

environmental management



First Nine Master Planned Residential Development

EPBC Act Preliminary Documentation Submission

Publication Issue



Springfield Land Corporation
Brookwater Drive, Brookwater

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Executive Summary

This First Nine EPBC Act Preliminary Documentation Report has been prepared on behalf to the proponent, **Springfield Land Corporation (SLC)** in direct response to additional information requested by the **Commonwealth Department of the Environment and Energy (DEE)** as part of the “Controlled Action” assessment by Preliminary Documentation” determination for the “First Nine Master Planned Residential Development” (First Nine) made on the 13th of May 2016 (EPBC Reference: 2016/7676). The Controlled Action decision is based on **DEE’s** assessment of the project as potentially resulting in a Significant Impact on the following Matters of National Environmental Significance (MNES):

- Listed Threatened Species & Communities (Sections 18 & 18A) – more specifically defined in the request for further information on the Koala (*Phascolarctos cinereus*) combined populations of QLD, NSW and the ACT.

Information provided within this report includes:

- A brief summary of the proposed development and a description of the EPBC process;
- A description of the action including timeframes and staging;
- A description of MNES which may be affected by the proposal;
- Comments on ‘critical habitat’ for the Koala and the quality of habitat to be removed;
- A discussion of empirical research about the impacts of development on MNES which may be affected by the proposal;
- Procedures to be implemented prior and during vegetation clearing and construction;
- Measures to avoid, minimize and mitigate impacts on MNES;
- Consideration of social and economic matters;
- Details of the proposed environmental offset for listed significant impacts, and;
- A number of preliminary Draft Management Plans outlining mitigation and management measures for protection of MNES.

Koala (*Phascolarctos cinereus*)

The Koala is listed as a vulnerable species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). At the time of the original referral, supplementary assessments and compilation of this preliminary documentation, **DEE** were operating under the *Draft Referral Guidelines for the Vulnerable Koala* which protects *habitat critical to the survival of the species*. Consequently, some of the assessment and supporting information provided as part of this documentation references the impact on *critical habitat* for the Koala under the draft definition, however, final calculations and discussion on impacts to *critical habitat for the survival of the species* have been made under the definition used within the final *EPBC Act Referral Guidelines for the Vulnerable Koala*, which were released by **DEE** in January 2015.

A significant portion of Queensland’s naturally occurring vegetation, particularly in South East Queensland, is identified as *critical habitat* for Koala due to the prevalence of Koala food tree species across most landscapes. The First Nine referral area is predominantly vegetated including a number of species that satisfy the *critical habitat* threshold, hence the project’s Controlled Action determination. The project will result in the removal of *critical habitat* for Koala and subsequently is considered to have the potential to have a ‘significant impact’ on the species based on assessment of site Koala usage and knowledge of the broader population.



Impacts

First Nine encapsulates a total land area of 47.25 ha, which includes the 40.8 ha First Nine development footprint and an additional 6.45 ha earthworks fill location external to the project. Of this 47.25 ha, 46.2 ha is considered to support vegetation defined by the **DEE** as *critical habitat* for the Koala. Impacts to MNES can be described as the clearing or fragmentation of this 46.2 ha of critical habitat for the Koala.

Environmental Offsets

As the First Nine project site falls within the Greater Springfield project area, environmental offsets will be provided via a portion of the 396 ha of Conservation Land previously dedicated by **SLC** to compensate environmental impacts associated with the development of Greater Springfield. Although designated for Urban Development in the *South East Queensland Regional Plan 2009-2031*, this land was set aside for the contribution it made towards continuing the Flinders – Greenbank – Karawatha Bioregional Corridor and its direct nexus to the White Rock Conservation Park; both significant strategic features in the long term sustainability of Koalas in South East Queensland. As part of the Preliminary Documentation submission and assessment process for Spring Mountain (EPBC Reference: 2013/7057) the **DEE** acknowledged the 396 ha conservation land dedicated to **Ipswich City Council (ICC)** over 2006 and 2011 as an “advanced offset” for the purposes of **DEE’s Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy 2012**. A portion of the remaining “advanced offset” is proposed to satisfy the offset requirements for First Nine.

Management Plans / Mitigation Measures

This First Nine EPBC Act Preliminary Documentation Report includes a preliminary Koala Management Plan to provide the Department with some certainty that potential impacts can be mitigated and managed, however, it is noted that conditions associated with an approval are nominated to be outcomes based in accordance with **DEE’s Outcomes-based Conditions Policy 2016**.

Preliminary Documentation Information Request

On the 15th June 2016, the Department issued the request for additional information required for assessment by Preliminary Documentation. This First Nine EPBC Act Preliminary Documentation Report provides a response to the item requirements requested by the **DEE**. The following summary table provides cross references to the locations where these items have been addressed throughout this report.

It is noted that further detail on response to items listed in Section 4.2 of the information request in relation to proposed avoidance, mitigation and management for impacts to Koalas is addressed in the Koala Management Plan contained in **Attachment C**.



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Acronyms

AKF	Australian Koala Foundation
BSMPP	Brookwater South Master Precinct Plan
DCP	Development Control Plan (now Springfield Structure Plan)
DEE	Department of the Environment and Energy (Cth)
EHP	Department of Environmental and Heritage Protection (Qld)
EIA	Environmental Impact Assessment
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
ICC	Ipswich City Council
IKPS	Ipswich Koala Protection Society
KMP	Koala Management Plan
MNES	Matters of National Environmental Significance
NCA	<i>Nature Conservation Act 1992</i> (Qld)
NRM	Department of Natural Resources and Mines (Qld)
PMST	Protected Matters Search Tool
QPWS	Queensland National Parks and Wildlife Services
RE	Regional Ecosystems
SBMP	Site Based Management Plan
SIA	Social Infrastructure Agreement
SLC	Springfield Land Corporation
SPP	State Planning Policy (Qld)
SPRP	State Regulatory Planning Provisions (Qld)
SSP	Springfield Structure Plan
SWC	Springfield Wildlife Corridor
TEC	Threatened Ecological Community
VCFMP	Vegetation Clearing and Fauna Management Plan
VMA	<i>Vegetation Management Act 1999</i> (Qld)
WPMP	Wildlife Protection and Management Plan



I. Introduction

The *Environmental Management Division* of the **Saunders Havill Group (SHG)** act on behalf of **Springfield Land Corporation (SLC)** in the coordination and production of the response to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Controlled Action Determination assessment on Preliminary Documentation for the proposed “First Nine Master Planned Residential Development” hereafter “First Nine” at Brookwater Drive, Brookwater (EPBC Reference: 2016/7676). First Nine falls within the broader Greater Springfield development area, however, this referral is limited to a component owned by **SLC**.

On the 30th of March 2016, a referral under the EPBC Act was made to the Commonwealth **Department of the Environment and Energy (DEE)** for a controlled action assessment. On the 13th of May 2016 this application was deemed a Controlled Action requiring assessment by “Preliminary Documentation”. The Controlled Action decision was based on the determination of potential impacts on the following Matters of National Environmental Significance (MNES):

- Listed threatened species and communities (sections 18 & 18A), specifically Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT, listed as Vulnerable.

This decision was made by the **DEE** despite the referral application and supporting technical reports suggesting a Not a Controlled Action outcome (refer to **Attachment A** for a copy of the original Referral Application). The First Nine referral area is shown as **Plan 1**.

I.I Site Description and Details

Address	Brookwater Drive, Brookwater QLD 4300
RPD	Part of Lot 161 on SP27165
Site Area	47.25ha
Area of Impact	46.2ha of the site remains vegetation and is considered to provide critical habitat for the Koala
Open Space Areas	1ha of parkland
Action Summary:	<ul style="list-style-type: none"> ▪ Residential ▪ Medium Density Residential ▪ Local Centre (local shops) ▪ Local Park ▪ Trunk and non-trunk roads and other infrastructure
Tenure	Freehold – Owned by Springfield Land Corporation
Local Government Area	Ipswich City Council
Planning Scheme/Local Plan	Greater Springfield portions of the <i>Ipswich Planning Scheme.2006</i> / Brookwater Precinct Plan
Area Classification	Community Residential
Existing Approvals:	The Greater Springfield statutory planning approval included in the preparation of a comprehensive Environmental Impact Statement that dealt with environmental matters including the Koala, amongst other relevant planning matters. The Springfield Structure Plan was approved by the Queensland State



Government on 24 January 1997, before the provisions of the EPBC Act existed. First Nine's core approvals occur within the approved Springfield Structure Plan. Significant advances have occurred in consultation with **Ipswich City Council** or this development area.

Site Context

Contextually, Frist Nine is located to the north of Springfield Central, approximately 13 km southeast of Ipswich City and approximately 26 km southwest of Brisbane City. The site is encompassed by the existing greens of the Brookwater Golf Course (Holes 1 to 9) and adjoins Brookwater Community Residential Development to the west, vacant land and Opossum Creek to the north, future town centre to the east and commercial land uses to the south. The site is bound by Augusta Parkway to the south and is traversed by the proposed extension of Brookwater Drive. The surrounding suburbs of Brookwater, Augustine Heights, Springfield Town Centre and Springfield Lakes are highly urbanised and contain a mixture of residential housing, commercial properties and industrial land uses. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial.

Environmental Values

Despite surrounding urban development, the site remains predominantly vegetated and partially connected to larger parcels of undeveloped land to the north associated with Opossum Creek and zoned Conservation. A number of unmapped drainage features traverse the site which ultimately flow into Opossum Creek. These features reflect incised gullies with no riparian vegetation or aquatic value.

The application site currently supports different vegetation communities identified through Queensland's Regulated Vegetation Management Mapping, protected under the *Vegetation Management Act 1999*, as 'Least Concern' and 'Of Concern' Regional Ecosystems. Vegetation surveys undertaken by **SHG** in 2015 identified most of the vegetation on-site contained a high density of *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark) and *Eucalyptus siderophloia* (Grey Ironbark), however, *Corymbia citriodora* (Spotted Gum) was also found in notable proportions. Sub-dominant species included *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash). While retaining a consistent canopy of Koala Trees, survey noted parts of the project area displayed a level of degradation caused by access tracks, historical clearing and weed infestations.

