated in **Inset 1**.



Inset 1: EcoSM 2018 – Figure 4: Locations of flora and fauna survey sites

⁵ In most instances a minimum of 40 m in elevation between civil works and infrastructure and Regulated Vegetation, or native vegetation in general.

⁶ Non-invasive elements of the Proposed Development (e.g. the proposed effluent irrigation area) are a minimum of approximately 400 m from Regulated Vegetation within the Project Site and a minimum of approximately 200 m from Regulated Vegetation outside the Project Site.

The data from the EcoSM surveys is directly relevant to the SRAIP in the context of the Scope of Work and the desire for a description of the ecological values of the broader Project Site.

The surveys undertaken by EcoSM on the proposed quarry site are also relevant in the context of gaining an appreciation of the koala population dynamics in the areas surrounding the SRAIP (i.e. within the peripheral Regulated Vegetation and non-remnant areas). The resultant EAR for the Frazerview Quarry is provided in **Attachment 15**.

Furthermore, the principal ecologist who undertook the EcoSM (quarry) surveys also led the 28 South (SRAIP) surveys for this EAR; ensuring consistency in approach and relevance of results.

A justification for the survey methods utilised for this EAR, in response to the Scope of Work requirements, is provided in **Attachment 16**. Where survey efforts employed for the SRAIP EAR are not as extensive as the methodologies listed within the Scope of Work, this is justified within **Attachment 16**. A precautionary approach has been applied to the impact assessment component of the EAR and 28 South contends that the survey techniques employed for this EAR do not increase the risk that species of conservation significance that may utilise the Project Area (and specifically the Project Footprint) have been overlooked in this assessment.

4.2 Flora Survey

A flora survey was undertaken within the Project Site on 15 October 2019 by qualified and experienced ecologists Chris Hansen and Rebecca Freese⁷. Flora surveys were undertaken for a period of 20 person hours and involved:

- (i) classifying the Project Site's discrete vegetation communities, surveying their constituent flora species, and spatially defining their boundaries;
- (ii) ground-truthing the RVMM and VMSM to ensure that the boundaries of the remnant polygons were correct in relation to the Project Site (noting that Regulated Vegetation within the Project Site was mapped via a PMAV by EcoSM for the Frazerview Quarry);

⁷ CVs for the survey team are provided in **Attachment 17**.

- (iii) searching for Threatened Ecological Communities and flora species listed as MNES under the EPBC Act (**flora MNES**). Communities and species known from the locality (**Attachments 5 and 6**) were a focus of the survey;
- (iv) searching for flora species listed as Endangered, Vulnerable and Near Threatened (**EVNT**) under the *Nature Conservation (Wildlife) Regulation 2006* (**flora MSES**). Species known from the locality (**Attachment 6**) were a focus of the survey;
- (v) searching for flora listed as Priority Species of the Scenic Rim Region, as defined by Appendix F of *Planning Scheme Policy 5 – Ecological Assessments* within the Draft Planning Scheme (**flora MLES**);
- (vi) ground-truthing the Draft Planning Scheme's Environmental Significance Overlay map;
- (vii) searching for native trees conspicuous hollows that provide important wildlife habitat (**habitat trees**); and
- (viii) determining the composition, condition and more general conservation value of vegetation.

4.3 Fauna Survey

Fauna habitat assessment survey was undertaken across the Project Site with a more detailed analysis of habitats and microhabitat features within the Project Footprint. Fauna habitat assessments included a complete and thorough traverse of the Project Footprint by three suitably qualified and experienced ecologists for a period of 30 person hours and employed a range of active searching methods including:

- **Active searches of logs, rocks and ground debris** – Logs, rock and ground debris was turned in order to detect amphibians, reptiles and small terrestrial mammals;

- **Active searches for habitat trees** – searches were completed for hollow bearing trees providing potential habitat for a range of tree hollow dependent fauna⁸;
- **Random meander searches and aural surveys** – searches of riparian and vegetated areas were undertaken to identify any potential important habitats;
- **Point census and flushing surveys** – fixed stationary observation assessments for fauna species (namely avian) were undertaken in proximity to habitat features or anthropogenic features such as soaks/dams/drains and habitat trees. Flushing surveys involved foot traverse of areas where taller sedges/grasses occurred in proximity to soaks/drains to flush any cryptic avian species (e.g. bitterns, rails, quails and snipes)
- **Koala Spot Assessment Technique (SAT) searches** – SAT⁹ surveys were undertaken during survey efforts to determine the presence of koala throughout the Project Site. These surveys were also coupled with general scratch and scat searches while traversing the Project Site.
- **Opportunistic observation** – while undertaking general survey across the Project Site, opportunistic observations were made to account for fauna observed during survey efforts.

Important fauna habitat features such as large fallen debris / logs and hollow-bearing trees were spatially located along with all native trees within and immediately surrounding the Project Footprint.

Given the significant separation distances (> 500 m) and elevation changes (>40 m) between the Project Footprint (specifically where civil works and permanent infrastructure is proposed) and mapped remnant vegetation within the Project Site, more detailed surveys of the greater Project Site were not warranted (as outlined within **Section 4.1**). It is considered that a precautionary approach to on-ground habitat assessment and fauna species associations is

⁸ For example, small hollow bearing trees providing roost sites for microchiropteran bats and gliders, medium sized hollows providing nest sites for small-medium sized birds and possums, and large hollows providing potential nest sites for large forest owls.

⁹ Stephen Phillips and John Callaghan (2011) The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas *Phascolarctos cinereus*. Australian Zoologist: 2011, Vol. 35, No. 3, pp. 774-780.

sufficient to determine the likelihood of species presence and potential impact of the Project Footprint in such a highly modified environment. Further, the Project Footprint is limited to areas which are currently:

- i) under heavy cropping;
- ii) used as channelised drainage and under heavy cattle grazing; or
- iii) under heavy cattle grazing.

Importantly, no part of the proposed Project Footprint supports any area of native vegetation, with only a small number of highly scattered relict paddock trees occurring on the periphery of the Project Footprint as shown in **Figure 7**. As such, habitat assessment and species associations are considered more than adequate to determine species' potential presence and the impacts of the SRAIP on these species and their habitat.

To assist within on-ground habitat assessments and species associations; a review of relevant, publicly available Government databases (**Attachments 5 and 6**) was undertaken to identify a potential suite of fauna that may occur within the broader locality (radii of 5 km). Further to this, a review of the fauna assessments undertaken by EcoSM (2018) for the adjoining quarry site (inclusive of the northern components of the Project Site and Project Footprint) was also undertaken. This review enabled the identification of a shortlist of target fauna species to guide habitat assessments and associations while on-ground survey was undertaken. The results of the desktop review and 2018 EcoSM study have been applied to the Project Footprint and more broadly the Project Site.

Database searches indicate known records and the potential occurrence of fauna listed under the EPBC Act within a 5 km radius of the Project Site (**fauna MNES**) (**Attachments 5 and 6**). Database searches also indicate known records of EVNT fauna (**fauna MSES**) within a 5 km radius of the Project Site (**Attachment 6**). Appendix F of *Planning Scheme Policy 5 – Ecological Assessments* within the Draft Planning Scheme lists locally significant fauna species for the Scenic Rim Region (**fauna MLES**).

In order to develop a working list of target species for on-ground habitat assessment, the habitat requirements of each species were considered, and a review of local records

undertaken. Where it was found that suitable habitat was absent from the Project Site or Project Footprint and adjoining areas, and there was a lack of local records¹⁰, it was deemed that the species under consideration was a highly unlikely occurrence. In such cases no further survey was proposed for this species.

Shortlisting based on Government database records (**Attachment 6**¹¹), known habitats present within the Project Site and immediate locale and those identified as known, likely or possibly occurring within the EcoSM Report (refer Appendix F of **Attachment 15**) identified the following conservation-significant species for targeted fauna habitat survey:

- *Hirundapus caudacutus* (white-throated needle-tail);
- *Petrogale penicillata* (brush-tailed rock-wallaby);
- *Phascolarctos cinereus* (koala); and
- *Acanthopis antarcticus* (common death adder).

Several migratory species identified within database searches and the EcoSM Reporting were also considered as part of habitat assessment surveys which include:

- *Apus pacificus* (fork-tailed swift);
- *Symposiachrus trivirgatus* (spectacled monarch);
- *Monarcha melanopsis* (black-faced monarch); and
- *Rhipidura rufifrons* (rufous fantail).

¹⁰ This was determined by way of Wildlife Online database searches established at 5km and 2km radii from the Site, and a range of other sources, including: aerial photography; publicly available ecological reports; Atlas of Living Australia threatened species mapping/modelling; Queensland Museum records; Regional Ecosystem mapping; Threatened flora trigger mapping; Wetland Protection Area mapping.

¹¹ It is noted that this assessment has ruled out records of marine species such as the record of *Phaethon rubricauda* (red-tailed tropicbird). The Site is well removed from marine environs and it would appear this record is an anomaly.

5 Flora Survey Results

5.1 Vegetation Community Descriptions

Figure 4 illustrates that much of the Project Site is heavily cleared and subject to various agricultural land management practices. Outside of the existing Kalfresh operating facilities, the Project Site supports open expanses of cultivated cropping in the east with engineered drainage and areas of overland flow, as well as open paddocks with scattered mature canopy trees subject to heavy cattle grazing. The north-western finger of the Project Site (Lot 2RP) transitions into undulating low hills and slopes with a mixed cohort of regrowth and remnant native woodland to open forest communities.

5.1.1 Cultivation Areas

The active cultivation occurring in the eastern extent of the Project Site were left fallow at the time of the survey, with *Daucus carota* spp. *sativus* (carrot) harvested the morning of the survey to the north of the existing facilities and a grain crop having been previously harvested south of the existing facilities. The intervening carriageways (access tracks) were subject to ongoing mechanical maintenance including slashing and regular vehicle flattening. These access tracks supported exotic species including, but not limited to, *Eragrostis tenuifolia*^{*12} (elastic grass), *Cynodon dactylon* (couch grass), *Cyclospermum leptophyllum** (celery top), *Dichanthium aristatum** (angleton grass) and *Polygonum aviculare** (prostrate knotweed) at the time of the survey.

5.1.2 Drainage Channel and Basin

A constructed drainage channel borders the western edge of the cultivation area and also occurs through the open paddocks in the north-eastern extent of the Project Site. A broader drainage basin extends to the north centrally within the Project Site and is fed by the facility's recycled grey water. The augmented channel and the basin supported an array of mostly exotic hydrophytes. Woody vegetation is largely absent from this community and limited to localised knolls within the basin and the edges of the drainage channel. The understorey is

¹² * denotes exotic species

dominated by *Ranunculus sceleratus* ssp. *sceleratus** (celery-top buttercup), *Paspalum distichum* (knot grass) and *Typha orientalis** (cumbungi) with associated couch grass, *Juncus polyanthemus* (many-flowered rush) and *Symphyotrichum subulatum** (wild aster). It is noted that the augmented drainage channel does not reflect the mapped DNRME waterway (Attachment 8).

5.1.3 Grazed Paddocks with Scattered Mature Trees

The open paddock areas were largely situated on the gently undulating lower rise west of the existing facility operations and were actively grazed at the time of the ecological inspection. The paddocks contained highly scattered mature canopy trees dominated by *Eucalyptus tereticornis* ssp. *tereticornis* (Queensland blue gum) with associated *Corymbia tessellaris* (Moreton Bay ash) and *Eucalyptus melanophloia* (silver-leaved ironbark). All other woody vegetation, including shrubs, was entirely absent due to the existing land use practices. The understorey was dominated by exotic pasture grasses including *Chloris gayana** (rhodes grass) and associated exotic herbs such as *Verbena officinalis** (common verbena) and *Gomphrena celosioides** (gomphrena weed).

5.1.4 Brush Box Open Forest

The lower to mid slope of the north-western finger of the Project Site supported a small polygon of *Lophostemon confertus* (brush box) low open forest. As described in the EcoSM EAR (2018), this community was dominated by brush box to a height of 9 m with a very sparse canopy of emergent *Eucalyptus crebra* (narrow-leaved ironbark) and *Corymbia intermedia* (pink bloodwood). It is considered likely that the community historically contained a canopy dominated by narrow-leaved ironbark over the brush box sub-canopy; however, evidence of cut-stumps suggests historical thinning has occurred. The shrub strata composition was complex and consisted of juvenile brush box as well as *Psydrax odorata* (shiny-leaved canthium), *Bridelia exaltata* (scrub ironbark), *Alphitonia excelsa* (red ash), *Eustrephus latifolius* (wombat berry) and scattered incursions of *Lantana camara** (lantana). The understorey was sparse and dominated by native grass species including *Aristida gracilipes* (a speargrass) and *Heteropogon contortus* (black speargrass).

5.1.5 Narrow-leaved Ironbark Open Forest

The balance of the Project Site supported a narrow-leaved ironbark open forest which was associated with the undulating slopes and trachyandesite deposits. This community was characterised by a canopy dominated by narrow-leaved ironbark at a height of 22 m with other associated species such as *Angophora leiocarpa* (smooth-barked apple), pink bloodwood, Moreton Bay ash and silver-leaved ironbark also present. The composition and distribution of the sub-canopy and shrub strata were variable, increasing in density in the gullies and tending to very sparse on the higher slopes and hill crests. The sub-canopy was characterised by regenerating canopy species as well as red ash and brush box to a median height of 9 m to 12 m. The shrub layer also included regenerating canopy species, *Acacia maidenii* (maiden's wattle) and shiny-leaved canthium with vine thicket generalists prevalent within the gullies and higher slopes. Such species included scrub ironbark, *Alectryon diversifolius* (scrub boonaree), *Mallotus philippensis* (red kamala), *Petalostigma pubescens* (quinine bush) and *Psydrax odorata forma buxifolia* (stiff-leaved canthium). Lantana was also observed in low densities throughout the community. The groundcover was characterised by native grasses such as black speargrass, *Ancistrachne uncinulata* (hooky grass), wiregrasses and barbed-wire grasses.

The far northern reaches of this community contained a variation with the canopy becoming dominated by *Eucalyptus moluccana* (gum-topped box) with scattered narrow-leaved ironbark. This was documented within the EcoSM EAR (2018).

A full flora species list for the areas subject to cultivation, the open paddocks and the drainage channel and basin is included in **Attachment 18**. Further, the extent of each described vegetation community is illustrated in **Figure 4**. All mature native canopy trees located within and surrounding the Project Footprint have also been surveyed and are shown on **Figure 7**.

5.2 Species and Features of Conservation Significance

The following conclusions can be drawn from the flora survey and ecological condition assessment:

- (i) The Project Site does not support any flora MNES or MSES;

- (ii) The Project Site does not support any Flora MLES.
- (iii) The occurrence of habitat trees within and adjacent to the Project Footprint is shown within the Vegetation and Fauna Management Plan in **Attachment 2**.
- (iv) The Queensland Government's koala habitat mapping within **Attachment 9** is grossly incorrect, with some cleared areas under cropping and the denuded wetland feature both mapped as containing Bushland Habitat. No areas within the Project Footprint could be considered Koala Bushland Habitat. The only areas of the Project Site that could potentially be considered as Koala Bushland Habitat are the areas of Regulated Vegetation in the north-west of Lot 2RP.

6 Fauna Habitat Assessment Results

6.1 Likelihood of Occurrence

Utilising known records within a 5 km radius (**Attachment 6**) and perceived habitat suitability within the Project Site, the presence of conservation significant fauna¹³ was evaluated as 'Known', 'Likely', 'Possible', 'Unlikely', 'Will not Occur' or 'Transient' based on their perceived probability of inhabiting/frequenting the Project Site (**Table 3**). The outcome of this habitat suitability assessment is provided in the following sections.

Table 4: Likelihood Assessment Criteria

Assessment	Habitat Criteria	Local Record Criteria	Perceived Probability
Known	The species has been confirmed as present within the Project Site, and those records are unlikely to represent transient or vagrant individuals.		100%
Likely	Habitat is considered moderately to good quality and similar to other locations where the species is found	There is a number (~5 or greater) of local (≤ 5 km from the Project Site), contemporary (post 1990) records of the species, or There is strong evidence that a cryptic species (which may not be frequently recorded in databases) has a nearby resident population(s).	>50%
Possible	Habitat is marginal to moderate	The species is known by a few local contemporary records and is not a transient species.	20-50%

¹³ Conservation significant fauna is defined as a MNES species under the EPBC Act, an EVNT species under the NC Act, and a Priority Species under Appendix F of the Draft Planning Scheme *Planning Scheme Policy 5 – Ecological Assessments*.

Assessment	Habitat Criteria	Local Record Criteria	Perceived Probability
Unlikely	The habitat is marginal	There are few, if any, local contemporary records.	≤19%
Will not Occur	The habitat is unsuitable	There are few, if any, local contemporary records.	0%
Transient	The habitat is suitable, marginal or good quality	The species is highly mobile and vagrant. They may infrequently appear in the local area over a long timeframe (e.g. 100+years) but are never resident or frequent visitors (e.g. return migrants). These species are typically birds which, while having some probability of occurring, are unlikely rely on the Project Site for their lifecycle or maintaining populations.	N/A

Where it was found that there were local records of conservation-significant species, and the habitat was broadly suitable, more detailed assessment of the SRAIP and potential impacts is warranted. The Precautionary Principle underpinned this decision-making process.

A further process of sieving occurred whereby species that are rare in the landscape and not readily detected by single surveys were considered a potential occurrence at the Project Site in the longer term if suitable habitat was present. For example, *Lathamus discolor* (swift parrot) is a rare winter migrant to south-east Queensland. During its over-wintering visit, *Eucalyptus tereticornis* (Queensland blue gum) is an important blossom resource. Queensland blue gum occurs at the Project Site, and swift parrot is tolerant of habitat fragmentation. Therefore, when assessed over time, it is reasonable to assume that swift parrot could utilise the Project Site's habitats (noting that habitats within the Project Footprint provide limited foraging habitat for this species, which is highly abundant in the immediate and broader region). It is generally accepted that there is little value in conducting targeted surveys for such species when habitat assessment is a reliable predictor of potential occurrence (even if the use is – ultimately - very rare).

In-field assessments considered a variety of factors such as vegetation complexities and structures, ground cover and debris, water bodies, hollows, weed infestations and important microhabitats for specific features (e.g. foraging resources such as winter flowering trees).

6.2 Amphibians

No amphibian species of conservation significance were identified as potentially occurring within the Project Site. Habitat Assessments undertaken during field assessments confirmed that the Project Footprint and broader Project Site lack any habitat features suitable for conservation significant amphibian species. Habitats observed within the Project Footprint and the immediate surrounds take the form of cleared, heavily degraded grazing lands on steeper slopes or areas under cropping.

The lower plain and channelised drain in the central components of the Project Site provide the most notable habitat for amphibian species in general. As described in **Section 2.3**, this broad basin area is under constant soaking from dispersed greywater. Within this area, heavy clays support a dense covering of exotic forbs (namely buttercup) with highly scattered native sedges and rushes; all of which exhibited regular grazing impacts. Small areas of ponding occurred infrequently where low depressions were present (with evidence of cattle trampling and wallowing). Habitats within these areas are considered marginal for most native amphibian species given the lack of suitable vegetative or ground structure combined with the constant grazing and trampling of habitats by cattle. It is likely that a reduced native amphibian species assemblage occurs within the Project Site and that this is limited to robust species. Further, the open nature of the environment lends itself to the proliferation of exotic fauna species such as *Rhinella marina* (cane toad) or predation from avian and reptile species.

6.3 Reptiles

The remnant habitats, particularly those with a denser understorey and high levels of coarse woody debris and leaf/mulch litter provide the highest quality habitat for reptiles within the Project Site. Cleared grazing or cropping lands represent very low-quality habitat for this group; however, where heavier clays occur, fossorial species are likely to persist despite the cleared and heavily grazed nature of the Project Site or Project Footprint.

A review of desktop database searches and the EcoSM (2018) reporting identified one reptile species of conservation significance recorded within the region; the common death adder. Habitat assessments identified that much of the Project Site and all of the Project Footprint do not support suitable habitat for this species, particularly given most habitats occur as either cleared grazed paddock or under heavy crop and distinctly lacking any form of coarse woody debris and leaf litter which are critical microhabitats for this species. Higher quality habitats for this species are associated with remnants in the far north-west of the Project Site which occurs at a minimum distance of 400 m from the Project Footprint (500 m from proposed civil works and permanent infrastructure), with the land in between not supporting suitable foraging or movement habitat as it is heavily grazed open paddocks lacking debris. Although suitable habitats for this species occur some distance from the Project Footprint, the fragmentation in the immediate landscape coupled with limited records in the locality (Wildlife Online has 1 record), suggests that there is only a low likelihood that this species would occur within the broader Project Site.

6.4 Birds

The Wildlife Online database indicates the presence of a diverse bird community in this locality. The PMST indicates the occurrence of several MNES and MSES bird species.

During habitat assessment surveys, the greatest diversity and abundance of bird species was found in the anthropogenically created soak areas centrally located within the Project Site. This area contains moist soils and pools of water, providing foraging and watering points for a range of open country and wetland oriented avian species.

The small area of remnant vegetation in the far north-west of the Project Site supported a moderate composition of common open country aves; however, did not support any uncommon or specific habitat features such as vine thickets, riparian corridors, sheltered gullies, etc. which would provide habitat for cryptic aves requiring such amenity or niches to persist.

The residual of the Project Site and the entirety of the Project Footprint support completely cleared habitats which are either: i) heavily grazed; or ii) under heavy cropping. These areas are of low value for avian species, providing habitat for aggressive open country species as

well as encouraging the dominance of aggressive sedentary avian species such as noisy minor, Torresian crow, butcherbirds and exotic avian species. European pigeons and starlings were regularly observed overflying the Project Footprint and observed utilising most built infrastructures for shelter.

It is likely that most of the common rural and peri-urban inhabitants known from the locality will reside, move through or overfly the Project Site at some point (refer Wildlife Online data – **Attachment 6**); including terrestrial migratory species. It is, however, unlikely that many of the noted species of conservation significance would reside within or rely on the Project Site as a core component of their habitat or life cycle. A review of desktop database searches and the EcoSM (2018) reporting identified one avian species of conservation significance and four migratory species known or likely to occur within the Project Site. A review of each species is provided below:

- ***Hiundapus caudacutus* (white-throated needletail)** – This species is not frequently recorded along the east coast, but has potential to occur anywhere, including in the air space above the Project Site as this species is wide ranging and highly mobile. Larger tree species within the Project Site, and in particular old-growth trees with hollows, may provide some roosting opportunity for white-throated needletails. Habitats within the Project Site are highly abundant within the broader region and it is unlikely that white-throated needle-tail would be reliant on the Project Site or surrounding terrestrial environs.
- ***Apus pacificus* (fork-tailed swift)** – This species is not frequently recorded along the east coast, but has potential to occur anywhere, including in the air-space above the Project Site. This species is wide ranging and highly mobile. It readily forages above urban areas and rural areas, and as such no particular values on the Project Site are uniquely important for this species.
- ***Monarcha melanopsis* (black-faced monarch)** – Habitat assessments across the Project Site failed to identify any suitable habitat for this species; however, it is noted that the EcoSM (2018) surveys identified this species on adjoining remnant parcels. These observations were restricted to areas of steeply incised drainage gullies occurring west of the Project Site. Remnant habitats in the far north-east of the Project

Site may facilitate movement opportunities for this species; however, these areas are well removed (>500 m) from the Project Footprint. The land between the remnant habitat and the Project Footprint supported no suitable habitat for this species.

- ***Symposiachrus trivirgatus* (spectacled monarch)** – Similar to the black-faced monarch, habitat assessments across the Project Site have identified that most of the areas which support remnant habitats in the far north-east of the Project Site may facilitate movement opportunities for this species; however, these areas are well removed (>500 m) from the Project Footprint. The land between the remnant habitat and the Project Footprint supported no suitable habitat for this species.
- ***Rhipidura rufifrons* (rufous fantail)** – Habitat assessments across the Project Site have failed to identify any suitable habitat for this species; however, it is noted that the EcoSM (2018) surveys identified this species on adjoining remnant parcels. These observations were restricted to areas of steeply incised drainage gullies occurring west of the Project Site. Remnant habitats in the far north-east of the Project Site may facilitate movement opportunities for this species; however, these areas are well removed (>500 m) from the Project Footprint. The land between the remnant habitat and the Project Footprint supported no suitable habitat for this species.

6.5 Mammals

A review of Government databases and the EcoSM (2018) ecological assessments indicated the known or potential occurrence of two mammal species of conservation significance in the broader locality. The shortlisting assessment has determined that one mammal species (koala) should be considered in further detail and that no suitable habitat for the brush-tailed rock-wallaby is present within the Project Site or surrounding remnants (i.e. those higher remnant areas lack rocky outcrops and other critical microhabitats for this species – known populations in the locality are restricted to national parks such as Mt French, Moogerah Peaks and Main Range National Parks).

6.6 Koala and Koala Habitat

The EcoSM (2018) ecological surveys directly and indirectly observed koala or koala evidence (scat or scratch). These observations were recorded in lower slope remnants dominated by

the recognised favoured forage tree Queensland blue gum (within RE 12.9-10-7 and lower slopes of 12.8.17).

Active searches (canopy scanning) of all trees within the Project Footprint failed to detect the physical presence of koala. Passive search techniques did, however, identify old koala scats in the far north-east of the Project Site where a small number of relict Queensland blue gums occur. Stands of young and advanced regrowth Queensland blue gum were observed to the north of the Project Footprint surrounding on-line dams / drainage features; while further north c.700 m larger tracts of remnant vegetation dominated by Queensland blue gum are present.

Within the Project Site limited stands of suitable koala habitat occur and these are restricted to the remnants within the extreme, higher north-west of the Project Site (**Figure 6**). Within the Project Footprint, only very highly scattered koala trees are present; most of which occur within the existing and/or proposed overland flow path. Some of these will be retained, while others will be removed for the Proposed Development (see **Figure 7** and **Attachment 2**, which shows all koala habitat trees within and surrounding the Project Footprint).

An assessment of the Project Footprint clearly demonstrates that habitats supported within the SRAIP do not support important koala habitat or suitable koala movement corridors. The vast majority of the Project Footprint comprises either areas under heavy cropping or cleared grazed paddocks generally devoid of vegetation. Further, the areas surrounding the Project Footprint to the east and south (off Site) also comprise areas under heavy cropping and intersected by the Cunningham Highway.

An assessment of koala habitat within the Project Footprint and immediately surrounding areas (i.e. those areas within approximately 400 m) has been undertaken against the provisions of the Koala Habitat Assessment Tool (DoEE 2014). This assessment identified that the Project Footprint and immediate surrounds do not support Habitat Critical to the Survival of the Koala¹⁴.

¹⁴ Koala Habitat Assessment Tool Scoring: **Koala Presence – 2; Vegetation Composition – 0; Habitat Connectivity- 2; Key Existing Threats – 0; Recovery Value – 0.**

6.7 Koala Population

The Project Footprint does not occur within any areas that could be conceivably considered as important koala habitat given the distinct lack of woodland, open forest or connective habitats for dispersal and breeding. It is acknowledged and well known that koalas will readily move across non-core habitat and utilise individual trees; however, the widely scattered, isolated paddock trees within the Project Footprint do not provide critical habitat elements for the local koala population; given the abundance of more favourable, intact or more aggregated habitats to the west and north of the Project Footprint and its immediate surrounds.

The individual koala(s) that, on occasion utilise these isolated trees belong to a larger meta-population which would occur in varying densities across the region and are likely to be more abundant where more intact tracts of vegetation persist on low fertile plains and their adjoining lower slopes (particularly where favoured feed trees are present and or dominant). The population and individuals residing in proximity to the Project Footprint are unlikely to be unique or disjunct from any other populations. Limited ecological or bio-regional barriers occur within the region that would result in the population being isolated from other populations and rendering the population genetically disjunct from others.

7 Potential Impacts and Proposed Mitigation Measures

7.1 Impact Avoidance

The location of the Project Footprint is such that many potential impacts associated with the SRAIP are avoided through physical separation from areas of notable ecological value within the Project Site. The SRAIP focuses on areas of existing and historic disturbance, thereby preserving the more intact habitats in the north-western portion of the Project Site on Lot 2RP. The residual impacts associated with the SRAIP are minor and are discussed in **Section 7.2**.

Further, the proposal establishes the EPA overlay over the native vegetation in the northern extents of the Site. No uses, works or infrastructures are proposed for approval in this application within or adjacent to any mapped areas of native vegetation. Any future works proposed here will be subject to detailed ecological assessment and and relevant planning frameworks relevant at the time of the application.

7.2 Residual Impacts

7.2.1 Vegetation

The Proposed Development will require the establishment of the proposed uses over a predominantly cleared and heavily modified landscape. The extent of each surveyed vegetation community type within the Project Site (defined in **Section 5.1**) is detailed in **Table 4**.

Table 5: Extent of surveyed Vegetation Communities within Project Footprint

Vegetation Community	Area within Project Footprint
Cultivation Areas	34.23 ha
Drainage Channel and Basin	7.1 ha
Grazed Paddocks with Scattered Mature Trees	50.94 ha
Brush Box Open Forest	Nil

Vegetation Community	Area within Project Footprint
Narrow-leaved Ironbark Open Forest	Nil

The balance of the Project Footprint (5.09 ha) is located within Kalfresh existing operational facilities.

Within the vegetation community described as grazed paddocks and scattered mature trees, the Proposed Development will require the removal of 20 Non-Juvenile Koala Habitat Trees (NJKHTs). The location of these NJKHTs is shown in **Figure 7**, and also within a Vegetation and Fauna Management Plan in **Attachment 2**.

7.2.2 Fauna

General Habitat Impacts

Based on the highly degraded and heavily modified nature of the Project Footprint, the SRAIP will have minimal impacts on native fauna species. The habitats that will be directly impacted consist of currently cropped lands, a table drain, and heavily grazed paddock areas with sporadic relict native trees.

The areas within the Project Footprint are not considered to provide important habitat for any fauna of significance. The primary fauna assemblages that utilise these areas are likely to consist of introduced species (e.g. field mouse) and locally common and robust species such as reptiles (see **Section 6.3**) and arboreal mammals such as possums.

Indirect Impacts

There is potential for the SRAIP to lead to indirect impacts on fauna within and surrounding the Project through increased traffic, light, air pollution, noise and odour. Air pollution, noise and odour elements are being assessed under ERA processes; it is expected that the regulations governing the ERAs will be sufficient for the purposes of avoiding notable impacts on resident fauna in what is a highly disturbed area. With respect to traffic and light generation, these aspects will likely increase through the establishment of the SRAIP. However, it must be noted that the Project Site is highly modified and largely devoid of important fauna habitat;

particularly in proximity to the Project Footprint. As such, it is considered that the SRAIP is located in an area that is well-suited to absorb increases in traffic and light spill. The indirect impacts associated with the SRAIP are also likely to further deter native animals from entering the operational areas of the Proposed Development; thus promoting the ongoing use of peripheral habitat areas.

Fauna of Conservation Significance

No significant impacts on fauna species of conservation significance are expected to result from the SRAIP. Nevertheless, based on its sporadic presence within the Project Site and potentially the Project Footprint, an impact assessment focusing on koalas is provided below. A total of 20 NJKHTs will be impacted to establish the SRAIP (see **Figure 7**).

This section of the EAR provides an assessment of the SRAIP against the DoEE's Significant Impact Criteria for the Vulnerable koala.

An action is likely to have a significant impact on a vulnerable species if there is a real chance of possibility that it will:

(a) Lead to a long-term decrease in the size of an important population of a species

As noted in **Section 6.7**, koalas in the locality are not considered to be an important population. The proposed SRAIP will result in the establishment of a concentrated industrial and agricultural precinct adjacent to the Cunningham Highway and will be co-located with areas under heavy cropping and focused around an existing primary produce process and packing facility. The SRAIP will also involve the establishment of a large pivot circle to spread digestate over a completely cleared paddock. Impacts arising from the SRAIP are negligible (20 highly isolated koala habitat trees) in the context of resident koala populations. Secondary impacts are also considered to be negligible in this context as works will be localised to the Project Footprint and consistent with the surrounding landscape. A minor increase in traffic will arise as a result of the SRAIP; however, no new roads will be established and all traffic generated will be utilising an already heavily trafficked highway with limited koala habitat adjoining it in the immediate area (i.e. bound by areas under heavy cropping).

(b) Reduce the area of occupancy of an important population

As noted in **Section 6.7**, koalas in the locality are not considered to be an important population. The proposed SRAIP will not reduce the area of favourable or movement habitat for koala. It is unlikely that the removal of 20 NJKHTs will impact the broader koala population; this impact is negligible for koala populations and can be significantly improved through landscaping mitigation measures within the Project Site and Project Footprint (within drainage areas).

(c) Fragment an existing important population into two or more populations

As noted in **Section 6.7**, koalas in the locality are not considered to be an important population. It is considered that the Project Footprint and immediate surrounds does not constitute important koala habitat; however, it is acknowledged that individuals will on occasion move through these areas despite their general poor quality and potential risks (e.g. dogs and cars). The SRAIP will not establish a barrier to movement nor is it proposed to be located in an area considered to be important for koala movement (i.e. it is positioned in an area of existing cropping land that stretches over a width of more than 1 km with a major highway bisecting the cropping area). As noted, a minor increase in traffic (slow moving as it will be pulling in or departing the SRAIP – reducing collision potential) will arise as a result of the SRAIP. There will be localised traffic increases within the internal road to be established within the SRAIP; however, increases on the Cunningham Highway are likely to be minor or negligible (refer to Traffic Impact Assessment prepared under separate cover). All generated traffic will occur within areas where limited koala habitat adjoins the carriageways; thereby reducing the likelihood of koala interaction with any traffic associated with the SRAIP.

(d) Adversely affect habitat critical to the survival of a species

The Project Footprint and immediately surrounding areas (c.400 m) do not support habitat critical to the survival of the koala. Consequently, the SRAIP will not adversely impact any habitat critical to the survival of koala.

(e) Disrupt the breeding cycle of an important population

As noted above, the Project Footprint and immediately surrounding areas do not support habitat critical to the survival of koala, nor does the broader locality support an important

population. It is unlikely that the aggregated nature of the SRAIP and its co-location with heavily cleared (cropped or grassed) habitats will impact opportunities for koalas to breed, to seek out mates or to disperse during breeding season.

(f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The SRAIP will not impact any habitat critical to the survival of koala. It will result in the removal of 20 NJKHTs in a heavily cleared and intensely used agricultural precinct (cropped and grazed) adjoining a major highway. The impacts from the removal of 20 individual NJKHTs and the establishment of the SRAIP over areas under heavy crop or grazing and enveloped by similar uses is unlikely to negatively impact on koala and lead to a decline in the species or local population. Landscaping mitigation measures within the broader Project Site (e.g. the proposed overland flow path) can significantly increase the available koala habitat, foraging resources and movement opportunities for koala.

(g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The SRAIP does not occur within any core koala habitat and is well removed from such. It is not expected that the establishment of the SRAIP will increase the level of invasive species that impact koala such as dog or fox.

(h) Introduce disease that may cause the species to decline

The SRAIP is unlikely to introduce pressures to the broader population that do not already existing in the region. The isolated nature of the Project Footprint in relation to the more intact habitat and movement corridors would also separate the proposed uses from koala populations. Individuals moving through the Project Site are unlikely to be incentivised to move towards or through the SRAIP, owing to a lack of suitable habitat (forage or roosting) within or adjoining the SRAIP or to the east across the highway.

(i) Interfere substantially with the recovery of the species

As noted above, the Project Footprint and immediately surrounding areas do not support habitat critical to the survival of koala, nor does the broader locality support an important

population. Opportunities that currently exist for koala movement through the Project Site will not be impacted by the SRAIP as they generally occur a large distance from the Project Footprint. Further, koalas are unlikely to be incentivised to move towards or through the SRAIP as there is no koala forage or roosting opportunities in this area (see **Figure 6**).

Based on this assessment:

- the Project Footprint and its immediate surrounds do not support habitat critical to the survival of the koala;
- the broader locality does not support a defined important population;
- the SRAIP does not occur in areas that support intact koala habitat nor will the SRAIP interfere with koala movement. Further, the location and setting of the Project Footprint does not provide an incentive or any habitat amenity for koala (post development) as there are no koala trees or other vegetation within or proximate to the location (i.e. koalas are unlikely to move through the SRAIP as there is no habitat to move to or adjoining it to the east); and
- koala habitat can be significantly improved within the Project Site through landscaping mitigation measures and/or active natural regeneration in areas not under graze or cropping.

7.2.3 Prescribed Matters

The SRAIP will not have a Significant Residual Impact on a prescribed matter.

7.3 Proposed Mitigation

Owing to the minor nature of impacts to flora and fauna resulting from the SRAIP, mitigation measures are largely unwarranted. Any minor residual impacts can be mitigated through landscaping measures for some of the habitats within the Project Site, as described below:

- Landscaping mitigation plantings of koala feed tree species. This will not affect any Manning's coefficient for stormwater and will increase the presence of koala trees in this area from the existing sparse and scattered prevalence. This is not an offset planting but rather a landscaping mitigation measure that will result in an uplift in the utility of the area for koalas and other arboreal fauna.
- Waterway embellishments or retention of soak areas utilising produced greywater.

Furthermore, the establishment of the SRAIP will be guided by an approved Vegetation Management Plan (**VMP**) and Fauna Management Plan (**FMP**) prepared in accordance with the Draft Planning Scheme's Planning Scheme Policy 5 – Ecological Assessments. A conceptual VMP and FMP is provided for the SRAIP in **Attachment 2**.

7.4 Offsets

Due to a lack of impacts on MNES, MSES and MLES, offsets are not required for the SRAIP under the *Queensland Environmental Offsets Policy*.

8 Compliance with Relevant State and Local Requirements

8.1 State Planning Policy

An assessment of the Proposed Development against the five Biodiversity State Interest Policies is provided in **Table 5**.

Table 6: Assessment of the Proposed Development against the Biodiversity State Interest Policies

Biodiversity State Interest Policies	Response
1. Development is located in areas to avoid significant impacts on matters of national environmental significance and considers the requirements of the EPBC Act.	Complies. The Proposed Development will not have a significant impact on a MNES.
2. Matters of State Environmental Significance area identified and development is located in areas that avoid adverse impacts; where adverse impacts cannot be reasonably avoided, they are minimised.	Complies. This EAR identifies MSES of relevance to the Proposed Development (Section 6). The SRAIP will not have an adverse impact on any MSES.
3. Matters of Local Environmental Significance are identified and development is located in areas that avoid adverse impacts; where adverse impacts cannot be reasonably avoided, they are minimised.	Complies. This EAR identifies MLES of relevance to the Proposed Development (Section 6). The Proposed Development will not have an adverse impact on any MLES.
4. Ecological processes and connectivity is maintained or enhanced by avoiding fragmentation of matters of environmental significance.	Complies. The SRAIP is located within a highly modified landscape and will have minimal impacts on ecological processes and connectivity. The Project Footprint does not contain any habitat of significance, nor is it located within an important movement corridor for fauna.
5. Viable koala populations in South East Queensland are protected by conserving and enhancing koala habitat extent and condition.	Complies. Koalas are known to exist within the Project Site, though the habitat of most utility to the species is far removed from the Project Footprint and restricted to remnant areas in the north-west of Lot 2RP. The SRAIP will require the removal of 20 NJKHTs within the Project Footprint (see Figure 7). This is not expected to have any significant impact on the koala (see Section 7.2.2). Proposed Landscape mitigation measures within the Project Site will result in a benefit for the species (see Section 7.3).

8.2 State Code 16

SARA mapping shows that areas defined as Category B and Category C on the Regulated Vegetation Management Map (**RVMM**) are limited to the north-eastern extent of Lot 2RP and Lot2RP4 within the Project Site; some 500 m or more from the proposed earthworks areas of the Project Footprint (**Attachment 7**). The balance of the Project Area is mapped as Category X vegetation.

The SRAIP will not impact Category B or Category C Regulated Vegetation.

Under the *Planning Regulation 2017* (Qld) (**Planning Regulation**) and the *Vegetation Management Act 1999* (Qld) (**VM Act**), a development permit is required for vegetation clearing (operational work and MCU) unless that clearing is exempt clearing work. Under Schedule 21, Part 2, Section 2 of the Planning Regulation, clearing vegetation on freehold land in a Category X area is “exempt clearing work”.

Despite no impact to Category B and Category C Regulated Vegetation, the proposed MCU application is proposed over the whole of the Site, including the areas mapped to contain this native vegetation. As such, a response has been provided to State Code 16: Native vegetation Clearing below for completeness,

Table 7 - Response to State Code 16: Native Vegetation Clearing

Performance outcomes	Acceptable outcomes	Response
Clearing avoids or minimises impacts		
PO1 Clearing and adverse impacts of clearing do not occur unless the application has demonstrated that the clearing and the adverse impacts of clearing have been: 1. reasonably avoided; or 2. reasonably minimised where it cannot be reasonably avoided.	No acceptable outcome is prescribed.	Complies with PO1 The proposed development avoids any clearing of native vegetation. The proposed MCU application for the SRAIP has included an Environmental Protection Area (EPA) precinct within the Masterplan (Attachment 1). This encompasses the Category B and Category C Regulated Vegetation within the north western extent of the Site. Subsequently, the Industrial precinct within the Site's south eastern extent is situated a minimum of 750m from the EPA precinct. Further, infrastructure associated with the proposed composting area centrally with the Site is situated more than 400m from the EPA precinct. No works, including clearing or the establishment of any infrastructure, are proposed within or adjoining the EPA precinct as part of this proposed MCU application. Further, no works or infrastructure is proposed within 1.5 times the average canopy height of the vegetation within the EPA precinct. Further, any future works proposed within the EPA precinct will be subject to further detailed assessment including the full requirements outlined within the Scope of Work as well as referral to all relevant state assessment agencies. Further, it is highlighted that the proposed Future Road Connection illustrated to occur through the EPA precinct is subject to a separate application; being proposed as part of the Frasersview Quarry over the properties adjoining the subject Site to the north (MCU19/005 & RAL19/003). Should this proposed MCU for the SRAIP Masterplan be approved, the proposed future road connection for the Frasersview Quarry will not be constructed until such time as the separate application is also approved. Should this separate application for Frasersview Quarry be refused, any future road connection through the EPA precinct will require another separate application and detailed assessment required by the State and relevant referral agencies.
Clearing on land in particular circumstances		
PO2 Clearing is consistent with any notice requiring compliance on the land subject to the development application, unless a better environmental outcome can be achieved. Note: The discharge of the vegetation management requirements under the notice requiring compliance can only occur in conjunction with the better environmental outcome being legally secured. Further guidance on meeting the requirements of a better environmental outcome can be found in State code 16: Native vegetation clearing guidance material.	No acceptable outcome is prescribed	Complies with PO2 The proposed development does not involve any clearing of native vegetation.

Performance outcomes	Acceptable outcomes	Response
PO3 Clearing is consistent with vegetation management requirements for particular regulated areas unless a better environmental outcome can be achieved. Note: The discharge of the vegetation management requirements under the notice requiring compliance can only occur in conjunction with the better environmental outcome being legally secured. Further guidance on meeting the requirements of a better environmental outcome can be found in State code 16: Native vegetation clearing guidance material.	No acceptable outcome is prescribed	Complies with PO3 The proposed development does not involve any clearing of native vegetation.
PO4 Clearing of a legally secured offset area: - is consistent with the offset delivery plan; or agreement for the offset area on the land subject to the development application; or - only occurs if an additional offset is provided that is consistent with the relevant policy in the Queensland Environmental Offsets Policy, Department of Environment and Heritage Protection, 2014. Note: Reference to 'agreement' above includes the 'agreed delivery arrangement' for the offset area as well as instruments associated with the legally secured offset area. Clearing should be consistent with any agreement however described.	No acceptable outcome is prescribed	Complies with PO4 The proposed development does not involve any clearing of native vegetation.
Clearing of vegetation as a result of the material change of use or reconfiguration of a lot		
PO5 Clearing as a result of a material change of use, or clearing as a result of reconfiguring a lot does not occur.	No acceptable outcome is prescribed.	Complies with PO5 The proposed development does not involve any clearing of native vegetation.
Clearing that could already be done under an exemption		
PO6 Clearing does not occur unless it is clearing that could be done under an exemption for the purpose of the development (as prescribed under Schedule 21 of the Planning Regulation 2017) prior to the material change of use or reconfiguring a lot application being approved.	No acceptable outcome is prescribed.	Complies with PO6 The proposed development does not involve any clearing of native vegetation.

8.3 Nature Conservation Act 1992

The Project Site is not located within a mapped “High Risk Trigger Area” (**Attachment 7**). The detailed botanical survey of the Project Footprint and surrounding area failed to identify the presence of protected plants and/or suitable habitat for these. Consequently, based on the information presently at hand, a Protected Plant Clearing Permit under the NC Act is not likely to be required for the SRAIP. Furthermore, an Exempt Clearing Notification under the NC Act is also not warranted.

Some of the relict trees that will be removed within the Project Footprint (see **Attachment 2**) contain hollows that would serve as animal breeding places. Therefore, clearing of these trees will require a Permit to Tamper with an Animal Breeding Place prior to works occurring. This in turn will require the preparation of a Species Management Program to the satisfaction of DES.

8.4 Operational Works – Waterway Barrier Works and Riverine Protection Permits

As identified in **Section 3.3.3**, the Operational Works phase of the Proposed Development will potentially require referral to DAF (waterway barrier works) and DNRME (riverine protection permit). With respect to the waterway barrier works matter, the waterway mapping within the Project Site is grossly inaccurate and does not reflect the heavily-altered nature of the Project Site’s hydrological characteristics. It is noted that the channelised drain running in a generally north direction is not identified as a waterway for waterway barrier works. Notwithstanding, it is understood that Cardno Pty Ltd have been engaged to undertake assessment potential impacts posed to fish passage and habitat for the draft IAR (Appendix M of the draft IAR package).

Riverine Protection Permits are required under the *Water Act 2000* for any proposed activity to excavate, place fill or destroy vegetation in a watercourse, lake or spring. A watercourse assessment undertaken by DAF on the Project Site (see **Attachment 10**) determined that no “watercourse” is present; however, the wetland to the rear of the development is classified as a “lake”.

It must be noted that this wetland area is of anthropogenic origin and does not function as a natural lake or wetland due to its reliance on greywater from the existing Kalfresh operations. This wetland would likely dry out and be significantly altered through grazing if its greywater

supply was removed, as will be the case once the Proposed Development is operational (i.e. with a closed wastewater loop).

8.5 Draft Planning Scheme Strategic Framework

An assessment of the SRAIP against the Strategic Outcomes in Section 3.6.2 of the Draft Planning Scheme Strategic Framework is provided in **Table 6**.

Table 8: Assessment of the SRAIP against environmental Strategic Outcomes (section 3.6.2) of the Draft Planning Scheme Strategic Framework

Strategic Outcome	Comment
Natural Landscape and Environmental Values	
(1) Development is located to avoid significant impacts on MNES	Complies. The SRAIP will not have a significant impact on a MNES.
(2) Development protects and enhances the ecological values of MSES, including: (a) Protected Areas; (b) Regulated Vegetation (as defined under the State Planning Policy); (c) State Significance Species; (d) High Ecological Value Waters (Watercourse); (e) High Ecological Value Waters (Wetland); (f) High Ecological Significance wetlands; and (g) Waterways and Wetlands Buffer Areas.	Complies. The SRAIP will not have a significant impact on a MSES.
(3) Development protects and enhances the ecological values of MLES including: (a) Core Corridor; (b) Node Corridor; (c) Stepping Stone; (d) Critical linkage; (e) Koala Habitat; and (f) Stream Orders 2-7 and Watercourse Buffer Areas	Complies. The SRAIP does not contain any MLES listed as (a) to (e). The mapped waterways will be augmented and improved where these intersect the Project Footprint.

Strategic Outcome	Comment
(4) Development location and design considers biodiversity values and does not compromise the intended function of intended biodiversity linkages.	Complies. The SRAIP avoids areas of biodiversity value within the Project Site and will not affect any biodiversity linkages or ecological corridors.
(5) Development protects habitat identified for State Significant Species.	Complies. The SRAIP avoids habitat of State Significant Species.
(6) Development protects viable koala populations by conserving and enhancing known koala habitat extent and condition.	Complies. The SRAIP avoids koala habitat within the Project Site and in doing so, protects the local koala population. The SRAIP will not adversely affect movement of koalas through the landscape, as it is significantly removed from any notable koala habitat and surrounded by significant impediments (i.e. expansive cropping land, cleared grazed areas and the Cunningham Highway). Further detail is provided in Section 7.2.2 . Landscaping mitigation measures described in Section 7.3 will lead to enhancements to the Project Site's provision of koala habitat.
(7) The habitat and ecological value of vegetated corridors and biodiversity linkages are protected and enhanced.	Complies. The SRAIP avoids areas of biodiversity value within the Project Site and will not affect any biodiversity linkages or ecological corridors.
(8) Development in an area having regionally significant landscape value, being the Border Ranges (including the Gondwana Rainforest World Heritage Area of Lamington National Park), Scenic Rim Corridor (including the Main Range, Mount Barney, Mount Maroon, Mount Chingee and Lamington national parks, Mount Lindesay and Tamborine Mountain, specifically land in the Rural Zone – Escarpment Precinct) and Flinders-Karawatha Corridor (including Mt Flinders, Teviot Range, Mt Joyce, Wyaralong Dam and south to Mt Barney), maintains the scenic amenity value of the area.	Complies. The SRAIP does not propose development in areas of regionally significant landscape value.
(9) Scenic amenity and landscape character is maintained, including through the protection of significant trees in the Vegetation Management Area.	Complies. The SRAIP is not within the mapped Vegetation Management Area.
(10) Development is located, designed and operated to avoid adverse impacts on the biodiversity values of MSES.	Complies. The SRAIP avoids adverse impacts on the biodiversity values of MSES.
(11) Development is located, designed and operated to avoid adverse impacts on the biodiversity values of MLES.	Complies. The SRAIP avoids adverse impacts on the biodiversity values of MLES.

Strategic Outcome	Comment
(12) The impacts of development on MLES are effectively managed by: (a) Avoiding impacts, where practicable; (b) Minimising impacts, where impacts cannot be reasonably avoided; (c) Restoring values on the same premises and in an appropriate location, where impacts cannot be reasonably avoided or minimised.	Complies. The SRAIP predominantly avoids adverse impacts on MLES. The establishment of the Project Footprint will require some modification to the man-made waterways within the Project Site; particularly the channelised drain that directs sheet flow northwards. These impacts will be managed through the re-establishment of natural characteristics within the modified drain (incorporating pools and riffles) to provide amenity for fish and other aquatic species. Native vegetation can also be established along the waterway corridor. This is described in Section 7.3 and will lead to improvements in the ecological values of, and water quality within, the mapped MLES waterway.
(13) Development maintains, and where possible, enhances the quality of surface water and groundwater.	N/A This matter is addressed under separate cover.
(14) Development within a Watercourse Buffer Area is designed and located to maintain native vegetation, terrestrial and aquatic habitat, ecological function (including maintenance of fish passage) and water quality.	Complies. The establishment of the Project Footprint will require some modification to the man-made waterways within the Project Site; particularly the channelised drain that directs sheet flow northwards. These impacts will be managed through the re-establishment of natural characteristics within the modified drain (incorporating pools and riffles) to provide amenity for fish and other aquatic species. Native vegetation can also be established along the waterway corridor. This is described in Section 7.3 and will lead to improvements in the ecological values of, and water quality within, the mapped MLES waterway.
(15) Development protects and enhances the water quality and biodiversity values (including the maintenance of fish passage) of waterways and wetlands and is appropriately set back and provides buffers.	Complies The Proposed Development will not create any barriers to fish passage and will result in the improvement of waterway values through embellishments and restorative planting within the engineered overland flow path.
(16) Water quality is protected and enhanced in the following Urban Water Supply Storages: (a) Maroon; (b) Moogerah; and (c) Wyaralong.	N/A The SRAIP will not affect any of the listed urban water supply storages. Water quality matters are addressed under separate cover (refer to Appendix L of the draft IAR package).

Strategic Outcome	Comment
(17) Development facilitates public access to the region's waterways at appropriate locations where the environmental values of the waterway are maintained.	N/A Waterways within the Project Site are not accessible to the public, as these are minor engineered drains to facilitate the collection and conveyance of sheet flow. It is not considered logical to encourage public access of such modified waterways within the boundaries of a commercial agricultural operation (and a proposed agricultural industrial precinct).
(18) Development is designed to incorporate the principles of total water cycle management and water sensitive urban design.	Complies One of the fundamental elements underpinning the SRAIP is the principles of total water cycle management, as evidenced through the symbiotic relationship of the proposed operations within the precinct. Wastes from one process will be used inputs for another. Greywater and waste products from the processing of crops will form inputs to the anaerobic digester as part of the bioenergy facility. Waste (digestate) from the bioenergy facility will be disposed of through pivot irrigation methods in the west of the Project Site. Further information in relation to these processes is provided under separate cover.
(19) Development within a Water Resource Buffer Area is planned, designed and managed to avoid or otherwise minimise adverse impacts on the water quality of drinking water.	N/A The SRAIP is not proposed within a Water Resource Buffer Area.
(20) Stormwater quality, quantity and velocity are managed in a manner which protects and improves water quality in waterways and wetlands.	Complies Stormwater quality, quantity and velocity associated with the SRAIP will be managed in accordance with the Stormwater Management Plan prepared under separate cover.
(21) The water quality of surface and groundwater systems is protected and improved.	N/A Stormwater and groundwater quality, quantity and velocity associated with the SRAIP are addressed under separate cover.
Cultural Heritage	
Cultural heritage elements of the SRAIP are addressed under separate cover.	
Natural Hazards, Risk and Resilience	
Natural hazard elements of the SRAIP are addressed under separate cover.	



Strategic Outcome	Comment
Emissions and Hazardous Activities	
Emissions and hazardous activities (e.g. Environmentally Relevant Activities) associated with the SRAIP are addressed under separate cover.	

8.6 Current Draft Planning Scheme Codes

An assessment of the SRAIP against the relevant components of the Environmental Significance Overlay Code of the Draft Planning Scheme is provided in **Table 7**.

Table 9: Assessment of the SRAIP against relevant components of the Environmental Significance Overlay Code of the Draft Planning Scheme

Performance Outcomes	Acceptable Outcomes	Comment
Protection of Matters of State and Local Environmental Significance		
PO1 Development protects and avoids impact on MSES and/or MLES	AO1.1 Development has no impact on the relevant environmental values of MSES and/or MLES OR AO1.2 An Ecological Assessment Report prepared in accordance with Planning Scheme Policy 5 – Ecological Assessments demonstrates that the development site does not contain any MSES and/or MLES OR AO1.3 An Ecological Assessment Report prepared in accordance with Planning Scheme Policy 5 – Ecological Assessments demonstrates that development is located, designed and operated to mitigate adverse impacts on the relevant environmental values of MSES and/or MLES.	Complies. This EAR demonstrates that the SRAIP is designed to avoid, minimise and mitigate impacts on MLES. The SRAIP will not impact on relevant environmental values of MSES.
PO2 Development is designed and constructed to: 1. avoid significant adverse impact on MSES and/or MLES; and 2. protect and enhance ecological connectivity and habitat extent between areas of MSES and/or MLES	AO2 The design and layout of development minimises adverse impacts on Matters of State and/or Local Environmental Significance by: (1) focusing development in non-vegetated areas to protect existing habitat; (2) using urban design to consolidate density and preserve existing habitat and native vegetation; (3) aligning property boundaries to maintain ecologically important areas;	Complies. (1) The Project Footprint is located in cleared areas currently cropped and grazed, and is centred around existing Kalfresh operations. (2) The SRAIP largely avoids areas of habitat value and native vegetation. Some individual relict trees can be retained in the north-west of the Project Footprint as demonstrated in the VMP (Attachment 2). (3) No ecologically important areas will be impacted by the SRAIP. (4) No ecologically important areas are located within an area of influence from the SRAIP. Existing regulated vegetation with highest habitat values within the Project Site are located more than 500 m from the Project Footprint. The low basin area located centrally within the Project Site is anthropogenic in

Performance Outcomes	Acceptable Outcomes	Comment
	(4) ensuring that alterations to natural landforms, hydrology and drainage patterns on the development site do not negatively affect ecologically important areas; (5) avoiding impacts on flora and fauna and their habitat as identified in the <i>Nature Conservation Act 1992</i> and locally significant species; (6) ensuring that significant fauna and flora and their habitats are protected in their environmental context and incorporate measures that allow for the safe movement of fauna through the site; (7) ensuring the clearing of native vegetation is minimised; (8) ensuring development does not isolate areas identified as Matters of State and/or Local Environmental Significance; (9) ensuring development retains native vegetation in areas large enough to maintain ecological values, functions and processes; and (10) ensuring development is operated and managed in a manner to ensure long term viability of the matter of environmental significance.	origin and is completely dominated by exotic weed growth which is under constant graze from stocked cattle which in turn, impact the soil profile by trampling wet heavy clays. The SRAIP avoids areas of ecological importance. (5) The SRAIP will not have a significant impact on any MSES or MLES species. (6) The SRAIP avoids impacts to significant flora and fauna through the location of the Project Footprint in areas devoid of habitat value. The SRAIP will not impact any movement of fauna through the Project Site, as the existing impediments to movement are a significant disincentive for fauna to move through this area, in the presence of suitable surrounding habitat to the west. (7) The SRAIP will require minimal native vegetation clearing, as demonstrated in the VMP (Attachment 2). (8) The SRAIP will not isolate areas identified as MSES and/or MLES. (9) The SRAIP will retain native vegetation in the areas of highest habitat value (i.e. the north-western areas of regulated vegetation within Lot 2RP). Ecological values, functions and processes will be retained. (10) The SRAIP will not affect the long-term viability of any matters of environmental significance within or proximate to the Project Site.
PO3 Buffers are provided and maintained that protect the long term viability of MSES and/or MLES	AO3.1 Development provides and maintains a buffer to MSES and/or MLES, the width of which is supported by an evaluation of the environmental values prepared in accordance with Planning Scheme Policy 5 – Ecological Assessments. OR AO3.2 Where involving a wetland or watercourse, development provides a buffer from an area identified as High Ecological Value Waters	Complies. The Project Footprint is not within 100m of an area identified as High Ecological Value Waters (Watercourse), High Ecological Value Waters (Wetland) or High Ecological Significance Wetlands.

Performance Outcomes	Acceptable Outcomes	Comment
	(Watercourse), High Ecological Value Waters (Wetland) and High Ecological Significance Wetlands which has a minimum width of: (1) 100m where the area is located outside an urban area; or (2) 50m where the area is located within an urban area.	
PO4 The ongoing management, operation and tenure of MSES and/or MLES ensures impacts on biodiversity values and ecological processes are avoided or minimised.	AO4.1 No ongoing impacts occur from the operation of the development. OR AO4.2 Where impacts are ongoing: (1) They are mitigated by appropriate management, tenure or monitoring and reporting; and (2) Relevant management plans and reporting are provided for assessment and approval.	Complies. The SRAIP will not have ongoing impacts on MSES and/or MLES.
PO5 Disturbed or cleared or degraded areas are rehabilitated.	AO5.1 Development provides for cleared, degraded or disturbed areas to be rehabilitated or allowed to regenerate naturally, where development is located in areas identified as: (1) Protected Areas; (2) Regulated Vegetation (as defined in the SPP); (3) Mapped areas of Local Environmental Significance; or (4) Other MSES and/or MLES identified within an Ecological Assessment Report as requiring rehabilitation AO5.2 Development provides for locally significant species to be	Complies. The SRAIP will include the landscape mitigation measures with in the Project Site, as described in Section 7.3 which will include locally endemic species.

Performance Outcomes	Acceptable Outcomes	Comment
	predominantly used in revegetation and landscape planting on the site.	
PO6 Where habitat or vegetation is proposed to be damaged, management strategies are implemented to ensure the protection and safety of wildlife and the protection of nearby habitat in areas identified as either MSES and/or MLES.	AO6 Development ensures that: (1) the native fauna is safely relocated to an area of similar habitat; (2) the sequence of habitat disturbance ensures that fauna is not isolated from adjoining areas of habitat; (3) fauna relocation occurs immediately prior to habitat disturbance; (4) qualified fauna spotter catchers, licenced by the Queensland Parks and Wildlife Service, are present on the site at the time of the damage, to direct and undertake the removal and relocation of fauna; (5) where possible, damaged habitat and nesting sites are rehabilitated outside of development areas; (6) vegetation planned for retention is protected from damage, in accordance with AS4970. (7) vegetation is cleared in accordance with Policy 6 of the Department of Environment and Heritage Protection's: Koala-Sensitive Design Guideline.	Complies. The SRAIP will generally avoid habitat for MSES and/or MLES. The FMP (Attachment 2) provides appropriate detail to address items (1) to (5). The VMP (Attachment 2) responds to the requirements of item (6). With respect to item (7), vegetation clearing will be undertaken in accordance with Policy 6 of the DEHP Koala Sensitive Design Guideline and will be undertaken in accordance with Schedule 11, Part 3, Section 8 of the <i>Planning Regulation 2017</i> .
PO7 Development design and location provides for the safe movement of native fauna through the site.	AO7 Where infrastructure crosses native fauna movement paths, the design of new development incorporates fauna friendly movement solutions.	Complies. The SRAIP will not cross any native fauna movement path.
Additional Matters – Environmental Significance – Priority Species Overlay Map OM-04-C - Koalas		
N/A – the Project Site is not mapped to contain any areas identified as koala habitat within the Priority Species Overlay Map.		
Local Vegetation Clearing - Offsets		

Performance Outcomes	Acceptable Outcomes	Comment
PO10 Where significant residual impacts resulting from damage to vegetation in areas identified as MLES (and where not identified as MSES) cannot be avoided or mitigated, the impacts are offset so that the environmental value proposed to be removed from the site is maintained.	AO10 No Acceptable Outcome is prescribed.	Complies. The SRAIP will not result in a significant residual impact on a MLES.
Water Quality – Waterways and Wetlands		
PO11 Development located in areas identified on Environmental Significance Overlay Map - Wetlands and Waterways OM-04-D: (1) protects or enhances habitat values (including maintenance of fish passage), ecological connectivity and other ecological functions and values; (2) protects water quality and aquatic conditions; (3) maintains natural micro-climatic conditions; (4) maintains natural hydrological processes; (5) prevents mass soil movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and (6) avoids loss or modification of chemical, physical or biological properties or functions of soil.	AO11.1 Development, including any associated filling or excavation (other than rehabilitation or restorative works) does not occur within a High Ecological Value Waters (Watercourse), High Ecological Value Waters (Wetland), High Ecological Significance Wetlands and Waterways and Wetlands Buffer Area. AO11.2 Development provides a buffer from an area identified as High Ecological Value Waters (Watercourse), High Ecological Value Waters (Wetland), and High Ecological Significance Wetlands which has a minimum width of: (1) 100m where the area is located outside an urban area; or (2) 50m where the area is located within an urban area; or (3) the buffer width of which is supported by an evaluation of the environmental values (identified by a suitably qualified person), including the function and threats.	Complies. The Project Footprint is not within 100m of an area identified as High Ecological Value Waters (Watercourse), High Ecological Value Waters (Wetland) or High Ecological Significance Wetlands.
PO12 Development within a Watercourse Buffer Area (A, B or C) shown on Environmental	AO12 The development footprint is not located within:	Performance Outcome. The establishment of the Project Footprint will require some modification to the man-made waterways within the Project Site; particularly the channelised drain that

Performance Outcomes	Acceptable Outcomes	Comment
Significance Overlay Map – Local Watercourse OM-04-E has no adverse impact on: (1) native vegetation; (2) terrestrial and aquatic habitat; (3) ecological functions; and (4) nature conservation functions.	(1) 10m from the high or outer bank of the watercourse located in Watercourse Buffer Area A; (2) 25m from the high or outer bank of the watercourse located in Watercourse Buffer Area B; (3) 50m from the high or outer bank of the watercourse located in Watercourse Buffer Area C.	directs sheet flow northwards. These impacts will be managed through the re-establishment of natural characteristics within the modified drain (incorporating pools and riffles) to provide amenity for fish and other aquatic species. Native vegetation can also be established along the waterway corridor. This is described in Section 7.3 and will lead to improvements in the ecological values of, and water quality within, the mapped MLES waterway.
Water Quality – All Waterways and Wetlands and Local Watercourses		
PO13 Development appropriately manages stormwater quality to: (1) protect natural ecosystems; (2) protect water quality; (3) reduce runoff and peak flows; and (4) meet the water quality objectives and environmental values for Queensland waters.	AO13 A site-based stormwater quality management plan (SQMP) is prepared by a suitably qualified person that demonstrates that the stormwater quality treatment measures meet the design objectives identified in Table 8.2.4.3.2 - Stormwater Management Design Objectives.	N/A A SQMP is prepared for the SRAIP under separate cover.
PO14 Stormwater quantity management outcomes demonstrate no adverse impact on stormwater flooding or the drainage of properties external to the subject site.	AO14.1 A site-based stormwater quantity management plan (SQMP) is prepared by a suitably qualified person: (1) that demonstrates achievable stormwater quantity control measures for discharge during both the construction and operational phases of development; and (2) is designed in accordance with the Queensland Urban Drainage Manual (QUDM). AO14.2 Stormwater flows discharged from development are either within the capacity of the downstream drainage system such that non-worsening occurs, or are mitigated to pre-development characteristics.	N/A A SQMP is prepared for the SRAIP under separate cover.

Performance Outcomes	Acceptable Outcomes	Comment
PO15 Development does not discharge wastewater to a waterway or wetland off-site unless demonstrated to be best practice environmental management for that site and addresses the: (1) applicable water quality objectives for the receiving waters; and (2) the potential adverse impact on ecosystem health of receiving waters.	AO15.1 Where the development involves the discharge of wastewater, a site-based Wastewater Management Plan is prepared by a suitably qualified person and addresses: (1) wastewater type; (2) climatic conditions; (3) water quality design objectives; and (4) best-practice environmental management. AO15.2 The site-based Wastewater Management Plan required in AO15.1 provides that wastewater is managed in accordance with a waste management hierarchy that: (1) avoids wastewater discharges to waterways, wetlands and watercourses; and (2) if wastewater discharge to waterways, wetlands or watercourses cannot practicably be avoided, minimises wastewater discharge to waterways, wetlands or watercourses by re-use, recycling, recovery and treatment for disposal to sewer, surface water and groundwater.	N/A A site-based Wastewater Management Plan is prepared for the SRAIP under separate cover.
PO16 The environmental value of receiving waters and the functionality of stormwater infrastructure are protected from the impacts of erosion, turbidity and sedimentation.	AO16 An erosion and sediment control plan is prepared by a suitably qualified person that achieves the design objectives in Table 8.2.4.3.2 - Stormwater Management Design Objectives.	Complies An erosion and sediment control plan for the SRAIP will be prepared to meet the required Stormwater Management Design Objectives at the operational works stage.
PO17 Development does not cause land degradation in areas identified as Matters of State Environmental Significance Waterways and Wetlands (identified on Environmental Significance Overlay Map - Wetlands and Waterways OM-04-D) or Matters of Local Environmental Significance Local Watercourses (identified on Environmental Significance Overlay Map - Local Watercourses OM-04-E), including: (1) mass soil movement, gully erosion, rill erosion, sheet erosion, tunnel erosion, stream bank erosion, wind erosion, or scalding; and (2) loss or modification of chemical, physical or biological properties or functions of soil.	AO17 Development does not change the natural surface water or groundwater hydrologic regime, including through channelization, redirection or interruption of flow, where located in areas identified as: (1) Matters of State Environmental Significance Waterways and Wetlands (identified on Environmental Significance Overlay Map - Wetlands and Waterways OM-04-D); or (2) Matters of Local Environmental Significance Local Watercourses (identified on Environmental Significance Overlay Map - Local Watercourses OM-04-E).	Performance Outcome. The establishment of the Project Footprint will require some modification to the man-made waterways within the Project Site; particularly the channelised drain that directs sheet flow northwards. These impacts will be managed through the re-establishment of natural characteristics within the modified drain (incorporating pools and riffles) to provide amenity for fish and other aquatic species. Native vegetation can also be established along the waterway corridor. This is described in Section 7.3 and will lead to improvements in the ecological values of, and water quality within, the mapped MLES waterway.

Performance Outcomes	Acceptable Outcomes	Comment
Reconfiguring a Lot		
PO18 Where the site is identified as having Matters of State and/or Local Environmental Significance the ecological function and biodiversity values of existing habitat are maintained by ensuring that reconfiguring a lot does not result in the: (1) fragmentation of habitat; (2) loss of habitat; and (3) loss of environmental values.	AO18.1 Where required, areas that are mapped as containing Matters of State and/or Local Environmental Significance are dedicated as public open space for purposes consistent with the ecological values and functions of the area. AO18.2 The design, location and shape of the development does not impact on Matters of State and/or Local Environmental Significance by: (1) ensuring the boundaries do not result in the clearing of Matters of State and/or Local Environmental Significance. (2) the shape size and location of lots and there boundaries minimise the impact of Matters of State and/or Local Environmental Significance. (3) dedicated Matters of State and/or Local Environmental Significance as conservation area in a private property conservation mechanism. AO18.3 Where required, open space is provided adjacent to waterway buffers with roads servicing linear parkland and lots located on the opposite side of the road. AO18.4 Where required, open space for conservation purposes is consolidated with existing conservation areas to allow for a connected movement corridor.	Complies. By focusing the development on highly modified areas surrounding the existing Kalfresh operations and with negligible habitat value, the SRAIP will not result in the fragmentation of habitat, loss of habitat or loss of environmental values.
Development in a Vegetation Management Area on Environmental Significance Overlay Map – Vegetation Management Area OM-04-F		
N/A – the Project Site is not within a Vegetation Management Area on Environmental Significance Overlay Map – Vegetation Management Area OM-04-F		

8.7 Current Draft Planning Scheme Codes

An assessment of the SRAIP against the relevant components of the Natural Features Overlay Code of the current Planning Scheme is provided in **Table 10**.

Table 10: Assessment of the SRAIP against relevant components of the Natural Features Overlay Code of the current Planning Scheme

Specific Outcomes	Probable Solutions	Comment
Element (i): Overlay Map 2A – Natural Values		
SO1 Biodiversity and habitat values are protected.	PS1.1 Buildings and associated infrastructure are located: i. 40 meters from any watercourse or wetland; ii. On land that has been previously cleared; iii. In an area not demonstrated as being an important ecological corridor.	Complies. (i) The establishment of the Project Footprint will require some modification to the man-made waterways within the Project Site; particularly the channelised drain that directs sheet flow northwards. These impacts will be managed through the re-establishment of natural characteristics within the modified drain (incorporating pools and riffles) to provide amenity for fish and other aquatic species. Native vegetation can also be established along the waterway corridor. This is described in Section 7.3 and will lead to improvements in the ecological values of, and water quality within, the mapped MLES waterway. (ii) The Project Footprint is located in cleared areas currently cropped and grazed, and is centred around existing Kalfresh operations. (iii) The SRAIP largely avoids areas of habitat value and native vegetation. Some individual relict trees can be retained in the north-west of the Project Footprint as demonstrated in the VMP (Attachment 2). These trees are not considered to form an important ecological corridor. Existing regulated vegetation with highest habitat values within the Project Site are located more than 500 m from the Project Footprint.
	PS1.2 A vegetated buffer of at least 50 meters width is provided between any waterway or wetland and any incompatible development activity.	
SO2 Water quality is not adversely affected by development.	PS2 Buildings and associated infrastructure are not located in areas identified on Overlay Map 2B.	Complies. The Project Site does not contain mapping of any features identified on Overlay Map 2B.
SO3 Viable networks of wildlife habitat area maintained or enhanced.	PS3 The maintenance of remnant native vegetation and other areas of habitat significant and wildlife corridor are achieved through site layout and the identification of “no-go” areas within the Site boundaries where the development must not occur.	Complies. Existing regulated vegetation with highest habitat values within the Project Site are located more than 500 m from the Project Footprint. Further, the SRAIP will include the restoration of ecological values within the Project Site, as described in Section 7.3 . Landscaping mitigation measures will include locally endemic species.

Specific Outcomes	Probable Solutions	Comment
SO4 The ecological values of an area identified in Overlay Map 2A are protected and/or enhanced.	SP4 Vegetation in areas identified as having 'state' or 'regional' value on Overlay Map 2A is retained.	Complies. The northern extent of the Project Site contain mapping of 'State Values' under Map 2A. This mapping reflects the regulated vegetation mapped within the Project Site. As previously discussed, the Project Footprint is located more than 500 m from the regulated vegetation which will be retained as part of the SRAIP.
SO5 Development will not negatively affect the integrity of the future water storage.	SPO5 Buildings, structures, infrastructure on lands with slopes over 15% are designed and sited so as: (i) natural drainage patterns are retained; (ii) hard surfaces such as paved and roofed areas are minimised; (iii) the length of driveways and roads and the number of water course crossings is minimised; (iv) slab on ground construction is minimised.	Complies. The Project Site is located outside of the areas identified on Overlay Map 2B. Notwithstanding, the establishment of the Project Footprint will require some modification to the man-made waterways within the Project Site; particularly the channelised drain that directs sheet flow northwards. These impacts will be managed through the re-establishment of natural characteristics within the modified drain (incorporating pools and riffles) to provide amenity for fish and other aquatic species. Native vegetation can also be established along the waterway corridor. This is described in Section 7.3 and will lead to improvements in the ecological values of, and water quality within, the mapped MLES waterway.
SO6 The level of nutrients entering the surface and ground water system is minimised.	SPO6 All runoff and infiltration will be contained and treated on site.	Complies. The Project Site is located outside of the areas identified on Overlay Map 2B. Notwithstanding, a SQMP is prepared for the SRAIP under separate cover.
SO7 Stormwater management minimises discharge of waterborne pollutants to watercourse.	SPO7 No probable solution.	Complies. The Project Site is located outside of the areas identified on Overlay Map 2B. Notwithstanding, a SQMP is prepared for the SRAIP under separate cover.
S8 Development will not negatively affect the integrity of the future water storage.	SP8 Development is not located on steep slopes (greater than 20%) or erosion prone areas.	Complies. The Project Site is located outside of the areas identified on Overlay Map 2B. Further, it is understood that the Site does not contain erosion prone areas and the Project Footprint does not occur on steep slopes.

9 Conclusion

State and SRRC environmental constraint mapping identify environmental values within and surrounding the Project Site. The more significant values are located in areas well-removed from the Project Footprint; particularly those requiring earthworks and permanent infrastructure and are protected by virtue of an Environmental Protection Area Overlay proposed as part of the masterplan layout.

The location of the Project Footprint is such that many potential impacts associated with the SRAIP are avoided through physical separation from areas of notable ecological value within the Project Site. The SRAIP focuses on areas of existing and historic disturbance, thereby preserving the more intact habitats in the north-western portion of the Project Site on Lot 2RP and Lot 2RP4.

Owing to the minor nature of impacts to flora and fauna resulting from the SRAIP, mitigation measures are largely unwarranted. Any minor residual impacts can be mitigated through landscaping mitigation measures of some of the habitats within the Project Site, including landscape planting works over components of the Site.

Operational Works phase of the Proposed Development will potentially require referral to DAF (waterway barrier works) and DNRME (riverine protection permit); though these areas are shown within this EAR to be highly modified and not reflective of current mapping.

The Proposed Development complies with all relevant environmental planning instruments and should be approved.

10 References

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PHOTO PLATES



Photo Plate 1 – View north within Project Footprint (proposed Lot 12) showing existing Kalfresh operations (right) and cropping (left).



Photo Plate 2 – View north-west within proposed Lot 12 showing existing cropping.



Photo Plate 3 – View north-east along existing overland flow path/engineered channel. Note relict trees in the background.



Photo Plate 4 – View south-west along existing overland flow path/engineered channel.



Photo Plate 5 – An example of the infrequent relict trees in proximity to the current (and proposed) overland flow path.



Photo Plate 6 – View west across the Project Footprint. Note the lack of ecological values.



Photo Plate 7 – View south along channel current used for conveyance of greywater from Kalfresh existing operations. This is roughly the location of the proposed digestate storage area.



Photo Plate 8 – View north from proposed digestate storage area, across the existing “lake” where the greywater is currently released. In the background is the closest Regulated Vegetation to the Development Footprint. Also beyond the “lake” is the proposed effluent irrigation area.



Photo Plate 9 – View west at a diversion in the engineered greywater channel. To the left of the picture is part of the proposed digestate irrigation area. To the right of the picture are existing composting activities, and in the central part of the picture is the proposed expanded composting area.



Photo Plate 10 – Existing disturbed area proposed for the dam/leachate pond.



Photo Plate 11 – View west from the hill where the proposed digestate irrigation will occur. In the background are existing quarrying operations on a neighbouring property. The vast expanse of cleared flat land is proposed for composting associated with the Proposed Development.



Photo Plate 12 – View east from the hill where the proposed digestate irrigation will occur. In the mid-ground is existing cropping land, and the existing Kalfresh infrastructure. The vast expanse of land contains few trees to promote fauna movement to the Warrill Creek riparian corridor (line of trees in the background).



Photo Plate 13 – View north-east from the hill where the proposed digestate irrigation will occur. In the mid-ground is existing cropping land, and the existing Kalfresh infrastructure. The vast expanse of land contains few trees to promote fauna movement from the habitat within and off-Site (to the right of picture) to the Warrill Creek riparian corridor (line of trees in the background).



Photo Plate 14 – View north across the existing “lake” showing current grazing pressures and exotic vegetation. In the background is mapped regulated vegetation.



Photo Plate 15 – Typical exotic vegetation within the anthropogenically influenced “lake” in the central portion of the Site.



Photo Plate 16 – View north-east along existing overland flow path. The scattered relict trees will be impacted by the proposed industrial lots in this area.



Photo Plate 17 – View north at the continued conveyance of water through the Site. This area is within the proposed overland flow path associated with the Proposed Development.



Photo Plate 18 – View west towards existing borrow pit and the location of the proposed digestate storage (existing trees to be retained).

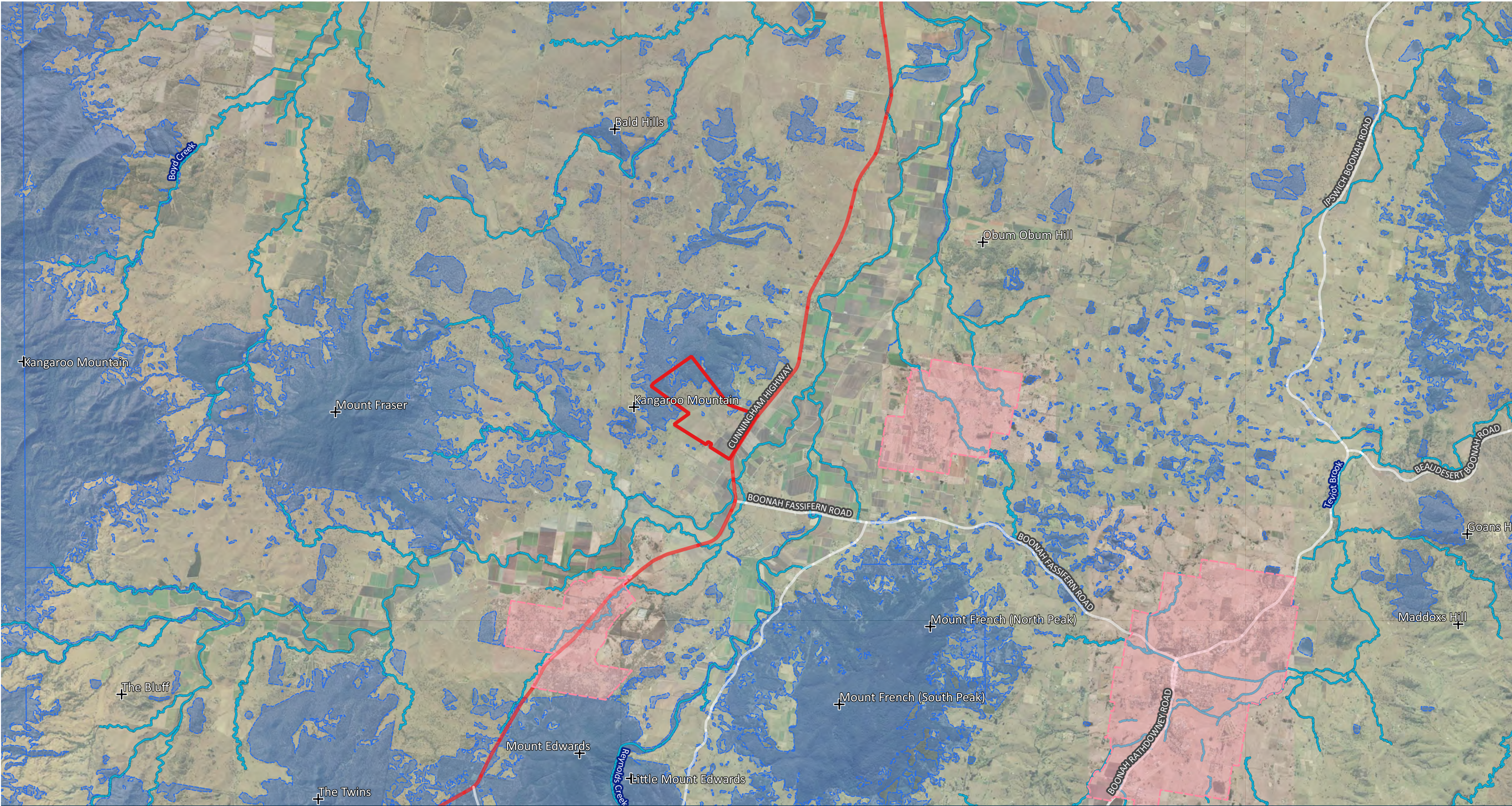


Photo Plate 19 – View north across the Site. Current greywater release point in the foreground, with the resultant “lake” in the mid-ground. Mapped regulated vegetation is in the background, beyond the Project Footprint.