MNES

Targeted flora and fauna surveys conducted by **SHG** in 2015 confirmed the presence of, and suitable habitat for, the Koala, which is listed as Vulnerable under the EPBC Act. A Koala Management Plan incorporating mitigation and management measures, has been prepared to ensure principles of Koala sensitive development, including road design and placement, vegetation clearing practices and fauna friendly fences and crossings, are incorporated into the design, construction, operation and management of the development. Surveys did not record the presence of, or consider a likely occurrence of, any other MNES.

Environmental Offsets

As part of the Preliminary Documentation submission and assessment process for Spring Mountain (EPBC Ref: 2013/7057), the **DEE** has acknowledged the 396 ha of Conservation Land dedicated over 2006 and 2011 by SLC to **Ipswich City Council (ICC)** as an "advanced offset" for the purposes of **DEE's Environmental Offsets Policy 2012** (it is noted that the offset is not a formally registered advanced offset). Importantly, the "advanced offset" remains in the ownership of the **SLC**. A portion of the remaining "advanced offset" is proposed to satisfy



the offset requirements for First Nine. **Chapter 7** of this Preliminary Documentation submission details offset outcomes in accordance with **DEE's Outcomes-based Conditions Policy 2016**.



1.2 Proposal Description (Action)

First Nine is proposed to be developed in accordance with the outcomes set out in the original 'master plan' for the Greater Springfield project, the Springfield Development Control Plan (DCP), now known as the Springfield Structure Plan (SSP), which forms part of the *Ipswich Planning Scheme 2006*. The SSP (refer **Plan 2**) defines areas for development and areas of open space, which are subsequently refined through the Precinct Planning approval process. The SSP also allows for predominantly residential uses at a variety of densities and product types. The precise type and volume of each residential type remains subject to final applications against the SSP to be approved by **ICC**. For the purposes of this referral, the action is described as a residential master planned development with ancillary local shopping and open space and will be developed in accordance with the proposed Brookwater South Precinct Plan and Brookwater South Master Precinct Plan (BSMPP) (refer **Plan 3**).

On the 5th of May 2016, a meeting was held with representatives from **SHG, SLC** and the **DEE** in Canberra to discuss the First Nine Referral. At this meeting it was noted that an additional 6.45 ha of land adjoining the First Nine Referral area is required to stockpile excavated material from the development footprint. It was agreed that this additional 6.45 ha fill area would form part of the First Nine impacts and was to be included in the revised referral area. Subsequently, the Preliminary Documentation Further Information Request issued by the **DEE** (refer **Attachment B**) requests further detail on potential impacts to MNES associated with the fill area. This Preliminary Documentation Report addresses impacts, management and offsets associated with the revised 47.25 ha First Nine Referral area (refer **Plan 1**).

Additionally, at the 5th of May meeting, the Habitat Assessment for the First Nine area was discussed. It was agreed by both parties that a revised critical habitat score of 6 (increased from 5 in the original referral in **Attachment A**) would be adopted in this Preliminary Documentation package. This revised score was agreed to apply to the critical habitat within the First Nine development footprint as well as the adjoining fill area, and has subsequently been fortified by field survey results as per accepted habitat quality protocols.

The primary statistics for assessment purposes are:

Site Area:	=	47.25 ha
Vegetated Areas of the Site:	=	46.2 ha
Cleared Areas of the Site:	=	1.25 ha
Total Direct Clearing Impact:	=	46.2 ha
Total Impact on Koala Habitat:	=	46.2 ha
Development Footprint:	=	39.8 ha
External Cut/Fill Area:	=	6.45 ha (within the 47.25ha)
Total Open Space Areas:	=	1 ha (Parkland) (within impact area)
Total number of allotments:	=	850 dwellings

The following land uses are proposed across the site

- Low Density Residential
- Medium Density Residential
- Local Centre
- Vehicular Movement
- Pedestrian and cycle paths
- Parks and Open Spaces



- Infrastructure (roads and stormwater)

In terms of MNES, the impacts of the action can be described as:

1. The direct clearing and fragmentation of approximately 46.2 ha of remnant and regrowth vegetation considered *habitat critical to the survival of the species* being the Koala with a Habitat Score of 6.
2. Earthworks linked to creating grades to support roads and dwelling construction.
3. Stockpiling of excavation material.
4. New and expanding infrastructure to support the creation of allotments.
5. Establishment of hardstand areas over the majority of the development site.
6. Expansion from surrounding areas of existing road networks (existing major roads already in place – new development primarily brings local roads).
7. Expansion of surrounding land uses (urban) bringing people, domestic pets and potential exotic garden planting species.

I.3 EPBC PROCESS

First Nine was issued a Controlled Action determination under the EPBC Act by the **DEE** on the 30th of March 2015, despite all application reporting and specialist technical reporting based on detailed site surveys supporting the position that the project is NOT a Controlled Action.

DEE have deemed the project a “Controlled Action” based on potential impacts on listed threatened species (sections 18 & 18A), specifically the Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT, listed as Vulnerable. Koala referrals are assessed against the triggers and thresholds of the January 2015 *EPBC Act Referral Guidelines for the Vulnerable Koala* (Koala Referral Guidelines).

Based on the **DEE** determination made, the project is to be assessed through “Preliminary Documentation” which is one of six assessment processes available under the EPBC Act. The assessment flowchart provided on the following pages has been highlighted in red to show components of the assessment already completed, also noting the current status of the project and remaining actions to be undertaken. With the Controlled Action determination made on the 13th May 2016, the **DEE** provides a list of additional information required within this [First Nine EPBC Act Preliminary Documentation Report](#) (refer **Attachment B**). As part of this assessment processes, the Preliminary Documentation must be published for public comment.

Additional Information Requested

Broadly the additional information requested revolves around the following items, which have been addressed as part of this Preliminary Documentation:

- A description of the action including timing, phasing and key infrastructure requirements.
- Details of the proposed excavation area including maps and assessments.
- An assessment of potential impacts to MNES including extent and quality of habitat.
- An assessment of site vegetation against the critical habitat criteria for Koala.
- Further details on Koala use of the site and habitat quality (assessment of direct and indirect impacts).
- Further evidence on how impacts on MNES can be mitigated and minimised.
- Discussion and comments on the indirect impacts of residential uses on Koalas (dogs, cars, etc.).
- Details of proposed offsets for MNES.
- Further information on economic and social impacts of the proposed action.

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- Further information on the development in relation to ecologically sustainable development.
- Further information on other approvals and conditions relevant to the proposal.



EPBC Act environment assessment process—referral

Deciding if a proposed action needs to be referred

Is the proposed action likely to have a significant impact on a matter of national environmental significance?

The matters of national environmental significance are:

- world heritage properties
- national heritage places
- wetlands of international importance
- threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park, and
- nuclear actions (including uranium mines)

• Is the proposed action likely to have a significant impact on the environment in general (for actions by Commonwealth agencies or actions on Commonwealth land) or the environment on Commonwealth land (for actions outside Commonwealth land)?

• If you are not certain about whether your proposed action requires approval under the EPBC Act you may refer the proposal for a decision by the minister.

RED = Completed
BLUE = To be completed

NO

Approval is not required from the minister.

YES

Person proposing to take the action makes a referral to the minister via the department.

The minister makes a decision within 20 business days on whether approval is required under the EPBC Act and on the process of assessment.

Controlled action

Not controlled action 'particular manner'

Not controlled action

Action is subject to the assessment and approval process under the EPBC Act.
(Refer to the Assessment/decision whether to approve flowchart)

Approval is not required if the action is taken in accordance with the manner specified.

Approval is not required if the action is taken in accordance with the referral.

Action is clearly unacceptable
The minister makes a decision within 20 business days.

Person informed of decision.

Person may withdraw referral and take no action.

Person may withdraw and submit a modified proposal as a new referral.

Person may request the minister to reconsider the decision.

10-business day public comment period.

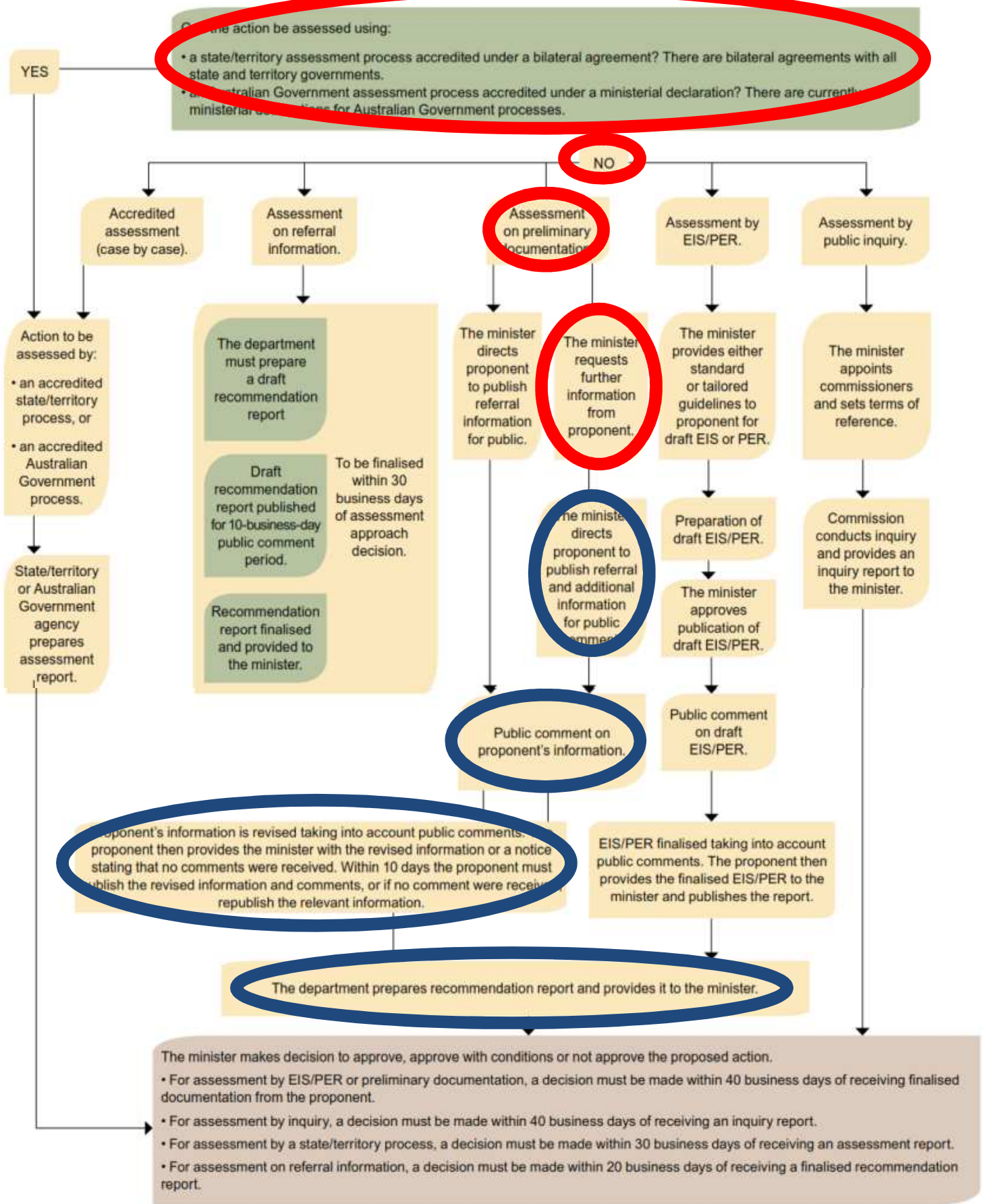
The department prepares report on relevant impacts and comments.

The minister makes a reconsideration decision within 20 business days.

Action is clearly unacceptable

Controlled action

EPBC Act environment assessment process—assessment/decision whether to approve





I.4 Purpose of this Preliminary Documentation Report

The purpose of this Preliminary Documentation Report is to provide additional information to the **DEE** to accompany the Preliminary Documentation assessment process to ultimately obtain formal approval for First Nine. To achieve this purpose, the structure of the report lists out and responds to each item of additional information requested by the Department.

The following chapters within this Preliminary Documentation Report address the item requirements of the request for additional information for assessment by Preliminary Documentation in the **DEE** Controlled Action determination dated 13th May 2016 (refer **Attachment B**), specifically:

- Description of the Action (refer **Chapter 3**)
- Description of the Environment and Matters of National Environmental Significance (refer **Chapter 4**)
- Relevant Impacts on MNES (refer **Chapter 5**)
- Proposed Avoidance, Management and Mitigation Measures (refer **Chapter 6**)
- Proposed Offsets (refer **Chapter 7**)
- Environmental Outcomes (refer **Chapter 8**)
- Social and Economic (refer **Chapter 9**)
- Ecologically Sustainable Development (refer **Chapter 10**)
- Environmental Record of Person(s) Proposing to Take the Action (refer **Chapter 11**)
- Other Approvals and Conditions (refer **Chapter 12**)
- Format (adopted throughout this document)

Figures, Plans and Attachments referred to in this Preliminary Documentation Report are provided as appendices to the main document.



2. Development Background

2.1 Background Information and Need for the Proposal

Statutory planning approval for the Greater Springfield project was obtained on 24th January 1997, when the Queensland Government approved the Springfield Development Control Plan (DCP), the original 'master plan' for the Greater Springfield project area. The DCP is now known as the 'Springfield Structure Plan' (SSP) (refer **Plan 2**). Soon after, a stand-alone Act of Queensland Parliament – the *Local Government (Springfield Zoning) Act 1997* (Qld) – was unanimously passed to endorse the land use intent of the SSP. In the Second Reading Speech for that Act, the Honourable Di McCauley MP (Minister for Local Government and Planning at the time) stated:

"The Government has agreed to undertake this zoning as Springfield is an important project for south-east Queensland. It has many benefits for the State's economy and for the Ipswich region in particular. It also points to the way in which communities in Queensland will be planned and developed in the future and for this reason it is important that the development control plan is put into operation without further delay."

SLC has entered into special infrastructure agreements with the Queensland Government and **ICC** to facilitate the Greater Springfield project. As early as 1994, **SLC** entities and the Queensland Government entered into a 'Social Infrastructure Agreement' setting out how the infrastructure needs of the newly-planned Springfield community would be delivered by the public and private sector. In 1998, **SLC** entities and the **ICC** entered into the Springfield Infrastructure Agreement (SIA), under which **SLC** and **ICC** agreed, in a collaborative way which was unique for its time, to each provide extensive infrastructure to Greater Springfield. The SIA was a 'first of its kind' in Queensland and has served as a model for similar agreements. The importance of the Springfield agreements was acknowledged by the Queensland Parliament in 1995, when legislation was passed (the *Local Government (Planning and Environment) Act Amendment Act 1995* (Qld)) confirming the validity of certain key agreements between SLC entities and Government, which might otherwise have been invalid.

SLC undertook a comprehensive Environmental Impact Assessment (EIA) as part of the requirement associated with securing the Queensland Government approval for the Springfield DCP. Investigations associated with the EIA did not note any significant Koala population present at Springfield or likely impact of the proposal on this species. It is noted that at this time Koala legislation was in its infancy at the Queensland State Government.

The EIA informed the future sustainable integrated land use planning for the Greater Springfield project based on a concept of a 'city within a parkland'. Areas of environmental value were retained and protected through inclusion within the project area of planned green space and open space networks. These green space areas provided shared use habitat and fauna movement corridors. **SLC** planned and retained land for linear central open space corridor that traverses for approximately 11 lineal kilometres through the entire land holding, with a series of green space spines that connect into the adjacent lands and provide a range of different functions from environmental, conservation to recreation and active sports. This resulted in **SLC** retaining approximately 32% of the Greater Springfield land holding as 'green space' – a far greater figure than the usual industry standard in land development, even by today's standards. One of the areas more recently set aside, referred to as the Springfield Conservation Area, today comprises 396 ha and is of significance because of its links to the Flinders-Karawatha Bioregional Corridor and the White Rock-Spring Mountain Conservation Estate. The area was dedicated by **SLC** to **ICC** free of charge over the period of 2006 to 2011.



Development at Greater Springfield by **SLC** and its development partners has always proceeded in accordance with 'best practice' environmental measures. Being a master-planned city, world best practice environmental design principles have been incorporated into Greater Springfield's development. The Springfield agreements have been the foundation of Greater Springfield, allowing the development to set new standards for master planning and providing critical certainty for both Government and developers about provision of infrastructure – including open space and conservation land – to the development. Greater Springfield is now one of the largest master planned cities in Australia.

2. Development Context

Greater Springfield area has been consistently developed since 1997. First Nine represents a small portion of land within the Greater Springfield area which is to be developed by **SLC**. It is noted that a number of other developers propose and continue to develop within Greater Springfield in complete isolation to any works completed by **SLC**.



3. Description of the Action

DEE request the following information in relation to Item 1 – Description of the Action:

The preliminary documentation must provide a detailed description of the proposed action. The preliminary documentation must include a summary of all component of the action, a description of the activities associated with the potential development, and plans or maps to delineate the position of all activities and components of the action (including retained vegetation). In particular, please clarify the following proposed activities and impact areas including:

- (a) The location, boundaries and size (in hectares) of the disturbance footprint and of any adjoining areas, which may be indirectly impacted by the proposal including areas adjoining proposed for dumping of the excavated material. Information should outline the proposed construction activities associated with each activity (pre-construction, construction and operational);
- (b) A description of the operational requirements of the action and any anticipated maintenance works;
- (c) The anticipated timing and duration (including state and completion dates) for both construction and operational components;
- (d) An indicative layout plan for the proposed action area, including the location and type of land use, key infrastructure, and the number and location of dwellings, other buildings, open space and conservation areas.
- (e) Details of the proposed excavation including:
 - i. maps of the area to be excavated,
 - ii. detail of the total volume of material to be excavated, and
 - iii. maps showing the location of fill placement on-site or off-site including transport routes.

Where relevant information was provided at the referral stage, incorporate or refer to this information as necessary in the consolidated preliminary documentation.

(DEE Preliminary Documentation Decision – Page 2)

3.1 Brief description of works

Description of proposed action

The First Nine project site comprises of 47.25 ha within the Greater Springfield development area (refer **Plan 1**). First Nine, formally known as Brookwater South, will be developed in accordance with the approved Springfield Structure Plan (refer **Plan 2**) and proposed Brookwater South Precinct Plan (March 2016). Proposed land use is shown by the proposed Brookwater South Master Precinct Plan (BSMPP) (refer **Plan 3**).



The following key statistics are proposed as part of the proposal:

Site Area:	=	47.25 ha
Vegetated Areas of the Site	=	46.2 ha
Total Direct Clearing Impact	=	46.2 ha
Total Impact on Koala Habitat	=	46.2 ha
Total Open Space Areas	=	1 ha (Parkland)
Total number of allotments	=	897
Future Population	=	2,400

The following land uses are proposed across the site:

- Low Density Residential
- Medium Density Residential
- Local Centre
- Vehicular Movement
- Pedestrian and cycle paths
- Parks and Open Spaces
- Trunk and non-trunk roads and other infrastructure

The First Nine development area adjoins the existing and completed Brookwater Community residential development and is immediately encompassed by the existing greens of Brookwater Golf Course (Holes 1 to 9). More broadly the site is surrounded by residential development, including Augustine Heights to the west, Springfield Town Centre to the south and Springfield Lakes to the east and Brentwood through the north. Environmental features adjoining the site include Opossum Creek to the north and a patch of vegetation to the east which is identified within the Springfield Structure Plan as future Town Centre.

The First Nine Residential Development, while adjoining the existing Brookwater Community, will be developed under a separate planning instrument being the Brookwater South Precinct Plan. The development will complement the existing pattern of development in Brookwater.

MNES Impacts

In terms of MNES, the impacts of the action can be described as:

- The direct clearing and fragmentation of approximately 46.2 ha of remnant and regrowth vegetation considered *critical habitat to the survival of the species* being the Koala with a Habitat Score of 6. The proposal includes:
 - Earthworks linked to creating grades to support roads and dwelling construction.
 - New and expanding infrastructure to support the creation of allotments.
 - Stockpiling of material excavated from the developed footprint
 - Establishment of hardstand areas over the majority of the development site.
 - Expansion from surrounding areas of existing road networks (existing major roads already in place – new development primarily brings local roads).
 - Expansion of surrounding land uses (urban) bringing people, domestic pets and potential exotic garden planting species.