Photo Plate 20 – Existing Kalfresh cropping activities within the Site and Project Footprint.

FIGURES



Kalfresh - Scenic Rim Agricultural Industrial Precinct

Figure 1 - Sub-regional Context

28 South Project Ref: 2019-085

Data Sources: Qld Globe Aerial Imagery (SISP 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2019); Roads (DNRME, 2018); SEQRP Land Use (DILGP 2014).

Project Site

SEQRP Land Use Categories

Regional Landscape and Rural Production Area

Rural Living Area

Urban Footprint

Mountain peaks

Waterway (DNRME)

SEQRP Regional Biodiversity Value

Issue Date

Dwg No.

Author

22 October 2019

2019-085-001

RF

Approved

Revision Note

CC

(A3) GDA 94 MGA 56

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7.5 km

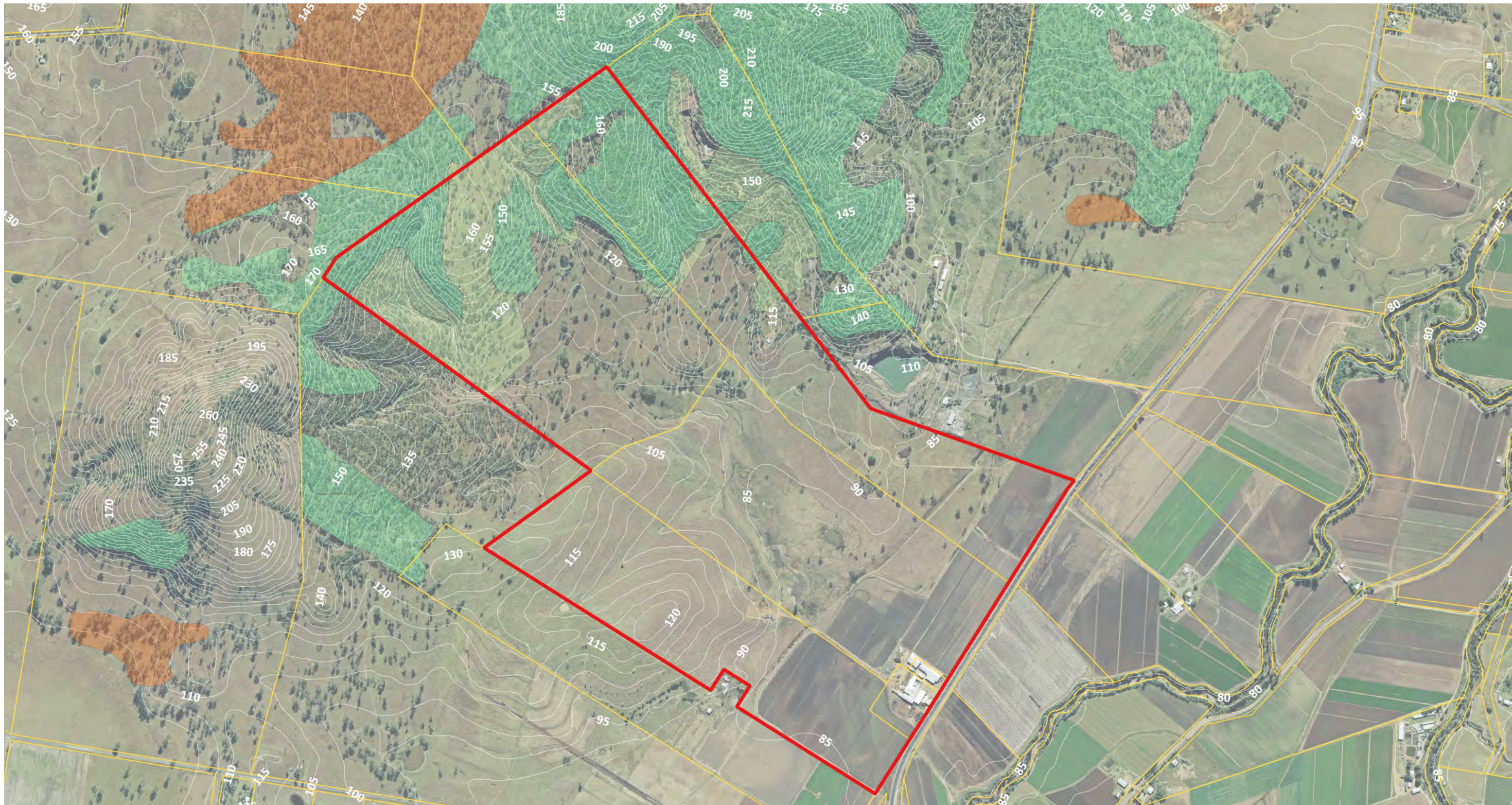


Figure 2 - Site Context

28 South Project Ref: 2019-085

Data Sources: Qld Globe Aerial Imagery (SISP 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2019); Roads (DNRME, 2018).



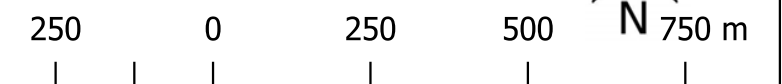
Legend

- Legend**
- | | | | |
|---|---------------------|---|-----------------------------------|
|  | Project Site |  | Regulated Vegetation |
| | Highway |  | Remnant Least Concern |
| | Road |  | Remnant Of Concern |
|  | Property Boundaries |  | High Value Regrowth Least Concern |
| | | | Contours (5m) |

Issue Date	Dwg No.	Author
21 November 2019	2019-085-002	RF
Approved		Revision Note
CC		Rev B - Revised Concept Layout

(A3) GDA 94 MGA 56

1:12000



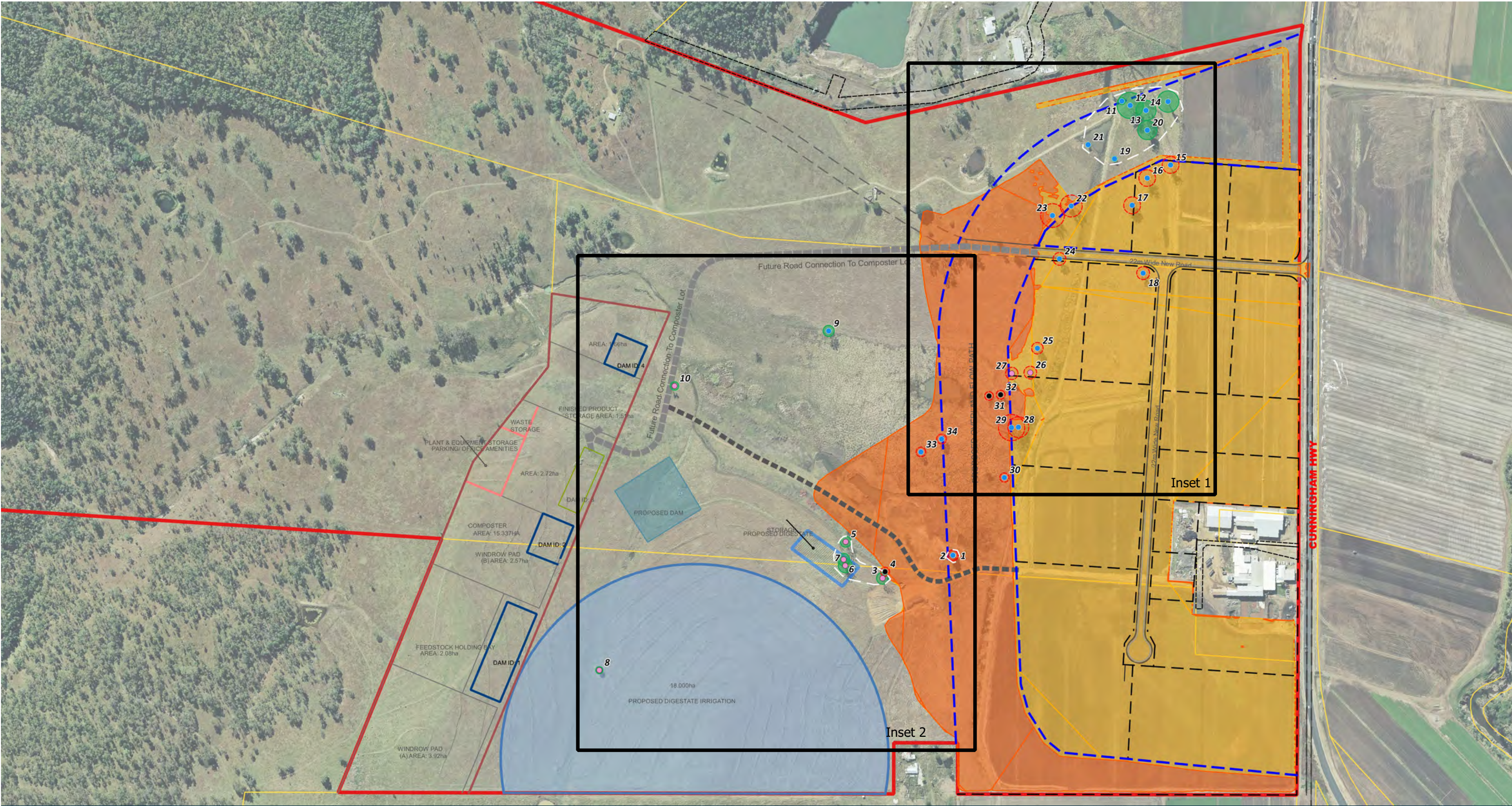


Figure 7 - Tree Retention Plan

28 South Project Ref: 2019-085

Data Sources: Qld Globe Aerial Imagery (SISP 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2019); Roads (DNRME, 2018).

28°S

ENVIRONMENTAL

Surveyed Tree Species

- Corymbia tessellaris
- Eucalyptus melanophloia
- Eucalyptus tereticornis

Tree Protection Zone

- Tree to be removed
- Tree to be retained

Site Boundary

Proposed Roads

Proposed Overland Flowpath

Proposed Cut

Proposed Fill

Property Boundaries

Issue Date

Dwg No.

Author

20 February 2020

2019-085-007_B

RF

Approved

Revision Note

MT

Rev B - Revised Concept Layout

(A3) GDA 94 MGA 56

1:5800

150

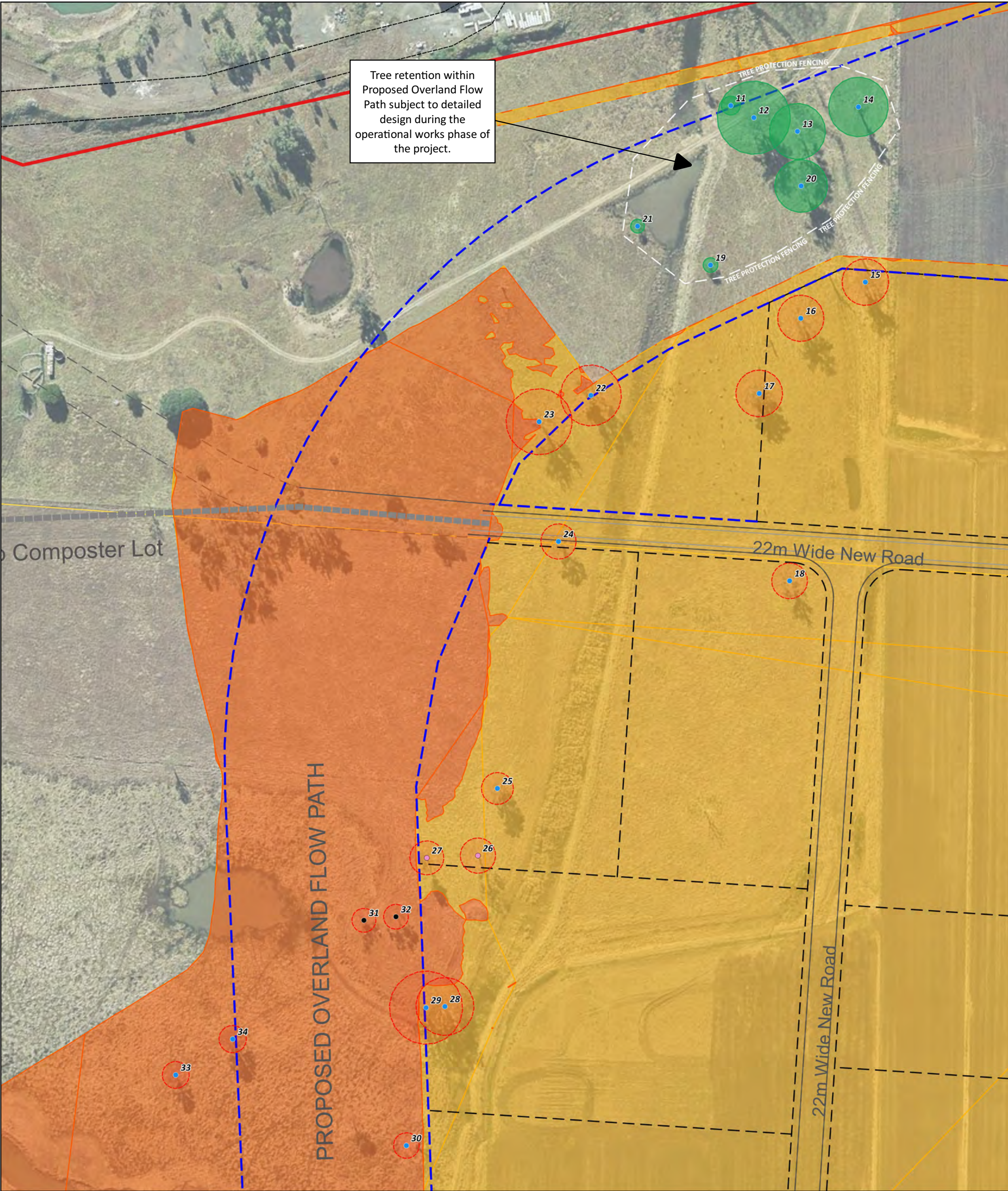
0

150

300

450 m

North Arrow



Kalfresh - Scenic Rim Agricultural Industrial Precinct

Legend

Figure 7 - Inset 1

28 South Project Ref: 2019-085

Data Sources: Qld Globe Aerial Imagery (SISP 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2019); Baseline Roads (DNRME 2017); Waterways (DNRME 2018).

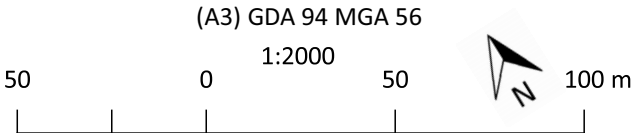
- Surveyed Tree Species**

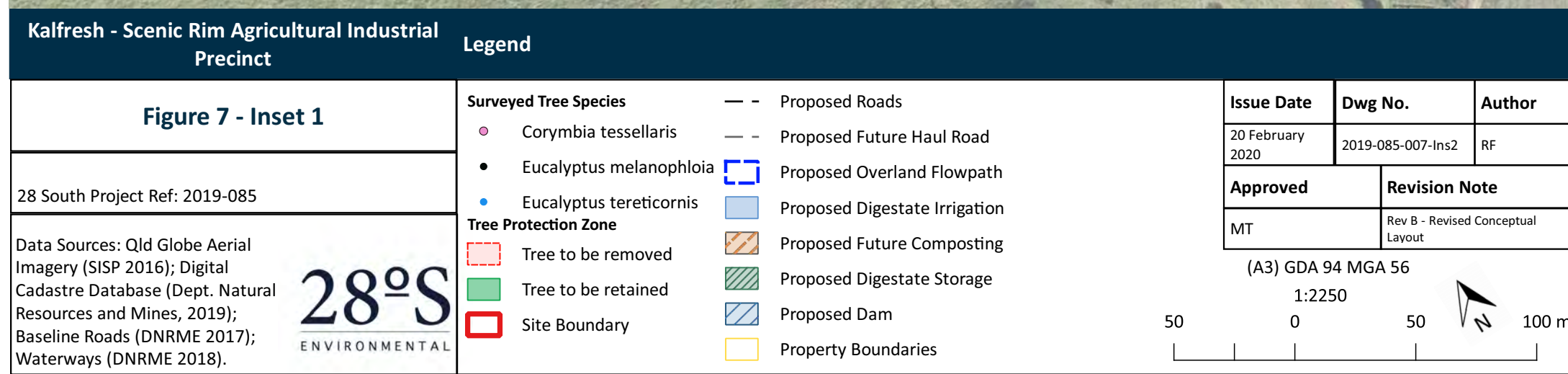
 - *Corymbia tessellaris*
 - *Eucalyptus melanophloia*
 - *Eucalyptus tereticornis*

Tree Protection Zone

 - Tree to be removed
- Tree to be retained
 - Site Boundary
 - Proposed Roads
 - Proposed Overland Flowpath
 - Proposed Cut
 - Proposed Fill

Issue Date	Dwg No.	Author
20 February 2020	2019-085-007-Ins1	RF
Approved		Revision Note
MT		Rev B - Revised Conceptual Layout





Tree ID	Scientific Name	DBH (mm)	Stems	Height (m)	Health	Comment	Structure	Comment	Habitat Features	Status	Tree Protection Zone (m)
1	Eucalyptus tereticornis	720	1 stem	15	Good	Typical	Good	Typical	No visible habitat features	Remove	8.64
2	Eucalyptus tereticornis	680	1 stem	16	Good	Typical	Good	Typical	No visible habitat features	Remove	8.16
3	Corymbia tessellaris	790	1 stem	17	Good	Typical	Good	Typical	No visible habitat features	To be retained	9.48
4	Eucalyptus melanophloia	600	1 stem	9	Declining	Epicormic Shoots	Poor	Poor Form - Limb failure	Small branch hollow	Remove	7.2
5	Corymbia tessellaris	720	1 stem	17	Good	Typical	Good	Typical	No visible habitat features	To be retained	8.64
6	Corymbia tessellaris	810	1 stem	18	Good	Typical	Good	Typical	No visible habitat features	To be retained	9.72
7	Corymbia tessellaris	920	1 stem	18	Good	Typical	Good	Typical	Small branch hollow	To be retained	11.04
8	Corymbia tessellaris	470	1 stem	16	Good	Typical	Good	Typical	No visible habitat features	To be retained	5.64
9	Eucalyptus tereticornis	730	1 stem	17	Poor	Crown Decline	Fair	Poor Form	No visible habitat features	To be retained	8.76
10	Corymbia tessellaris	560	1 stem	17	Good	Typical	Good	Poor Form	No visible habitat features	To be retained	6.72
11	Eucalyptus tereticornis	450	1 stem	14	Good	Typical	Good	Poor Form	No visible habitat features	To be retained	5.4
12	Eucalyptus tereticornis	1740	1 stem	18	Fair	Epicormic Shoots	Fair	Typical	Medium Hollow	To be retained	20.88
13	Eucalyptus tereticornis	1330	1 stem	18	Fair	Crown Decline	Fair	Typical	Medium Hollow	To be retained	15.96
14	Eucalyptus tereticornis	1415	1 stem	16	Fair	Crown Decline	Fair	Typical	Medium Hollow	To be retained	16.98
15	Eucalyptus tereticornis	1110	1 stem	14	Fair	Crown Decline and canopy failure	Fair	Typical	Multiple medium and large branch hollows	Remove	13.32
16	Eucalyptus tereticornis	1102	1 stem	16	Fair	Crown Decline - Epicormic growth	Fair	Typical	No visible habitat features	Remove	13.224
17	Eucalyptus tereticornis	1112	1 stem	16	Fair	Typical	Fair	Typical	No visible habitat features	Remove	13.344
18	Eucalyptus tereticornis	850	1 stem	16	Fair	Typical	Fair	Typical	Multiple medium branch hollows	Remove	10.2
19	Eucalyptus tereticornis	350	1 stem	14	Fair	Typical	Fair	Typical	No visible habitat features	To be retained	4.2
20	Eucalyptus tereticornis	1255	1 stem	18	Fair	Typical	Fair	Typical	Multiple medium branch hollows	To be retained	15.06
21	Eucalyptus tereticornis	330	1 stem	12	Fair	Typical	Fair	Typical	No visible habitat features	To be retained	3.96
22	Eucalyptus tereticornis	1448	1 stem	18	Fair	Typical	Fair	Typical	Multiple medium branch hollows	Remove	17.376
23	Eucalyptus tereticornis	1571	1 stem	18	Fair	Typical	Fair	Typical	Multiple medium branch hollows	Remove	18.852
24	Eucalyptus tereticornis	840	1 stem	16	Fair	Typical	Fair	Typical	No visible habitat features	Remove	10.08
25	Eucalyptus tereticornis	760	1 stem	16	Fair	Typical	Fair	Typical	No visible habitat features	Remove	9.12
26	Corymbia tessellaris	840	1 stem	18	Good	Typical	Good	Typical	No visible habitat features	Remove	10.08
27	Corymbia tessellaris	810	1 stem	17	Good	Typical	Good	Typical	No visible habitat features	Remove	9.72
28	Eucalyptus tereticornis	1380	1 stem	18	Good	Typical	Good	Typical	No visible habitat features	Remove	16.56
29	Eucalyptus tereticornis	1740	1 stem	18	Fair	Epicormic Shoots	Fair	Typical	No visible habitat features	Remove	20.88
30	Eucalyptus tereticornis	610	1 stem	16	Fair	Epicormic Shoots	Fair	Typical	No visible habitat features	Remove	7.32
31	Eucalyptus melanophloia	570	1 stem	14	Fair	Epicormic Shoots	Fair	Typical	No visible habitat features	Remove	6.84
32	Eucalyptus melanophloia	590	1 stem	14	Fair	Epicormic Shoots	Fair	Typical	No visible habitat features	Remove	7.08
33	Eucalyptus tereticornis	640	1 stem	14	Fair	Epicormic Shoots	Fair	Typical	No visible habitat features	Remove	7.68
34	Eucalyptus tereticornis	650	1 stem	15	Fair	Epicormic Shoots	Fair	Typical	No visible habitat features	Remove	7.8

ATTACHMENTS

ATTACHMENT 1

0 25 50 75 100 150 1:5,000 @ A1

SCENIC RIM AGRICULTURAL
INDUSTRIAL PRECINCT

6200 CUNNINGHAM HWY
KALBAR
CONCEPT OVERALL

PLAN REF: 142489-06L
DATE: 16 MARCH 2020
CLIENT: KALFRESH
DRAWN BY: LZ
CHECKED BY: PHE

Legend

- Site Boundary
- SRAIP Industrial Precinct
- 0.25m Contours
- Existing Boundaries
- Existing Easement
- Drainage
- Detention Basin
- Proposed Overland Flow Path
- Proposed Flow Path Q100
- Proposed Bio Basin
- Proposed Effluent Irrigation
- Proposed Digestate Irrigation
- Proposed Dam
- Proposed Digestate Storage
- Proposed Composting Area
- Lechate Pond
- Proposed Composter Lot Road Access
- Proposed Plant & Equipment
- Proposed Windrow & Finished Product
- Proposed Stormwater Basin
- Proposed Wagner Quarry Access - (not part of the SRAIP proposal and subject to separate development approval)
- Environmental Protection Area (clearing within the Environmental Protection Area is subject to future Lower Order Approval)
- Lower Order Approval Waterway
- Medium Order Queensland Waterway
- Road Connection to Composter Area
- Access Easement for Wagners Road Alignment

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:

Site boundaries: DCDB

Adjoining information: DCDB

Contours: RPS Survey

Aerial photography: RPS Survey

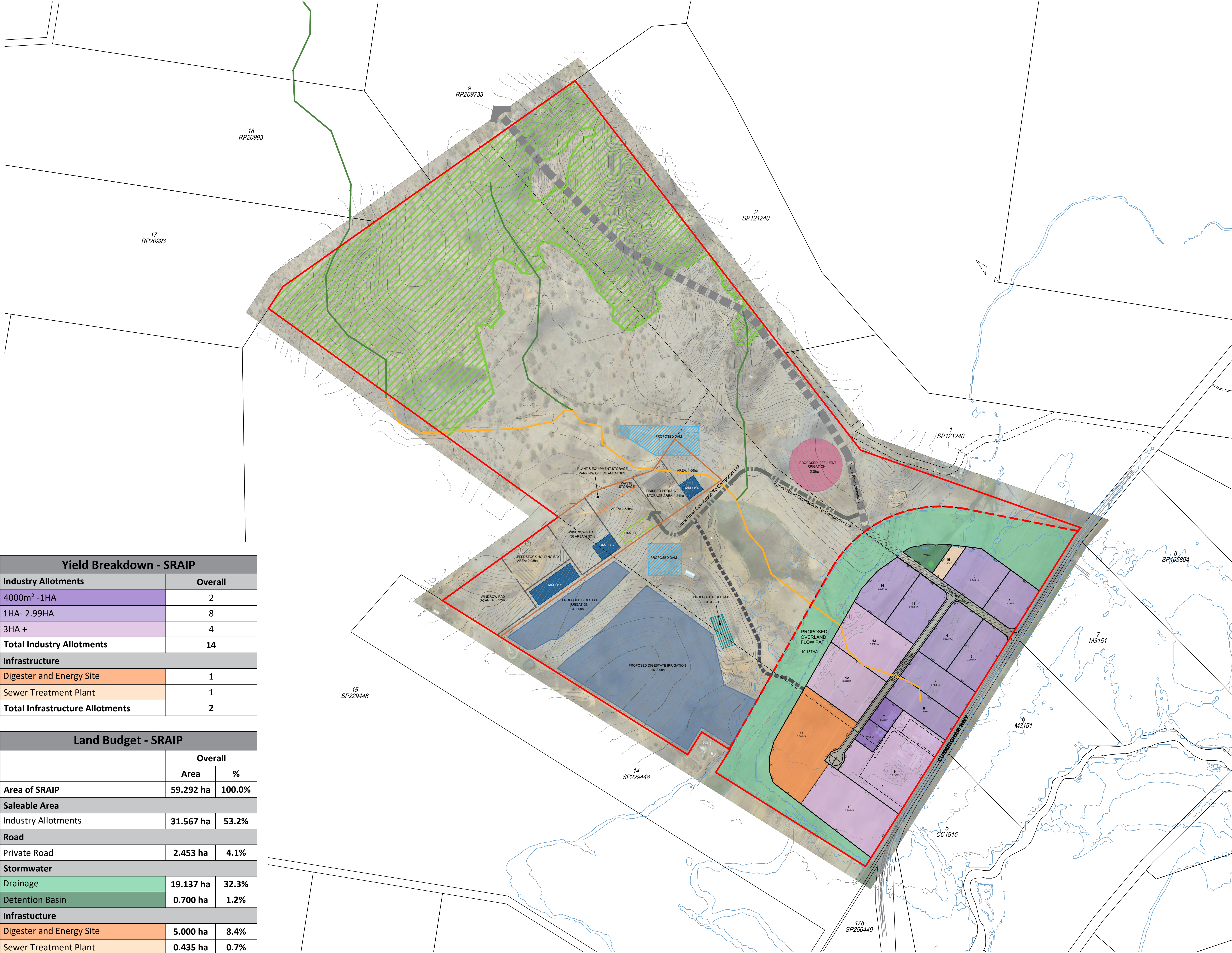
Overland Flow Path: Aurecon

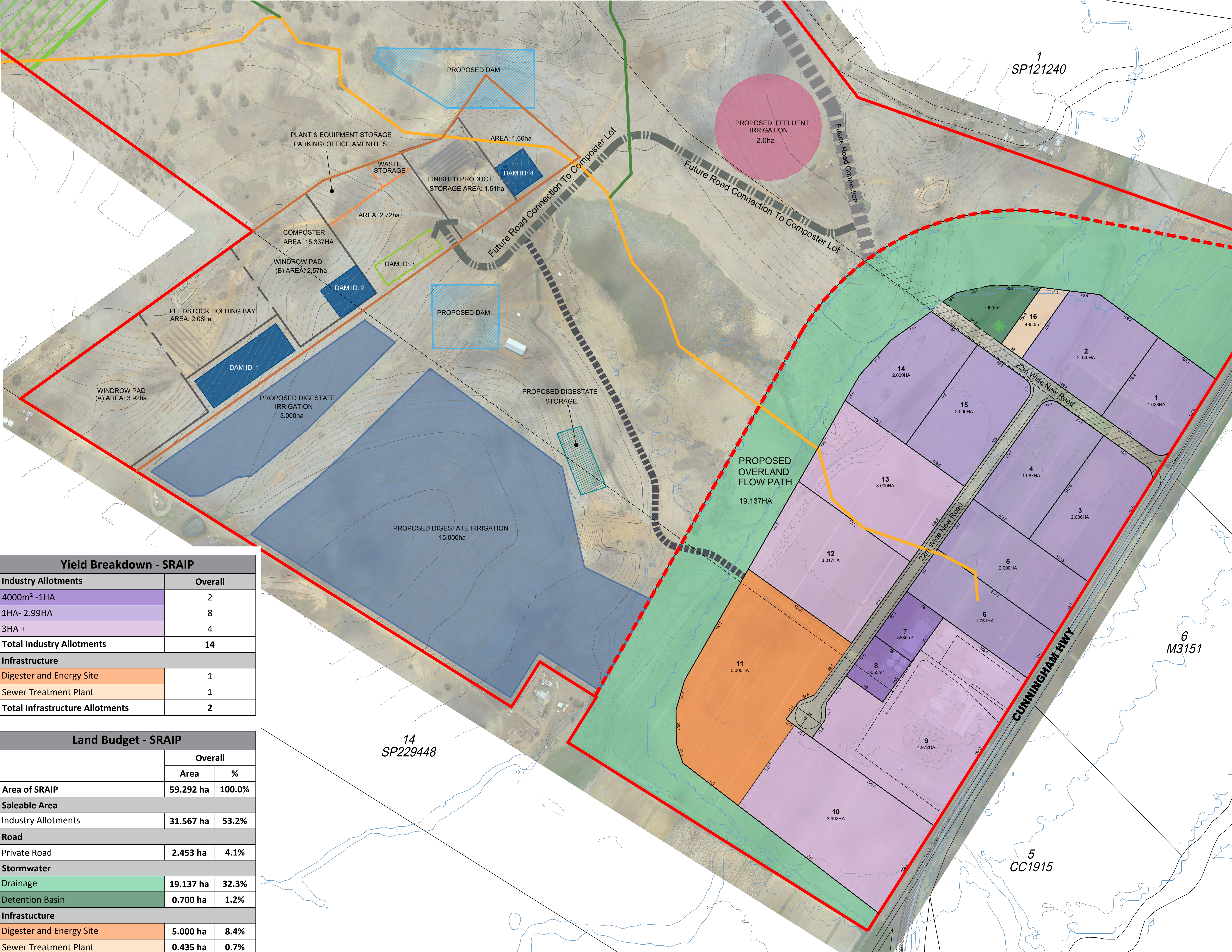


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Level 4 HQ South
520 Wickham Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
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Yield Breakdown - SRAIP		
Industry Allotments	Overall	
4000m ² -1HA	2	
1HA- 2.99HA	8	
3HA +	4	
Total Industry Allotments	14	
Infrastructure		
Digester and Energy Site	1	
Sewer Treatment Plant	1	
Total Infrastructure Allotments	2	

Land Budget - SRAIP		
	Overall	
	Area	%
Area of SRAIP	59.292 ha	100.0%
Saleable Area		
Industry Allotments	31.567 ha	53.2%
Road		
Private Road	2.453 ha	4.1%
Stormwater		
Drainage	19.137 ha	32.3%
Detention Basin	0.700 ha	1.2%
Infrastrcture		
Digester and Energy Site	5.000 ha	8.4%
Sewer Treatment Plant	0.435 ha	0.7%

0 10 20 40 60 80 1:2,500 @ A1

SCENIC RIM AGRICULTURAL
INDUSTRIAL PRECINCT

6200 CUNNINGHAM HWY
KALBAR
CONCEPT LAYOUT

PLAN REF: 142489-05M
DATE: 16 MARCH 2020
CLIENT: KALFRESH
DRAWN BY: LZ
CHECKED BY: PHE

Legend

- Site Boundary
- SRAIP Industrial Precinct
- 0.25m Contours
- Existing Boundaries
- Existing Easement
- Drainage
- Detention Basin
- Proposed Overland Flow Path
- Proposed Flow Path Q100
- Proposed Bio Basin
- Proposed Effluent Irrigation
- Proposed Digestate Irrigation
- Proposed Dam
- Proposed Digestate Storage
- Proposed Composting Area
- Lechate Pond
- Proposed Composter Lot Road Access
- Proposed Plant & Equipment
- Proposed Windrow & Finished Product
- Proposed Stormwater Basin
- Proposed Wagner Quarry Access - (not part of the SRAIP proposal and subject to separate development approval)
- Environmental Protection Area (clearing within the Environmental Protection Area is subject to future investigation/approvals)
- Low Order Queensland Waterway
- Medium Order Queensland Waterway
- Road Connection to Composter Area
- Access Easement for Wagners Road Alignment

Note:

All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:

Site boundaries: DCDB
Adjoining information: DCDB
Contours: RPS Survey
Aerial photography: RPS Survey
Overland Flow Path: Aurecon

6
M3151

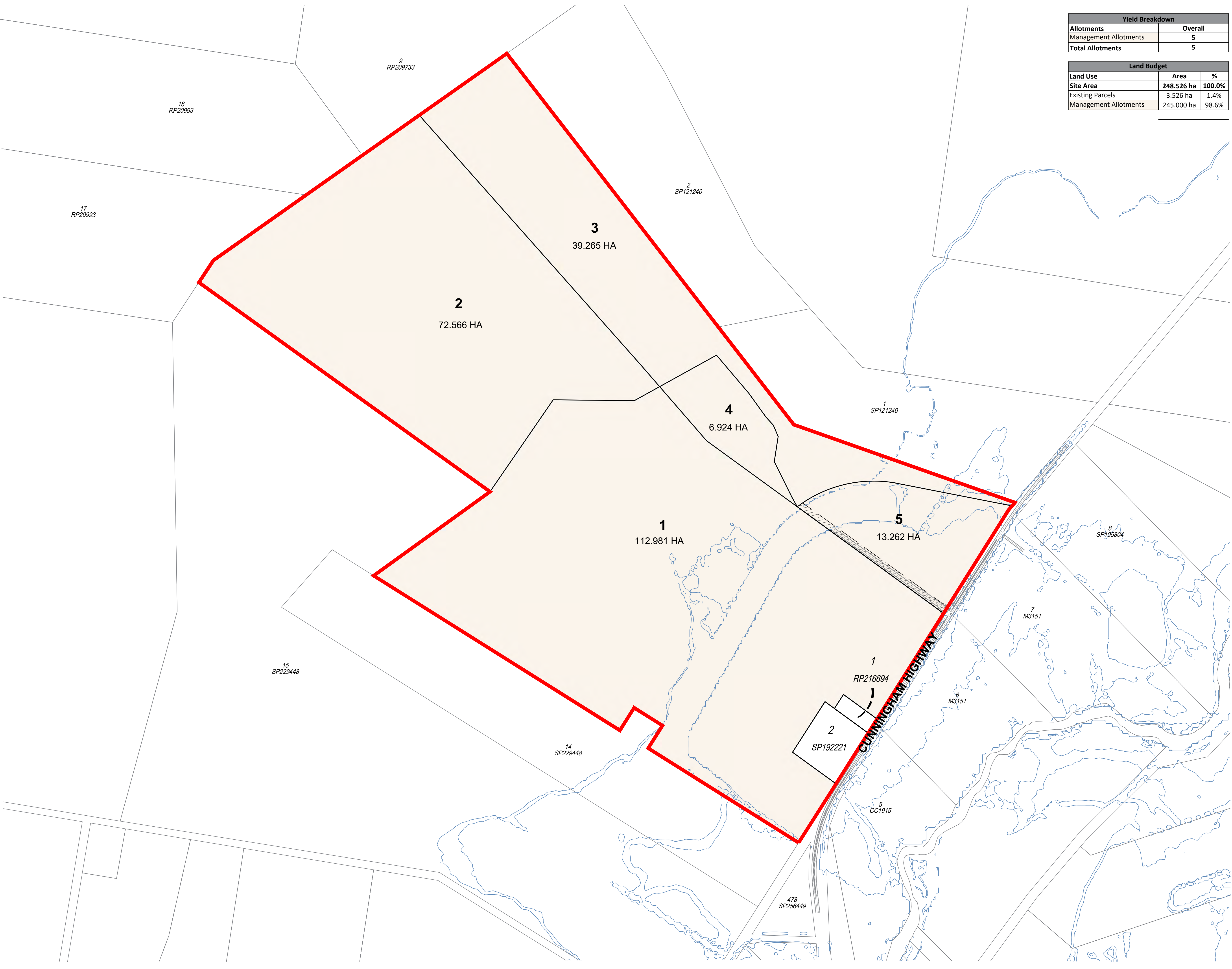
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SP229448

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Yield Breakdown	
Allotments	Overall
Management Allotments	5
Total Allotments	5

Land Budget		
Land Use	Area	%
Site Area	248.526 ha	100.0%
Existing Parcels	3.526 ha	1.4%
Management Allotments	245.000 ha	98.6%

0 25 50 75 100 150 1:5,000 @ A1

SCENIC RIM AGRICULTURAL
INDUSTRIAL PRECINCT

SUBDIVISION PLAN
6200 CUNNINGHAM HWY
KALBAR
STAGE 1

PLAN REF: **142489- 11H**
DATE: 16 MARCH 2020
CLIENT: KALFRESH
DRAWN BY: LZ
CHECKED BY: MD/PHE

Legend

- Site Boundary
- Proposed Flow Path (Q100)
- Access Easement
for Wagners Road Alignment

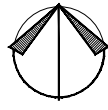
Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

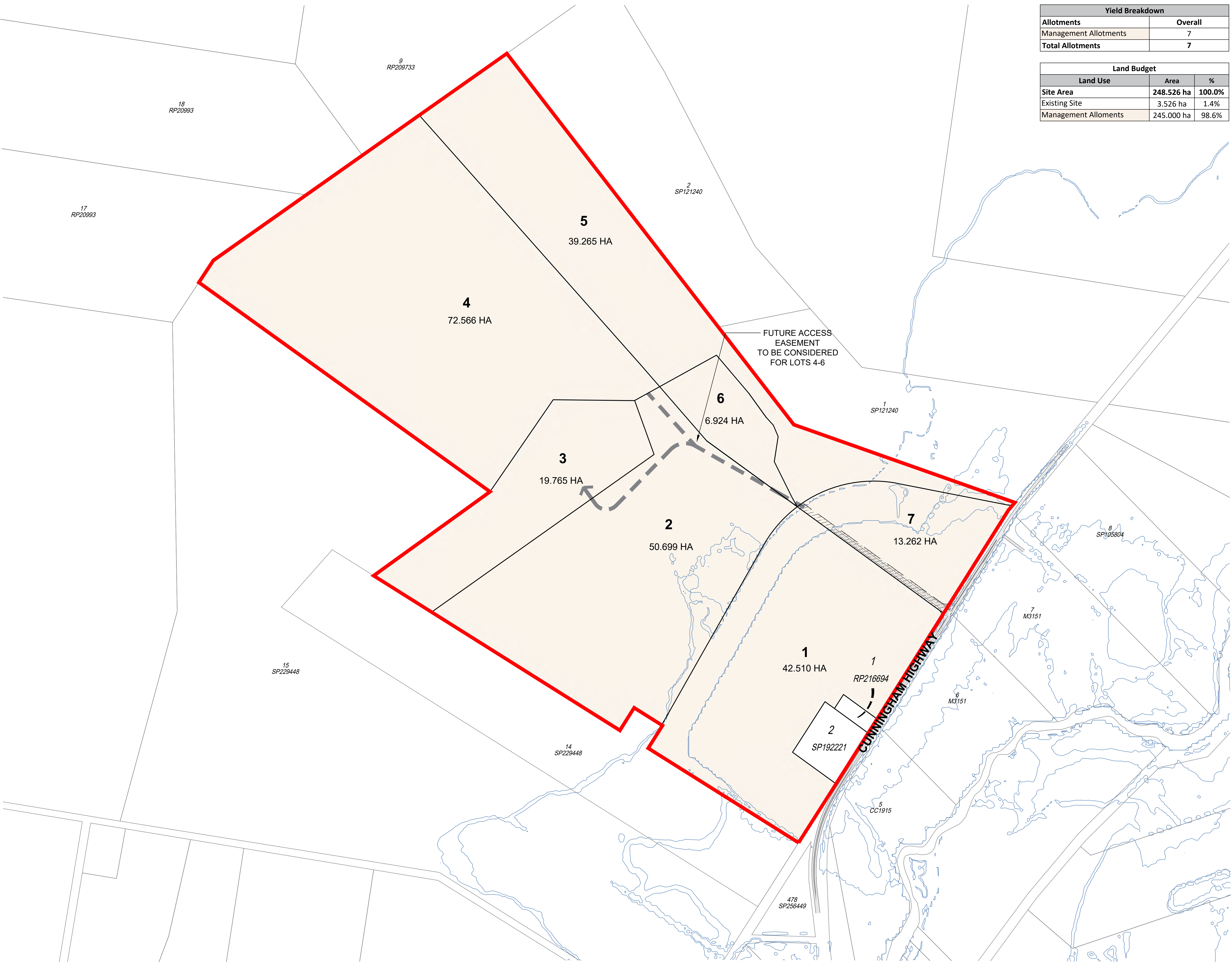
Source Information:
Site boundaries: DCDB
Adjoining information: DCDB.
Contours: RPS Survey
Overland Flow Path: Aurecon



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Yield Breakdown	
Allotments	Overall
Management Allotments	7
Total Allotments	7

Land Budget		
Land Use	Area	%
Site Area	248.526 ha	100.0%
Existing Site	3.526 ha	1.4%
Management Allotments	245.000 ha	98.6%

0 25 50 75 100 150 1:5,000 @ A1

SCENIC RIM AGRICULTURAL
INDUSTRIAL PRECINCT

SUBDIVISION PLAN
6200 CUNNINGHAM HWY
KALBAR
STAGE 2

PLAN REF: **142489- 11H**
DATE: 16 MARCH 2020
CLIENT: KALFRESH
DRAWN BY: LZ
CHECKED BY: MD/PHE

Legend

- Site Boundary
- Proposed Flow Path Q100
- Future Access Easement
- Access Easement for Wagners Road Alignment

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

Areas have been rounded down to the nearest 5m².

The boundaries shown on this plan should not be used for final detailed engineers design.

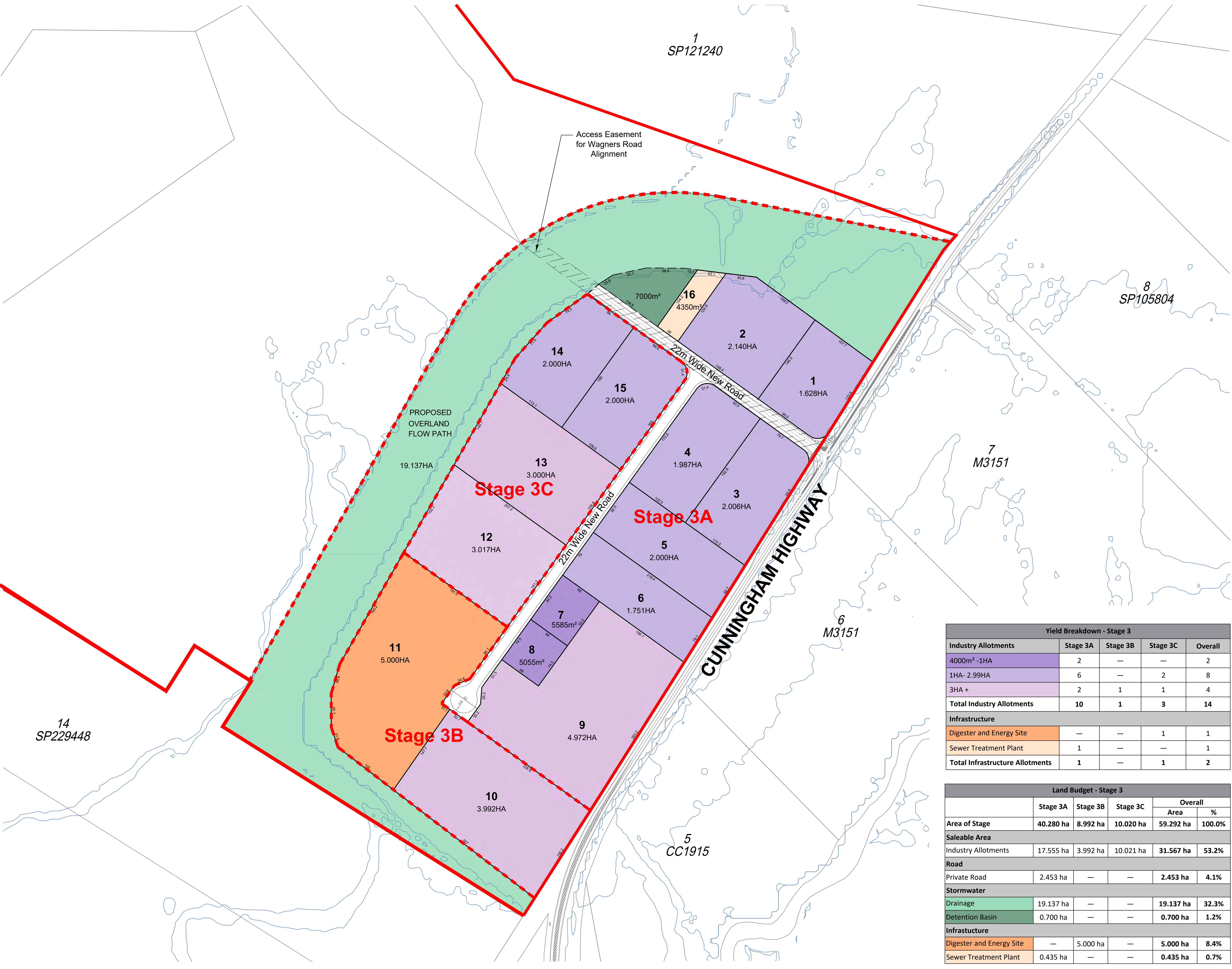
Source Information:
Site boundaries: DCDB
Adjoining information: DCDB
Contours: RPS Survey
Overland Flow Path: Aurecon



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SCENIC RIM AGRICULTURAL INDUSTRIAL PRECINCT

SUBDIVISION PLAN
6200 CUNNINGHAM HWY
KALBAR
STAGE 3

PLAN REF: **142489- 11H**

DATE: 16 MARCH 2020
CLIENT: KALFRESH
DRAWN BY: LZ
CHECKED BY: MD/PHE

Legend

- Site Boundary
- Proposed Flow Path Q100
- Stage Boundary
- Access Easement

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.
Dimensions have been rounded to the nearest 0.1 metres.
Areas have been rounded down to the nearest 5m².
The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: DCDB
Adjoining information: DCDB.
Contours: RPS Survey
Overland Flow Path: Aurecon

Yield Breakdown - Stage 3				
Industry Allotments	Stage 3A	Stage 3B	Stage 3C	Overall
4000m² -1HA	2	—	—	2
1HA- 2.99HA	6	—	2	8
3HA +	2	1	1	4
Total Industry Allotments	10	1	3	14
Infrastructure				
Digester and Energy Site	—	—	1	1
Sewer Treatment Plant	1	—	—	1
Total Infrastructure Allotments	1	—	1	2

Land Budget - Stage 3					
	Stage 3A	Stage 3B	Stage 3C	Overall	
				Area	%
Area of Stage	40.280 ha	8.992 ha	10.020 ha	59.292 ha	100.0%
Saleable Area					
Industry Allotments	17.555 ha	3.992 ha	10.021 ha	31.567 ha	53.2%
Road					
Private Road	2.453 ha	—	—	2.453 ha	4.1%
Stormwater					
Drainage	19.137 ha	—	—	19.137 ha	32.3%
Detention Basin	0.700 ha	—	—	0.700 ha	1.2%
Infrastructure					
Digester and Energy Site	—	5.000 ha	—	5.000 ha	8.4%
Sewer Treatment Plant	0.435 ha	—	—	0.435 ha	0.7%

14
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1
SP121240

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SP105804

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ATTACHMENT 2

Background and Purpose of This Plan

28 South Environmental Pty Ltd (**28 South**) has been engaged by Kalfresh Pty Ltd (**Applicant**) to prepare a Vegetation and Fauna Management Plan (**VFMP**) in association with the Draft Impact Assessment Report (**Draft IAR**) for the Scenic Rim Agricultural Industrial Precinct (**SRAIP**) Project. The SRAIP Precinct is a proposed hub for fresh and frozen food production situated over the lands described as Lot 1 on RP216694, Lot 2 on SP192221, Lot 2 on RP20974, Lot 3 on SP192221 and Lot 4 on SP192221. Collectively, these properties are referred to as the ‘**Project Site**’. This VFMP has been prepared to satisfy the requirements of the Draft Planning Scheme Policy 5 – Ecological Assessments for the Scenic Rim Regional Council.

The purpose of this VFMP is to outline the extent of the proposed works over the Project Site and the implications for vegetation, including the vegetation proposed for removal and retention as well as protection and management measures to be employed during and after the construction phase of the project. This VFMP will also provide detail on the fauna management protocols to be adopted during and after the construction phase of the project. The management measures included in this VFMP have been proposed in accordance with best practice standards and are to be employed in a proactive manner.

This VFMP is to be read in concert with all other Approved Operational Works plans prepared for the Project. This will ensure consistency and continuity across these operational works plans and their implementation. This VFMP has taken into account the proposed plans for the Site that have been prepared as part of the Draft IAR and observations made during the in-field ecological assessments undertaken by EcoSM in 2018 and by 28 South Environmental in October 2019.

Vegetation Retention Plan

The proposed vegetation retention and removal is illustrated within **VFMP-002-004**. The plans illustrate the proposed conceptual layout for the SRAIP development footprint (Appendix A of the draft IAR package). Where the proposed lots, new roads and infrastructure are situated, vegetation has been identified for removal due to the necessary requirements for earthworks and construction activities within these areas. It is understood that vegetation retention can be achieved within the proposed overland flow path and irrigation, however these areas will be subject to heavier scrutiny and assessment during the detailed design phase of the project. Vegetation has been subject to detailed botanical assessment with the following data collected for each surveyed tree: Species; DBH; Height; Spread; Health; Structure and Habitat Features.

A Tree Protection Zone (**TPZ**) has been assigned to all trees in accord with the AS4970-2009. A TPZ is represented by a buffer of 12 times the DBH. All TPZs shown for each tree within **VMP-002-004**. A review of this plan has been undertaken to

VMP-001

establish which trees are fit for retention and which trees are impacted by the approved development layout.

Tree Protection Zones and Fencing

The Project Manager will be ultimately responsible for the establishment of or engage a contractor to establish the necessary Tree Protection Fencing. Tree Protection Fencing must be erected under the direction of the Project Arborist in accordance with AS4970-2009 and remain erected prior to and during all phases of the clearing and construction.

The establishment of TPZs and the erection of tree protection fencing between the development interface and the areas for retention must occur prior to the commencement of works (refer to fencing depicted on **VMP-002-004**). This is to be inspected and approved by the project arborist or ecologist and SRRC prior to any clearing or civil works commencing. Tree Protection Fencing should be established by utilising temporary metal panel fencing or orange barrier fencing with star pickets and a top and bottom tension wire is required as a minimum. A Gap between the ground level and bottom of this fencing should be a minimum of 200mm to allow any fauna vacating clearing areas access underneath this fencing. Signage should be attached to the Fencing and should at a minimum, state: Tree Protection Zone – No Construction Access Permitted (Inset 1). Fencing should be established at the outer edge of the trees Tree Protection Zone or the trees drip line whichever is the greater, unless otherwise directed by the Project Arborist.

The fenced Tree Protection Zone must employ the following restrictions during construction phases

- No access or activities are to be carried out within the TPZ unless approved by the project arborist, SRRC or for rehabilitation purposes (e.g. weed removal and revegetation).
- All tree protection measures are to be monitored and recorded monthly. This is to be summarised in a Completion Report certifying that the tree protection was maintained for the duration of the project.
- No parking or movement of construction machinery and vehicles are permitted within the TPZ. Parking is to be limited to approved development areas.
- No vehicle access is permitted within individual TPZ’s or proximate to them. Vehicle and pedestrian access are to be restricted to areas of existing compaction or earthworks. Exhausts of vehicles or plant that are left running such as cranes, trucks and generators are not to point into the canopy of any trees proposed for retention.

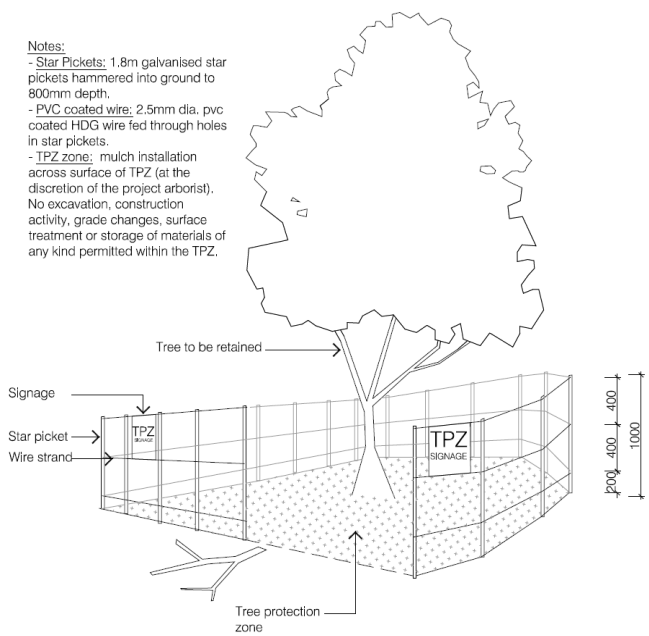
- No placement of site offices, storage sheds, portaloos, and other permanent or temporary structures within TPZ.
- No storage of topsoil, stockpiles, building materials, fuels and other chemicals is to occur within TPZs.
- No washing off vehicles and construction machinery, rinsing out fuel containers, and disposal of cleaning products is to occur within the TPZ.
- No pruning works of vegetation situated within the TPZ can be undertaken, any overhanging limbs must be assessed the project arborist and pruned in accordance with the Australian Standard (AS4373/96).



Image 1 – Temporary Metal Exclusions Fencing and Exclusion Zone Signage (Source Arbor Australis)

Pre-Start Meeting

A pre-start meeting is to occur with the following people: Project Manager, Fauna Spotter Catcher and Project Arborist/Ecologist. It would be preferable but not necessary to have the civil and clearing contractors and rehabilitation contractors at this pre-start meeting; however, they may not be appointed at this point in time. It is mandatory that the Project Manager, Project Arborist/Ecologist and Fauna Spotter Catcher are present. Once the pre-start meeting has been completed, clearing and civil works may commence under the supervision of the Project Arborist/Ecologist and Fauna Spotter Catcher.



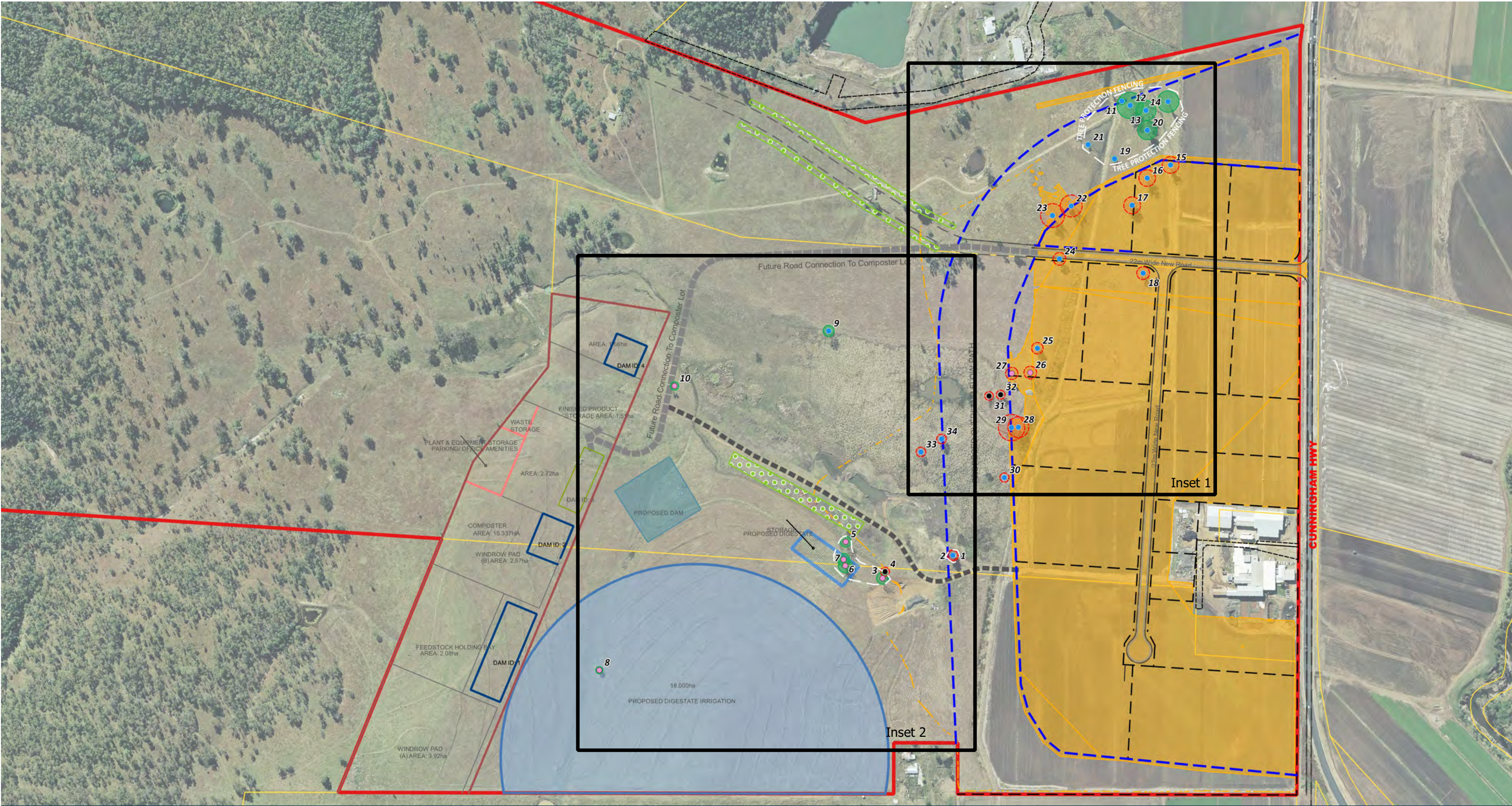


Figure 7 - Tree Retention Plan

28 South Project Ref: 2019-085

Data Sources: Qld Globe Aerial Imagery (SISP 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2019); Roads (DNRME, 2018).

28°S

ENVIRONMENTAL

Surveyed Tree Species

Corymbia tessellaris

Eucalyptus melanophloia

Eucalyptus tereticornis

Tree Protection Zone

Tree to be removed

Tree to be retained

Site Boundary

Proposed Landscaping

Proposed Roads

Proposed Overland Flowpath

Proposed Cut

Proposed Fill

Property Boundaries

Issue Date

Dwg No.

Author

20 February 2020

2019-085-007_B

RF

Approved

Revision Note

MT

Rev B - Revised Concept Layout

(A3) GDA 94 MGA 56

1:5800

150

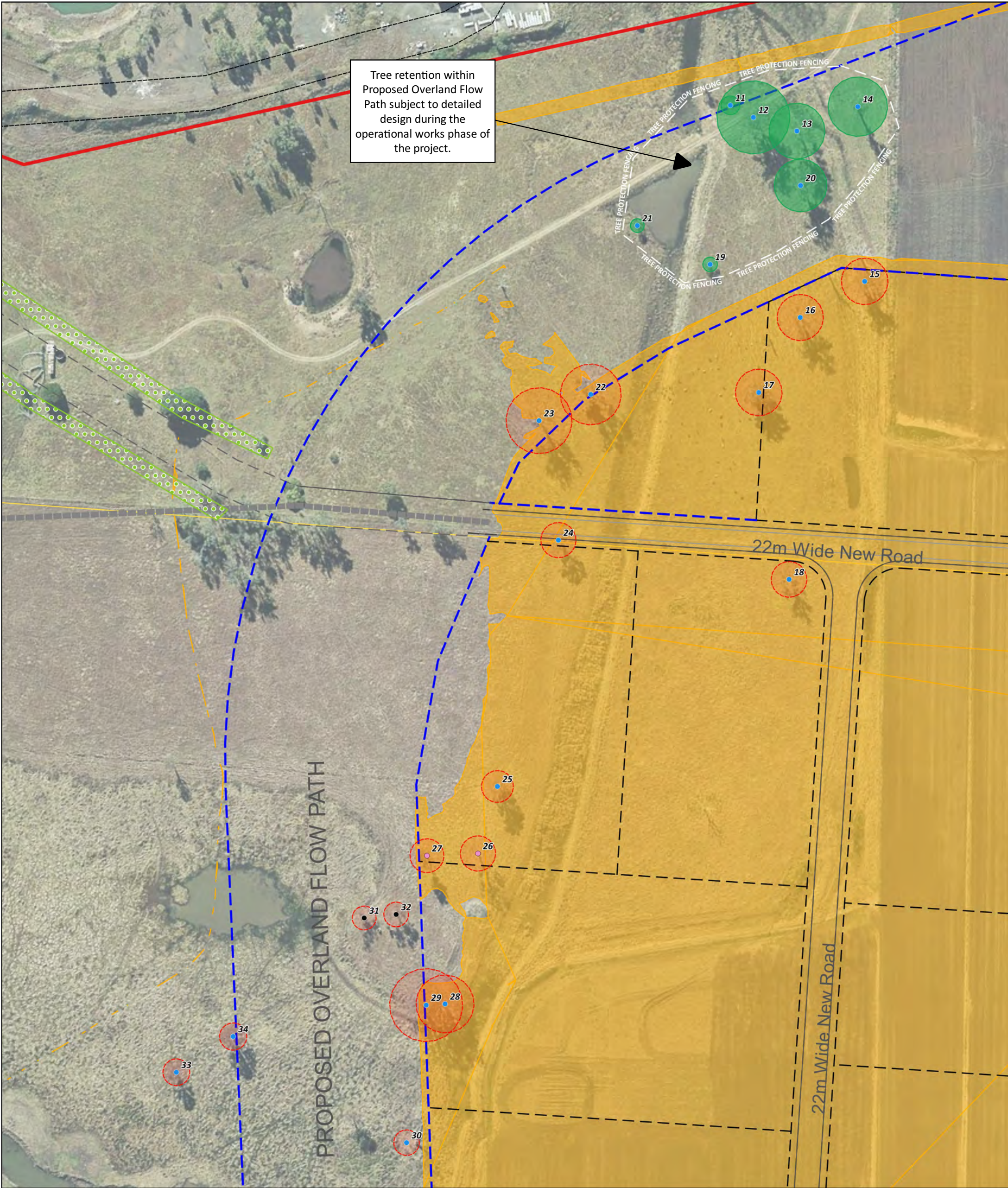
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150

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450 m

N



Kalfresh - Scenic Rim Agricultural Industrial Precinct

Legend

Figure 7 - Inset 1

28 South Project Ref: 2019-085

Data Sources: Qld Globe Aerial Imagery (SISP 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2019); Baseline Roads (DNRME 2017); Waterways (DNRME 2018).

28°S
ENVIRONMENTAL

Surveyed Tree Species

- *Corymbia tessellaris*
- *Eucalyptus melanophloia*
- *Eucalyptus tereticornis*

Tree Protection Zone

- Tree to be removed
- Tree to be retained

- Site Boundary
- Proposed Landscaping
- Proposed Roads
- Proposed Overland Flowpath
- Proposed Cut
- Proposed Fill

Issue Date	Dwg No.	Author
20 February 2020	2019-085-007-Ins1	RF
Approved		Revision Note
MT		Rev B - Revised Conceptual Layout

(A3) GDA 94 MGA 56

1:2000

50 0 50 100 m

Fauna Management Plan

As a requirement for development within the SRRC Planning Scheme Policy 5 – Ecological Assessment, a licensed Fauna Spotter Catcher is to be engaged to manage the protection and relocation of any fauna prior to and during vegetation / ecological feature clearing. The below outlines the procedures for dealing with fauna observed immediately prior to and during vegetation clearing as well as treatment and removal of injured fauna from the Site.

Habitat assessments of the proposed impact areas have identified these areas contain low to medium ecological values. Where mature canopy trees existing within the development footprint, a minor level of foraging and refuge for common or more robust fauna species is present. As such clearing should consider the presence of more robust and common urban fauna species (e.g. possums and robust avifauna species). All clearing is to be supervised by a suitably qualified and permitted fauna spotter catcher and a pre-clear inspection undertaken prior to clearing works with a certification report prepared and submitted to SRRC prior to the required pre-start meeting.

The Site is not located within a Koala Assessable Development Area. Notwithstanding, all clearing works should be undertaken generally in accordance with Schedule 11, Part 3 of the Planning Regulation 2017 and general best practice for clearing. Fauna pre-clearance surveys should be undertaken in the days prior to clearing to flag all noted habitat features within the proposed clearing areas as well as undertake koala presence surveys. Should Koalas be present within clearing areas prior to or at the time of clearing, the tree in which the identified koala is residing must be flagged and retained. Further, all trees within an interlocking canopy must also be retained as well as a vegetated escape route to assist in guiding the koala offsite of its own volition. Koalas may not be interfered with by any means unless the koala is at risk of injury or death. Only once Koalas have vacated all trees and the immediate vicinity of works can clearing operations including the host tree and surrounding vegetation commence.

All microhabitats should be flagged during specific pre-clearance inspections, and areas where the presence of ground fauna is likely to be high, should be monitored during clearance procedures. During clearing activities, an escape corridor of remnant vegetation should be maintained to allow vacating fauna safe dispersal. This will be achieved through clearing direction.

As a minimum, clearing must be conducted in a slow sequential manner. Clearing should be commenced in an east to west direction. Directional clearing will allow any fauna vacating the Site of their own volition the opportunity to move to the trees retained to the east of the development footprint.

VMP-005

Felled trees containing hollows, nests and dreys should be monitored for animal presence. Trees should be ‘tapped’ by the excavator (or other machinery being used for felling) prior to felling to allow animals time to escape. Where limited habitat or resources remain on site (and adjacent) or if safe escape corridors cannot be maintained, animals vacating felled trees should be hand captured (if possible) for relocation. Where suitable escape corridors or contiguous offsite habitat is present, animals should be monitored as they disperse of their own volition to ensure adequate temporary refuge is found. Where possible, hollow bearing trees and trees containing nests or dreys should be felled as close to sunset as practical to afford the predominantly nocturnal fauna a minimal period of daylight hours spent out of shelter.

The hollows of felled trees should be inspected for fauna, and fauna recovered if encountered, and trees be allowed to lie overnight, where felled, to allow any undetected fauna time to vacate. Felled vegetation should be inspected the following morning prior to works commencing to detect any fauna which may have sought refuge overnight.

Where possible, the fauna spotter catcher should have on them a range of nest boxes which recovered fauna can be relocated into areas where vegetation is being retained in the south EPZ areas of the Site.

Fauna Management Recommendations

In order to affect the clearing the following recommendations are made with respect to fauna management:

- 1. An appropriately qualified fauna manager / spotter-catcher(s) is commissioned and is present during the clearing of all trees which are not being retained which have any signs of fauna use. As a minimum, an inspection of all trees should be performed at the start of work on each day clearing. The determination of the fauna spotter catcher’s presence is to be solely determined by the fauna spotter catcher given the approval conductions of their Rehabilitation Permit.
- 2. An appropriate qualified clearing and earth-moving contractor with a relevant ARMP should be engaged to conduct clearing and earth moving activities. Note: all vegetation or soil moved off site must be conducted under an ARMP. It is the contractor’s responsibility to conduct all activities in accord with their ARMP.
- 3. Clearing should be commenced in an east to west direction.
- 4. Owing to the potential presence of stick nests or dreys between initial surveys and clearing, it is recommended that the understorey or dense areas of weed

within clearing fronts is under-scrubbed and removed before trees are felled. This will also allow for a safer work area for the plant operator, fauna spotter catcher and fauna alike.

- 5. All hollow bearing trees should be felled late in the afternoon and allowed to rest once felled until the following morning. This will afford for undetected fauna to potentially move of their own volition.
- 6. Upon felling and prior to moving hollow bearing trees will be inspected by the Fauna Manager/Spotter-catcher for fauna.
- 7. Any habitat tree or tree which has a fauna issue should be dealt with as advised by the onsite Fauna Manager/Spotter-catcher to obtain the best outcome for the fauna possible.
- 8. All small (non-macropod) fauna which has to be relocated during this period will be taken (if healthy) to the adjoining vegetated properties proximate to their capture location with relevance to the species known home range. All hollow dependent fauna should be re-located with species specific denning boxes where practical.
- 9. SRRC shall be advised of relocation by the Fauna Manager.
- 10. Injured animals recovered from the site should be released into a suitably qualified carer or veterinary (unless another suitably qualified veterinarian or carer can be found in a more proximate location):
 - a) Kalbar Veterinary Services - 1A Charles Street, Kalbar (07) 5463 7260; or
 - b) Walter Street Veterinary Clinic – 9 Walter Street, Boonah (07) 5463 4646.

Should you have any questions, please do not hesitate to contact Mitch Taylor of 28 South Environmental on 0488 204 523 or via e-mail mitch@28south.com.au

Tree Number	Species	Common Name	DBH (mm)	Height (m)	TPZ (m)	Health	Health Comment	Structure	Status	Habitat Features	Further Comments
1	<i>Eucalyptus tereticornis</i>	Queensland blue gum	720	15	8.64	Good	Typical	Typical	Remove		
2	<i>Eucalyptus tereticornis</i>	Queensland blue gum	680	16	8.16	Good	Typical	Typical	Remove		
3	<i>Corymbia tessellaris</i>	Moreton Bay ash	790	17	9.48	Good	Typical	Typical	To be retained		
4	<i>Eucalyptus melanophloia</i>	Silver-leaved ironbark	600	9	7.2	Declining	Epicormic Shoots	Poor Form	Remove	Limb failure, branch hollow.	
5	<i>Corymbia tessellaris</i>	Moreton Bay ash	720	17	8.64	Good	Typical	Typical	To be retained		
6	<i>Corymbia tessellaris</i>	Moreton Bay ash	810	18	9.72	Good	Typical	Typical	To be retained		
7	<i>Corymbia tessellaris</i>	Moreton Bay ash	920	18	11.04	Good	Typical	Typical	To be retained	Small branch hollows	
8	<i>Corymbia tessellaris</i>	Moreton Bay ash	470	16	5.64	Good	Typical	Typical	To be retained		
9	<i>Eucalyptus tereticornis</i>	Queensland blue gum	730	17	8.76	Poor	Crown Decline	Poor Form	To be retained		
10	<i>Corymbia tessellaris</i>	Moreton Bay ash	560	17	6.72	Good	Typical	Poor Form	To be retained		
11	<i>Eucalyptus tereticornis</i>	Queensland blue gum	450	14	5.4	Good	Typical	Poor Form	To be retained		
12	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1740	18	20.88	Fair	Epicormic Shoots	Typical	To be retained	Medium Hollow	
13	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1330	18	15.96	Fair	Crown Decline	Typical	To be retained	Medium Hollow	
14	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1415	16	16.98	Fair	Crown Decline	Typical	To be retained	Multiple medium hollows	Dead wood in canopy and significant burls
15	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1110	14	13.32	Fair	Crown Decline	Typical	Remove	Multiple medium and large hollows	Canopy failure
16	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1102	16	13.224	Fair	Crown Decline	Typical	Remove		
17	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1112	16	13.344	Fair	Crown Decline	Typical	Remove		
18	<i>Eucalyptus tereticornis</i>	Queensland blue gum	850	16	10.2	Fair	Crown Decline	Typical	Remove	Multiple medium hollows	
19	<i>Eucalyptus tereticornis</i>	Queensland blue gum	350	14	4.2	Fair	Crown Decline	Typical	To be retained		
20	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1255	18	15.06	Fair	Crown Decline	Typical	To be retained	Multiple medium hollows	
21	<i>Eucalyptus tereticornis</i>	Queensland blue gum	330	12	3.96	Fair	Crown Decline	Typical	To be retained		
22	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1448	18	17.376	Fair	Crown Decline	Typical	Remove	Multiple medium hollows	
23	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1571	18	18.852	Fair	Crown Decline	Typical	Remove	Multiple medium hollows	
24	<i>Eucalyptus tereticornis</i>	Queensland blue gum	840	16	10.08	Fair	Crown Decline	Typical	Remove		
25	<i>Eucalyptus tereticornis</i>	Queensland blue gum	760	16	9.12	Fair	Crown Decline	Typical	Remove		
26	<i>Corymbia tessellaris</i>	Moreton Bay ash	840	18	10.08	Good	Typical	Typical	Remove		
27	<i>Corymbia tessellaris</i>	Moreton Bay ash	810	17	9.72	Good	Typical	Typical	Remove		
28	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1380	18	16.56	Good	Typical	Typical	Remove		
29	<i>Eucalyptus tereticornis</i>	Queensland blue gum	1740	18	20.88	Fair	Epicormic Shoots	Typical	Remove		
30	<i>Eucalyptus tereticornis</i>	Queensland blue gum	610	16	7.32	Fair	Epicormic Shoots	Typical	Remove		
31	<i>Eucalyptus melanophloia</i>	Silver-leaved ironbark	570	14	6.84	Fair	Epicormic Shoots	Typical	Remove		
32	<i>Eucalyptus melanophloia</i>	Silver-leaved ironbark	590	14	7.08	Fair	Epicormic Shoots	Typical	Remove		
33	<i>Eucalyptus tereticornis</i>	Queensland blue gum	640	14	7.68	Fair	Epicormic Shoots	Typical	Remove		
34	<i>Eucalyptus tereticornis</i>	Queensland blue gum	650	15	7.8	Fair	Epicormic Shoots	Typical	Remove		

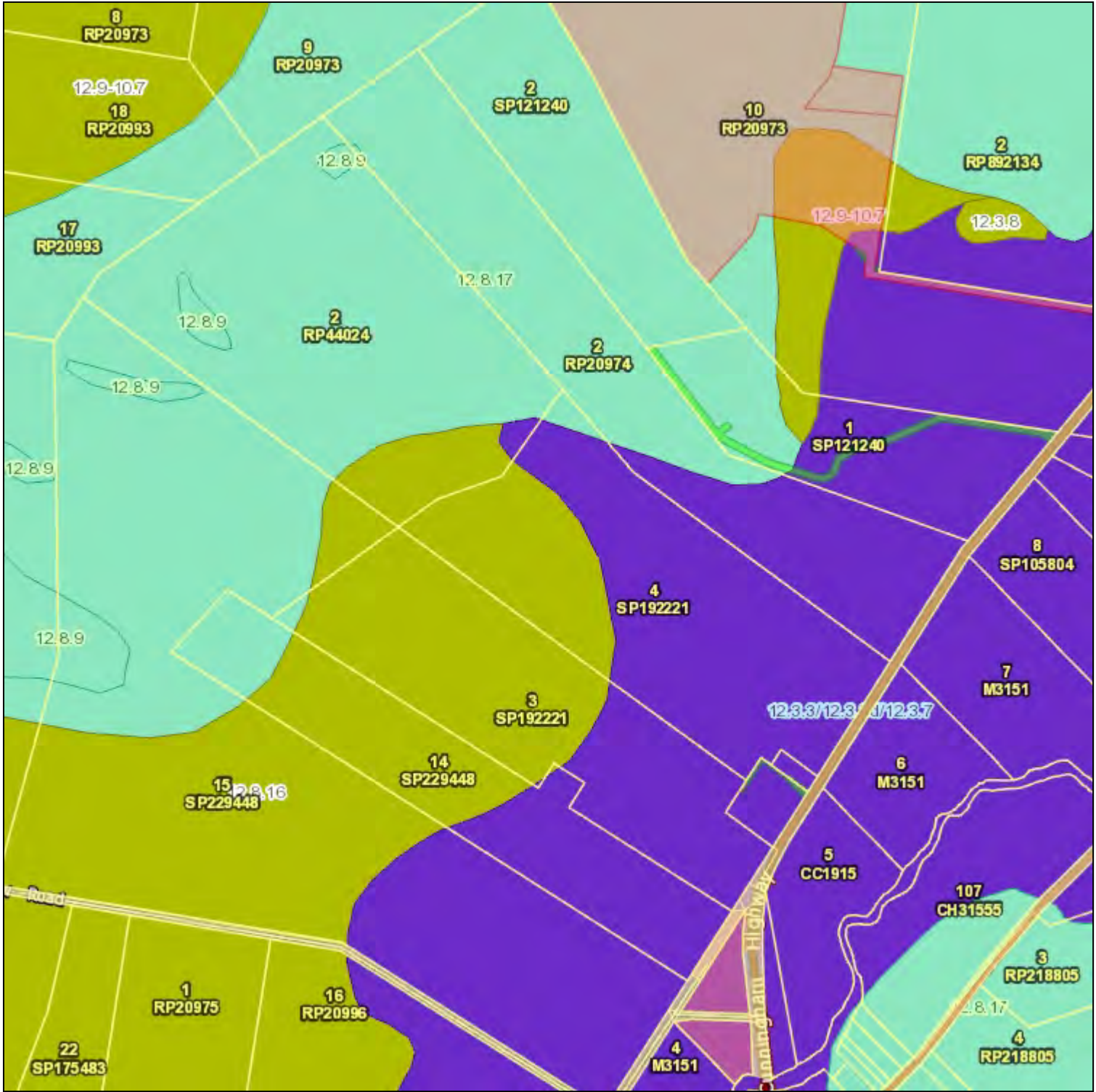
ATTACHMENT 3

Pre-clear Regional Ecosystems

SRAIP

27°55'45"S 152°33'26"E

27°55'45"S 152°35'16"E

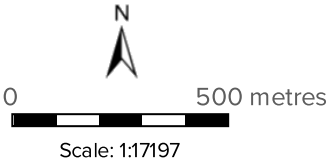


27°57'22"S 152°33'26"E

27°57'22"S 152°35'16"E

A product of

Legend located on next page



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Datum: Geocentric Datum of Australia 1994
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Department of Natural Resources, Mines and Energy

Pre-clear Regional Ecosystems

SRAIP

Legend

Attribution

Natural parcel boundary



Road parcel



Land parcel



Easement parcel



Strata parcel



Volumetric parcel



Land parcel label

Biodiversity status - preclear

Endangered - Dominant vegetation

Endangered - Sub-dominant

Of Concern - Dominant

Of Concern - Sub-dominant

No concern at present

Estuary, ocean

Road

Highway

Main

Local

Private

Railway



Cities and Towns



DigitalGlobe

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Queensland Herbarium (2018) Biodiversity Status of Pre-clearing Regional Ecosystems of Queensland, Version 11 (December 2018). State of Queensland (Department of Environment and Science).

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Regional ecosystem details for 12.3.3

Regional ecosystem	12.3.3
Vegetation Management Act class	Endangered
Wetlands	Floodplain (other than floodplain wetlands).
Biodiversity status	Endangered
Subregion	10, 7, 8, 6, 2, (5), (11.31), (3), (1), (11.18), (4), (11.22), (11.14)
Estimated extent ¹	Pre-clearing 438000 ha; Remnant 2017 40000 ha
Extent in reserves	Low
Short description	Eucalyptus tereticornis woodland on Quaternary alluvium
Structure category	Sparse
Description	Eucalyptus tereticornis woodland. Eucalyptus crebra and E. moluccana are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include Angophora subvelutina or A. floribunda, Corymbia clarksoniana, C. intermedia, C. tessellaris, Lophostemon suaveolens and E. melanophloia. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. (BVG1M: 16c)

Vegetation communities in this regional ecosystem include:

12.3.3a: *Eucalyptus crebra*, *C. tessellaris* woodland to open forest. Other species that may be present as scattered individuals or clumps include *Corymbia clarksoniana*, *Eucalyptus melanophloia*, *E. tereticornis* and *C. citriodora* subsp. *variegata*. Occurs on high level alluvial plains often of Pleistocene age, terraces and fans where rainfall is usually less than 1000mm/y. Floodplain (other than floodplain wetlands). (BVG1M: 18b)

12.3.3b: [Not in RE version 11]²: This vegetation community is now mapped as 12.3.19. Open forest to woodland of *Eucalyptus moluccana* and/or *Eucalyptus tereticornis* and *E. crebra*, with a sparse to mid-dense understorey of *Melaleuca irbyana*. Occurs on margins of Quaternary alluvial plains. Floodplain (other than floodplain wetlands). (BVG1M: 13d)

12.3.3c: [Not in RE version 11]²: This vegetation community is now mapped as 12.3.18. *Melaleuca irbyana* low open forest or thicket. Emergent *Eucalyptus moluccana*, *E. crebra*, *E. tereticornis* or *Corymbia citriodora* subsp. *variegata* may be present. Occurs on Quaternary alluvial plains where drainage of soils is impeded. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 21b)

12.3.3d: *Eucalyptus moluccana* woodland. Other frequently occurring species include *Eucalyptus tereticornis*, *E. crebra*, *E. siderophloia*, *Corymbia citriodora* subsp. *variegata*, *Angophora leiocarpa* and *C. intermedia*. Occurs on margins of Quaternary alluvial plains often adjacent sedimentary geologies. May also occur on stranded Pleistocene river terraces. Floodplain (other than floodplain wetlands). (BVG1M: 13d)

Supplementary description	Ryan, T.S. (ed.) (2012); Bean et al. (1998), E10.
Protected areas	Bulburin NP, Eurimbula NP, Littabella NP, Curtis Island NP, Beninbi NP, Good Night Scrub NP, Bunya Mountains NP, Curtis Island CP, Grongah NP, Warro NP, Mount Colosseum NP, Dawes NP, Nour Nour NP, Southend CP, Main Range NP, Bottle Creek CP, Mount Barney
Special values	Habitat for threatened plant species including <i>Rhaponticum australe</i> . 12.3.3a: Habitat for threatened plant species including occasional <i>Rhaponticum australe</i> . 12.3.3b: Habitat for threatened flora species including <i>Melaleuca irbyana</i> . 12.3.3c: Habitat for threatened flora species including <i>Melaleuca irbyana</i> and <i>Marsdenia coronata</i> . 12.3.3d: Habitat for threatened plant species including <i>Rhaponticum australe</i> .
Fire management guidelines	SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.
Comments	12.3.3: While <i>Eucalyptus tereticornis</i> remains common in the landscape, very few intact stands remain. <i>Eucalyptus tereticornis</i> grows into a very large hollow-forming tree and has a special significance for fauna species, especially in drier areas. The

type is variable, ranging from woodland in drier parts to tall open forest in higher rainfall areas and mono-specific to mixed with other canopy species. *Eucalyptus tereticornis* will regenerate readily but there is a lack of recruitment to replace old trees in stands that are logged, thinned or grazed and regularly burnt. The grasses and herbs associated with intact *Eucalyptus tereticornis* communities also persist in the landscape, so there is a potential for re-establishing the RE and increasing its remnant area. *Eucalyptus tereticornis* is replaced by *E. grandis* in highest-rainfall parts of the bioregion. Sub-coastal and inland parts of bioregion. Also occurs in coastal areas north of Bundaberg. 12.3.3a: Sub-coastal and inland parts of bioregion. Characteristic localities include Burnett River catchment and Ripley Valley. Too small to map at 1:100 000 scale. 12.3.3b: Restricted to the Ipswich and Jimboomba regions. Erected as new RE 12.3.19 in August 2016. 12.3.3c: Restricted to the Ipswich and Jimboomba regions. This floristic association on land zone 9-10 is mapped as 12.9-10.11.