The proposal is currently forecast to begin trading and construction in October/November 2017. Logically, First Nine will expand from the west continuing on from the development type, theme and style already



completed in this area. The development is anticipated to be staged over 5-8 years. A Conceptual Phasing Plan is included as **Plan 3**.

3.2 Location, boundaries and size of the disturbance footprint and impact areas

The 47.25 ha First Nine referral area is comprised of a 40.8 ha development footprint and 6.45 ha external fill site (refer **Plan 1** for the referral area and boundary coordinates). The total impact on Koala habitat is listed as approximately 46.2 ha. The footprint will be disturbed progressively in accordance with the relevant approved management plans. These plans will include a raft of mitigation and management measures for construction and operational phases of development including:

- Pre-clearance fauna checks and approvals
- Fauna exclusion and habitat protection fencing
- Weed management and control
- Revegetation and natural bushland regeneration
- Signage and education

3.3 Brief overview of construction methods, techniques and materials

The specific construction methods, techniques and materials relating to the proposal are yet to be determined. Appropriate construction methods, techniques and materials will be determined in accordance with the site specific Vegetation Clearing and Fauna Management Plan (VCFMP), Fauna Management Plan (FMP) and Koala Management Plan (KMP).

A KMP addressing ecological issues relevant to Koala for the construction and operation stages of First Nine has been prepared by **SHG** and included as **Attachment C**. The KMP should be read in conjunction with all approved Civil, Landscape, Vegetation Clearing and Management Plans, Fauna Management Plans and Rehabilitation Plans and Specifications.

3.4 Brief overview of the operational and maintenance requirements

First Nine will be subject to an on maintenance period before handover to Council. Due to the fragmentation of the First Nine Development site, the development does not propose to retain significant tracts of vegetation which would support a local fauna population and does not intend to provide fauna movement solutions to encourage fauna into the development area.

Given the careful identification of likely impacts and the base studies undertaken as part of this Preliminary Documentation process, it is anticipated that the implementation of the KMP will ensure the efficient and effective protection for the Koala, throughout the project site and for the life of the project.

3.5 The anticipated timing and duration for construction and operation

Construction activities will commence shortly after EPBC Act approval is obtained (anticipated to ideally commence in October / November 2017), and will continue for approximately 5-8 years. A Conceptual Phasing Plan is included as **Plan 4**.



3.6 Indicative Layout Plans

First Nine will be developed in accordance with the approved Brookwater South Master Precinct Plan (refer **Plan 3**).

3.7 External Fill Site

The referral area includes a 6.45 ha area external to the First Nine development footprint which will be cleared as part of the proposal to stockpile fill material removed from the development footprint (refer **Plan 1**). The fill site adjoins the existing greens of Brookwater Golf Course and Eden Station Drive.

Queensland contour mapping (refer **Figure 3**) shows the First Nine site reflects a low hill, with ridgeline extending from northeast to southwest across the centre of the site. Contours range from 80 m AHD along the ridgeline to 30 m AHD at the lowest point to the north. Approximately 287,500 m³ from the ridgelines will need to be excavated to establish a practicable development footprint and will be used to fill future Town Centre land to the east. **Figure 3** shows this area slopes towards the east from 50 m to 40 m AHD.

Access to the fill area will be via existing access tracks along Brookwater Drive and off Eden Station Road. The material will be used to fill the future town centre land (which includes the proposed fill site and land to the north) which will be developed in accordance with demand.



4 Description of the Environment and MNES

DEE request the following information in relation to Item 2 –Description of the Environment and Matters of National Environmental Significance:

The preliminary documentation must provide a general description of the environment of the development site, as well as the surrounding areas that may be impacted by the action both in the short and long term. This section must specifically address the following matters:

- (a) A description of the matters of national environmental significance (MNES), which may be affected by the proposal. This section must address, but need not be limited to the following matters:
 - Koala (*Phascolarctos cinereus*) combined populations of Queensland, New South Wales and the Australian Capital Territory – Vulnerable.

Where information was provided in the referral but updated information is now available, please provide the updated information. This may include

- Information about the resources used to identify and address the environmental values on site (i.e. was consultation or advice sought from flora and fauna experts in regard to the potential presence of threatened species and ecological communities);
- Information detailing known/recorded populations or habitat for the relevant MNES in the area surrounding the proposed action area. Information may include maps with distribution of MNES and associated habitat; and
- An assessment of the adequacy of any surveys undertaken (including survey effort and timing), in particular the extent to which these surveys were appropriate to key MNES and undertaken in accordance with the Department’s relevant scientific policy guidance.

(DoE Preliminary Documentation Decision – Pages 2 &3)

4.1 Description of the Environment


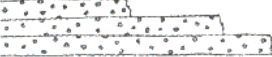
First Nine is located within the broader 2,860 ha Greater Springfield development area, which is located in Ipswich in South East Queensland. The development site adjoins the existing Brookwater residential development to the west and is encompassed by Holes 1 to 9 of the Brookwater Golf Course. Land to the south consists of commercial offices. Vacant land to the east is proposed for future expansion of the Springfield Town Centre (refer **Plan 2**). While separating existing golf course, the site adjoins Opossum Creek to the north, which is zoned for Conservation under the Springfield Structure Plan. It is proposed that First Nine will be developed as predominantly residential in accordance with the Springfield Structure Plan (refer **Plan 2**) and Brookwater Master Area Development Plan (refer **Plan 3**).

The referral area includes 6.45 ha to the south of the development footprint adjoining the Brookwater Golf Course and Eden’s Station Road, which will be filled with material from the development footprint. This parcel is highly disturbed as a result of edge effects and illegal dumping of rubbish. The southern portion of the external fill area has been cleared as part of construction of Eden’s Station Road. A number of access tracks traverse this area.



The First Nine referral area is a predominately vegetated. Regulated Vegetation mapping suggests the site contains composite Of Concern Regional Ecosystem 12.9-10.2/12.9-10.7/12.9-10.18 and essential habitat for the Koala (refer **Figure 4**). Areas not identified as remnant occur in the west over the western extent of Brookwater Drive. The site was found to be highly disturbed as a result of maintained access tracks, unlawful activities including motorbike and 4wd impacts, weed infestations, evidence of dogs, dumping of domestic rubbish and edge effects from surrounding development, in particular edge effects from the encompassing golf course. A number of access tracks, including the proposed extension of Brookwater Drive, traverse the site.

Regional Ecosystem mapping identifies the referral area is within Land Zones 9 and 10, which are described as:

<p>Land Zone 9</p> <p>Short description: fine grained sedimentary rocks</p> <p>General term: undulating country on fine grained sedimentary rocks</p> <p>Fine grained sedimentary rocks, generally with little or no deformation and usually forming undulating landscapes. Siltstones, mudstones, shales, calcareous sediments, and labile sandstones are typical rock types although minor interbedded volcanics may occur. Includes a diverse range of fine textured soils of moderate to high fertility, predominantly Vertosols, Sodosols, and Chromosols.</p>	
<p>Land Zone 10</p> <p>Short description: coarse grained sedimentary rocks</p> <p>General term: sandstone ranges</p> <p>Medium to coarse grained sedimentary rocks, with little or no deformation, forming plateaus, benches and scarps. Includes siliceous (quartzose) sandstones, conglomerates and minor interbedded volcanics, and springs associated with these rocks. Excludes overlying Cainozoic sand deposits (land zone 5). Soils are predominantly shallow Rudosols and Tenosols of low fertility, but include sandy surfaced Kandosols, Kurosols, Sodosols and Chromosols.</p>	

Extract: Land Zone definitions, Source: Queensland Government

Information on the site's soil properties has been obtained from the Australian Soil Resource Information System (ASRIS). Level 4 soil order mapping exists for the region and defines the application area as containing Dermosols (refer **Figure 5**). Dermosols are moderately deep and well-drained soils, occurring in the mountainous high rainfall zones of south-eastern Australia. They may be strongly acidic in the high rainfall areas or highly alkaline if they contain calcium carbonate. Dermosols support a wide range of land uses including cattle and sheep grazing of native pastures, forestry and sugar cane. Cereal crops, especially wheat, are commonly grown on the more fertile Dermosols.

Importantly, Dermosols do not have strong texture contrast. They have a well-structured B2 horizon containing low levels of free iron. The parent materials of dermosols range from siliceous, intermediate to mafic in composition. The soils are found in imperfectly drained sites (yellow and grey dermosols) with rainfall between 550 mm and 1350 mm and in well-drained sites with rainfall between 450 mm and 1200 mm. Dermosols generally have high agricultural potential with good structure and moderate to high chemical fertility and water-holding capacity with few problems.

Overall, no outstanding natural features were observed across the site. While the site remains vegetated with predominately native species, disturbance to the ground layer and surrounding influences of the golf course and development result in an open modified development site.



4.1.1 Field Survey Results

To identify existing ecological values at the site, on ground survey by **SHG** occurred in September 2015 over the First Nine Development area with conditions fine and sunny. A supplementary field survey was undertaken by **SHG** over the external fill area in May 2016. These surveys were carried out to address EPBC issues in relation to potential Matters of National Environmental Significance, however, a focus was placed on the Koala as this species is known to occur in the region. The survey methodology and results are presented in the Ecological Technical Memo Report, prepared by **SHG**, dated March 2016, which was submitted as part of the referral (refer **Attachment A**). The methodology adopted for Koala survey was the Spot Assessment Technique (SAT) by Phillips and Callaghan which is listed in the Koala Referral Guidelines. The same survey methods were repeated for the May survey of the external fill area.

A summary of broad vegetation zones and features presented below is shown by **Plan 5**.

It is noted that an additional habitat quality survey was completed by **SHG** in July 2017 over both the referral impact area and proposed offset area using the Queensland Government's 'Guide to determining habitat quality' (v1.2, April 2017). Findings from this assessment are discussed in **Section 7**, with regards to offset values, however, general findings have also been incorporated into the field results sections below.

Zone 1 – Eucalyptus Woodland

Zone 1 is largely reflective of mapped composite Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19. These regional ecosystems are described as:

- Least Concern RE 12.9-10.2: *Corymbia citriodora subsp. variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)
- Of Concern RE 12.9-10.7: *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c)
- Least Concern 12.9-10.19: *Eucalyptus fibrosa subsp. fibrosa* woodland +/- *Corymbia citriodora subsp. variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major*. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a)

Zone 1 contained a high density of *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark) and *Eucalyptus siderophloia* (Grey Ironbark), however *Corymbia citriodora* (Spotted Gum) was also found in notable proportions. Sub-dominant species included *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash). Vegetation within this zone was mostly undisturbed, with only minor disturbance from fire and track construction observed (refer photos).



Photos: Zone 1: Rocky outcrops



Photos: Zone 1: Eucalyptus Woodland

Zone 2 – Disturbed Areas

Zone 2 reflects non-remnant areas (both mapped and not mapped) which have been previously cleared. It is noted that a small portion of land within the western extent of Brookwater Drive has been previously cleared which is mapped as non-remnant (refer photos).

In addition, a number of access tracks were noted to have been previously cleared and heavily infested with weeds. Weeds found within this zone included *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton). Consists of areas previously cleared containing existing infrastructure.



Photos: Zone 2: Disturbed Areas



Photos: Zone 2: Disturbed Areas



Photos: Zone 2: Access tracks

Waterways and Drainage Features

Three mapped low order (Stream Order 1) tributaries envelope the site (outside the referral extent) within the existing golf course (refer **Plan 5**). These drainage features are not identified by Fisheries mapping. Field survey confirmed that these mapped watercourses reflect disturbed drainage lines which have been highly modified as a result of the encompassing Brookwater Golf Course. Unmapped overland flow paths (refer Photos below) drain from the centre of the site towards the Golf Course before ultimately draining into Opossum Creek. These features reflect incised gullies with no riparian vegetation or aquatic value.



Opossum Creek, approximately 50 m to the north, is separated from the site by the existing Brookwater Golf Course. Opossum Creek is identified as a Stream Order 4 watercourse and high risk (red) waterway by Fisheries. While outside the referral extent and not part of this assessment, the portion of Opossum Creek nearest to the site was noted by survey to contain relatively in-tact riparian vegetation consistent with mapped Of Concern Regional Ecosystems. This creek corridor is identified as Open Space within the Springfield Structure Plan to retain biodiversity values and maintain connectivity within the broader landscape.



Photos: Gullies within First Nine site

Fauna Habitat

The site is considered to contain suitable habitat for a variety of common mammals, reptiles, amphibians and birds. The majority of fauna observed on site were made up of avi-fauna common to the local area. These species included the *Eolophus roseicapilla* (Galah), *Corvus orru* (Torresian Crow), *Centropus phasianinus* (Pheasant Coucal), *Dacelo novaeguineae* (Kookaburra), *Manorina melanocephala* (Noisy Minor), *Ocyphaps lophotes* (Crested Pigeon), *Podargus strigoides* (Tawny Frogmouth), *Rhipidura albiscapa* (Grey Fantail) and *Rhipidura leucophrys* (Willie Wagtail). Other species observed on site included *Canis familiaris* (Dog), *Crinia parinsignifera* (Beeping Froglet) and *Tiliqua sp.* (Blue Tongued Skink).

A few small rocky areas were observed within the subject site, however, they contained limited habitat value due to the absence of suitable overhangs, crevices and hollows.

The site contained areas of eucalypt woodland typical of dry sclerophyll species (particularly avi-fauna and Koalas). One (1) Koala was recorded on site.

One (1) *Merops ornatus* (Rainbow Bee-eater) was observed on site and is considered to utilise the site as part of a broader home range. At the time of the referral this species was listed as migratory, however, has since been delisted. No suitable breeding places for the species was observed within the referral area.

No listed migratory species were recorded or are considered frequent visitors to the site. Survey did not locate any large or unusual nests associated with migratory, rare birds or birds of prey on site.

Fill Area

The proposed external fill area is highly disturbed as a result of clearing for Eden's Station Road to the south and unlawful land uses including dumping of rubbish. The area is traversed by a number of access tracks and weed infestations were noted along the edges of vegetation where adjoining cleared areas. The remainder of the site contains vegetation consistent with Zone 1 – Eucalyptus Woodland.



4.2 MNES which may be affected by the proposal

The **DEE** Controlled Action decision was based on the determination of potential impacts on the *Phascolarctos cinereus* (Koala) combined populations of QLD, NSW and ACT which is a listed threatened species and MNES under the EPBC Act. Field surveys were undertaken over the First Nine development site in September 2015 and over the external fill site in May 2016, as well as in July 2017 for habitat quality assessments. Potential impacts to MNES, including direct and indirect impacts as a result of the action, have been considered in this Preliminary Documentation Report. In terms of potential impacts to MNES, field assessment concluded that the Koala is the only threatened species that may be affected by the action. Surveys over the referral area confirmed the presence of suitable habitat for the Koala and recorded a sighting for one (1) individual during one day of the survey period.

It is acknowledged that Koala habitat by default provides temporal foraging habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*), desktop searches and review of previous ecological survey of the Greater Springfield Area by **Biodiversity Assessment and Management** in 2005, identified the potential for the Grey-headed Flying-fox to occur within the area. Site specific surveys by **SHG** over the referral area in both September 2015 and May 2016, however, did not record any individuals or roosting camps for the species. Further, survey confirmed that the proposed referral area does not contain optimal habitat for the species, such as wetter gully and drainage lines or ridges where higher value foraging habitat is predominately located. Survey noted that suitable habitat for the species was identified within the Opossum Creek corridor to the north, which is separated from the referral area by the existing Brookwater Golf Course and is designated within the Springfield Structure Plan as Open Space (refer **Plan 1**). As assessment against the **DEE's** Significant Impact Guideline 1.1 included as part of the referral (refer **Attachment A**) concluded that the abundance of suitable foraging habitat in the surrounding landscape to be retained within open space and conservation areas in close proximity to the proposed development, in particularly Opossum Creek corridor to the north, would likely mitigate any potential reduction of suitable habitat for Grey-headed Flying-fox.

The referral (refer **Attachment A**) noted one (1) *Merops ornatus* (Rainbow Bee-eater) was observed on site and is considered to utilise the site as part of a broader home range. This species has since been delisted as migratory. Further, as discussed in **Section 4.1** of this Preliminary Documentation Report, the field surveys concluded that no suitable breeding places were observed within, or within close proximity to, the referral area and thus impacts to the species are considered to be negligible.

4.2.2 Koala

Species Profile

Phascolarctos cinereus (Koala) is listed as Vulnerable under the EPBC Act. Koalas inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by *Eucalyptus* and *Corymbia* spp. In Queensland, Koala populations are known to occur in moist coastal forests, sub-humid woodlands, eucalypt woodlands along watercourses and non-riverine communities in the semiarid environments, from southern Queensland through to the Atherton Tablelands (Munks et al. 1996; Patterson 1996; Melzer et al. 2000; Ellis et al. 2002a; Sullivan et al. 2003). Koalas are absent from the tropical north and the arid west (Melzer et al. 2000). The species is known to occur in sclerophyll forests and woodlands on more fertile soils of coastal landscapes (QEPA 2006a). The highest density of Koalas occurs within the south-east part of the state (Dique et al. 2004).

In South East Queensland, White and Kunst (1990) estimated Koala densities for the Koala Coast Region to be 0.4 koalas/ha. Within the Koala Coast, Dique et al. (2004) estimated a mean density ranging from 0.02 to 1.26 Koalas/ha, and generally higher within large tracts, whilst at Point Halloran, Hasegawa (1995) recorded



densities as high as 1.9 to 2.5 Koalas/ha. To the near north within the Pine Rivers Shire, estimates of Koala density ranged from 0.06-0.42 Koalas/ha (urban environments) to 0-0.79 Koalas/ha (bushland sites) (Dique et al. 2003). These figures highlight the significant variation possible from various assessments and within the same region.

Home ranges are also known to vary considerably due to a variety of factors including location (e.g. home ranges in habitats of lower productivity being larger than those within higher quality habitats) and availability of preferred forage trees, though typically, males have larger home ranges on average than females. In South East Queensland, Koala Coast home ranges were found to vary between 2-20 ha (Thomson 2006), whilst in rural south-east Queensland, home ranges varied between 5.3-91.4 ha (White 1999). Koalas successfully use highly fragmented habitats that have only small remnants of the original vegetation (White 1999; QEPA 2006a and references cited therein). They also use young forest and highly modified vegetation such as grazed, disturbed or thinned forest and regrowth areas, moving significant distances across the ground between preferred trees (e.g. White 1999). Research has also found they prefer larger trees (QEPA 2006a and references cited therein).

While Koalas choose their habitat based on the suitability of food trees, the reasons for choosing these trees are not well understood. Soil fertility is thought to strongly influence the acceptability, palatability and nutritional content of selected browse species, whilst chemical composition is also suspected as a major factor determining the acceptance of selected foliage (Cork & Sanson 1990, Cork & Braithwaite 1996; Moore & Foley 2000; Moore et al. 2005). Collectively, the suite of tree species considered to be of primary and/or secondary importance to Koalas within South East Queensland include the following (after: Pahl 1993; QEPA 2002 & 2006a; & EHP 2012): *Eucalyptus acmenoides*, *E. carnea*, *E. crebra*, *E. exserta*, *E. fibrosa*, *E. grandis*, *E. major*, *E. moluccana*, *E. populnea*, *E. propinqua*, *E. racemosa*, *E. resinifera*, *E. robusta*, *E. seeana*, *E. siderophloia*, *E. signata*, *E. tereticornis*, *E. tindaliae*, *E. microcorys*, *E. umbra*, *Corymbia citriodora*, *C. intermedia*, *Lophostemon confertus*, and *Melaleuca quinquenervia*.