¹ Estimated extent is from version 11 pre-clearing and 2017 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/) (<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/>).

² Superseded: Revision of the regional ecosystem classification removed this regional ecosystem code from use. It is included in the regional ecosystem description database because the RE code may appear in older versions of RE mapping and the Vegetation Management regulation.

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Regional ecosystem details for 12.3.7

Regional ecosystem	12.3.7
Vegetation Management Act class	Least concern
Wetlands	Riverine wetland or fringing riverine wetland.
Biodiversity status	Of concern
Subregion	7, 10, 8, 2, 5, (3), (6), (1), (11.31), (4), (9), (11.18)
Estimated extent ¹	Pre-clearing 118000 ha; Remnant 2017 60000 ha
Extent in reserves	Low
Short description	Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp. fringing woodland
Structure category	Sparse

Description Narrow fringing woodland of Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca viminalis. Other species associated with this RE include Melaleuca bracteata, M. trichostachya, M. linariifolia. North of Brisbane Waterhousea floribunda commonly occurs and may at times dominate this RE. Melaleuca fluviatilis occurs in this RE in the north of the bioregion. Lomandra hystrix often present in stream beds. Occurs on fringing levees and banks of rivers and drainage lines of alluvial plains throughout the region. (BVG1M: 16a)

Vegetation communities in this regional ecosystem include:

12.3.7a: *Melaleuca bracteata* open forest +/- emergent *Eucalypts tereticornis*.

Occurs in drainage depressions on Quaternary alluvial plains. Riverine wetland or fringing riverine wetland. (BVG1M: 22c)

12.3.7b: Naturally occurring instream waterholes and lagoons, both permanent and intermittent. Includes exposed stream bed and bars. Occurs in the bed of active (may be intermittent) river channels. Riverine wetland or fringing riverine wetland. (BVG1M: 16d)

12.3.7c: Billabongs and ox-bow lakes containing either permanent or periodic water bodies. Often fringed with *Eucalyptus tereticornis* Old river beds now cut off from regular flow. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 34d)

12.3.7d: Aquatic vegetation usually fringed with *Eucalyptus tereticornis*. Closed depressions on alluvial plains. Palustrine wetland (e.g. vegetated swamp). (BVG1M: 34d)

Supplementary description	Ryan, T.S. (ed.) (2012); Bean et al. (1998), E11, E12
Protected areas	Lockyer NP, Wongi NP, Curtis Island NP, Bulburin NP, Main Range NP, Grongah NP, Cordalba NP, Crows Nest NP, Warro NP, Mount Walsh NP, Bania NP, Great Sandy NP, Woowoonga NP, Esk NP, Eurimbula NP, Wrattens NP, Burrum Coast NP, D'Aguilar NP, Curtis Island C
Special values	Habitat for an extensive range of aquatic flora and fauna.
Fire management guidelines	STRATEGY: Avoid intentionally burning this fringe vegetation. Burn surrounding ecosystems in conditions that would minimise fire incursion. ISSUES: Protection relies on broad-scale management of surrounding country. However, fire exclusion is not necessary. <i>Casuarina cunninghamiana</i> is sensitive to fire and germination after fire is typically low. Triggers unrelated to fire appear to maintain a healthy ecosystem. Issues with lantana and other weeds may result from fire and other disturbance.
Comments	12.3.7: Too small to map at 1:100 000 scale. Prone to invasions by weeds such as (Chinese elm) <i>Celtis sinensis</i> , (broad leaved pepper tree) <i>Schinus terebinthifolius</i> and (cat's claw creeper) <i>Macfadyena unguis-cati</i> . Canopy height and cover is highly variable due to flood damage. 12.3.7a: Prone to invasions by weeds such as Chinese elm <i>Celtis sinensis</i> , broad leaved pepper tree <i>Schinus terebinthifolius</i> and cat's claw creeper <i>Macfadyena unguis-cati</i> . Too small to map at 1:100 000 scale. 12.3.7b: Vegetation may occur on infrequently inundated areas. 12.3.7c: Vegetation occurs on infrequently inundated areas. 12.3.7d: Vegetation occurs on infrequently inundated areas. Generally too small to map at 1:100 000 scale. Important for water birds and freshwater invertebrates and vertebrates such as tortoises.

¹ Estimated extent is from version 11 pre-clearing and 2017 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/).



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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.8.16**

Regional ecosystem details for 12.8.16

Regional ecosystem	12.8.16
Vegetation Management Act class	Of concern
Biodiversity status	Of concern
Subregion	1, 6, 11.31, 2, (8), (5), (3), (7), (11.22)
Estimated extent ¹	Pre-clearing 113000 ha; Remnant 2017 33000 ha
Extent in reserves	Medium
Short description	Eucalyptus crebra +/- E. melliodora, E. tereticornis woodland on Cainozoic igneous rocks
Structure category	Sparse
Description	Eucalyptus crebra, generally with E. melliodora and E. tereticornis +/- E. albens grassy woodland. Occurs on dry hillslopes on Cainozoic igneous rocks, especially basalt. (BVG1M: 11a)
Supplementary description	Ryan, T.S. (ed.) (2012); Bean et al. (1998), G31, G31a
Protected areas	Bunya Mountains NP, Main Range NP, Lamington NP, Pidna NP, Mount Beau Brummell CP, Tamborine NP

Special values	Habitat for threatened plant species including <i>Rhaponticum australe</i> and near threatened species including <i>Callitris baileyi</i> .
Fire management guidelines	SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: A grassy system is especially important for species such as the eastern bristlebird and its habitat. Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.
Comments	Naturalised species associated with this regional ecosystem include * <i>Dichanthium aristatum</i> . Most extensive occurrences are in southern part of bioregion.

¹ Estimated extent is from version 11 pre-clearing and 2017 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/).

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.8.17**

Regional ecosystem details for 12.8.17

Regional ecosystem	12.8.17
Vegetation Management Act class	Least concern
Biodiversity status	No concern at present
Subregion	2, 1, 11.31, (6), (10), (5), (7)
Estimated extent ¹	Pre-clearing 77000 ha; Remnant 2017 28000 ha
Extent in reserves	Medium
Short description	Eucalyptus melanophloia +/- E. crebra, E. tereticornis, Corymbia tessellaris woodland on Cainozoic igneous rocks
Structure category	Sparse
Description	Eucalyptus melanophloia +/- E. crebra, E. tereticornis, Corymbia tessellaris, C. intermedia and/or C. clarksoniana, E. melliodora, Angophora subvelutina grassy woodland. Occurs on Cainozoic igneous rocks, especially basalt. (BVG1M: 11a)
Supplementary description	Ryan, T.S. (ed.) (2012); Bean et al. (1998), G32
Protected areas	Main Range NP, Bunya Mountains NP, Mount Barney NP, Dwyers Scrub CP, Mount Beau Brummell CP, Dawes NP, Cordalba NP, Mount Binga NP, White Rock CP, Lockyer NP, Pidna NP, Mount Chinghee NP, Flagstone Creek CP

Special values	Habitat for threatened plant species including <i>Rhaponticum australe</i> .
Fire management guidelines	SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.
Comments	<i>Corymbia erythrophloia</i> replaces other bloodwoods in northern part of bioregion. Cleared for pasture.

¹ Estimated extent is from version 11 pre-clearing and 2017 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/).

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ATTACHMENT 4



Kalfresh - Scenic Rim Agricultural Industrial Precinct

Legend

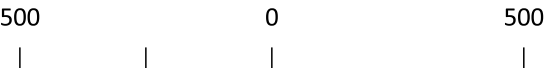
Attachment 4 - Historical Aerial Imagery (1944 + 1963)

28 South Project Ref: 2019-085

Data Sources: Digital Cadastre Database (Dept. Natural Resources and Mines, 2016); Q Imagery (1944 & 1963)

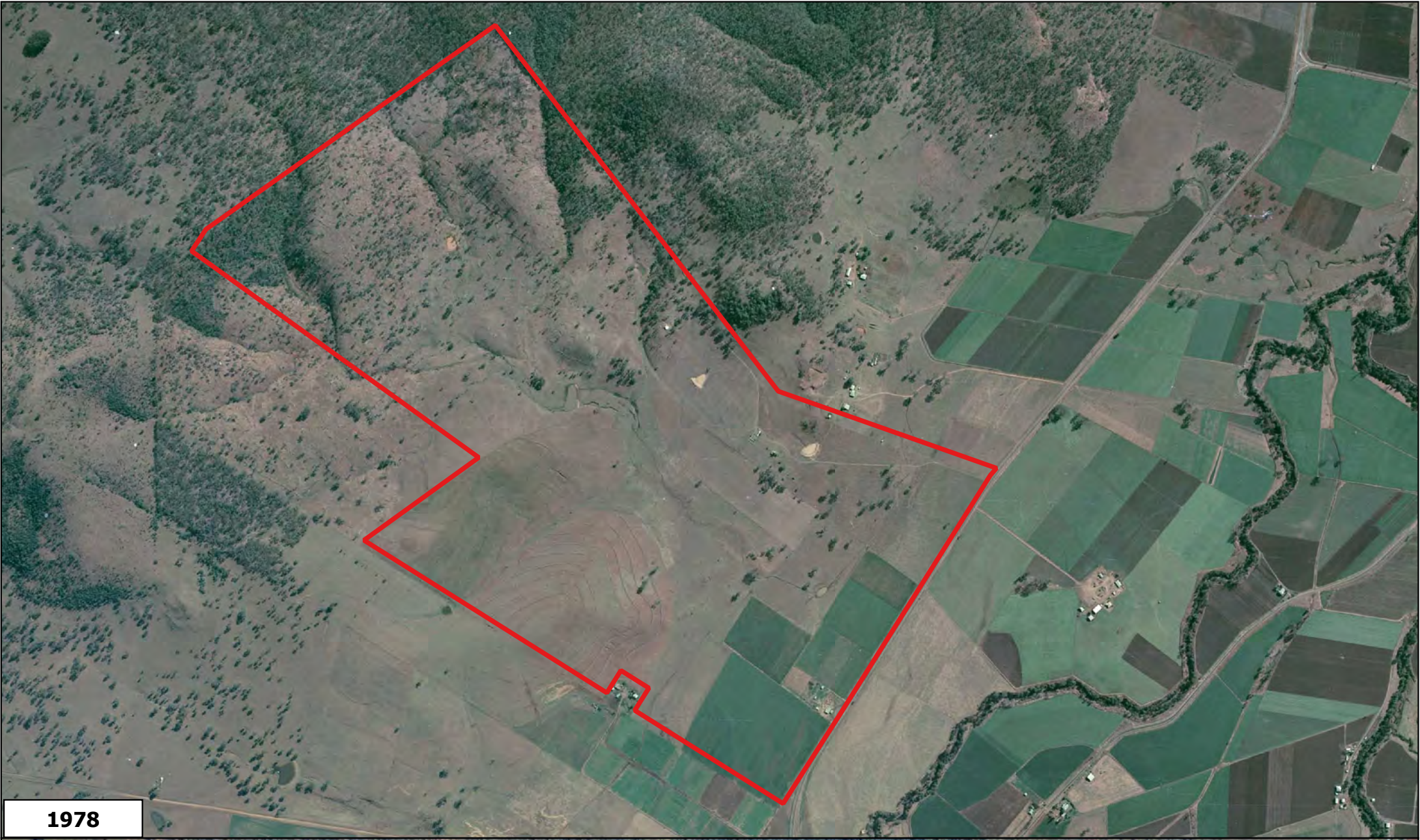


 Site Boundary



(A3) GDA 94 MGA 56
1:15000
1000





Kalfresh - Scenic Rim Agricultural Industrial Precinct

28 South Project Ref: 2019-085

Data Sources: Digital Cadastre Database (Dept. Natural Resources and Mines, 2016); Q Imagery (1944 & 1963)

28°S

ENVIRONMENTAL

Legend

Site Boundary

Attachment 4 - Historical Aerial Imagery (1978 + 1998)

28 South Project Ref: 2019-085

Data Sources: Digital Cadastre Database (Dept. Natural Resources and Mines, 2016); Q Imagery (1944 & 1963)

Issue Date

Dwg. No.

Author

21 November 2019

2019-085-A04

RF

Approved

Revision Note

MT

(A3) GDA 94 MGA 56

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ATTACHMENT 5



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: 24/10/19 09:47:51

[Summary](#)

[Details](#)

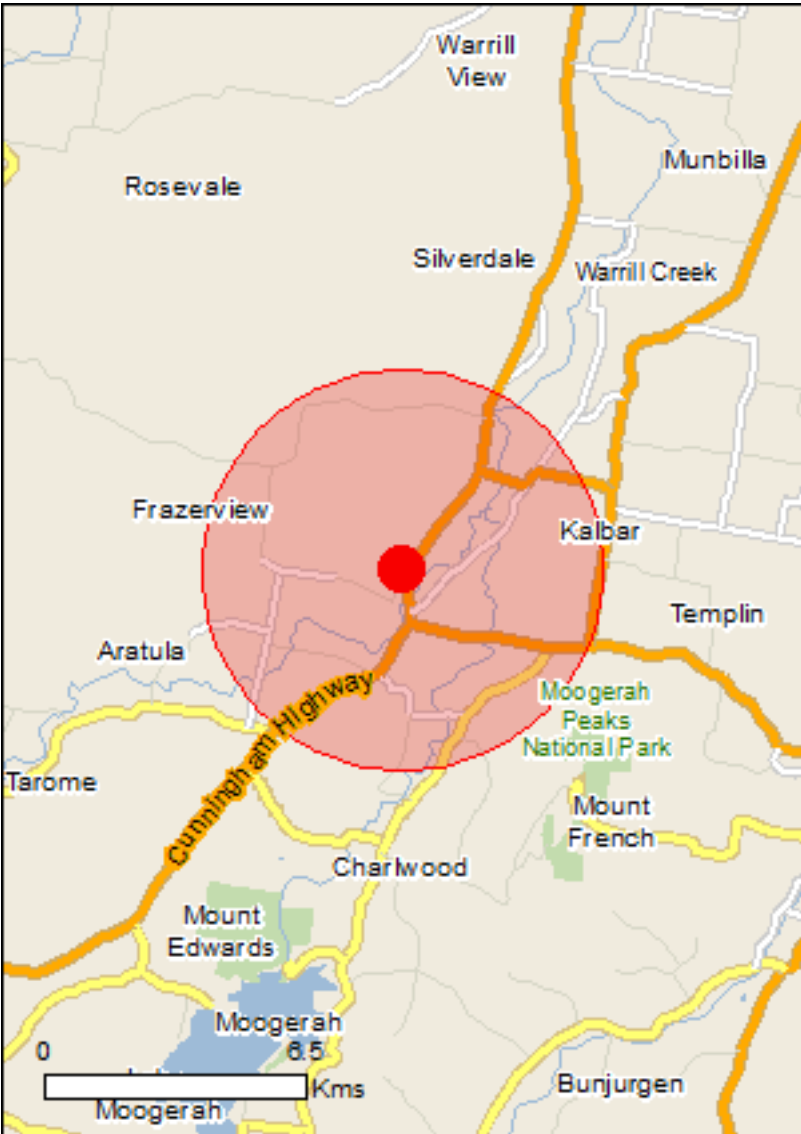
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

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[Coordinates](#)

[Buffer: 5.0Km](#)



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:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	37
Listed Migratory Species:	16

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:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Moreton bay	50 - 100km upstream	

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
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to 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
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Mixophyes fleayi Fleay's Frog [25960]	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 likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat known 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 known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Bertya ernestiana a shrub [78349]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Cupaniopsis tomentella Boonah Tuckeroo [3322]	Vulnerable	Species or species habitat known to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Lepidium peregrinum Wandering Pepper-cress [14035]	Endangered	Species or species habitat may occur within area
Lychnothamnus barbatus a green alga [64479]	Endangered	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area

Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	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		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[<u>Resource Information</u>]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
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

Name	Threatened	Type of Presence
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		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 likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to 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		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		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 known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
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
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
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		
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area Species or species habitat may occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to 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] Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area 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
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and		Species or species

Name	Status	Type of Presence
Sterile Pussy Willow [68497]		habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium		
Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

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 and National Heritage properties, Wetlands of International and National 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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

-27.94981 152.57784

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:

- [Office of Environment and Heritage, New South Wales](#)
- [Department of Environment and Primary Industries, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment, Water and Natural Resources, South Australia](#)
- [Department of Land and Resource Management, Northern Territory](#)
- [Department of Environmental and Heritage Protection, Queensland](#)
- [Department of Parks and Wildlife, Western Australia](#)
- [Environment and Planning Directorate, ACT](#)
- [Birdlife Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [South Australian 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, Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- [Australian Tropical Herbarium, Cairns](#)
- [eBird Australia](#)
- [Australian Government – Australian Antarctic Data Centre](#)
- [Museum and Art Gallery of the Northern Territory](#)
- [Australian Government National Environmental Science Program](#)
- [Australian Institute of Marine Science](#)
- [Reef Life Survey Australia](#)
- [American Museum of Natural History](#)
- [Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- 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.

ATTACHMENT 6



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Status: All

Records: All

Date: Since 1980

Latitude: -27.9498

Longitude: 152.5778

Distance: 5

Email: mitch@28south.com.au

Date submitted: Thursday 24 Oct 2019 08:47:36

Date extracted: Thursday 24 Oct 2019 09:00:02

The number of records retrieved = 413

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	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			10
animals	amphibians	Hylidae	<i>Litoria rubella</i>	ruddy treefrog		C		3
animals	amphibians	Hylidae	<i>Litoria caerulea</i>	common green treefrog		C		2
animals	amphibians	Hylidae	<i>Litoria wilcoxii</i>	eastern stony creek frog		C		1
animals	amphibians	Hylidae	<i>Litoria gracilentia</i>	graceful treefrog		C		2
animals	amphibians	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog		C		2
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		3
animals	amphibians	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk		C		2
animals	amphibians	Myobatrachidae	<i>Pseudophryne</i> sp.					2
animals	amphibians	Myobatrachidae	<i>Uperoleia laevigata</i>	eastern gungan		C		1
animals	amphibians	Myobatrachidae	<i>Mixophyes fasciolatus</i>	great barred frog		C		2
animals	amphibians	Myobatrachidae	<i>Pseudophryne coriacea</i>	red backed broodfrog		C		1
animals	amphibians	Myobatrachidae	<i>Uperoleia</i> sp.					1
animals	birds	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone		C		11
animals	birds	Acanthizidae	<i>Acanthiza lineata</i>	striated thornbill		C		6
animals	birds	Acanthizidae	<i>Sericornis citreogularis</i>	yellow-throated scrubwren		C		1
animals	birds	Acanthizidae	<i>Smicromis brevirostris</i>	weebill		C		12
animals	birds	Acanthizidae	<i>Sericornis magnirostra</i>	large-billed scrubwren		C		9
animals	birds	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone		C		15
animals	birds	Acanthizidae	<i>Acanthiza reguloides</i>	buff-rumped thornbill		C		4
animals	birds	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren		C		18
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		5
animals	birds	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill		C		18
animals	birds	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza		C		5
animals	birds	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk		C		1
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		1
animals	birds	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk		C		2
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		2
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		3
animals	birds	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle		C		11
animals	birds	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar		C		6
animals	birds	Anatidae	<i>Dendrocygna eytoni</i>	plumed whistling-duck		C		2
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		1
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		3
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		6
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		1
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		2
animals	birds	Apodidae	<i>Apus pacificus</i>	fork-tailed swift		SL		1
animals	birds	Apodidae	<i>Hirundapus caudacutus</i>	white-throated needletail		V	V	3
animals	birds	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret		C		1
animals	birds	Ardeidae	<i>Bubulcus ibis</i>	cattle egret		C		4
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		6
animals	birds	Artamidae	<i>Strepera graculina</i>	pied currawong		C		25
animals	birds	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie		C		19
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		9
animals	birds	Artamidae	<i>Artamus cyanopterus</i>	dusky woodswallow		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		15
animals	birds	Cacatuidae	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo		C		4
animals	birds	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo		C		2
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		2
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		7
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		18
animals	birds	Campephagidae	<i>Coracina tenuirostris</i>	cicadabird		C		11
animals	birds	Campephagidae	<i>Lalage leucomela</i>	varied triller		C		13
animals	birds	Campephagidae	<i>Coracina lineata</i>	barred cuckoo-shrike		C		6
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		2
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		4
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		C		1
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		2
animals	birds	Climacteridae	<i>Cormobates leucophaea</i>	white-throated treecreeper		C		2
animals	birds	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)		C		19
animals	birds	Columbidae	<i>Leucosarcia melanoleuca</i>	wonga pigeon		C		3
animals	birds	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	Y			3
animals	birds	Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove		C		9
animals	birds	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove		C		7
animals	birds	Columbidae	<i>Chalcophaps indica</i>	emerald dove		C		4
animals	birds	Columbidae	<i>Ptilinopus regina</i>	rose-crowned fruit-dove		C		7
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		7
animals	birds	Columbidae	<i>Columba leucomela</i>	white-headed pigeon		C		3
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		7
animals	birds	Columbidae	<i>Columba livia</i>	rock dove	Y			2
animals	birds	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird		C		5
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		21
animals	birds	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo		C		14
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		7
animals	birds	Cuculidae	<i>Chalcites minutillus barnardi</i>	Eastern little bronze-cuckoo		C		1
animals	birds	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo		C		9
animals	birds	Cuculidae	<i>Eudynamys orientalis</i>	eastern koel		C		7/1
animals	birds	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo		C		7
animals	birds	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo		C		6
animals	birds	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo		C		11
animals	birds	Estrildidae	<i>Neochmia temporalis</i>	red-browed finch		C		17
animals	birds	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin		C		1
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		8
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		4
animals	birds	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar		C		4
animals	birds	Falconidae	<i>Falco berigora</i>	brown falcon		C		2
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		7
animals	birds	Falconidae	<i>Falco peregrinus</i>	peregrine falcon		C		1
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		1
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		22
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		5/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Hirundinidae	<i>Cheramoeca leucosterna</i>	white-backed swallow		C		1
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		7
animals	birds	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin		C		1
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		9
animals	birds	Laridae	<i>Chroicocephalus novaehollandiae</i>	silver gull		C		1
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		5
animals	birds	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren		C		14
animals	birds	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren		C		7
animals	birds	Megapodiidae	<i>Alectura lathamii</i>	Australian brush-turkey		C		7
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		4
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		13
animals	birds	Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	eastern spinebill		C		6
animals	birds	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater		C		20
animals	birds	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater		C		23
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		4
animals	birds	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater		C		3
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		4
animals	birds	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater		C		1
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		8
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		22
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		17
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		9
animals	birds	Monarchidae	<i>Symposiachrus trivirgatus</i>	spectacled monarch		SL		13
animals	birds	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch		SL		12
animals	birds	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher		C		12
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	maggie-lark		C		12
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		1
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		23
animals	birds	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella		C		6
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		11
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		12
animals	birds	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler		C		17
animals	birds	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush		C		6
animals	birds	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler		C		11
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		26
animals	birds	Pachycephalidae	<i>Falcunculus frontatus</i>	crested shrike-tit		C		3
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		12
animals	birds	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote		C		18
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			6
animals	birds	Petroicidae	<i>Petroica rosea</i>	rose robin		C		6
animals	birds	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		20
animals	birds	Phaethontidae	<i>Phaethon rubricauda</i>	red-tailed tropicbird		V		3/1
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		1
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		2
animals	birds	Pittidae	<i>Pitta versicolor</i>	noisy pitta		C		11
animals	birds	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		2
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		15
animals	birds	Psittacidae	<i>Psitteuteles versicolor</i>	varied lorikeet		C		1
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		9
animals	birds	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot		C		8
animals	birds	Psittacidae	<i>Platycercus elegans</i>	crimson rosella		C		2
animals	birds	Psittacidae	<i>Parvipsitta pusilla</i>	little lorikeet		C		6
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		10
animals	birds	Psophodidae	<i>Psophodes olivaceus</i>	eastern whipbird		C		16
animals	birds	Ptilonorhynchidae	<i>Ailuroedus crassirostris</i>	green catbird		C		4
animals	birds	Ptilonorhynchidae	<i>Ptilonorhynchus violaceus</i>	satin bowerbird		C		2
animals	birds	Ptilonorhynchidae	<i>Sericulus chrysocephalus</i>	regent bowerbird		C		5
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		1
animals	birds	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen		C		3
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		1
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		16
animals	birds	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		18
animals	birds	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		SL		12
animals	birds	Strigidae	<i>Ninox boobook</i>	southern boobook		C		4
animals	birds	Sturnidae	<i>Acridotheres tristis</i>	common myna	Y			3
animals	birds	Sturnidae	<i>Sturnus vulgaris</i>	common starling	Y			7
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		1
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		3
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		3
animals	birds	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		25
animals	birds	Turdidae	<i>Zoothera lunulata</i>	Bassian thrush		C		3
animals	birds	Tytonidae	<i>Tyto delicatula</i>	eastern barn owl		C		1
animals	insects	Nymphalidae	<i>Danaus petilia</i>	lesser wanderer				1
animals	insects	Nymphalidae	<i>Euploea corinna</i>	common crow				2
animals	insects	Nymphalidae	<i>Danaus plexippus</i>	monarch	Y			3
animals	insects	Nymphalidae	<i>Acraea andromacha andromacha</i>	glasswing				1
animals	insects	Nymphalidae	<i>Melanitis leda bankia</i>	evening brown				1
animals	insects	Nymphalidae	<i>Tirumala hamata hamata</i>	blue tiger				1
animals	insects	Nymphalidae	<i>Heteronympha merope merope</i>	common brown				2
animals	insects	Nymphalidae	<i>Vanessa kershawi</i>	Australian painted lady				3
animals	insects	Papilionidae	<i>Papilio aegaeus aegaeus</i>	orchard swallowtail (Australian subspecies)				2
animals	insects	Papilionidae	<i>Graphium eurypylus lycaon</i>	pale triangle				1
animals	insects	Papilionidae	<i>Papilio demoleus sthenelus</i>	chequered swallowtail				1
animals	insects	Papilionidae	<i>Graphium choredon</i>	blue triangle				1
animals	insects	Pieridae	<i>Catopsilia pyranthe crokera</i>	white migrant				1
animals	insects	Pieridae	<i>Eurema hecabe</i>	large grass-yellow				1
animals	insects	Pieridae	<i>Catopsilia pomona</i>	lemon migrant				1
animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			2
animals	mammals	Dasyuridae	<i>Phascogale tapoatafa tapoatafa</i>	brush-tailed phascogale		C		3
animals	mammals	Dasyuridae	<i>Antechinus flavipes flavipes</i>	yellow-footed antechinus (south-east Queensland)		C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		5
animals	mammals	Macropodidae	<i>Macropus rufogriseus</i>	red-necked wallaby		C		5
animals	mammals	Macropodidae	<i>Petrogale penicillata</i>	brush-tailed rock-wallaby		V	V	4
animals	mammals	Miniopteridae	<i>Miniopterus schreibersii oceanensis</i>	eastern bent-wing bat		C		1
animals	mammals	Miniopteridae	<i>Miniopterus australis</i>	little bent-wing bat		C		2
animals	mammals	Molossidae	<i>Tadarida australis</i>	white-striped freetail bat		C		8
animals	mammals	Molossidae	<i>Mormopterus lumsdenae</i>	northern free-tailed bat		C		2
animals	mammals	Molossidae	<i>Mormopterus ridei</i>	eastern free-tailed bat		C		5
animals	mammals	Molossidae	<i>Mormopterus sp.</i>					2
animals	mammals	Muridae	<i>Rattus fuscipes</i>	bush rat		C		4
animals	mammals	Muridae	<i>Rattus rattus</i>	black rat	Y			1
animals	mammals	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot		C		2
animals	mammals	Peramelidae	<i>Perameles nasuta</i>	long-nosed bandicoot		C		4
animals	mammals	Phalangeridae	<i>Trichosurus caninus</i>	short-eared possum		C		4
animals	mammals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C		6
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	43
animals	mammals	Potoroidae	<i>Aepyprymnus rufescens</i>	rufous bettong		C		1
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		1
animals	mammals	Pteropodidae	<i>Pteropus sp.</i>					1
animals	mammals	Rhinolophidae	<i>Rhinolophus megaphyllus</i>	eastern horseshoe-bat		C		3
animals	mammals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		SL		1
animals	mammals	Vespertilionidae	<i>Nyctophilus gouldi</i>	Gould's long-eared bat		C		2
animals	mammals	Vespertilionidae	<i>Vespadelus pumilus</i>	eastern forest bat		C		2
animals	mammals	Vespertilionidae	<i>Vespadelus sp.</i>					1
animals	mammals	Vespertilionidae	<i>Nyctophilus bifax</i>	northern long-eared bat		C		2
animals	ray-finned fishes	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				8
animals	ray-finned fishes	Anguillidae	<i>Anguilla australis</i>	southern shortfin eel				13
animals	ray-finned fishes	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel				14
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus marjoriae</i>	silverstreak hardyhead				1
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				8
animals	ray-finned fishes	Clupeidae	<i>Nematalosa erebi</i>	bony bream				2
animals	ray-finned fishes	Eleotridae	<i>Gobiomorphus coxii</i>	Cox gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris galii</i>	firetail gudgeon				18
animals	ray-finned fishes	Eleotridae	<i>Gobiomorphus australis</i>	striped gudgeon				2
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Philypnodon grandiceps</i>	flathead gudgeon				7
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon				15
animals	ray-finned fishes	Melanotaeniidae	<i>Melanotaenia duboulayi</i>	crimsonspotted rainbowfish				13
animals	ray-finned fishes	Mugilidae	<i>Mugil cephalus</i>	sea mullet				1
animals	ray-finned fishes	Percichthyidae	<i>Macquaria novemaculeata</i>	Australian bass				4
animals	ray-finned fishes	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish				12
animals	ray-finned fishes	Poeciliidae	<i>Gambusia holbrooki</i>	mosquitofish	Y			16
animals	ray-finned fishes	Retropinnidae	<i>Retropinna semoni</i>	Australian smelt				11
animals	ray-finned fishes	Scorpaenidae	<i>Notesthes robusta</i>	bullrout				1
animals	ray-finned fishes	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				14
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon		C		2
animals	reptiles	Boidae	<i>Morelia spilota</i>	carpet python		C		5
animals	reptiles	Chelidae	<i>Chelodina expansa</i>	broad-shelled river turtle		C		1
animals	reptiles	Colubridae	<i>Boiga irregularis</i>	brown tree snake		C		1
animals	reptiles	Diplodactylidae	<i>Nebulifera robusta</i>	robust velvet gecko		C		4
animals	reptiles	Diplodactylidae	<i>Amalosia lesueurii</i>	Lesueur's velvet gecko		C		1
animals	reptiles	Diplodactylidae	<i>Oedura tryoni</i>	southern spotted velvet gecko		C		4
animals	reptiles	Elapidae	<i>Hoplocephalus stephensii</i>	Stephens' banded snake		C		1
animals	reptiles	Elapidae	<i>Furina diadema</i>	red-naped snake		C		1
animals	reptiles	Elapidae	<i>Cacophis krefftii</i>	dwarf crowned snake		C		3
animals	reptiles	Elapidae	<i>Acanthophis antarcticus</i>	common death adder		V		1
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		1
animals	reptiles	Gekkonidae	<i>Hemidactylus frenatus</i>	house gecko	Y			1
animals	reptiles	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella		C		4
animals	reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		1
animals	reptiles	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink		C		4
animals	reptiles	Scincidae	<i>Ophioscincus ophioscincus</i>	yolk-bellied snake-skink		C		3
animals	reptiles	Scincidae	<i>Calyptotis scutirostrum</i>	scute-snouted calyptotis		C		5
animals	reptiles	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink		C		6
animals	reptiles	Scincidae	<i>Lampropholis amacula</i>	friendly sunskink		C		1
animals	reptiles	Scincidae	<i>Egernia cunninghami</i>	Cunningham's skink		C		2
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus		C		2
animals	reptiles	Scincidae	<i>Bellatorias frerei</i>	major skink		C		4
animals	reptiles	Scincidae	<i>Eulamprus sp.</i>					1
animals	reptiles	Scincidae	<i>Concinnia martini</i>	dark bar-sided skink		C		3
animals	reptiles	Varanidae	<i>Varanus varius</i>	lace monitor		C		5
fungi	Agaricomycetes	Gomphaceae	<i>Ramaria</i>			C		1/1
fungi	lecanoromycetes	Acarosporaceae	<i>Acarospora citrina</i>			C		1/1
fungi	lecanoromycetes	Caliciaceae	<i>Pyxine microspora</i>			C		1/1
fungi	lecanoromycetes	Caliciaceae	<i>Dirinaria confluens</i>			C		2/2
fungi	lecanoromycetes	Caliciaceae	<i>Pyxine pungens</i>			C		1/1
fungi	lecanoromycetes	Caliciaceae	<i>Buellia</i>			C		3/3
fungi	lecanoromycetes	Caliciaceae	<i>Buellia spuria</i> var. <i>spuria</i>			C		1/1
fungi	lecanoromycetes	Cladoniaceae	<i>Cladonia cervicornis</i> subsp. <i>verticillata</i>			C		1/1
fungi	lecanoromycetes	Cladoniaceae	<i>Thysanothecium scutellatum</i>			C		1/1
fungi	lecanoromycetes	Cladoniaceae	<i>Cladia muelleri</i>			C		1/1
fungi	lecanoromycetes	Cladoniaceae	<i>Cladia aggregata</i>			C		2/2
fungi	lecanoromycetes	Cladoniaceae	<i>Cladonia floerkeana</i>			C		2/2
fungi	lecanoromycetes	Graphidaceae	<i>Diploschistes sticticus</i>			C		1/1
fungi	lecanoromycetes	Lecanoraceae	<i>Lecanora pseudogangaleoides</i> subsp. <i>verdonii</i>			C		1/1
fungi	lecanoromycetes	Lecanoraceae	<i>Lecanora impressa</i>			C		1/1
fungi	lecanoromycetes	Lecanoraceae	<i>Lecanora pseudistera</i>			C		1/1
fungi	lecanoromycetes	Lecideaceae	<i>Paraporpidia leptocarpa</i>			C		1/1
fungi	lecanoromycetes	Pannariaceae	<i>Psoroma</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia hypoconstictica</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia australasica</i>			C		1/1

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fungi	lecanoromycetes	Parmeliaceae	<i>Punctelia pseudocoralloidea</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Relicina limbata</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmelia signifera</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema tinctorum</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Relicina sydneyensis</i>			C		2/2
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia pulla</i>			C		3/3
fungi	lecanoromycetes	Parmeliaceae	<i>Flavoparmelia euplecta</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Parmotrema reticulatum</i>			C		5/5
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia exillima</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia isidiosa</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia amplexula</i>			C		1/1
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia barbatica</i>			C		5/5
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia isidiigera</i>			C		4/4
fungi	lecanoromycetes	Parmeliaceae	<i>Xanthoparmelia subtropica</i>			C		1/1
fungi	lecanoromycetes	Pertusariaceae	<i>Pertusaria</i>			C		2/2
fungi	lecanoromycetes	Physciaceae	<i>Physcia poncinsii</i>			C		1/1
fungi	lecanoromycetes	Physciaceae	<i>Heterodermia obscurata</i>			C		4/4
fungi	lecanoromycetes	Psoraceae	<i>Protoblastenia</i>			C		2/2
fungi	lecanoromycetes	Stereocaulaceae	<i>Lepraria coriensis</i>			C		1/1
fungi	lecanoromycetes	Teloschistaceae	<i>Caloplaca cinnabarina</i>			C		1/1
fungi	lecanoromycetes	Tephromelataceae	<i>Tephromela lillipillensis</i>			C		1/1
plants	land plants	Apocynaceae	<i>Parsonsia leichhardtii</i>	black silkpod		C		1/1
plants	land plants	Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cottonbush	Y			1/1
plants	land plants	Apocynaceae	<i>Parsonsia longipetiolata</i>			C		1/1
plants	land plants	Apocynaceae	<i>Carissa ovata</i>	currantbush		C		1/1
plants	land plants	Apocynaceae	<i>Parsonsia rotata</i>	veinless silkpod		C		1/1
plants	land plants	Apocynaceae	<i>Alyxia ruscifolia</i>			C		1/1
plants	land plants	Apocynaceae	<i>Secamone elliptica</i>			C		1/1
plants	land plants	Apocynaceae	<i>Alstonia constricta</i>	bitterbark		C		1/1
plants	land plants	Apocynaceae	<i>Vincetoxicum ovatum</i>			C		1/1
plants	land plants	Araceae	<i>Gymnostachys anceps</i>	settler's flax		C		1/1
plants	land plants	Araliaceae	<i>Astrotricha latifolia</i>			C		3/3
plants	land plants	Asparagaceae	<i>Asparagus plumosus</i>	feathered asparagus fern	Y			1/1
plants	land plants	Asparagaceae	<i>Asparagus africanus</i>	ornamental asparagus	Y			2/2
plants	land plants	Asteraceae	<i>Acanthospermum hispidum</i>	star burr	Y			1/1
plants	land plants	Asteraceae	<i>Senecio</i>			C		1/1
plants	land plants	Asteraceae	<i>Schkuhria pinnata</i>		Y			1/1
plants	land plants	Bignoniaceae	<i>Dolichandra unguis-cati</i>	cat's claw creeper	Y			2/2
plants	land plants	Boraginaceae	<i>Ehretia membranifolia</i>	weeping koda		C		1/1
plants	land plants	Byttneriaceae	<i>Commersonia prostrata</i>			C	E	1/1
plants	land plants	Caesalpiniaceae	<i>Cassia tomentella</i>			C		1/1
plants	land plants	Caesalpiniaceae	<i>Senna alata</i>		Y			1/1
plants	land plants	Caesalpiniaceae	<i>Senna didymobotrya</i>		Y			1/1
plants	land plants	Caesalpiniaceae	<i>Mezoneuron brachycarpum</i>			C		1/1
plants	land plants	Celastraceae	<i>Elaeodendron australe</i> var. <i>australe</i>			C		1/1
plants	land plants	Celastraceae	<i>Siphonodon australis</i>	ivorywood		C		1/1

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plants	land plants	Celastraceae	<i>Celastrus subspicata</i>	large-leaved staffvine		C		1/1
plants	land plants	Celastraceae	<i>Denhamia disperma</i>			C		1/1
plants	land plants	Celastraceae	<i>Hippocratea barbata</i>	knotvine		C		1/1
plants	land plants	Convolvulaceae	<i>Polymeria calycina</i>	pink bindweed		C		1/1
plants	land plants	Cornaceae	<i>Alangium polyosmoides subsp. tomentosum</i>			C		1/1
plants	land plants	Corynocarpaceae	<i>Corynocarpus rupestris subsp. arborescens</i>	southern corynocarpus		V		4/4
plants	land plants	Cyperaceae	<i>Bolboschoenus caldwellii</i>			C		1/1
plants	land plants	Cyperaceae	<i>Cyperus eragrostis</i>		Y			1/1
plants	land plants	Cyperaceae	<i>Cyperus curvistylis</i>			C		1/1
plants	land plants	Cyperaceae	<i>Bulbostylis pyriformis</i>			C		1/1
plants	land plants	Cyperaceae	<i>Lepidosperma clipeicola</i>			C		1/1
plants	land plants	Dryopteridaceae	<i>Lastreopsis decomposita</i>	trim shield fern		C		1/1
plants	land plants	Ebenaceae	<i>Diospyros pentamera</i>	myrtle ebony		C		1/1
plants	land plants	Erythroxylaceae	<i>Erythroxylum sp. (Splityard Creek L.Pedley 5360)</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Acalypha australis</i>		Y			1/1
plants	land plants	Euphorbiaceae	<i>Baloghia inophylla</i>	scrub bloodwood		C		1/1
plants	land plants	Euphorbiaceae	<i>Croton acronychioides</i>	thick-leaved croton		C		1/1
plants	land plants	Euphorbiaceae	<i>Mallotus philippensis</i>	red kamala		C		1/1
plants	land plants	Euphorbiaceae	<i>Monotaxis macrophylla</i>			C		1/1
plants	land plants	Euphorbiaceae	<i>Tragia novae-hollandiae</i>	stinging-vine		C		1/1
plants	land plants	Euphorbiaceae	<i>Ricinus communis</i>	castor oil bush	Y			2/2
plants	land plants	Euphorbiaceae	<i>Acalypha nemorum</i>	hairy acalypha		C		1/1
plants	land plants	Euphorbiaceae	<i>Mallotus claoxyloides</i>	green kamala		C		2/2
plants	land plants	Fabaceae	<i>Bossiaea rupicola</i>	pea flower		C		2/2
plants	land plants	Fabaceae	<i>Glycine sp. (Marburg K.A.Williams 83006)</i>			C		1/1
plants	land plants	Fabaceae	<i>Hovea impressinerva</i>			C		1/1
plants	land plants	Fabaceae	<i>Bossiaea buxifolia</i>			C		2/2
plants	land plants	Lamiaceae	<i>Prostanthera nivea</i>			C		3/3
plants	land plants	Lamiaceae	<i>Coleus alloplectus</i>			C		1/1
plants	land plants	Lauraceae	<i>Cryptocarya bidwillii</i>	yellow laurel		C		2/2
plants	land plants	Lauraceae	<i>Cryptocarya sclerophylla</i>	totempole		C		1
plants	land plants	Lauraceae	<i>Cryptocarya</i>			C		1/1
plants	land plants	Laxmanniaceae	<i>Cordyline congesta</i>	Boonah palm lily		C		1/1
plants	land plants	Laxmanniaceae	<i>Cordyline rubra</i>	red-fruited palm lily		C		1/1
plants	land plants	Meliaceae	<i>Turraea pubescens</i>	native honeysuckle		C		1/1
plants	land plants	Menispermaceae	<i>Pleogyne australis</i>	wiry grape		C		1/1
plants	land plants	Mimosaceae	<i>Acacia acronastes</i>			NT		2/2
plants	land plants	Mimosaceae	<i>Acacia brunioides subsp. brunioides</i>			C		3/3
plants	land plants	Moraceae	<i>Ficus virens var. virens</i>			C		1/1
plants	land plants	Myrtaceae	<i>Backhousia sciadophora</i>	shatterwood		C		2/1
plants	land plants	Myrtaceae	<i>Melaleuca groveana</i>			NT		1/1
plants	land plants	Onagraceae	<i>Epilobium ciliatum</i>		Y			1/1
plants	land plants	Petiveriaceae	<i>Monococcus echinophorus</i>	burr bush		C		2/2
plants	land plants	Phyllanthaceae	<i>Phyllanthus gunnii</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Bridelia exaltata</i>			C		1/1
plants	land plants	Phyllanthaceae	<i>Cleistanthus cunninghamii</i>	omega		C		1/1

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plants	land plants	Phyllanthaceae	<i>Bridelia leichhardtii</i>			C		3/3
plants	land plants	Phytolaccaceae	<i>Phytolacca dioica</i>	bella sombra	Y			1/1
plants	land plants	Piperaceae	<i>Piper hederaceum</i> var. <i>hederaceum</i>			C		1/1
plants	land plants	Pittosporaceae	<i>Pittosporum viscidum</i>	black-fruited thornbush		C		1/1
plants	land plants	Plumbaginaceae	<i>Plumbago zeylanica</i>	native plumbago		C		1/1
plants	land plants	Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass		C		1/1
plants	land plants	Poaceae	<i>Oplismenus imbecillis</i>			C		1/1
plants	land plants	Poaceae	<i>Dichanthium aristatum</i>	angleton grass	Y			1/1
plants	land plants	Poaceae	<i>Oplismenus aemulus</i>	creeping shade grass		C		1/1
plants	land plants	Poaceae	<i>Arundo donax</i>		Y			1/1
plants	land plants	Poaceae	<i>Sporobolus coromandelianus</i>		Y			1/1
plants	land plants	Poaceae	<i>Austrostipa ramosissima</i>	bamboo grass		C		1/1
plants	land plants	Poaceae	<i>Dichanthium sericeum</i> subsp. <i>humilius</i>			C		1/1
plants	land plants	Polygalaceae	<i>Comesperma breviflorum</i>			NT		1/1
plants	land plants	Polypodiaceae	<i>Microsorium scandens</i>	fragrant climbing fern		C		1/1
plants	land plants	Pottiaceae	<i>Trichostomum brachydontium</i>			C		1/1
plants	land plants	Proteaceae	<i>Stenocarpus salignus</i>	scrub beefwood		C		1/1
plants	land plants	Proteaceae	<i>Persoonia sericea</i>	silky geebung		C		1/1
plants	land plants	Pteridaceae	<i>Doryopteris concolor</i>			C		1/1
plants	land plants	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree		C		1/1
plants	land plants	Rhamnaceae	<i>Pomaderris argyrophylla</i>			C		1/1
plants	land plants	Rubiaceae	<i>Cyclophyllum coprosmoides</i> var. <i>coprosmoides</i>			C		1/1
plants	land plants	Rubiaceae	<i>Pomax umbellata</i>			C		1/1
plants	land plants	Rubiaceae	<i>Galium aparine</i>	cleavers	Y			1/1
plants	land plants	Rutaceae	<i>Sarcomelicope simplicifolia</i> subsp. <i>simplicifolia</i>	yellow aspen		C		1/1
plants	land plants	Rutaceae	<i>Boronia occidentalis</i>			C		1/1
plants	land plants	Rutaceae	<i>Poncirus trifoliata</i>		Y			1/1
plants	land plants	Rutaceae	<i>Coatesia paniculata</i>			C		1/1
plants	land plants	Rutaceae	<i>Flindersia collina</i>	broad-leaved leopard tree		C		2/2
plants	land plants	Rutaceae	<i>Acronychia laevis</i>	glossy acronychia		C		1/1
plants	land plants	Rutaceae	<i>Bosistoa pentacocca</i> subsp. <i>pentacocca</i>			C		6/6
plants	land plants	Sapindaceae	<i>Cupaniopsis parvifolia</i>	small-leaved tuckeroo		C		1/1
plants	land plants	Sapindaceae	<i>Cupaniopsis tomentella</i>	Boonah tuckeroo		V	V	6/6
plants	land plants	Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree		C		2/2
plants	land plants	Sapindaceae	<i>Elaeagnus xylocarpa</i>	white tamarind		C		1/1
plants	land plants	Sapindaceae	<i>Rhysotoechia bifoliolata</i> subsp. <i>bifoliolata</i>			C		1/1
plants	land plants	Sapotaceae	<i>Planchonella cotinifolia</i> var. <i>cotinifolia</i>			C		1/1
plants	land plants	Simaroubaceae	<i>Ailanthus triphysa</i>	white siris		C		2/2
plants	land plants	Solanaceae	<i>Capsicum annuum</i> var. <i>glabriusculum</i>		Y			1/1
plants	land plants	Solanaceae	<i>Solanum elaeagnifolium</i>	silverleaf nightshade	Y			1/1
plants	land plants	Stackhousiaceae	<i>Stackhousia muricata</i>			C		1/1
plants	land plants	Stylidiaceae	<i>Stylidium laricifolium</i>	tree trigger plant		C		1/1
plants	land plants	Thuidiaceae	<i>Thuidium</i>			C		1/1
plants	land plants	Ulmaceae	<i>Aphananthe philippinensis</i>			C		1/1
plants	land plants	Ulmaceae	<i>Celtis sinensis</i>	Chinese elm	Y			1/1
plants	land plants	Vitaceae	<i>Cayratia acris</i>	hairy grape		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.



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point

Species: All

Type: All

Status: Rare and threatened species

Records: All

Date: Since 1980

Latitude: -27.9498

Longitude: 152.5778

Distance: 2

Email: mitch@28south.com.au

Date submitted: Thursday 24 Oct 2019 08:48:13

Date extracted: Thursday 24 Oct 2019 09:00:20

The number of records retrieved = 2

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	Phaethontidae	<i>Phaethon rubricauda</i>	red-tailed tropicbird		V		1
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	14

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.

ATTACHMENT 7



Vegetation management report

For Lot: 4 Plan: SP192221

Current as at 24/10/2019

This publication has been compiled by Operations Support, Department of Natural Resources, Mines and Energy.

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Recent changes

Updated mapping

The Regulated Vegetation Management Map and Supporting Map was updated in June 2019 to reflect the most up to date information available in relation to regional ecosystems, essential habitat and wetland mapping (Version 11).

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:

- *Vegetation management framework* - an explanation of the application of the framework.
- *Property details* - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s), catchment(s), coastal or non coastal status, and any applicable area management plans associated with your property.
- *Vegetation management details for the specified Lot on Plan* - specific information about your property including vegetation categories, regional ecosystems, watercourses, wetlands, essential habitat, and protected plants.
- *Contact information*.
- *Maps* - a series of colour maps to assist in identifying regulated vegetation on your property.
- *Other legislation contact information*.

This information will assist you to determine your options for managing vegetation under the vegetation management framework, which may include:

- exempt clearing work
- accepted development vegetation clearing code
- an area management plan
- a development approval.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as Queensland's Protected Plants framework or the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 6 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

Table of Contents

1. Vegetation management framework	5
1.1 Exempt clearing work	5
1.2 Accepted development vegetation clearing codes	5
1.3 Area management plans	6
1.4 Development approvals	6
2. Property details	6
2.1 Tenure	6
2.2 Property location	6
3. Vegetation management details for Lot: 4 Plan: SP192221	8
3.1 Vegetation categories	8
3.2 Regional ecosystems	9
3.3 Watercourses	9
3.4 Wetlands	9
3.5 Essential habitat	9
3.6 Protected plants (administered by the Department of Environment and Science (DES))	10
3.7 Emissions Reduction Fund (ERF)	10
4. Contact information for DNRME	11
5. Maps	12
5.1 Regulated vegetation management map	13
5.2 Vegetation management supporting map	14
5.3 Pre-clear map	15
5.4 Coastal/non coastal map	16
5.5 Agricultural Land Class A or B map	17
5.6 Protected plants map administered by DES	18
6. Other relevant legislation contacts list	20

1. Vegetation management framework

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2012, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem prescribed under Schedule 5 of the Vegetation Management Regulation 2012; and
- a mangrove.

1.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify DNRME or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 5.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact DNRME before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

<https://www.qld.gov.au/environment/land/vegetation/exemptions/>.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact DNRME prior to clearing in any of these areas.

1.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

<https://www.qld.gov.au/environment/land/vegetation/codes/>

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify DNRME before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at

<https://apps.dnrm.qld.gov.au/vegetation/>

1.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

AMPs for fodder harvesting, managing thickened vegetation and managing encroachment will continue until March 2020. New notifications cannot be made for these AMPs.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an area management plan applies to your property for which you can make a new notification, it will be listed in Section 2.2 of this report. Before clearing under one of these AMPs, you must first notify the DNRME and then follow the conditions and requirements listed in the AMP.

<https://www.qld.gov.au/environment/land/vegetation/area-plans/>

1.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

<https://www.qld.gov.au/environment/land/management/vegetation/development>

2. Property details

2.1 Tenure

All of the lot, plan and tenure information associated with property Lot: 4 Plan: SP192221, including links to relevant Smart Maps, are listed in Table 1. The tenure of the property (whether it is freehold, leasehold, or other) may be viewed by clicking on the Smart Map link(s) provided.

Table 1: Lot, plan and tenure information for the property

Lot	Plan	Tenure	Link to property on SmartMap
4	SP192221	Freehold	https://apps.information.qld.gov.au/data/cadastre/GenerateSmartMap?q=4\SP192221

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

2.2 Property location

Table 2 provides a summary of the locations for property Lot: 4 Plan: SP192221, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)
Scenic Rim Regional

Bioregion(s)	Subregion(s)
Southeast Queensland	Moreton Basin

Catchment(s)
Brisbane

Area Management Plan(s)

Nil

For the purposes of the accepted development vegetation clearing codes and the State Development Assessment Provisions (SDAP), this property is regarded as*

Coastal

*See also Map 5.4

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

Class A: 32.38ha

Class B: 16.86ha

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See section 5 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 4 Plan: SP192221.

3. Vegetation management details for Lot: 4 Plan: SP192221

3.1 Vegetation categories

Vegetation categories are shown on the regulated vegetation management map in section 5.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property. Total area: 61.27ha

Vegetation category	Area (ha)
Category X	61.3

Table 4

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact DNRME to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact DNRME to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

This report does not confirm if a Property Map of Assessable Vegetation (PMAV) exists on a lot. To confirm whether or not a PMAV exists on a lot, please check the PMAV layer on the Queensland Globe2, or contact DNRME on 135VEG (135 834).

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 5.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at

<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/>

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
non-rem	None	X	61.27	None	None

Please note:

1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work
- accepted development vegetation clearing codes
- performance outcomes in State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 5.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA), and includes endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 5.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map as assessable vegetation -

- 1) 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. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
- 2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

No records

3.6 Protected plants (administered by the Department of Environment and Science (DES))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA), with clearing of protected plants in the wild regulated by the [Nature Conservation \(Wildlife Management\) Regulation 2006](#). These requirements apply irrespective of the classification of the vegetation under the *Vegetation Management Act 1999*.

Prior to clearing, if the plants proposed to be cleared are in the wild (see [Operational policy: When a protected plant in Queensland is considered to be 'in the wild'](#)) and the exemptions under the [Nature Conservation \(Wildlife Management\) Regulation 2006](#) are not applicable to the proposed clearing, you must check the flora survey trigger map to determine if any part of the area to be cleared is within a high risk area. The trigger map for this property is provided in section 5.6. The exemptions relate to:

- imminent risk of death or serious injury (refer s261A)
- imminent risk of serious damage to a building or other structure on land, or to personal property (refer s261B)
- *Fire and Emergency Service Act 1990* (refer 261C)
- previously cleared areas (refer s261ZB)
- maintenance activities (refer s261ZC)
- firebreak or fire management line (refer s261ZD)
- accepted development vegetation clearing code (refer s261ZE)
- conservation purposes (refer s261ZG)
- authorised in particular circumstances (refer s385).

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) from the *Vegetation Management Act 1999* (i.e. listed in the Planning Regulations 2017) while some are different.

If the proposed area to be cleared is shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken in accordance with the flora survey guidelines. The main objective of a flora survey is to locate any endangered, vulnerable or near threatened plants (EVNT plants) that may be present in the clearing impact area.

If a flora survey identifies that EVNT plants are not present within the clearing impact area or clearing within 100m of EVNT plants can be avoided, the clearing activity is exempt from a permit. An [exempt clearing notification form](#) must be submitted to the Department of Environment and Science, with a copy of the flora survey report, at least one week prior to clearing. The clearing must be conducted within two years after the flora survey report was submitted.

If a flora survey identifies that EVNT plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the [application form clearing permit](#).

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that EVNT plants are present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

Further information on protected plants is available at

<http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/>

For assistance on the protected plants flora survey trigger map for this property, please contact the Department of Environment and Science at palm@des.qld.gov.au.

3.7 Emissions Reduction Fund (ERF)

The ERF is an Australian Government scheme which offers incentives for businesses and communities across the economy to reduce emissions.

Under the ERF, landholders can earn money from activities such as planting (and keeping) trees, managing regrowth vegetation and adopting more sustainable agricultural practices.

The purpose of a project is to remove greenhouse gases from the atmosphere. Each project will provide new economic opportunities for farmers, forest growers and land managers.

Further information on ERF is available at <https://www.qld.gov.au/environment/land/state/use/carbon-rights/>.

4. Contact information for DNRME

For further information on vegetation management:

Phone 135VEG (135 834)

Email vegetation@dnrme.qld.gov.au

Visit <https://www.dnrme.qld.gov.au/?contact=vegetation> to submit an online enquiry.

For contact details for other State and Commonwealth agencies, please see Section 6.

5. Maps

Maps included in this report may also be requested individually at:

<https://www.dnrme.qld.gov.au/qld/environment/land/vegetation/vegetation-map-request-form>

and

<http://www.ehp.qld.gov.au/licences-permits/plants-animals/protected-plants/map-request.php>

Regulated vegetation management map

The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new [property maps of assessable vegetation \(PMAV\)](#).

Vegetation management supporting map

The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

Pre-clear map

The vegetation management pre-clear regional ecosystem mapping shows the regional ecosystem, location and extent which is likely to have occurred at that location prior to clearing. This map can be used for identifying exchange areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code. It may also be used for identifying offsets under the vegetation management framework.

Coastal/non coastal map

The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and the State Development Assessment Provisions (SDAP).

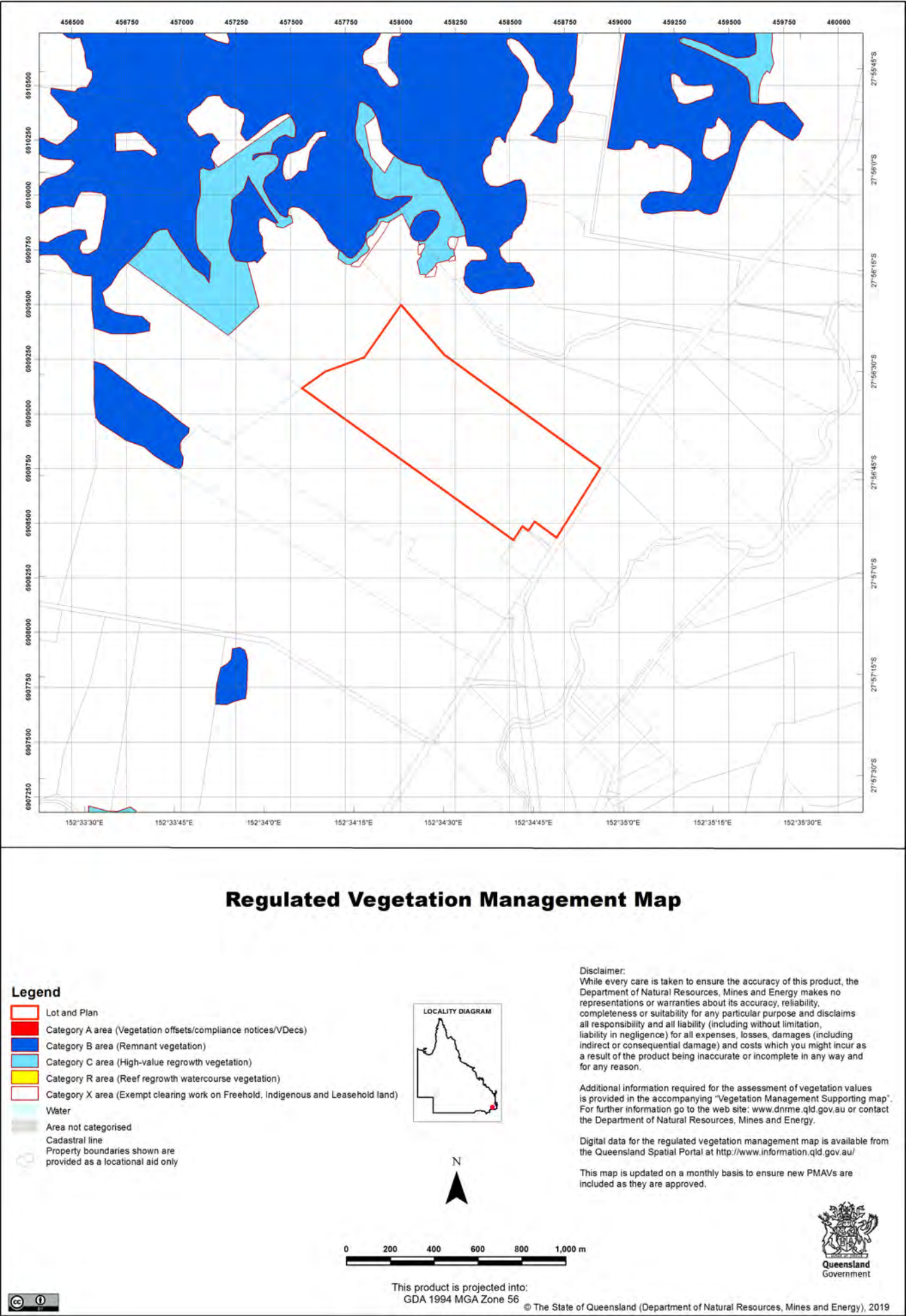
Agricultural Land Class A or B

The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

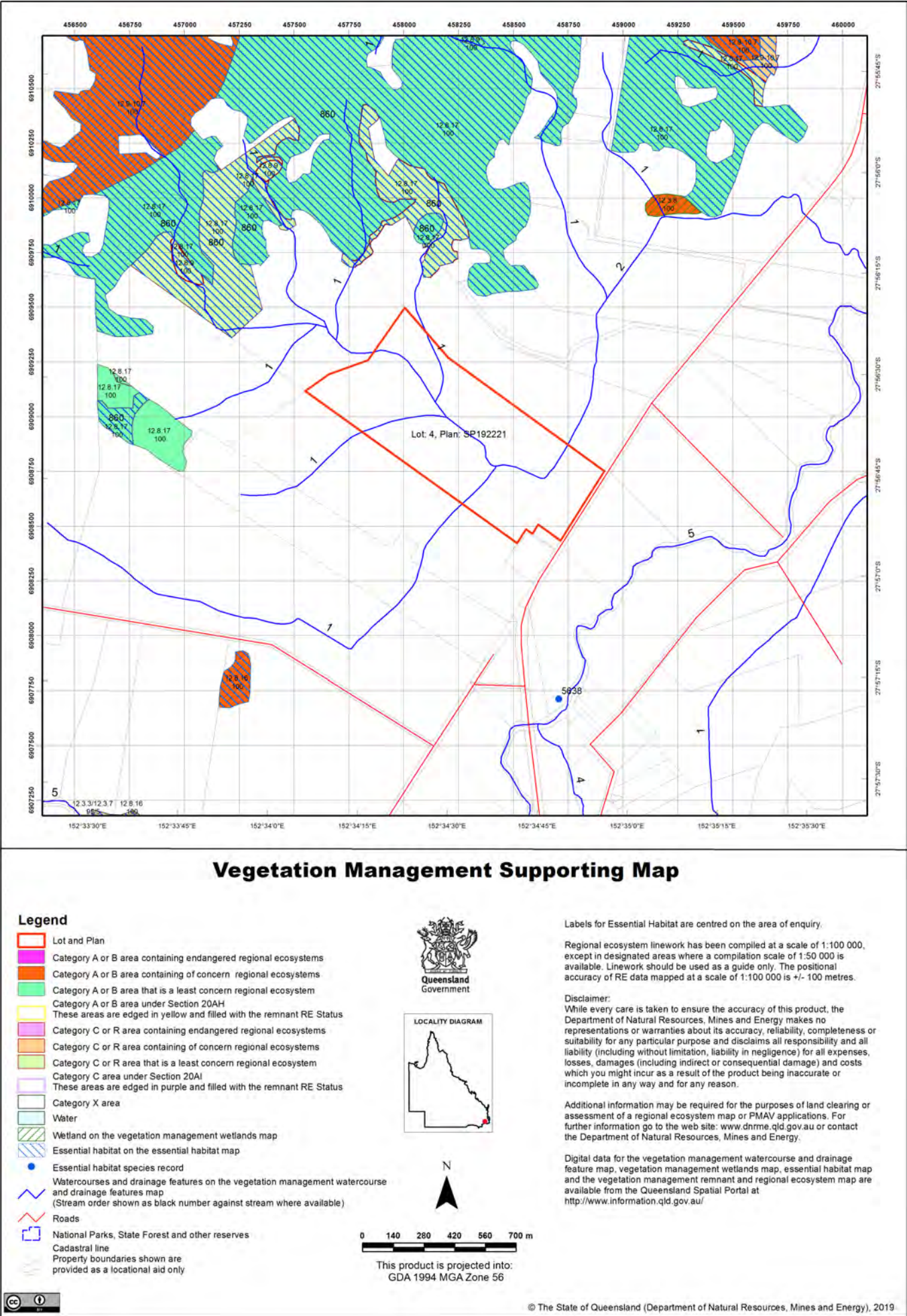
Protected plants map

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

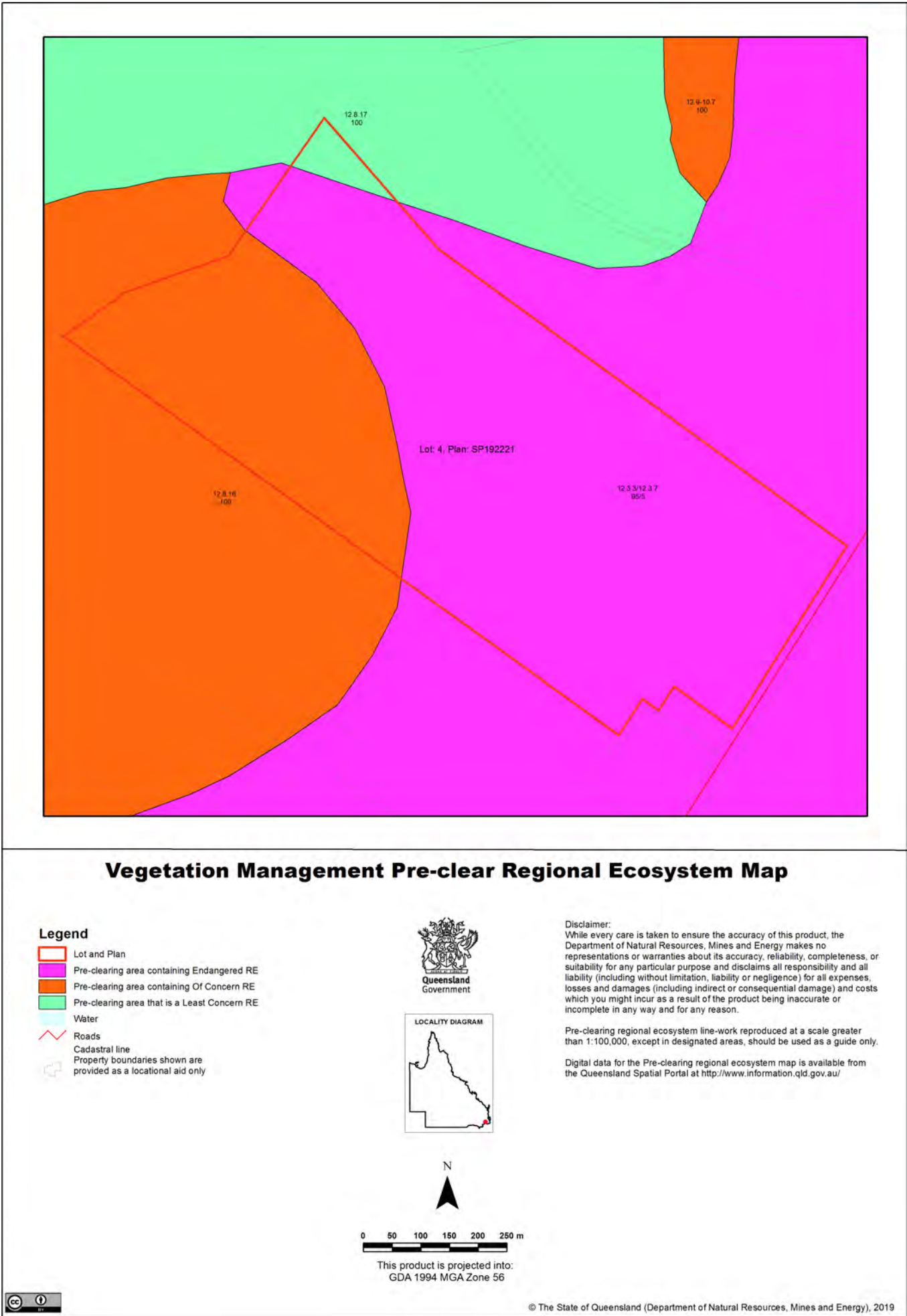
5.1 Regulated vegetation management map



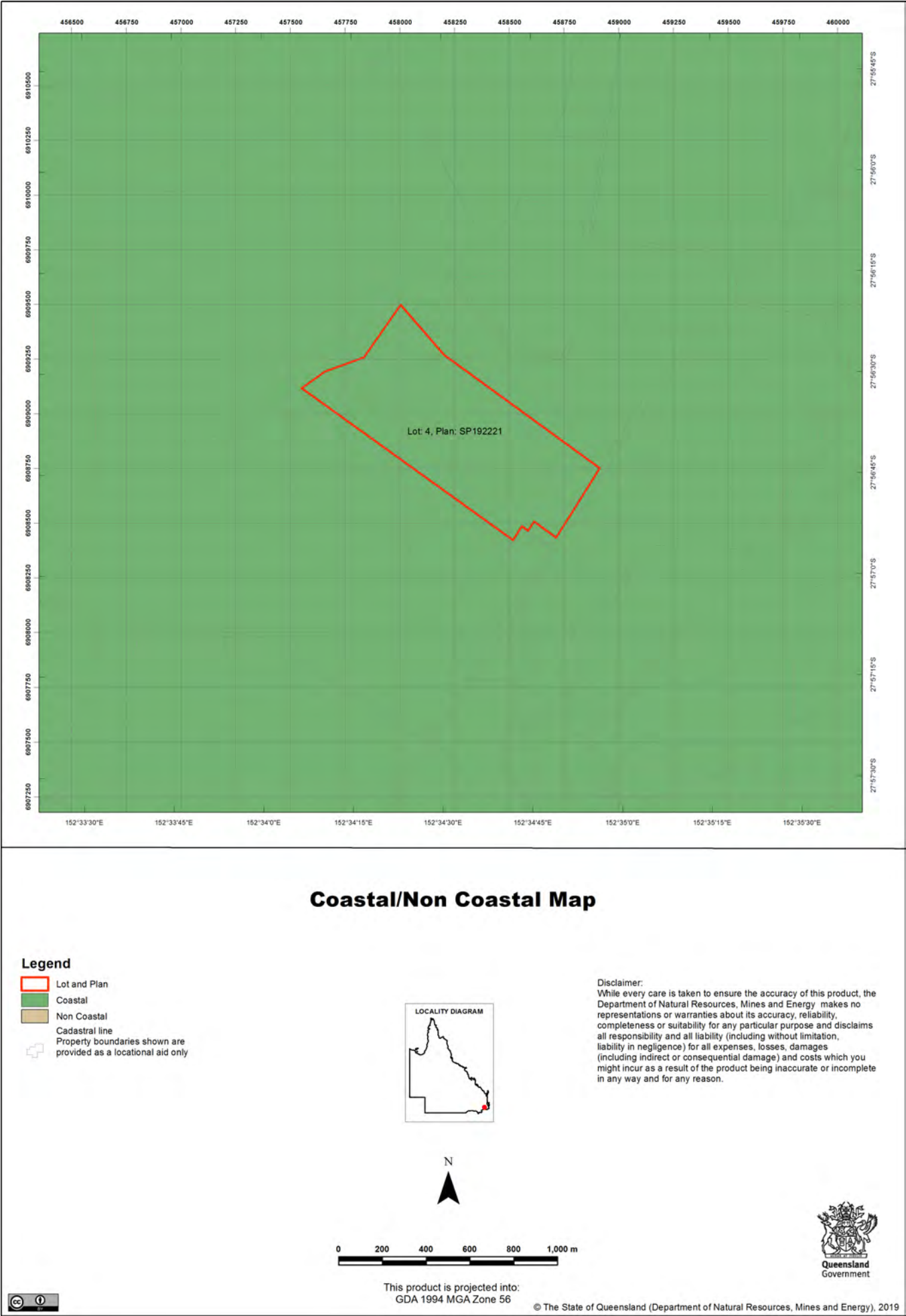
5.2 Vegetation management supporting map



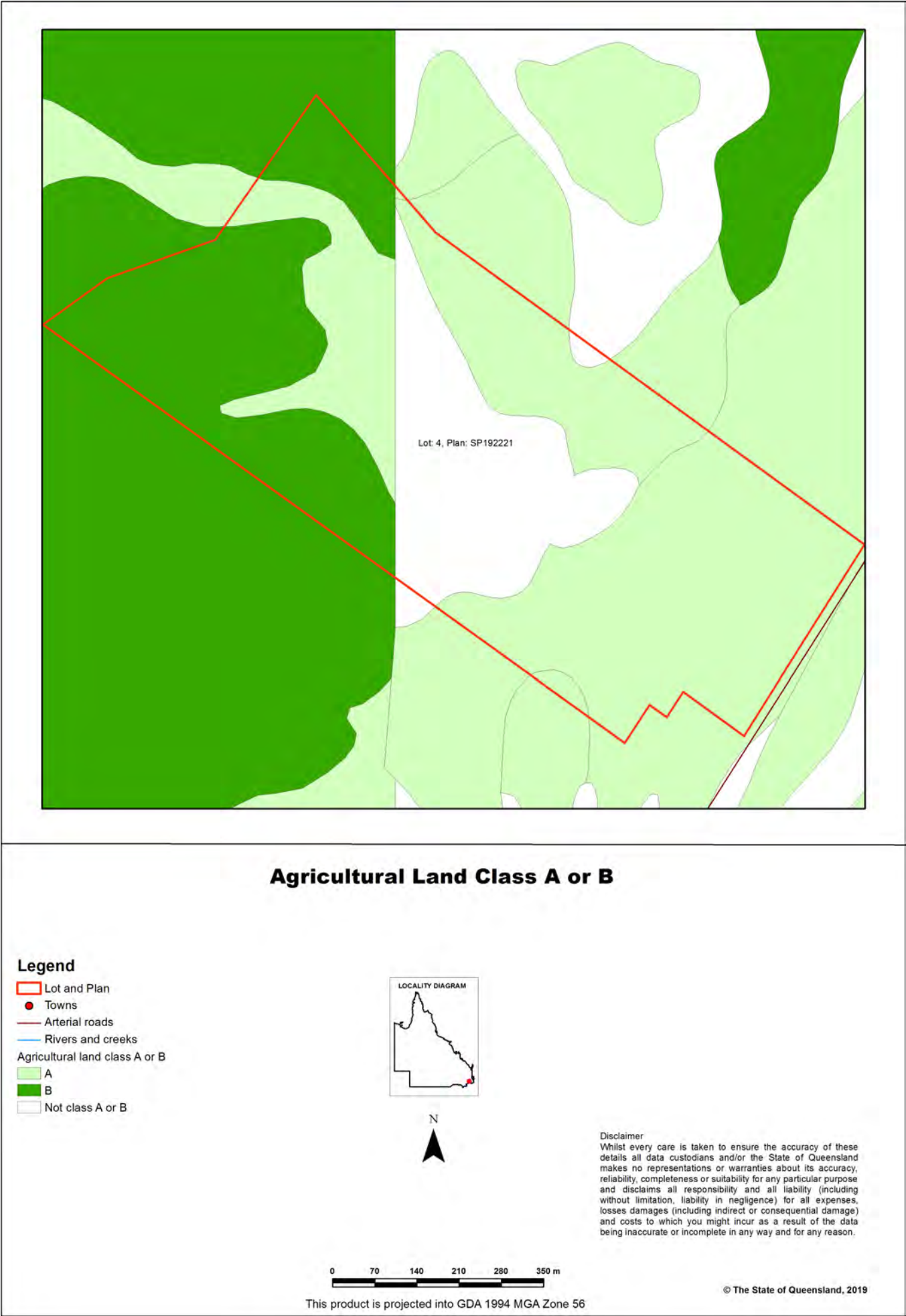
5.3 Pre-clear map



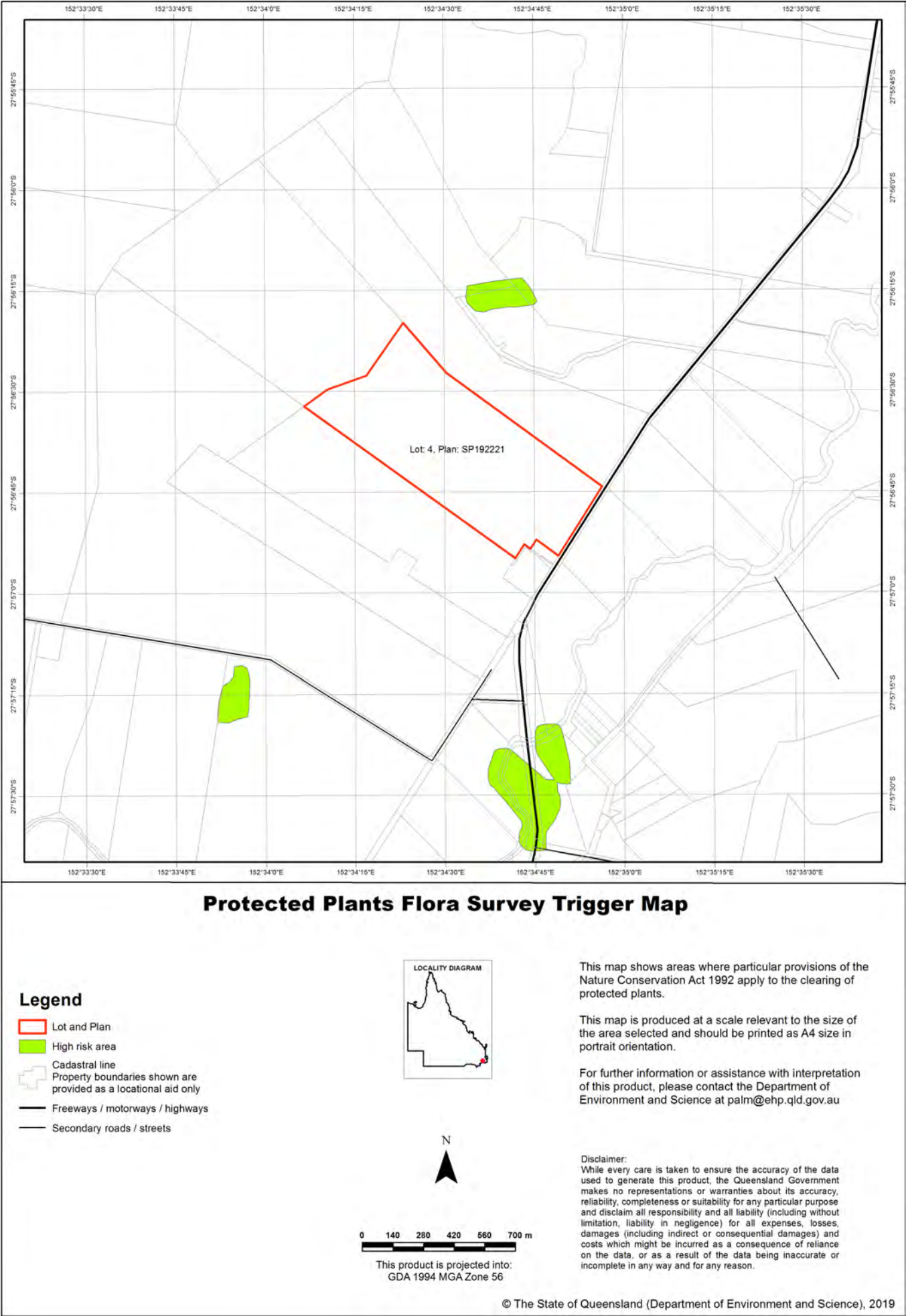
5.4 Coastal/non coastal map



5.5 Agricultural Land Class A or B map



5.6 Protected plants map administered by DES



Protected plants flora survey trigger map

The protected plants flora survey trigger map identifies 'high risk areas' where endangered, vulnerable or near threatened plants are known to exist or are likely to exist. Under the *Nature Conservation Act 1992* (the Act) it is an offence to clear protected plants that are 'in the wild' unless you are authorised or the clearing is exempt, for more information see [section 89](#) of the Act.

Please see the Department of Environment and Science webpage on the [clearing of protected plants](#) for information on what exemptions may apply in your circumstances, whether you may need to undertake a flora survey, and whether you may need a protected plants clearing permit.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the [Queensland Spatial Catalogue](#), the Department of Environment and Science does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of Environment and Science webpage on the [clearing of protected plants](#) for more information.

6. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
• Interference with overland flow • Earthworks, significant disturbance	<i>Water Act 2000</i> <i>Soil Conservation Act 1986</i>	Department of Natural Resources, Mines and Energy (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
• Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
• Mining and environmentally relevant activities • Infrastructure development (coastal) • Heritage issues • Protected plants and protected areas¹	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i> <i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
• Interference with fish passage in a watercourse, mangroves • Forestry activities²	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
• Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
• Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Department of State Development, Manufacturing, Infrastructure and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
• Local government requirements	<i>Local Government Act 2009</i> <i>Planning Act 2016</i>	Department of Local Government, Racing and Multicultural Affairs (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office

1. In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](http://www.des.qld.gov.au), which endeavours to ensure that protected plants (whether whole plants or protected plants parts) are not illegally removed from the wild, or illegally traded. Prior to clearing, you should check the flora survey trigger map to determine if the clearing is within a high-risk area by visiting www.des.qld.gov.au. For further information or assistance on the protected plants flora survey trigger map for your property, please contact the Department of Environment and Science on 13QGOV (13 74 68) or email palm@des.qld.gov.au.

2. Contact the Department of Agriculture and Fisheries before clearing:

- Any sandalwood on state-owned land (including leasehold land)
- On freehold land in a 'forest consent area' or a 'forest entitlement area'
- More than five hectares on state-owned land (including leasehold land) containing commercial timber species listed in parts 2 or 3 of Schedule 6 of the Vegetation Management Regulation 2012 and located within any of the following local government management areas-Banana, Bundaberg Regional, Fraser Coast Regional, Gladstone Regional, Isaac Regional, North Burnett Regional, Somerset Regional, South Burnett Regional, Southern Downs Regional, Tablelands Regional, Toowoomba Regional, Western Downs Regional.

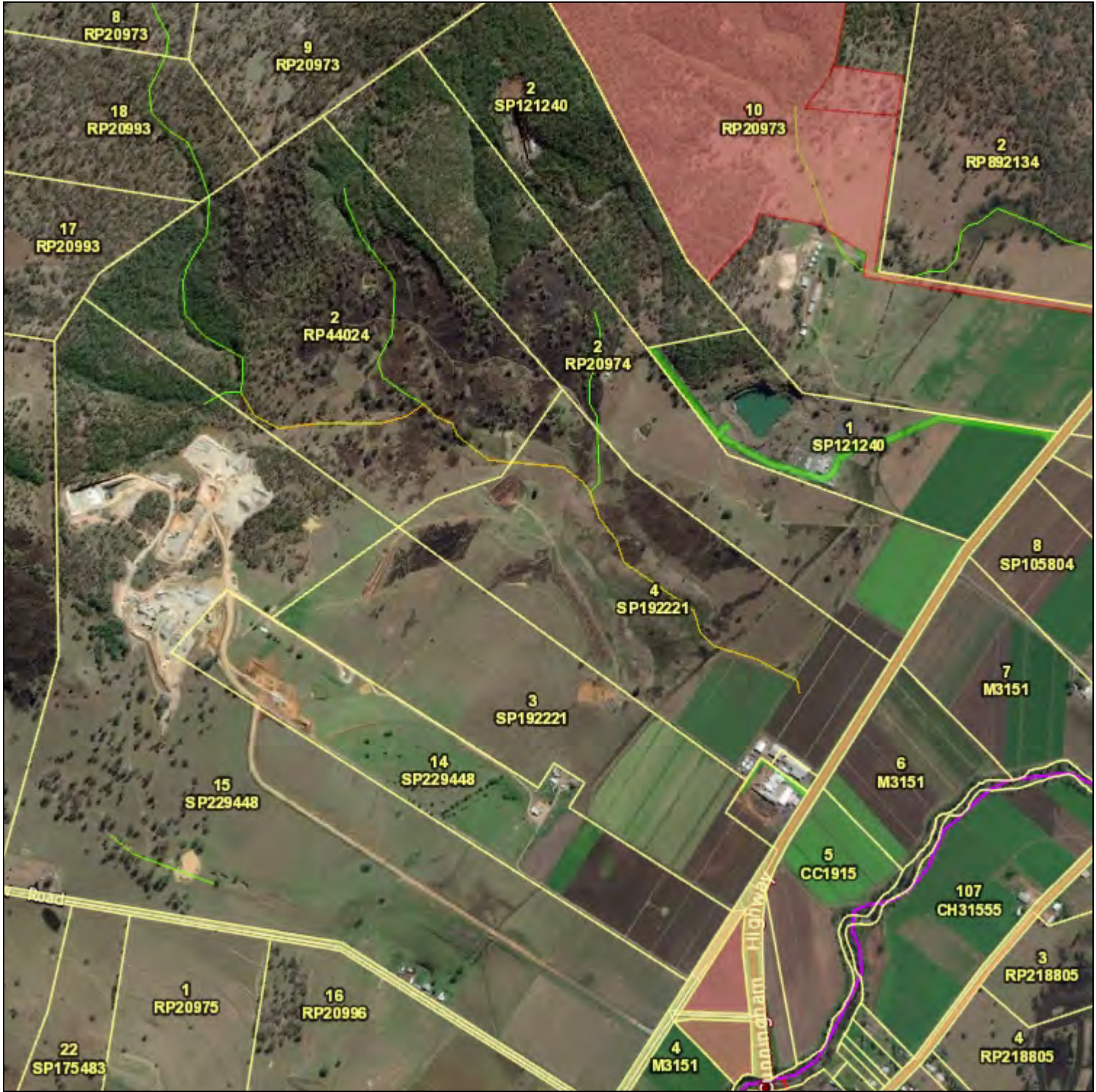
ATTACHMENT 8

Waterways for Waterway Barrier Works

SRAIP

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27°55'45"S 152°35'16"E

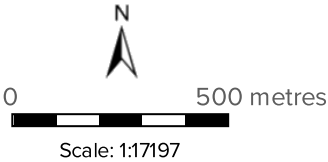


27°57'22"S 152°33'26"E

27°57'22"S 152°35'16"E

A product of

Legend located on next page



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Department of Natural Resources, Mines and Energy

Waterways for Waterway Barrier Works

SRAIP

Legend

Attribution

Queensland waterways for waterway barrier works

- Major
- High
- Moderate
- Low

Natural parcel boundary



Road parcel



Land parcel



Easement parcel



Strata parcel



Volumetric parcel



Land parcel label

Railway



Road

- Highway
- Main
- Local
- Private

Cities and Towns



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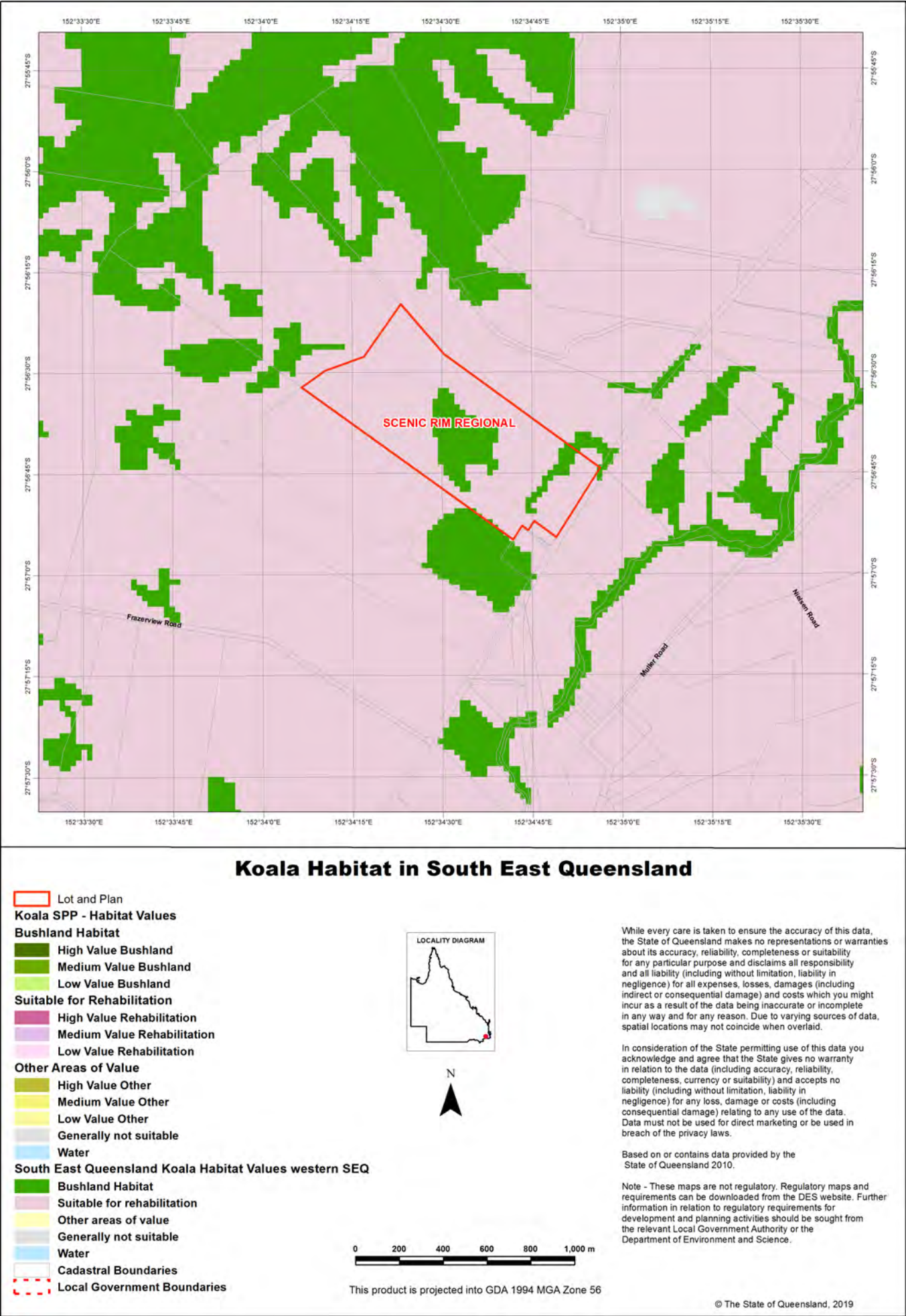
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ATTACHMENT 9



ATTACHMENT 10



Department of Infrastructure,
Local Government and Planning

Our reference: SPL-0617-040212
Your reference: 16-130

20 July 2017

Kalfresh
c/- I Cubed Consulting
PO Box 878
TOOWONG QLD 4066
Richard.jenkins@icubed.com.au

Attn: Mr Richard Jenkins

Dear Mr Jenkins

Pre-lodgement supplementary advice

6200-6206 Cunningham Highway, Kalbar

This supplementary advice provides further advice prepared following the two pre-lodgement meetings held on 29 and 30 June 2017 and the corresponding pre-lodgement meeting record dated 12 July 2017. This record provides further advice regarding matters discussed during a site visit by Department of Natural Resources and Mines officers on 13 July 2017, and should be read in conjunction with the original pre-lodgement meeting record dated 12 July 2017. While this pre-lodgement advice is provided in good faith, if the proposal is changed from that which was discussed with the department during the pre-lodgement meetings, this advice is not binding.

Reference information

Departmental role:	Concurrence agency
Jurisdiction:	Schedule 10, Part 5, Division 4, Table 2 – Environmentally relevant activities (Material Change of Use)
	Schedule 10, Part 6, Division 4, Subdivision 3, Table 1 – Waterway barrier works (Operational Work)
	Schedule 10, Part 9, Division 4, Subdivision 1, Table 1 – State-transport infrastructure (Material Change of Use and Reconfiguring a Lot)
	Schedule 10, Part 9, Division 4, Subdivision 2, Table 1 – State-transport corridors (Reconfiguring a Lot)

Reference information

Schedule 10, Part 9, Division 4, Subdivision 2, Table 4 –
State-transport corridors (Material Change of Use)

Schedule 10, Part 16, Division 6, Subdivision 3, Table 1 –
SEQ Regional Landscape and Rural Production Area (Material
Change of Use and Reconfiguring a Lot)

Schedule 10, Part 19, Division 1, Subdivision 2, Subdivision 3,
Table 1 – Taking or interfering with water (Operational Work)

Site details

Street address:	6200-6206 Cunningham Highway, Kalbar
Real property description:	Lots 2-4 on SP192221, Lot 2 on RP44024, Lot 2 on RP20974 and Lot 1 on RP216694
Site area:	248.611 hectares
Local government area:	Scenic Rim Regional Council
Local government zone:	Rural
Existing use:	Primary industry processing and packaging, cropping and cattle breeding

Proposed development details

Development type:	Material Change of Use, Reconfiguring a Lot and Operational Work
Development description:	Development of a regional fresh food processing hub precinct in two stages. Stage 1 will comprise a Development Permit for Reconfiguring a Lot for six lots into six lots and a Preliminary Approval for a Material Change of Use. Stage 2 will comprise a Preliminary Approval for a Material Change of Use for a variation of the planning scheme and a Development Permit for Reconfiguring a Lot for six lots into 19 lots and two easement lots.

The following information is provided as further advice prepared subsequent to the meeting.

Further advice

Item	Further advice
Surface water management	
1.	The <i>Water Act 2000</i> and subordinate legislation manages the take and/or interference of watercourse water, ground water and overland flow water within Queensland. All take of water is managed through legislation, statutory instruments or through an authorisation issued under the <i>Water Act 2000</i> .

Item	Further advice
	The subject site is located within the <i>Water Plan (Moreton) 2007</i>, which manages the take of surface water (watercourse water). All surface water within the Moreton plan area has been fully allocated and licences issued authorising take. A Department of Natural Resources and Mines (DNRM) data base search has indicated that there are no licences for the take of surface water associated with the properties of interest. However, the property is within the Warrill Valley Water Supply Scheme and the applicant may purchase water allocations from the Warrill Creek system. A Watercourse Determination was undertaken on 13 July 2017 by a DNRM water management officer. It was determined that all of the features on the properties are drainage features as defined by the <i>Water Act 2000</i>, with the exception of a wetland at the rear of the development. This wetland is defined as a 'lake' by the <i>Water Act 2000</i> and must be protected from the development, with no interference to inflows and outflows from the feature. It is recommended that the wetland be fenced and maintained as protected green space within the development.
2.	As part of any development application the applicant should address the relevant provisions contained in the State Development Assessment Provisions (SDAP), State code 10: Taking or interfering with water. In doing so, the applicant should provide more detailed information on how the Material Change of Use, Reconfiguring a Lot and Operational Work will not cause interference with inflows and outflows from the wetland (lake) and how the lake will be protected.

If you require any further information, please contact Kieran Hanna, Principal Planning Officer, on (07) 3432 2404 or via email at IpswichSARA@dilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

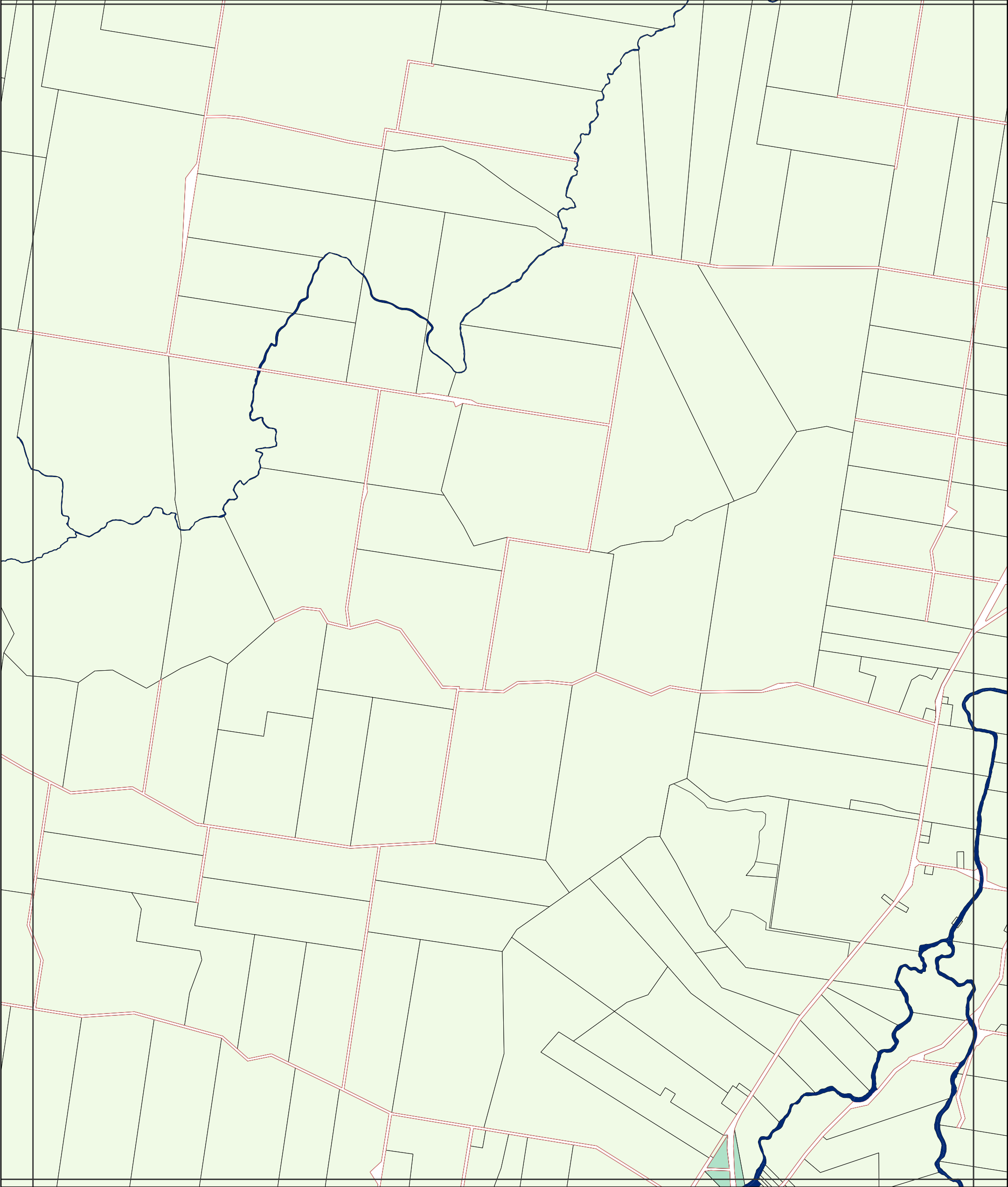


Ursula O'Donnell

Manager – Planning

cc: Department of Agriculture and Fisheries, planningassessment@daf.qld.gov.au
 Department of Environment and Heritage Protection, sara-ehp@ehp.qld.gov.au
 Department of Natural Resources and Mines, planningservicessouth@dnrm.qld.gov.au
 Department of Transport and Main Roads, scrland@tmr.qld.gov.au

ATTACHMENT 11



Legend

Zones

- Community Facilities
- Conservation
- District Centre
- Emerging Community
- Industry
- Limited Development
- Local Centre
- Low Density Residential
- Low-medium Density Residential
- Major Centre
- Major Tourism
- Minor Tourism

Mixed Use

- Neighbourhood Centre
- Recreation & Open Space
- Rural
- Rural Residential
- Special Purpose
- Township

Precincts

- BSDA Bromelton State Development Area
- BW Bulk Water Storage
- CI Commercial Industrial
- FL Flood Land
- HS Historical Subdivision
- MR Mountain Residential
- RE Rural Escarpment Protection
- RREA Rural Residential A
- TMR Tamborine Mountain Rural
- TR Township Residential
- PR Passive Recreation

General Information

- Cadastral Boundary
- Road Reserve
- Waterway or Waterbody

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Approx Scale @ A3 1:30000

0 0.4 0.8 1.6 KM

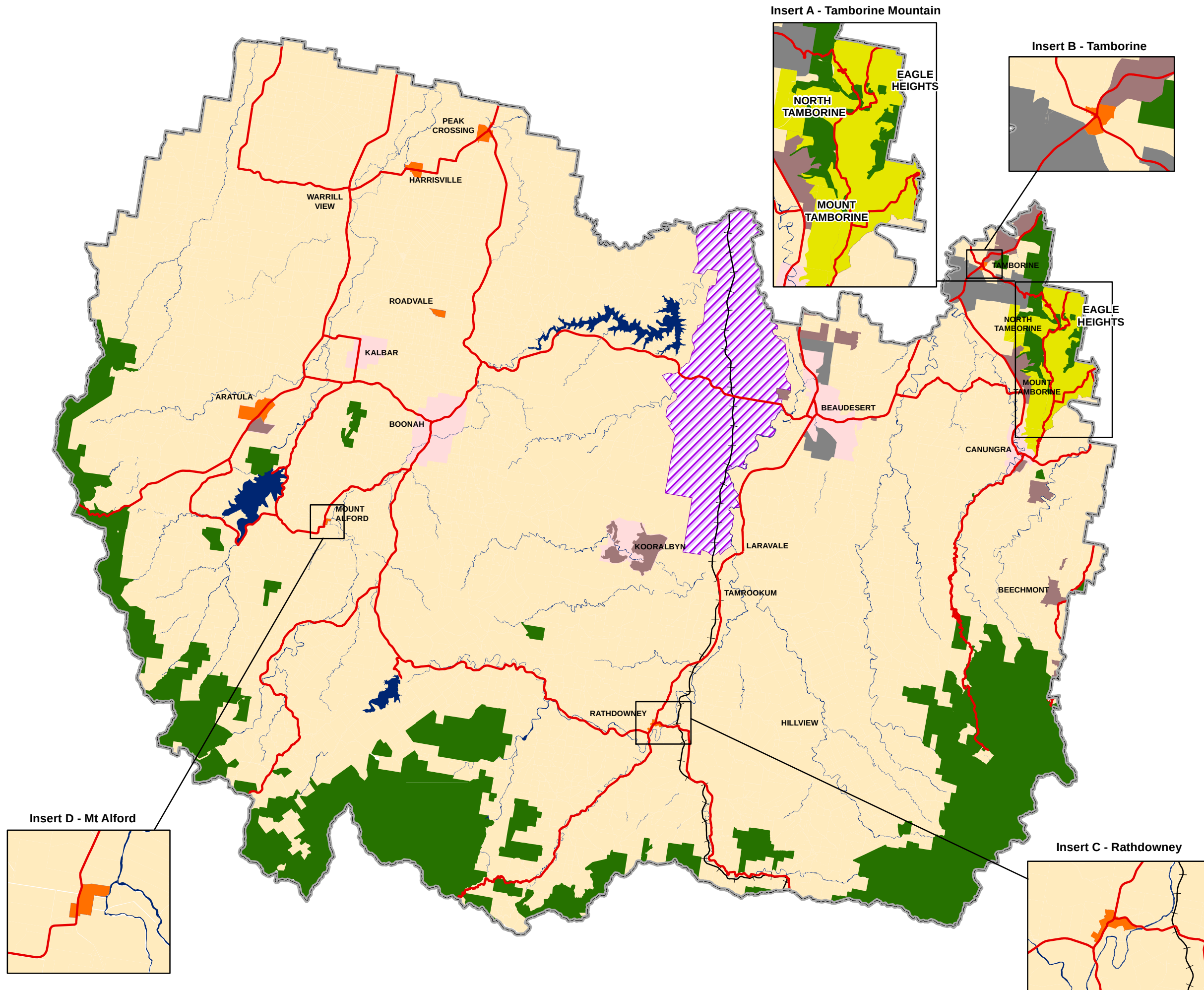
Map Sheet Reference

	01	02	03	04	
05	06	07	08	09	10
11	12	13	14	15	16
17	18	19	20	21	22
23	24	25	26	27	28
29	30	31	32	33	34
35	36	37	38	39	40
41	42	43	44	45	46
47	48	49	50	51	52
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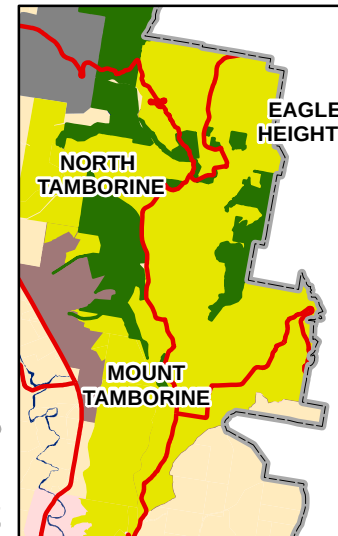
SCENIC RIM
Regional Council

ATTACHMENT 12

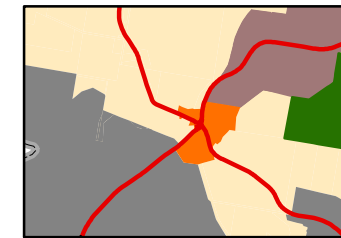
Scenic Rim Planning Scheme Strategic Framework Map SFM-01 -Communities and Character-



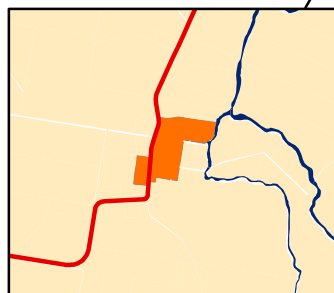
Insert A - Tamborine Mountain



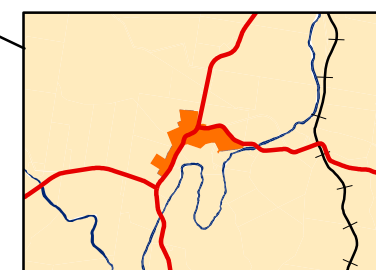
Insert B - Tamborine



Insert D - Mt Alford



Insert C - Rathdowney



Land Use Categories

- Urban Areas
- Acreage Areas
- Rural Areas
- Natural Areas
- Mountain Community
- Townships
- Bromelton State Development Area
- Investigation Area

Regional Infrastructure

- State-controlled Roads
- Rail Network
- Local Government Area Boundary
- Waterway or Waterbody

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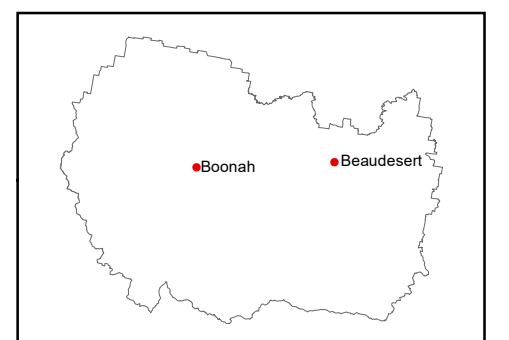
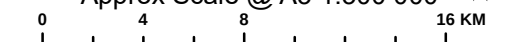
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Scenic Rim Planning Scheme
Strategic Framework Map SFM-02
-Growing Economy-

Centres Hierarchy

- (M) Major Centre
- (D) District Centre
- (L) Local Centre
- (N) Neighbourhood Centre
- (T) Township
- ★ Future Neighbourhood Centre

Land Use Categories

- ★ Key Tourism Areas
- ◆ Industry
- ▨ Bromelton State Development Area

Natural Resources

Agricultural Land

- Orange Agricultural Land Classification (Class A and Class B)

Key Resource Areas

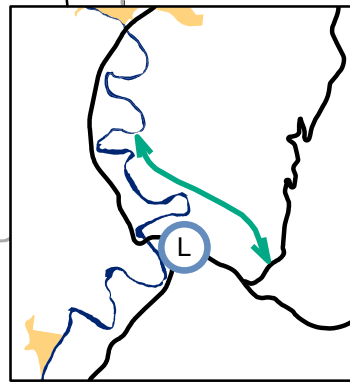
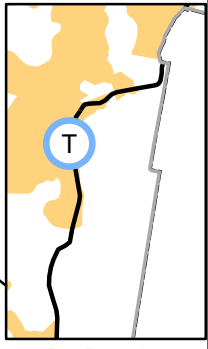
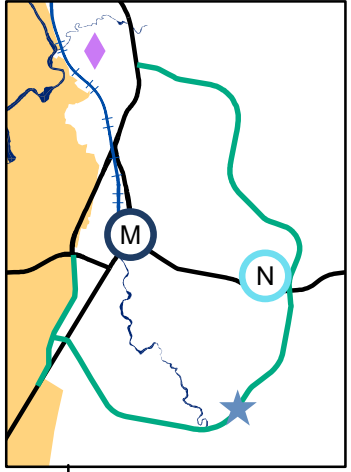
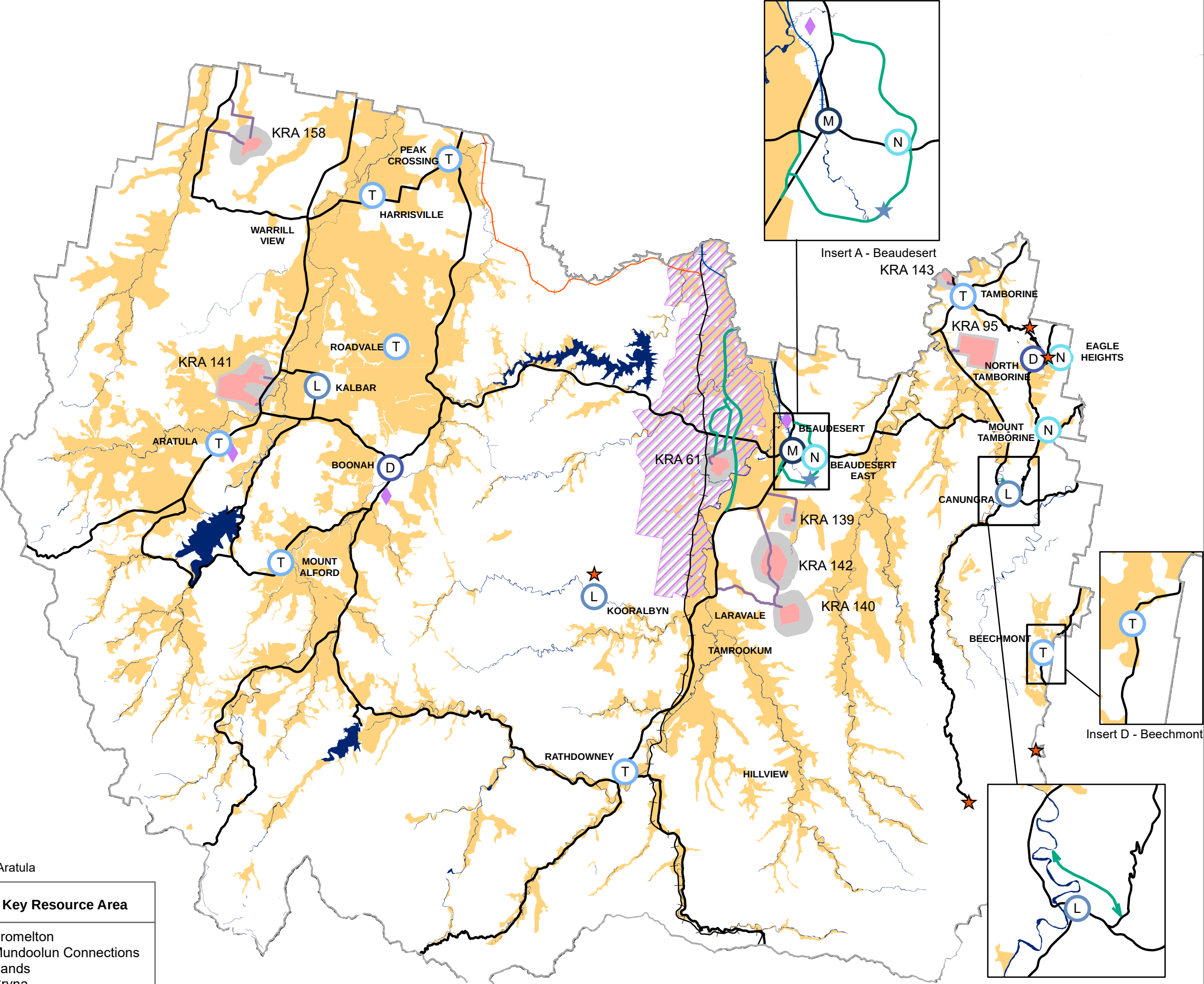
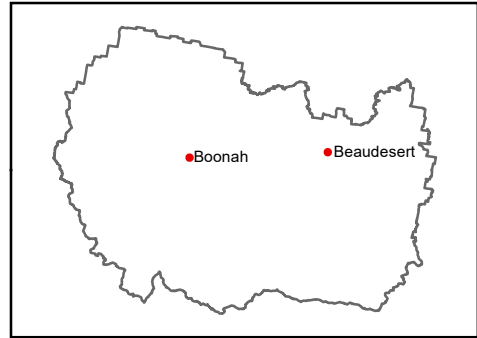
- Red Resource Area/ Processing Area
- Grey Extractive Resource Separation Area
- Purple Transport Route
- Light Purple Transport Route Separation Area

Regional Infrastructure

- Thick Black State-controlled Roads
- Green Road Investigation Corridor
- Black Rail Network
- Orange Future Rail Network
- Blue Rail Investigation Corridor
- Grey Local Government Area Boundary
- Dark Blue Waterway or Waterbody

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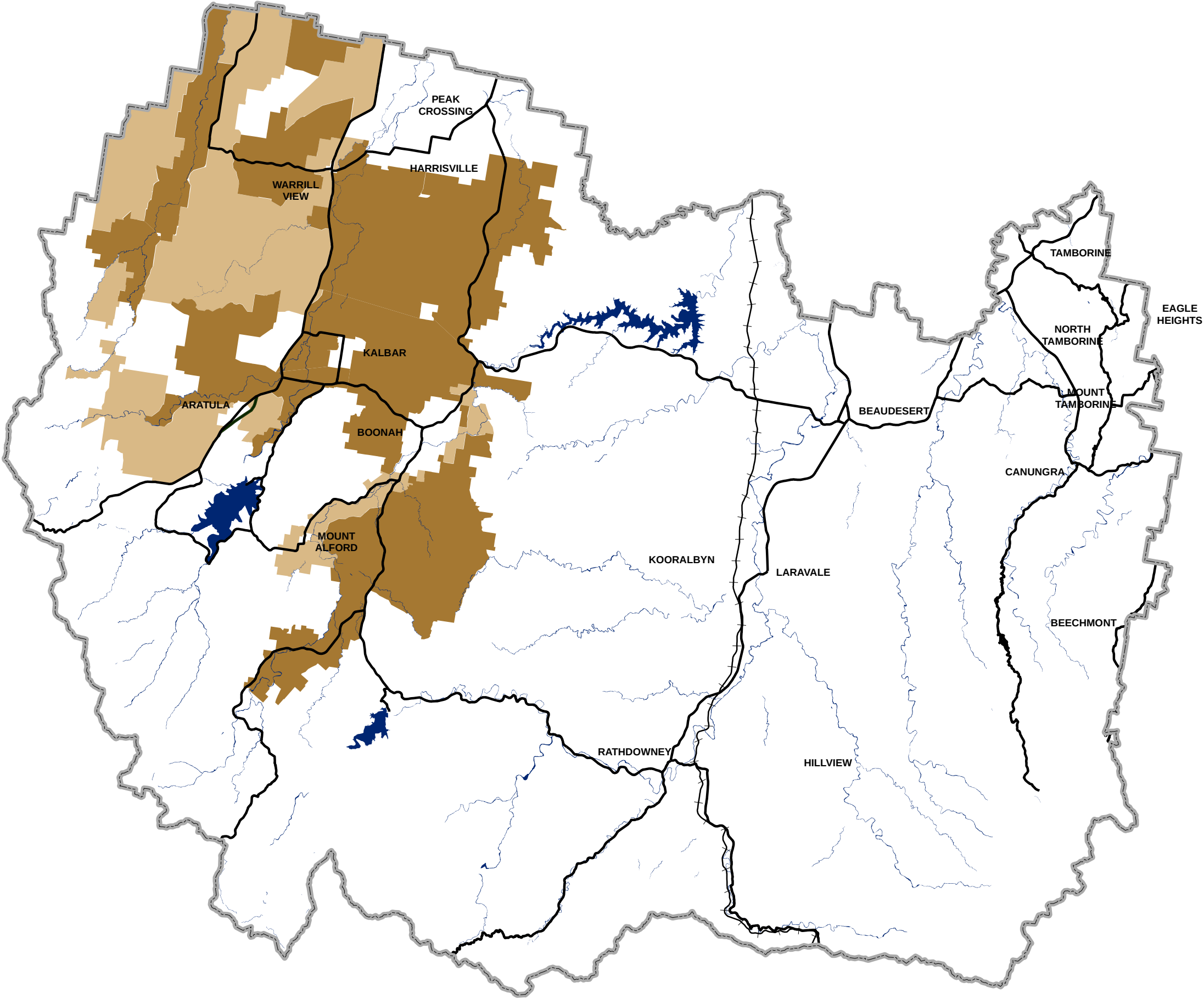
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Insert C - Aratula

KRA Number	Key Resource Area
KRA 61	Bromelton
KRA 95	Mundoolun Connections Sands
KRA 139	Cryna
KRA 140	Erin View
KRA 141	Kangaroo Mountain
KRA 142	Markwell Creek
KRA 143	Yore Road
KRA 158	Mount Walker

Scenic Rim Planning Scheme
Strategic Framework Map
SFM-03
-Rural Precinct Plan-



Rural Subdivision Precincts

- Rural 40ha Precinct
- Rural 60ha Precinct

Regional Infrastructure

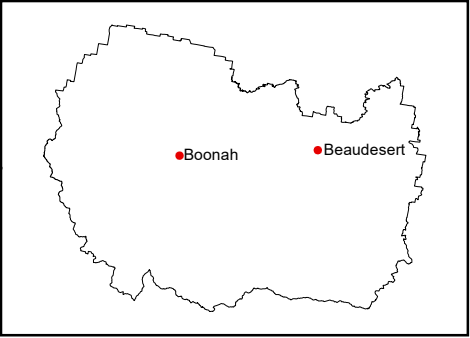
- State-controlled Roads
- Rail Network
- Local Government Area Boundary
- Waterway or Waterbody

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ATTACHMENT 13

KRA Reports and Maps

Key Resource Area reports and maps 121 to 160

April 2016

KANGAROO MOUNTAIN KEY RESOURCE AREA - KRA 141

LOCAL GOVERNMENT AREA: Scenic Rim Regional Council

LOCATION:

The resource is located approximately 4 kilometres north of Aratula, west of the Cunningham Highway and 46 kilometres southwest of Ipswich in Southeast Queensland (see map KRA 141).

EXTRACTIVE RESOURCE: Quarry Rock (and minor sand and gravel)

EXTRACTIVE RESOURCE DESCRIPTION:

The resource consists of a massive trachyandesite intrusion. It forms a broad northeasterly trending ridge between two peaks, Kangaroo Mountain on the southern end and the northern unnamed peak. The broad saddle between the peaks is approximately a kilometre long with trachyandesite outcropping throughout. The intrusion is known to greater than 100 metres thick with minimal overburden. A sand and gravel alluvial deposit has been identified to the western and southern foot of Kangaroo Mountain and is included in the resource area.

SIGNIFICANCE:

The resource is well placed to supply the expansion of urban development in the South East Queensland Regional Plan Area. It is estimated to be sufficient for 50 years at the current level of demand for the Ipswich and Scenic Rim regions.

The resource is suitable for most types of construction aggregate and may be capable of producing rip rap with application of appropriate extraction techniques.

SEPARATION AREA:

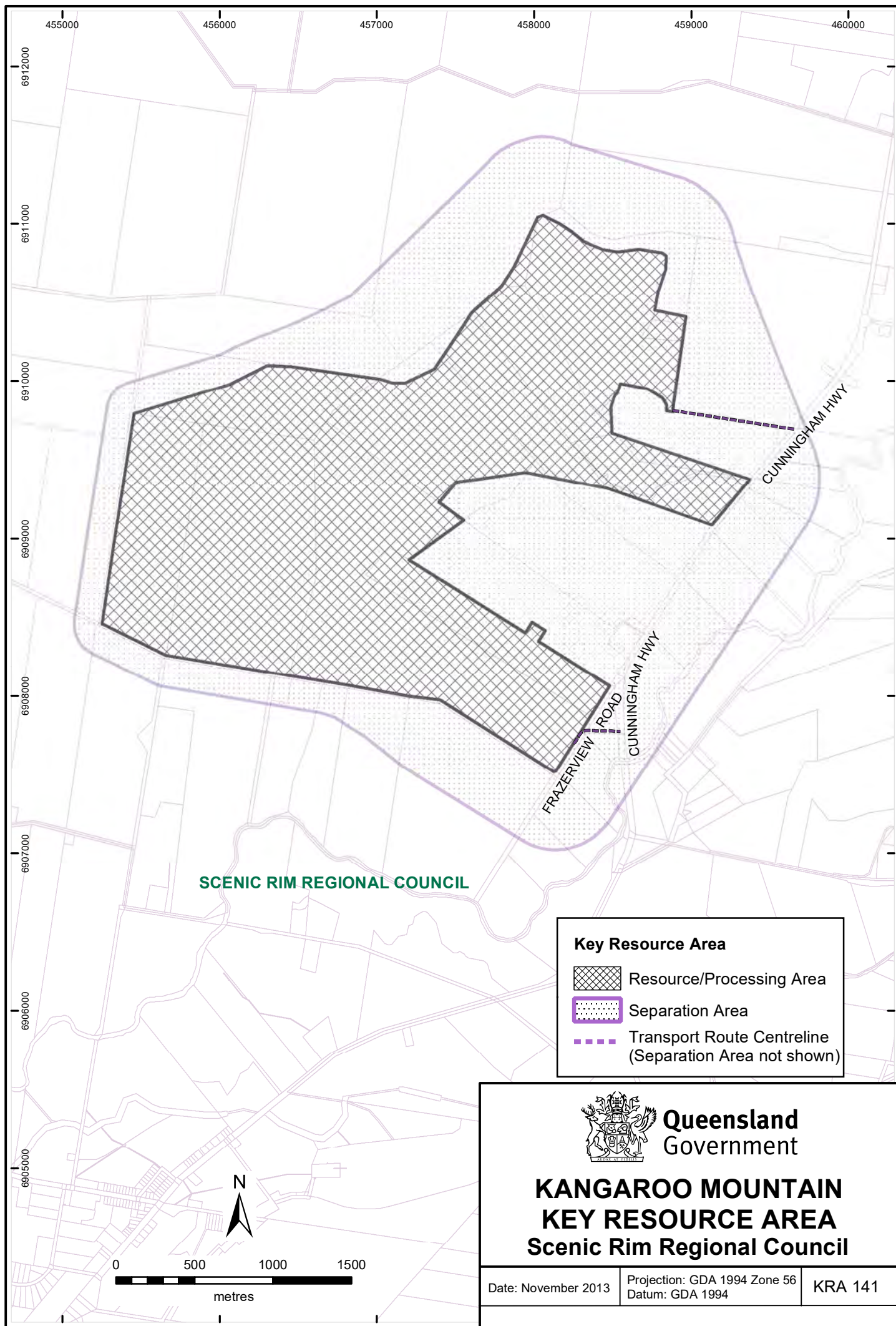
The resource/processing area is defined by the area which is screened from adjacent properties and topographic highs as well as a current extractive industry approval over the western portion of the KRA. As most of this area is surrounded by ridge crests which are higher than the surrounding land, a separation distance of 500 metres from the resource/processing area has been applied. A 200 metre separation area is applied around the sand resource at the western portion of the KRA.

TRANSPORT ROUTE:

An existing route exits the centre of the resource using existing road reserves and extends eastwards to the Cunningham Highway. Upgrades of existing roads and intersections with the highway are likely to be required. The long narrow blocks extend from the resource to the highway to allow development of haul roads over privately owned land.

SPECIAL CONSIDERATIONS:

Some parts of the KRA is covered by Strategic Cropping Land (SCL) Trigger Mapping under the *Strategic Cropping Land Act 2011* administered by the Department of Natural Resources and Mines. This indicates the location of potential SCL and further on-ground assessment against the SCL criteria is required to confirm whether the area is SCL or non-SCL.



ATTACHMENT 14

Scenic Rim Planning Scheme Overlay Map OM-04-A.1 Environmental Significance Overlay -Biodiversity-

Matters of State Environmental Significance

-  Regulated Vegetation
(as defined in the SPP)
-  Protected Areas

-  Cadastral Boundary
-  Waterway or Waterbody
-  State-controlled Roads
-  Road Reserve
-  Local Government
Area Boundary

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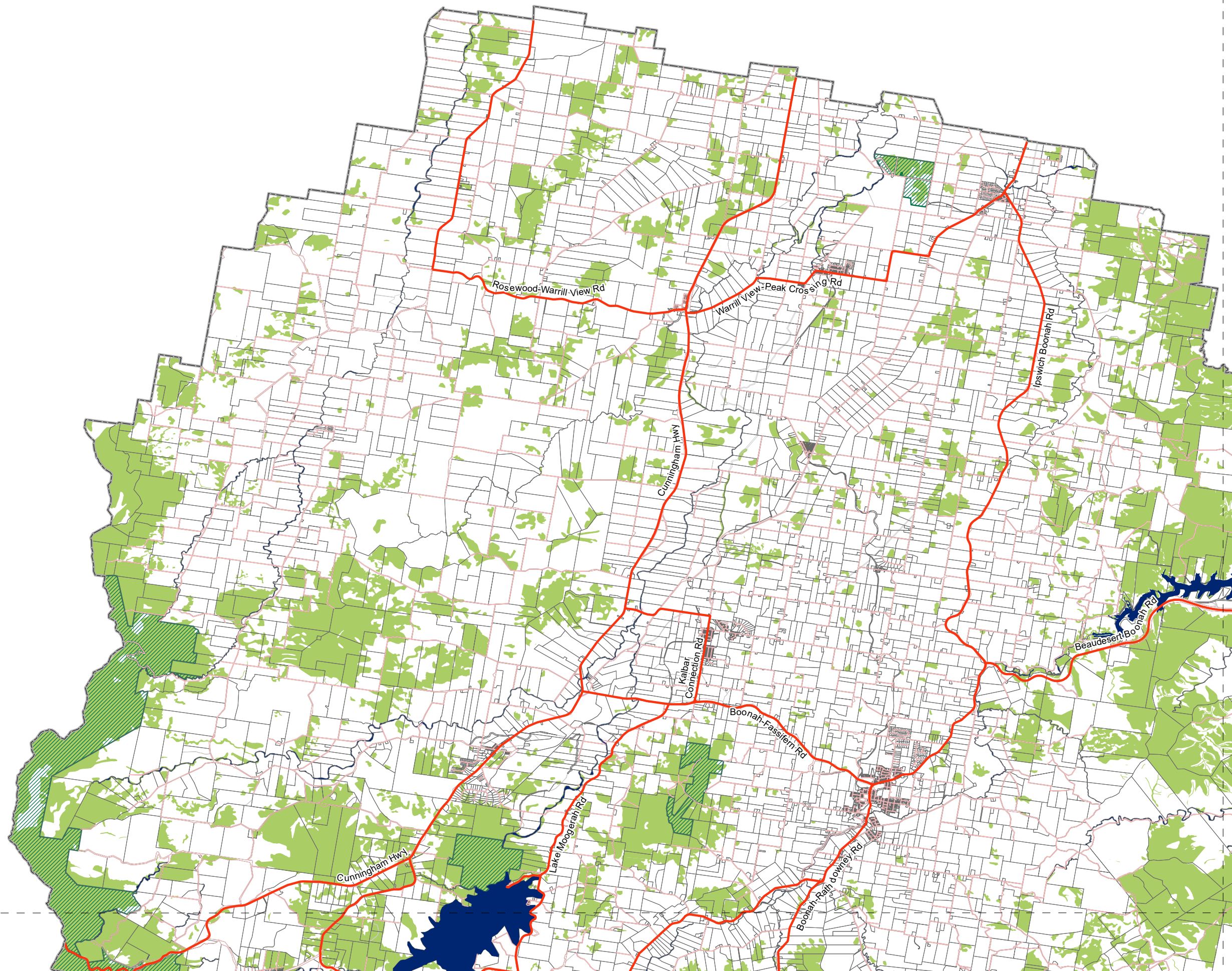
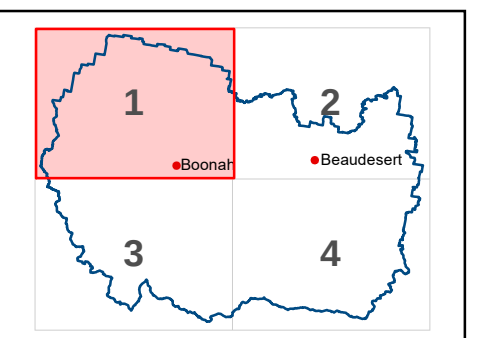
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0 2 4 8 KM



Scenic Rim Planning Scheme Overlay Map OM-04-B.1 Environmental Significance Overlay -Local Biodiversity-

Matters of Local Environmental Significance

- Core Corridor
- Node Corridor
- Stepping Stone
- Critical Linkage

- Cadastral Boundary
- Waterway or Waterbody
- State-controlled Roads
- Road Reserve
- Local Government
Area Boundary

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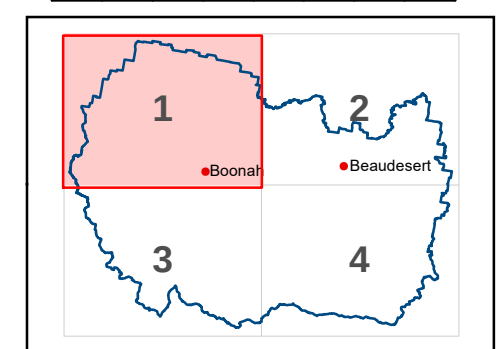
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Scenic Rim Planning Scheme Overlay Map OM-04-C.1 Environmental Significance Overlay -Priority Species-

Matters of State Environmental Significance

 State Significant Species

Matters of Local Environmental Significance

 Koala Habitat

 Cadastral Boundary

 Waterway or Waterbody

 State-controlled Roads

 Road Reserve

 Local Government
Area Boundary

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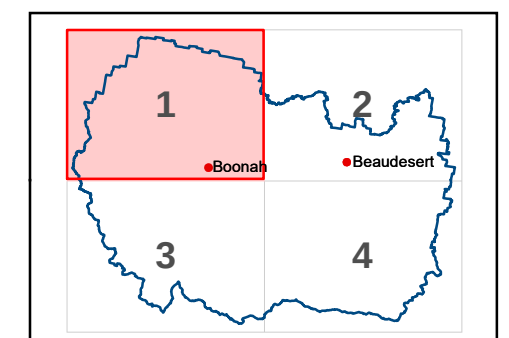
DRAFT Scenic Rim Planning Scheme

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SECOND CONSULTATION DRAFT 2019

Approx Scale @ A3 1:150 000

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Scenic Rim Planning Scheme Overlay Map OM-04-D.1 Environmental Significance Overlay -Wetlands and Waterways-

Matters of State Environmental Significance Waterways and Wetlands

-  High Ecological Value Waters (Watercourse)
-  High Ecological Value Waters (Wetland)
-  High Ecological Significance Wetlands
-  Waterways and Wetlands Buffer Area

-  Cadastral Boundary
-  Waterbody
-  State-controlled Roads
-  Road Reserve
-  Local Government Area Boundary

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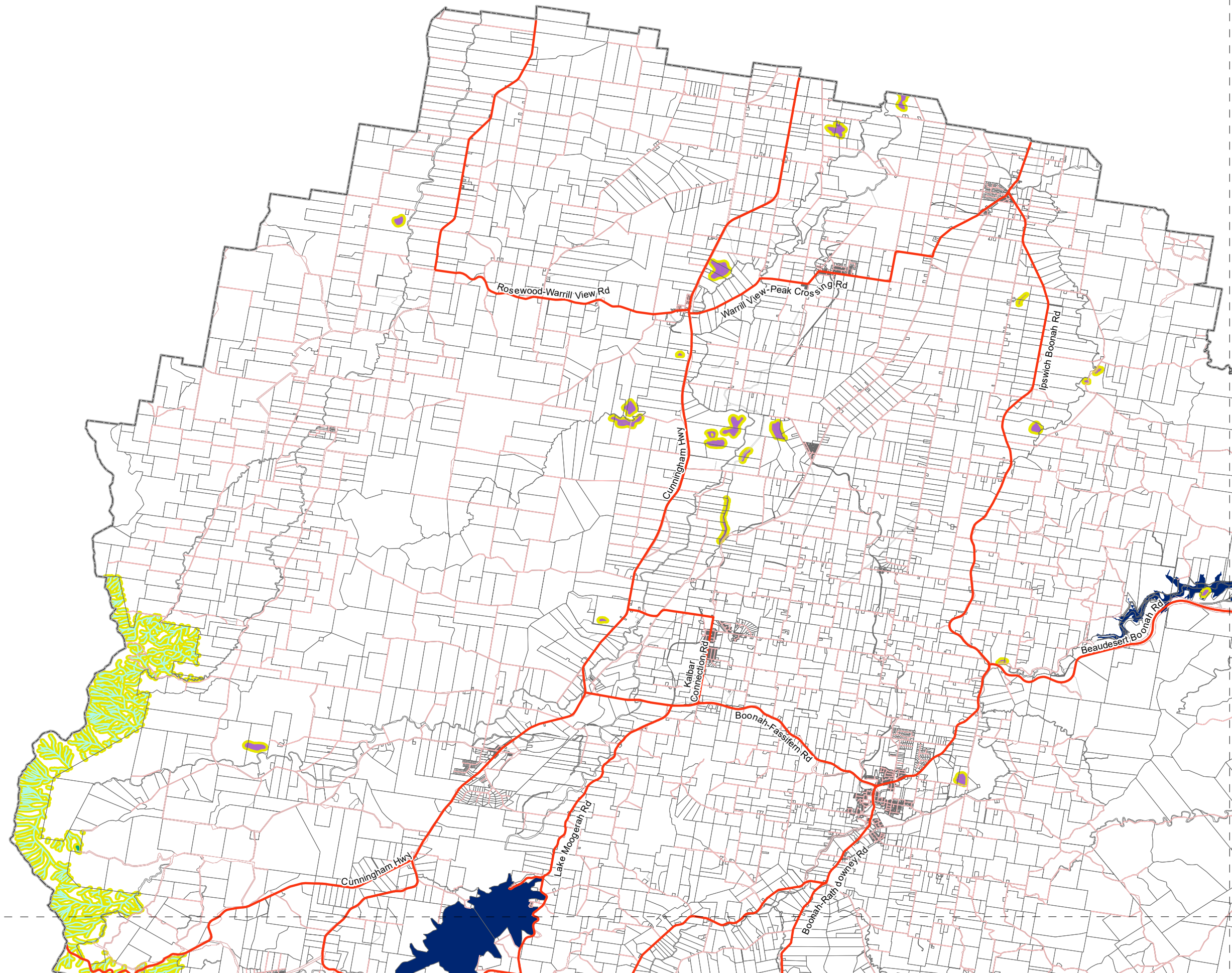
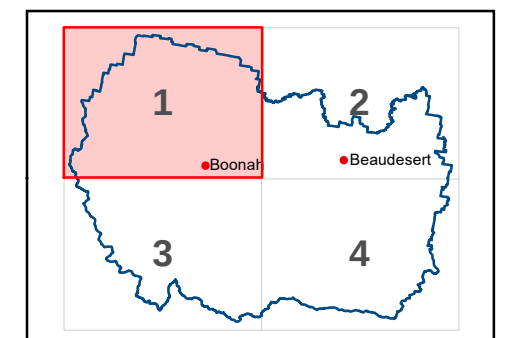
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Approx Scale @ A3 1:150 000

0 2 4 8 KM



Scenic Rim Planning Scheme Overlay Map OM-04-E.1 Environmental Significance Overlay -Local Watercourses-

Matters of Local Environmental Significance Local Watercourses

- Stream Order 2

Stream Order 3 and 4

Stream Order 5 to 7
- Watercourse Buffer Area A

Watercourse Buffer Area B

Watercourse Buffer Area C
- Cadastral Boundary

Waterbody

State-controlled Roads

Road Reserve

Local Government Area Boundary

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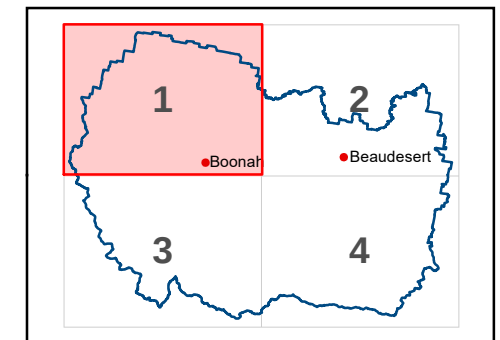
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ATTACHMENT 15



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FRAZERVIEW QUARRY ECOLOGICAL ASSESSMENT REPORT

Wagner Investments Pty Ltd

PO Box 5385
Brendale Q 4500

P 0448 899 649
F 07 3264 7131
E contact.team@ecosm.com.au

December 2018

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Document version:	18032 Rpt01b
Author(s):	Monica Campbell
Reviewed by:	Steve Marston, Chris Hansen
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Contents

Summary	ix
1 Introduction	1
1.1 Project background	1
1.2 Scope of works	1
1.3 Study area description	2
1.4 Regulatory framework	2
2 Methods	4
2.1 Desktop assessment	4
2.2 Field methods	4
2.2.1 Flora methods	4
2.2.2 Fauna methods	6
2.3 Likelihood of occurrence assessment	7
2.3.1 Ecological community assessment	7
2.3.2 Significant species assessment	7
2.4 Limitations	8
3 Ecological values of the study area	9
3.1 Desktop results	9
3.2 Field survey results	10
3.2.1 Flora	10
Vegetation communities within the study area	10
Species diversity	15
Exotic flora	16
3.2.2 Fauna	16
Exotic fauna	17
4 Matters of national environmental significance	18
4.1.1 Threatened ecological communities	18
4.1.2 Threatened flora	18
4.1.3 Threatened fauna	18
Koala	20
4.1.4 Migratory species	22
5 Matters of state environmental significance	24
5.1.1 Regulated vegetation	24
5.1.2 Essential habitat	25
5.1.3 Threatened and near threatened flora	25
5.1.4 Threatened and special least concern fauna	26

6	Impact Assessment	27
6.1	Direct impacts	27
6.2	Indirect impacts.....	27
6.3	Impact mitigation	27
6.3.1	Measures to avoid impacts	27
6.3.2	Measures to mitigate impacts	28
7	Legislative requirements	30
7.1	Matters of national environmental significance.....	30
7.1.1	Koala	30
7.1.2	Migratory bird species	39
7.2	Matters of state environmental significance	41
7.2.1	Regulated vegetation	41
7.2.2	Threatened flora.....	42
7.2.3	Threatened fauna	43
7.3	Matters of local environmental significance.....	44
8	References	47

List of Tables

Table 1:	Criteria to assess potential for significant species to occur in the study area	7
Table 2:	Comparison of Queensland Government mapped and field-validated REs in the study area.....	25
Table 3:	Assessment against significant impact criteria for the vulnerable Koala	34
Table 4:	Assessment of significance of impacts for migratory birds.....	40
Table 5:	Assessment against Natural Areas Overlay Code – Natural Values .	45

List of Figures

Figure 1:	Locality plan	55
Figure 2:	Aerial photograph of the study area.....	56
Figure 3:	Queensland Government RE mapping	57
Figure 4:	Locations of flora and fauna survey sites	58
Figure 5:	Boonah Planning Scheme Natural Values overlay map.....	59
Figure 6:	Field-validated RE mapping	60
Figure 7:	Proposed quarry layout	61
Figure 8:	Koala habitat in relation to elevation	62
Figure 9:	Koala habitat in relation to slope	63

Appendices

Appendix A: KRA 141 – Kangaroo Mountain Map

Appendix B: Database search results

Appendix C: Queensland Government Mapping

Appendix D: Flora species recorded within the study area

Appendix E: Fauna species recorded within the study area

Appendix F: Likelihood of occurrence assessments

Appendix G: Koala SAT sites datasheets

Appendix H: Koala critical habitat assessment

Appendix I: Summary resource assessment – Frazerview Quarry

Symbols and Abbreviations

*	(Preceding a plant species name) plant species not native to Australia
±	With or without, more or less
Biosecurity Act	(Queensland) <i>Biosecurity Act 2014</i>
BoM	Bureau of Meteorology
DES	(Queensland) Department of Environment and Science
DNRME	(Queensland) Department of Natural Resources, Mines and Energy
DoEE	(Commonwealth) Department of the Environment and Energy
EDL	Ecologically Dominant Layer
EHP	(Queensland) Department of Environment and Heritage Protection
EO Act	(Queensland) <i>Environmental Offsets Act 2014</i>
EPBC Act	(Commonwealth) <i>Environment Protection and Biodiversity Conservation Act 1999</i>
GBO	General biosecurity obligation under the Queensland <i>Biosecurity Act 2014</i>
GPS	Global positioning system
ha	Hectares
km	Kilometres
MLES	Matters of local environmental significance (EO Act)
MNES	Matters of national environmental significance (EPBC Act)
MSES	Matters of state environmental significance (EO Act)
NC Act	(Queensland) <i>Nature Conservation Act 1992</i>
NRM	(Queensland) Department of Natural Resources and Mines
RE	Regional Ecosystem as defined under the Queensland Vegetation Management Regulation 2000
REDD	Regional Ecosystem Description Database
SPRAT	Species Profile and Threats Database
TEC	Threatened Ecological Community
TSSC	Threatened Species Scientific Committee
VM Act	(Queensland) <i>Vegetation Management Act 1999</i>
WoNS	Weeds of National Significance

Glossary

Term	Definition
Bioregion	A geographically distinct biological region, which is a reporting unit for assessing the status of native ecosystems and their level of protection. Australia is divided into 89 bioregions. Bioregions form part of the regional ecosystem classification code system. The study area is located largely in the Moreton Basin sub-region of the South East Queensland Bioregion.
Endangered	Prescribed to a threatened ecological community, regional ecosystem or species under the Queensland <i>Vegetation Management Act 1999</i> , <i>Nature Conservation Act 1992</i> or Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
EPBC Act conservation status	The <i>Environment Protection and Biodiversity Conservation Act 1999</i> lists species and communities: Extinct in the wild: - It is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or - It has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a timeframe appropriate to its life cycle and form. Critically Endangered: - It is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria. Endangered: - It is not critically endangered; and it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria. Vulnerable: - It is not critically endangered or endangered; and - It is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria. Migratory: - Migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II); - Migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA); - Native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).
Least Concern	Prescribed to regional ecosystems listed under the Queensland <i>Vegetation Management Act 1999</i> .

Term	Definition
MNES	A matter protected under the EPBC Act, including: ▪ World heritage properties ▪ National heritage places ▪ Wetlands of international importance ▪ Listed threatened species and ecological communities ▪ Migratory species ▪ Commonwealth marine areas ▪ The Great Barrier Reef Marine Park ▪ Nuclear actions ▪ A water resource, in relation to coal seam gas development and large coal mining development.
MSES	A matter of State environmental significance listed in Schedule 2 of the Queensland Environmental Offsets Regulation 2014 including: ▪ Regulated vegetation ▪ Connectivity areas ▪ Wetlands and watercourses ▪ High preservation areas of wild river areas ▪ Protected wildlife habitat ▪ Protected areas ▪ Highly protected zones of State marine parks ▪ Fish habitat areas ▪ Waterways providing for fish passage ▪ Marine plants ▪ Legally secured offset areas.
MLES	A matter described in Section 5(3) of the Queensland Environmental Offset Regulation 2014 as a matter of local environmental significance for which an environmental offset is required under a local planning instrument.
NC Act conservation status	Under the <i>Nature Conservation Act 1992</i>, native wildlife may be prescribed as: Extinct in the wild: ▪ There have been thorough searches conducted for the wildlife; and ▪ The wildlife has not been seen in the wild over a period that is appropriate for the life cycle or form of the wildlife. Endangered: ▪ There have not been thorough searches conducted for the wildlife and the wildlife has not been seen in the wild over a period that is appropriate for the life cycle or form of the wildlife; or ▪ The habitat or distribution of the wildlife has been reduced to an extent that the wildlife may be in danger of extinction; or ▪ The population size of the wildlife has declined, or is likely to decline, to an extent that the wildlife may be in danger of extinction; or

Term	Definition
	▪ The survival of the wildlife in the wild is unlikely if a threatening process continues. Vulnerable: ▪ The population size or distribution of the wildlife has declined, or is likely to decline, to an extent that the wildlife may become endangered because of a threatened process; or ▪ The population size of the wildlife has been seriously depleted and the protection of the wildlife is not secured; or ▪ The population of the wildlife is low or localised and dependent on habitat that has been, or is likely to be, adversely affected, in terms of quantity or quality, by a threatening process. Near Threatened: ▪ The population size or distribution of the wildlife is small and may become smaller; or ▪ The population size of the wildlife has declined, or is likely to decline, at a rate higher than the usual rate for population changes for the wildlife; or ▪ The survival of the wildlife in the wild is affected to an extent that the wildlife is in danger of becoming vulnerable. Least Concern: ▪ The Wildlife is common or abundant and is likely to survive in the wild.
Near Threatened	Prescribed to species listed under the Queensland <i>Nature Conservation Act 1992</i> .
Of Concern	Prescribed to regional ecosystems listed under the Queensland <i>Vegetation Management Act 1999</i> .
Regional ecosystem	A vegetation community within a bioregion that is consistently associated with a particular combination of geology, landform and soils.
Regulated vegetation	Vegetation regulated through the <i>Planning Act 2017</i>
Remnant vegetation	Defined under the Queensland <i>Vegetation Management Act 1999</i> as, woody vegetation that has not been cleared or vegetation that has been cleared but where the dominant canopy has >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.
Restricted pests	Plants and animals listed under the Queensland <i>Biosecurity Act 2014</i> .
Significant species and vegetation	Refers to: ▪ Species listed as Endangered, Vulnerable or Near Threatened under the Queensland Nature Conservation (Wildlife) Regulation 2006 or Critically Endangered, Endangered or Vulnerable under the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> ▪ Threatened ecological community listed as Critically Endangered, Endangered or Vulnerable under the

Term	Definition
	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> ▪ Regional ecosystems with an Endangered or Of Concern biodiversity status or <i>Vegetation Management Act 1999</i> status.
Special least concern	Defined under the Queensland Nature Conservation (Wildlife) Regulation 2006 as: a) the echidna (<i>Tachyglossus aculeatus</i>) b) the platypus (<i>Ornithorhynchus anatinus</i>) c) a least concern bird to which any of the following apply – i. Agreement Between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA) ii. Agreement Between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment (CAMBA) iii. Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).
Study area	An area defined for the purposes of this ecological assessment report and shown on Figure 1 and which comprises portions Lot 9 on RP20973 and Lot 2 on RP20974.
Threatened ecological community	A community listed under the provisions of the Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .
Vegetation Management Act status	This is a statutory classification under the Queensland <i>Vegetation Management Act 1999</i>. A regional ecosystem is listed as 'endangered' if: ▪ Remnant vegetation for the regional ecosystem is less than 10% of its pre-clearing extent across the bioregion; or 10-30% of its pre-clearing extent remains and the remnant vegetation for the regional ecosystem is less than 10,000 ha. A regional ecosystem is listed as 'of concern' if: ▪ Remnant vegetation for the regional ecosystem is 10-30% of its pre-clearing extent across the bioregion; or more than 30% of its pre-clearing extent remains and the remnant vegetation extent for the regional ecosystem is less than 10,000 ha. A regional ecosystem is listed 'least concern' if: ▪ Remnant vegetation for the regional ecosystem is over 30% of its pre-clearing extent across the bioregion, and the remnant vegetation area for the regional ecosystem is greater than 10,000 ha.
Vulnerable	Prescribed to a threatened ecological community or species under the Queensland <i>Nature Conservation Act 1992</i> or Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> .

Summary

Ecological Survey & Management has been engaged by Ausrocks Pty Ltd on behalf of Wagners Investments Pty Ltd to assess the ecological values of a proposed quarry site at Frazerview in South East Queensland (the project). It is intended to establish a hard-rock quarry within Lot 9 on RP20973 located on Horan Road at Frazerview (quarry site) and a haul road within Lot 2 on RP20974 that will connect the quarry to the Cunningham Highway at Kalbar. For the purposes of the ecological assessment the study area comprises both Lot 9 and Lot 2. Trachyandesite is the target resource and is primarily associated with an undulated low hill in the central portion of the study area. Once extracted and processed the resource will be used for road base, aggregates and rail ballast. The study area is partially located within the Kangaroo Mountain Key Resource Area (KRA No. 141).

Ecological values

A flora and fauna assessment of the study area was undertaken over two days between 4 and 5 October 2018, inclusive. The key findings of the survey can be summarised as follows.

- Historic and recent land management practices (i.e. clearing, cattle grazing and timber getting) have influenced the structure and composition of vegetation across the study area. In general, lower-lying portions of the study area have been cleared historically, with more intact eucalypt woodlands being associated with undulated low hills and associated slopes within the study area.
- Five remnant regional ecosystems (RE) types were identified in the study area during the field surveys. Four of these communities have a least concern status under the *Vegetation Management Act 1999* (VM Act) and one (i.e. RE 12.9-10.7) has an of concern status under the VM Act. The field-validated vegetation mapping identified discrepancies between the on-ground vegetation communities and the Queensland Government's Regulated Vegetation Mapping for the study area. The key differences being an additional 6.5 ha of remnant (Category B) vegetation and an increase in the area (i.e. from 18.7 ha to 26.3 ha) of remnant of concern vegetation being mapped within the study area, as a result of the field surveys.
- Field-validated vegetation mapping identified remnant least concern vegetation (i.e. RE 12.8.9, RE 12.8.14a and RE 12.8.17) across the low hill in the central portion of the study area that is underlain by the target resource (i.e. Trachyandesite).
- A total of 151 flora species were recorded during the field surveys representing 60 families and 129 genera. Of these 33 (or 22%) were exotic species, six of which are listed as restricted matters under the *Biosecurity Act 2014*. However, weeds occurred in relatively low densities across the study area.
- None of the vegetation communities recorded within the study area support the structural or floristic characteristics of any threatened ecological communities (TECs) listed under the Commonwealth's *Environment Protection*

and Biodiversity Conservation Act 1999 (EPBC Act). No threatened or near threatened flora species or their habitat, were recorded during the survey.

- A range of common fauna species were recorded within the site, with birds being the most diverse and numerous of the faunal groups observed. However, two Koalas were observed within areas of RE 12.9-10.7 in the north-western portion of the study area. Koala scats and scratch marks were also recorded throughout this RE types, as well as within RE 12.8.17 on the lower slopes of the undulated low hill in the south-western portion of Lot 9. The Koala is currently listed as vulnerable under the EPBC Act and Queensland's *Nature Conservation Act 1992* (NC Act). Approximately 146.8 ha of Koala habitat has been identified in the study area.
- No other threatened fauna were recorded or expected occur within the study area during the field surveys. However, three migratory bird species were recorded during the field survey, namely Fork-tailed Swift, Black-faced Monarch and Rufous Fantail.

Impacts to Ecological Values

Construction of the proposed quarry will have a direct impact on approximately 75 ha of vegetation consisting of:

- 14.6 ha of non-remnant (i.e. Category X) vegetation
- 0.2 ha of least concern high-value regrowth vegetation
- 60.2 ha of remnant least concern (i.e. Category B) vegetation.

The quarry layout has specifically been designed to avoid direct impacts to remnant of concern vegetation (RE 12.9-10.7) within the study area, which is preferentially being used by the local Koala population. Clearing of remnant least concern vegetation is unavoidable given:

- the 43.8 ha of remnant least concern vegetation that falls within the extraction area coincides with the location of the highest quality resource within the study area
- a logical and practical approach to the design of the quarry has resulted in some of the processing/stockpile/infrastructure areas encroaching into remnant least concern vegetation
- the proposed haul road to Cunningham Highway is constrained by topography, land ownership/access issues and traffic modelling.

Indirect impacts (i.e. noise, erosion, dust) will be minimised and managed through standard industry practices specified in the Site Based Management Plan.

Government legislation and policy

An assessment of the project against key biodiversity legislation and policy is provided and summarised below.

Legislation / policy	Ecological values present in study area	Permit /approval required	Notes
<i>Matters of National Environmental Significance</i>			
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	Koalas and Koala habitat identified within the study area	Referral to Commonwealth Government recommended	Approximately 69.7 ha of Koala habitat will be directly impacted by the proposed quarry. Koala habitat in the study area is considered critical to the survival of the Koala (i.e. a score of 8 was achieved using the Commonwealth's scoring tool). The Commonwealth considers that projects involving >20 ha of habitat critical to the Koala with a habitat score of 8 or greater are likely to have a significant impact and a Referral is required. Notwithstanding the above, the project is considered unlikely to have a significant impact on the Koala given (refer Section 7.1.1): ▪ 26.3 ha of higher quality Koala habitat (RE 12.9-10.7) will be retained and protected by a 30 m buffer ▪ the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given: - it is associated with elevations (i.e. greater 150 mAHD) with which Koalas are less commonly associated - it is associated with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated - the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill. - Koalas have a tendency to use the same set of trees within their home range - opportunities for Koala movement will remain. Nonetheless the project should be Referred to the Commonwealth for a determination as to whether assessment against the EPBC Act is required.

Legislation / policy	Ecological values present in study area	Permit / approval required	Notes
	Migratory species	Referral not recommended	Three Migratory species were recorded within the study area during the field survey. However, the project is unlikely to have a significant impact on Migratory species given that: - the study area does not provide any area of important habitat for these species. - the study area is unlikely to support an ecologically significant proportion of the population for these species. - the project is unlikely to result in the introduction of an invasive species that is known to be harmful to these Migratory species.
<i>Matters of State Environmental Significance</i>			
<i>Vegetation Management Act 1999 (VM Act)</i>	Category B Vegetation containing of concern and least concern REs. Essential Habitat for the Koala (i.e. Category B vegetation).	A permit to clear Of Concern vegetation.	A permit to clear remnant least concern vegetation will need to be obtained, a Property Vegetation Management Plan has been prepared as part of the Development Application. It is noted that the proposed quarry layout has avoided impacts to field-validated remnant of concern vegetation. In addition, connectivity of field-validated remnant vegetation has been maintained through the inclusion of 100 m wide corridors along the base of the extraction area.
<i>Nature Conservation Act 1992 (NC Act)</i>	Lot 2 is partially within a high-risk area (HRA) on the Protected Plant Flora Survey Trigger Map. No threatened flora recorded within the study area. Least Concern plant species recorded within the study area.	A Clearing Permit (Protected Plants) or exempt clearing notification required.	It is recommended that prior to any vegetation clearing taking place, a formal flora survey that complies with the Flora Survey Guidelines is carried out along the proposed haul route, plus a 100 m buffer. Following the flora survey, a formal Flora Survey Report (FSR) will need to be submitted to Department of Environment and Science in: - order to demonstrate that no threatened flora species were identified within the clearing impact area (including the 100 m buffer) – the FSR must be submitted at least one week prior to any vegetation clearing; or - support of an application for a Clearing Permit, when

Legislation / policy	Ecological values present in study area	Permit / approval required	Notes
			threatened flora have been identified within the clearing impact area and 100 m buffer. Note that the FSR must be lodged with DES within 12 months of the flora surveys being undertaken.
	Koalas and Koala habitat identified within the study area	If the project is Referred to the Commonwealth and deemed a controlled action no further assessment required under State legislation.	Under the current Queensland legislative framework, the EO Act does not apply to impacts on EPBC Act listed MNES, including those that are also MSES, and the assessment and approval process for offsets required for significant residual impacts to MNES is the responsibility of the Commonwealth government. For the same reasons presented above in relation to MNES, it is also considered unlikely that the proposed quarry will result in a significant residual impact on the Koala in accordance with Department of Local Government, Racing and Multicultural Affairs' (DLGRMA) Significant Residual Impact Guideline (SRI Guideline) (SDIP 2014).
	Fauna breeding places recorded.	Disturbance to fauna breeding places (i.e. waterbodies, hollow-bearing trees, bird nests) can only lawfully be undertaken if there is an approved Species Management Program in place.	Given a threatened species (i.e. Koala) has been recorded within the study area, a High-risk Species Management Program (SMP) is required to minimise the risk of tampering with animal breeding places and where necessary, to do so in a sensitive manner during the course of the construction and operation of the quarry.

Legislation / policy	Ecological values present in study area	Permit /approval required	Notes
<i>Matters of Local Environmental Significance</i>			
Boonah Shire Planning Scheme 2006	State and Regional values on the Overlay Map 2A: Natural Areas Overlay – Natural Values	Assessment against the provisions of the Natural Areas Overlay Code has been completed and demonstrates that the proposal is consistent with the purpose and intent of this code.	Impacts to environmental sensitive areas (i.e. remnant vegetation, watercourses) have been avoided and minimised as far as practicable.

1 Introduction

Ecological Survey & Management has been engaged to assess the ecological values of a proposed quarry site at Frazerview in South East Queensland (the project). Specifically, the project involves the construction and operation of a:

- hard-rock quarry within Lot 9 on RP20973 located on Horan Road at Frazerview (quarry site)
- haul road within Lot 2 on RP20974 that will connect the quarry to the Cunningham Highway at Kalbar

For the purposes of this ecological assessment the study area encompassed both Lot 9 and Lot 2. The study area locality is provided as Figure 1 and aerial photography is provided as Figure 2.

1.1 Project background

The project involves the establishment and operation of a hard rock quarry with an estimated extraction rate of 1.2 million tonnes per annum. Trachyandesite is the target resource located within the north-western portion of Lot 9 and is suitable for road base, aggregates and rail ballast.

The proposed Environmentally Relevant Activities (ERAs) for the site are as follows:

- ERA 16 2(c) Extracting rock or other material >1,000,00 tonnes per annum)
- ERA 16(3)(c) Screening >1,000,00 tonnes per annum
- ERA 6 Asphalt Manufacturing (>1,000 t/a).

The boundaries of Lot 9 and Lot 2 will be realigned such that Lot 9 can be directly accessed from the Cunningham Highway.

The study area is partially located within the Kangaroo Mountain Key Resource Area (KRA No. 141). Approximately half of Lot 2 falls within the "Resource/Processing Area" of the KRA, with balance of Lot 2 being located within the "Separation Area". A small portion of Lot 9 is also located in the "Resource/Processing Area" of KRA 141 and the central portion occurs within the "Separation Area" (Appendix A).

1.2 Scope of works

The following activities were required as part of this ecological assessment:

- validate and map remnant vegetation in accordance with the criteria of the *Vegetation Management Act 1999* (VM Act), within and adjacent to the quarry site and haul road
- identify, map and describe any threatened ecological communities (TECs) present that are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- assess the likelihood of occurrence and where possible identify significant species of flora and fauna and/or their habitats protected under the

Commonwealth EPBC Act and Queensland *Nature Conservation Act 1992* (NC Act)

- prepare an ecological assessment report to accompany an application for the proposed quarry that:
 - o describes and maps ecological values of the study area
 - o assesses the potential for threatened species and communities to occur
 - o assesses the potential impacts associated with the proposed quarry against the provisions of Commonwealth, State and Local Government legislation with a biodiversity conservation focus.

1.3 Study area description

The study area encompasses two large rural properties (Lot 9 and Lot 2) approximately 7 km north-north-east of Aratula within the Scenic Rim Regional Council Local Government Area (LGA). The study area encompasses approximately 187.8 ha and includes an undulated low hill (approximate elevation of 220 m) in the central portion that extends into the adjoining property to the east (Figure 2).

A number of small first order drainage lines originate from steeper terrain in the central portions of Lot 9 and connect with a more defined 2nd order drainage line that extends through the north-western portion of Lot 9. This 2nd order drainage line connects with a network of drainage lines to the north of Lot 9 that drain in an easterly direction, eventually discharging into Warrill Creek approximately 2.5 km to the east of the study area. A dam has been constructed within the flow path of the stream order 2 drainage line in the north-western portion of Lot 9 (Figure 2).

A number of 1st order drainage lines and one 2nd order drainage line also originate from steeper terrain in Lot 2 and extend in a southerly direction, connecting with a drainage system that has been modified and channelised through cultivated cropping land adjacent to the Cunningham Highway (Figure 2).

Lower-lying portions of the study area have been subject to vegetation clearing in the past to facilitate agricultural land uses such as cattle grazing and crop cultivation. More intact vegetation communities have been retained on steeper terrain associated with the undulated low hill. Intact vegetation within the study area have been mapped by the Queensland Government as supporting remnant vegetation (i.e. Category B vegetation) containing of concern Regional Ecosystem (RE) 12.9-10.7 or the least concern RE 12.8.17 (Figure 3; Section 3.1).

1.4 Regulatory framework

Quarry applications are subject to the provisions of the *Planning Act 2016* and are typically treated as a material change of use – extractive industry application assessable against the local government planning scheme. In this case, the proposed quarry will be assessed against the Boonah Shire Planning Scheme 2006 (the Planning Scheme). The Scenic Rim Regional Council was formed by an amalgamation of three LGAs, including the Boonah LGA however, a new planning

scheme has yet to be developed. Therefore, until a new planning scheme is implemented, the Planning Scheme of the former Boonah Shire will be used to assess planning applications in the Frazerview area.

Both Lot 9 and Lot 2 are freehold parcels of land and have a “rural” designation under the Planning Scheme. A key objective of the Planning Scheme is to ensure the rural zone retains its viability as an area of primary production and natural resource use. The Planning Scheme considers extractive industry to be an appropriate land use in the rural zone, providing quarries are located and operated in a manner that does not have an unacceptable detrimental impact on surrounding uses or on the environment.

In addition to the requirements of the Planning Scheme, following key pieces of legislation with a biodiversity conservation focus are of relevance to the proposed quarry, the:

- Commonwealth EPBC Act, which regulates impacts to matters of national environmental significance (MNES)
- Queensland NC Act, which regulates impacts to threatened and near threatened flora and fauna
- Queensland VM Act, which regulates the clearing of native vegetation communities across Queensland
- Queensland *Environmental Offsets Act 2014* (EO Act), which is used to condition offsets for significant residual impacts to matters of state environmental significance (MSES).

2 Methods

A desktop and field based assessment was undertaken to assess the likely ecological values of the study area.