In Queensland, current data indicate that Koalas in the South East Queensland (though also the Brigalow Belt and Mulga Lands bioregions) are subject to substantial declines (Dique et al. 2004; DERM 2009). The so-called Koala Coast has been the subject of long-term monitoring of Koala ecology and population dynamics and the data derived from the area has been widely used as an important reference to assess the overall health of the Koala population of South East Queensland, as well as provided reference points for assessments of Koala elsewhere in the bioregion. On the basis of the results of the former DERM (now EHP) 2008 Koala Coast Koala survey, the 2008 population estimate of 2,279 Koalas represented a 51% decline in less than three years and a 64% decline in the decade following the original 1996-1999 estimate of 6246 koalas (see data cited in Dique et al. 2004 and DERM 2009). DERM (2009) identified that the largest declines occurred in bushland areas which showed a 59% reduction in koala numbers compared with a 30% reduction in urban areas. The large reduction of koalas in otherwise secure bushland was thought to be a flow on effect from excessive habitat loss and mortality in urban areas (DERM 2009). DERM (2009) concluded that the reduction in adequate recruitment to apparently secure bushland habitat areas is likely to be evidence of a dynamic process operating between the urban and bushland koala populations. DERM (2010) concluded that whilst there was a decline detected between the 2008 and 2010 surveys, the apparent difference was not statistically significant, meaning that there was no clear evidence of a decrease between the two years when margins of error were considered. DERM (2010) also concluded that the long term downward trend since the 1996-1999 survey was still statistically significant, showing a 68 per cent decline between 1996-1999 and the most recent (2010) survey.

Koala Survey Results



Site survey results presented in the Ecological Technical Memo (March 2016) prepared by **SHG** (refer **Attachment A**) and summarised in the Field Assessment Plan (refer **Plan 6**, which incorporates supplementary survey results for the external fill area) confirmed the only threatened fauna species detected on the site was the Koala. Detailed field surveys targeting this species were undertaken by **SHG** in accordance with the **DEE** Koala Referral Guidelines, which included Spot Assessment Technique (SAT) surveys and visual searches. Survey was completed over two (2) days during September 2015 and one (1) day in May 2016, and included 11 SAT surveys. During this time, a single Koala was sighted in the First Nine development area. It is noted that this specimen was sighted on the first survey day and not re-sighted during the survey period, indicating the individual is not confined to the site. Several scats were also recorded across the application area, however, overall 'low' level of Koala use was recorded (refer to **Plan 6** for further detail, and further discussion of critical habitat assessment in **Chapter 5**). It is noted that, although not the specific purpose of the surveys, no koalas were signed during habitat quality assessments conducted by **SHG** in July 2017.

Potential Impacts

Relevant impacts to Koala as a result of the action are discussed in **Chapter 5**.

The main identified threats to the Koala are loss and fragmentation of habitat, vehicle strike, disease, and predation by dogs (*Canis lupus familiaris*) (DERM 2009).

On average, approximately 110 Koalas are attacked and killed by dogs each year in South East Queensland. Records indicate that between 1997 and 2008 the Queensland Department of Environment and Heritage Protection's Moggill Koala Hospital and the Australian Wildlife Hospital at Beerwah admitted around 1,400 koalas that had been attacked by dogs

A search of the Atlas of Living Australia database returned one (1) record for the Koala within the 10 km of the project site and Wildlife Online search identified 568 records for the Koala within 10 km of the site (however the locations and dates of these records are unavailable).

A review of previous ecological assessments results by **BAAM**, **Austecology** and **SHG** for other land within the Greater Springfield area concluded that for the Koala:

- The species is known to occur in the Greater Springfield area and evidence of activity in the form of scats and sightings has been recorded,
- In general, the Greater Springfield development area provides relatively low value habitat,
- Vehicle strike is a significant risk factor, especially Centenary Highway,
- Areas of ecological significant and preferred Koala habitat are associated with the Springfield Conservation Land and its association with the Flinders-Karawatha Bioregional Corridor (approximately 4km south of the First Nine project site) and Opossum Creek to the north.

Mitigation and Management

A Koala Management Plan (KMP) incorporating Koala mitigation and management measures has been prepared to guide vegetation clearing (refer following chapters and **Attachment C**). Further details regarding anticipated impacts to Koala as a result of the development are discussed in **Chapter 5**, mitigation and management measures are discussed in **Chapter 6** and proposed offsets are discussed in **Chapter 7**.



5. Relevant Impacts

DEE request the following information in relation to Item 3 – Relevant impacts, specifically Part A which relates to Koalas:

The preliminary documentation must include an assessment of potential impacts (including direct, indirect, consequential and cumulative impacts) that may occur as a result of all elements and project phases of the proposed action on the MNES protected species addressed at Section 2.

Consideration of impacts must not be confined to the immediate areas surrounding the proposed action but must also consider the potential for the proposed action to impact on adjacent areas that are likely to contain MNES. For each protected MNES, this must include, but not be limited to, an assessment of:

- (a) The direct and indirect loss and/or disturbance of habitat from the proposed action. This must include the quality of the habitat and total area in hectares (and as a number of individuals, if available and applicable), and the area of potential habitat for the species and communities likely to be impacted;
- (b) Details on the distance of proposed works to any habitat for, or individuals of, EPBC Act listed threatened species and communities within 500metres of the disturbance footprint, and analysis of the long term viability of these populations if the proposal was to proceed. The information should consider and describe in detail all possible indirect impacts associated with the action, and should quantify the areas of habitat in hectares (and as number of individuals, if available) which may be indirectly impacted as a result of the proposal;
- (c) An assessment of environmental values at any potential off-site areas where excavated material may be dumped;
- (d) Details on whether any impacts are likely to be unknown, unpredictable or irreversible;
- (e) Analysis of the acceptability of relevant impacts;
- (f) Any technical data and other information used or needed to make a detailed assessment of the relevant impacts;
- (g) Detailed assessment of the proposed excavation including:
 - i. geological assessments of the excavation area such as acid sulfate soils assessment;
 - ii. hydrological assessments of the excavation area; and
 - iii. sediment and erosion controls to be used within the project area and any off-site fill placement (such as may be within an Erosion and Sediment Control Plan); and
- (h) A local and regional scale analysis of the likely impacts. This should include a discussion of connectivity, potential cumulative impacts with the broader regional and information on the long term viability of MNES if the proposal was to proceed.

All discussions and conclusions drawn regarding the assessment of impacts, direct or indirect, should include a full justification based on the best available information, including relevant conservation advices, recovery plans and threat abatement plans, if applicable. If these are not applicable, a brief statement to this effect must be included.

(DoE Preliminary Documentation Decision – Page 3 & 4)



5.1 Koala Profile

Conservation Status

Under the EPBC Act, Koala populations in Queensland, New South Wales and the Australian Capital Territory are listed as Vulnerable. The Koala is also listed as Vulnerable under Queensland's *Nature Conservation Act 1999* (NCA). The site is located within the modelled distribution of the Koala, within the "coastal context" as per the EPBC Act Referral Guidelines for the Vulnerable Koala (Koala Referral Guidelines).

Habitat

As described in the Koala SPRAT species profile, Koalas inhabit a wide range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species.

Distribution

Koalas are endemic to Australia and have a known distribution from north-eastern Queensland to south-east South Australia. The species is widespread within coastal and inland areas, however densities of Koalas are higher within coastal areas with higher average annual rainfalls. South East Queensland is known to support Queensland's highest density of Koalas.

Threats

The three (3) main threats to Koala have been identified within the SPRAT profile as:

- Habitat loss and fragmentation,
- Vehicle strike, and
- Predation by domestic and/or feral dogs.

In addition, the prevalence of disease such as the *Chlamydia* virus in many Koala populations has led to symptoms such as infections of the eyes, urinary tract, respiratory tract and reproductive tract, with the later having the potential to head to infertility in females. More recently, Koala Retrovirus (KoRV) has had an increasing impact on most of Queensland's Koala populations. While most Koalas carry the disease, environmental stresses such as poor nutrition and overcrowding lead to conditions caused by KoRV such as leukaemia and immunodeficiency syndrome.

5.2 Critical Habitat for Koala

The *EPBC Act referral guidelines for the vulnerable Koala* (Koala Referral Guidelines) issued in December 2014 describes Koala habitat as:

'Any forest or woodland containing species that are known Koala food trees or shrubland with emergent food trees. This can include remnant or non-remnant vegetation in natural, agricultural and urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; Koalas do not necessarily have to be present.'

A Koala Food Tree is defined within the Koala Referral Guidelines as:

'Species of trees whose leaves are consumed by Koalas. Koala food trees can generally be considered to be those of the following genus: Angophora, Corymbia, Eucalyptus, Lophostemon and Melaleuca. Note that food tree species may vary spatially and temporally and information specific to the local area is likely to be most accurate. Also note that 'primary' and 'secondary' food trees (as defined by some resource) are all considered



to be 'food trees' for the purpose of assessment using these guidelines. For some lists of Koala food tree species, refer to the scientific literature, or the:

- NSW Office of Environment and Heritage Koala habitat web page
- QLD Department of Environment and Heritage Protection Koala habitat webpage
- The New South Wales Recovery Plan for the Koala

Queensland's Regulated Vegetation Management Map shows the site contains areas of Category X (non-remnant) vegetation and Category B remnant vegetation containing composite Of Concern Regional Ecosystem RE12.9-10.2/12.9-10.7/12.9-10.19 (65/20/15). These Regional Ecosystems are shown in **Figure 4** and are described below:

RE12.9-10.2 (Least Concern)

Corymbia citriodora subsp. variegata open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis* and *Corymbia intermedia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments.

RE 12.9-10.19 (Least Concern)

Open-forest of *Eucalyptus fibrosa subsp. fibrosa* +/- *Corymbia citriodora subsp. variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major* open-forest. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments.

12.9-10.19a: *Corymbia henryi* +/- *Eucalyptus fibrosa subsp. fibrosa*, *Corymbia citriodora subsp. variegata*, *E. siderophloia*, *E. crebra* open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments

RE 12.9-10.7 (Of Concern)

Eucalyptus crebra +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments.

12.9-10.7a: *Eucalyptus siderophloia*, *Corymbia intermedia* +/- *E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas.

Essential habitat for the Koala is mapped across the site associated with mapped Regional Ecosystems. Queensland's Koala Habitat Values Map shows the site has been identified as containing areas of High and Medium Value Bushland Habitat and areas suitable for Medium and Low Value Rehabilitation (refer **Figure 6**).

5.2.1 Critical Habitat for Koala to be impacted

The site was assessed by Senior Ecologists from **SHG** over the original referral area over two days in September 2015 and over the external fill area over one day in May 2016 with weather conditions fine and sunny. The purpose of the survey was to determine the level of Koala usage across the site and to assess the availability of suitable Koala habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) development by Philips and Callaghan (2011)
- Quaternary Assessments (Habitat Surveys)
- Opportunistic Searches

In total, site specific searches observed the presence of one (1) Koala individual within the centre of the site as well as several scats across the site. Eleven (11) SAT surveys were conducted across the referral area, as shown



by the field survey effort presented in **Plan 6**. It is noted that in the referral, Koala activity assessment was undertaken in accordance with the “East Coast (Low) Density Area” use category as defined by the **Australian Koala Foundation’s** Koala Activity Level Classification. This Low activity category was originally used as it is considered the default for areas outside of the published study area (Philips & Callaghan 2011). Through further clarification via personal communication with the author Steve Phillips, it is acknowledged that the low use category, however, is not universally applicable and habitat and landscape characteristics should be considered when assigning the applicable use category. Subsequently, survey results have been reassessed using the East Coast (med-high) Density Area, which is applicable in habitats dominated by residual, transferral or alluvial type landscapes considered med-high nutrient soils with good water holding capacity (Steve Phillips, personal communication). Dermosols dominate the application area and this soil type, along with vegetation structure, is considered to meet the landscape requirement for the East Coast (med-high) use category.

The revised assessment shows all eleven (11) SAT surveys recorded evidence consistent with the “low” usage category for Koala Use (<22.52% of trees with scats) in coastal regions for East Coast (med-high) Density Area as defined and extracted below. **Table 1** shows a summary of the SAT survey results using the revised assessment category.

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
East Coast (low)	< 9.47%	≥ 9.47% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western areas (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

Extract: AKF Koala Activity Level Classification Table

▪ **Table 1: SAT Survey Results- Summary**

SAT Survey	Scats	%of Trees with Scats	Usage Level
SAT 1	Yes	13.3	Low
SAT 2	Yes	10	Low
SAT 3	Yes	16.7	Low
SAT 4	Yes	6.7	Low
SAT 5	Yes / Koala	10	Low
SAT 6	Yes	6.7	Low
SAT 7	Yes	16.7	Low
SAT 8	Yes	6.7	Low
SAT 9	Yes	6.7	Low
SAT 10	Yes	16.7	Low
SAT 11	Yes	6.7	Low

On the 5th May 2016, at a meeting with **SHG** and the **DEE** in Canberra, the Habitat Assessment for the First Nine area was discussed. It was agreed by both parties that a revised critical habitat score of 6 (increased from 5 in the original referral in **Attachment A**) would be adopted in this Preliminary Documentation package. The increase reflects a +1 for key existing threats. **Table 2** provides the revised Habitat Assessment for First Nine



with a score of 6. It is noted that this score of 6 has been given to both the original referral area and the external fill area due to consistent vegetation characteristics.

Table 2: Critical Habitat Assessment

Attribute	Score	Comment
Koala occurrence	+2	<p>The EPBC Act Protected Matters Search Tool identified the Koala as having potential to occur on site. A search of Queensland’s Wildlife Online Search Tool using a 10 kilometre radius found 568 records for the Koala. However, a search of the Atlas of Living Australia using a 10km radius returned no records for the species and a search of the Australian Koala Foundation Koala Map using a 10km radius found 1 record for a dead individual on Augusta Parkway in 2010.</p> <p>A single koala was observed on the site during the September 2015 field survey. In addition, scats were observed in several locations across the site corresponding with “high”, “normal” and “low” levels of use.</p> <p>As there is evidence of Koala occurrence in the previous two years, this attribute has been scored 2.</p>
Vegetation composition	+2	<p>A detailed description of the vegetation composition on site is provided in Chapter 4, based on the results from 2015 and 2016 ecological field survey. Overall, the site was found to be dominated by species that achieve the definition of ‘woodland’ as referenced in the Koala Referral Guidelines. Ecological survey of the site shows the referral area is predominately dominated by Eucalyptus and Corymbia species. Specifically, these species included <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus siderophloia</i> (Grey Gum), <i>Eucalyptus fibrosa</i> (Red Ironbark), <i>Eucalyptus moluccana</i> (Gum-topped Box), <i>Corymbia intermedia</i> (Pink Bloodwood), <i>Corymbia citriodora</i> (Spotted Gum), Broad-leaved Ironbark (<i>Eucalyptus fibrosa</i>) and Grey Ironbark (<i>E. siderophloia</i>). Further, there was a high dominance of <i>Allocasuarina littoralis</i> (Black She-oak) and <i>Acacia spp.</i> throughout the shrub layer and a number of weed species were identified. As vegetation composition of canopy species on site is made up of more than two species considered to be Koala food trees, this attribute has been given a score of 2.</p> <p>Two or more Koala food trees were identified in the canopy, resulting in an attribute score of 2.</p>



<p>Habitat connectivity</p>	<p>+1</p>	<p>Contextually, the site is bound by three (3) large 4-lane roads - Augusta Parkway to the south west, Eden Station Road to the south and Springfield Greenbank Arterial to the east. These major arterials and ultimately, Centenary Highway approximately 500m to the south, sever connectivity for Koala movement from the site to areas of suitable Koala habitat to the south (refer Plan 7).</p> <p>Locally, the site is disconnected from these habitats by the Brookwater Golf Course. The referral area occurs as a cul-de-sac of vegetation completely fragmented in all directions with the exception of Opossum Creek. Opportunities for connectivity are impeded as a result of properties to the south being cleared of vegetation for industrial, commercial and retail purposes, existing development of the Brookwater Community residential estate to the west, and zoning for future Town Centre on land to the east. Further no viable movement corridors or retention of Koala habitat has been planned for the referral area under the Springfield Structure Plan (refer Plan 2).</p> <p>Opportunities for Koala movement and wildlife connectivity remain along the Opossum Creek, which has been zoned for open space under the structure plan, and to the large patch of vegetation to the north. It is however noted that the majority of this remaining vegetation to the north is proposed to be cleared by current EPBC applications for Investa (EPBC Ref: 2013/7074) and Cherish Enterprises (EPBC Ref: 2014/7306) (refer Plan 7). Ignoring all surrounding developments and EPBC applications, the site forms part of a contiguous landscape of vegetation >500ha however once these approvals are in place, this vegetated landscape will be reduced to a contiguous landscape of approximately 210ha (i.e. <300ha) which falls below the medium habitat assessment score for coastal regions.</p> <p>While the site will be reduced to a contiguous landscape <300ha, as the site retains connectivity to Opossum Creek this attribute has been scored a 1.</p>
<p>Key existing threats</p>	<p>+1</p>	<p>Given the site's proximity to trunk roads that provide vehicle connectivity to the Centenary Motorway and nearby high density residential development, the threat of vehicle strikes is considerably high. A search of the Australian Koala Foundation Koala Map using a 10km radius found 1 record for a dead individual on Augusta Parkway in 2010. In addition, increases in dog ownership due to the rapid expansion of residential development in the Brookwater area also pose a significant threat to Koalas. Evidence of dogs within surrounding residential areas was observed. Given the existence of key threats to Koalas from vehicle strikes and dog attack, as well as the combined impacts from development in the surrounding area, the attribute has been scored 1.</p> <p>Due to the existence of key threats, the attribute has been scored 1.</p>



Recovery value	0	<p>The interim recovery objective for coastal areas is based upon protecting and conserving large, connected areas of Koala habitat, particularly where Koalas are genetically diverse/distinct, free of disease or have a low incidence of disease or where there is evidence of breeding. None of these elements are considered to be present on the referral site. This is primarily due to:</p> <ul style="list-style-type: none"> ▪ Surrounding development to the west and south and high density residential development proposed to the east. ▪ The proximity of existing residential development to the west and major arterials to the south. ▪ The prevalence of disease within the local population ▪ The insufficient size of the site in isolation to support a genetically robust sub-population. ▪ Absence of dedicated conservation areas or habitat linkages within the referral site. ▪ No evidence of breeding was observed. ▪ Suitable habitat will be retained along Opossum Creek corridor to the north of the site which provides wildlife movement and connectivity within the broader landscape. <p>Further, while majority of the site is identified under the Koala Habitat is South East Queensland mapping as containing Medium Value Bushland, surrounding areas are mapped as Medium and Low Value Rehabilitation or generally not suitable for the species. This is because the site is largely encompassed by existing development which restricts movement of to the west, south and east of the site. Further, as shown in Plan 2 -Springfield Structure Plan, planning intent is for the area to be completely developed with no conservation linkages to be retained within the referral area. Planned areas of retained open space have been dedicated along Opossum Creek corridor directly north of the site. This corridor is mapped as Low Value Bushland under the Koala SPRP and provides suitable habitat and wildlife movement for the Koala, and common fauna in the area, within the broader landscape.</p> <p>As discussed previously, the local Koala population is not considered to be genetically distinct and no evidence of Koala breeding was recoded on or near the site. Disease is known to be prevalent across all South East Queensland populations in the form of Chlamydia and Koala Retrovirus. The local Koala population is extremely unlikely to be free of disease.</p> <p>In addition, the site makes up a central portion of the Greater Springfield development area, adjoining existing residential to the west and Town Centre to the south and east. If the development does not go ahead, it will significantly affect existing and proposed development in the Greater Springfield area, specifically in its role providing a trunk collector from the Town Centre to the east to the existing development of Brookfield to the west. Overall, the site does not meet the interim recovery objectives for coastal regions.</p> <p>As the referral site does not meet the interim recovery objectives, this attribute has been scored 0.</p>
Total	6	Critical Habitat

The First Nine referral package prepared by **SHG** (refer **Attachment A**) outlines the methods and results of ecological survey of the subject site to quantify and qualify *critical habitat* for Koala under the Koala Referral Guidelines definition. Areas considered to contain *critical habitat* are shown in **Plan 8**. From this, the following statistics have been derived:



Site Area:	47.25 hectares
Area of Critical Habitat:	46.2 hectares
Area of Critical Habitat Removed:	46.2 hectares
Area of Critical Habitat Retained:	0 hectares

The proposed development of First Nine will impact on 46.2 ha of habitat critical to the survival of the species, as defined by the Koala Referral Guidelines

5.3 Impacts on the Koala

5.3.1 Long-term impacts of urban development on the Koala and long term persistence of the species in future urban areas

Research and monitoring on the long-term impacts on Koalas due to residential development is relatively limited, however, the density of a Koala population both prior to and following completion of a residential development has been studied within the Koala Beach Estate, a residential development on the northern New South Wales coast, in association with the **AKF**. This development incorporated a 'Koala-friendly' design to encourage the long term persistence of Koalas in the area. The most recent results of monitoring available for review suggest that Koala activity continues to be high in many areas of the residential estate, although no comparisons of actual numbers of Koalas were made (Callaghan and Rhodes 2005).