2.1 Desktop assessment

The following desktop searches were used to provide an initial assessment of the potential ecological values of the study area:

- Commonwealth EPBC Act Protected Matters Search Tool (DoEE 2018a) (Appendix B)
- Wildlife Online database (DES 2018a) (Appendix B)
- Regulated Vegetation Management Map and Vegetation Management Supporting Map v10.1 (DNRME 2018a) and Essential Habitat Map v7.19 (DNRME 2018b)(Appendix C)
- Protected Plants Flora Survey Trigger Map (DES 2018b)(Appendix C)
- Atlas of Living Australia database¹ (CSIRO 2018).

A 5 km radial search area around a central coordinate was used for the database searches (the search area).

The results of the desktop review were used to refine the field assessment described in the following sections.

2.2 Field methods

A flora and fauna assessment was undertaken over two days between 4 and 5 October 2018, inclusive, to validate the Queensland Government RE mapping for the study area, search for threatened flora and fauna species and assess potential habitat for threatened species.

The following sections outline the methodologies used during this field assessment.

2.2.1 Flora methods

The field assessment was conducted in compliance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 4.0* (Neldner et al. 2017). Queensland Government mapped REs were validated in the field using the survey data collected as part of vegetation assessment sites and referencing the latest geology mapping (NRM 2011).

Assessment sites were performed throughout the study area so as to thoroughly assess Queensland Government mapped remnant vegetation. A total of 31 vegetation assessment sites were completed across the study area, comprising of 2 detailed secondary sites, 13 tertiary sites and 16 modified quaternary sites. An

¹ The Atlas of Living Australia is a publically available database that is populated by a wide range of contributors including 'citizen-based' contributors. The database does not allow for every individual observation to be validated, therefore, this database has been used as secondary supporting information.

additional 15 quaternary photo monitoring points were also taken (Figure 4). The less detailed sampling (quaternary sites) was conducted to provide additional information relating to the vegetative structure and composition and to assist in mapping the extent and distribution of the REs within the study area and to assess habitat for threatened species.

Data recorded at each secondary site included (Figure 4):

- date and precise location (with reference to handheld GPS)
- soils, slope, aspect and landform observations
- ground-layer, mid-stratum and canopy species composition and abundance
- structural characteristics
- condition and disturbance of existing vegetation communities (including distribution of weed species)
- quantitative and qualitative species composition within a 1,000 m² quadrat, and documentation of ancillary species identified within the immediate area or during foot traverse
- basal area of vegetation (Bitterlich Stick methodology)
- photographs of the community (north, east, south, west, groundcover and soils).

Data recorded at each tertiary site included (Figure 4):

- date and precise location (with reference to handheld GPS)
- soils, slope, aspect and landform observations
- ground-layer, mid-stratum and canopy species composition and abundance
- structural characteristics
- basal area of vegetation (Bitterlich Stick methodology)
- condition and disturbance of existing vegetation communities (including distribution of weed species)
- photographs of the community.

Data recorded at each quaternary site included (Figure 4):

- precise location (with reference to handheld GPS)
- ground-cover, mid-stratum and canopy species composition and abundance
- structural characteristics of the ecologically dominant layer (EDL)
- condition
- limited photographs of the community.

A detailed flora species inventory was collected throughout the study area, including at the secondary sites and by traversing the study area to account for additional species.

2.2.2 Fauna methods

The fauna assessment was not intended to be a full detailed survey, but rather a habitat assessment that allowed a prediction of the potential for threatened fauna to occur in the study area. Techniques employed during the two day site visit included, active searching for signs, tracks and scats and opportunistic observations. Notable fauna features were also recorded where observed.

The EPBC Act Protected Matters Search Report and Wildlife Online search for the study area and surrounding areas, indicates that the Koala (*Phascolarctos cinereus*) and/or its habitat is known from the search area. In line with the EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory (DoE 2014), line transects were stratified across the study area to establish an estimate of population density, distribution and habitat preferences (Figure 4). Based on the field-validated vegetation mapping described in Section 2.2.1, only vegetation communities that contained Koala food trees were sampled.

The methodology employed for the line transects generally involved walking the transect length of 200 m approximately 25 m from one side of the transect centreline and then returning along the other side of the 200 m centreline also remaining a distance of 25 m from the centreline, while inspecting each tree along this transect. This approach results in a search area of 1 ha (200 m x 50 m search area) for each transect. A total of nine line transects were conducted resulting in 9 ha of potential habitat actively searched.

At the one end of eight of the Koala transects, Spot Assessment Technique (SAT) surveys were completed. SAT surveys involved searching the base of 30 trees for characteristic Koala scats (Phillips and Callaghan 2011). The species and diameter at breast height of each of the 30 trees was also recorded.

Assessment of the habitat values of the vegetation within the study area for fauna was undertaken during the field survey. The potential for threatened species to use the study area can then be assessed through knowledge of the species ecology, information on the occurrence of threatened species in the area and consideration of the habitat present in the study area.

Significant habitat features such as potential Koala refuge habitats, stands of trees containing hollows, water points and wetland habitats (including the wetland to the south-east of the study area) were assessed and mapped in line with the Department of the Environment and Energy (DoEE) and DES threatened species profiles (e.g. SPRAT Profiles).

The quality of fauna habitat in the study area was assessed on the basis of following criteria:

- Low: Many fauna habitat elements in low quality areas have been removed or altered such as mature, hollow-bearing trees, fallen timber and deep leaf litter. Remnants are often small in size, support substantial weed infestations of high or moderate threat weeds (e.g. Lantana [**Lantana camara*]), and are poorly connected to other areas of remnant vegetation.

- Moderate: Some habitat components are present but others are lacking. For example a remnant may have a reasonably intact understorey but lack mature canopy species and fallen timber. Some weed infestations are present but are relatively small in size or comprise species of low to moderate threat. Linkages with other remnant habitats in the landscape may be lacking or somewhat tenuous.
- High: Most habitat components are present (e.g. old-growth trees, fallen timber, lack of weeds and deep leaf litter), the remnant is large enough to support species that are typically associated with large intact areas of habitat (e.g. Powerful Owl [*Ninox strenua*] and Greater Glider [*Petauroides volans*]) and it is well connected or contiguous with other areas of native vegetation.

These criteria were adapted for treeless habitat types such as wetlands as appropriate.

2.3 Likelihood of occurrence assessment

2.3.1 Ecological community assessment

The flora assessment was conducted across the study area at a scale and intensity to sufficiently identify if any Commonwealth TECs were present or likely to have been present in the study area. TECs not recorded during the field surveys were therefore considered to have a low likelihood to occur within the study area.

2.3.2 Significant species assessment

Database searches identified significant species that may potentially occur within the study area and surrounds. The likelihood of such species occurring was then assessed based on the results of the field assessment.

The likelihood of species occurring within the study area was classified using the criteria presented in Table 1. The assessment was based on the species' known ranges and habitat preferences, which were evaluated based on characteristics of the study area observed during the field assessment.

Table 1: Criteria to assess potential for significant species to occur in the study area

Likelihood to occur	Definition
Present	The species was recorded within the study area during the field assessment.
High	The species was not recorded within the study area during the field assessment, but is known to occur within the surrounding area/region, and habitat of suitable quality exists, within the study area
Moderate	The species was not recorded within the study area during the field assessment, although it is known to occur in the wider region. Habitat was identified for the species in the study area during the field assessment, however, it is marginal, fragmented and/or small in size, or degraded.

Likelihood to occur	Definition
Low	The species was not recorded within the study area during the field assessment. The species is either: a) unlikely to occur in the wider region and due to the lack of, or due to poor quality habitat in the study area, the species is not expected to occur within the study area b) in the case of fauna, may forage periodically in the wider region and may overfly the study area, but the habitat in the study area is generally not suitable.

2.4 Limitations

The purpose of the field assessment was to identify the on-ground ecological features of the study area. Ecological surveys often fail to record all species of flora and fauna present on a site for a variety of reasons such as seasonal absence or reduced activity during certain seasons. In addition, the ecology and nature of rare and/or cryptic species means that such species are often not recorded during short field visits. However, an assessment of habitat suitability is made for significant species that may occur in an area, thereby applying a precautionary approach.

Leading up to the field survey, the Frazerview region had experienced relatively low levels of rainfall, with only a total of 1.6 mm recorded during the two weeks preceding the survey (Kalbar TM, BOM Station No. 040867)(BoM 2018). Approximately 1.8 mm of rainfall was received in the region during the field survey on the 5 October 2018. Conditions during the field survey were warm to hot during the day (i.e. 25 – 30°C) and cold to mild in the evening (i.e. 8 – 16°C) (Amberley AMO, BOM Station No. 040004)(BOM 2018).

The dry conditions leading up to and during the field survey, may have influenced the detectability and identification of some orchids, annual herbaceous and grass species. The majority of key threatened flora species most likely to be present within the study area were likely to be identifiable at the time of the survey.

3 Ecological values of the study area

3.1 Desktop results

A total of 2 threatened ecological communities (TECs), 10 threatened flora, 25 threatened fauna, 18 migratory birds (also listed as special least concern under the NC Act) was returned from the desktop review as either having been recorded or having the potential to occur in the search area. Database search results are provided in Appendix B.

With reference to Figure 3, the majority of the study area has been mapped by the Queensland Government as supporting Category B - remnant vegetation. The majority of mapped remnant vegetation in the study area has been identified as supporting RE 12.8.17, with some areas of RE 12.9-10-7 in the western and north-eastern portions of Lot 9 (Figure 3). These REs are described below.

- RE 12.9-10.7 – Narrow-leaved Red Ironbark (*Eucalyptus crebra*) +/- Queensland Blue Gum (*E. tereticornis* subsp. *tereticornis*), Carbeen (*Corymbia tessellaris*), *Angophora* spp., Silver-leaved Ironbark (*E. melanophloia*) woodland on sedimentary rocks. This RE falls within the sparse structural category and has an of concern status under the VM Act.
- RE 12.8.17 – Silver-leaved Ironbark +/- Narrow-leaved Red Ironbark, Queensland Blue Gum, Carbeen woodland on Cainozoic igneous rocks. This RE falls within the sparse structural category and has a least concern status under the VM Act.

Areas of Category B vegetation (i.e. RE 12.8.17 and RE 12.9-10.7) mapped within the study area have been identified as essential habitat for the Koala, which is listed as vulnerable under the NC Act and the Commonwealth EPBC Act.

In addition to mapped remnant vegetation, the Queensland Government has mapped areas of high-value regrowth (i.e. Category C) vegetation within Lot 2. These polygons of high-value regrowth have been identified as supporting RE 12.8.17.

The study area is not mapped as support any vegetation management wetlands. However, drainage lines within the study area (Section 1.3) have been identified as vegetation management watercourses and drainage features with a stream order 1 or 2.

Approximately half of Lot 2 occurs within a mapped high risk area (HRA) on the Protected Plant Flora Survey Trigger Map (Figure 3; Appendix C). The ALA and Wildlife search results indicate that the mapped HRA is associated with records for Boonah Tuckeroo (*Cupaniopsis tomentella*), listed as vulnerable under the NC Act and EPBC Act.

The Planning Scheme's Overlay Map 2A: Natural Features - Natural Values does not currently identify any Local Values within the study area. However, there are areas of 'state' and 'regional' values that appear to align with mapped remnant vegetation within the study area (Figure 5).

3.2 Field survey results

3.2.1 Flora

Vegetation communities within the study area

A number of historic and recent land management practices have influenced the structure and composition of vegetation across the study area. There has been broad-scale clearing of native vegetation within the north-western, north-eastern and southern portion of the study area to facilitate cattle grazing (Lots 2 and 9) and occasionally the cultivation of crops (Lot 2). More intact eucalypt woodland communities are associated with the undulated low hill and associated slopes within the study area. However, there was evidence (i.e. stumps and felled timber) of historic and more recent timber harvesting throughout most of these communities. Five vegetation types were recorded within and extended beyond the study area:

- Narrow-leaved Red Ironbark and Queensland Blue Gum woodland on sedimentary rocks (RE 12.9-10.7)
- Narrow-leaved Red Ironbark woodland to open forest on Cainozoic igneous rocks (RE 12.8.17)
- Gum-topped Box (*Eucalyptus moluccana*) open forest on Cainozoic igneous rocks (RE 12.8.14a)
- Brush Box (*Lophostemon confertus*) open forest on Cainozoic igneous rocks (RE 12.8.9)
- non-remnant vegetation.

These communities are described below and the field-validated extent illustrated in Figure 6. It is noted that RE 12.9-10.7 and RE 12.8.17 are very similar in structure and species composition. Delineation between the two communities within the study area was primarily driven by the underlying geology (i.e. land zone 9-10, sedimentary rocks versus land zone 8, Cainozoic igneous rocks).

Narrow-leaved Red Ironbark and Queensland Blue Gum woodland on sedimentary rocks (RE 12.9-10.7) (Plate 1)

This community was associated with undulated low rises within the western and north-western portion of Lot 9. The canopy layer was dominated by Narrow-leaved Red Ironbark, but Queensland Blue Gum was also prevalent on lower slopes and gullies. Other canopy species recorded include Pink Bloodwood (*Corymbia intermedia*), Carbeen, Silver-leaved Ironbark and Gum-topped Box. Across the vegetation assessment sites, the height of canopy trees ranged from 18 to 30 m, with a median height of 22 m and a projective foliage cover of 25 to 45%.

A very sparse (2 to 20% cover) sub-canopy layer was present and consisted of regenerating canopy species with a median height of 14 m (range: 11 to 16 m). The shrub layer was characterised by scattered (<2% cover) juvenile canopy species, Maiden's Wattle (*Acacia maidenii*), Wallaby Apple (*Pittosporum spinescens*) and Shiny-leaved Canthium (*Psydrax odorata*). Common Lantana (**Lantana camara*) was also present in low densities throughout the shrub layer

of this community. The groundcover was dominated by native grasses such as Barbed-wire Grass (*Cymbopogon refractus*), Black Speargrass (*Heteropogon contortus*), Pitted Bluegrass (*Bothriochloa decipiens* var. *decipiens*) and various Wiregrasses (*Aristida* spp.).

The structure and composition of this community is consistent with RE 12.9.10.7, which is described by the Queensland Herbarium as:

'Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks.' This RE has an of concern status under the VM Act.

The community was found to satisfy the 70% height and 50% cover rule for the community to be mapped as remnant vegetation. This community does not align with any of the EPBC Act listed TECs that were returned from database searches.



Plate 1. Remnant RE 12.9-10.7 within the study area

Narrow-leaved Red Ironbark woodland to open forest on Cainzoic igneous rocks – RE 12.8.17 (Plate 2)

This woodland to open forest community was associated with the trachyandesite, undulated low hill in the central portion of the study area. The canopy layer was primarily dominated by Narrow-leaved Red Ironbark. Other canopy species recorded include Smooth-barked Apple (*Angophora leiocarpa*), Pink Bloodwood, Carbeen and Silver-leaved Ironbark. In the western portion of Lot 9, Queensland Blue Gum became prevalent on the lower slopes of the undulated low rise. Across the vegetation assessment sites, the height of canopy trees ranged from 17 to 23 m, with a median height of 22 m and a projective foliage cover of 25 to 40%.

On the upper slopes and crests the mid-strata (i.e. sub-canopy and shrub layer) were very sparse (2 to 20% cover) but tending to mid-dense (50 to 80%) cover in gullies. The sub-canopy layer supports regenerating canopy species, Red Ash (*Alphitonia excelsa*) and Brush Box with a median height of 9 to 12 m (range: 6 to 16 m). The shrub layer was characterised by juvenile canopy species, Maiden's Wattle and Shiny-leaved Canthium. However, vine thicket generalist species such as Scrub Ironbark (*Bridelia exaltata*), Scrub Boonaree (*Alectryon diversifolius*), Red Kamala (*Mallotus philipensis*), Quinine Bush (*Petalostigma pubescens*) and Stiff-leaved Canthium (*P. odorata* forma *buxifolia*) were prevalent in gullies and some upper slope areas. Common Lantana was also recorded in low densities throughout the shrub layer of this community. The groundcover was dominated by native grasses such as Wiregrasses, Barbed-wire Grass, Black Speargrass and Hooky Grass (*Ancistrachne uncinulata*).

The structure and composition of this community is consistent with RE 12.8.17, and is described by the Queensland Herbarium as:

'Eucalyptus melanophloia +/- E. crebra, E. tereticornis, Corymbia tessellaris woodland on Cainozoic igneous rocks.' This RE has a least concern status under the VM Act.

The community was found to satisfy the 70% height and 50% cover rule for the community to be mapped as remnant vegetation. This community does not align with any of the EPBC Act listed TECs that were returned from database searches.



Plate 2. Remnant RE 12.8.17 within the study area

Gum-topped Box open forest on Cainzoic igneous rocks - 12.8.14a (Plate 3)

This community was recorded on the lower slopes of the trachyandesite undulated low hill in the south-western portion of Lot 9. The canopy was dominated by Gum-topped Box with scattered Narrow-leaved Red Ironbark, with a median height of 25 m (range: 21 to 32 m) and cover of 45 to 60%.

A very sparse (<5% cover) sub-canopy layer was present and consisted of mid-mature canopy species and Silver-leaved Ironbark with a median height of 9 m (range: 8 to 12 m). The shrubs layer was also very sparse (<2% cover) and was characterised by juvenile Gum-topped Box, Shiny-leaved Canthium, Bitterbark (*Alstonia constricta*) and low densities of Common Lantana. The groundcover layer was mid-dense and dominated by native grasses such as Barbed-wire Grass, Slender Chloris (*Chloris divaricata* var. *divaricata*) and Two-coloured Panic (*Panicum simile*).

The structure and composition of this community is consistent with RE 12.8.14a, which is described by the Queensland Herbarium as:

'Eucalyptus moluccana open forest +/- *E. tereticornis*, *Eucalyptus siderophloia* or *E. crebra*. Understorey generally sparse but can become shrubby in absence of fire. Occurs on Cainozoic igneous rocks.' This RE has a least concern status under the VM Act.

The community was found to satisfy the 70% height and 50% cover rule for the community to be mapped as remnant vegetation. This community does not align with any of the EPBC Act listed TECs that were returned from database searches.



Plate 3. Remnant RE 12.8.14a within the study area

Brush Box low open forest on Cainozoic igneous rocks RE 12.8.9 – (Plate 4)

One polygon of this community was recorded on the mid to lower slopes of the trachyandesite undulated low hill in the north-western portion of Lot 2. It is possible this community historically supported Narrow-leaved Ironbark woodland with a Brushbox dominated mid-stratum. A very sparse (<5% cover) canopy layer was present and supported Narrow-leaved Ironbark and Pink Bloodwood with a median height of 14 m (range: 12 to 16 m). However, the presence of cut stumps throughout the community indicate historic thinning of the canopy layer. At present, the Brushbox dominated sub-canopy was the ecologically dominant layer (EDL) with a median height of 9 m (range: 7 to 11 m) and a cover of 60 to 70%. Although it is noted that Narrow-leaved Red Ironbark and Pink Bloodwood were also present in low densities through the sub-canopy.

The shrub layer was more complex than other communities (i.e. two distinct layers were present) in the study area and was characterised by juvenile Brush Box, Shiny-leaved Canthium, Scrub Ironbark, Red Ash, Wombat Berry (*Eustrephus latifolius*) and low densities of Common Lantana. The groundcover layer was sparse and dominated by native grasses such as *Aristida gracilipes* and Black Speargrass.

The structure and composition of this community is consistent with RE 12.8.9, which is described by the Queensland Herbarium as:

'Lophostemon confertus open forest often with vine forest understorey ('wet sclerophyll'). Occurs on Cainozoic igneous rocks. Tends to occur mostly in gullies and on exposed ridges on basalt.' This RE has a least concern status under the VM Act.

The community was found to satisfy the 70% height and 50% cover rule for the community to be mapped as remnant vegetation. This community does not align with any of the EPBC Act listed TECs that were returned from database searches.



Plate 4. Remnant RE 12.8.9 within the study area

Non-remnant vegetation

Non-remnant vegetation in the study area consists of:

- historically cleared and maintained grazing paddocks with scattered mature trees and regrowth
- two constructed dams that have some aquatic value but are impacted by cattle
- augmented land surfaces, drainage and cultivated cropping land in the eastern portion of Lot 2.

Three areas of non-remnant vegetation within the study area were found to support sufficient coverage of mid-mature to mature native woody vegetation to be classified as high-value regrowth vegetation. Two polygons of high-value regrowth representative of RE 12.8.17 were identified on the lower slopes of an undulated and folded low hill in Lot 2. An additional polygon of high-value regrowth supporting vegetation representative of RE 12.8.14a/RE 12.8.17 in a 70:30 combination has been mapped on the boundary between Lot 2 and Lot 9 (Figure 6).

Species diversity

A total of 151 flora species were recorded during the field surveys representing 60 families and 129 genera. The dominant family group was Poaceae (19 species) with Asteraceae (16 species), Myrtaceae (7 species) and Sapindaceae (6 species) also prominent. The dominant family groups exemplify the overall composition and condition of the vegetation communities surveyed, with the ground layer

being the most diverse. A list of the flora species recorded during the field surveys is presented in Appendix D.

Exotic flora

Exotic flora occurred in relatively low densities across the study area. The species inventory (Appendix D) included 33 (22%) exotic species, of which the following six species are listed as restricted matters under the *Biosecurity Act 2014*:

- Asparagus Fern (**Asparagus africanus*)
- Cat's Claw Creeper (**Dolichandra unguis-cati*)
- Common Lantana (**Lantana camara* var. *camara*)
- Creeping Lantana (**Lantana montevidensis*)
- Common Pest Pear (**Opuntia stricta*)
- Fireweed (**Senecio madagascariensis*).

Restricted invasive plants must not be given away, sold, or released into the environment without a permit. Under the Act, landholders have a general biosecurity obligation (GBO) in relation to restricted invasive plants, meaning all reasonable and practical steps to minimise the risks associated with invasive animals under their control.

With the exception of Creeping Lantana, the above species are also recognised as Weeds of National Significance (WoNS). The ranking criteria for WoNS is based on assessments of the weed's invasiveness, economic, social and environmental impacts, the potential for spread and socio-economic (such as impacts on health, fire risk, and recreational values of land) and environmental values. There is no legislated requirement for the control of WoNS – this task is primarily a state and local government responsibility.

3.2.2 *Fauna*

Areas of remnant vegetation within the study area have moderate fauna habitat values given the diversity of mature and mid-mature trees present and felled timber on the ground in some areas. More complex communities associated with folds and gullies of the undulated low hill, offer a more diverse range of habitats than communities that have a sparse understorey.

Given the land use history both within and adjacent to the study area, highly mobile fauna such as birds and macropods that are adapted to modified rural landscapes are more likely to use the habitats present. This was evidenced by the variety of common bird species recorded during the field survey including Torresion Crow (*Corvus orru*), Australian Magpie (*Cracticus tibicen*), Laughing Kookaburra (*Dacelo novaeguineae*), Noisy Miner (*Manorina melanocephala*), Willie Wagtail (*Rhipidura leucophrys*), and Rainbow Lorikeet (*Trichoglossus haematodus*). In addition, three of the six mammal species recorded were macropods, namely Eastern Grey Kangaroo (*Macropus giganteus*), Pretty-faced Wallaby (*Macropus parryi*) and Red-necked Wallaby (*Macropus rufogriseus*).

However, more complex remnant vegetation communities (i.e. with denser and more diverse mid and lower strata) were found to support smaller woodland and forest birds such as Yellow-rumped Thornbill (*Acanthiza chrysorrhoa*), White-throated Gerygone (*Gerygone albugularis*), Leaden Flycatcher (*Myiagra rubecula*) and Silvereye (*Zosterops lateralis*). Similarly, more cryptic mammal species such as Brush-tailed Phascogale (*Phascogale tapoatafa tapoatafa*) are likely to occur in more complex remnant vegetation communities within the study area.

Two common reptile species were recorded in the study area during the study area, namely Yellow-faced Whip Snake (*Demansia psammophis*) and Eastern Bearded Dragon (*Pogona barbata*). Rocky habitats associated with the undulated low hill, fallen timber and communities with a dense groundcover provide habitat for a range of reptile species.

Non-remnant areas generally had low to very low fauna habitat value given the history of vegetation clearing, cattle grazing and modification of the landscape. The two constructed dams in the study have moderate aquatic value, although the dam in Lot 2 has been degraded by cattle activity. In contrast the dam in Lot 9 is located within non-remnant woodland vegetation with a sparse coverage of mature trees many of which were hollow-bearing. A number of common wetland bird species were recorded using the dams including Pacific Black Duck (*Anas superciliosa*), Australasian Darter (*Anhinga novaehollandiae*) and Plumed Whistling Duck (*Dendrocygna eytoni*). White-faced Heron (*Egretta novaehollandiae*), Royal Spoonbill (*Platalea regia*) and Purple Swamphen (*Porphyrio porphyrio*) were recorded in the degraded drainage corridor in the southern portion of Lot 2.

A total of 56 fauna species were recorded within the study area during the field surveys. The majority of species recorded were birds (47 species) with 6 mammals, two reptiles and one amphibian also observed. One threatened fauna species was recorded, namely Koala, which is listed as vulnerable under the both the EPBC Act and NC act. Three of the bird species recorded are listed as migratory under the EPBC Act and special least concern under the NC Act. These threatened and migratory species are discussed further in Sections 4.1.3 and 4.1.4.

A full list of fauna species recorded during the fauna surveys is provided as Appendix E.

Exotic fauna

Two exotic fauna species were recorded during the field surveys, namely Common Myna (**Sturnis tristis*) and European Red Fox (**Vulpes vulpes*). Given the rural landscape the study area occurs in, it is likely that species such as Wild Dog (**Canis familiaris*), Feral Cat (**Felis catus*), Black Rat (**Rattus rattus*) and European Brown Hare (**Lepus europaeus*) are also likely to occur. European Red Fox, Feral Cat and Wild Dog are all listed as restricted invasive animals under the *Biosecurity Act 2014*. Restricted invasive animals must not be moved, fed, given away, sold, or released into the environment without a permit. Under the Act, landholders have a GBO in relation to restricted invasive animals.

4 Matters of national environmental significance

4.1.1 *Threatened ecological communities*

Two critically endangered TECs were identified in the EPBC Act Protected Matters Search Report as potentially occurring within the 5 km radial search area (Appendix B), namely:

- Lowland Rainforest of Subtropical Australia
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Vegetation communities within or adjacent to the study area do not support the structural or floristic characteristics of either of these TECs. Further, the vegetation communities present are not representative of any TECs currently described for the South East Queensland Bioregion.

4.1.2 *Threatened flora*

Database searches (Appendix B) identified the following 10 threatened flora species listed under the EPBC Act as potentially occurring in the search area.

- Wandering Pepper-cress (*Lepidium peregrinum*) – endangered (EPBC Act)
- Hairy-joint Grass (*Arthraxon hispidus*) – vulnerable (EPBC Act & NC Act)
- *Bertya ernestiana* (no common name) – vulnerable (EPBC Act & NC Act)
- Three-leaved Bosistoa (*Bosistoa transversa*) – vulnerable (EPBC Act)
- Miniature Moss-orchid (*Bulbophyllum globuliforme*) - vulnerable (EPBC Act), near threatened (NC Act)
- Boonah Tuckeroo (*Cupaniopsis tomentella*) - vulnerable (EPBC Act & NC Act)
- Bluegrass (*Dichanthium setosum*) – vulnerable (EPBC Act)
- Macadamia Nut (*Macadamia integrifolia*) - vulnerable (EPBC Act & NC Act)
- Lloyd's Olive (*Notelaea lloydii*) - vulnerable (EPBC Act & NC Act)
- Austral Toadflax (*Thesium australe*) - vulnerable (EPBC Act & NC Act).

No EPBC Act listed flora were recorded or are considered likely to occur in the study area as habitat is generally unsuitable. An assessment of the likelihood for listed species returned from database searches to occur in the study area has been undertaken and is presented in Appendix F.

4.1.3 *Threatened fauna*

Database searches (Appendix B) identified 25 threatened fauna species listed under the EPBC Act as potentially occurring in the search area, as follows.

Amphibians:

- Fleay's Frog (*Mixophyes fleayi*) – endangered (EPBC Act & NC Act).

Birds:

- Regent Honeyeater (*Anthochaera phrygia*) – critically endangered (EPBC Act), endangered (NC Act)
- Swift Parrot (*Lathamus discolor*) – critically endangered (EPBC Act), endangered (NC Act)
- Eastern Curlew (*Numenius madagascariensis*) - critically endangered (EPBC Act), endangered (NC Act)
- Curlew Sandpiper (*Calidris ferruginea*) - critically endangered (EPBC Act)
- Australasian Bittern (*Botaurus poiciloptilus*) – endangered (EPBC Act)
- Coxen's Fig-Parrot (*Cyclopsitta diophthalma coxeni*) – endangered (EPBC Act & NC Act)
- Eastern Bristlebird (*Dasyornis brachypterus*) – endangered (EPBC Act & NC Act)
- Australian Painted Snipe (*Rostratula australis*) - endangered (EPBC Act), Vulnerable (NC Act)
- Southern Black-throated Finch (*Poephila cincta cincta*) - endangered (EPBC Act & NC Act)
- Red Goshawk (*Erythrorhynchus radiatus*) - vulnerable (EPBC Act), Endangered (NC Act)
- Squatter Pigeon (*Geophaps scripta scripta*) - vulnerable (EPBC Act & NC Act)
- Painted Honeyeater (*Grantiella picta*) - vulnerable (EPBC Act & NC Act)
- Black-breasted Button-quail (*Turnix melanogaster*) – vulnerable (EPBC Act & NC Act)

Mammals:

- Spot-tailed Quoll (*Dasyurus maculatus maculatus*) (SE mainland population) – endangered (EPBC Act), vulnerable (NC Act)
- Large-eared Pied Bat (*Chalinolobus dwyeri*) - vulnerable (EPBC Act & NC Act)
- Greater Glider (*Petauroides volans*) – vulnerable (EPBC Act & NC Act)
- Brush-tailed Rock-wallaby (*Petrogale penicillata*) – vulnerable (EPBC Act & NC Act)
- Koala (*Phascolarctos cinereus*) - vulnerable (EPBC Act & NC Act)
- Long-nosed Potoroo (SE mainland) (*Potorous tridactylus tridactylus*) - vulnerable (EPBC Act & NC Act)
- New Holland Mouse (*Pseudomys novaehollandiae*) - vulnerable (EPBC Act & NC Act)
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable (EPBC Act)

Reptiles:

- Collared Delma (*Delma torquata*) - vulnerable (EPBC Act & NC Act)

- Dunmall's Snake (*Furina dunmalli*) - vulnerable (EPBC Act & NC Act)
- Three-toed Snake-tooth Skink (*Saiphos reticulatus*) – vulnerable (EPBC Act).

The Koala was the only threatened fauna species recorded in the study area during the field surveys. This species and its habitat within the study area is discussed further below. The study area is considered unlikely to provide suitable habitat for the remaining threatened species listed above. Further, for most of these species there are no nearby records. An assessment of the likelihood for listed species returned from database searches to occur in the study area has been undertaken and is presented in Appendix F.

Koala

Species overview

The Koala population in South East Queensland are listed as vulnerable under the EPBC Act and NC Act. The Commonwealth Government defines Koala habitat as any forest or woodland (including remnant, regrowth and modified vegetation communities) containing species that are Koala food trees, or any shrubland with emergent Koala food trees (DoEE 2017b DotE 2015a). Koala food trees include species of the genera *Eucalyptus*, *Lophostemon*, *Angophora*, *Corymbia*, *Leptospermum* and *Melaleuca*.

Presence and habitat in the study area

Targeted surveys for this species (refer Section 2.2.2) were successful in identifying this species in the study area. Two Koalas were directly observed in remnant RE 12.9-10.7 (Figure 6; Koala transect 8 and SAT site 7 on Figure 4) in the north-western corner of Lot 9. Evidence of this species in the form of scats and scratch marks were also recorded in remnant RE 12.9-10.7 (Figure 6; SAT site 3 on Figure 4) and in remnant RE 12.8.17 on the lower slopes of the undulated low hill in the western portion of Lot 9 (Figure 6; SAT site 2 on Figure 4). No Koalas or their scats were recorded within transects or SAT survey sites conducted in areas of RE 12.8.9, 12.8.14a or RE 12.8.17 associated with the upper slopes and crest of the undulated low hill in the central portion of the study area. Based on the results of the Koala transects and SAT surveys, Koalas are favouring communities in the study area that support Queensland Blue Gum (i.e. RE 12.9-10.7 and lower slopes of RE 12.8.17), which is recognised as a preferred feed tree in coastal South East Queensland (EHP 2011). It is noted that both Koalas were recorded within Queensland Blue Gum and this is the only tree species within the SAT survey sites found to have Koala scats at the base (Appendix G).



Plate 1. Koala recorded in a Queensland Blue Gum in remnant RE 12.9-10.7 in Lot 9

Notwithstanding the above, all of the remnant REs in the study area provide habitat for the Koala due to the presence of the following 10 Koala habitat trees:

- RE 12.8.9 – Pink Bloodwood, Narrow-leaved Red Ironbark and Brush Box
- RE 12.8.14a – Narrow-leaved Red Ironbark, Gum-topped Box, Silver-leaved Ironbark and Brush Box
- RE 12.8.17 – Smooth-barked Apple, Broad-leaved Apple (*Angophora subvelutina*), Pink Bloodwood, Carbeen, Narrow-leaved Red Ironbark, Silver-leaved Ironbark, Yellow Box (*E. melliodora*), Queensland Blue Gum and Brush Box
- RE 12.9-10.7 - Broad-leaved Apple, Carbeen, Narrow-leaved Red Ironbark, Silver-leaved Ironbark, Gum-topped Box and Queensland Blue Gum.

Approximately 146.8 ha of habitat is present in the study area in the form of (Figure 6):

- 26.3 ha of remnant of concern vegetation (RE 12.9-10.7)
- 102.6 ha of remnant least concern vegetation (RE 12.8.9, RE 12.8.14a and RE 12.8.17)
- 3.0 ha of least high-value regrowth vegetation
- 14.9 ha of non-remnant vegetation in Lot 9 that has sufficient cover of non-juvenile Koala habitat trees.

In accordance with the Koala Habitat Assessment Tool in the EPBC Act referral guidelines for the vulnerable Koala (DotE 2014), the study area is considered to support habitat critical to the survival of the Koala (a score of 8 was achieved), as

outlined in Appendix H. The main factors contributing to habitat within the study area being assessed as critical are:

- direct evidence of the presence of this species (in the form of individuals, scats and scratch marks) was recorded in the study area
- habitat in the study area support 10 potential feed tree species for the Koala
- habitat in the study area is contiguous with more than 500 ha of habitat in the surrounding area.

4.1.4 Migratory species

The following 18 migratory birds were returned from database searches as potentially occurring in the 5 km radial search area:

- Common Sandpiper (*Actitis hypoleucos*)
- Fork-tailed Swift (*Apus pacificus*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- Curlew Sandpiper (also listed as threatened under the EPBC Act, see Section 3.3.3)
- Pectoral Sandpiper (*Calidris melanotos*)
- Latham's Snipe (*Gallinago hardwickii*)
- Oriental Cuckoo (*Cuculus optatus*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Sharp-tailed Sandpiper (*Calidris acuminata*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Black-faced Monarch (*Monarcha melanopsis*)
- Spectacled Monarch (*Monarcha trivirgatus*)
- Yellow Wagtail (*Motacilla flava*)
- Satin Flycatcher (*Myiagra cyanoleuca*)
- Eastern Curlew (also listed as threatened under the EPBC Act, see Section 3.3.3)
- Osprey (*Pandion haliaetus*)
- Rufous Fantail (*Rhipidura rufifrons*)
- Common Greenshank (*Tringa nebularia*).

Three migratory bird species were recorded during the field survey, namely Fork-tailed Swift, Black-faced Monarch and Rufous Fantail. The Black-faced Monarch and Rufous Fantail were observed in a steeply inclined drainage gully within Narrow-leaved Red Ironbark woodland to open forest in the central portion of the study area. The gully and associated slopes supported a mid-dense cover within the mid and lower strata comprising Brush Box and various vine forest generalists such as Red Kamala. The Fork-tailed Swift was observed overflying the study area and neighbouring properties. This species was commonly observed soaring 50 to 100 m above the various woodland communities within the study area.

There is a moderate likelihood that White-throated Needletail would also overfly the study area (Appendix F). Habitats within the study area are considered generally unsuitable for the remaining migratory bird species listed above, due to the lack of well-developed wetland and aquatic habitats, closed and wet sclerophyll forests and riparian communities (Appendix F).

5 Matters of state environmental significance

5.1.1 Regulated vegetation

Ground-truthing surveys were undertaken across the study area to accurately assess the RE type, condition and ecological value of the vegetation proposed to be significantly disturbed by the proposed quarry. The surveys were conducted by an appropriately qualified and experienced ecologist from Ecological Survey & Management. The surveys were designed to ensure that the survey methodology was consistent with relevant State and Commonwealth guidelines, and vegetation communities were identified according to the Queensland Government's Regional Ecosystem Description Database (REDD).

With reference to Figure 6, the extent of field-validated remnant (i.e. Category B) vegetation within the study area is more or less consistent with that mapped by the Queensland Government. However, there were some discrepancies within the RE types that have been identified on the Vegetation Management Supporting Map (Figure 3; Appendix C). Key differences between the Government mapping and field-validated mapping are as follows.

- The polygon of remnant RE 12.8.17 in the north-western portion of Lot 9 was found to be located on sedimentary siltstone which is not consistent with the classification of landzone 8 (i.e. Cainozoic igneous rocks). Therefore this vegetation community is analogous to RE 12.9-10.7.
- The polygon of RE 12.9-10.7 in the south-western portion of Lot 9 was found to be less extensive than the Queensland Government mapping. The contraction of the mapped extent of this RE in this location is also driven by the underlying geology, which was found to be trachyandesite and consistent with landzone 8 (Cainozoic igneous rocks), not landzone 9-10 (sedimentary rocks).
- Gum-topped Box was found to dominate the ecologically dominant layer (EDL) of a polygon of remnant vegetation in the southern extent of Lot 9. Given the scarcity of Narrow-leaved Red Ironbark in this area and the absence of Gum-topped Box from the REDD description for RE 12.8.17, this polygon is better described as RE 12.8.14a. This RE is briefly described as – Gum-topped Box open forest +/- Queensland Blue Gum, Narrow-leaved Ironbark (*Eucalyptus siderophloia*) or Narrow-leaved Red Ironbark and has a least concern status under the VM Act.
- A polygon of high-value regrowth identified by the Queensland Government as supporting RE 12.8.17 along the boundary of Lot 9 and Lot 2, was found to support a combination of probable RE types, RE 12.8.14a/12.8.17 (70:30).
- A portion of RE 12.8.17 mapped by the Queensland Government in the central portion of Lot 2 was found to support RE 12.8.9. Brushbox was the dominant species in the EDL of this vegetation community and therefore the appropriate RE type is 12.8.9, which is briefly described as 'Brushbox open forest on Cainozoic igneous rocks' and has a least concern status under the VM Act.

- Two areas of high-value regrowth supporting RE 12.8.17 were identified along the north-eastern boundary of Lot 2.

A comparison of the Queensland Government and field-validated vegetation is provided in Table 2 below.

Table 2: Comparison of Queensland Government mapped and field-validated REs in the study area

RE Type	Brief description	VM Act status	Area (ha)	
			Regulated Vegetation Map	Field-validated mapping
Category B (remnant) vegetation				
12.8.9	Brushbox open forest on Cainozoic igneous rocks	Least concern	-	1.2
12.8.14a	Gum-topped Box open forest +/- Queensland Blue Gum, Narrow-leaved Ironbark or Northern Grey Ironbark. Understorey generally sparse but can become shrubby in absence of fire. Occurs on Cainozoic igneous rocks.	Least concern	-	4.2
12.8.17	Silver-leaved Ironbark +/- Northern Grey Ironbark, Queensland Blue Gum, Carbeen woodland on Cainozoic igneous rocks.	Least concern	103.7	97.2
12.9-10.7	Northern Grey Ironbark +/- Queensland Blue Gum, Carbeen, <i>Angophora</i> spp., Silver-leaved Ironbark woodland on sedimentary rocks.	Of concern	18.7	26.3
TOTAL			122.4	128.9
Category C (high-value regrowth) vegetation				
12.8.9	See above	Least concern	0.06	-
12.8.14a/12.8.7		Least concern	-	1.5
12.8.17		Least concern	3.7	1.5
TOTAL			4.1	3.0

5.1.2 Essential habitat

The Queensland Government has identified mapped areas of Category B vegetation as supporting essential habitat for the Koala (Figure 3; Appendix C). It is noted that Koalas were directly recorded within the polygon of RE 12.9-10.7 in the north-western portion of Lot 9 (Section 4.1.3).

5.1.3 Threatened and near threatened flora

No NC Act listed flora species that are not also listed under the EPBC Act (and discussed in Section 4.1.3) were returned from database searches. No NC Act

listed flora species were identified during the flora surveys. Further, no NC Act listed flora species are considered likely to occur in the study area. The likelihood of occurrence assessment is provided in Appendix F.

5.1.4 *Threatened and special least concern fauna*

Only one fauna species listed solely under the NC Act was returned from database searches, namely the vulnerable Red-tailed Tropic Bird (*Phaethon rubricauda*). Fauna species that are also listed under the EPBC Act are discussed in Section 3.3.3.

The Red-tailed Tropicbird is a pelagic, marine bird that is rarely recorded inland. The study area is approximately 83 km inland from the coast and does not support suitable coastal habitats for foraging, sheltering or breeding. The ALA data quality tests indicate there may be an issue with the records given this is a marine species being reported in a terrestrial area. The mismatch could be an identification or name match error instead of geospatial issue. In any event the study area does not support habitat suitable for this species and it is considered unlikely to occur.

It is noted that the migratory bird species discussed in Section 3.3.4 are also listed as special least concern species under the NC Act. No other migratory birds were returned from database searches.

6 Impact Assessment

6.1 Direct impacts

The proposed quarry layout has been overlaid on the field-validated remnant vegetation mapping as Figure 7. Construction of the proposed quarry will have a direct impact on approximately:

- 14.6 ha of non-remnant (i.e. Category X) vegetation
- 0.2 ha of least concern high-value regrowth vegetation
- 60.2 ha of remnant least concern (i.e. Category B) vegetation consisting of:
 - 43.8 ha within the extraction area
 - 14.6 ha that fall within the processing/stockpile/infrastructure areas
 - 1.8 ha that occur within the access road corridors

The majority of access roads within the quarry layout will have a maximum width of 15 m. However, the haul road to be constructed through Lot 2 will have varying widths (15-120 m) due to the cut and fill profile associated with constructing a road through steep terrain.

The quarry layout has specifically been designed to avoid direct impacts to remnant of concern vegetation (RE 12.9-10.7) within the study area. Clearing of remnant least concern vegetation is unavoidable given the:

- 43.8 ha of remnant least concern vegetation that falls within the extraction area coincides with the location of the highest quality resource within the study area (Appendix I)
- a logical and practical approach to the design of the quarry has resulted in some of the processing/stockpile/infrastructure areas encroaching into remnant least concern vegetation
- proposed haul road to Cunningham Highway is constrained by topography, land access issues and traffic modelling.

6.2 Indirect impacts

Indirect impacts associated with construction and operation of the proposed quarry include noise and vibration, vehicle strike, dust, erosion and the introduction or spread of invasive species.

6.3 Impact mitigation

6.3.1 Measures to avoid impacts

The proposed quarry layout is largely dependent on the geology of the area, and is constrained by the availability of the target resource (i.e. trachyandesite). Nonetheless, the following measures have been taken to avoid direct impacts associated with the quarry.

- Completion of this ecological assessment to confirm the remnant vegetation mapping across the study area and identify areas of important habitat features.

- The quarry layout has been designed to avoid clearing in areas of the field-validated remnant of concern vegetation (RE 12.9-10.7). A minimum 30 m buffer to retained remnant of concern vegetation has also been included to minimise the risk of indirect impacts to these areas.
- Maintaining connectivity of retained remnant vegetation has also been a key consideration in the design of the quarry layout. Specifically, corridors of remnant vegetation at least 100 m in width have been retained along the lower slopes of the undulated low hill adjoining the extraction area. It is recognised that access roads will traverse some areas of retained remnant vegetation. In most cases these roads will be 15 m in width and will not present a significant interruption to the connectivity of vegetation.
- Areas of non-remnant (Category X) vegetation have been utilised for the locations of the processing and stockpile area, and asphalt and concrete plant.
- The potential also exists to retain trees within the site office and stockpile area where practical.

6.3.2 Measures to mitigate impacts

A number of controls on the clearing method are proposed in order to minimise impacts on vegetation communities and fauna habitat.

1. Prior to the commencement of clearing activities, an inspection of the area should be undertaken by an appropriately qualified and licensed ecologist/fauna spotter-catcher to identify the presence of any potential important fauna habitat features. Where habitat trees are identified, a spotter-catcher should be present during clearing activities. Prior to the commencement of clearing activities in areas which contain habitat trees, the spotter catcher will undertake pre-clearing translocation inspections of the areas proposed to be cleared.
2. Clearing will be undertaken sequentially. This process includes delineation of the approved clearing area with survey pegs or flagging tape. This will ensure that any areas of remnant vegetation to be cleared are restricted to the minimum area necessary for construction of the proposed quarry to prevent unnecessary encroachment of disturbance into adjoining remnant vegetation.
3. Where there is flexibility in the locating of certain infrastructure (e.g. site office, stockpile area), the proponent will prioritise avoiding clearing of trees, where possible.
4. Appropriate weed control and management measures should be incorporated into the Site Based Management Plan for the proposed quarry.
5. Traffic volumes will be staged, with a maximum of 250 to 300 truck movements. Speed along the internal access roads will be limited to between 40-50 km/hr. A limit of 60 km/hr will apply to the haul road that connects to Cunningham Highway.
6. Stormwater will be managed and treated internally prior to discharge from the quarry as specified by the Stormwater Management Plan (Ausrocks 2018a) and Site Based Management Plan (SBMP) (Ausrocks 2018b).

7. Other environmental impacts such as dust, noise and vibration shall be managed in accordance with the SBMP (Ausrocks 2018b).

7 Legislative requirements

Sections 7.1 and 7.2 outline the MNES and MSES (i.e. threatened fauna, migratory birds and regulated vegetation,) that are considered relevant to the study area that have the potential to be impacted by the proposed quarry. Section 7.3 provides an assessment of the merits of the proposed quarry against the Boonah Shire Planning Scheme and the regulation of MLES.

Environmental offsets are required to compensate for significant residual impacts on MNES and MSES.

Offsets are required under the EPBC Act if an action is likely to give rise to a significant residual impact on MNES. The EPBC Act Environmental Offsets Policy (SEWPaC 2012) details requirements under the EPBC Act in relation to biodiversity offsets. The Significant Impact Guidelines 1.1: Matters of National Environmental Significance (DoE 2013) provides guidance to assist with determining whether an impact is considered significant.

In Queensland, offsets are required under the EO Act for activities likely to cause a significant residual impact on MSES. For projects being assessed under the *Planning Act 2016*, the Department of Local Government, Racing and Multicultural Affairs' (DLGRMA) Significant Residual Impact Guideline (SRI Guideline) (SDIP 2014) is used to assess the potential for a proposal to have a significant residual impacts on MSES.

In the case of matters that are prescribed as being both MNES and MSES, offsets are not required under the Queensland EO Act if the same, or substantially the same, impact to the prescribed matter has been assessed under the EPBC Act.

7.1 Matters of national environmental significance

The field surveys confirmed the presence of the Koala and three migratory bird species listed under the EPBC Act within the study area. No other MNES are considered likely to occur within the study area or be impacted by the proposed quarry development (Section 4.0). Assessment of the significance impacts on MNES recorded within the study area is provided below.

7.1.1 Koala

This species was directly and indirectly (i.e. scats and scratch marks) recorded during the field survey within woodland communities supporting Queensland Blue Gum (i.e. RE 12.9-10.7 and RE 12.8.17 on lower slopes). In line with DoEE's habitat definition, approximately 146.8 ha of Koala habitat has been identified in the study area consisting of:

- 26.3 ha of remnant of concern vegetation (RE 12.9-10.7)
- 102.6 ha of remnant least concern vegetation (RE 12.8.9, RE 12.8.14a and RE 12.8.17)
- 3.0 ha of least high-value regrowth vegetation
- 14.9 ha of non-remnant vegetation in Lot 9 that has sufficient cover of non-juvenile Koala habitat trees.

Approximately 69.7 ha of Koala habitat occurs within the quarry footprint, this represents around 48% of habitat within the study area. Koala habitat within the quarry footprint consists of:

- 9.3 ha of non-remnant (i.e. Category X) vegetation within processing/stockpiling/infrastructure areas and an internal access road in Lot 9
- 0.2 ha of least concern high-value regrowth vegetation
- 60.2 ha of remnant least concern (i.e. Category B) vegetation consisting of:
 - 43.8 ha within the extraction area
 - 14.6 ha that fall within the processing/stockpile/infrastructure areas
 - 1.8 ha that occur within the access road corridors.

Koala habitat in the study area has been assessed, using the Koala habitat assessment tool (DotE 2014), as being habitat critical to the survival of the Koala (i.e. a score of 8 was achieved). The draft Koala referral guidelines (DotE 2014) state that the likelihood of a proposal to have a significant impact on the Koala will come down two key considerations:

- adversely affecting habitat critical to the survival of the Koala; and/or
- interfering substantially with the recovery of the Koala through the introduction or exacerbation of key threats in areas of habitat critical to the survival of the Koala.

Section 5 of the guidelines indicates that projects involving >20 ha of habitat critical to the Koala with a habitat score of 8 or greater are likely to have a significant impact and a Referral, including an assessment of the significance of impacts, is required. An assessment against the EPBC Act significant impact guidelines for vulnerable species is provided in Table 3 below. This assessment of significance has taken into consideration the following factors concerning habitat quality and importance of the population.

Habitat quality

The SPRAT profile for the Koala states that Koala habitat can be broadly defined as any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees (DoEE 2018b). However, it is generally acknowledged that higher quality Koala habitat is associated with flatter, fertile land where preferred feed and shelter trees are naturally abundant (DoEE 2018). The influence of elevation, temperature and soil fertility and moisture on leaf chemistry may be important in influencing the feeding patterns of and hence occupancy of Koalas (Crowther et al. 2009; DoEE 2018b). By example, Crowther et al. (2009) found that low altitude areas associated with some depositional flood plains and coastal lowlands that have higher fertility soils tend to support higher Koala densities.

With regard to Koala habitat and occupancy in the study area, it is considered that field-validated areas of vegetation associated with landzone 8 on upper slopes and crests of the undulated, low hill (i.e. RE 12.8.9, RE 12.8.14a and RE 12.8.17) are not as favourable for the Koala and are less likely to be used than areas of RE 12.9-10.7, RE 12.8.17 on lower slopes and adjoining non-remnant woodlands that support a sufficient cover of non-juvenile Koala habitat trees. This assessment is based on the following.

1. The results of the targeted field surveys demonstrate that Koalas are favouring vegetation communities in the lower-lying portions of Lot 9, particularly where Queensland Blue Gum is naturally abundant. This is evidenced by:
 - Koalas and signs of their presence (i.e. scats and scratch marks) only be recorded in remnant RE 12.9-10.7 in the north-western portion of Lot 9 and the lower slopes of RE 12.8.17 in the western portion of Lot 9
 - no Koalas or signs of their presence were recorded in remnant least concern vegetation on the upper slopes and crests of undulated low hill (refer Section 4.1.3).
2. In the 'South East Queensland Koala Habitat Assessment and Mapping Project' (GHD 2009), which included the Scenic Rim LGA, a key underlying contributor to classifying Koala habitat was the determination of landscape features that have a relationship with the location of existing Koala records. Koala records (the primary database being the Queensland Government's WildNet database which provided 7,389 koala records dating from 1870) were therefore analysed with respect to a number of landscape features that had the potential to influence the spatial distribution of Koalas. In summary, GHD (2009) report the following relationships between landform attributes and Koala sightings.
 - A negative relationship between slope and the percentage of Koala records, with approximately 93% of the records analysed in their study coming from landscapes with 0 to 5° slope. It is noted that within the study area, vegetation communities where Koalas were sighted during the field surveys (i.e. RE 12.9-10.7 and RE 12.8.17 on lower slopes) were associated with 0-6° slopes. GHD (2009) also found that only around 4% of Koala records came from landforms with slopes between 5 to 10° and 2% of sightings came from slopes between 10 to 15°. The central undulated, low hill is a prominent feature of the study area's physiography and is characterised by slopes ranging between 3 to 7° on the lower slopes and 8 to 14° on the upper slopes. The majority of Koala habitat within the study area is associated with this hill and located on slopes where Koalas are less likely to occur.
 - A negative relationship between elevation and Koala records, with approximately 91% of the records analysed in their study coming from landscapes with 0 to 100 m elevation. GHD (2009), reported that approximately 5% of the records they analysed came from landforms with 100 to 200 m elevation, 2% coming from landforms with 200 to 300 m elevation. Within the study area, vegetation communities (i.e. RE 12.9-10.7 and RE 12.8.17 on lower slopes) where Koalas, or signs

of their presence were recorded during the field surveys were associated with elevations between approximately 100 to 150 m. In contrast, no Koalas or signs of their presence were found in habitat between 150 and 220 m AHD.

- Approximately 6% of the records analysed came from areas supporting land zone 8 (i.e. the predominant landzone type within the quarry footprint). In contrast, 39% of the records analysed came from landzone 9-10.

The SPRAT profile also acknowledges that land clearing has been and continues to be focussed disproportionately on flatter, more fertile areas, which constitute high-quality habitat for Koalas (DoEE 2018b). This inevitably results in poorer quality habitat on steep terrain and/or poorer soils remaining in the landscape. In the context of the study area, the majority of Koala habitat that will be impacted by the proposed quarry is located on steeper terrain with higher elevations than the habitat within which Koalas were sighted and appear to be preferentially using. To assist with illustrating Koala habitat within the study area in relation to elevation and slope the following figures have been prepared.

- Figure 8, which provides field-validated vegetation types in relation to contour information for the study area and surrounds. With reference to this figure, the majority of the quarry footprint encompasses land with elevations greater than 150 m AHD. Further, approximately 46.3 ha of Koala habitat within the quarry footprint (i.e. consisting RE 12.8.14a and RE 12.8.17) is located on elevations greater than 150 m AHD. This translates to approximately 66% of Koala habitat within the quarry footprint being located on elevations with which Koalas are less commonly associated.
- Figure 9 which provides field-validated vegetation in relation to slopes across the study area. With reference to this figure, more than half of the quarry footprint is located on slopes of 10-50°. Further, approximately 37.6 ha of Koala habitat within the quarry footprint (i.e. consisting RE 12.8.9, RE 12.8.14a and RE 12.8.17) is located on is located on slopes of 10-50°. This translates to approximately 54% of Koala habitat within the quarry footprint being located on slopes with which Koalas are less commonly associated.

In addition, Koalas tend to use the same set of trees in their home range, but generally not at the same time (DoEE 2018b). This would indicate that the local Koala population is more likely to consistently use the habitat they were recorded within on lower elevations (<150 m) and gentler slopes (<10°) with a natural abundance of Queensland Blue Gum, than moving into vegetation associated with less favourable landscape features such as steep slopes and higher elevations (refer thresholds above).

Importance of the population

Another key component of the significant impact assessment for vulnerable species is whether the population that will be impacted by a proposal is an important population. The concept of 'important populations' has not been expanded on in the Koala referral guidelines as sufficient information was not available to adequately identify and separate the nature of any important

populations throughout the range of the listed species. At present there is no recovery plan for the Koala that identifies important populations of the species. Therefore, with reference to the significant impact guidelines, the population of Koalas that uses the study area is considered unlikely to be an important population for the following reasons.

- Suitable woodland habitat is widespread throughout the study area and the broader landscape. Therefore, dispersal and breeding is likely to occur throughout the region and the study area is part of this broader regional habitat area.
- The individual Koalas that occur within the study area are considered likely to belong to a larger meta-population of Koalas that would occur within areas of suitable habitat throughout the broader region.
- The population of Koalas using the study area is considered unlikely to be unique, large, isolated or genetically disjunct from any other Koalas occurring in the region. Therefore, the population using the study area would not be considered necessary for maintaining genetic diversity.
- The survey area is not at or near the limit of this species' range. The Koala occurs throughout coastal and inland areas of eastern Australia and the survey area is located more or less centrally within the known distribution of this species (DotE 2014).

Table 3: Assessment against significant impact criteria for the vulnerable Koala

Significant impact criteria	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance of possibility that it will: ▪ Lead to a long-term decrease in the size of an important population of a species	The population of Koalas within the study area is not considered to be an important population. Nonetheless, the proposed quarry is unlikely to lead to a long-term decrease in the size of the local population given that ▪ the quarry has been designed to avoid impacts to 26.3 ha of higher quality Koala habitat in the form remnant RE 12.9-10.7 that is preferentially being used by the local Koala population ▪ to reduce indirect impacts to higher quality Koala habitat within the study area, a 30 m buffer has been provided to areas remnant RE 12.9-10.7 that will be retained ▪ as discussed above, the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given: - the slope (i.e. 10–50°) and elevation (i.e. above 150 m AHD) of these areas is not consistent with: - o habitat within the study area currently being used by the local Koala population - o the landscape features preferred by Koalas in South East Queensland (i.e. slopes 0-5° and elevations between 0-100 m AHD (GHD 2009))

	- the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011) - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crests of the undulated low hill.
▪ Reduce the area of occupancy of an important population	The population of Koalas using the study area is not considered to be an important population. The proposed quarry is not likely to significantly impact the area of occupancy of the local Koala population given: ▪ 23.6 ha of higher quality habitat within the study area (i.e. remnant RE 12.9-10.7) that is being used by Koalas is being retained ▪ direct impacts associated with the proposed quarry will largely be confined to less favourable Koala habitat within the study area (i.e. on upper slopes and crest of the low hill) ▪ connectivity between preferred habitat within the study area and similar habitat (remnant and high-value regrowth RE 12.9-10.7) on adjoining properties to the west, north and north-east will not be substantially impacted by the proposal. As noted previously, Koalas are known to use the same set of trees within their home ranges (DoEE 2018b). This would indicate that the local Koala population is likely to consistently use vegetation within the study area they were (directly and indirectly) recorded in during the field surveys. This habitat will be retained as part of the proposed quarry layout.
▪ Fragment an existing important population into two or more populations	The population of Koalas using the study area is not considered to be an important population. Nonetheless, connectivity of habitat will not be substantially compromised as a result of the quarry and the local Koala population will not be fragmented given that: ▪ 26.3 ha of higher quality and preferred habitat (i.e. RE 12.9-10.7) is being retained ▪ movement opportunities for the Koala will remain: - along the western boundary of Lot 9 - through the central portion of the study area along the lower slopes of the undulated low hill - through the south-western corner of Lot 9 into Lot 2. It is noted that internal quarry access road intersect the movement corridors through the central portion of the study area and the south-western corner of Lot 9 into Lot 2. However, the majority of the internal roads will only be 15 m in width and speed limited to between 40 and 60 km/hr. It is not anticipated that these access road will act as a barrier to Koala movement.
▪ Adversely affect habitat critical to the survival of a species	The Draft Referral Guidelines for the Koala (DotE 2014) indicate that for proposals that involve clearing greater than 20 ha of habitat that containing Koala food trees and with a critical habitat score of 8 (or greater), are likely to adversely affect habitat critical for the Koala. Approximately 69.7 ha of habitat critical for the Koala occurs within the quarry footprint, this represents around 48% of habitat within the study area. Koala habitat within the quarry footprint consists of:

	▪ 9.3 ha of non-remnant (i.e. Category X) vegetation within processing/ stockpiling/infrastructure areas and an internal access road in Lot 9 ▪ 0.2 ha of least concern high-value regrowth vegetation ▪ 60.2 ha of remnant least concern (i.e. Category B) vegetation consisting of: - 43.8 ha within the extraction area - 14.6 ha that fall within the processing/stockpile/infrastructure areas - 1.8 ha that occur within the access road corridors. However, as noted above, the majority of Koala habitat that will impacted by the proposed quarry is considered to be less likely to be used by the local Koala population. More specifically: ▪ approximately 46.3 ha (or 66%) of Koala habitat within the quarry footprint is located on land with elevations (i.e. greater 150 mAHD) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD 2009) ▪ approximately 37.6 ha (or 54%) of Koala habitat within the quarry footprint is located on land with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD 2009) ▪ the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011) ▪ no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill. Moreover, 26.3 ha of RE 12.9-10.7 that are being preferentially used by the local Koala population will be retained as part of the proposed development. To reduce indirect impacts on these retained areas, a 30 m buffer has been allowed for in the design of the quarry layout.
▪ Disrupt the breeding cycle of an important population	The population of Koalas using the study area is not considered to be an important population. Nonetheless, impacts to approximately 69.7 ha of habitat is unlikely to disrupt the breeding cycle of the local population. This is because higher quality habitat that the local Koala population is currently using (i.e. remnant RE 12.9-10.7 and RE 12.8.17 on lower slopes) will be retained. In addition, to minimise the indirect impacts to these retained areas of habitat a minimum 30 m wide buffer has been included in the quarry layout. Further, the majority of habitat that will be directly impacted by the proposed quarry is less likely to be used by than habitat being retained Koalas given: ▪ approximately 46.3 ha (or 66%) of Koala habitat within the quarry footprint is located on land with elevations (i.e. greater 150 mAHD) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009)) ▪ approximately 37.6 ha (or 54%) of Koala habitat within the quarry footprint is located on land with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated

	both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009)) - the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011) - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill. Standard industry recognised measures will also be employed during the vegetation clearing stages of the project to minimise harm and disruption to animals and breeding places in accordance with the requirements of the Queensland NC Act.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed clearing of 69.7 ha of Koala habitat will not remove habitats, isolate habitats or degrade remaining habitats to the extent that the species is likely to decline. This assessment is based on: 26.3 ha of higher quality habitat that the local Koala population is currently using (i.e. remnant RE 12.9-10.7 and RE 12.8.17 on lower slopes) being retained - the inclusion of a 30 m buffer being provided to areas of retained remnant RE 12.9-10.7 to reduce indirect impacts to these areas - the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given: - approximately 46.3 ha (or 66%) of Koala habitat within the quarry footprint is located on land with elevations (i.e. greater 150 mAHD) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009)) - approximately 37.6 ha (or 54%) of Koala habitat within the quarry footprint is located on land with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009)) - the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011) - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	There are no invasive plant species that are specifically recognised as a threat to the Koala. Nonetheless, the management of existing infestations of invasive plants and control of the introduction/spread of invasive plants will be managed through the SBMP. The European Red Fox was recorded within the study area during the field survey. Other species such as Wild Dogs are also likely to occur in the broader landscape. These predatory species already pose a risk to the Koala in the habitat areas present and the proposed quarry is unlikely to increase this threat.

Introduce disease that may cause the species to decline, or	Three viruses are known to affect Koalas in the wild, Chlamydia and Koala Retrovirus (KoRV-A and KoRV-B). It is known that Chlamydia is a sexually transmitted disease in Koalas, however, how the Retrovirus is spread contagiously is unknown. Studies have shown that 100% of Koalas in the wild have the Retrovirus, and the majority of Queensland and New South Wales populations are infected with Chlamydia (Hanger and Loader 2009). Stress has been suggested to exacerbate the effects of disease on Koala populations in more populated areas. However, the proposed quarry is unlikely to result in the introduction or increase the prevalence of these diseases in the local Koala population particularly given areas of preferred habitat will be retained and protected by a minimum 30 m buffer.
Interfere substantially with the recovery of the species.	The project will result in the clearing of 69.7 ha of Koala habitat. While this habitat is considered by DoEE to be critical habitat, the extent of clearing is considered unlikely to interfere substantially with the recovery of the Koala given: 26.3 ha of higher quality habitat that the local Koala population is currently using (i.e. remnant RE 12.9-10.7 and RE 12.8.17 on lower slopes) will be retained - the inclusion of a 30 m buffer being provided to areas of retained remnant RE 12.9-10.7 to reduce indirect impacts to these areas - the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given: - approximately 46.3 ha (or 66%) of Koala habitat within the quarry footprint is located on land with elevations (i.e. greater 150 mAHd) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009)) - approximately 37.6 ha (or 54%) of Koala habitat within the quarry footprint is located on land with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009)) - the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011) - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill. - Opportunities for Koala movement will remain: - along the western boundary of Lot 9 - through the northern portion of Lot 9 - through the central portion of the study area along the lower slopes of the undulated low hill - and through the south-western corner of Lot 9 into Lot 2.
Conclusion: The proposed quarry is considered unlikely to cause a significant impact to the Koala given the following.	

- 26.3 ha of higher quality habitat that the local Koala population is currently using (i.e. remnant RE 12.9-10.7 and RE 12.8.17 located on lower elevations and with a natural abundance of Queensland Blue Gum) will be retained
- the inclusion of a 30 m buffer being provided to areas of retained remnant RE 12.9-10.7 to reduce indirect impacts to these areas
- the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given:
 - approximately 46.3 ha (or 66 %) of Koala habitat within the quarry footprint is located on land with elevations (i.e. greater 150 mAHD) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009))
 - approximately 37.6 ha (or 54 %) of Koala habitat within the quarry footprint is located on land with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009))
 - the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011)
 - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill.
- Koalas tend to use the same set of trees within their home range (DoEE 2018). It therefore follows that the local Koala population is more likely to consistently use higher quality habitat in the study area within which individuals were recorded (directly and indirectly) and that will be retained as part of the proposed quarry layout, rather than move into lower quality habitat associated with less favourable landscape features (i.e. slopes above 10° and elevations above 150 m) that will be directly impacted by the proposed quarry.
- Opportunities for Koala movement will remain:
 - along the western boundary of Lot 9
 - through the northern portion of Lot 9
 - through the central portion of the study area along the lower slopes of the undulated low hill
 - through the south-western corner of Lot 9 into Lot 2.

Notwithstanding the above, given the proposal will result in the removal of approximately 69.7 ha of Koala habitat with a critical habitat score of 8, DoEE consider the proposal is likely to adversely impact habitat critical for the Koala. It is therefore recommended that the proposed hard-rock quarry is Referred to DoEE for their determination as to whether the proposal requires assessment against the EPBC Act.

7.1.2 Migratory bird species

Habitat occurs throughout the study area for the three migratory birds identified or considered to potentially occur, namely Fork-tailed Swift, Black-faced Monarch, Rufous Fantail and White-throated Needletail. The study area provides foraging habitat but is unlikely to provide breeding habitat for any migratory species. In the case of the Fork-tail Swift and White-throated Needletail these species are more likely to overfly and forage above the survey area rather than use on-ground habitats.

All remnant vegetation in the study area potentially provides habitat, to some extent, for Black-faced Monarch, Fork-tailed Swift, Rufous Fantail and White-throated Needletail. These habitats are preferred over cleared or heavily disturbed areas due to the structural diversity of habitats in remnant areas. Remnant

habitats comprise 128.9 ha within the study area. The project would result in the removal of 60.5 ha of remnant vegetation mapped in the project site.

Two key concepts are important in assessing the significance of impacts against the EPBC Act Significant Impact Guidelines. They are defined below.

Important habitat

Determining if an area of 'important habitat' for a migratory species listed under the EPBC Act occurs within the project site is necessary in addressing the significant impact criteria for migratory species. Important habitat for a migratory species is:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecological significant proportion of the population of the species, and/or
- habitat that is of critical importance to the species at particular life-cycle stages, and/or
- habitat utilised by a migratory species which is at the limit of the species range, and/or
- habitat within an area where the species is declining (DotE 2013).

It is considered unlikely that the study area provides important habitat for any migratory species as the habitat is homogenous in the surrounding landscape and would be unlikely to form important breeding habitat for any migratory species. Furthermore, the study area is not at the limit of the range of any of the four migratory species, nor within an area where the species is declining.

Ecologically significant proportion

An ecologically significant proportion of a migratory species will differ between species, however, the species' population status, genetic distinctiveness and species specific behavioral patterns (for example, site fidelity and dispersal rates) should be considered in evaluating this (DotE 2013).

The study area is unlikely to provide important habitat for any migratory species. It is also unlikely to support an ecologically significant proportion of the population of a migratory species, as this would have been evident during the field survey. There was no evidence of important habitat areas, roost sites or other features that could be used by large numbers of birds.

Table 4 provides an assessment of the significance of impacts to migratory birds against the Commonwealth Significant Impact Guidelines.

Table 4: Assessment of significance of impacts for migratory birds

Significance criteria	Assessment of significance
<i>An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:</i>	
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an	The study area is unlikely to provide important habitat for a migratory species, therefore, important habitat will not be substantially modified, destroyed or isolated by the proposed quarry.

Significance criteria	Assessment of significance
area of important habitat for a migratory species;	
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	The study area is unlikely to provide important habitat for a migratory species. The Draft referral guidelines for 14 birds listed migratory under the EPBC Act (DotE 2015) does not include any known invasive species that may be harmful to White-throated Needletail or Fork-tailed Swift. However, Black Rat and Rubber Vine (<i>*Cryptostegia grandiflora</i>) are recognised as harmful invasive species for Black-faced Monarch and Rufous Fantail (DotE 2015b). Rubbervine was not recorded within the study area during the field surveys and was not returned from database searches. It is likely that Black Rat occurs within the study area and surrounds. This project is unlikely to result in invasive species becoming established in suitable habitat. The SBMP will provide measures for the management of weed and feral animal control, and these will be applied to the project.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the migratory species.	An ecologically significant proportion of the population of a migratory species is considered unlikely to occur in the study area. Therefore, the project is unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species.
<i>Conclusion</i>	<i>The proposed quarry will not cause a significant residual impact to migratory species listed under the EPBC Act.</i>

7.2 Matters of state environmental significance

Assessments of the potential for significant residual impacts to MSES that have either been recorded in the study area or have a likelihood of occurrence against the SRI Guideline are provided below. It is noted that at present there are no regulatory requirements for the assessment of impacts to special least concern fauna that are migratory species. Therefore impacts to migratory birds recorded or considered likely to occur within the study area have been considered in this section.

7.2.1 Regulated vegetation

The field-validated vegetation mapping found that the study area (Figure 6) supports approximately:

- 102.6 ha of remnant least concern vegetation (i.e. RE 12.8.9, 12.8.14a and 12.8.17)
- 26.3 ha of remnant of concern vegetation (i.e. RE 12.9-10.7).

With reference to Figure 7, the proposed quarry layout provides for the retention and protection of all areas of remnant of concern vegetation (RE 12.9-10.7). However, approximately 60.2 ha of remnant least concern vegetation will be

impacted for the purposes of establishing the extraction footprint, processing and stockpile areas, access roads and infrastructure (i.e. site office, carpark, staff amenities etc.) associated with the proposed quarry. It is noted that some areas of remnant least concern vegetation intersect with stream order 1 and 2 drainage lines within the study area.

Under the *Planning Act 2016*, there are no exemptions for clearing remnant least concern vegetation on freehold land in a non-urban area to establish an extractive industry operation. Therefore, the proposed quarry, including the internal access track and haul road, must be assessed against the relevant components of 'State Code 16: Native vegetation clearing and a permit to clear native vegetation under the VM Act' must be obtained.

In accordance with the VM Act, an application to clear native vegetation will be included with the MCU – extractive industry application for the Queensland Government's State Assessment and Referral Agency (SARA) assessment and approval. This application will include assessment against the relevant performance outcomes (PO) of State Code 16, including POs relating to of concerns REs, essential habitat, connectivity and regulated vegetation intersecting a watercourse.

7.2.2 *Threatened flora*

No threatened flora were recorded, or are considered likely to occur in the study area during the field survey.

Notwithstanding the above, a considerable portion of Lot 2 is identified as occurring within mapped HRA on the DES Protected Plants - Flora Survey Trigger Map (Figure 3; Appendix C). Under the NC Act, a formal flora survey that satisfies DES' 'Flora Survey Guidelines – Protected Plants' (EHP 2016) is required. Targeted searches for threatened flora in suitable habitat and at vegetation assessment sites were carried out during the current field survey. However these surveys do not comply with the DES's Flora Survey Guidelines. More specifically, the Flora Survey Guidelines require timed random meanders or transect surveys to be carried out in the 'clearing impact area' plus a 100 m buffer.

It is recommended that prior to any vegetation clearing taking place, a formal flora survey that complies with the Flora Survey Guidelines is carried out along the proposed haul route, plus a 100 m buffer. Following the flora survey, a formal Flora Survey Report (FSR) will need to be submitted to DES in:

- order to demonstrate that no threatened flora species were identified within the clearing impact area (including the 100 m buffer) – the FSR must be submitted at least one week prior to any vegetation clearing; or
- support of an application for a Clearing Permit, when threatened flora have been identified within the clearing impact area and 100 m buffer.

Note that the FSR must be lodged with DES within 12 months of the flora surveys being undertaken.

As part of this process, should any threatened or near threatened flora be recorded, an assessment of the impacts against the DLGRMA's Significant Residual

Impact Guidelines (SDIP 2014) would be undertaken and the requirements for an environment offset under Queensland's EO Act determined.

7.2.3 *Threatened fauna*

The Koala is the only NC Act listed threatened species that was recorded within or is considered likely to occur within the study area. The level of impact to Koala habitat under the provisions of the EPBC Act has been addressed in Section 7.2.1. However, the proposed quarry will also be assessed against 'State Code 22: Environmentally Relevant Activities', which requires activities to avoid or minimise impacts to MSES, including protected wildlife habitat. It is also considered unlikely that the proposed quarry will result in a significant residual impact on the Koala in accordance with the SRI Guideline. Specifically, it is unlikely that habitat clearance associated with the proposed quarry will:

- lead to a long-term decrease in the size of a local population of the Koala, or
- reduce the extent of occurrence of the Koala, or
- fragment an existing population of the Koala, or
- result in genetically distinct populations of the Koala, or
- result in invasive species that are harmful to the Koala, or
- introduce disease that may cause populations of the Koala to decline, or
- interfere with the recovery of Koala or
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) for the Koala.

This assessment is based on the same reasoning present in Section 7.1.1 in that:

- 26.3 ha of higher quality habitat within which Koalas were recorded (i.e. remnant RE 12.9-10.7 and RE 12.8.17 located on lower slopes with a natural abundance of Queensland Blue Gum) will be retained
- to reduce indirect impacts to retained field-validated RE 12.9-10.7, a minimum 30 m wide buffer to these areas has been included in the quarry layout
- the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given:
 - approximately 46.3 ha (or 66%) of Koala habitat within the quarry footprint is located on land with elevations (i.e. greater 150 mAHD) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009))
 - approximately 37.6 ha (or 54%) of Koala habitat within the quarry footprint is located on land with slopes (i.e. 10 - 50°) with which Koalas are less commonly associated both within the study area and broader South East Queensland Region (refer thresholds reported by GHD (2009))

- the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011)
- no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill
- Koalas tend to use the same set of trees in their home range (DoEE 2018). It therefore follows that the local Koala population is more likely to consistently use higher quality habitat in the study area within which individuals were recorded (directly and indirectly) and that will be retained as part of the proposed quarry layout, rather than move into lower quality habitat associated with less favourable landscape features (i.e. slopes above 10° and elevations above 150 mAHD) that will be directly impacted by the proposed quarry.
- Opportunities for Koala movement will remain:
 - along the western boundary of Lot 9
 - through the northern portion of Lot 9
 - through the central portion of the study area along the lower slopes of the undulated low hill
 - through the south-western corner of Lot 9 into Lot 2.

An additional requirement of the NC Act, under Section 332 (1) of the *Nature Conservation (Wildlife Management) Regulation 2006* (NC Reg.), is that; 'a person must not, without a reasonable excuse, tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring', unless 'an approved species management program for animals of the same species' is in place. Given a threatened species has been recorded on site, a High-risk Species Management Program (SMP) is required to minimise the risk of tampering with animal breeding places and where necessary, to do so in a sensitive manner during the course of the construction and operation of the quarry. The SMP would also include provisions (such as pre-clearing surveys, vegetation clearing protocols and presence of a spotter-catcher during clearing) to minimise harm to least concern fauna species that are likely to occur and potentially breed within the quarry footprint such as nesting birds, arboreal mammals (i.e. possums and Brush-tailed Phascogales) and reptiles. An application for a High-risk SMP would be prepared and submitted to DES once all necessary planning approvals have been secured for the project. Vegetation clearing required to construct the proposed quarry would not take place until the SMP has been approved.

7.3 Matters of local environmental significance

The study area has been identified as supporting State and Regional values on the Boonah Shire Planning Scheme's Overlay Map 2A: Natural Areas Overlay – Natural Values. An assessment of the proposed quarry against the relevant specific outcomes (SO) of the Natural Areas Overlay Code (i.e. those relating to natural values) is provided in Table 5 below.

Table 5: Assessment against Natural Areas Overlay Code – Natural Values

Performance criteria	Acceptable solution	Assessment
SO1 Biodiversity and habitat values are protected.	PS1.1 Buildings and associated infrastructure are located: (i) 40 metres from any watercourse or wetland; (ii) on land that has been previously cleared; (iii) in an area not demonstrated as being an important ecological corridor. OR PS1.2 A vegetated buffer of at least 50 metres width is provided between any waterway or wetland and any incompatible development activity.	There are a number of ephemeral 1st order drainage lines and two 2nd order drainages line within the study area. The proposed quarry layout has been designed to avoid impacts as far practical, whilst facilitating extraction of the target resource, i.e. trachyandesite. In this regard, the majority of drainage lines within the study area are not directly impacted by the proposed quarry. However, there will be unavoidable impacts to the majority of the 1st order drainage line that originates from within the undulated low hill that will form part of the main extraction area. There will also be some impacts to six 1st order drainage lines where proposed access roads intersect these drainage lines. The majority of these roads will be a maximum width of 15 m and flow within the drainage lines will be maintained through reinforced concrete pipes or box culverts where wider crossings are required (i.e. Lot 2). It is noted that the quarry layout is primarily driven by the underlying geology and the location of the target resource. In this regard, the layout has been designed to avoid impacts to remnant of concern vegetation that is also habitat for the Koala. The majority of direct impacts associated with the quarry have been restricted to areas of non-remnant and remnant least concern vegetation. The study area is identified as forming part of a regional terrestrial corridor by the Queensland Government. However, the corridor values of the study area itself have been reduced by the extent of vegetation clearing in the broader region, the fragmented nature of remnant vegetation communities in the landscape and the presence of barriers to fauna movement such as the Cunningham Highway to the east and south-east, and cleared cropping and pastoral lands. While the project will further reduce the connectivity values of the study area, movement opportunities for fauna will remain through the retention of vegetation: ▪ along the western boundary of Lot 9 ▪ in the northern portion of Lot 9

Performance criteria	Acceptable solution	Assessment
		- through the central portion of the study area (i.e. along the lower slopes of the undulated low hill) - through the south-western portion of Lot 9 in and into Lot 2.
SO3 Viable networks of wildlife habitat are maintained or enhanced.	PS3.1 The maintenance of remnant native vegetation and other areas of habitat significance and wildlife corridors are achieved through site layout and the identification of “no-go” areas within the site boundaries where the development must not occur.	It is not possible to retain all areas of remnant vegetation identified within the study area and extract the target resource (i.e. trachyandesite). As a result, approximately 60.2 ha of remnant least concern vegetation will be removed as part of the proposal. However, the proposed layout has been specifically designed to avoid impacts to remnant of concern vegetation in the study area. In addition, a 30 m buffer has been provided to reduce indirect impacts to retained remnant of concern vegetation. In addition, movement opportunities for fauna will remain in the study area through the retention of vegetation: - along the western boundary of Lot 9 - in the northern portion of Lot 9 - through the central portion of the study area along the lower slopes of the undulated low hill - through the south-western portion of Lot 9 in and into Lot 2. While some of these corridors will be intersected by internal access roads, these are not anticipated to affect fauna movement given: - the majority of the roads will be a maximum width of 15 m - a 40 to 60 km/hr speed limit will be applied to all internal roads - the quarry will not be operational at night, except through periods of peak demand.
SO4 The ecological values of an area identified in Overlay Map 2A are protected and/or enhanced.	PS4 Vegetation in areas identified as having ‘state’ or ‘regional’ value on Overlay Map 2A is retained.	As noted above it is not possible to retain all areas of vegetation in the study area identified as having state and regional values on Overlay Map 2A. However, the quarry layout has been designed to avoid impacts to areas of higher ecological value (i.e. remnant of concern vegetation that is also Koala habitat) and impacts to remnant least concern vegetation has been minimised as far as practicable.

8 References

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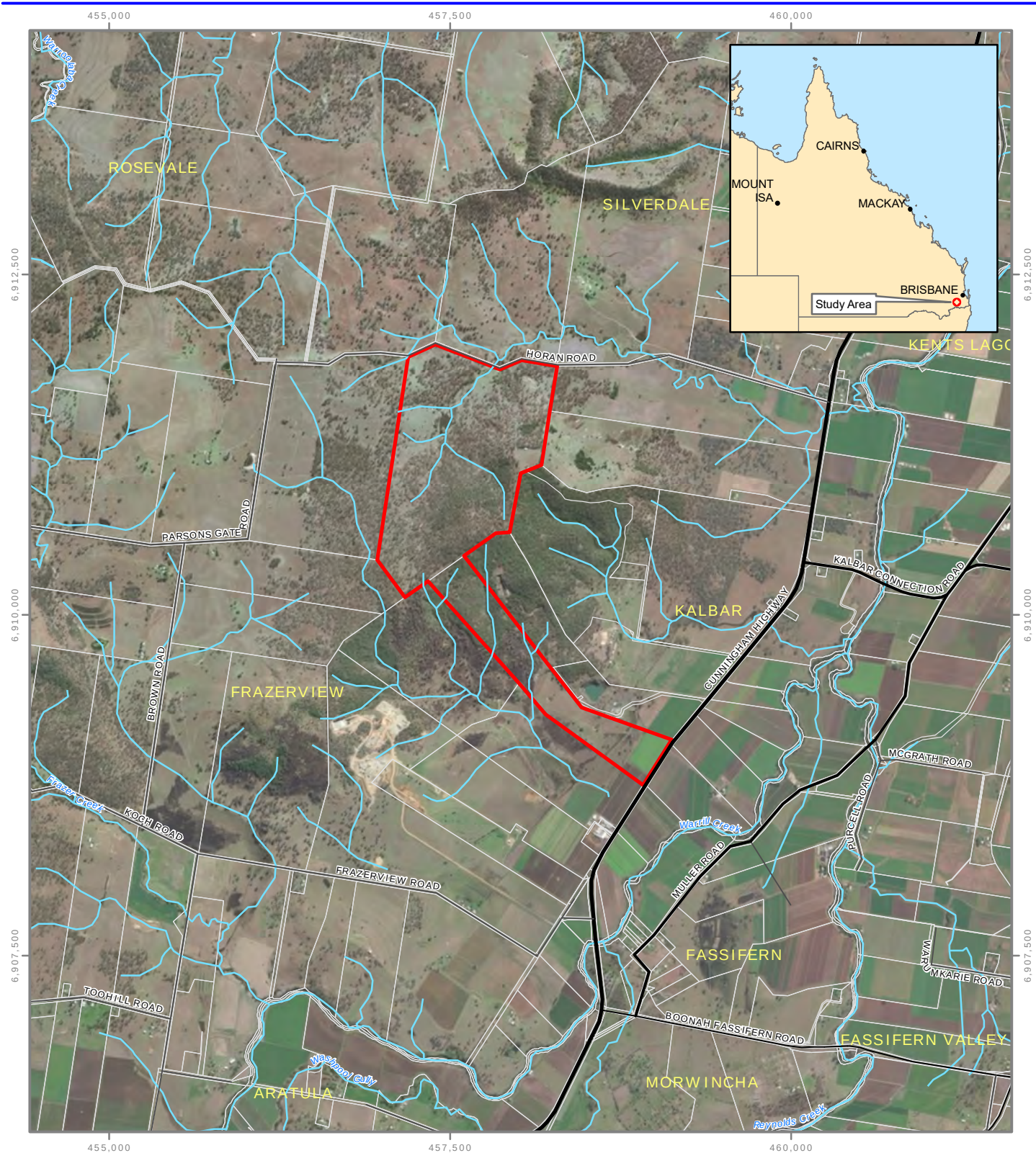
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Figures



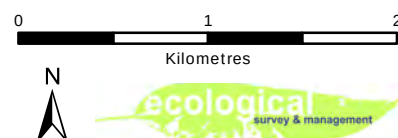
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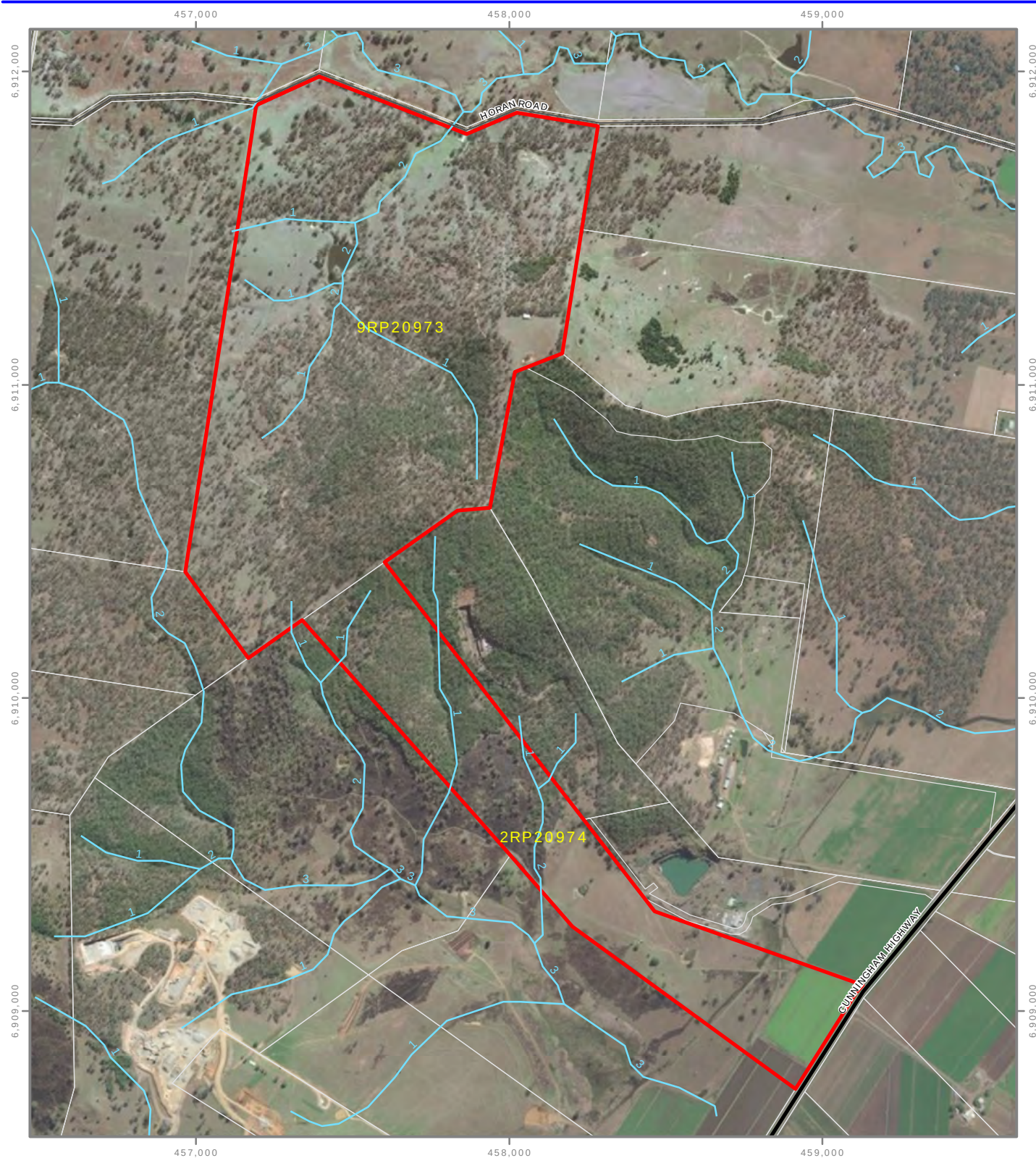
- Study Area
- Highway
- Secondary Road
- Local Connector Road
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary

Figure 1 : Study area locality

Frazerview Quarry

Map Number: 18032_EAR_01_C
 Date: 07 November 2018
 Map Projection: GDA 1994 MGA Zone 56
 Imagery: Digital Globe
 Data: Roads, Watercourse, DCDB - (c)DNRM 2018





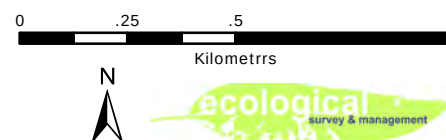
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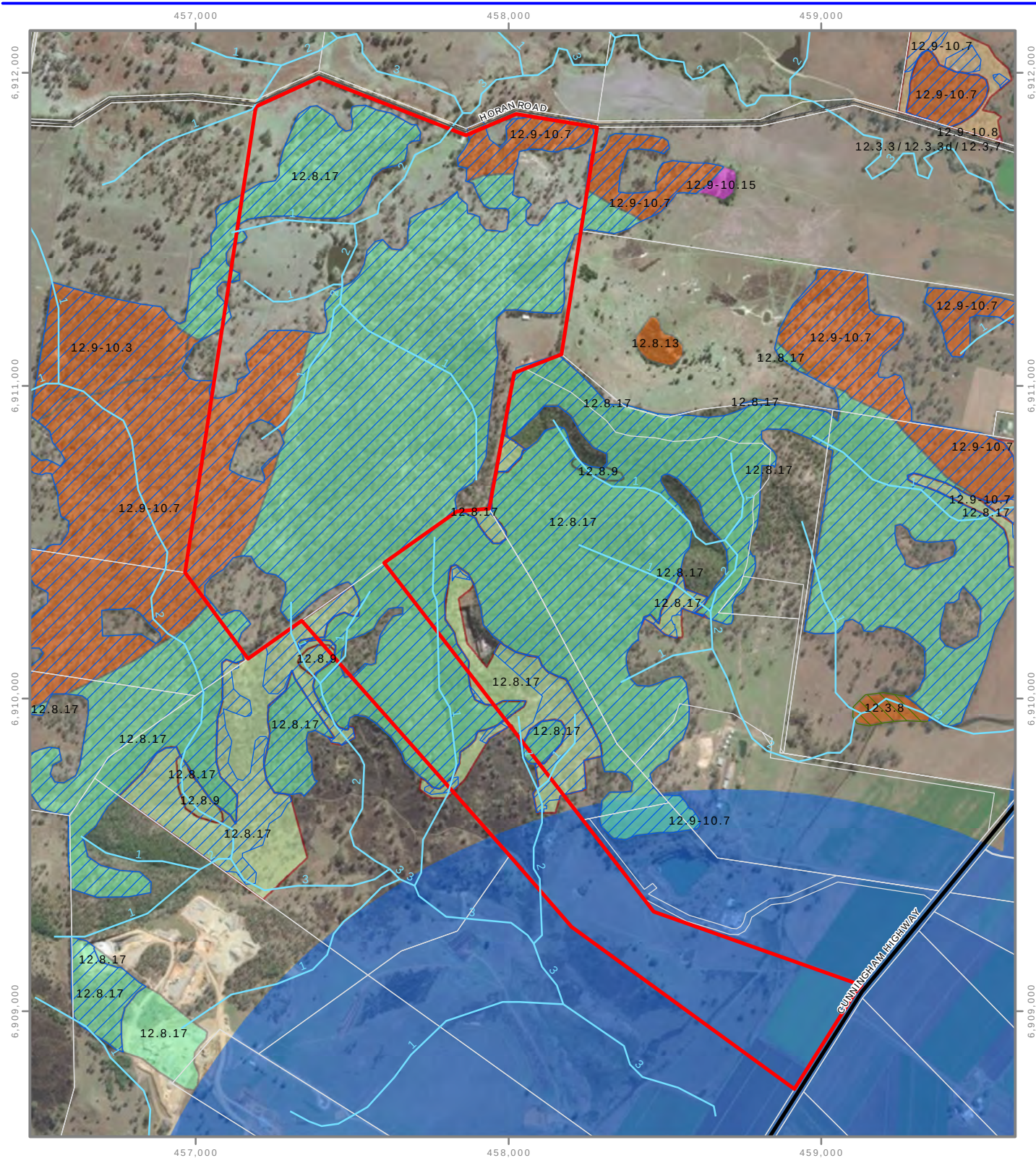
- Study Area
- Highway
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary

Figure 2 : Aerial photograph of study area

Frazerview Quarry

Map Number: 18032_EAR_02_C
 Date: 07 November 2018
 Map Projection: GDA 1994 MGA Zone 56
 Imagery: Digital Globe
 Data: Roads, Watercourse, DCDB - (c)DNRM 2018





Legend

- Study Area
- Highway
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary
- VMA Essential Habitat - V7.19
- VMA Wetland - V4.7
- Flora Survey Trigger Mapping

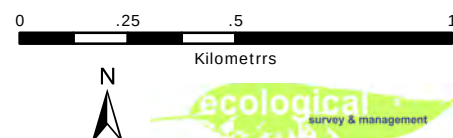
Vegetation Management Regional Ecosystem Map - V10.1

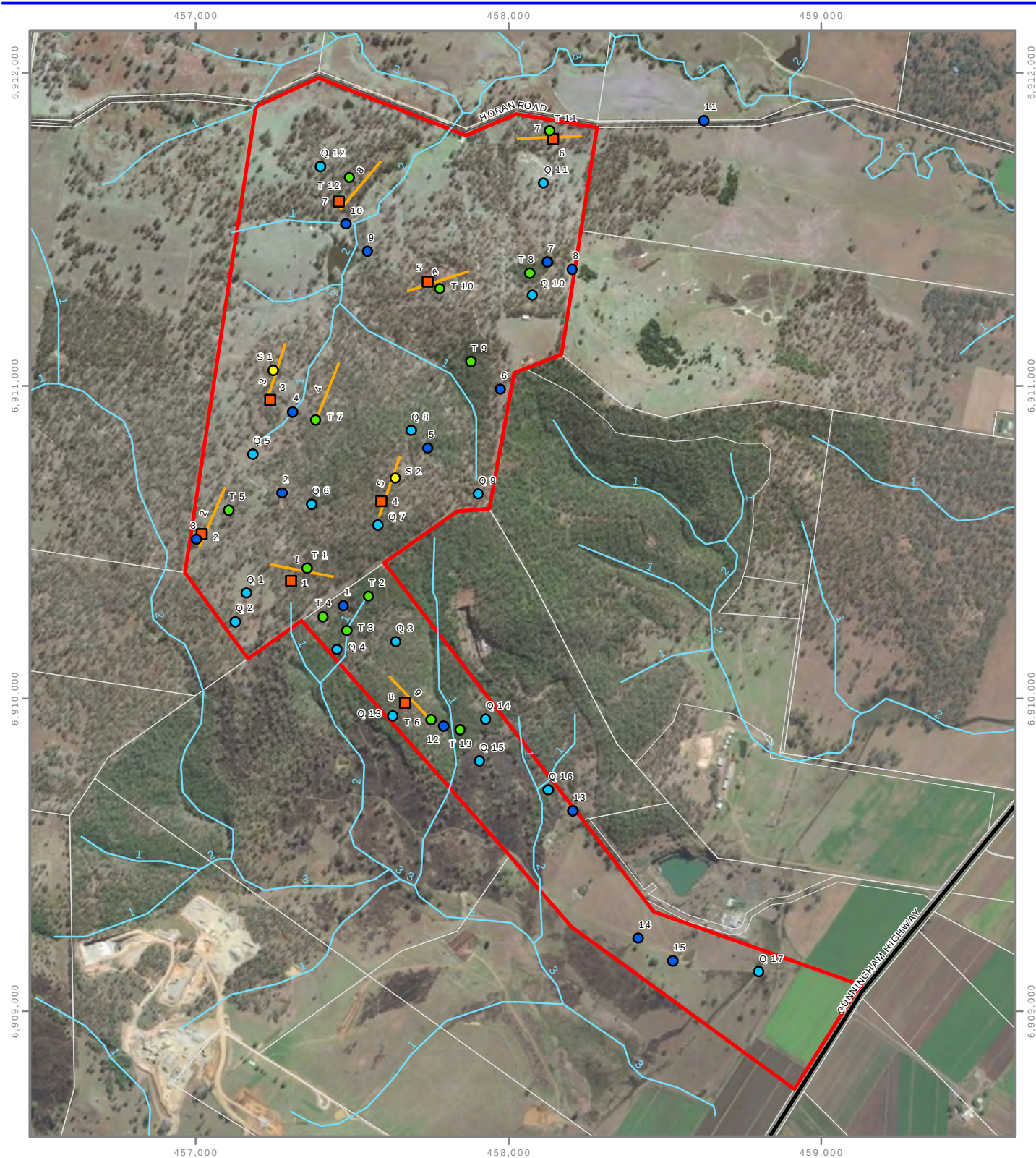
- Category A or B area containing endangered
- Category A or B area containing of concern
- Category A or B area that is least concern
- Category C area containing endangered
- Category C area containing of concern
- Category C area that is of least concern

Figure 3 : Queensland Government RE mapping

Frazerview Quarry

Map Number: 18032_EAR_03_E
Date: 17 December 2018
Map Projection: GDA 1994 MGA Zone 56
Imagery: Digital Globe
Data: Roads, Watercourse, DCDB - (c)DNRM 2018





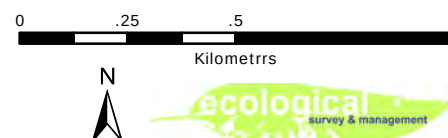
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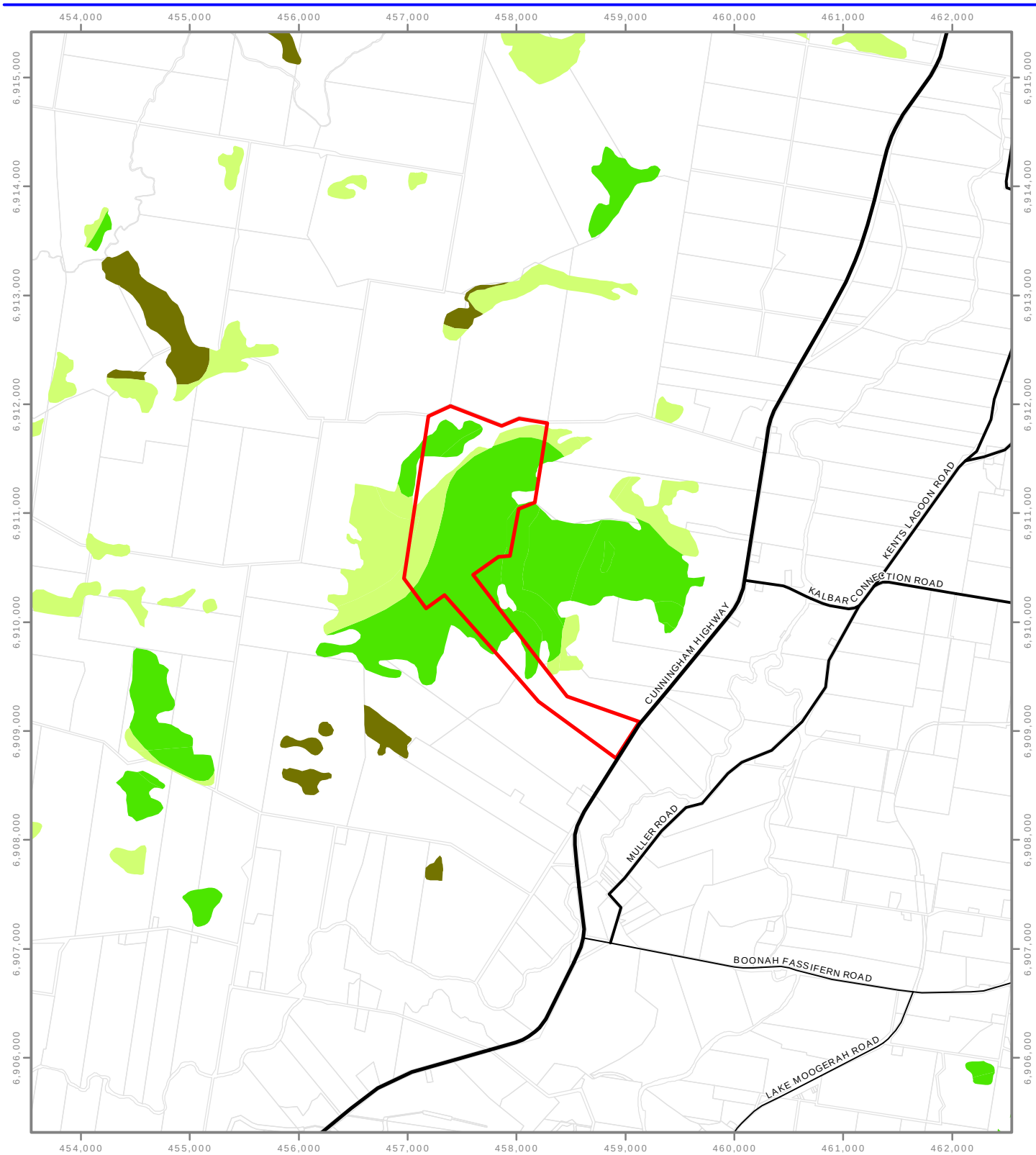
- Study Area
- Highway
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary
- Vegetation Assessment Sites**
 - Secondary Assessment Site
 - Tertiary Assessment Site
 - Quaternary Assessment Site
 - Quaternary Assessment Site (Photo Point)
 - Koala SAT Site
 - Koala Transect

Figure 4 : Locations of flora and fauna survey sites

Frazerview Quarry

Map Number: 18032_EAR_04_C
Date: 07 November 2018
Map Projection: GDA 1994 MGA Zone 56
Imagery: Digital Globe
Data: Roads, Watercourse, DCDB - (c)DNRM 2018



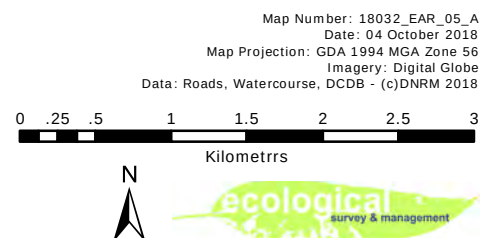


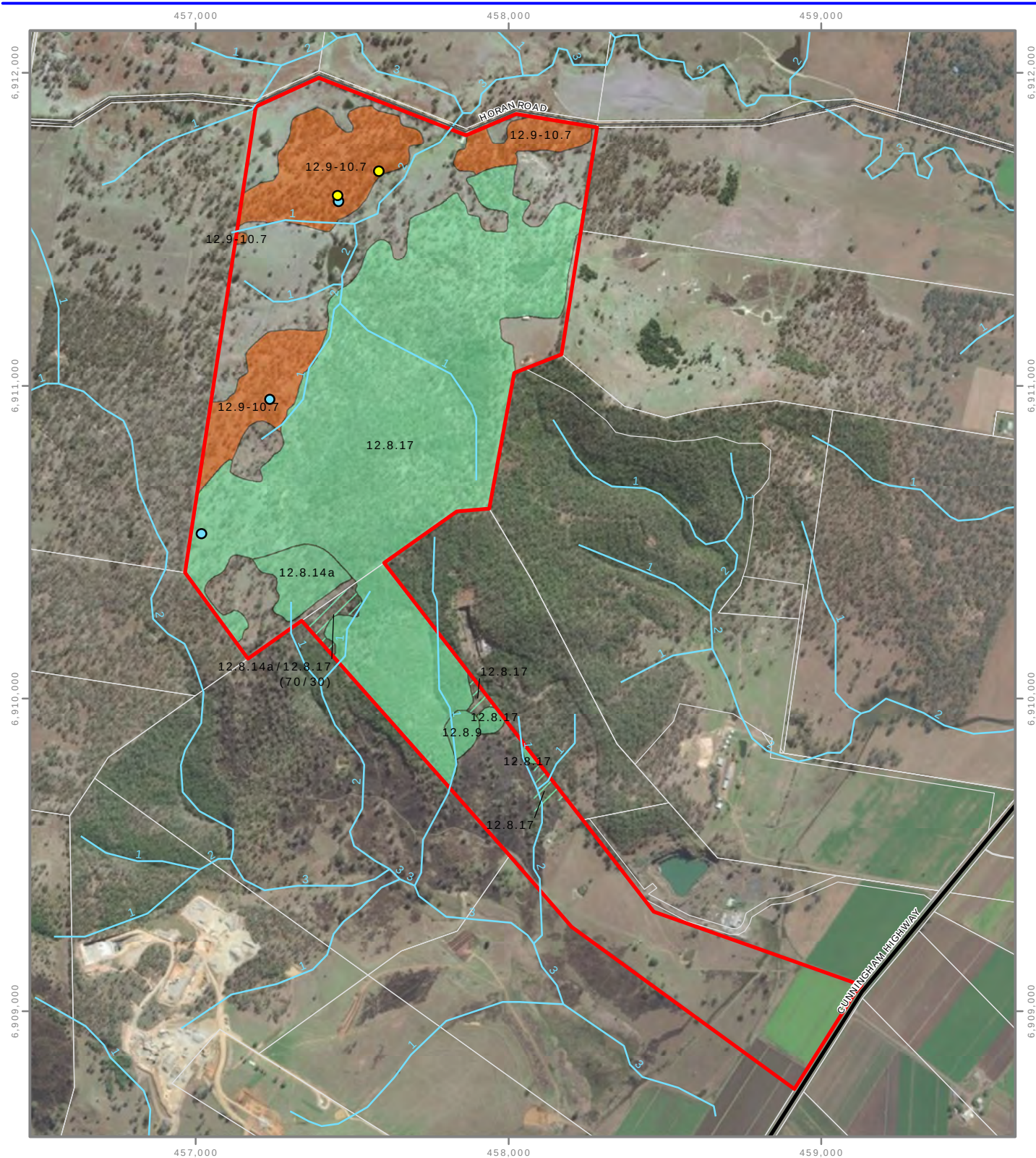
Legend

- Study Area
- Highway
- Secondary Road
- Local Connector Road
- Local_Government_Areas
- Cadastral Boundary
- Biodiversity Significance**
- Local or Other Values
- Regional Values
- State Values

**Figure 5 : Boonah Planning Scheme
Natural Values overlay map**

Frazerview Quarry





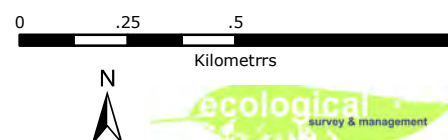
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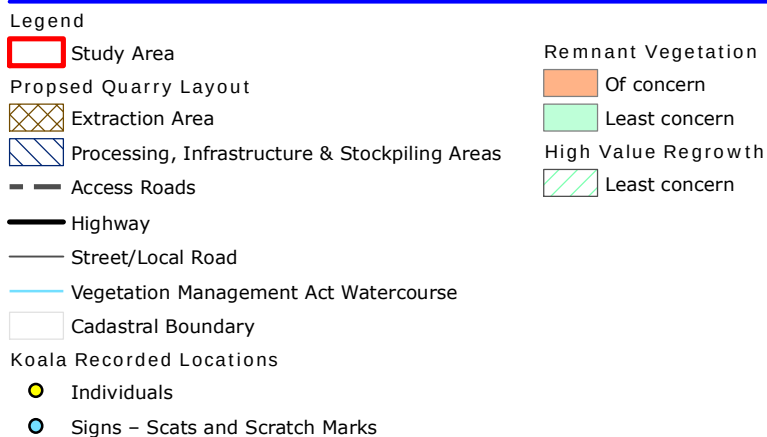
- Study Area
- Highway
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary
- Koala Recorded Locations**
 - Individuals
 - Signs – Scats and Scratch Marks
- Remnant Vegetation**
 - Of concern
 - Least concern
- High Value Regrowth**
 - Least concern

Figure 6 : Field-validated RE Mapping

Frazerview Quarry

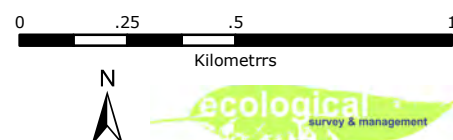
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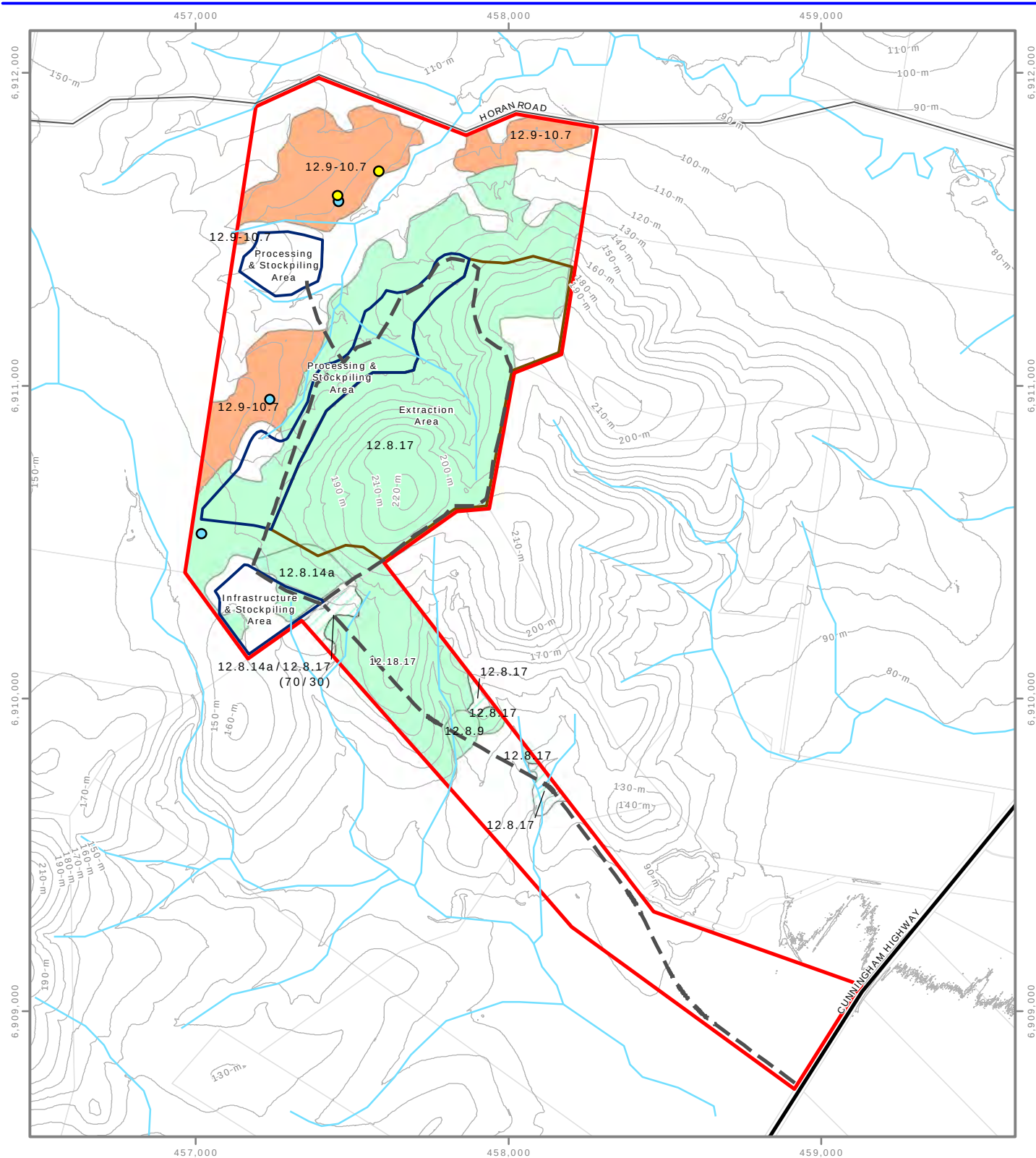




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Date: 15 November 2018
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Imagery: Digital Globe
Data: Roads, Watercourse, DCDB - (c)DNRM 2018





Legend

- Study Area
- Proposed Quarry Layout
- Extraction Area
- Processing, Infrastructure & Stockpiling Areas
- Access Roads
- Contours - 10m
- Highway
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary
- Koala Recorded Locations
- Individuals
- Signs - Scats and Scratch Marks

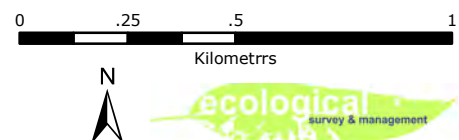
Remnant Vegetation

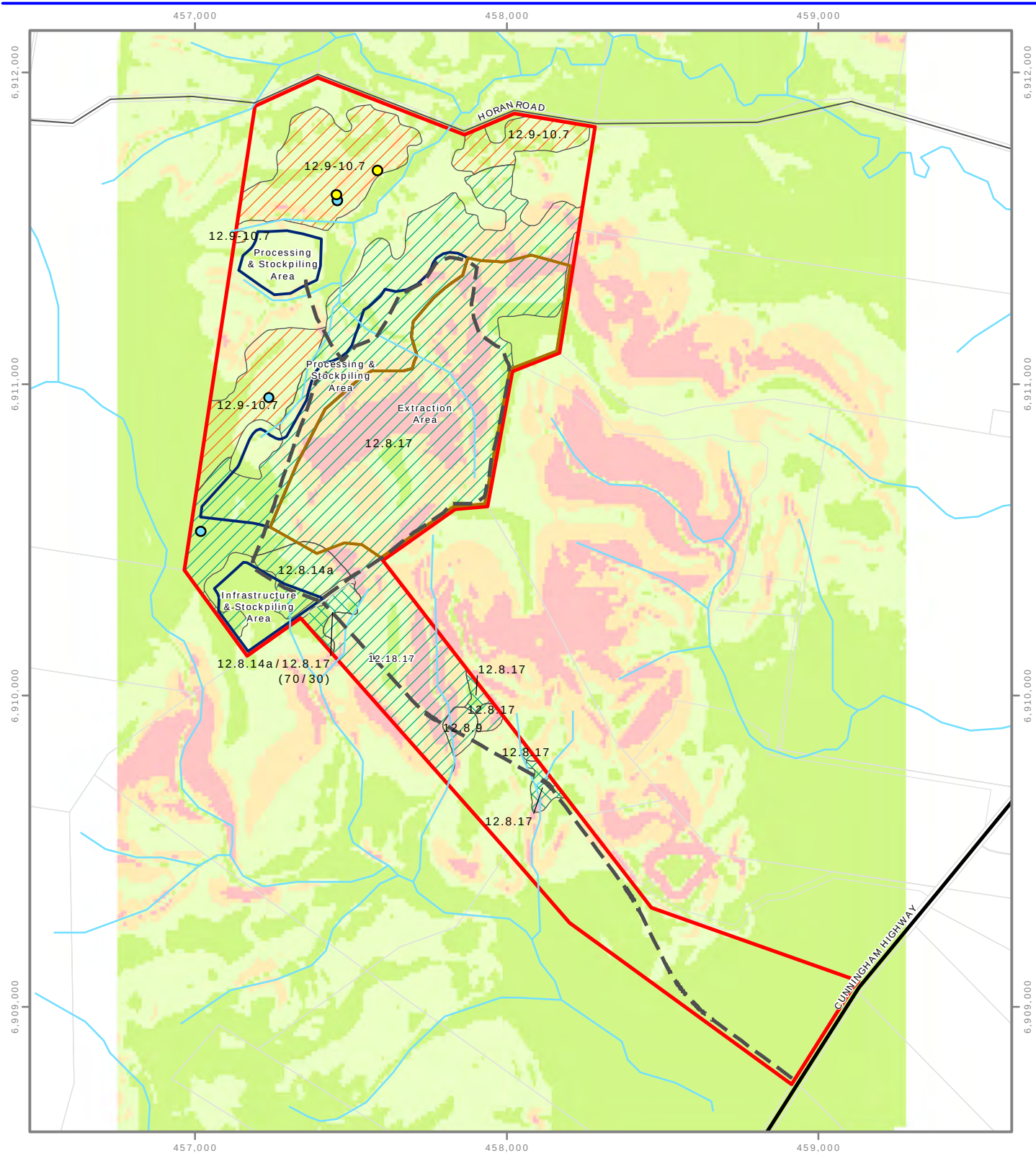
- Of concern
 - Least concern
- #### High Value Regrowth
- Least concern

Figure 8 : Koala habitat in relation to elevation

Frazerview Quarry

Map Number: 18032_EAR_08_E
Date: 17 December 2018
Map Projection: GDA 1994 MGA Zone 56
Imagery: Digital Globe
Data: Roads, Watercourse, DCDB - (c)DNRM 2018





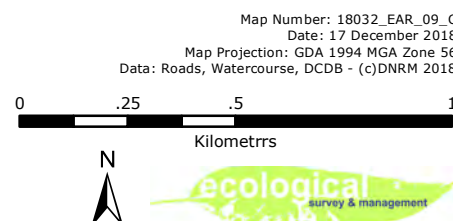
Legend

- Study Area
- Proposed Quarry Layout
- Extraction Area
- Processing, Infrastructure & Stockpiling Areas
- Access Roads
- Highway
- Street/Local Road
- Vegetation Management Act Watercourse
- Cadastral Boundary
- Koala Recorded Locations
- Individuals
- Signs - Scats and Scratch Marks

- Remnant Vegetation
- Of concern
- Least concern
- High Value Regrowth
- Least concern
- Slope
- 0 - 5
- 5 - 10
- 10 - 15
- 15 - 50

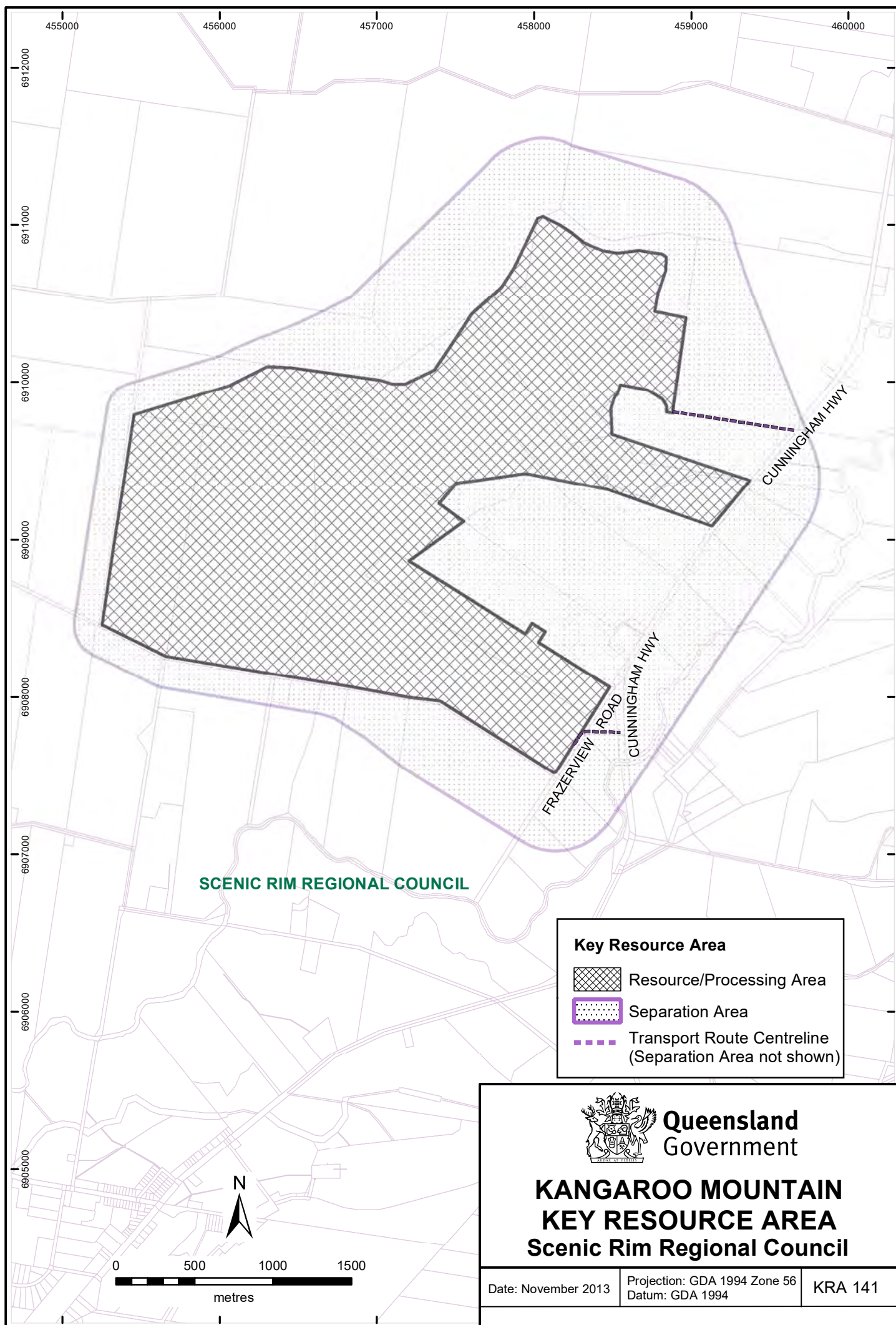
Figure 9 : Koala habitat in relation to slope

Frazerview Quarry



Appendix A

KRA 141 - Kangaroo Mountain Map



Appendix B

Database search results



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: 17/10/18 11:20:02

[Summary](#)

[Details](#)

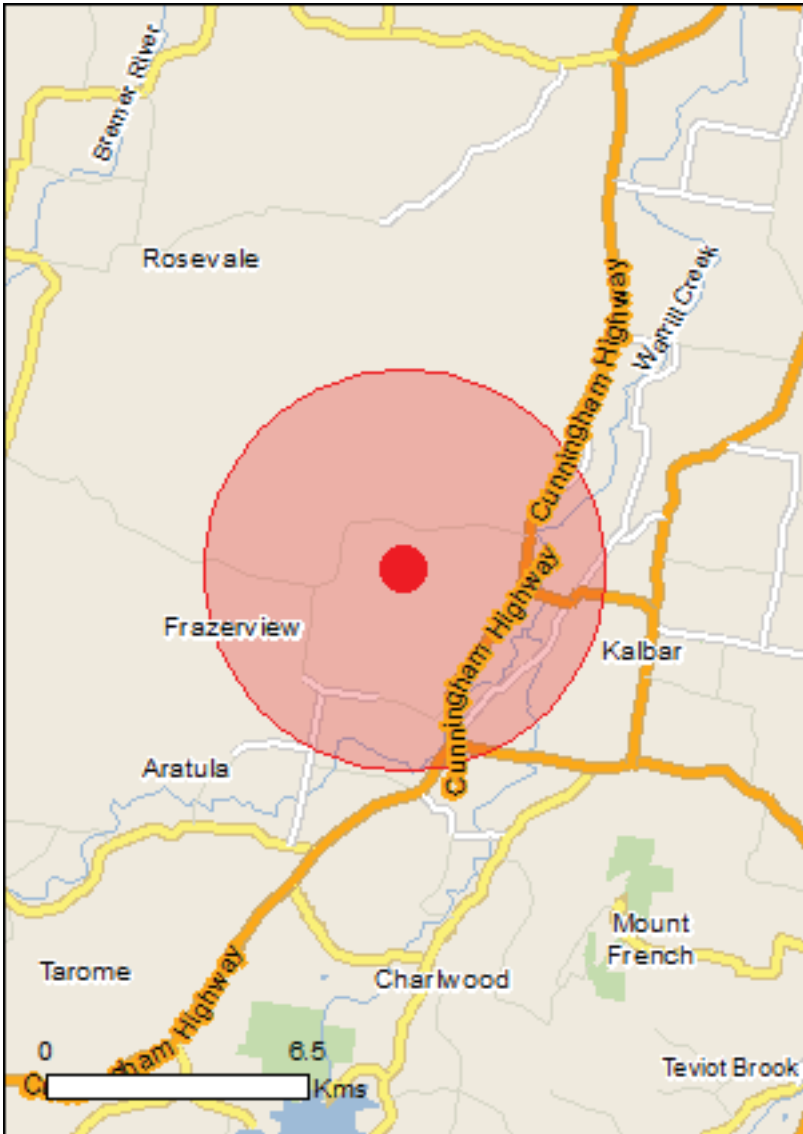
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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[Coordinates](#)

[Buffer: 5.0Km](#)



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 Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	37
Listed Migratory Species:	16

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:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	33
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
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to 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
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Frogs		
Mixophyes fleayi Fleay's Frog [25960]	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 likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species 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 known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Bertya ernestiana a shrub [78349]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Cupaniopsis tomentella Boonah Tuckeroo [3322]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Lepidium peregrinum Wandering Pepper-cress [14035]	Endangered	Species or species habitat may occur within area
Lychnothamnus barbatus a green alga [64479]	Endangered	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area

Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	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		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to 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		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
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

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		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 likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to 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		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		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 known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur

Name	Status	Type of Presence
Canis lupus familiaris Domestic Dog [82654] Felis catus Cat, House Cat, Domestic Cat [19] Lepus capensis Brown Hare [127] Mus musculus House Mouse [120] Oryctolagus cuniculus Rabbit, European Rabbit [128] Rattus norvegicus Brown Rat, Norway Rat [83] Rattus rattus Black Rat, Ship Rat [84] Sus scrofa Pig [6] Vulpes vulpes Red Fox, Fox [18]		within area
		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907] Asparagus plumosus Climbing Asparagus-fern [48993] Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera Bitou Bush, Boneseed [18983] Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119] Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301] Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566] Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species habitat may occur within area
		Species or species habitat likely to occur within area
Plants		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species habitat likely to occur within area
		Species or species

Name	Status	Type of Presence
Sterile Pussy Willow [68497]		habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium		
Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

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 and National Heritage properties, Wetlands of International and National 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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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

-27.9262 152.5688

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:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
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- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-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](#)
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111



Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: All
Records: All
Date: All
Latitude: -27.9262
Longitude: 152.5688
Distance: 5
Email: monica.campbell@ecosm.com.au
Date submitted: Friday 11 May 2018 20:24:03
Date extracted: Friday 11 May 2018 20:30:17

The number of records retrieved = 115

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	amphibians	Bufonidae	<i>Rhinella marina</i>	cane toad	Y			1
animals	amphibians	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog		C		1
animals	birds	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	yellow-rumped thornbill		C		1
animals	birds	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite		C		1
animals	birds	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite		C		1
animals	birds	Accipitridae	<i>Milvus migrans</i>	black kite		C		1
animals	birds	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck		C		2
animals	birds	Anatidae	<i>Aythya australis</i>	hardhead		C		1
animals	birds	Anatidae	<i>Anas gracilis</i>	grey teal		C		1
animals	birds	Anatidae	<i>Anas superciliosa</i>	Pacific black duck		C		3
animals	birds	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter		C		1
animals	birds	Apodidae	<i>Apus pacificus</i>	fork-tailed swift		SL		1
animals	birds	Ardeidae	<i>Bubulcus ibis</i>	cattle egret		C		2
animals	birds	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron		C		3
animals	birds	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird		C		1
animals	birds	Artamidae	<i>Cracticus tibicen</i>	Australian magpie		C		3
animals	birds	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird		C		1
animals	birds	Cacatuidae	<i>Nymphicus hollandicus</i>	cockatiel		C		1
animals	birds	Cacatuidae	<i>Eolophus roseicapilla</i>	galah		C		1
animals	birds	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike		C		1
animals	birds	Campephagidae	<i>Coracina maxima</i>	ground cuckoo-shrike		C		1
animals	birds	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)		C		2
animals	birds	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		C		1
animals	birds	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola		C		2
animals	birds	Columbidae	<i>Columba livia</i>	rock dove	Y			1
animals	birds	Columbidae	<i>Geopelia striata</i>	peaceful dove		C		1
animals	birds	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon		C		2
animals	birds	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	Y			2
animals	birds	Corvidae	<i>Corvus orru</i>	Torresian crow		C		6
animals	birds	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal		C		2
animals	birds	Estrildidae	<i>Taeniopygia guttata</i>	zebra finch		C		1
animals	birds	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch		C		1
animals	birds	Falconidae	<i>Falco subniger</i>	black falcon		C		1
animals	birds	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel		C		1
animals	birds	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra		C		1
animals	birds	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher		C		1
animals	birds	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin		C		2
animals	birds	Hirundinidae	<i>Cheramoeca leucosterna</i>	white-backed swallow		C		1
animals	birds	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow		C		1
animals	birds	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren		C		2
animals	birds	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater		C		2
animals	birds	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird		C		2
animals	birds	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater		C		1
animals	birds	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird		C		1
animals	birds	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater		C		3
animals	birds	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner		C		1
animals	birds	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater		C		1
animals	birds	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark		C		3
animals	birds	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit		C		1
animals	birds	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird		C		3
animals	birds	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole		C		1
animals	birds	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird		C		2
animals	birds	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush		C		1
animals	birds	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		1
animals	birds	Passeridae	<i>Passer domesticus</i>	house sparrow	Y			2
animals	birds	Phaethontidae	<i>Phaethon rubricauda</i>	red-tailed tropicbird		V		3/1
animals	birds	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		1
animals	birds	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail		C		1
animals	birds	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe		C		1
animals	birds	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet		C		3
animals	birds	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		2
animals	birds	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		2
animals	birds	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen		C		1
animals	birds	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		1
animals	birds	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt		C		1
animals	birds	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		2
animals	birds	Sturnidae	<i>Acridotheres tristis</i>	common myna	Y			1
animals	birds	Sturnidae	<i>Sturnus vulgaris</i>	common starling	Y			4
animals	birds	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		2
animals	birds	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill		C		1
animals	birds	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		2
animals	birds	Tytonidae	<i>Tyto delicatula</i>	eastern barn owl		C		2
animals	mammals	Canidae	<i>Vulpes vulpes</i>	red fox	Y			2
animals	mammals	Dasyuridae	<i>Phascogale tapoatafa tapoatafa</i>	brush-tailed phascogale		C		2
animals	mammals	Muridae	<i>Rattus rattus</i>	black rat	Y			1
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	27
animals	mammals	Pteropodidae	<i>Pteropus scapulatus</i>	little red flying-fox		C		1
animals	ray-finned fishes	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish				8
animals	ray-finned fishes	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel				14
animals	ray-finned fishes	Anguillidae	<i>Anguilla australis</i>	southern shortfin eel				13
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus stercusmuscarum</i>	flyspecked hardyhead				8
animals	ray-finned fishes	Atherinidae	<i>Craterocephalus marjoriae</i>	silverstreak hardyhead				1
animals	ray-finned fishes	Clupeidae	<i>Nematalosa erebi</i>	bony bream				2
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris klunzingeri</i>	western carp gudgeon				15
animals	ray-finned fishes	Eleotridae	<i>Philypnodon grandiceps</i>	flathead gudgeon				7
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Gobiomorphus coxii</i>	Cox gudgeon				1
animals	ray-finned fishes	Eleotridae	<i>Hypseleotris galii</i>	firetail gudgeon				18
animals	ray-finned fishes	Eleotridae	<i>Gobiomorphus australis</i>	striped gudgeon				2
animals	ray-finned fishes	Melanotaeniidae	<i>Melanotaenia duboulayi</i>	crimsonspotted rainbowfish				13
animals	ray-finned fishes	Mugilidae	<i>Mugil cephalus</i>	sea mullet				1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	ray-finned fishes	Percichthyidae	<i>Macquaria novemaculeata</i>	Australian bass				4
animals	ray-finned fishes	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish				12
animals	ray-finned fishes	Poeciliidae	<i>Gambusia holbrooki</i>	mosquitofish	Y			16
animals	ray-finned fishes	Retropinnidae	<i>Retropinna semoni</i>	Australian smelt				11
animals	ray-finned fishes	Scorpaenidae	<i>Notesthes robusta</i>	bullrout				1
animals	ray-finned fishes	Terapontidae	<i>Leiopotherapon unicolor</i>	spangled perch				14
animals	reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon			C	1
animals	reptiles	Boidae	<i>Morelia spilota</i>	carpet python			C	1
animals	reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake			C	1
animals	reptiles	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus			C	1
animals	reptiles	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink			C	1
plants	higher dicots	Bignoniaceae	<i>Dolichandra unguis-cati</i>	cat's claw creeper	Y			1/1
plants	higher dicots	Euphorbiaceae	<i>Ricinus communis</i>	castor oil bush	Y			2/2
plants	higher dicots	Phytolaccaceae	<i>Phytolacca dioica</i>	bella sombra	Y			1/1
plants	higher dicots	Sapindaceae	<i>Cupaniopsis tomentella</i>	Boonah tuckeroo			V V	1/1
plants	higher dicots	Ulmaceae	<i>Celtis sinensis</i>	Chinese elm	Y			1/1
plants	monocots	Asparagaceae	<i>Asparagus africanus</i>	ornamental asparagus	Y			1/1
plants	monocots	Cyperaceae	<i>Cyperus eragrostis</i>		Y			1/1
plants	monocots	Poaceae	<i>Sporobolus coromandelianus</i>		Y			1/1
plants	monocots	Poaceae	<i>Arundo donax</i>		Y			1/1
plants	mosses	Meteoriaceae	<i>Papillaria flexicaulis</i>				C	2/2
protists	green algae	Chlorophyceae	<i>Stigeoclonium askenasyi</i>				C	1/1
protists		Streptophyceae	<i>Lychnothamnus barbatus</i>				V E	2/2

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).

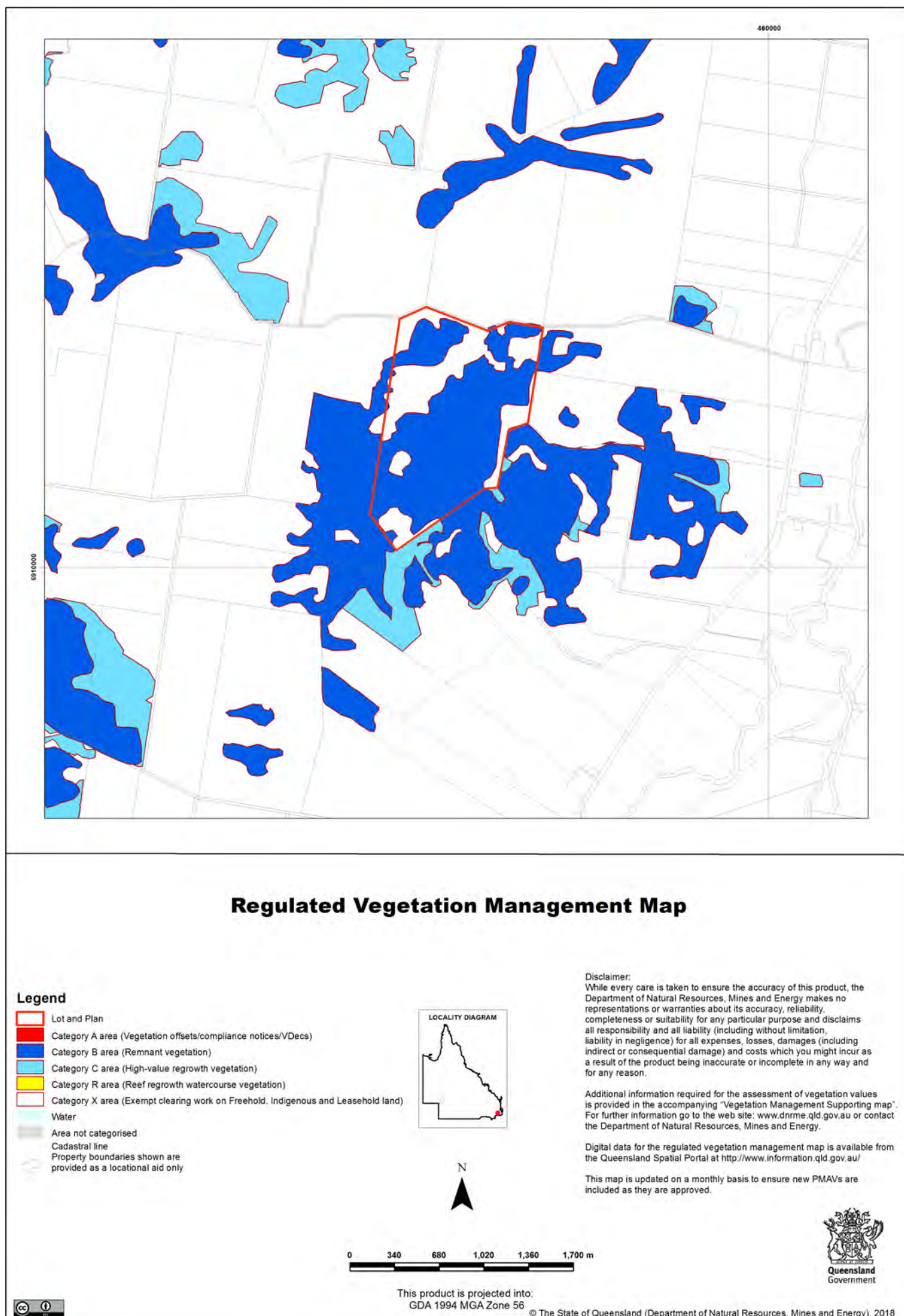
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

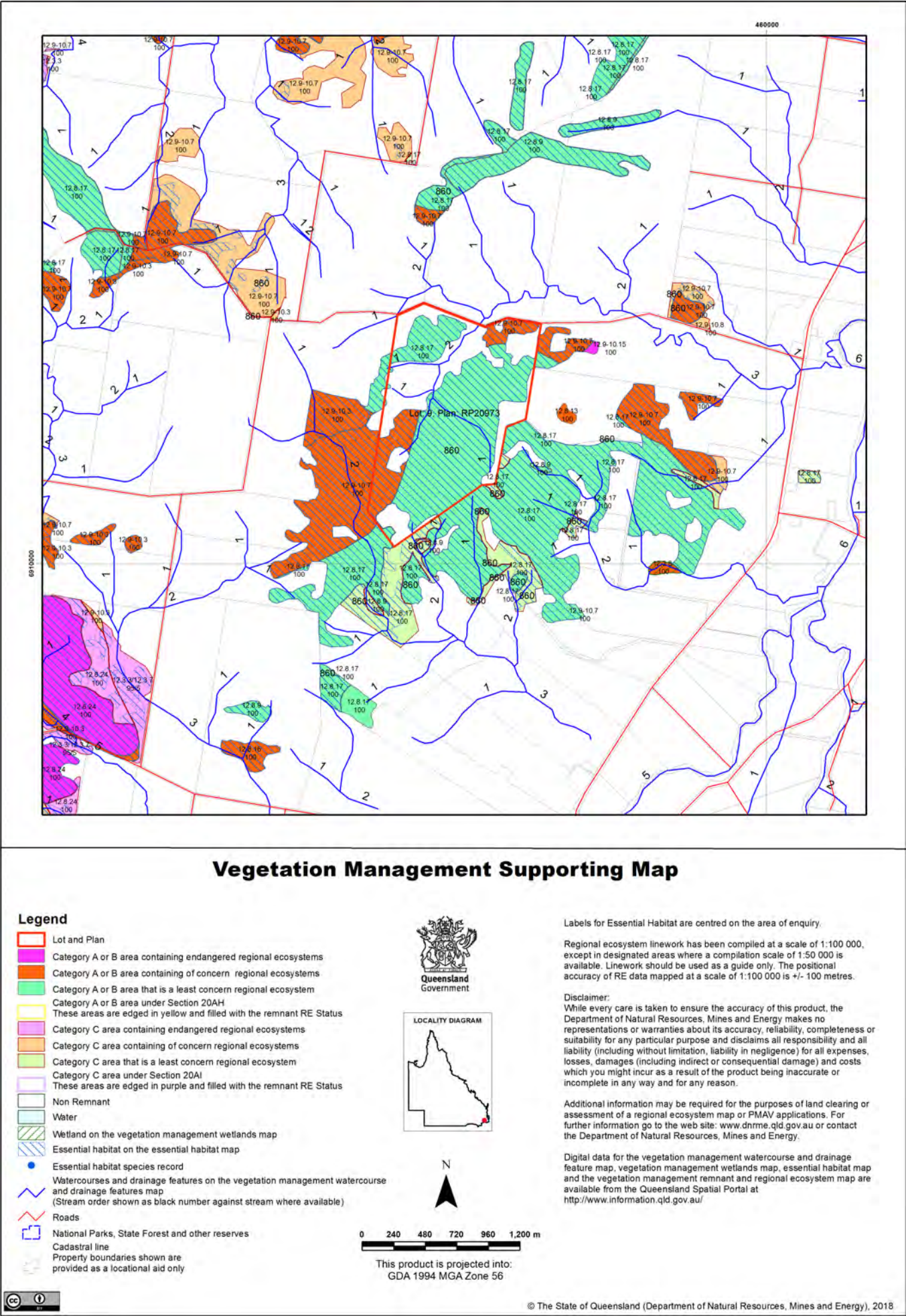
Appendix C

Queensland Government Mapping

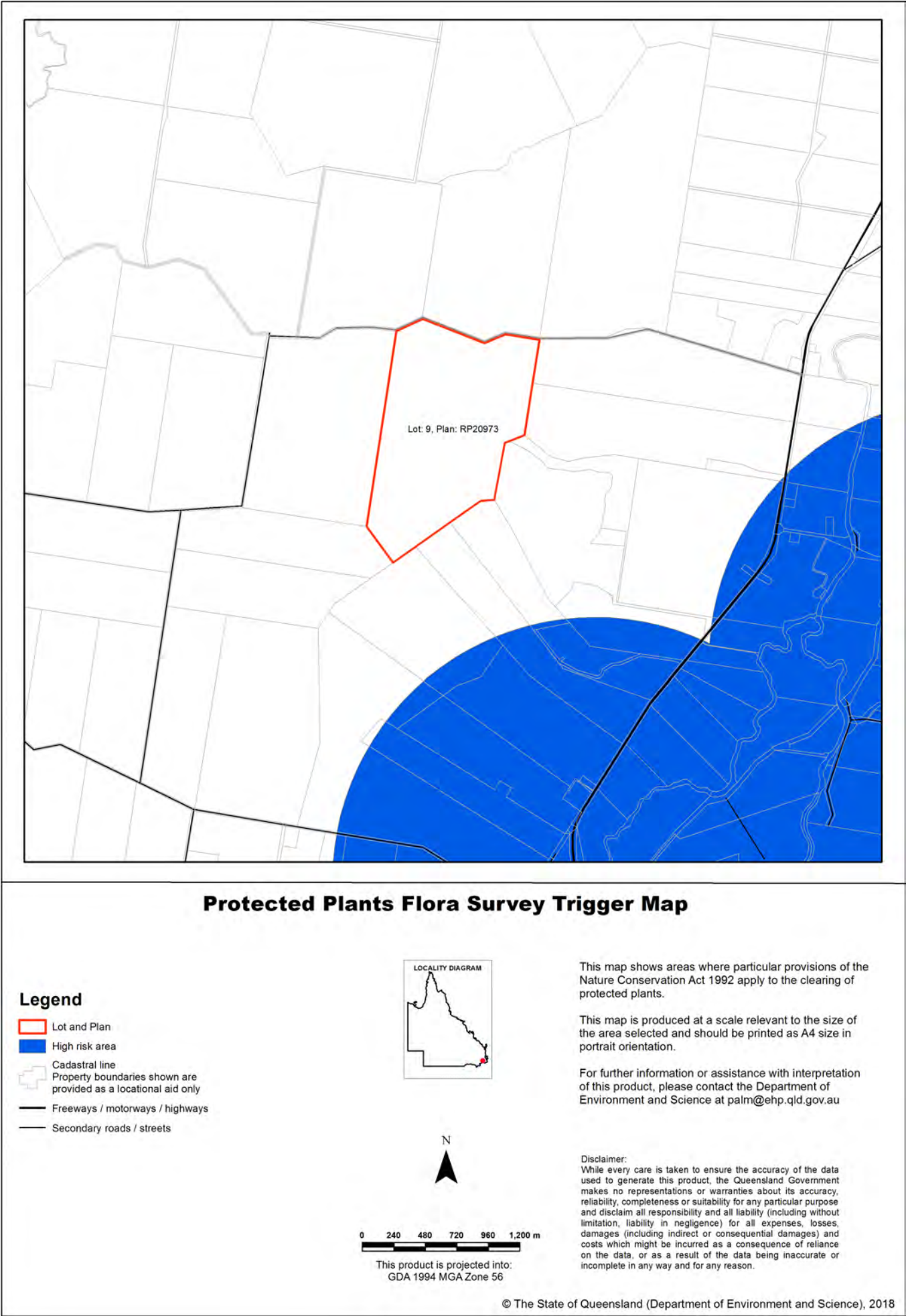
5.1 Regulated vegetation management map



5.2 Vegetation management supporting map



5.4 Protected plants map administered by DES



6. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow Earthworks, significant disturbance	<i>Water Act 2000</i> <i>Soil Conservation Act 1986</i>	Department of Natural Resources, Mines and Energy (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dnrme.qld.gov.au
Indigenous Cultural Heritage	<i>Aboriginal Cultural Heritage Act 2003</i> <i>Torres Strait Islander Cultural Heritage Act 2003</i>	Department of Aboriginal and Torres Strait Islander Partnerships (Queensland Government)	Ph: 13 QGOV (13 74 68) www.datsip.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues Protected plants and protected areas ¹	<i>Environmental Protection Act 1994</i> <i>Coastal Protection and Management Act 1995</i> <i>Queensland Heritage Act 1992</i> <i>Nature Conservation Act 1992</i>	Department of Environment and Science (Queensland Government)	Ph: 13 QGOV (13 74 68) www.des.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities ²	<i>Fisheries Act 1994</i> <i>Forestry Act 1959</i>	Department of Agriculture and Fisheries (Queensland Government)	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Department of the Environment (Australian Government)	Ph: 1800 803 772 www.environment.gov.au
Development and planning processes	<i>Planning Act 2016</i> <i>State Development and Public Works Organisation Act 1971</i>	Department of State Development, Manufacturing, Infrastructure and Planning (Queensland Government)	Ph: 13 QGOV (13 74 68) www.dsdmip.qld.gov.au
Local government requirements	<i>Local Government Act 2009</i> <i>Planning Act 2016</i>	Department of Local Government, Racing and Multicultural Affairs (Queensland Government)	Ph: 13 QGOV (13 74 68) Your relevant local government office

1. In Queensland, all plants that are native to Australia are protected plants under the [Nature Conservation Act 1992](http://www.des.qld.gov.au), which endeavours to ensure that protected plants (whether whole plants or protected plants parts) are not illegally removed from the wild, or illegally traded. Prior to clearing, you should check the flora survey trigger map to determine if the clearing is within a high-risk area by visiting www.des.qld.gov.au. For further information or assistance on the protected plants flora survey trigger map for your property, please contact the Department of Environment and Science on 13QGOV (13 74 68) or email palm@des.qld.gov.au.

2. Contact the Department of Agriculture and Fisheries before clearing:

- Any sandalwood on state-owned land (including leasehold land)
- On freehold land in a 'forest consent area'
- More than five hectares on state-owned land (including leasehold land) containing commercial timber species listed in parts 2 or 3 of Schedule 6 of the Vegetation Management Regulation 2012 and located within any of the following local government management areas-Banana, Bundaberg Regional, Fraser Coast Regional, Gladstone Regional, Isaac Regional, North Burnett Regional, Somerset Regional, South Burnett Regional, Southern Downs Regional, Tablelands Regional, Toowoomba Regional, Western Downs Regional.

Appendix D

Flora species recorded within the study area

Table D1. Flora species recorded in the study area

Family	Scientific name	Common name	Status ¹		Remnant (Category B)				Non-remnant (Category X)	
			EPBC Act	NC Act	12.8.17		12.9-10.7			
					S2	Extras	S1	Extras	Dam	
Malvaceae	<i>Abutilon oxycarpum</i> var. <i>oxycarpum</i>	Straggly Lantern Bush	NL	LC	+(t)					
Mimosaceae	<i>Acacia falcata</i>	Sickle-leaved Wattle	NL	LC		+				
Mimosaceae	<i>Acacia fasciculifera</i>	Scaly Bark	NL	LC		1				
Amaranthaceae	<i>Achyranthes aspera</i>	Chaff Flower	NL	LC		1				
Adiantaceae	<i>Adiantum aethiopicum</i>	Maidenhair Fern	NL	LC		+				
Adiantaceae	<i>Adiantum hispidulum</i> var. <i>hispidulum</i>	Rough Maidenhair Fern	NL	LC		1				
Asteraceae	<i>Ageratum houstonianum</i>	Blue Billygoat Weed	NL	*		+(g)				
Euphorbiaceae	<i>Alchornea ilicifolia</i>	Native Holly	NL	LC		2-3				
Sapindaceae	<i>Alectryon diversifolius</i>	Scrub Boonaree	NL	LC	+(t)					
Sapindaceae	<i>Alectryon pubescens</i>	Hairy Boonaree	NL	LC	+(t)					
Rhamnaceae	<i>Alphitonia excelsa</i>	Red Ash	NL	LC	4-+					
Apocynaceae	<i>Alstonia constricta</i>	Bitterbark	NL	LC		1				
Apocynaceae	<i>Alyxia ruscifolia</i>	Chain Fruit	NL	LC	+(t)					
Loranthaceae	<i>Amyema bifurcata</i>	Bloodwood Mistletoe	NL	LC		+				
Loranthaceae	<i>Amyema conspicua</i> subsp. <i>conspicua</i>	Alphitonia Mistletoe	NL	LC	1(t)					
Poaceae	<i>Ancistrachne uncinulata</i>	Hooky Grass	NL	LC		+ -3				
Myrtaceae	<i>Angophora subvelutina</i>	Broad-leaved Apple	NL	LC		+(e)		+		
Poaceae	<i>Aristida calycina</i> var. <i>calycina</i>	Dark Wiregrass	NL	LC			3			
Poaceae	<i>Aristida gracilipes</i>	ncn	NL	LC	3					
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	NL	LC	4		3			
Asparagaceae	<i>Asparagus africanus</i>	Asparagus Fern	NL	*(RI)		1				
Pittosporaceae	<i>Auranticarpa rhombifolia</i>	Diamond-leaved Pittosporum	NL	LC		+				
Azollaceae	<i>Azolla pinnata</i>	Azolla Fern	NL	LC					2	
Asteraceae	<i>Bidens pilosa</i>	Cobbler's Pegs	NL	*	1(t)					
Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	Pitted Bluegrass	NL	LC	2		4			
Nyctaginaceae	<i>Bougainvillea glabra</i>	ncn	NL	*						+
Sterculiaceae	<i>Brachychiton populneus</i> subsp. <i>populneus</i>	Kurrajong	NL	LC		1				
Phyllanthaceae	<i>Breynia oblongifolia</i>	Coffee Bush	NL	LC	1(t)					
Phyllanthaceae	<i>Bridelia exaltata</i>	Scrub Ironbark	NL	LC		+ -4				
Phyllanthaceae	<i>Bridelia leichhardtii</i>	Small-leaved Scrub Ironbark	NL	LC	1-3(t)	+				

Frazerview Quarry
Ecological Assessment Report

Family	Scientific name	Common name	Status ¹		Remnant (Category B)				Non-remnant (Category X)	
			EPBC Act	NC Act	12.8.17		12.9-10.7		Dam	
					S2	Extras	S1	Extras		
Pittosporaceae	<i>Bursaria incana</i>	Prickly Pine	NL	LC		+				
Fabaceae	<i>Caesalpinia ferrea</i>	Leopard Tree	NL	*						+
Apocynaceae	<i>Carissa ovata</i>	Klunkerberry	NL	LC		+				
Poaceae	<i>Cenchrus caliculatus</i>	Hillside Burrgrass	NL	LC	+(t)					
Adiantaceae	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	Mulga Fern	NL	LC		2				
Chenopodiaceae	<i>Chenopodium album</i>	Goosefoot	NL	*						+
Poaceae	<i>Chloris divaricata</i> var. <i>divaricata</i>	Slender Chloris	NL	LC			2-3			
Poaceae	<i>Chloris ventricosa</i>	Tall Chloris	NL	LC	3					
Poaceae	<i>Chrysopogon fallax</i>	Golden Beard Grass	NL	LC	2(t)					
Asteraceae	<i>Cirsium vulgare</i>	Scotch Thistle	NL	*			+(t)			
Vitaceae	<i>Cissus antarctica</i>	Kangaroo Vine	NL	LC		+				
Myrtaceae	<i>Corymbia intermedia</i>	Pink Bloodwood	NL	LC	2					
Asteraceae	<i>Cotula australis</i>	Common Cotula	NL	LC						1
Asteraceae	<i>Crassocephalum crepidioides</i>	Thickhead	NL	*		+(g)				
Sapindaceae	<i>Cupaniopsis parvifolia</i>	Small-leaved Tuckeroo	NL	LC		1				
Apiaceae	<i>Cyclospermum leptophyllum</i>	Wild Carrot	NL	*					+	
Orchidaceae	<i>Cymbidium canaliculatum</i>	Black Orchid	NL	LC		+				
Poaceae	<i>Cymbopogon refractus</i>	Barbed Wire Grass	NL	LC	4		4			
Poaceae	<i>Cynodon dactylon</i>	Couch	NL	*					+	
Cyperaceae	<i>Cyperus gracilis</i>	Whisker Grass	NL	LC	2		2			
Celastraceae	<i>Denhamia pittosporoides</i> subsp. <i>pittosporoides</i>	Denhamia	NL	LC		1				
Hemerocallidaceae	<i>Dianella brevipedunculata</i>	ncn	NL	LC	2		2			
Hemerocallidaceae	<i>Dianella caerulea</i>	Blueberry Flax Lily	NL	LC	+(t)					
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	NL	LC						1
Ebenaceae	<i>Diospyros fasciculosa</i>	Grey Ebony	NL	LC		1-3				
Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>viscosa</i>	Sticky Hop-bush	NL	LC		+				
Bignoniaceae	<i>Dolichandra unguis-cati</i>	Cat's Claw Creeper	NL	*(RI)		+				
Putranjivaceae	<i>Drypetes deplanchei</i>	Yellow Tulip	NL	LC	+(t)					
Chenopodiaceae	<i>Dysphania pumilio</i>	Black Crumbweed	NL	LC						+
Boraginaceae	<i>Ehretia membranifolia</i>	Peach Bush	NL	LC		+				
Celastraceae	<i>Elaeodendron australe</i> var. <i>integrifolium</i>	Narrow-leaved Red Olive Plum	NL	LC		1				

Frazerview Quarry
Ecological Assessment Report

Family	Scientific name	Common name	Status ¹		Remnant (Category B)				Non-remnant (Category X)	
			EPBC Act	NC Act	12.8.17		12.9-10.7		Dam	
					S2	Extras	S1	Extras		
Elatinaceae	<i>Elatine gratioloides</i>	Waterwort	NL	LC					1	
Sapindaceae	<i>Elattostachys xylocarpa</i>	White Tamarind	NL	LC		1				
Cyperaceae	<i>Eleocharis dulcis</i>	Water Chestnut	NL	LC					5	
Cyperaceae	<i>Eleocharis equisetina</i>	Spiked Bogrush	NL	LC					+	
Poaceae	<i>Enneapogon lindleyanus</i>	Cone-top Nineawn	NL	LC	1(t)					
Poaceae	<i>Eragrostis leptostachya</i>	Paddock Lovegrass	NL	LC	2					
Poaceae	<i>Eragrostis spartinoides</i>	(a) Lovegrass	NL	LC	2		2			
Fabaceae	<i>Erythrina vespertilio</i> subsp. <i>vespertilio</i>	Bat's Wing Coral Tree	NL	LC	+(t)					
Erythroxylaceae	<i>Erythroxylum</i> sp. (Splityard Creek L.Pedley 5360)	ncn	NL	LC		1				
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved Red Ironbark	NL	LC	5		6			
Myrtaceae	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark	NL	LC	3		1			
Myrtaceae	<i>Eucalyptus melliodora</i>	Yellow Box	NL	LC		+				
Myrtaceae	<i>Eucalyptus moluccana</i>	Grey Box	NL	LC				+		
Euphorbiaceae	<i>Euphorbia australis</i> var. <i>subtomentosa</i>	ncn	NL	LC					+	
Euphorbiaceae	<i>Euphorbia hirta</i>	Asthma plant	NL	*					+	
Laxmanniaceae	<i>Eustrephus latifolius</i>	Wombat Berry	NL	LC	1(t)					
Santalaceae	<i>Exocarpos latifolius</i>	Broad-leaved Cherry	NL	LC		1				
Rutaceae	<i>Flindersia australis</i>	Crow's Ash	NL	LC		1				
Rutaceae	<i>Flindersia collina</i>	Leopardwood	NL	LC		+				
Fabaceae	<i>Galactia tenuiflora</i>	ncn	NL	LC			+			
Asteraceae	<i>Glossocardia bidens</i>	Native Cobblers Pegs	NL	LC			+			
Apocynaceae	<i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush	NL	*		1				
Proteaceae	<i>Grevillea robusta</i>	Dotted Myrtle	NL	LC						+
Boraginaceae	<i>Heliotropium amplexicaule</i>	Blue Heliotrope	NL	*		+				
Poaceae	<i>Heteropogon contortus</i>	Black Speargrass	NL	LC	3		3-4			
Araliaceae	<i>Hydrocotyle laxiflora</i>	Pennyweed	NL	LC						1
Fabaceae	<i>Jacksonia scoparia</i>	Dogwood	NL	LC		+				
Sapindaceae	<i>Jagera pseudorhus</i>	Foambark	NL	LC		1				
Oleaceae	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>	Stiff Jasmine	NL	LC		1				
Juncaceae	<i>Juncus usitatus</i>	Common Rush	NL	LC				+	4	
Verbenaceae	<i>Lantana camara</i>	Common Lantana	NL	*(RI)	+		2			

Frazerview Quarry
Ecological Assessment Report

Family	Scientific name	Common name	Status ¹		Remnant (Category B)				Non-remnant (Category X)	
			EPBC Act	NC Act	12.8.17		12.9-10.7		Dam	
					S2	Extras	S1	Extras		
Verbenaceae	<i>Lantana montevidensis</i>	Creeping Lantana	NL	*(RI)						1
Poaceae	<i>Leersia hexandra</i>	Swamp Ricegrass	NL	LC					3	
Campanulaceae	<i>Lobelia purpurascens</i>	White Root	NL	LC					+	
Laxmanniaceae	<i>Lomandra multiflora</i>	Many-headed Mat Rush	NL	LC	1		1			
Myrtaceae	<i>Lophostemon confertus</i>	Brush Box	NL	LC	2					
Onagraceae	<i>Ludwigia peploides</i> subsp. <i>montevidensis</i>	Creeping Primrose	NL	LC					2	
Euphorbiaceae	<i>Mallotus claoxyloides</i>	Green Kamala	NL	LC		2				
Euphorbiaceae	<i>Mallotus philippensis</i>	Red Kamala	NL	LC		+ -4				
Malvaceae	<i>Malvastrum americanum</i> var. <i>americanum</i>	Spiked Malvastrum	NL	*	2					
Marsileaceae	<i>Marsilea drummondii</i>	Nardoo	NL	LC					+	
Plantaginaceae	<i>Mecardonia procumbens</i>	ncn	NL	*		+(g)				
Meliaceae	<i>Melia azedarach</i>	White Cedar	NL	LC		+				
Poaceae	<i>Melinis repens</i>	Red Natal Grass	NL	*					+ -4	
Myrsinaceae	<i>Myrsine variabilis</i>	Muttonwood	NL	LC		1				
Nephrolepidaceae	<i>Nephrolepis cordifolia</i>	Fishbone Fern	NL	LC		+				
Oleaceae	<i>Notelaea longifolia</i>	Large-leaved Mock Olive	NL	LC	+(t)	2				
Oleaceae	<i>Notelaea microcarpa</i>	Small-fruited Mock Olive	NL	LC		+				
Viscaceae	<i>Notothixos subaureus</i>	Golden Mistletoe	NL	LC	+(t)					
Ochnaceae	<i>Ochna serrulata</i>	Mickey Mouse Bush	NL	*		+				
Cactaceae	<i>Opuntia stricta</i>	Common Pest Pear	NL	*(RI)				+		
Cactaceae	<i>Opuntia tomentosa</i>	Velvety Tree Pear	NL	*	+(t)					
Meliaceae	<i>Owenia venosa</i>	Crow's Apple	NL	LC		+				
Bignoniaceae	<i>Pandorea jasminoides</i>	Bower Vine	NL	LC		1				
Poaceae	<i>Panicum simile</i>	Two-coloured Panic	NL	LC	1		2			
Poaceae	<i>Paspalum distichum</i>	Water Couch	NL	LC					4	
Passifloraceae	<i>Passiflora suberosa</i>	Corky Passionvine	NL	*	2					
Rubiaceae	<i>Pavetta australiensis</i>	Pavetta	NL	LC		1				
Rutaceae	<i>Pentaceras australe</i>	Penta's Ash	NL	LC		+				
Asteraceae	<i>Peripleura diffusa</i>	ncn	NL	LC			1			
Polygonaceae	<i>Persicaria lapathifolia</i>	Pale Knotweed	NL	LC					+	
Picrodendraceae	<i>Petalostigma pubescens</i>	Quinine Bush	NL	LC	+ -4(t)					
Pittosporaceae	<i>Pittosporum spinescens</i>	Wallaby Apple	NL	LC		1				

Frazerview Quarry
Ecological Assessment Report

Family	Scientific name	Common name	Status ¹		Remnant (Category B)				Non-remnant (Category X)	
			EPBC Act	NC Act	12.8.17		12.9-10.7		Dam	
					S2	Extras	S1	Extras		
Pittosporaceae	<i>Pittosporum viscidum</i>	Black-fruited Thornbush	NL	LC		2				
Polypodiaceae	<i>Platyserium superbum</i>	Staghorn	NL	LC		+				
Rubiaceae	<i>Pomax umbellata</i>	Pomax	NL	LC	1(t)					
Rubiaceae	<i>Psydrax odorata</i>	Shiny-leaved Canthium	NL	LC	4-+		3			
Rubiaceae	<i>Psydrax odorata forma buxifolia</i>	Stiff-leaved Canthium	NL	LC	1(t)					
Asteraceae	<i>Pterocaulon redolens</i>	ncn	NL	LC			+(t)			
Polypodiaceae	<i>Pyrrosia rupestris</i>	Rock Felt Fern	NL	LC		2				
Ranunculaceae	<i>Ranunculus lappaceus</i>	Common Buttercup	NL	LC					2	
Polygonaceae	<i>Rumex brownii</i>	Swamp Dock	NL	LC					+	
Anacardiaceae	<i>Schinus molle</i> var. <i>areira</i>	Pepper Tree	NL	*						+
Cyperaceae	<i>Schoenoplectiella mucronata</i>	Triangular Swordsedge	NL	LC					1	
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	NL	*(RI)						2
Malvaceae	<i>Sida hackettiana</i>	Spiked Sida	NL	LC	2					
Celastraceae	<i>Siphonodon australis</i>	Ivorywood	NL	LC		+				
Solanaceae	<i>Solanum nigrum</i> subsp. <i>nigrum</i>	Blackberry Nightshade	NL	*						+
Asteraceae	<i>Sonchus oleraceus</i>	Milk Thistle	NL	*					+	
Araceae	<i>Spirodela polyrhiza</i>	Duckweed	NL	LC					2	
Asteraceae	<i>Symphyotrichum subulatum</i>	Wild Aster	NL	*					1	
Asteraceae	<i>Tagetes minuta</i>	Stinking Roger	NL	*		1				
Moraceae	<i>Trophis scandens</i> subsp. <i>scandens</i>	Burney Vine	NL	LC		+				
Meliaceae	<i>Turraea pubescens</i>	Witch Hazel	NL	LC		+				
Verbenaceae	<i>Verbena litoralis</i> var. <i>litoralis</i>	Common Verbena	NL	*					+	
Asteraceae	<i>Vittadinia dissecta</i> var. <i>hirta</i>	ncn	NL	LC	1					
Campanulaceae	<i>Wahlenbergia queenslandica</i>	ncn	NL	LC						1
Asteraceae	<i>Xanthium occidentale</i>	Noogera Burr	NL	*					+	
Asteraceae	<i>Xanthium spinosum</i>	Bathurst Burr	NL	*					+	
Asteraceae	<i>Zinnia peruviana</i>	Zinnia	NL	*	2					

¹ Status:

- EPBC Act - *Environment Protection and Biodiversity Conservation Act 1999*: NL, not listed.
- NC Act - *Nature Conservation Act 1992*: LC, Least concern; *RI, restricted invasive plant under the *Biosecurity Act 2014*; *, introduced species.

ncn, no common name

Relative abundance for species was based on the Braun-Blanquet technique cover-abundance scale (Hurst and Allen 2007, Whittaker 1975, Mueller-Dombois 1974) as follows:

+ = one or two individuals only

1 = sparse, <5

2 = any number, <5%

3 = 5 – 24%

4 = 25 – 49%

5 = 50 – 74%

6 = 75 – 100%.

Suffices applied to relative abundance values are as follows:

(t) traverse

(g) gully

Appendix E

Fauna species recorded in the study area

Table E1. Fauna species recorded in the study area.

Scientific name	Common name	Status ¹	
		EPBC Act	NC Act
Amphibians			
<i>Litoria fallax</i>	Eastern Sedgefrog	NL	LC
Birds			
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	NL	LC
<i>Alisterus scapularis</i>	Australian King Parrot	NL	LC
<i>Anas superciliosa</i>	Pacific Black Duck	NL	LC
<i>Anhinga novaehollandiae</i>	Australasian Darter	NL	LC
<i>Anthus novaeseelandiae</i>	Australasian Pipit	NL	LC
<i>Apus pacificus</i>	Fork-tailed Swift	M	SLC
<i>Aquila audax</i>	Wedge-tailed Eagle	NL	LC
<i>Ardea pacifica</i>	White-necked Heron	NL	LC
<i>Aythya australis</i>	Hardhead	NL	LC
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	NL	LC
<i>Cacatua sanguinea</i>	Little Corella	NL	LC
<i>Cacomantis pallidus</i>	Pallid Cuckoo	NL	LC
<i>Centropus phasianinus</i>	Pheasant Coucal	NL	LC
<i>Chenonetta jubata</i>	Australian Wood Duck	NL	LC
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	NL	LC
<i>Corvus orru</i>	Torresian Crow	NL	LC
<i>Cracticus tibicen</i>	Australian Magpie	NL	LC
<i>Cracticus nigrogularis</i>	Pied Butcherbird	NL	LC
<i>Cracticus torquatus</i>	Grey Butcherbird	NL	LC
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	NL	LC
<i>Dendrocygna eytoni</i>	Plumed Whistling-duck	NL	LC
<i>Dicrurus bracteatus</i>	Spangled Drongo	NL	LC
<i>Egretta novaehollandiae</i>	White-faced Heron	NL	LC
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	NL	LC
<i>Eolophus roseicapillus</i>	Galah	NL	LC
<i>Gerygone albogularis</i>	White-throated Gerygone	NL	LC
<i>Grallina cyanoleuca</i>	Magpie-lark	NL	LC
<i>Himantopus himantopus</i>	Black-winged Stilt	NL	LC
<i>Manorina melanocephala</i>	Noisy Miner	NL	LC
<i>Monarcha melanopsis</i>	Black-faced Monarch	M	SLC
<i>Myiagra rubecula</i>	Leaden Flycatcher	NL	LC
<i>Pachycephala rufiventris</i>	Rufous Whistler	NL	LC
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant	NL	LC

Scientific name	Common name	Status ¹	
		EPBC Act	NC Act
<i>Phalacrocorax varius</i>	Pied Cormorant	NL	LC
<i>Platalea regia</i>	Royal Spoonbill	NL	LC
<i>Platycercus adscitus</i>	Pale-headed Rosella	NL	LC
<i>Porphyrio porphyrio</i>	Purple Swamphen	NL	LC
<i>Rhipidura rufifrons</i>	Rufous Fantail	M	SLC
<i>Rhipidura leucophrys</i>	Willie Wagtail	NL	LC
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo	NL	LC
<i>Smicrornis brevirostris</i>	Weebill	NL	LC
<i>Acridotheres tristis</i>	Common Myna	NL	*
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	NL	LC
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet	NL	LC
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	NL	LC
<i>Vanellus miles</i>	Masked Lapwing	NL	LC
<i>Zosterops lateralis</i>	Silvereye	NL	LC
Mammals			
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	NL	LC
<i>Macropus parryi</i>	Pretty-faced Wallaby	NL	LC
<i>Macropus rufogriseus</i>	Red-necked Wallaby	NL	LC
<i>Phascolarctos cinereus</i>	Koala	V	V
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	NL	LC
<i>Vulpes vulpes</i>	European Red Fox	NL	*(RI)
Reptiles			
<i>Demansia psammophis</i>	Yellow-faced Whip Snake	NL	LC
<i>Pogona barbata</i>	Eastern Bearded Dragon	NL	LC

¹Status:

- EPBC Act - *Environment Protection and Biodiversity Conservation Act 1999*: M, Migratory; NL, not listed.
- NC Act - *Nature Conservation Act 1992*: LC, Least concern; *RI, restricted invasive animal under the Biosecurity Act 2014; *, introduced species.

Appendix F

Likelihood of occurrence assessment

Table F1: Likelihood of significant flora and fauna to occur in the study area

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
Plants					
Wandering Pepper- cress (<i>Lepidium peregrinum</i>)	E	LC	PMST	<i>Distribution:</i> <i>Lepidium peregrinum</i> occurs from the Bunya Mountains, south-east Queensland, to near Tenterfield, in northern New South Wales (TSSC 2014). Since 2001, further populations have been discovered from Rosin's Lookout at Beechmont (Qld), D'Aguilar Range, Deer Reserve State Forest near Kilcoy (Qld), Condamine Gorge near Killarney (Qld), Picnic Point Toowoomba (Qld) and Highfields Falls near Toowoomba (Qld). Additionally, new locations have been recorded for this species from the Bunya Mountains and Mt Glorious areas (TSSC 2014). <i>Habitat preferences:</i> This species tends to occur in the tussock grassland fringe in riparian open forest (TSSC 2014). <i>Dispersal mode:</i> not known. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	Low: The study area does not support suitable habitat for this species in the form of tussock grassland fringing riparian open forest. There are no records for this species in the search area and this vegetatively distinct species would have been detectable in the field if individuals were present.
Hairy-joint Grass (<i>Arthraxon hispidus</i>)	V	V	PMST	<i>Distribution:</i> This species occurs in scattered locations from Port Douglas, Queensland south to Kempsey, NSW (EHP 2014a). In Queensland, disjunct populations have been recorded around springs as far west as Carnarvon National Park however most occurrences are from Noosa South (EHP 2014a). In NSW, the species has been recorded as far west as Glen Innes (EHP 2014a). <i>Habitat preferences:</i> This species occurs around moist areas in or fringing rainforest, wet eucalyptus forest and woodland (EHP 2014a). In South East Queensland bioregion the species has also been	Low: The study area does not support suitable habitat for this species in the form of moist areas and forests. The drainage line in the southern extent of the proposed haul road is heavily degraded by exotic grasses and cattle utilisation. There are no records for this species in the search area and this species was not recorded during the field surveys.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				recorded around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests (EHP 2014a). This species has also been recorded growing with bog mosses in mound springs (EHP 2014a). <i>Notable features:</i> Hairy Joint Grass is a slender tufted, creeping perennial grass that roots at the nodes and has erect to semi-erect stems. Fertile specimens have been collected from March to May and July (EHP 2014a). Flowering is also thought to occur from summer to autumn (EHP 2014a). <i>Dispersal mode:</i> Little is known about the biology and ecology of this species. Possibly gravity, wind and mammal dispersed – awned and hairy seeds assist with wind movement and attachment to mammals. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
<i>Bertya ernestiana</i> (no common name)	V	V	PMST	<i>Distribution:</i> This shrub species is known from Mt May and Mt Ernest within Mt Barney National Park, in the Moreton district of south-east Queensland. The population at Mt Ernest supports an estimated few hundred plants and the population at Mt May supports approximately 50 plants (TSSC 2012). <i>Habitat preferences:</i> This species typically occurs within heath or open eucalypt forest with heath understorey on skeletal sandy loam soils derived from rhyolite on steep rocky slopes, rock pavements and in mountain gorges. The species has been recorded growing with Tea Tree (<i>Leptospermum</i> spp.), <i>Gynura</i> spp., <i>Keraudrenia</i> spp., and <i>Plectranthus suaveolens</i> (TSSC 2012).	Low: The study area does not support the heath communities or landforms (i.e. steep slopes, rock pavements and mountain gorges) that are favoured by this species. There are no records for this species in the search area and this vegetatively distinct species would have been detectable in the field if individuals were present.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>Notable features:</i> <i>Bertya ernestiana</i> is a branched shrub growing to 1.5 m high with terminal inflorescences with a solitary flower. Plants are monoecious (having male and female flowers on the same plant. Flowers and fruits have been recorded in April, July, and September (TSSC 2012). <i>Dispersal mode:</i> Explosive release; Water and invertebrates may assist dispersal. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Three-leaved Bosistoa (<i>Bosistoa transversa</i>)	V	LC	PMST	<i>Distribution:</i> Three-leaved Bosistoa occurs from the Nightcap Range north of Lismore in north-east NSW to Mount Larcom (near Gladstone) in south-east Queensland (DoEE 2018c). <i>Habitat preferences:</i> Three-leaved Bosistoa grows in lowland subtropical rainforest and complex notophyll vine forest up to 300 m above sea level on steep slopes to level ground and on a variety of soil types (DoEE 2018c). <i>Notable features:</i> This species flowers from January to May with ripe fruit present from May to November (DoEE 2018c). <i>Dispersal mode:</i> Gravity and water dispersed – woody endocarp assists floatation. <i>Nearest record:</i> Nearest record: There are no Wildlife Online records for this species within 5 km of the study area.	Low: The study area does not support suitable habitat for this species in the form of subtropical rainforest and complex notophyll vine forest habitats. A very small thicket of dry vine forest was observed in the northern portion of the study area, however this vegetation type is not suitable habitat for this species. There are no records for this species in the search area and this vegetatively distinct species would have been detectable in the field if individuals were present.
Miniature Moss-orchid (<i>Bulbophyllum globuliforme</i>)	V	NT	PMST	<i>Distribution:</i> Known from the McPherson Range of north-east New South Wales, Maleny and Noosa in south-east Queensland, Calliope Range near Gladstone and Hidden Valley near Ingham (TSSC 2008a).	Low: The study area does not support preferred habitat for this species in the form of upland rainforest communities with mature Hoop Pine.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>Habitat preferences:</i> This species only grows on the upper branches of mature on Hoop Pines (<i>Araucaria cunninghamii</i>) in upland rainforest (TSSC 2008a). The species appears to favour the underside of tree limbs (DoEE 2018d). <i>Notable features:</i> A tiny rhizomatous orchid that grows on the bark of trees, forming a dense mat. Flowers from September to November (TSSC 2008a). <i>Dispersal mode:</i> Pollination mechanisms are unknown. Fragmentation of individual plants is the only form of vegetative reproduction known (DoEE 2018d). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	There are no records for this species in the search area and this species was not recorded during the field surveys.
Boonah Tuckeroo (<i>Cupaniopsis tomentella</i>)	V	V	PMST, Wildlife Online	<i>Distribution:</i> This tree species is known only from an area between Boonah and Ipswich in south-eastern Queensland (DEWHA 2008). <i>Habitat preferences:</i> Boonah Tuckeroo grows in vine thickets predominantly on fertile clay soils. There are only seven known occurrences all of which are confined to small isolated remnants on scree slopes and roadsides (DEWHA 2008). <i>Notable features:</i> This species has compound leaves with 3–4 pairs of elliptic, often serrated leaflets which are densely rusty hairy, especially when young (DEWHA 2008). <i>Dispersal mode:</i> Gravity and birds. <i>Nearest record:</i> There is one Wildlife Online record for this species within 5 km of the study area.	Low: The very small thicket of dry vine forest that was observed in the northern portion of the study area does provide a potential opportunity for this species to subsist. An exhaustive grid-based search of this patch and surrounding vegetation was undertaken and no specimens were observed. There are records for this species in the search area. However, this vegetatively distinct species would have been detectable in the field if individuals were present.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
<i>Dichanthium setosum</i> (no common name)	V	LC	PMST	<i>Distribution:</i> This grass species is known from inland New South Wales and Queensland. In Queensland the species has been recorded in the Leichardt, Morton, North Kennedy and Port Curtis regions (DoEE 2018e). <i>Habitat preferences:</i> It grows on heavy basaltic black soils and red-brown loams with clay subsoil. It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnant and highly disturbed pasture (DoEE 2018e). <i>Notable features:</i> This is a perennial grass that commences growing in spring, flowers in summer and becomes dormant in late autumn (DoEE 2018e). <i>Dispersal mode:</i> Wind and mammal dispersed – awned seeds assist with wind movement and attachment to mammals. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	Low: The study area's underlying geology is a combination of Cainozoic igneous rocks and sedimentary rocks. The heavy basaltic soils and red-brown clay loams this species is typically associated with do not occur within the study area. Further there are no areas of natural grassland within or adjacent to the study area. There are no records for this species in the search area and this species was not recorded during the field surveys.
Queensland Nut (<i>Macadamia integrifolia</i>)	V	V	PMST	<i>Distribution:</i> This species is known from remnant rainforest in northern New South Wales and south-east Queensland (from Mt Bauple, north of Gympie to the Currumbin Valley in the Gold Coast hinterland) (DoEE 2018f). <i>Habitat preferences:</i> This species occurs in complex notophyll mixed forest, extremely tall closed forest, simple notophyll mixed very tall closed forest to simple microphyll-notophyll mixed mid-high closed forest with <i>Araucaria</i> and <i>Argyrodendron</i> emergents as well as partially open areas along the edges of remnant rainforest (DotE 2016a). The species will grow on a wide range of landforms from hill crests to gullies with level to steep surfaces. Soils	Low: The study area does not support habitat (i.e. tall open forest or rainforest) that this species is typically associated with. There are no records for this species in the search area and this vegetatively distinct species would have been detectable in the field if individuals were present.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				are typically well drained, high nutrient volcanics of varying texture (DoEE 2018f). <i>Notable features:</i> The species has been recorded flowering in January, March and from June to November with fruits recorded from November to January and March to April (DoEE 2018f). <i>Dispersal mode:</i> Seeds (nut) are typically eaten by mammals and dispersed by stream (DoEE 2018f). <i>Nearest record:</i> There are no Wildlife Online records within 5 km of the study area.	
Lloyd's Olive (<i>Notelaea lloydii</i>)	V	V	PMST	<i>Distribution:</i> Species is endemic to south-east Queensland between Mt Brisbane, near Somerset Dam, to just south of Beaudesert and as far west as Mt Berryman near Laidley, a range of approximately 120 km (Harden et al. 2006; TSSC 2008b). <i>Habitat Preferences:</i> It commonly occurs in open eucalypt forest, often near the margins of vine thickets, vine forests and softwood scrub at altitudes between 80 and 480 m. It is usually found on stony, shallow and rocky soils derived from sandstone or acid volcanic rocks, often on steep slopes, or near drainage lines (Harden et al. 2006; TSSC 2008b). <i>Notable Features:</i> Lloyd's Olive is a multi-stemmed shrub to 4 m (Harden et al. 2006; TSSC 2008b). <i>Dispersal Mode:</i> Small fleshy purple fruits suggest animal dispersal particularly birds. <i>Nearest record:</i> There are no Wildlife Online records within 5 km of the study area.	Low: The study area does not support preferred habitat for this species in the form of vine thicket and dry rainforest habitat does not occur in the study area. There are no records for this species in the search area and this vegetatively distinct species would have been detectable in the field if individuals were present.
Austral Toadflax (<i>Thesium australe</i>)	V	V	PMST	<i>Distribution:</i> The current distribution of Austral Toadflax is sporadic but widespread, occurring between the Bunya Mountains in south-east Queensland to north-east Victoria and as far inland as the southern, central and northern tablelands in	Low: The study area does not support habitat preferred by this species in the form of vegetation communities with a prevalence of Kangaroo Grass.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				New South Wales and the Toowoomba region (DoEE 2018g). There is an outlier in Carnarvon National Park on the Consuelo Tableland of the southern Brigalow Belt (DoEE 2018g). <i>Habitat preferences:</i> Austral Toadflax is semi-parasitic on roots of a range of grass species most notably Kangaroo Grass (<i>Themeda triandra</i>). The species occurs in shrubland, grassland or woodland, often on damp sites, on a variety of soil types and altitudes (DoEE 2018g). <i>Notable features:</i> Austral Toadflax is a hairless, yellowish-green perennial herb with slender, wiry stems to 40 cm high with tiny white flowers (DoEE 2018g). This species flowers and fruits throughout the year on the coast and in summer at higher altitudes (DoEE 2018g). In Queensland the species has been recorded flowering from October through to April (EHP 2014b). <i>Dispersal mode:</i> Fruit is a small nut (2-2.5 mm). No information on dispersal mode. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	There are no records for this species in the search area and this vegetatively distinct species would have been detectable in the field if individuals were present.
<i>Amphibians</i>					
Fleay's Frog (<i>Mixophyes fleayi</i>)	E	E	PMST	<i>Distribution:</i> This species is narrowly and disjunctly distributed in wet forests from the Conondale Range in south-east Queensland, south to Yabbra Scrub in north-east New South Wales. While the majority of records for the species are from altitudes above 400m, Fleay's Frog is also known from lowland rainforest; 200m (DoEE 2018h). <i>General habitat preferences:</i> Fleay's Frog is associated with montane rainforest and open forest communities adjoining rainforest (DoEE 2018h). The	Low: The study area does not support or adjoin preferred habitat for this species in the form of 'permanent and semi-permanent freshwater streams in lowland rainforest, montane rainforest and adjoining open forests.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				species occurs along stream habitats from first to third order streams (i.e. small streams close to their origin through to permanent streams with grades of 1 in 50) and is not found in ponds or ephemeral pools. In Queensland, important habitat has been defined as: 'permanent and semi-permanent freshwater streams, between 100-1000 m in altitude, in rainforest and other forest communities of the McPherson, Main and Conondale Ranges, Mt Tamborine, and the Mistake and Bunya Mountains' (DoEE 2018h). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	
<i>Birds</i>					
Regent Honeyeater (<i>Anthochaera phrygia</i>)	CE	E	PMST	<i>Distribution:</i> The Regent Honeyeater is endemic to south-east Australia, where its range extends from south-east Queensland to central Victoria. In Queensland, the Regent Honeyeater has been recorded from 15 sites, primarily south of a line between Chinchilla and the Sunshine Coast. There are several records on Bribie Island and the Granite Belt between Warwick in the east, Gore in the west and Sundown NP in the south (DoEE 2018i). <i>General habitat preferences:</i> Regent Honeyeaters mostly occur in dry Box-Ironbark eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief. The species tends to prefer moister, more fertile sites, for example along creek flats, or in broad river valleys and foothills. The Regent Honeyeater is believed to use lowland coastal forest as a refuge when the preferred box-ironbark habitats are affected by drought (DoEE 2018i).	Low: The underlying geology, landform and vegetation present in the study area is not consistent with the habitat requirements of the Regent Honeyeater in that: - Box-Ironbark dominated woodlands are not present - moist, fertile communities associated with creek flats, broad river valleys and/or foothills are not present.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>Foraging habitat:</i> Regent Honeyeaters typically are associated with plant species that reliably produce copious amounts of nectar particularly species of ironbark and box (DoEE 2018i). <i>Breeding habitat:</i> Regent Honeyeaters usually nest in the canopy of forests or woodlands, and in the crowns of tall trees, mostly eucalypts. The species shows a preference for tall mature rough bark species such as ironbarks. Nests have also been recorded from amongst mistletoes (DoEE 2018i). <i>Notable features:</i> The Regent Honeyeater has a black head, with a patch of warty, dirty yellowish to pinkish skin around its dark red-brown eye, and a sturdy, decurved, black bill. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Curlew Sandpiper (<i>Calidris ferruginea</i>)	CE	LC	PMST	<i>Distribution:</i> This species occurs along the coasts but is also widespread inland. In Queensland there are scattered records in the Gulf of Carpentaria, widespread records along the coast, south of Cairns, and sparsely scattered records inland (DoEE 2018j). <i>General habitat preferences:</i> Near the coast it inhabits intertidal mudflats in sheltered areas, such as estuaries, bays inlets and lagoons and non-tidal swamps, lakes, lagoons, ponds in saltworks and sewage farms. Inland they are occasionally recorded around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. The will use fresh and brackish habitats and floodwaters (DoEE 2018j). The usually wade and forage in waters 15-30 mm deep, but up to 60 mm deep at the edge of saltmarsh, emergent vegetation and inundated	Low: The study area is characterised by a eucalypt woodlands on undulating terrain. There is a constructed dam that extends into the western portion of the study area. However this dam does not have edges of bare mud and sand that form part of the foraging habitat matrix preferred by the Curlew Sandpiper.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				saltflats. It feeds on invertebrates, including worms, molluscs, crustaceans, and insects as well as seeds (DoEE 2018j). The species usually roosts on bare dry shingle, shell or sand beaches, sandspits and islets and sometimes in dunes (DoEE 2018j). <i>Notable features:</i> This species does not breed in Australia (DoEE 2018j). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Swift Parrot (<i>Lathamus discolor</i>)	CE	E	PMST	<i>Distribution:</i> The swift parrot breeds in Tasmania during the summer and the entire population migrates north to mainland Australia for the winter (TSSC 2016a). The species has been recorded from Victoria through coastal New South Wales to coastal south eastern and central Queensland. <i>General habitat preferences:</i> Whilst on the mainland the swift parrot disperses widely to forage on flowers and psyllid lerps in <i>Eucalyptus</i> species, with the majority being found in Victoria and New South Wales. <i>Foraging habitat:</i> In Victoria, swift parrots are predominantly found in the dry forests and woodlands of the box-ironbark region on the inland slopes of the Great Dividing Range (TSSC 2016a). In New South Wales, swift parrots forage in forests and woodlands throughout the coastal and western slopes regions each year. Coastal regions tend to support larger numbers of birds when inland habitats are subjected to drought (TSSC 2016a). <i>Breeding preferences:</i> This species only breeds in Tasmania (TSSC 2016a).	Low: The Swift Parrot breeds in Tasmania and migrates to the mainland every year. It is an uncommon winter migrant to South-east Queensland. The study area and surrounds do support some potential feed trees for this species (i.e. <i>Eucalyptus</i> species). However, there are no records within 5 km of the study area and only two records within 20 km of the study area. It is therefore unlikely that the Swift Parrot uses habitat resources within and adjacent to the study area on a regular basis.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>Nearest record:</i> There are no Wildlife Online record of this species within 5 km of the study area.	
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	E	LC	PMST	<i>Distribution:</i> The Australasian Bittern occurs from south-east Queensland to south-east South Australia, Tasmania and the south-west of Western Australia (DoEE 2018k). In Queensland, the Australasian Bittern occurs in the far south-east where it has been reported north to Baralaba and west to Wyandra. At present the species is rarely recorded in Queensland and my only survive in protected areas such as the Cooloola and Fraser regions (DoEE 2018k). <i>General habitat preferences:</i> The Australasian Bittern occurs in terrestrial freshwater wetlands and, rarely, estuarine habitats. The species favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and/or reeds or cutting grass (<i>Gahnia</i>) growing over muddy or peaty substrate (DoEE 2018k). <i>Foraging habitat:</i> The species favours wetlands with tall, dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water (DoEE 2018k). <i>Breeding habitat:</i> Knowledge of the breeding ecology of the Australasian Bittern is relatively poor. The limited information available indicates that the species breeds in relatively deep, densely vegetated freshwater swamps and pools, building its nests in deep cover over shallow water (DoEE 2018k). <i>Notable features:</i> A large, stocky, thick-necked heron-like bird with camouflage-like plumage. Due to its habitat (wetlands with dense vegetation) and	Low: The study area is characterised by eucalypt woodlands on undulating terrain. There is a constructed dam that extends into the western portion of the study area. However this dam does not have the tall, dense fringing vegetation that is an important part of the breeding and foraging habitat matrix preferred by the Australasian Bittern.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				plumage this species is typically heard rather than seen (DoEE 2018k). <i>Nearest record:</i> There are no Wildlife Online records for this species 5 km of the study area.	
Coxen's Fig Parrot (<i>Cyclopsitta diophthalma coxeni</i>)	E	E	PMST	<i>Distribution:</i> The distribution of Coxen's Fig-Parrot is poorly known. Based on accepted records, the core distribution extends from Gympie in south-eastern Queensland to the Richmond River in north-eastern New South Wales, and west to the Bunya Mountains, Main Range and Koreelah Range (DoEE 2018l). <i>General habitat preferences:</i> Coxen's Fig-Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest (DoEE 2018l). The fig-parrot was, in the past, probably most abundant in lowland subtropical rainforest. Within these rainforest habitats, the fig-parrot is likely to favour alluvial areas that support figs and other trees with fleshy fruits, in particular, habitats that have a high diversity of fig species, and that have a fruiting season that is staggered across moisture and altitudinal gradients. Coxen's Fig-parrots have also been recorded at trees in gardens, cultivated farmlands, and along streets in country towns (DoEE 2018l). <i>Foraging habitat:</i> Coxen's Fig-Parrot feeds on seeds and, occasionally, nectar and lichen. Food is mainly taken from fig trees, especially <i>Ficus macrophylla</i> and <i>F. watkinsiana</i>, but also <i>F. rubiginosa</i>, <i>F. virens</i>, <i>F. obliqua</i>, <i>F. racemosa</i>, <i>F. coronata</i>, <i>F. opposita</i>, <i>F. fraseri</i>, <i>F. superba</i> and the introduced <i>F. carica</i>. Other food plants that have been recorded in the diet include <i>Elaeocarpus grandis</i>, <i>Syzygium corynanthum</i>, <i>Litsea reticulata</i>	Low: The study area does not support suitable rainforest habitats for this species. In addition, preferred feed trees (i.e. <i>Ficus</i> spp.) were not recorded within the study area.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				and <i>Grevillea robusta</i>, and the introduced species <i>*Cotoneaster lacteus</i>, <i>*Eriobotrya japonica</i> and <i>*Syagrus romanzoffianum</i>. It is possible that the fig-parrot feeds at introduced plants when native foods become scarce (DoEE 2018l). <i>Breeding habitat:</i> Nests of Coxen's Fig-Parrot have been recorded in subtropical rainforest and dry rainforest, and in the ecotone (i.e. the zone of transition) between subtropical rainforest and sclerophyll forest (DoEE 2018l). <i>Notable features:</i> Coxen's Fig-Parrot is a small parrot that measures approximately 13 to 16 cm in length. Adults are predominantly bright green, but have a prominent yellow line along the flanks and the sides of the breast, blue edges on the primary feathers, bright red marks on the tertial feathers, broad cream bands and grey-black edging on the undersides of the wings, and dark grey edging around the underside of the tail (DoEE 2018l). <i>Nearest record:</i> There are no Wildlife Online records for this species 5 km of the study area.	
Eastern Bristlebird (<i>Dasyornis brachypterus</i>)	E	E	PMST	<i>Distribution:</i> The Eastern Bristlebird occurs in three geographically-separate regional populations in south-eastern Australia. The first, a northern population, occurs in south-eastern Queensland and north-eastern NSW, and consists of extant local populations at Conondale Range National Park, Main Range National Park, Mount Barney National Park, Lamington National Park, Border Ranges National Park, Grady's Creek and Gibraltar Range National Park (DoEE 2018m). The remaining two populations occur in central NSW and south eastern NSW and Victoria.	Low: Vegetation within the study consists of eucalypt woodlands to open forest with a very sparse shrub layer. Field data indicates that the shrub layer in these communities typically had a cover of between <5 – 15% with a ground layer ranging from being very sparse (2-20%) to mid-dense (50-80%). Vegetation communities within the study area therefore do not support preferred habitat for the Eastern Bristlebird given the vegetation communities present do not support a consistently dense ground or understorey layer with a cover of 65-90%.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>General habitat preferences:</i> The Eastern Bristlebirds inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest (DoEE 2018m). All habitats vary in species composition but share a similar structure of low, dense, ground or understorey vegetation that provides about 65–90% coverage (DoEE 2018m). <i>Foraging habitat:</i> The Eastern Bristlebirds mainly feed on seeds, small fruits and invertebrates, but it also take fungi and occasionally nectar (DoEE 2018m). The species forage mostly on the ground, where they toss aside leaf litter with their bill, peck food items from the surface and probe into soil (DoEE 2018m). <i>Breeding habitat:</i> There is no distinction between foraging and breeding habitats for this species. A small, globular nest is placed less than 1 m above the ground in low dense vegetation, in or near the base of sedges, grasses, ferns and shrubs (DoEE 2018m). <i>Notable features:</i> The Eastern Bristlebird is a cryptic and secretive species whose presence is typically detected by call rather than sight. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Australian Painted Snipe (<i>Rostratula australis</i>)	E	V	PMST	<i>Distribution:</i> The Australian Painted Snipe has been recorded at wetlands in all states of Australia. It is most common in eastern Australia, where it has been recorded at scattered locations throughout	Low: The study area is characterised by a eucalypt woodlands on undulating terrain. There is a constructed dam that extends into the western portion of the study area.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				much of Queensland, New South Wales, Victoria and south-eastern South Australia. This population is considered to occur as a single, contiguous breeding population (DoEE 2018n). <i>General habitat preferences:</i> This secretive, cryptic, crepuscular (active at dawn, dusk and during the night) species occurs in terrestrial shallow wetlands, both ephemeral and permanent, usually freshwater but occasionally brackish. They also use inundated grasslands, salt-marsh, dams, rice crops, sewage farms and bore drains with rank emergent tussocks of grass, sedges, rushes or reeds or samphire, and often with scattered clumps of Lignum (<i>Muehlenbeckia florulenta</i>), canegrass or sometimes tea trees. It has been known to use areas lined with trees, or that have some scattered fallen or washed-up timber (DoEE 2018n). <i>Foraging habitat:</i> The species feeds on vegetation, seeds, and invertebrates including crustaceans and molluscs as well as insects, worms and other invertebrates (DotE 2016b; Marchant and Higgins 1994). Foraging habitats are not well understood (DoEE 2018n). <i>Breeding habitat:</i> Requirements are specific and include shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Almost all records of nests occur on or near small islands in freshwater wetlands characterised by a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover. Although this species uses modified habitat, it doesn't necessarily breed in these habitats. It most likely breeds in response to wetland conditions rather than during a particular season (DoEE 2018n).	However, this dam does not have the emergent vegetation and areas of bare mud that are important components of the breeding and foraging habitat matrix preferred by the Australian Painted Snipe.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Southern Black-throated Finch (<i>Poephila cincta cincta</i>)	E	E	PMST	<i>Distribution:</i> The Black-throated Finch (southern) occurs at two general locations: in the Townsville region, where it is considered to be locally common at a few sites around Townsville and Charters Towers (Garnett & Crowley 2000). It has also been recorded at scattered sites in central-eastern Queensland (between Aramac and Great Basalt Wall National Park) (DoEE 2018o). DoEE considers birds recorded since 1998, at the following locations to be part of the southern: ▪ Townsville and its surrounds (Giru, Serpentine Lagoon, Toonpan, and near Ross River Dam) ▪ Ingham, and sites nearby (near Mutarnee [at Ollera Creek], and near Mount Fox) ▪ scattered sites in central-eastern Queensland (Great Basalt Wall, Yarrowmere Station, Moonoomoo Station, Doongmabulla Station, Fortuna Station and Aramac) (DoEE 2018o). <i>General habitat preferences:</i> This species is known from dry, open grassy woodlands and forests and grasslands of the sub-tropics and tropics with seeding grasses and ready access to water (Higgins et al. 2006). Also thought to probably require a mosaic of different habitat in the wet season to find seed (Garnett et al. 2011). Black-throated Finch mainly inhabit dry open to very open eucalypt woodlands with dense grassy ground cover and often along watercourses or in the vicinity of water (DoEE 2018o; Higgins et al. 2006). Almost all recent records of this species, south of the tropics, have been from riparian habitat (DoEE 2018o). It is thought that permanent sources of water and	Low: Vegetation communities recorded within the study area are not consistent with the preferred habitat that is described for the Black-throated Finch. Specifically, the study area does not support riparian habitat that this is preferred by this species. The study area is outside the current known range of this species. Further, the Black-throated Finch has not been recorded in southern Queensland since the 1980s (DoEE 2018o).

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				surrounding habitat provides refuge for this species during the dry season and particularly during drought conditions (DoEE 2018o). This species has been recorded in degraded habitats such as heavily grazed paddocks (DoEE 2018o). This species has undergone a significant range contraction from the southern parts of its former distribution. It has not been recorded in south-east Queensland since the early 80s and is now thought to be extinct in NSW. It is noted as being mostly absent from the coastal plain but occasionally recorded from the area around Townsville and Ingham (Higgins et al. 2006). <i>Foraging habitat:</i> This subspecies is thought to require a mosaic of different habitats in which it can find seed during the wet season (DoEE 2018o). <i>Breeding habitat:</i> Nests are often built in a hollow branch of a tree, or in a fork of a tree, shrub or sapling. It is not uncommon for nests to be placed in other sites, such as in tall grass, amongst mistletoe, beneath active raptor nests, or in an old nest of a Babbler (<i>Pomatostomus</i> spp.) or Diamond Firetail (<i>Stagonopleura guttata</i>) (DoEE 2018o). Nest sites tend to be located in close proximity to water. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Red Goshawk (<i>Erythroriorchis radiatus</i>)	V	E	PMST	<i>Distribution:</i> This species is sparsely dispersed across coastal and sub-coastal Australia from western Kimberly Division to north-eastern New South Wales and occasionally on continental islands. <i>General habitat preferences:</i> This species occurs in woodlands and forests, ideally with a mosaic of vegetation types and permanent water, particularly riverine forests. The species avoids both very dense	Low: There is a distinct lack of preferred habitat for the Red Goshawk in the form of permanent water and riverine forests in the study area.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				and very open habitats. They are solitary and secretive birds and hunt mainly from ambush. Their prey is mostly birds, but also mammals, reptiles and insects (Marchant and Higgins 1994). <i>Breeding habitat:</i> Nests are restricted to trees taller than 20 m and within 1 km of a watercourse or wetland. It is thought to rarely breed in areas with fragmented native vegetation (Garnett et al. 2011). Home ranges of 120 km² and 200 km² for females and males, respectively have been recorded (Marchant and Higgins 1994). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Squatter Pigeon (southern) (<i>Geophaps scripta scripta</i>)	V	V	PMST, ALA	<i>Distribution:</i> The southern sub-species for the Squatter Pigeon (southern subspecies) is described as occurring south of the Burdekin River-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern New South Wales, and from the east coast to Hughenden, Longreach and Charleville (Higgins and Davies 1996). The known distribution of the southern sub-species overlaps with the known distribution of the northern subspecies (DoEE 2018p). <i>General habitat preferences:</i> This species is known from tropical dry, open sclerophyll woodlands and sometimes savannah with <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species in the overstorey. The groundcover layer is patchy consisting of native, perennial tussock grasses or a mix of grasses and low shrubs or forbs. However, the groundcover layer rarely exceeds 33% of the ground area. It appears to favour sandy soil dissected with low gravelly ridges and is less common on heavier soils with dense grass cover. It	Low: The study area does not support habitat suitable for this species. Specifically, the vegetation communities present are taller and more closed than habitat the Squatter Pigeon is typically associated with. Further the study area is located on land zones 8 and 9-10, and does not support any areas of land zone 5 and 7. The study is also not characterised by sandy soils separated by low gravelly rises that are preferred by the Squatter Pigeon.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				is nearly always found in close association i.e. within 3 km, with permanent water. While the species is unlikely to move far from woodland trees, where scattered trees still occur and the distance of cleared land between remnant trees or patches of habitat does not exceed 100 m, individuals may be found foraging in, or moving across modified or degraded environments (DoEE 2018p). <i>Foraging habitat:</i> This occurs in any remnant or regrowth open-forest to sparse, open woodland or scrub dominated by <i>Eucalyptus</i>, <i>Corymbia</i>, <i>Acacia</i> or <i>Callitris</i> species, on sandy or gravelly soils. It feeds primarily on seeds of grasses, herbs and shrubs (DoEE 2018p). <i>Breeding habitat:</i> This occurs on well-draining, stony rises occurring on sandy or gravelly soils or on low 'jump-ups' and escarpments (i.e. land zones 5 and 7), within 1 km of a suitable, permanent waterbody (DoEE 2018p). <i>Dispersal habitat:</i> This can be any forest or woodland occurring between patches of foraging or breeding habitat, and suitable waterbodies and may include denser patches of vegetation not suitable for foraging or breeding. <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Painted Honeyeater (<i>Grantiella picta</i>)	V	V	PMST	<i>Distribution:</i> This species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. Greatest concentrations, including all breeding records, come from south of 26°, on inland slopes of the Great Dividing Range between the Grampians in Victoria and Roma in Queensland. After breeding,	Low: The study area supports some suitable habitat resources for this species in the form a mature eucalypt woodlands. However, mistletoe species were not prevalent in the vegetation communities present.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				many birds move to semi-arid regions such as north-eastern South Australia, central and western Queensland and central Northern Territory. This species is considered to have a single population. <i>General habitat preferences:</i> This species occurs in mistletoes in eucalypt forests, woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, Callitris, and trees on farmland or gardens. Prefers woodlands with a higher number of mature trees, as these generally support more mistletoes. More common in larger remnant tracts, rather than narrow remnant strips. <i>Breeding preferences:</i> Breeding season is closely aligned with fruiting of mistletoe, therefore north-south movements have been observed (TSSC 2015). It has been known to breed in narrow roadside strips if ample mistletoe fruit is present. The species appears to prefer mistletoe as a nest substrate and is likely to be attracted to habitats where mistletoe is prevalent and parasitism rates are high (TSSC 2015). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Red-tailed Tropicbird (<i>Phaethon rubricauda</i>)	M	V	Wildlife Online, ALA	<i>Distribution:</i> This species ranges throughout tropical and subtropical zones of the Indian and West Pacific Oceans, breeding on oceanic islands. Lord Howe Island is said to have the greatest breeding concentration in the world (OEH 2018). <i>General habitat preferences:</i> This pelagic, marine species spends most of its time on the open ocean, often far from land. Cliffs and the forest canopy of	Low: The Red-tailed Tropicbird is a pelagic, marine bird that is rarely recorded inland. The study area is approximately 83 km inland from the coast and the study area does not support suitable coastal habitats for foraging, sheltering or breeding. It is noted that there are three records for this species within 5 km of the study area.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				islands are used for rest and shelter. Vagrant birds occur in coastal NSW waters, and occasionally even inland, particularly after storm events (Morcombe and Stewart 2013; OEH 2018). <i>Foraging habitat:</i> The Red-tailed Tropicbird plunge-dives for fish on the open ocean (Morcombe and Stewart 2013; OEH 2018) <i>Breeding habitat:</i> Breeds in coastal cliffs and under bushes in tropical Australia. Nests on cliffs of the northern hills and southern mountains on the main island at Lord Howe Island (OEH 2018). <i>Notable features:</i> A large white seabird, often with long red tail streamers and red bill. Juveniles mottled above, tail streamers missing, bill black (OEH 2018). <i>Nearest record:</i> There are three Wildlife Online records for this species within 5 km of the study area.	The ALA database indicates that these three records are all dated February 1991 and are likely to be from the same collection event. Two of the records specify the specimen is a preserved specimen. The ALA data quality tests indicate there may be an issue with the records given this is a marine species being reported in a terrestrial area. The mismatch could be an identification or name match error instead of geospatial issue.
Black-breasted Button-quail (<i>Turnix melanogaster</i>)	V	V	PMST	<i>Distribution:</i> Endemic to eastern Australia, this species is restricted to coastal and near-coastal regions of south-eastern Queensland and north-eastern New South Wales (DoEE 2018q). The main populations occur within south-east Queensland, where the current known distribution extends from near Byfield in the north, south to the New South Wales border and westwards to Palm Grove National Park and Barakula State Forest (DoEE 2018q). The most significant populations appear to be in the Yarraman-Nanango, Jimna-Conondale and Great Sandy regions. <i>General habitat preferences:</i> This species is most commonly associated with vine thicket rainforest with greater than 800 mm rainfall, deep leaf litter and a closed canopy but also occur in softwood	Low: The study area does not support preferred habitat for the Black-breasted Button Quail in the form of vine thicket rainforest or mature Hoop Pine forest. Distinctive feeding platelets in the litter layer were not observed in any of the vegetation communities within the study area during the field survey.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				scrubs in the Brigalow Belt, vine scrub regrowth and mature Hoop Pine (<i>Araucaria cunninghamii</i>) particularly with a Common Lantana (<i>*Lantana camara</i>) understorey. They also occur in dry sclerophyll forest adjacent to rainforest and <i>Acacia</i> and <i>Austromyrtus</i> scrubs on sandy coastal soils (Inskip Point) (Garnett et al. 2011). <i>Foraging habitat:</i> An extensive dense leaf-litter layer is required for foraging (DoEE 2018q). As such, optimum habitat is often associated with highly fertile soils. It is believed that the highly fertile soils promote rapid leaf growth on plants, which dropped to the ground during dry periods thus maintaining the deep leaf litter layer which is crucial to the foraging requirements of the species (DoEE 2018q). In Googa State Forest, south-eastern Queensland, birds are most commonly associated with remnant microphyll vine forest with no lantana in the understorey, but lantana is often used for diurnal foraging and nocturnal roosting (DoEE 2018q). <i>Breeding habitat:</i> Nests consist of a scrape in the ground, lined with leaves, grass or moss (DoEE 2018q). Fallen logs and a dense, heterogeneously distributed shrub layers are also considered to be important habitat characteristics for shelter and breeding. Nests are often in areas where the common understorey plants include species such as Bracken (<i>Pteridium esculentum</i>), Rasp Fern (<i>Doodia aspera</i>) and Lantana (<i>Lantana camara</i>) and are often placed in the buttress root of a tree or sapling, the base of a fern or under a low bush or grass tussock (DoEE 2018q). <i>Notable features:</i> Black-breasted Button quail are commonly seen in pairs or occasionally in small groups. This species is cryptic in nature and direct	

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				observation can be difficult. One of the key methods of detecting the presence of birds in an area is the presence of feeding traces (platelets) (DoEE 2018q). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
<i>Mammals</i>					
Spotted-tailed Quoll (south-eastern mainland population) (<i>Dasyurus maculatus maculatus</i>)	E	V	PMST	<i>Distribution:</i> The Spotted-tailed Quoll occurs in south-east Queensland coastally from Bundaberg to the New South Wales border and inland to Monto and Stanthorpe (DoEE 2018r). Occurrences from five broad geographic areas are known with four from coastal ranges and the Great Dividing Range from the NSW border to Gladstone. The fifth is centred on the eastern Darling Downs-Inglewood Sandstone provinces of the Brigalow Belt South Bioregion (DoEE 2018r). In New South Wales, the Spot-tailed Quoll records are generally confined to within 200 km of the coast and range from the Queensland border to Kosciuszko NP (DoEE 2018r). <i>General habitat preferences:</i> The Spotted-tailed Quoll has been recorded from a wide range of habitats, including: temperate and subtropical rainforests in mountain areas, wet sclerophyll forest, lowland forests, open and closed eucalypt woodlands, inland riparian and River Red Gum (<i>Eucalyptus camaldulensis</i>) forests, dry 'rainshadow' woodland, sub-alpine woodlands, coastal heathlands and occasional sightings from open country, grazing lands, rocky outcrops and other treeless areas (DoEE 2018r). <i>Refuge habitat:</i> The Spotted-tailed Quoll is predominantly nocturnal and rests during the day in dens. Habitat requirements include suitable den	Low: The study area supports a relatively intact mosaic of eucalypt woodlands however the prevalence of suitable denning sites was limited to virtually absent. Large pieces of fallen woody debris, low hollows and caves were limited to non-existent.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				sites such as hollow logs, tree hollows, rock outcrops or caves (DoEE 2018r). Individuals also require an abundance of food, such as birds and small mammals, and large areas of relatively intact vegetation through which to forage (DoEE 2018r). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	
Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>)	V	V	PMST	<i>Distribution:</i> The species' current distribution is poorly known. Records exist from Shoalwater Bay, north of Rockhampton, Queensland, through to the vicinity of Ulladulla, NSW in the south. Despite the large range, it has been suggested that the species is far more restricted within the species' range than previously understood (DoEE 2018s). In Queensland, records are known from sandstone escarpments in the Carnarvon, Expedition Ranges and Blackdown Tablelands. Additional records exist in the Scenic Rim near the NSW/Queensland border (DoEE 2018s). <i>General habitat preferences:</i> This species is uncommon in dry and wet eucalypt forests from Blackdown Tableland to near Wollongong NSW (Menkhorst and Knight 2011). It is primarily a cave roosting species that inhabits sclerophyll forests and woodland throughout much of its range (Churchill 2009). <i>Foraging habitat:</i> Higher fertility sites, particularly box gum woodlands or river/rainforest corridors are used for foraging (DoEE 2018s). <i>Roosting habitat:</i> Sandstone cliffs and fertile woodland valley habitat within close proximity of each other is important roosting habitat for this species. Records from south-east Queensland	Low: The study area does not support high fertility sites with box-gum woodlands or riverine/rainforest corridors. The study area also does not support any suitable roosting habitat (i.e. caves).

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				suggest that rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation are of similar importance to the species are also of importance (DoEE 2018s). <i>Breeding habitat:</i> The structure of primary nursery roosts appears to be very specific, i.e. arch caves with dome roofs (that need to be deep enough to allow juvenile bats to learn to fly safely inside) and with indentations in the roof, presumably to allow the capture of heat (DoEE 2018s). These physical characteristics are not very common in the landscape and therefore a limiting factor. No maternity roost sites are known in Queensland (TSSC, 2010). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	
Greater Glider (<i>Petauroides volans</i>)	V	V	PMST	<i>Distribution:</i> This species is restricted to eastern Australia, between Windsor Tableland in north Queensland and Wombat State Forest in central Victoria. It occurs from sea level up to 1,200 m above sea level. Two isolated subpopulations exist in Queensland, one in the Gregory Range west of Townsville and another in the Einasleigh Uplands (TSSC 2016b). <i>General habitat preferences:</i> The Greater Glider occurs in a range of eucalypt-dominated habitats, including low open forests on the coast to tall forests in the ranges and low woodland westwards of the Dividing Range. It does not use rainforest habitats (van Dyck et al. 2013; van Dyck and Strahan 2008a). This species favours taller, montane, moist eucalypt forests with relatively old trees and	Low: The study area does not support habitat preferred by this species in the form of tall, montane, moist eucalypt forests with large hollow bearing trees that are the preferred habitat.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				abundant hollows and a diversity of eucalypt species (TSSC 2016b). <i>Foraging habitat:</i> The Greater Glider has an almost exclusive diet of eucalypt leaves and occasionally flowers or buds (TSSC 2016b; van Dyck and Strahan 2008a). Although the species is known to feed on a range of eucalypt species, in any particular area it is likely to only forage on one or two species (van Dyck and Strahan 2008a). <i>Breeding habitat:</i> Breeding occurs between March and June and a single young is born each year (TSSC 2016b; van Dyck and Strahan 2008a). The young stays with the mother or is left in the nest and becomes independent at about 9 months (Menkhorst and Knight 2011). <i>Notable features:</i> This species appears to have low dispersal ability and typically small home ranges of 1-4 ha. In lower productivity forests, home ranges may be as large as 16 ha for males. Male home ranges generally do not overlap (TSSC 2016b). It may glide over distances of up to 100 m. It is a nocturnal species and uses tree hollows during the day to rest (van Dyck and Strahan 2008a). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	
Brush-tailed Rock-wallaby (<i>Petrogale penicillata</i>)	V	V	PMST	<i>Distribution:</i> The Brush-tailed Rock-wallaby was once widespread and abundant in south-eastern Australia (van Dyck and Strahan 2008b). In Queensland, populations of the Brush-tailed Rock-wallaby occur, or did occur, throughout the Great Dividing Range from the border with NSW to Nanango, 100 km northwest of Brisbane (DoEE 2018t). In the northeastern region of New South	Low: The study area is unlikely to provide habitat for this species given the absence of rocky outcrops, steep rock slopes, cliffs, gorges and isolated rock stacks. Further, habitats supporting fig trees and vegetation with a dense canopy cover beneath cliffs are not present.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
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				Wales, most Brush-tailed Rock-Wallabies were in one of three main populations; one consisting of more than 50 colonies in the Macleay Gorges system, one consisting of more than 20 colonies on the Cataract River, and one consisting of more than 20 colonies on the Clarence River (DoEE 2018t). <i>General habitat preferences:</i> This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks (DoEE 2018t). <i>Foraging habitat:</i> Rocky outcrops appear crucial to current habitat selection by rock-wallabies, however, vegetation structure and composition is also considered to be an important factor. Rock-wallabies are closely associated with dense arboreal cover, especially fig trees and the vegetation on and below cliffs appear to be important to this species as a source of food and shelter and in some cases may provide some protection from predation (DoEE 2018t). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	Populations of this species are not highly mobile and rarely move from established home ranges. The nearest known populations of this species are located at Main Range National Park (at least 12 km west of the study area), Moogerah Peaks NP (approximately 8 km south-south-west of the study area) and Mt French NP (approximately 5 km south-east of the study area).
Koala (Combined populations of QLD, NSW and the ACT) (<i>Phascolarctos cinereus</i>)	V	V	PMST	<i>Distribution:</i> This species is widespread in sclerophyll forest and woodlands on foothills and plains on both sides of the Great Dividing Range from about Chillagoe, Queensland to Mt Lofty Ranges in South Australia (Menkhorst and Knight 2011). <i>General habitat preferences:</i> Koalas use a range of habitats, including temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species. Essentially any forest or woodland containing species that are	Present: This species was directly observed in remnant RE 12.9-10.7 in the north-western corner of Lot 9. Scats of this species were also recorded in eucalypt woodland on the lower slopes in the western portion of Lot 9. This species appears to be favouring communities with a higher density of Queensland Blue Gum (<i>Eucalyptus tereticornis</i> subsp. <i>tereticornis</i>) (i.e. RE 12.9-10.7 and lower slopes of RE 12.8.17),

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
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				known Koala food trees, or shrubland with emergent food trees provides potential Koala habitat. Koala are known to occur in modified or regenerating native vegetation communities (DotE 2016c). <i>Foraging habitat:</i> The South East Queensland Koala Conservation State Planning Regulatory Provisions define Koala food trees as species of the <i>Corymbia</i>, <i>Melaleuca</i>, <i>Lophostemon</i> or <i>Eucalyptus</i> genera (DERM 2010; DotE 2016c). <i>Refuge habitat:</i> Habitat that allows for the persistence of the Koala during droughts and periods of extreme heat, especially in riparian environments and other areas with reliable soil moisture and fertility. Such habitats occur on permanent aquifers, in riparian zones, on upper or mid-slopes, on fertile alluvial plains or where soil moisture/rainfall is reliable (DotE 2016c). <i>Nearest record:</i> This species was recorded within eucalypt woodland communities within the study area.	which is recognised preferred feed tree in coastal South East Queensland (EHP 2011). The study area also supports nine other Koala habitat trees: ▪ Smooth-barked Apple (<i>Angophora leiocarpa</i>) ▪ Broad-leaved Apple (<i>Angophora subvelutina</i>) ▪ Pink Bloodwood (<i>Corymbia intermedia</i>) ▪ Carbeen (<i>C. tessellaris</i>) ▪ Narrow-leaved Red Ironbark (<i>Eucalyptus crebra</i>) ▪ Silver-leaved Ironbark (<i>E. melanophloia</i>) ▪ Gum-topped Box (<i>E. moluccana</i>) ▪ Yellow Box (<i>E. melliodora</i>) ▪ Brush Box (<i>Lophostemon confertus</i>). A total of 146.8 ha of Koala habitat have been identified within the study area in the form of remnant, high-value regrowth and non-remnant vegetation in Lot 9 with sufficient cover of non-juvenile Koala habitat trees (Figure 6). However, as discussed in Section 7.1.1, the majority of Koala habitat within the proposed quarry footprint is considered less likely to be used by Koalas given: ▪ the slope (i.e. between 3 and >14°) and elevation (i.e. above 150 m AHD) of these areas is not consistent with the landscape features preferred by Koalas in South East Queensland (i.e. slopes 0-5° and

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
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					elevations between 0-100 m AHD (GHD 2009)) - the absence of Queensland Blue Gum, which is being preferentially used by Koalas as they move through the study area and is recognised a preferred feed tree in South East Queensland (EHP 2011) - no individuals, scats or scratch marks were recorded in survey plots conducted throughout vegetation communities on the upper slopes and crest of the low hill.
Long-nosed Potoroo (<i>Potorous tridactylus tridactylus</i>)	V	LC	PMST	<i>Distribution:</i> The Long-nosed Potoroo (SE Mainland) has scattered populations extending from south-eastern Queensland through to NSW. The species has been recorded at Many Peaks Range, south-east of Gladstone, Bellthorpe near Beerwah and in the Border Ranges (DoEE 2018u). It has also been seen at Bulburin, south-west of Miriam Vale and in the Lamington National Park and surrounds (DoEE 2018u). <i>General habitat preferences:</i> There is limited information about the species habitat in Queensland and NSW. There is no consistent pattern to the habitat for this species, it can be found in wet eucalypt forests to coastal heaths and scrubs (DoEE 2018u). The main factors would appear to be access to some form of dense vegetation for shelter (and the presence of an abundant supply of fungi for food (DoEE 2018u). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	Low: The study area does not support preferred habitat for this species. Specifically, the vegetation present in the study area is not characterised by dense vegetation that provides shelter or the presence of an abundant supply of fungi for food.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
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New Holland Mouse (<i>Pseudomys novaehollandiae</i>)	V	LC	PMST	<i>Distribution:</i> The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, NSW and Queensland. The species is now largely restricted to the coast of central and northern NSW, with one inland occurrence near Parkes (DoEE 2018v). <i>General habitat preferences:</i> The New Holland Mouse is predominantly nocturnal and shelters and nests in burrows up to 5 m long (van Dyck and Strahan 2008b). The species occurs in heathland, woodland, open forests, paperbark swamps and on deeper sandy, loamy or rocky soils (van Dyck and Strahan 2008b). Important attributes of habitat are a diverse understory of leguminous shrubs and substrates capable of supporting their burrows (van Dyck and Strahan 2008b). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	Low: The soil types (primarily shallow clay-loams with pebbles) within the study area are unlikely to support the burrowing habits of this species. Further, field data indicates that the vegetation communities present have a relatively sparse shrub layer, which does not align with the diverse understorey of leguminous shrubs that is preferred by the New Holland Mouse.
Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>)	V	LC	PMST	<i>Distribution:</i> This species is endemic to Australia and occurs in the coastal belt between Rockhampton in central Queensland and Melbourne in Victoria. It infrequently occurs west of the Great Dividing Range. It moves throughout its range in response to availability of foraging resources (DoEE 2018w). <i>General habitat preferences:</i> This species is a canopy-feeding frugivore and nectarivore, usually feeding on rainforest, open forest, closed and open woodland communities as well as <i>Melaleuca</i> swamps and <i>Banksia</i> woodlands. It will also feed on fruit crops and other introduced tree species. Its primary food source is <i>Eucalyptus</i> (and related genera) blossom (DoEE 2018w).	Low: The potential exists for this species to feed on eucalypt species (and related genera) throughout the woodlands within the study area and surrounds. Historically, there may have been a moderate likelihood for this species to use habitats within the study area. There was an active flying fox camp located in Boonah (approximately 12 km south-east of the study area) that was known to support Grey-headed Flying Fox. However, this camp was decommissioned in 2014 (SRRC 2016). The nearby Boonah - Mount French roost site is also known to support Grey-headed Flying-

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				<i>Camps:</i> Camps are generally in rainforest patches, stands of <i>Melaleuca</i>, mangroves and riparian vegetation located near water, such as lakes, rivers or the coast (DoEE 2018w). <i>Breeding:</i> Mating occurs in early autumn. Young are usually born in October (DoEE 2018w). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	fox, but this site is used irregularly (SRRC 2016). There are no Wildlife Online records for this species within 5 km of the study area.
Reptiles					
Collared Delma (<i>Delma torquata</i>)	V	V	PMST	<i>Distribution:</i> The species has been recorded within the Bunya Mountains (approximately 200 km north-west of Brisbane), Blackdown Tablelands National Park (approximately 200 km west of Rockhampton), Expedition National Park (Central Queensland), Western Creek, near Millmerran (approximately 200 km south-west of Brisbane) and the Toowoomba Range. A large concentration of records are from the western suburbs of Brisbane (DoEE 2018x). <i>General habitat preferences:</i> This species is predominantly associated with open rocky terrain although it has also been found in eucalypt woodlands and brigalow with little surface rock (Wilson 2005). It is most likely to inhabit eucalypt-dominated woodland and open forests on landzones 3, 9 and 10. The presence of rocks, logs, bark and other coarse woody debris, and mats of leaf litter typically 30-100 mm thick) appear to be essential characteristics of Collared Delma microhabitat, which may be a limiting factor for recolonising recently burnt areas (DoEE 2018x). This species has been found in only a hand full of small isolated	Low: The majority of the study area is located on landzone 8 with areas of land zones 9-10 located within the northern and western portions of Lot 9 (i.e. refer to mapped areas of RE 12.9-10.7 on Figure 6). However, vegetation associated with landzone 9-10 within the study area lacks critical microhabitat features for this species in the form of rocks, logs, bark and other coarse woody debris. In addition the litter layer in these areas was sparse and shallow.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
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				populations in South-east Queensland and the Brigalow Belt bioregions (DoEE 2018x). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the project site.	
Dunmall's Snake (<i>Furina dunmalli</i>)	V	V	PMST	<i>Distribution:</i> This snake occurs in the Brigalow Belt South and Nandewar bioregions from near the Queensland border south to Ashford in New South Wales (DoEE 2018y). <i>General habitat preferences:</i> Dunmall's Snake has been found in a broad range of habitats between 200-500 m above sea level. Habitats including forests and woodlands on clay or clay loam soils dominated by Brigalow (<i>Acacia harpophylla</i>), other wattles such as <i>A. burrowii</i>, <i>A. deanii</i>, <i>A. leiocalyx</i>, native Cypress (<i>Callitris spp.</i>) or Bull Oak and various Spotted Gum (<i>Corymbia citriodora ssp. variegata</i>), Ironbark (<i>Eucalyptus crebra</i> and <i>E. melanophloia</i>), White Cypress Pine (<i>Callitris glaucophylla</i>) and Bull Oak open forest and woodland associations on sandstone derived soils. It has rarely been found on the edge of dry vine scrub and in hard ironstone country. It shelters under fallen timber and ground litter and may use cracks in alluvial clay soils. The Dunmall's Snake feeds on small skinks and geckos (DoEE 2018y). <i>Notable features:</i> This is a very secretive snake with few known records. The high number of mid-body scales (21) and small yellow flecks over the temporal region and lips will generally distinguish this snake from other similar species (DoEE 2018y). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	Low: The vegetation types present in the study area, are not consistent with the preferred habitat for this species.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
Three-toed Snake-tooth Skink (<i>Salphos reticulatus</i>)	V	LC	PMST	<i>Distribution:</i> The Three-toed Snake-tooth Skink occurs from Crescent Head in north-east NSW to Fraser Island in south-east Queensland (DoEE 2018z). Most records are from the Border Ranges in the vicinity of the NSW/Queensland border (DoEE 2018z). <i>General habitat preferences:</i> In Queensland, the Three-toed Snake-tooth Skink has been recorded in rainforest, closed forest, wet sclerophyll forest, tall open Blackbutt (<i>Eucalyptus pilularis</i>) forest, tall layered open eucalypt forest and closed Brush Box (<i>Lophostemon confertus</i>) forest (DoEE 2018z). It has also been recorded from extensive regrowth in heavily logged areas (DoEE 2018z). <i>Foraging habitat:</i> This species feeds on worms, insects and insect larvae (DoEE 2018z). <i>Breeding habitat:</i> There is no life cycle information available for this species. <i>Notable features:</i> The Three-toed Snake-tooth Skink can be easily distinguished from most other skinks by its reduced limbs, three toes per limb, robust shape and, in most instances, distinctive body markings (especially in juveniles) (DoEE 2018z). <i>Nearest record:</i> There are no Wildlife Online records for this species within 5 km of the study area.	Low: The study area does not support habitat suitable for this species in the form of rainforest, closed forest, tall open Blackbutt forest or closed Brush Box forest. It is noted that the brush Box dominated vegetation (i.e. 12.8.9) recorded within the central portion of Lot 2 is a low open forest community.
<i>Migratory</i>					
Common Sandpiper (<i>Actitis hypoleucos</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> Occurs in a range of coastal wetland habitats, and some inland wetlands with varying levels of salinity. Generally occurs on muddy margins or rocky shores, which may be narrow or steep, and rarely found on	Low: The study area does not support coastal aquatic habitats that are preferred by this species.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				mudflats. Forages in shallow water or edges of wetlands. May also use grassy areas adjoining wetlands (DoEE 2018aa). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Fork-tailed Swift (<i>Apus pacificus</i>)	M	SLC	PMST, Wildlife Online	<i>Distribution and habitat preferences:</i> Aerial species that flies over open habitat sometimes over forests and cities (Pizzey et al. 2012). Sometimes occurs above rainforests, wet sclerophyll forest or pine plantations (DoEE 2018ab) <i>Nearest record:</i> There is one Wildlife Online and one ALA record for this species within 5 km of the study area.	Present: This species was observed overflying the study area and neighbouring properties. This species was commonly observed soaring 50 to 100 m above the various woodland communities within the study area.
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> A widespread summer migrant to coastal and inland Australia (Pizzey et al. 2012). This species has been recorded from tidal mudflats, saltmarshes, mangroves, shallow Saline, brackish or fresh water inland wetlands, Floodwaters, irrigated pastures and crops (Pizzey et al. 2012). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support wetland habitats that are preferred by this species. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Pectoral Sandpiper (<i>Calidris melanotos</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> In Queensland this species mainly occurs in shallow fresh to saline wetlands around Cairns, although there have been few records near Mt Isa, Longreach and Oakley. Wetland habitat includes lakes, swamps, inundated grasslands, saltmarshes, rive pools, creeks, flood plains, estuaries, bays, coastal lagoons and artificial wetlands (DoEE 2018ac). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support suitable coastal aquatic habitat for this species. The study area is outside of the current known range of this species.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
Oriental Cuckoo (<i>Cuculus optatus</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> Non-breeding habitat occurs in Australia and is characterised by monsoonal rainforest, vine thickets, wet sclerophyll forest or open <i>Casuarina</i> , <i>Acacia</i> or <i>Eucalyptus</i> woodlands (DotE 2015). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area supports suitable habitat for this species in the form of eucalypt woodlands. However, the lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Latham's Snipe (<i>Gallinago hardwickii</i>)	M	SLC	PMST, Wildlife Online	<i>Distribution and habitat preferences:</i> Soft wet ground or shallow water with tussocks, wet paddocks, seepage below dams, irrigated areas, scrub or open woodland (Pizzey et al. 2012). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support suitable wetland habitats for this species. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
White-throated Needletail (<i>Hirundapus caudacutus</i>)	M	SLC	PMST, Wildlife Online	<i>Distribution and habitat preferences:</i> Aerial over forests, woodlands, farmlands, plains, lakes and towns (Pizzey et al. 2012). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Moderate: This species may overfly the study area as part of a larger foraging range. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Black-faced Monarch (<i>Monarcha melanopsis</i>)	M	SLC	PMST, ALA	<i>Distribution and habitat preferences:</i> Mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest (DoEE 2018ad). The species also occurs in selectively logged and 20—30 years old regrowth rainforest. It is also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey. The species especially occurs in	Present: This species was recorded in a steeply inclined drainage gully within Narrow-leaved Red Ironbark woodland to open forest in the central portion of the study area. The gully and associated slopes supported a mid-dense cover within the mid and lower strata comprising Brush Box and various vine forest generalists (e.g. Red Kamala (<i>Mallotus philippensis</i>)).

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				'marginal' habitats during winter or during passage (migration). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	
Spectacled Monarch (<i>Monarcha trivirgatus</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> Dense vegetation, mainly in rainforest but also in moist forest or wet sclerophyll and occasionally in other dense vegetation such as mangroves, drier forest and woodlands (DotE 2015) <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support suitable habitat for this species in the form of rainforest, thickly wooded gullies and waterside vegetation. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Yellow Wagtail (<i>Motacilla flava</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> Non-breeding habitat occurs in Australia and is characterised by mostly well-watered open grasslands and the fringes of wetlands. Roosts in mangrove and other dense vegetation (DoEE 2018ae) <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support suitable habitat for this species in the form of well-watered open grasslands and wetlands. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Satin Flycatcher (<i>Myiagra cyanoleuca</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> Heavily vegetated gullies in forests and taller woodlands and during migration coastal forests, woodlands, mangroves, gardens and open country (Pizzey et al. 2012). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support suitable habitat for this species in the form of heavily vegetated forests and gullies. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.
Osprey (<i>Pandion haliaetus</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> This species occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands (DoEE 2018af). The Osprey has been occasionally observed further inland along major rivers (DoEE 2018af). This	Low: The study area does not support suitable coastal or riverine habitats that are preferred by this species. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.

Common name (Scientific name)	Status ¹		Record source ²	Habitat preferences	Likelihood to occur in the study area
	EPBC Act	NC Act			
				species requires extensive areas of fresh, brackish or saline waters for foraging (DoEE 2018af). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	
Rufous Fantail (<i>Rhipidura rufifrons</i>)	M	SLC	PMST	Rainforest, wet eucalypt forests, monsoon forests, paperbarks, sub-inland and coastal scrubs, mangroves, watercourses, parks (Pizzey et al. 2012). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Present: This species was recorded in a steeply inclined drainage gully within Narrow-leaved Red Ironbark woodland to open forest in the central portion of the study area. The gully and associated slopes supported a mid-dense cover within the mid and lower strata comprising Brush Box and various vine forest generalists (e.g. Red Kamala (<i>Mallotus philippensis</i>)).
Common Greenshank (<i>Tringa nebularia</i>)	M	SLC	PMST	<i>Distribution and habitat preferences:</i> This species occurs mainly in coastal regions with some scattered records south of a line from near Dalby to Mt Guide. It occurs in a variety of inland wetlands and sheltered coastal habitats of varying salinity. This species uses permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats mudflats, saltmarsh, mangroves, seagrass, embayments, harbours, river estuaries, deltas and lagoons. It will also use artificial wetlands and impoundments. It generally does not occur in dry grassland (DoEE 2018ag). <i>Nearest record:</i> There are no Wildlife Online records of this species within 5 km of the study area.	Low: The study area does not support suitable wetland habitats for this species. The lack of records within the search area indicates this species does not use habitats in the locality on a regular basis.

¹Status:

- EPBC Act Status – *Environment Protection and Biodiversity Conservation Act 1999*: E, Endangered; V, Vulnerable; M, Migratory; NL, Not listed
- NC Act Status - *Nature Conservation Act 1992*: E, Endangered; V, Vulnerable; NT, Near threatened; LC, Least concern; SLC, Special least concern

³Record source:

- PMST – Protected Matters Search Tool (refer Appendix B)
- Wildlife Online – Wildlife Online database (refer Appendix B)
- ALA – Atlas of Living Australia

Appendix G

Koala SAT site data sheets

KOALA HABITAT SPOT ASSESSMENT

SAT No: 1	Recorder: Chris Hansen	Date: 4/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting: 152.56605	Northing:-27.93091	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. moluccana</i>	450	-	-
2	<i>E. moluccana</i>	270	-	-
3	<i>E. moluccana</i>	270	-	-
4	<i>E. moluccana</i>	320, 250	-	-
5	<i>E. melanophloia</i>	250	-	-
6	<i>E. melanophloia</i>	250	-	-
7	<i>E. moluccana</i>	310	-	-
8	<i>E. moluccana</i>	420	-	-
9	<i>E. moluccana</i>	300	-	-
10	<i>E. crebra</i>	190	-	-
11	<i>E. moluccana</i>	320	-	-
12	<i>E. moluccana</i>	260	-	-
13	<i>E. moluccana</i>	400	-	-
14	<i>E. moluccana</i>	330	-	-
15	<i>E. moluccana</i>	360	-	-
16	<i>E. moluccana</i>	400	-	-
17	<i>E. moluccana</i>	310	-	-
18	<i>E. moluccana</i>	320	-	-
19	<i>E. moluccana</i>	340	-	-
20	<i>E. moluccana</i>	420	-	-
21	<i>E. moluccana</i>	410	-	-
22	<i>E. moluccana</i>	280	-	-
23	<i>E. moluccana</i>	290	-	-
24	<i>E. moluccana</i>	430	-	-
25	<i>E. moluccana</i>	290	-	-
26	<i>E. moluccana</i>	280	-	-
27	<i>E. moluccana</i>	320	-	-
28	<i>E. moluccana</i>	500	-	-
29	<i>E. moluccana</i>	320	-	-
30	<i>E. moluccana</i>	300	-	-

1. Soil landscape Trachyandesite

2. SAT Criteria: 1 2 3

3. Age of pellets: ~~Old~~ ~~Mixed~~ Fresh

4. A/Level: _ _ / _ _ = _ _ _ %

5. Mean % groundcover in search area:

← ~~30%~~ 30 – 70 % → ~~70%~~

6. Comments: Macropod scats at base of most trees. Brushtail Possum scats at trees 11 and 26.

7. No. Koalas within 25 m of CT: 0

8. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m):

No. Koalas: 0

Comment / Detail:

KOALA HABITAT SPOT ASSESSMENT

SAT No: 2	Recorder: Chris Hansen	Date: 4/10/2018		
Project Location: Frazerview Quarry - Lot				
Easting: 152.36306	Northing:-27.92964	Datum: 56J/WGS84	Error: ±	3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. tereticornis</i>	320	Scratch	Yes
2	<i>E. crebra</i>	340	-	-
3	<i>E. crebra</i>	260	-	-
4	<i>E. crebra</i>	400	-	-
5	<i>E. crebra</i>	420	-	-
6	<i>E. crebra</i>	210	-	-
7	<i>E. crebra</i>	220	-	-
8	<i>E. crebra</i>	380	-	-
9	<i>E. crebra</i>	300	-	-
10	<i>E. tereticornis</i>	410	Scratch	Yes
11	<i>E. crebra</i>	210	-	-
12	<i>E. tereticornis</i>	520	Scratch	Yes
13	<i>E. tereticornis</i>	380	Scratch	Yes
14	<i>E. tereticornis</i>	270	Scratch	Yes
15	<i>E. crebra</i>	470	-	-
16	<i>E. crebra</i>	410	-	-
17	<i>E. crebra</i>	420	-	-
18	<i>E. crebra</i>	100	-	-
19	<i>E. crebra</i>	320	-	-
20	<i>E. crebra</i>	300	-	-
21	<i>E. crebra</i>	200	-	-
22	<i>E. crebra</i>	270	-	-
23	<i>E. crebra</i>	180	-	-
24	<i>E. crebra</i>	320	-	-
25	<i>E. crebra</i>	120	-	-
26	<i>E. crebra</i>	150	-	-
27	<i>E. crebra</i>	260	-	-
28	<i>E. crebra</i>	350	-	-
29	<i>E. crebra</i>	260	-	Yes
30	<i>E. tereticornis</i>	410	Scratch	Yes

9. Soil landscape Trachyandesite

10. SAT Criteria:	1	2	3
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11. Age of pellets: ~~Old~~ ~~Mixed~~ **Fresh**
Several weeks

12. A/Level: / = %

13. Mean % groundcover in search area:

~~← 30%~~ ~~30 – 70%~~ > 70%

14. Comments: Native groundcover, actively grazed

15. No. Koalas within 25 m of CT: 0

16. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 50 m

No. Koalas: 0

Comment/Detail: Timbergetting, fragmented patch. *Eucalyptus tereticornis* in centre of transect (i.e. o/s SAT sites) and 2 to north of transect, all have scratch marks and scats.



Plate 1. SAT Site 2 – Example of Koala scats recorded



Plate 2. SAT Site 2 – Example of Koala scratch marks recorded

KOALA HABITAT SPOT ASSESSMENT

SAT No: 3	Recorder: Chris Hansen	Date: 4/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting: 152.56538	Northing: -27.92568	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. crebra</i>	220	-	-
2	<i>E. crebra</i>	210	-	-
3	<i>E. crebra</i>	250	-	-
4	<i>E. crebra</i>	170	-	-
5	<i>E. crebra</i>	180	-	-
6	<i>E. crebra</i>	200	-	-
7	<i>E. crebra</i>	210	-	-
8	<i>E. crebra</i>	300	-	-
9	<i>E. crebra</i>	180	-	-
10	<i>E. crebra</i>	410	-	-
11	<i>E. crebra</i>	270	-	-
12	<i>E. crebra</i>	250	-	-
13	<i>E. crebra</i>	450	-	-
14	<i>E. crebra</i>	290	-	-
15	<i>E. crebra</i>	180	-	-
16	<i>E. crebra</i>	270	-	Yes
17	<i>E. crebra</i>	120	-	-
18	<i>E. crebra</i>	220	-	-
19	<i>E. crebra</i>	200	-	-
20	<i>E. crebra</i>	210	-	-
21	<i>E. crebra</i>	200	-	-
22	<i>E. crebra</i>	260	-	-
23	<i>E. crebra</i>	210	-	-
24	<i>E. crebra</i>	260	-	-
25	<i>E. crebra</i>	280	-	-
26	<i>E. crebra</i>	220	-	-
27	<i>E. crebra</i>	300	-	-
28	<i>E. crebra</i>	290	-	-
29	<i>E. crebra</i>	350	-	-
30	<i>C. intermedia</i>	330	-	-

17. Soil landscape Sedimentary (siltstone)

18. SAT Criteria: 1 2 3

19. Age of pellets: Old ~~Mixed~~ ~~Fresh~~

20. A/Level: __ / __ = __ __ %

21. Mean % groundcover in search area:

~~← 30%~~ ~~30 — 70%~~ > 70%

22. Comments: Macropod scats throughout
 Brushtail Possum scats at trees 6,10,13,25 and 30.

23. No. Koalas within 25 m of CT: 0

24. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 30 m

No. Koalas: 0

Comment / Detail:

KOALA HABITAT SPOT ASSESSMENT

SAT No: 4	Recorder: Chris Hansen	Date: 4/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting: 152.56893	Northing: -27.92560	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. crebra</i>	410	-	-
2	<i>E. crebra</i>	200	-	-
3	<i>E. crebra</i>	270	-	-
4	<i>E. crebra</i>	200	-	-
5	<i>E. melanophloia</i>	370	-	-
6	<i>E. crebra</i>	320	-	-
7	<i>E. crebra</i>	250	-	-
8	<i>E. crebra</i>	290	-	-
9	<i>E. crebra</i>	400	-	-
10	<i>E. crebra</i>	350	-	-
11	<i>E. crebra</i>	290	-	-
12	<i>E. crebra</i>	200	-	-
13	<i>E. crebra</i>	200	-	-
14	<i>E. crebra</i>	310	-	-
15	<i>E. crebra</i>	450	-	-
16	<i>E. crebra</i>	260	-	-
17	<i>E. crebra</i>	200	-	-
18	<i>E. melanophloia</i>	260	-	-
19	<i>E. crebra</i>	420	-	-
20	<i>E. crebra</i>	400	-	-
21	<i>E. crebra</i>	250	-	-
22	<i>E. crebra</i>	130	-	-
23	<i>E. crebra</i>	170	-	-
24	<i>E. crebra</i>	180	-	-
25	<i>E. crebra</i>	170	-	-
26	<i>E. crebra</i>	150	-	-
27	<i>E. crebra</i>	190	-	-
28	<i>E. melanophloia</i>	450	-	-
29	<i>E. melanophloia</i>	380	-	-
30	<i>C. intermedia</i>	190	-	-

25. Soil landscape Trachyandesite

26. SAT Criteria: 1 2 3

27. Age of pellets: ~~Old~~ ~~Mixed~~ **Fresh**

28. A/Level: __ / __ = __ __ %

29. Mean % groundcover in search area:

~~< 30 %~~ 30 – 70 % > 70 %

30. Comments: Brushtail Possum scats at trees 10,15 and 18.

31. No. Koalas within 25 m of CT: 0

32. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 30 m

No. Koalas: 0

Comment / Detail:

KOALA HABITAT SPOT ASSESSMENT

SAT No: 5	Recorder: Chris Hansen	Date: 5/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting:	Northing:	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>C. intermedia</i>	390	-	-
2	<i>E. crebra</i>	210	-	-
3	<i>E. crebra</i>	330	-	-
4	<i>E. crebra</i>	240	-	-
5	<i>E. crebra</i>	190	-	-
6	<i>E. crebra</i>	350	-	-
7	<i>E. crebra</i>	340	-	-
8	<i>E. crebra</i>	270	-	-
9	<i>E. crebra</i>	400	-	-
10	<i>E. crebra</i>	200	-	-
11	<i>E. crebra</i>	450	-	-
12	<i>E. crebra</i>	390	-	-
13	<i>E. crebra</i>	340	-	-
14	<i>E. crebra</i>	200	-	-
15	<i>E. crebra</i>	300	-	-
16	<i>E. crebra</i>	330	-	-
17	<i>E. melanophloia</i>	210	-	-
18	<i>E. crebra</i>	200	-	-
19	<i>E. crebra</i>	230	-	-
20	<i>E. crebra</i>	210	-	-
21	<i>E. crebra</i>	220	-	-
22	<i>E. crebra</i>	260	-	-
23	<i>E. crebra</i>	350	-	-
24	<i>E. crebra</i>	300	-	-
25	<i>E. crebra</i>	300	-	-
26	<i>E. crebra</i>	290	-	-
27	<i>E. crebra</i>	310	-	-
28	<i>E. crebra</i>	190	-	-
29	<i>E. crebra</i>	170	-	-
30	<i>E. crebra</i>	210	-	-

33. Soil landscape Trachyandesite

34. SAT Criteria: 1 2 3

35. Age of pellets: ~~Old~~ ~~Mixed~~ **Fresh**

36. A/Level: __ / __ = __ __ %

37. Mean % groundcover in search area:

~~← 30 %~~ 30 – 70 % > 70 %

38. Comments: Brushtail Possum scats at tree 11.
Macropod scats common under most trees.

39. No. Koalas within 25 m of CT: 0

40. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 30 m

No. Koalas: 0

Comment / Detail:

KOALA HABITAT SPOT ASSESSMENT

SAT No: 6	Recorder: Chris Hansen	Date: 5/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting:	Northing:	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. crebra</i>	300	-	-
2	<i>E. crebra</i>	160	-	-
3	<i>E. crebra</i>	330	-	-
4	<i>E. crebra</i>	190	-	-
5	<i>E. crebra</i>	240	-	-
6	<i>E. crebra</i>	270	-	-
7	<i>E. crebra</i>	210	-	-
8	<i>E. crebra</i>	240	-	-
9	<i>E. crebra</i>	220	-	-
10	<i>E. crebra</i>	310	-	-
11	<i>E. crebra</i>	330	-	-
12	<i>E. crebra</i>	190	-	-
13	<i>E. crebra</i>	320	-	-
14	<i>C. intermedia</i>	390	-	-
15	<i>E. crebra</i>	210	-	-
16	<i>E. crebra</i>	340	-	-
17	<i>E. melanophloia</i>	300	-	-
18	<i>E. crebra</i>	420	-	-
19	<i>E. crebra</i>	110	-	-
20	<i>E. crebra</i>	320	-	-
21	<i>E. crebra</i>	220	-	-
22	<i>E. crebra</i>	290	-	-
23	<i>E. crebra</i>	310	-	-
24	<i>E. crebra</i>	180	-	-
25	<i>E. crebra</i>	330	-	-
26	<i>E. crebra</i>	210	-	-
27	<i>E. crebra</i>	190	-	-
28	<i>E. crebra</i>	190	-	-
29	<i>E. crebra</i>	180	-	-
30	<i>E. crebra</i>	220	-	-

41. Soil landscape Sedimentary soils

42. SAT Criteria: 1 2 3

43. Age of pellets: ~~Old~~ ~~Mixed~~ ~~Fresh~~

44. A/Level: _ _ / _ _ = _ _ _ %

45. Mean % groundcover in search area:

← ~~30%~~ 30 – 70 % → ~~70%~~

46. Comments: Brushtail Possum scats at tree 11.
Macropod scats common under most trees.

47. No. Koalas within 25 m of CT: 0

48. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 30 m

No. Koalas: 0

Comment/Detail:

KOALA HABITAT SPOT ASSESSMENT

SAT No: 7	Recorder: Chris Hansen	Date: 5/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting:	Northing:	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. crebra</i>	190	-	-
2	<i>E. tereticornis</i>	350	Scratch	Yes
3	<i>E. tereticornis</i>	220	Yes	Yes
4	<i>E. crebra</i>	410	-	-
5	<i>E. crebra</i>	310	-	-
6	<i>E. crebra</i>	220	-	-
7	<i>E. tereticornis</i>	330	Scratch	Yes
8	<i>E. tereticornis</i>	350	Scratch	Yes
9	<i>E. tereticornis</i>	320	Scratch	Yes
10	<i>E. tereticornis</i>	360	Scratch	Yes
11	<i>E. melanophloia</i>	210	-	-
12	<i>A. subvelutina</i>	290	-	-
13	<i>E. crebra</i>	310	-	-
14	<i>E. crebra</i>	340	-	-
15	<i>E. crebra</i>	310	-	-
16	<i>E. crebra</i>	200	-	-
17	<i>E. crebra</i>	270	-	-
18	<i>E. tereticornis</i>	310	Scratch	Yes
19	<i>E. tereticornis</i>	480	Scratch	Yes
20	<i>E. tereticornis</i>	390	Scratch	Yes
21	<i>E. crebra</i>	220	-	-
22	<i>E. melanophloia</i>	450	-	-
23	<i>E. melanophloia</i>	340	-	-
24	<i>E. crebra</i>	420	-	-
25	<i>E. crebra</i>	200	-	-
26	<i>E. crebra</i>	310	-	-
27	<i>E. crebra</i>	300	-	-
28	<i>E. tereticornis</i>	600	-	Yes
29	<i>E. melanophloia</i>	450	-	-
30	<i>E. tereticornis</i>	370	Scratch	Yes

49. Soil landscape Sedimentary soils

50. SAT Criteria: 1 2 3

51. Age of pellets: ~~Old~~ ~~Mixed~~ Fresh

52. A/Level: _ _ / _ _ = _ _ _ %

53. Mean % groundcover in search area:

~~← 30%~~ 30 – 70 % ~~→ 70%~~

54. Comments: Koala in tree 3.

55. No. Koalas within 25 m of CT: 1

56. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 30 m

No. Koalas: 2

Comment / Detail:

KOALA HABITAT SPOT ASSESSMENT

SAT No: 8	Recorder: Chris Hansen	Date: 5/10/2018	
Project Location: Frazerview Quarry - Lot			
Easting: 152.56973	Northing: -27.93443	Datum: 56J/WGS84	Error: ± 3 m

	Tree Species	DBH (mm)	K	FP
1	<i>E. crebra</i>	100	-	-
2	<i>E. crebra</i>	110	-	-
3	<i>E. crebra</i>	110	-	-
4	<i>E. crebra</i>	200	-	-
5	<i>E. crebra</i>	100	-	-
6	<i>E. crebra</i>	10	-	-
7	<i>E. crebra</i>	130	-	-
8	<i>E. crebra</i>	150	-	-
9	<i>E. crebra</i>	100	-	-
10	<i>E. crebra</i>	120	-	-
11	<i>E. crebra</i>	190	-	-
12	<i>C. intermedia</i>	150, 70	-	-
13	<i>E. crebra</i>	120, 60	-	-
14	<i>E. crebra</i>	110	-	-
15	<i>C. intermedia</i>	160	-	-
16	<i>E. crebra</i>	150	-	-
17	<i>E. crebra</i>	120	-	-
18	<i>E. crebra</i>	120	-	-
19	<i>E. crebra</i>	110	-	-
20	<i>E. crebra</i>	120	-	-
21	<i>E. crebra</i>	170	-	-
22	<i>E. crebra</i>	110	-	-
23	<i>E. crebra</i>	200	-	-
24	<i>E. crebra</i>	100	-	-
25	<i>E. crebra</i>	100	-	-
26	<i>E. crebra</i>	110	-	-
27	<i>E. crebra</i>	130	-	-
28	<i>E. crebra</i>	120	-	-
29	<i>E. crebra</i>	100	-	-
30	<i>E. crebra</i>	190	-	-

57. Soil landscape Cainzoic igneous rocks

58. SAT Criteria: 1 2 3

59. Age of pellets: ~~Old~~ ~~Mixed~~ ~~Fresh~~

60. A/Level: __ / __ = __ __ %

61. Mean % groundcover in search area:

< 30 % ~~30 — 70 %~~ ~~> 70 %~~

62. Comments: Koala in tree 3.

63. No. Koalas within 25 m of CT: 0

64. Transect Data

Length: 200 m Width: 50 m

Area: 1 ha No. Personnel: 1

Estimated sighting distance (m): 25 m

No. Koalas: 0

Comment / Detail:

Attachment H

Koala EPBC Act critical habitat assessment

Table H1: Koala EPBC Act critical habitat assessment

Attributes and scores from Koala habitat assessment tool			Results of desktop and field analysis	
Attribute	Score	Coastal	Score	Comment
Koala occurrence	+2 (high)	Evidence of one or more Koalas within the last 2 years.	2	Two Koalas were recorded within remnant RE 12.9-10.7 within the study area. In addition, scats and characteristic scratch marks were recorded within remnant RE 12.9-10.7 and RE 12.8.17 on the lower slopes of the undulated low hill.
	+1 (medium)	Evidence of one or more Koalas within 2 km of the edge of the impact area within the last 5 years.		
	0 (low)	None of the above.		
Vegetation composition	+2 (high)	Has forest or woodland with 2 or more known koala food tree species, OR 1 food tree species that alone accounts for >50% of the vegetation in the relevant strata.	2	Remnant eucalypt woodland communities in the study area contains the following ten species of Koala food trees: ▪ Smooth-barked Apple (<i>Angophora leiocarpa</i>) ▪ Broad-leaved Apple (<i>Angophora subvelutina</i>) ▪ Pink Bloodwood (<i>Corymbia intermedia</i>) ▪ Carbeen (<i>C. tessellaris</i>) ▪ Narrow-leaved Red Ironbark (<i>Eucalyptus crebra</i>) ▪ Silver-leaved Ironbark (<i>E. melanophloia</i>) ▪ Gum-topped Box (<i>E. moluccana</i>) ▪ Yellow Box (<i>Eucalyptus melliodora</i>) ▪ Queensland Blue Gum (<i>Eucalyptus tereticornis</i> subsp. <i>tereticornis</i>) ▪ Brush Box (<i>Lophostemon confertus</i>).
	+1 (medium)	Has forest or woodland with only 1 species of known koala food tree present.		
	0 (low)	None of the above.		

Attributes and scores from Koala habitat assessment tool			Results of desktop and field analysis	
Attribute	Score	Coastal	Score	Comment
Habitat connectivity	+2 (high)	Area is part of a contiguous landscape ≥ 500 ha.	2	The study area is part of a contiguous landscape of remnant woodland vegetation, greater than 500 ha in area.
	+1 (medium)	Area is part of a contiguous landscape < 500 ha, but ≥ 300 ha.		
	0 (low)	None of the above.		
Key existing threats	+2 (high)	Little or no evidence of Koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence. Areas which score 0 for koala occurrence and have no dog or vehicle threat present	1	There was no evidence of mortality from dog attack in the study area, although wild dogs are likely to pose a threat throughout the region. The potential for vehicle strike on Cunningham Highway and local roads in the study area locality is likely to pose a threat to the local Koala population.
	+1 (medium)	Evidence of infrequent or irregular Koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for Koala occurrence, OR Areas which score 0 for Koala occurrence and are likely to have some degree dog or vehicle threat present.		
	0 (low)	Evidence of frequent or regular Koala mortality from vehicle strike or dog attack in the study area at present, OR Areas which score 0 for Koala occurrence and have a significant dog or vehicle threat present.		

Attributes and scores from Koala habitat assessment tool			Results of desktop and field analysis	
Attribute	Score	Coastal	Score	Comment
Recovery value [‡]	+2 (high)	Habitat is likely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.	1	The study area encompasses vegetation primarily on land zones 8 and 9-10 and there are no riparian/refuge communities are present in the study area. Nonetheless, Koalas were recorded during the field survey and the study area connects with larger areas of Koala habitat (i.e. dominated by Koala feed trees). It is uncertain whether habitat within the study area is important for the recovery objectives for this species.
	+1 (medium)	Uncertain whether the habitat is important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.		
	0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1.		
TOTAL			8	Outcome: Habitat critical to the survival of the Koala

Attachment I

Summary resource assessment – Frazerview Quarry



Office:
3/344 Bilsen Road
Geebung QLD 4034
Telephone (07) 3265 3399
www.ausrocks.com.au

Ausrocks Pty Ltd
ABN 64 056 939 014

All Correspondence to
PO Box 359
Virginia BC QLD 4014

10 December 2018

John Hunt
Wagner Investments Pty Ltd
quarrypro@bigpond.com

Summary Resource Assessment – Frazerview Quarry

1. Introduction

Ausrocks Pty Ltd (Ausrocks) has been contracted by Wagner Investments Pty Ltd (Wagners) to evaluate the potential quarry resource at Horan Road, Frazerview. The property on which the identified Trachyandesite resource is located is Lot 9 RP20973, totaling 155.85 ha located in the Scenic Rim Regional Council. Access to the quarry site is via Horan Road currently, however a new access route through Lot 2 on RP20974 will connect the site directly with the Cunningham Highway about 3 km West of Kalbar. Lot 2 has a surface area of 59.744ha and proposed access is facilitated via a boundary realignment. Preparation of a Development Application has also commenced at the site for approval of extraction up to 1,200,000 tonnes per annum. **Figure 1** shows the site location.



Figure 1 Site Location

Site visits of the proposed Wagners property have been conducted at regular intervals between April 2018 and November 2018 as part of the Development Application and the Resource Assessment. Elevation data was sourced from the online Elevation Foundation Spatial Database (ELVIS) titled 'Queensland LiDAR Data – Scenic Rim 2011 Project'. This data was captured between 19 July 2011 and 19 December 2011 using an Airborne Laser Scanner (ALS) with appropriate ground control. Vertical accuracy of the data is estimated at +/- 0.15m and horizontal accuracy is estimated at +/- 0.4m with 68% confidence. The site resource estimation and pit design were completed using Global Mapper Software (version 20).

2. Scope of work

The investigation was required to assess the quantity and quality of materials considered for use as construction material resources for a proposed long-term quarry. The aims of the investigation were as follows:

- Assess the spatial distribution of quarry resources within the site;
- Estimate potential in-situ volumes of materials; and
- Assess potential suitability of material for use as raw feed to produce various quarry products.

This report presents the findings of the investigation, together with estimates of material suitability to produce quarry products in accordance with existing material specifications for the Department of Transport and Main Roads (TMR).

3. Geology

The formal geology for the site is well known and has been mapped at 1:100,000 Scale (Ref: Qld Govt 1989). The site is dominated by the target rock type referred to as Unit **Tia-SEQ**, its lithology being **Trachyandesite**, an intrusive rock of Tertiary Age. The unit has been mapped to be a flat lying sub-horizontal sheets or "sills", intruding into the flat lying **Walloon Coal Measures (Jw)** rocks, a stratified unit of shale, sandstone, sandstone and coals seams. Erosion has exposed the previously buried trachyandesite unit, which is variably weathered to depths up to several metres. The trachyandesite primarily is a robust and durable dark grey-black fine-grained rock, but may include lighter coloured altered intrusive variations. The trachyandesite bodies in the region, including throughout the site, are semi-resistant forming high-rounded hills in the region and in the south and east of the property. Refer **Figure 2**.

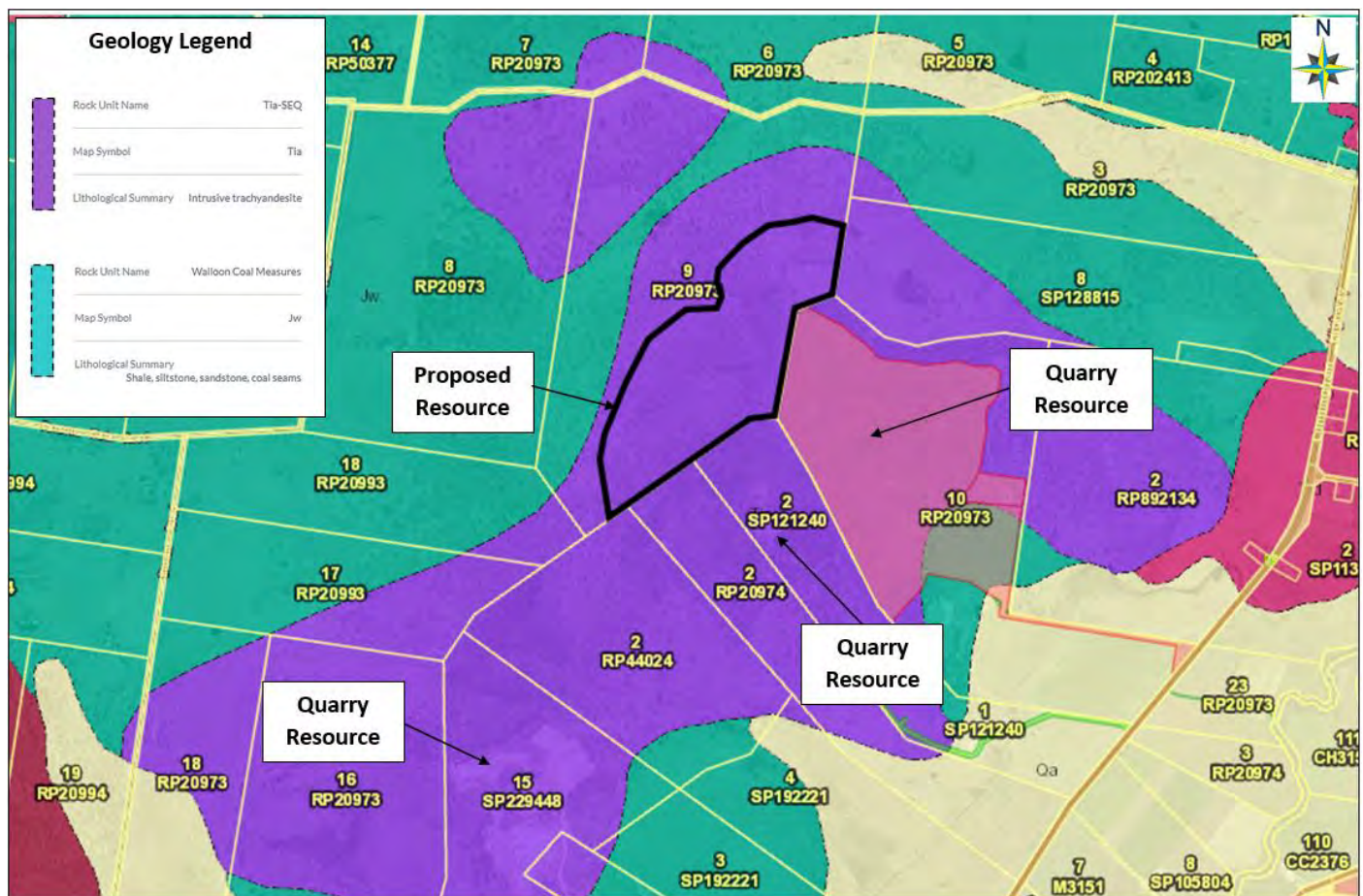


Figure 2 Regional Geology

A SW-NE narrow trending zone of older Walloon Coal Measures has also been mapped at surface on the site. This unit passes through the western side of the site and underlies all the trachyandesite. Its mapped location coincides with the SW-NE trending dominant creek, adjacent alluvial flood flats and a large dam.

The mapped trachyandesite at the site occurs on the very northern end of a much larger mapped mass which extends well outside the Horan Rd property to the south and is approx. 4km long SW-NE and 1.5km wide NW-SE. Formally, a section of this mass to the immediate south has been displayed in cross section and interpreted to have formed from a connecting vertical plug (location unknown). The proposed site sits alongside existing Quarry Resource sites to the east and south (refer **Figure 2**) and these are considered to have similar geology.

4. Site Investigation

A series of investigations at the site have been undertaken to determine the location and potential of the resource. A basic field geological investigation was conducted at the site in April 2018, which resulted in a clear indication that potential resources were contained within the elevated slopes of the south-eastern property area. The field investigation recorded a number of surface observations (including spalls, outcrop & exposures) distributed over the site at various elevations. Subsequently a hand sample was collected and submitted for Petrographic analysis. The material was identified as a Trachyte (commonly associated with Trachyandesite in this type of resource) which was suitable for a range of products including road base, aggregates (with certain precautions), ballast and rip rap. Importantly the sample was identified to have a low (2%) free silica content.

Following the field investigation, a drilling campaign was conducted in November 2018 by Sequel Drilling over a 3-day period. A total of 12 holes were drilled, mostly within the target area but some outside to confirm the surrounding geology. The drilling campaign identified a mix of weathered and fresh rock potentially suitable for quarrying within the blue dotted line on **Figure 3**.

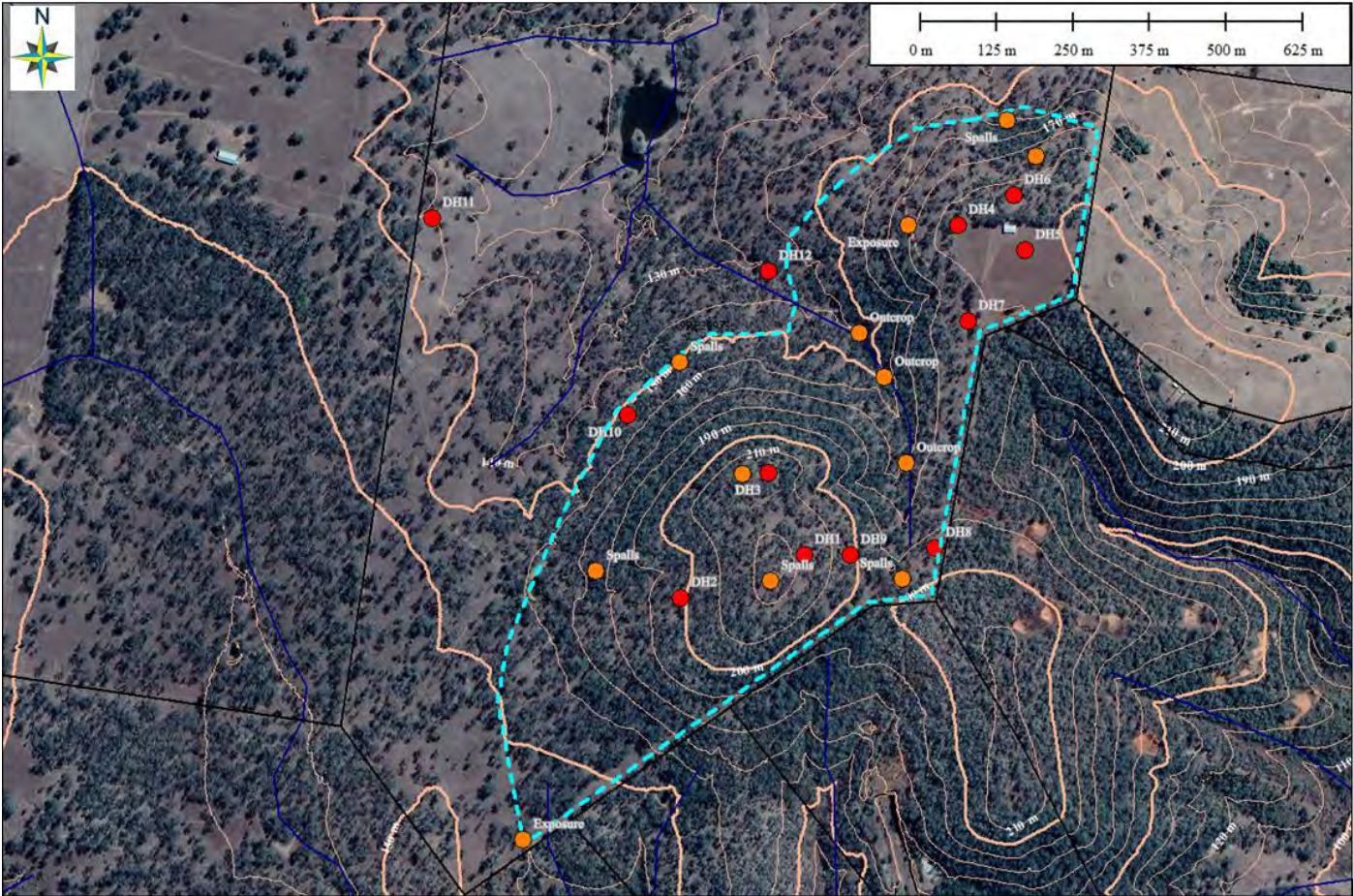


Figure 3 Site Investigation

Based on available data, it appears that groundwater has a limited distribution within the resource area, however, longer-term observations may be required to confirm this.

5. Resource

Work is ongoing to further evaluate the resource and it is proposed to submit 2 additional samples for petrographic assessment, one from the weathered zone and one from the fresh material. In addition, detailed modelling of the resource is proposed to assist with detailed pit stage design and optimization of weathered material extraction planning. Detailed modelling will split the resource into the following classifications;

- Topsoil
- Highly to moderately weathered trachyandesite (HW-MW)
- Slightly-weathered to fresh trachyandesite (SW-FR)

An estimate of volumes has been prepared for this resource justification report. Geological work and interpretation for this assessment ascribes a deposit ranging from approximately 10m to 97m in thickness from a base elevation of 120m Above Sea Level (ASL) to approximately 222.5m ASL. The deposit is flat, with continuity throughout from north east to south west for approximately 1200m, and the east to west for 550m. The deposit is rectangular in shape with rounded corners following the topography. The pit design was used to constrain the lower surface of the resource. The total calculated volume of the pit is 22.76Mm³ which predominantly contains a mixture of weathered to fresh trachyandesite.

Work completed to date is considered sufficient to justify the submission of the development application and approval. However, recommended further work as the project progresses includes the following;

- a test blast and trial crush of the weathered material to determine suitability;
- additional drilling to delineate the base of the resource more thoroughly throughout the resource area; and
- further product testing of the fresh material for suitability of a range of specialist products.

Brice Mutton
Resource Geologist
Ausrocks Pty Ltd

Bill Taylor
Environmental Manager
Ausrocks Pty Ltd

ATTACHMENT 16

This attachment describes the flora and fauna surveys adopted for the SRAIP EAR, with reference to the Scope of Work and the associated DES EIS Information Guideline – Flora and Fauna (the EIS Information Guideline).

Scope of Work	Survey Method used for EAR and Justification
2.1.3.2(a)(i) Flora and fauna surveys must be completed as per the EIS Information Guideline (see below).	See responses to individual requirements of the EIS Information Guideline below.
Selecting suitably qualified persons	The surveys by EcoSM (2018) and 28 South (2019) within the Project Site were undertaken by qualified and experienced ecologists with recent experience on ecological surveys in the locality and broader region.
Desktop assessment	A desktop assessment was undertaken to provide an appreciation of the likelihood that species and communities of conservation significance might be within the Project Site. This included a review of: 1. EPBC Act Protected Matters Search Tool; 2. Previous EPBC Controlled Action Referrals and Environmental Impact Statements; 3. Regulated Vegetation Management Map, Supporting Maps, and Essential Habitat Maps; 4. Wildlife Online database; 5. Protected Plants Flora Survey Trigger Map; 6. Imagery (Nearmap 2019); 7. Biodiversity Planning Assessments – Southeast Queensland Version 3.5; 8. State Planning Policy Natural Hazard Overlays; 9. Queensland Governments Bionet mapping; 10. Draft Planning Scheme Overlays; and 11. Atlas of Living Australia. This also included a review of the general habitat requirements of a species or community.
Defining the survey area and survey effort	The surveys focused on ensuring differentiation between the Project Site and the Project Footprint, with a key determining factor for survey effort being the extent of the “potentially impacted surrounding area”.

Scope of Work	Survey Method used for EAR and Justification
	The highly modified nature of the Project Footprint and the distance of impacted areas from features of ecological value meant that survey effort relevant to the SRAIP was confined to those areas that would be impacted by the proposed development and the immediate surrounds (i.e. a 400 m buffer). The EcoSM (2018) surveys for the Frazerview Quarry included considerable survey effort within Lot 2RP that represents the most intact habitat within the Project Site. The results of these surveys were therefore used for instances where the broader ecological values of the Project Site and surrounds was required for the EAR.
Timing of surveys	The survey undertaken for the SRAIP EAR was undertaken on 15 October 2019. Owing to time constraints, it was not possible to undertake a seasonal survey. The results from this mid-October survey are combined with the early October 2018 surveys of EcoSM to provide a basis for the SRAIP EAR .
Timed meander flora surveys	Timed meander surveys were undertaken within the Project Site as part of both the SRAIP EAR survey and the EcoSM (2018) survey.
As a minimum, fauna surveys should include: • incidental observations (visual, auditory, tracks and scats) • trapping surveys • area searches (active diurnal and passive nocturnal searches) • ultrasonic recordings – microbat echo location call detection • call playback searches • spotlight searches • camera traps • targeted species searches. Fauna assessment based on habitat assessment alone is not advised. In areas where no fauna surveys were carried out, listed threatened fauna species that are likely to occur (based on the presence of suitable habitat and recent records) should be assumed to occur in the identified habitat. However, the probable absence or low likelihood of occurrence of a listed threatened fauna species must be determined on the balance of evidence of historical records, known distribution and	Fauna habitat assessment survey was undertaken across the Project Site with a more detailed analysis of habitats and microhabitat features within the Project Footprint. Fauna habitat assessments included a complete and thorough traverse of the Project Footprint by three suitably qualified and experienced ecologists and employed a range of active searching methods including: • Active searches of logs, rocks and ground debris – Logs, rock and ground debris was turned in order to detect amphibians, reptiles and small terrestrial mammals; • Active searches for habitat trees – searches were completed for hollow bearing trees providing potential habitat for a range of tree hollow dependent fauna¹; • Random meander searches and aural surveys – searches of riparian and vegetated areas were undertaken to identify any potential important habitats; • Point census and flushing surveys – fixed stationary observation assessments for fauna species (namely avian) were undertaken in proximity to habitat features or anthropogenic features such as soaks/dams/drains and habitat trees. Flushing surveys involved foot traverse of areas where taller sedges/grasses occurred in proximity to soaks/drains to flush any cryptic avian species (e.g. bitterns, rails, quails and snipes) • Koala Spot Assessment Technique (SAT) searches – 4 SAT² surveys were undertaken during survey efforts to determine the presence of koala throughout the Project Site. These surveys were also coupled with general scratch and scat searches while traversing the Project Site. • opportunistic observation – while undertaking general survey across the Project Site, opportunistic observations were made to account for fauna observed during survey efforts. Important fauna habitat features such as large fallen debris / logs and hollow-bearing trees were spatially located along with all native trees within and immediately surrounding the Project Footprint. Owing to (1) the highly-disturbed nature of the Project Footprint, (2) the high level of confidence that more intact habitats (over 500 m from the earthworks and permanent infrastructure associated with the Project Footprint) would not be impacted

¹ For example, small hollow bearing trees providing roost sites for microchiropteran bats and gliders, medium sized hollows providing nest sites for small-medium sized birds and possums, and large hollows providing potential nest sites for large forest owls.

² Stephen Phillips and John Callaghan (2011) The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas *Phascolarctos cinereus*. Australian Zoologist: 2011, Vol. 35, No. 3, pp. 774-780.

Scope of Work	Survey Method used for EAR and Justification
habitat, and the scope, effort and results of surveys.	by the SRAIP, and (3) timing constraints, the SRAIP EAR did not include trapping surveys, ultrasonic recordings, call playback searches, spotlight searches, camera traps or targeted species searches. Given the significant separation distances (> 500 m) and elevation changes (>40 m) between the Project Footprint (specifically where disturbance and permanent infrastructure is proposed) and remnant habitat within the Project Site, more detailed surveys of the greater Project Site were not warranted. It is considered that a precautionary approach to on-ground habitat assessment and fauna species associations is sufficient to determine the likelihood of species presence and potential impact of the Project Footprint in such a highly modified environment. A fauna assessment based on known habitat preferences and habitat assessment (underpinned by the precautionary principle) and described in Section 4.3 of the EAR was undertaken for the SRAIP.
Vegetation Community Mapping	Quaternary site assessments were undertaken throughout the Project Site to determine the characteristics and extent of vegetation communities.
2.1.3.2(a)(ii) Desktop potential habitat assessment in conjunction with survey data could be used to estimate the likelihood of this species occurring at the site.	This was a key element of the ecological assessment (refer to Section 4.2 , Section 4.3 and Section 6.1 of the EAR).
2.1.3.2(a)(iii) Desktop potential habitat assessment in conjunction with survey data could be used to estimate the likelihood of this species occurring at the site.	This was a key element of the ecological assessment (refer to Section 4.2 , Section 4.3 and Section 6.1 of the EAR).
2.1.3.2(c)(i) Carry out field surveys that meet best practice professional standards to identify koala habitat, including single koala habitat trees, within and adjacent to the project area.	Surveys for koala included 4 SAT surveys as part of the EcoSM (2018) surveys in the more intact habitat within the Project Site, and searches for evidence of koala within and adjoining the Project Footprint – which involved searching for koala presence (actual or indirect – scats and scratches) on all NJKHTs within and adjoining the Project Footprint.
2.1.3.2(d)(i) Carry out surveys to verify the presence (and/or habitat) of listed threatened species and communities within and adjacent to the project area.	Surveys of habitat for listed threatened species were undertaken throughout the Project Area as described in Section 6.1 of the EAR.

ATTACHMENT 17

CONTACT

0488 204 523

mitch@28south.com.au

Mitch Taylor

DIRECTOR

Mitch is a Director of 28 South with over fourteen years consulting experience in Queensland and New South Wales. He has worked on a range of projects across many industry sectors including mining and extractive industries, coal seam gas, eco-tourism, linear (pipeline/rail/road/water) infrastructure, strategic, industrial and urban development for private, public and government clients. The scale of these has ranged from small single lot developments through to the country's most significant mining, gas, industrial and residential developments.

Mitch has managed teams undertaking broad and specific ecological assessments for the mining, CSG and Urban Development sectors, authoring ecological impact assessment reports and liaising directly with Commonwealth, State and Local government agencies on a range of projects and their relevant environmental approvals. Mitch has undertaken many applications under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* as well as the various principal Queensland environmental legislations and approval requirements. Mitch has developed a strong understanding to highly technical environmental planning legislation through all levels of government regulation and often advises both regulators, legal teams and clients alike. Mitch has provided a wide range of services to clients covering many aspects of ecology and environmental planning. Through his experience, Mitch understands the practical application of ecology and environmental planning and the need to identify and liaise directly with his clients to achieve a sound scientific outcome whilst incorporating the ultimate goal of a project. Mitch's ability to think laterally and pragmatically to address constraints and management issues is a strong aspect of his skill and one regularly sought by clients.

Education

Bachelor of Environmental Science, Australian Catholic University, North Sydney, Australia.

Memberships/Affiliations/Permits/Licenses

NSW Rural Fire Service.

Queensland Environmental Law Association.

Scientific Purposes Permit (QLD).

Animal Ethics Permit (QLD).

Wildlife Rehabilitation Permit (QLD).

Employment History

2015 to present | 28 South Environmental | Director – Environmental Consultant

2011 to 2015 | Amec Foster Wheeler | Senior Ecologist.

2007 to 2011 | PLACE Design Group | Senior Ecologist / Environmental Scientist.

2005 to 2007 | Cumberland Ecology | Ecologist.

28 South Environmental

info@28south.com.au

Recent Project Experience

Mitch is a Director of 28 South Environmental. In this role he is responsible for project management, as well as coordinating applied ecological studies servicing Commonwealth, State and Local Government Regulatory Approvals for the energy, mineral, infrastructure, industrial and urban development sectors.

Emerald Industrial Precinct Investigations – Ecological Assessment and PMAV Central Highlands Regional Council, Queensland, Australia 2016-2017

Mitch conducted detailed site investigations over a number large rural allotments to determine each site's environmental constraints and opportunities for strategic industrial developments critical to the economic growth of the CHRC LGA. Surveys involved the ground-truthing of on-ground ecological and environmental constraints and opportunities. Our work lead to a significant reduction in constraints and identified greater opportunities to consolidate development areas avoid fragmented and disassociated development.

Petrie Mill Redevelopment – Ecological and Environmental Assessments and Approvals Moreton Bay Regional Council, Australia 2016 - Present

Mitch conducted detailed Koala and Botanical surveys over the broader Petrie Mill site and co-authored the projects EPBC Controlled Action referral. During this project, Mitch spatially mapped out the Sites vegetation communities and koala habitat areas with reference to the Koala State Planning Regulator Provisions (Division 9 mapping amendment). These works were a critical component in addressing the proposed impacts to koala and other MNES/MSES and identifying the potential opportunities surrounding the Sites development and offset carrying capacity.

Warner Structure Plan – Ecological Assessment and Strategic Structure Planning AUSBUILD Development Corporation, Queensland, Australia 2015-Present

Mitch undertook detailed on-ground ecological assessment surveys to spatially map vegetation communities and fauna habitats across large areas within the suburb of Warner. Results from these surveys and mapping provided the basis for the development of a strategic structure planning exercise over these lands to ensure ecological and environmental matters were considered and incorporated into the structure plans design. This structure planning exercise also involved collaboratively working with a range of other design disciplines and MBRC to establish the most logical plan over these lands.

Birkdale Relocatable Home Park – Flying Fox Management Plan and Implementation Gateway Lifestyle Pty Ltd, Queensland, Australia 2016-Present

Mitch worked closely with his internal colleagues, Redlands City Council and the Department of Environment and Heritage Protection to assess potential impacts that may arise from the construction and establishment of a relocatable home park adjoining a flying fox camp in Birkdale, Queensland. Mitch and the 28 South team successfully developed and implemented a flying fox management plan which saw the construction of the park without significant impacts to the flying fox camp. Surveys remain on-going and will spatially map the camps extent over the course of a year to identify movements and core camp locations over the course of inhabitation of the park.

Mt Margret Mine – Purple-Necked Rock Wallaby offset Xstrata Copper, Queensland, Australia 2012-2013

Mitch undertook detail ecological equivalence surveys to identify suitable habitats for the purple-necked rock wallaby within ML5058 and other adjacent MLs to the north. Data obtained from these surveys was spatially reviewed and synthesized into preferential habitat mapping for the purple-necked rock wallaby and subsequently into an approved offsets program.

Selwyn Mining Lease Microbat Management Ivanhoe Cloncurry Mines, Queensland, Australia, May 2011

Proposed re-engagement of discontinued mining declines within the Selwyn mining lease. During previous surveys Mitch identified that significant population of microbat species were inhabitation mining declines which are proposed for re-engagement works, including threatened species. Together with Ivanhoe Cloncurry Mines staff Mitch co-authored a microbat management plan to allow the reengagement works to be conducted after the passive relocation of the microbat populations inhabiting the mining declines. This included the tracking of 12 individual microbats to observe the movement and confirm the re-location roost sites.

Moranbah Gas Project - Ecological and Environmental Approval Surveys Arrow Energy, Queensland, Australia 2013-2014

Mitch conducting ecological and environmental approval surveys over the four tenements which are being focused on during this project. He conducted these assessments with a focus on their two and three dimension seismic surveys and pilot wells. Further, Mitch has looked at all legacy wells on these four development areas as well as all other arrow sites in the Bowen basin except their Baralaba site.

Mt Isa Open Pit – Ecological Gap Analysis Xstrata Mt Isa Mines, Queensland, Australia 2012

Mitch oversaw the development of a detailed ecological gap analysis for Xstrata MIM which provided an overview of the effort and adequacy of historical ecological surveys completed within Site (ML5058). This analysis was undertaken with a view to identifying potential long-lead ecological surveys that may be required for the Environmental Impact Statement (EIS) for the MIOP Project and provide advice on the most appropriate direction forward to achieve an approval through the EIS process from an ecological perspective.

Selwyn Mining Leases Ecological Impact Assessments

Ivanhoe Cloncurry Mines, Queensland, Australia, 2010 - 2011

Established and proposed underground/open cut gold and copper mining activities in the Selwyn Ranges, North Western Queensland (southern extent of the Mt Isa Inlier/Northern extent of Mitchell Grass Downs bioregions). Mitchell oversaw detailed flora and fauna surveys of all Ivanhoe Cloncurry Mines mining leases. These investigations provided the client with detailed mapping of all vegetation and habitat types present within each mining lease. Mitchell managed a number of ecological teams as well as leading the detailed fauna assessment and habitat mapping of 20 mining leases. This work provided Ivanhoe Cloncurry Mines with a detailed and geo-referenced constraint mapping tool to implement within their Environmental Management Plan going forward.

Surat and Bowen gas fields

APLNG/Origin, Queensland, Australia, 2011 - 2015

Mitchell carried out pre-clearance and ecological surveys for Origin Energy. These surveys involved surveying and reporting on a broad range of environmental constraints for the APLNG Project. Areas covered include identification and locations of Threatened Ecological Communities (TEC); Ecologically Sensitive Areas; Endangered, Vulnerable and Near Threatened flora species and likely habitats; Essential Habitat features for flora and fauna; field verification of High Value Regrowth for TECs, waterways and wetlands; weeds and pests; wildlife corridors and regional ecosystems. All field information has been collected using Trimble GeoExplorers with corrected capabilities.

Surat Basin gas fields

QGC, Queensland, Australia, 2011 - 2015

Mitchell undertook various gas pipeline projects, extensive flora and fauna surveys within the Surat and Bowen Basins gas fields. These flora and fauna surveys included identification of species listed in both the Nature Conservation Act (NC Act) and Environment Protection and Biodiversity Act 1999 (EPBC Act) (2011- 2012).

Byerwen Coal Mine EIS

QCOAL, Queensland, Australia, April – November 2011

Proposed open cut and underground coal mining activity located in the Bowen basin south of Collinsville, Queensland. Mitchell conducted detailed fauna assessments utilizing a wide variety of trapping and habitat assessment techniques which provided field data for the EIS process as well as authoring the terrestrial fauna component of the report.

Curragh Coal Mine - Blackwater Creek Diversion Project

Westfarmers, Queensland, Australia, 2009

Established open cut coal mine near Blackwater Queensland, 10 kilometer diversion of Blackwater Creek. Mitchell was responsible for assisting in background research and co-authoring the Blackwater Creek Diversion Rehabilitation Management Plan to allow the expansion of the current mining operations. He was involved in ongoing monitoring of the rehabilitation works and compliance with the approved Rehabilitation Management Plan.

Wandoan Coal Project EIS

Xstrata, Queensland, Australia, 2007

Proposed open cut coal mining activity located in the area surround the township of Wandoan, Queensland. Mitchell conducted detailed fauna assessments utilizing a wide variety trapping and habitat assessment techniques which provided field data for the EIS process.

Mitch is highly experienced, reliable and resilient, and will creates value for all of his projects. To illustrate this, Mitch has been engaged by prominent land development and government clients to advise on highly complex, large scale resort and tourism master planning projects in Queensland. Recent examples of these projects in which Mitch as led include:

- The Big Pineapple Renewal (Sunshine Coast Council);
- The Petrie Mill Redevelopment (Moreton Bay Regional Council);
- Lake Proserpine Masterplan (Whitsunday Regional Council);
- Pacific Harbour Golf Course (Moreton Bay Regional Council);
- Yeppoon Foreshore Redevelopment (Livingstone Regional Council);
- Caloundra Coastal Walk (Sunshine Coast Council);
- Noosa Sanctuary (Noosa Regional Council);
- Shute Harbour Marina (Whitsunday Regional Council);
- Port of Airlie Redevelopment (Whitsunday Regional Council);
- Minnippi Golf Course and Residential Development (Brisbane City Council);
- The Pinnacles (Townsville Regional Council);
- Tamborine Mountain Skywalk (Scenic Rim Regional Council);
- Guanaba Experience (Scenic Rim Regional Council);
- Mt Coot-tha Zipline (Brisbane City Council); and
- Takarakka Bush Resort (Central Highlands Regional Council).

Mitch forms part of a team that offers the perfect synergy of highly technical expertise in ecological assessment combined with strong environmental planning and policy credentials. This is also demonstrated through our companies regular work as expert witnesses in the Queensland Planning and Environment Court, support for State and Local Government Departments on environmental planning matters and involvement with prominent town planning and development firms.



Rebecca Freese

ECOLOGIST AND ENVIRONMENTAL CONSULTANT

With over five years' experience in the environmental industry, Rebecca has provided a range of environmental consulting and habitat restoration services in Queensland. She has worked on a range of projects across many industry sectors including urban development for private, public and government clients, ecotourism and strategic master planning projects. The scale of these has ranged from small single lot developments through to suburb-scale structure plans.

Rebecca has lead broad and specific ecological assessments around Queensland, specifically South East Queensland, authoring ecological assessment reports and providing supporting documentation for development applications and associated compliance requirements for Commonwealth, State and Local government agencies. Rebecca has collated applications for referral under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and assisted with a variety of Planning and Environmental Court Appeal cases.

Rebecca has provided a wide range of services to clients covering many aspects of environmental management. Through her experience, Rebecca understands the practical application of ecology and the need to identify and liaise directly with clients to achieve a sound scientific outcome whilst incorporating the ultimate goal of the project. Rebecca has the ability to think laterally and pragmatically to address ecological constraints and management issues.

Education

Bachelor of Environmental Management, University of Queensland, Brisbane, Australia.

Employment History

2018 to Present | 28 South Environmental | Ecologist and Environmental Consultant

2017 to 2018 | S5 Environmental | Graduate Ecologist.

2016 to 2017 | Austspray Environmental Weed Control| Natural Areas Team Member

Representative Projects

ELLENDALE

Cedar Woods Properties Ltd

2014 – Ongoing

Rebecca coordinated the remaining vegetation surveys over the Development Stages yet to be approved. The Tree Survey data informed the Vegetation Management Plans for various operational works applications over the Site of which Rebecca developed.

CARSELDINE URBAN VILLAGE

Economic Development Queensland

2017 – Ongoing

Rebecca assisted with the development of the Site's Fauna Flora Management Plans under the broader Fitzgibbon Bushland Management Plan for the operational works phase of the development. This included spatial mapping of significant habitat features throughout the stages of CUV and determination of management units for ecological restoration in line with the requirements in the FBMP. Rebecca also assisted with the fauna spotter catcher team throughout the vegetation clearing works.

AUSBUILD DEVELOPMENT CORPORATION

260-284 Ritchie Road, Pallara

2018 – Ongoing

Rebecca has undertaken numerous ecological assessments over the various Sites of interest for a residential subdivision for AUSBUILD. The site presented a unique challenge being zoned within both urban and non-urban designation which subsequently triggered the consideration of theoretical impact to Regulated Vegetation under State environmental legislation as well as Brisbane City Council's own environmental considerations.

Fernbourne Road, Wellington Point

2018 – Ongoing

Rebecca assisted with the provision of environmental planning advice including an Environmental Assessment Report and community consultation. The Site provided another unique situation for environmental planning matters, with Stage 1 of a previous development application having been constructed and subject to an EPBC Particular Matter Decision.

BURDEKIN DOWNS APPEAL

Department of State Development, Manufacturing, Infrastructure and Planning

2016 – Ongoing

Rebecca assisted Wayne Moffatt as the Expert Witness (Ecology) for the Burdekin Downs Appeal Case through Geographical Information Systems (GIS) Analysis and Mapping. Rebecca's GIS products were used during the mediation process to settle the Case and support approval conditions

PINE VALLEY

Lendlease

2016 – Ongoing

Rebecca assisted with detailed on-ground botanical and habitat assessment surveys to spatially map vegetation communities and fauna habitats across large areas of the Investigation Area within Burpengary. Results from these surveys and mapping provided the basis for the development of a strategic structure planning exercise over these lands to ensure ecological and environmental matters were considered and incorporated into the structure plans design. This structure planning exercise also involved collaboratively working with a range of other design disciplines and MBRC to establish the most logical plan over these lands. Further, Rebecca assisted with collation of the EPBC Referral Submission for the Project.

LAKE PROSERPINE MASTERPLAN

Whitsunday Regional Council

2018 – Ongoing

Rebecca assisted with detailed ecological surveys of the Site as part of the environmental analysis for the Proserpine Dam Recreation Masterplan. Results from these surveys assisted with the development of design constraints and opportunities for the Proserpine Dam. Rebecca also assisted the 28 South team with the ongoing master planning consultation advice with Place Design Group.

MT COOTHA POWERFUL OWL PROJECT

Brisbane City Council, Australia

2018 – Ongoing

Rebecca assisted with the targeted Powerful Owl surveys over Mt Coota Forest Park. As part of the broader ecological assessment of the Site, the Powerful Owl surveys were undertaken to inform the design and location of infrastructure for a Brisbane City Council ecotourism development. During this project, Rebecca spatially mapped the location of any Powerful Owl nest trees within the Reserve.

TOOWOOMBA RV PARKS MASTERPLAN

Toowoomba Regional Council

2018 – Ongoing

Rebecca undertook ecological assessment of three existing campgrounds that were the focus of Toowoomba Regional Council's Parks and Recreation master planning exercise. The results from the ecological surveys formed the basis of individual Vegetation Management Plans for each of the Sites.

28 South Environmental

info@28south.com.au

CURRICULUM VITAE

CHRIS HANSEN

Director / Principal Botanist

Education

Bachelor of Biomedical Science, Griffith University (1994)

Bachelor of Science (Honours), University of Queensland (1995)

Professional Development

Bio-condition Monitoring training, Queensland Herbarium

Regional Ecosystem Training, Queensland Herbarium (certified by the Department of Natural Resources Mines and Water)

Vegetation Structure Training, Queensland Herbarium

Seed Collection and Propagation Workshop, Greening Australia

Compilation of 1500+ plant herbarium from across Queensland and northern NSW

Skills and Expertise

Chris has worked within the consultancy sector for the past 17 years. During this time he has gained a wealth of experience in the assessment of vegetation types from central NSW to Cape York Peninsula, Queensland, with experience in Gove in the Northern Territory and Balranald in south-western NSW. Following over five years of service as the senior botanist and associate for a specialist environmental consultancy, Chris established his own specialist botanical consultancy practice in 2008 before joining Ecological Survey & Management in 2010.

Chris has conducted detailed botanical assessments on sites, which range from 800 m² to more than 100,000 hectares in area. These assessments have been conducted as part of the environmental assessment process relating to the reconfiguration of residential lots through to Environmental Impact Statements for large infrastructure and mining projects.

Chris has regularly been engaged to provide the technical lead role for the on-ground qualitative vegetation assessment of projects such as water pipelines, dams, power transmission corridors, major highway upgrades, coal and metaliferous mining and liquefied natural gas infrastructure. Chris has also conducted numerous bio-condition monitoring and vegetation offset assessments relating to these and other projects. Chris has developed a specialty for the assessment of vegetation to which the *Vegetation Management Act 1999* (Qld), *Nature Conservation Act 1992* (Qld), *Local Land Services Act 2013* (NSW) and the *Biodiversity Conservation Act 2016* (NSW) and *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) applies.

Professional History

2010 – present:	Director & Principal Botanist, Ecological Survey & Management
2008 – 2010:	Principal Consultant, Hansen Botanical Assessments
2007 – 2008:	Associate - Senior Botanist/Ecologist, PLACE Design Group (Environment)
2004 – 2007:	Botanist/Ecologist, PLACE Design Group Pty Ltd (Environment)
2003 – 2004:	Botanical Sub-consultant and Regeneration Contractor, Hansen Vegetation Management
2000 – 2003:	Bushland Regeneration Contractor, Rainforest Repairs

Experience

The following projects have been categorised into projects involving targeted threatened species surveys followed by specific resource sectors. It should be noted that most of the projects undertaken in the past six to twelve months are subject to confidentiality agreements and as such are yet to be included. Once the corresponding reports (e.g. EIA, EIS, REFs) are submitted for assessment the CV will be updated.

Protected Plants Surveys

In addition to the following projects, most of the terrestrial ecology assessments listed beyond this section involved 'educated walks' (Garrard *et al.*, 2008), which facilitated targeted threatened species searches of suitable habitat.

- Walton threatened plant survey and report, in accordance with the Queensland Protected Plants flora Survey Guidelines, Bluff, central Queensland (Ecological Survey & Management)
- Terrestrial ecological assessment, condition threshold assessment and targeted threatened flora species searches of lowland rainforest and wet sclerophyll forest for the Big Pineapple project, Nambour (Ecological Survey & Management for 28 South Environmental)
- Terrestrial ecological assessment and targeted threatened flora species searches of wet sclerophyll forest for private property conservation abutting Mt Crosby Road, Buderim (Ecological Survey & Management)
- Terrestrial ecological assessment and targeted threatened flora species searches of road reserve of David Low Way, Coolumb to Yaroomba (Ecological Survey & Management)
- Targeted threatened flora species searches of upland rainforest and wet sclerophyll forest on VCA properties for the Scenic Rim Regional Council, Tamborine Mountain
- Terrestrial ecological assessment, condition threshold assessment and targeted threatened flora species searches of lowland rainforest and wet sclerophyll forest for the Guanaba Experience project, Tamborine Mountain (Ecological Survey & Management)
- Terrestrial ecological assessment, condition threshold assessment and targeted threatened flora species searches of lowland rainforest and wet sclerophyll forest for the Guanaba Indigenous Protection Area, Tamborine Mountain (Ecological Survey & Management)
- Targeted threatened species surveys, Barro Quarry, Hervey Bay (Ecological Survey & Management)
- Targeted threatened species surveys, Easement Maintenance, Clear Mountain and Cashmere (Ecological Survey & Management)
- Targeted threatened species surveys, NBN Tower and Fibre Spur, Chuwar West (Ecological Survey & Management)
- Targeted threatened species surveys, Eldorado Goldmine (closed), Gympie (Ecological Survey & Management)
- Targeted threatened species surveys, Cherabah Resort, Elbow Valley (Ecological Survey & Management)
- Terrestrial ecological assessment and targeted threatened flora species searches, 'One Mile' Quandamooka Land Council, North Stradbroke Island (Ecological Survey & Management for 28 South Environmental)

- Targeted Flora Survey and Ecological Constraints Assessment for Helidon Quarry, Helidon (Ecological Survey & Management)
- Targeted Flora Survey, Hinze Dam Wall Raising, Gold Coast (PLACE Design Group for Sinclair Knight Mertz)
- Targeted Flora Survey and Mapping, Hinze Dam Wall Raising, Gold Coast (HBA for Sinclair Knight Mertz)

OEH Investigations

- Terrestrial ecological assessment and targeted threatened flora species searches, 'Fairland's & 'Allawa', Walgett district (Ecological Survey & Management for 28 South Environmental)
- Terrestrial ecological assessment and targeted threatened flora species searches, 'Cubbaroo', Wee Waa district (Ecological Survey & Management for 28 South Environmental)
- Terrestrial ecological assessment and targeted threatened flora species searches, 'Beefwood' & 'The Prairies', Moree district (Ecological Survey & Management for 28 South Environmental)
- Offset Investigation and Assessment, 'Bryanungra', Moree district (Ecological Survey & Management for 28 South Environmental)

Power Transmission Projects

- Terrestrial Ecology Assessment, vegetation validation and flora surveys, Stage 2 of Collinsville Solar Farm (Ecological Survey & Management)
- Terrestrial Ecology Assessment, including vegetation validation and mapping, Majors Creek Solar Farm near Townsville (Ecological Survey & Management)
- Terrestrial Ecology Assessment, Tully sub-station upgrade (Ecological Survey & Management for Gaia Consulting)
- Ecological Constraints Assessment for Queensland Sun Farms in Middlemount, Dysart, Glenden (Ecological Survey & Management)
- Terrestrial Ecology Assessment, Majors Creek Solar Farm near Townsville (Ecological Survey & Management)
- Terrestrial Ecology Assessment, Stage 2 of Collinsville Solar Farm (Ecological Survey & Management)
- Targeted Threatened Species Survey, Weed Audit and Treatment Control Plan, Western Downs to Coolumbolla High Voltage Transmission Line and Substations (Ecological Survey & Management)
- Close-out Weed Audit, Western Downs to Halys High Voltage Transmission Line and Substations (Ecological Survey & Management)
- Baseline and Targeted Threatened Species Survey and RE Assessment, Surat Stage 1 and 2 (Coolumbolla-Wandoan South and Coolumbolla to Talinga), High Voltage Transmission Line and Substations (HBA for Parson Brinckerhoff)
- Targeted Threatened Species Survey and Mapping, Darling Downs Power Station (DDPS) 2, Braemar (HBA for Parsons Brinckerhoff).
- Targeted Threatened Species Survey, Granite Creek to Agnes, High Voltage Transmission Line and Substation (PLACE Design Group for Parson Brinckerhoff)
- Baseline Flora Survey, Ebenezer to Greenbank High Voltage Transmission Line, South East Queensland (PLACE Design Group for Parson Brinckerhoff)

- Baseline Flora Survey, Springdale to Blackwall and Lockrose to Abermain High Voltage Transmission Line and Substation, Gatton to Ipswich (HBA for Parsons Brinckerhoff)
- Baseline Flora Survey, Blackwater Powerline Alignment, Blackwater (Ecological Survey & Management).
- Baseline Flora Survey, Kogan Creek Power Station (Ecological Survey & Management)
- Vegetation Offset Analysis, Kogan Creek Power Station (Ecological Survey & Management)
- Vegetation Offset Analysis, 'Rockwood' gas fields, Wieambilla (HBA for Parsons Brinckerhoff)
- Property Map of Assessable Vegetation (PMAV) Tarong Power Station (Ecological Survey & Management)
- Moratorium Vegetation Assessment, Tarong Power Station (HBA for Ecological Survey & Management)
- Flora Survey, Goodna Substation (PLACE Design Group)

Water Infrastructure Projects

- Ecological Assessment, Modification of Water Infrastructure, Tooralee National Park (Ecological Survey & Management for Biosis)
- Flora Survey, Tooralee National Park, Bourke (Ecological Survey & Management for Biosis)
- Flora Survey, Nimmie-Caira Ecological Assessment, Balranald (Ecological Survey & Management for Biosis)
- Flora Survey, Wandoan Mine Water Pipelines, Wandoan (HBA for Parsons Brinckerhoff).
- Flora Survey, Wetella to Acland Water Pipeline, Toowoomba/Oakey (HBA for Parsons Brinckerhoff).
- Flora Survey, Water for Bowen, North Queensland (HBA for Parsons Brinckerhoff)
- Flora Survey, De-salination Water Pipeline, Gold Coast (PLACE Design Group for Sinclair Knight Mertz)

Transport Infrastructure Projects

- Flora Survey, Multi-modal Transport Corridor, Kawana (PLACE Design Group for Parsons Brinckerhoff)
- Detailed Flora Survey, Dickson Road, Sippy Downs (PLACE Design Group for Parsons Brinckerhoff)
- Flora Survey, Tarong Transport Corridor, Tarong Transport Alliance (HBA for Parsons Brinckerhoff)
- Targeted Flora Survey, Stage B – Bruce Highway Upgrade, Cooroy to Curra (HBA for Parsons Brinckerhoff).
- Targeted Flora Survey, Dawson Highway Upgrade, Eaton Range Crossing (HBA for Ecological Survey & Management)
- Eaton Range Supplementary Flora Surveys (Ecological Survey & Management)

Mining Projects (Bowen Basin)

- Terrestrial Ecological Assessment, Moranbah North Mine Expansion, Moranbah (Ecological Survey & Management)
- Terrestrial Ecological Assessment, Grasstree Mine Expansion, Middlemount (Ecological Survey & Management)
- Terrestrial Ecological Assessment, Grosvenor Mine Expansion, Moranbah (Ecological Survey & Management)
- Terrestrial Ecological Assessment, Hail Creek Mine Mine Expansion, Nebo (Ecological Survey & Management)
- Terrestrial Ecological Assessment and Offset Procurement, Byerwen Coal Project, Glenden (Ecological Survey & Management)
- Black Ironbox Monitoring, Sonoma Mine, Collinsville (Ecological Survey & Management)
- Flora Survey, Belvedere Lease Areas, Moura (HBA for Ecological Survey & Management)
- Flora Survey, Minyango Lease Areas, Blackwater (HBA for Ecological Survey & Management)
- Flora Survey, Moranbah South Project, Moranbah (Ecological Survey & Management)
- Flora Survey, Valeria Project, Capella (Ecological Survey & Management)
- Flora Survey, Winchester South Project, Moranbah (Ecological Survey & Management)
- Natural Grassland Assessment, Eagle Downs Project, Moranbah (Ecological Survey & Management)
- Flora Survey, Train Load Out (TLO) Facility and Haul Road, Baralaba Coal Mine (Ecological Survey & Management)
- Regional Ecosystem Map Amendment Application, Hail Creek Mine (Ecological Survey & Management)
- Bio-condition Monitoring (2009 to present), Hail Creek Mine (Ecological Survey & Management)
- Rehabilitation Monitoring (2010 to present), Hail Creek Mine (Ecological Survey & Management)
- Rehabilitation Manual, Hail Creek Mine (Ecological Survey & Management)
- Weed Audit, Hail Creek Mine (Ecological Survey & Management)
- Flora Survey, Backwater Creek Diversion, East Curragh Mine, (PLACE Design Group for Parsons Brinckerhoff)
- Bio-condition Monitoring, Curragh East Mine (HBA for PLACE Design Group)
- Flora Survey, Coppabella Underground Lease Areas, Coppabella (HBA for Ecological Survey & Management)
- Endangered Ecological Community Assessment, Rolleston Coal Mine, Rolleston (HBA for Booyong Forest Service)
- Flora Survey, Abbot Point State Development Area, Abbot Point, Bowen (HBA for Parsons Brinckerhoff)
- Regional Ecosystem Validation and EIS, "Winchester South" Mine Lease Area, Moranbah (Ecological Survey & Management)

- Bio-condition, Rehabilitation and Black Ironbox Monitoring, Hail Creek Mine, north-west of Nebo (Ecological Survey & Management)
- Bio-condition Monitoring, Hail Creek Mine, north-west of Nebo (HBA for Sinclair Knight Mertz)
- Exotic Flora Audit, Mt. Flora Offset, Nebo (Ecological Survey & Management)
- Flora Survey, Collinsville Mine Lease Areas, Collinsville (HBA for Biodiversity Australia)

Mining Projects (Surat Basin)

- Flora Survey, Wandoan Mine Lease Areas, Wandoan (PLACE Design Group for Parsons Brinckerhoff)
- Flora Survey, Linc Energy Gas Extraction Project, Chinchilla (PLACE Design Group for Sinclair Knight Mertz)
- Baseline Bio-condition Monitoring, Spring Gully Gas Fields, north-east of Roma (HBA for Lewis Ecological Services)

Mining Projects (outside Bowen and Surat Basin)

- Terrestrial Ecological Assessment, including seasonal vegetation validation and mapping and targeted threatened flora survey – Tcharawopin Project, Aurukun, Cape York (Ecological Survey & Management)
- Terrestrial Ecological Assessment, including seasonal vegetation validation and mapping and targeted threatened flora survey – Coconut Project, Aurukun, Cape York (Ecological Survey & Management)
- Ecological Equivalence Assessments and Offset Procurement, BHP Cannington Mine (Ecological Survey & Management)
- Offset Management Plan, BHP Cannington Mine (Ecological Survey & Management)
- Offset Area Monitoring (2016 & 2018), BHP Cannington Mine (Ecological Survey & Management)
- Weed Audit (2016 & 2018), BHP Cannington Mine (Ecological Survey & Management)
- Weed Audit (2018), Yurbi Load Out Facility (Ecological Survey & Management)
- Bio-condition Monitoring, Rio Tinto-Alcan Aluminium Refinery, Gove (HBA for Booyong Forest Service)
- Flora Survey, Trekelano Satellite Operation, Osborne Mine, north-west Queensland (PLACE Design Group for Resource Strategies Australia)
- Flora Survey, Lucky Luke Satellite Operation, Osborne Mine, north-west Queensland (PLACE Design Group for Resource Strategies Australia).
- Flora Survey Proposed Coal Mine, Kingaroy, (PLACE Design Group for Parson Brinckerhoff)
- Flora Survey Proposed Conveyor, Kingaroy (PLACE Design Group for Parson Brinckerhoff)
- Targeted Flora Survey, Tarong (PLACE Design Group for Parson Brinckerhoff)

Natural Resource Management Projects

- Flora Survey, Parkinson Bushland, Brisbane City Council (PLACE Design Group).

Property Development Projects

Chris has conducted numerous botanical assessments relating to proposed property developments throughout south East Queensland and northern NSW (PLACE Design Group). These assessments included assessments of small one into two lot reconfigurations through to assessments across hundreds of hectares. This has required detailed knowledge of the regulatory framework of numerous local government bodies and state concurrence agencies. Some larger and/or noteworthy examples are provided below.

- Regional Ecosystem Remap Applications, Fernvale.
- Regional Ecosystem Remap Applications, Parkinson.
- Flora Survey, Caloundra Coastal Walk, Caloundra City Council.
- Botanical Assessment, Thornlands Master Plan, Thornlands.
- Flora Survey, Trinity Drive, Lismore.
- Flora Survey, Shute Harbour Marina, Airlie Beach.
- Flora Survey, Mongogarrie Chicken Sheds, near Casino.
- Flora Survey, Baida Chicken Sheds, near Tamworth and Gunnedah.
- Flora Survey, Morayfield Aged Care Facility, Morayfield.
- Ecological Assessment, Eumundi Noosa Road, Doonan.

Rehabilitation Projects

- Prepared a rehabilitation plan for the degraded terraces of Oxley Creek in the Larapinta area. The site had been subjected to intensive sand-mining activities.
- Prepared a rehabilitation plan that was required as part of the operation works application for a site bordering the Brisbane River. The plan provided detailed strategies to manage weeds and revegetate the degraded bank of the river.
- Prepared a rehabilitation plan for Yandina Caravan Park, which was required to support a development application to expand the existing Yandina Caravan Park. The site was bordered by the Maroochy River and traversed by two of the river's tributaries.
- Prepared numerous rehabilitation plans for property developments located throughout the Richmond Valley Shire (greater Lismore area). These sites were primarily modified landscapes with rehabilitation intent afforded to drainage lines and minor watercourses vegetated with pastoral grasses or weed tree species.

Chris Cantwell

Principal Environmental Planner (CEnvP)

Chris is a qualified Environmental Planner, Environmental Scientist and Certified Environmental Practitioner with broad experience managing multidisciplinary impact assessments for large-scale infrastructure projects and a particular knowledge of Queensland environmental planning approvals processes. Chris has considerable experience in the provision of strategic environmental approvals advice and in coordinating and managing projects characterised by complex environmental issues. In challenging circumstances, Chris has developed a reputation for being able to identify and deliver project outcomes that are acceptable to all stakeholders.

Education

2006 | Bachelor of Environmental Planning (Honours 1) | Griffith University | Brisbane, QLD

2006 | Bachelor of Science | Urban and Regional Planning and Environmental Science, Ecology and Conservation Biology | Griffith University | Brisbane, QLD.

Memberships/Affiliations/Permits/Licenses

Certified Environmental Practitioner (CEnvP)

Member Environment Institute of Australia and New Zealand (MEIANZ)

Member of the EIANZ Professional Development Committee (SEQ)

Member of the Queensland Environmental Law Association (MQELA)

Employment History

2018 to Present | 28° South Environmental | Principal Environmental Planner

2016 to 2018 | ACCIONA Energy | Project Developer

2014 to 2016 | Amec Foster Wheeler Environment & Infrastructure | Principal Environmental Planner

2011 to 2014 | Amec Foster Wheeler Environment & Infrastructure | Senior Environmental Planner

2006 to 2011 | AECOM | Environmental Planner

2005 to 2006 | Umwelt Environmental Consultants | Ecological Assistant (Undergraduate)

Recent Project Experience

2018 to Present | 28 South Environmental | Principal Environmental Planner

In his time with 28 South Environmental, Chris has provided environmental planning advice for a range of clients in South-East Queensland. This has largely centered on the provision of ecological assessment reports to address Commonwealth, State and Local Government environmental requirements for projects in the urban development and waste management sectors. Projects of note include large residential masterplan projects in the Moreton Bay Regional Council and Ipswich City Council areas. Chris has authored multiple Controlled Action Referral documents and has submitted these under the *Environment Protection and Biodiversity Conservation Act 1999*. Chris has also played a substantial role in providing technical environmental planning support to one of 28 South's Directors for expert witness work across various cases before the *Queensland Planning and Environment Court*.

Chris currently manages 28 South Environmental's technical peer review work for Economic Development Queensland, involving ecological matters associated with development applications within the Weinam Creek and Toondah Harbour Priority Development Areas.

2016 to 2018 | ACCIONA Energy | Project Developer

In Chris' role as Project Developer, he was exposed to the full spectrum of challenges associated with renewable energy development from pre-feasibility through to construction, commissioning and operations on wind and solar farm projects in Australia. Working as part of a small satellite office in Brisbane (2-3 people), he was responsible for helping to drive the growth of the company's portfolio of projects within Queensland (MacIntyre Wind Farm, Aldoga Solar Farm, others currently confidential) and New South Wales (currently confidential). Among other things, this included preparation and presentation of targeted development strategies to national and international management, extensive greenfield prospecting, competitor analysis, landowner negotiation, stakeholder identification and management, project management, coordination of internal resources (particularly engineering and legal), management of external consultants and tender preparation. Whilst the planning and environmental elements of these projects were very familiar to Chris, in this role he had to develop a working understanding of the technical aspects associated with grid connection for renewable energy projects; grid connection consistently becomes the critical path item for renewable energy developments. This role also required continual commitment to working effectively across cultures as there was a very heavy Spanish influence within the business.

After ACCIONA Energy was awarded the right to enter into an Agreement for Lease with the Queensland Government for the development of the Aldoga Solar Farm Project, Chris was ACCIONA Energy's Project Manager for this project. The company viewed the Aldoga Solar Farm as a strategically important project for the business in Australia; owing to the high profile that comes with having the Queensland Government as landholder, and the ambitious development milestones within the Agreement for Lease. Chris' hands-on role required total coordination of internal and external resources to drive many parallel work streams including planning and environment, grid connection, stakeholder and community engagement and client management (Minister for Economic Development Queensland). In this role, Chris was responsible for all project management elements including schedule, budget, team coordination, internal and external reporting and contract management. The role required constant travel – on average, fortnightly – to both Melbourne (Australian head office) and Gladstone (site).

2011 to 2016 | Amec Foster Wheeler | Principal Environmental Planner (formerly Senior)

Throughout Chris' time at Amec Foster Wheeler (now Wood Group), he was responsible for the coordination of complex environmental studies involving large infrastructure projects. These project management roles required strategic approvals advice, coordination of environmental and planning approvals processes (including EPBC Act referrals, Environmental Authority applications and local government Development Assessment applications), ecological survey design, complex data collection and processing, preparation of comprehensive environmental reporting and preparation of alignment refinement advice where necessary. Chris was the Assessments and Approvals Team Lead within the Brisbane office for his final three years. Prior to his departure he spent six months as the company's national renewables lead as the business was seeking to transfer its balance-of-plant EPC experiences from North American wind farm projects to the burgeoning renewable energy sector in Australia.

Selected project experience is outlined in the following pages.

2014 to 2016 | Regulatory Approvals and Environment Lead (CloughAMEC JV) | Bowen Gas Project | Arrow Energy, QLD

- The joint venture's primary client contact for all environmental management and regulatory approvals matters associated with the Bowen Gas Project.
- Led a team of environmental management and approvals professionals from the Clough AMEC JV during the Front-End Engineering and Design (FEED) phase of the Bowen Gas Project.
- Designed and executed the regulatory compliance and regulatory approvals management systems for the FEED.
- Key responsibilities included the development and management of a regulatory approvals register for the project, provision of environmental and regulatory approvals input into design documents, environmental review of field development layouts and proposed infrastructure locations, overseeing the development of a Construction Environmental Management Plan (including 12 subordinate Key Value Management Plans).
- Provided environmental and approvals input into construction-focused activities such as overall project scheduling and cost estimating.

2013 to 2014 | Environmental Coordinator | South Georgina Basin Exploration Program | Central Petroleum, QLD

- Responsible for determining and delivering an approvals strategy for the proposed exploration activities.
- Prepared applications for EA amendments, data acquisition authorities and EPBC Act referrals.
- Primary point of contact for the administering authorities and was responsible for the design of desktop, targeted (via helicopter) and pre-clearance surveys associated with the project, which involved approximately 1,000km of seismic surveys near the Queensland/Northern Territory border.
- Although this project presented some unique challenges due to influential stakeholders, the approvals were obtained through the recently-amended Environmental Protection Act 1994 and were some of the first to be issued under the DEHP's new regulatory approach.

2011 to 2012 | Project Manager | Australia Pacific LNG Pipeline | Australia Pacific LNG, QLD

- Project Manager of the Detailed Environmental Infield Studies (DEIS) for the Australia Pacific LNG pipeline pre-clearance surveys.
- Responsible for coordinating detailed ecological studies in accordance with the Federal survey guidelines and across a pipeline length of more than 400km.
- This project saw the collection and delivery of an unprecedented amount of ecological data, within a corridor extending from south of Miles to Curtis Island.

2013 | Technical Reviewer | Selective Salt Recovery Facility Project | QGC, QLD

- Technical Reviewer of the approvals plan and approvals register during the Pre-FEED phase of this confidential project involving the major CSG to LNG proponents in Queensland.

2011 to 2012 | Environmental Planner | Kennedy Wind Farm Route Selection Study | Windlab Developments, QLD

- Led a route selection study for the transmission lines connecting the proposed Kennedy Wind Farm with the CopperString substation south of Hughenden.
- The route development report prepared for this project was to accompany the development approval application for the Kennedy Wind Farm.

2011 to 2012 | CopperString Project | Leighton, QLD

- Responsible for the preparation of land use and planning, socio-economic and environmental offsets technical chapters in response to submissions received on the CopperString EIS.

2011 | Project Manager | Burngrove West Upgrade Project | QR National, QLD

- Oversaw the preparation and delivery of a Preliminary Environmental and Planning Assessment (PEPA) for a component of QR National's Blackwater System upgrade.

2006 to 2011 | AECOM | Environmental Planner

In Chris' five years at AECOM (formerly Maunsell) as an Environmental Planner, he was involved in a wide variety of infrastructure projects and planning studies for public and private sector clients. Following successful roles preparing land use and planning technical papers for large projects such as the Ipswich Motorway Alternative Northern Corridor and the Surat Basin Rail Project, Chris became heavily involved in the management and coordination of large multidisciplinary projects.

Selected project experience is outlined below.

2010 to 2011 | Project Coordinator, Environment and Approvals Lead | Coopers Gap Wind Farm Project | AGL, QLD

- The focal point for client liaison.
- Management of the environmental and social impact assessment process under the Community Infrastructure Designation provisions of the Sustainable Planning Act 2009.
- Scoping, coordination and lead authoring of a comprehensive EIA document.
- Management of all technical study teams.
- Led the regulatory authority and local council engagement process, including workshop facilitation.
- Played a central role in community engagement activities.

2007 to 2010 | Project Coordinator, Environment and Approvals Lead | Southern Freight Rail Corridor Study | Department of Transport and Main Roads

- The focal point for client liaison.
- Management of the environmental and social impact assessment process under the Community Infrastructure Designation provisions of the former Integrated Planning Act 1997.
- Scoping, coordination and lead authoring of a comprehensive EIA document.
- Management of technical study teams.
- Led engagement with regulatory authorities, including workshop facilitation.
- Played a central role in community engagement activities.
- Coordinated the re-alignment of a portion of the SFRC to avoid areas recognised as high value bushland habitat under new DEHP habitat classifications.
- Authored a report assessing an alternative alignment which was proposed by a community group.

2010 to 2011 | Cedar Grove Feasibility Study | LinkWater, QLD

- Involved in the formulation of criteria for a multi-criteria analysis (MCA) process.
- Prepared an Environment, Planning and Social Assessment for the preferred corridor, advising LinkWater of potential impacts and any risks associated with the preferred alignment option for future stages of the project.

2010 | Amberley Perimeter Fence Project | Department of Defence, QLD

- Oversaw the preparation of an Initial Environmental Review (IER) for the construction of a perimeter fence at RAAF Base Amberley.
- Provided advice for the management of vegetation, macropods and arboreal fauna on the site.

2009 | Environmental Coordinator | Banana to Wooderson Rail Track Upgrade | QR National, QLD

- Lead author of a land use and planning assessment for the EIA document.
- Responsible for the compilation of the Environmental Planning Study and accompanying Environmental Management Plan.

2008 | Surat Basin Rail Project | Surat Basin Rail, QLD

- Lead author of a land use and planning technical paper for the EIS.

2007 | Ipswich Motorway Alternative Northern Corridor Project | Department of Transport and Main Roads, QLD

- Lead author of cultural heritage and land use and planning chapters for the EIA document.

2006 to 2007 | Petrie to Redcliffe Multi-modal Corridor Study | Translink, QLD

- Lead author of land use and statutory assessment chapters for the Concept Design and Impact Management Plan.

Publications and presentations

Cantwell, C. "Complying with Environmental Approval Conditions – Coal Seam Gas Projects in Central Queensland, Australia", AMEC Environment & Infrastructure Technical Summit, New York, USA, October 2012.

Cantwell, C. and Harrison, G., "Maintaining the Balance – Ports and Urban Encroachment", Regional Ports Conference, Townsville, QLD, 2009.

Professional development

- Current | MOOC – Energy Principles and Renewable Energy | UQ, Brisbane
- 2018 | NEM Market Overview Course | AEMO
- 2016 | MOOC – Sustainable Urban Development | Delft & Wageningen Universities, Netherlands
- 2015 | MOOC – Making Sense of Climate Science Denial | UQ, Brisbane
- 2013 | AMEC Project Management Course
- 2010 | Managing AECOM Projects
- 2008 | PSMJ Project Management Accreditation

ATTACHMENT 18

Family	Scientific Name	Common Name	EPBC Act 1999	NC Act 1992
Amaranthaceae	<i>Alternanthera pungens</i>	Khaki Weed	NL	*
Amaranthaceae	<i>Amaranthus spinosus</i>	Spiny Amaranth	NL	*
Papaveraceae	<i>Argemone ochroleuca</i> subsp. <i>ochroleuca</i>	Mexican Poppy	NL	*
Brassicaceae	<i>Capsella bursapastoris</i>		NL	*
Chenopodiaceae	<i>Chenopodium album</i>		NL	*
Poaceae	<i>Chloris gayana</i>	Rhodes Grass	NL	*
Asteraceae	<i>Cirsium vulgare</i>	Scotch Thistle	NL	*
Asteraceae	<i>Crassocephalum crepidioides</i>	Thickhead	NL	*
Fabaceae	<i>Crotalaria pallida</i> var. <i>obovata</i>		NL	*
Poaceae	<i>Cynodon dactylon</i>	Couch	NL	*
Cyperaceae	<i>Cyperus brevifolius</i>		NL	*
Solanaceae	<i>Datura ferox</i>		NL	*
Poaceae	<i>Dichanthium aristatum</i>	Angleton Grass	NL	*
Poaceae	<i>Digitaria eriantha</i>	Blue Digit	NL	*
Poaceae	<i>Echinochloa esculenta</i>		NL	*
Asteraceae	<i>Eclipta prostrata</i>	White Eclipta	NL	*
Poaceae	<i>Eleusine indica</i>	Crowsfoot Grass	NL	*
Poaceae	<i>Eragrostis tenuifolia</i>	Elastic Grass	NL	*
Asteraceae	<i>Erigeron bonariensis</i>		NL	*
Euphorbiaceae	<i>Euphorbia hirta</i>		NL	*
Euphorbiaceae	<i>Euphorbia hyssopifolia</i>		NL	*
Euphorbiaceae	<i>Euphorbia prostrata</i>		NL	*
Verbenaceae	<i>Glandularia aristigera</i>	Mayne's Pest	NL	*
Asteraceae	<i>Gnaphalium polycaulon</i>	Cudweed	NL	*
Apocynaceae	<i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush	NL	*
Amaranthaceae	<i>Gomphrena celosioides</i>	Gomphrena Weed	NL	*
Fabaceae	<i>Indigofera spicata</i>	Creeping Indigo	NL	*
Lamiaceae	<i>Lamium amplexicaule</i>		NL	*
Brassicaceae	<i>Lepidium bonariense</i>		NL	*
Fabaceae	<i>Macroptilium atropurpureum</i>	Siratro	NL	*
Malvaceae	<i>Malvastrum coromandelianum</i>	False Mallow	NL	*
Fabaceae	<i>Medicago polymorpha</i>		NL	*
Poaceae	<i>Melinis repens</i>	Red Natal Grass	NL	*
Malvaceae	<i>Modiola caroliniana</i>		NL	*
Cactaceae	<i>Opuntia tomentosa</i>	Velvety Tree Pear	NL	*
Oxalidaceae	<i>Oxalis corniculata</i>	Creeping Oxalis	NL	*
Malvaceae	<i>Pavonia hastata</i>		NL	*
Verbenaceae	<i>Phyla canescens</i>		NL	*
Solanaceae	<i>Physalis peruviana</i>		NL	*
Portulacaceae	<i>Portulaca oleracea</i>	Pigweed	NL	*
Portulacaceae	<i>Portulaca pilosa</i>	Hairy Pigweed	NL	*
Ranunculaceae	<i>Ranunculus sceleratus</i> subsp. <i>sceleratus</i>		NL	*
Brassicaceae	<i>Raphanus raphanistrum</i>		NL	*
Euphorbiaceae	<i>Ricinus communis</i>		NL	*
Polygonaceae	<i>Rumex conglomeratus</i>		NL	*
Lamiaceae	<i>Salvia reflexa</i>		NL	*
Malvaceae	<i>Sida rhombifolia</i>		NL	*
Asteraceae	<i>Silybum marianum</i>		NL	*
Brassicaceae	<i>Sisymbrium irio</i>		NL	*
Solanaceae	<i>Solanum nigrum</i>		NL	*
Asteraceae	<i>Sonchus oleraceus</i>		NL	*
Poaceae	<i>Sorghum halepense</i>		NL	*
Lamiaceae	<i>Stachys arvensis</i>		NL	*
Asteraceae	<i>Symphyotrichum subulatum</i>		NL	*
Fabaceae	<i>Trifolium repens</i> var. <i>repens</i>		NL	*

Family	Scientific Name	Common Name	EPBC Act 1999	NC Act 1992
Malvaceae	<i>Urena lobata</i>		NL	*
Asteraceae	<i>Xanthium spinosum</i>		NL	*
Ulmaceae	<i>Celtis sinensis</i>	Chinese Celtis	NL	*(RI)
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	NL	*(RI)
Poaceae	<i>Sporobolus fertilis</i>	Giant Parramatta Grass	NL	*(RI)
Amaranthaceae	<i>Alternanthera denticulata</i>	Lesser Joyweed	NL	LC
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	NL	LC
Poaceae	<i>Bothriochloa bladhii</i> subsp. <i>bladhii</i>	Forest Bluegrass	NL	LC
Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	Pitted Bluegrass	NL	LC
Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet	NL	LC
Myrtaceae	<i>Corymbia tessellaris</i>	Carbeen	NL	LC
Cyperaceae	<i>Cyperus exaltatus</i>	Tall Sedge	NL	LC
Cyperaceae	<i>Cyperus gracilis</i>	Whisker Grass	NL	LC
Poaceae	<i>Digitaria longiflora</i>		NL	LC
Chenopodiaceae	<i>Dysphania pumilio</i>		NL	LC
Cyperaceae	<i>Eleocharis equisetina</i>		NL	LC
Poaceae	<i>Eragrostis sororia</i>		NL	LC
Poaceae	<i>Eriochloa pseudoacrotricha</i>	Early Spring Grass	NL	LC
Myrtaceae	<i>Eucalyptus melanophloia</i>	Silver-leaved Ironbark	NL	LC
Myrtaceae	<i>Eucalyptus tereticornis</i>	Queensland Blue Gum	NL	LC
Fabaceae	<i>Glycine microphylla</i>		NL	LC
Fabaceae	<i>Glycine tabacina</i>	Glycine Pea	NL	LC
Poaceae	<i>Heteropogon contortus</i>	Black Speargrass	NL	LC
Clusiaceae	<i>Hypericum gramineum</i>	Native St. John's Wort	NL	LC
Fabaceae	<i>Indigofera linifolia</i>		NL	LC
Juncaceae	<i>Juncus polyanthemus</i>		NL	LC
Juncaceae	<i>Juncus usitatus</i>	Common Rush	NL	LC
Poaceae	<i>Lachnagrostis filiformis</i>		NL	LC
Poaceae	<i>Leersia hexandra</i>	Swamp Ricegrass	NL	LC
Onagraceae	<i>Ludwigia peploides</i> subsp. <i>montevidensis</i>	Creeping Primrose	NL	LC
Mimosaceae	<i>Neptunia gracilis</i> forma <i>gracilis</i>	Native Sensitive Plant	NL	LC
Poaceae	<i>Paspalum distichum</i>	Water Couch	NL	LC
Polygonaceae	<i>Persicaria attenuata</i>	Smartweed	NL	LC
Polygonaceae	<i>Persicaria decipiens</i>	Slender Knotweed	NL	LC
Polygonaceae	<i>Persicaria hydropiper</i>		NL	LC
Polygonaceae	<i>Persicaria prostrata</i>		NL	LC
Asteraceae	<i>Pterocaulon redolens</i>		NL	LC
Fabaceae	<i>Rhynchosia minima</i> var. <i>australis</i>		NL	LC
Brassicaceae	<i>Rorippa eustylis</i>		NL	LC
Zygophyllaceae	<i>Tribulus micrococcus</i>		NL	LC
Typhaceae	<i>Typha orientalis</i>		NL	LC
Asteraceae	<i>Vittadinia sulcata</i>		NL	LC
Campanulaceae	<i>Wahlenbergia stricta</i>	Australian Bluebell	NL	LC
	<i>Anagallis arvensis</i> var. <i>arvensis</i>			
	<i>Cyperus</i> spp.			
	<i>Daucus carota</i> subsp. <i>sativus</i>			
	<i>Phytolacca oleracea</i>			
	<i>Verbena officinalis</i>			
	<i>Xanthium pungens</i>			