Rhodes (et. al 2011) undertook a study quantifying the impacts of multiple threats such as habitat loss, disease, vehicle strike and dog attacks using an integrated population modelling approach. This study found that addressing single threats is insufficient to recover a Koala population, rather, in order to minimise the long term impacts on Koalas from development, each threatening process must be addressed.

Systematic surveys for Koala have been conducted within the Koala Coast, an area 20 km south-east of Brisbane, since 1996 (Dique et al. 2004, EPA 2007, DERM 2009 and DERM 2010). The area subject to surveys has undergone extensive residential and commercial development (DERM 2010). The initial survey of the area estimated that the Koala population of the Koala Coast consisted of approximately 6000 individuals (Dique et al. 2004). Studies from 2008 have shown that this population has declined by up to 50% from 1996 estimates (DERM 2009), however, it has been suggested that this number has now stabilised as a result of a reduction in the rate of habitat clearing (DERM 2010).

A detailed assessment of Koala activity within Redland City showed that Koalas can survive in highly urbanised areas and Koalas are regularly observed within residential properties and in street trees (BAAM 2012). This study also suggested that Koala densities were highest in some of the more heavily urbanised areas in comparison to some rural-residential or bushland areas; a factor most likely attributable to a correlation between Koala abundance and the presence of primary food trees grown on nutrient-rich alluvial soils.

Disease has been cited by many authors as a serious and emerging threat to persistence of Koala populations and results from the **BAAM** (2012) study showed that disease contributed to 60% of the recorded Koala deaths between 1997 and 2012. Research has found that the loss of habitat as a result of development can lead to an increase in stress levels, which results in susceptibility to disease, leading to lower fecundity (birth rates) (Brearley et al. 2012).

Population models predict that as the amount of habitat declines, the overall landscape scale population mortality increases relative to the overall rate of reproduction (Fahrig 2001).



Changes to leaf moisture and foliar chemistry due to elevated CO₂ levels are predicted to significantly affect Koalas and other arboreal fauna (Kanowski 2001; Hughes 2003). A reduction in rainfall and an increase in bushfires will lead to increased mortality rates and will have a significant negative impact on Koala populations, especially small-isolated populations (Seebrook et al. 2011).

The available research indicates that continued loss of habitats, habitat fragmentation, disease, mortality from vehicles and dogs together with climate change impacts may result in many low-density Koala populations becoming unviable and ultimately locally extinct in some landscapes.

5.3.2 Impacts of roads and potential for long-term persistence of the Koala post development

Koalas are unusual amongst mammals in showing relative insensitivity to approaching vehicles and they fail to take evasive action (Prevet et al. 1992). Road deaths are recognised as a major cause of Koala mortality in fragmented urban areas (Dique et al. 2003).

As habitat is cleared, males are forced to disperse further in search of females, which can lead to detrimental encounters with dogs and vehicles, increasing rates of mortality (McAlpine et al. 2006). In quantifying the threatening processes for Koalas in the Koala Coast, it was found that the highest mortality rates occur in 2-3 year old Koalas, particularly in males (Rhodes et al. 2011).

Of the 6,329 records of Koala mortality obtained from the Daisy Hill Koala Hospital, 30% were a result of vehicle collisions (BAAM 2012). **BAAM** have conducted a specific study on Koalas and roads within the Redland City area which identified that high speed and high volume roads cause the majority of vehicle related deaths (BAAM 2004).

The location of the proposed development is such that Koalas restricted to habitats associated with waterway corridors on-site and vegetation to the west and south associated with White Rock-Spring Mountain Conservation Estate and more broadly Flinders-Karawatha Corridor, will not be forced to cross any major roadways to access any remaining habitats. However, there are opportunities for Koala/vehicle interactions at the site where the waterway corridors extend to the north and east and intersect Centenary Highway and local roads associated with Springfield Central.

The proposed development will include the retention of Koala food trees within open space; a factor which may bring local Koalas into contact with vehicles as they enter the residential development. Traffic-calming measures will be incorporated into the final development plans for the site to minimise the risk of vehicle-related mortalities. It should be noted that the internal roads will have a speed limit of 50 km/h, again reducing the risk of Koala fatalities as a result of high speed roads. Providing education packs to home owners and ongoing interpretation/awareness of dog controls will also reduce potential threats.

5.3.3 Critical size of 'habitat patches' and the long-term persistence of Koalas (general and relative to the site)

A study on the occurrence of Koalas in a fragmented rural-urban landscape at Noosa, Queensland, found that Koala presence was higher in patches of more than 100 hectares (McAlpine et al. 2006). This study also found increased fragmentation and isolation of habitat patches has a negative impact on Koala utilisation of the area.



The literature review has failed to identify any studies that have effectively quantified the minimum patch size required to ensure Koala population viability. However, a study that looked at alternative models for Koala conservation predicted that the occurrence of Koalas increases with habitat quality, size, shape complexity and proximity of neighbouring patches of similar habitat quality (McAlpine et al. 2006); size alone was not the single contributing factor for Koala occurrence. This study also found the area of forest habitat at the landscape level, together with fine scale habitat quality were important determinants of Koala occurrence, but landscape configuration had a negative effect directly related to the intensity of the land use matrix (e.g. presences of roads) (McAlpine et al. 2006).

While habitat for the Koala will not be retained within the development footprint, Opossum Creek to the north will be retained as Conservation under the Springfield Structure Plan (refer **Plan 2**).

Site Level

Approximately 46.2 hectares of vegetation on-site achieves the definition of *critical habitat* as defined by the Koala Referral Guidelines. However, there are many influencing factors that reduce the functionality of this habitat. In particular, disturbance from the encompassing golf course, surrounding residential and commercial development, arterial roads and rail as well on site factors such as clearing for access tracks and infrastructure and prevalence of weeds around these areas (refer **Chapter 3** for further detail).

Landscape Level

There have been countless studies conducted across Australia which have determined the key factors to consider when assessing the importance of a 'Koala habitat patch' within a landscape. Key literature, such as that by McAlpine (et al. 2006) states that while the proportion of the landscape occupied by forest habitat has an important influence over the prevalence of Koalas, it is also necessary to consider the combined effect of habitat patch size, spatial configuration and road densities. Koalas can cross non-forested gaps between habitat patches, however, as the level of hostility influenced by cleared land, residential allotments, domestic dogs and roads increases, so does the probability of mortality. In essence, the more residential allotments and roads the Koala has to cross to access the site, the less likely the Koala is to survive. The importance of the vegetation patch as Koala habitat is dependent upon the ability of Koalas to actually cross to the patch.

When considering accessibility to First Nine, there are many factors that reduce the ability for the site to support an important population of Koalas. The most obvious of these is the high densities of local roads and residential development surrounding the First Nine development area, specifically Centenary Highway and the Springfield rail line to the south and east as well as established commercial and residential to the south and west. In addition, expansion of the town centre over land directly to the east is anticipated in line with issued approvals and planning scheme intent. As a result, the subject site will be largely surrounded by urban development diminishing the ability for Koalas to access the site. In its current condition, drainage features which traverse the site provide extremely limited values to Koalas and other fauna species, however, the site's proximity to Opossum Creek and vegetation to the north yielded positive results for Koala activity and occurrence within the project area. Retention and rehabilitation of Opossum Creek, which is designated for Conservation in the Springfield Structure Plan (refer **Plan 2**), will provide a movement corridor for Koalas within the Greater Springfield landscape and while deterring Koalas from threats such as vehicles and dogs associated with, and surrounding the development.

While the site itself does provide *critical habitat* for the Koala, the importance of the habitat on-site is significantly diminished when considered in the context of accessibility and habitat availability within the broader landscape. The risks of mortality within the landscape as a result of vehicle strike and dog attacks is



high, especially when considering the location of pre-existing and committed development. This highlights the importance of rehabilitating waterways on site so that a continuous ecological corridor exists throughout the local landscape where risks of dog attacks and vehicle strikes are low.

5.3.4 Potential cumulative direct and indirect impacts to Koala within the broader area

As shown in **Plan 7**, a number of existing approvals for master planned community development, major infrastructure upgrades and commercial and educational facilities exist surrounding the site and within the Greater Springfield area. This future urban development will result in both direct and indirect impacts to Koala, which, combined with the development of First Nine, will have a cumulative impact on the local Koala population in the area. These impacts include direct impacts, such as removal of habitat and impediments to movement through the construction of roads etc. as well as increased risk of vehicular strike, attacks from domestic animals and disease. While habitat for the Koala will not be retained within the isolated project site, movement corridors will be maintained within the broader Springfield area which allow connectivity to areas of protected habitat associated within White Rock Conservation Park and the Flinders-Karawatha Bioregional Corridor.

5.3.5 Potential impacts to Koala associated with the fill site

Potential impacts to the Koala associated with the proposed fill site is limited to the clearing of critical habitat, which has been included in the cumulative impact total in this Preliminary Documentation Report. The proposed fill area is a low lying depression and is not associated with any waterways or significant ecological features.

All future works are subject to Bulk Earthworks approval from **ICC** which will include detailed assessments and provision of mitigation and management measures included in Erosion and Sediment Control Plans.

A **KMP** incorporating Koala mitigation and management measures, has been prepared to guide vegetation clearing (refer **Chapter 6** and **Attachment C**).

5.3.6 Conclusion

As stated in supporting technical reports and summarised in **Chapter 5** of this Preliminary Documentation Report, Koala densities in the Springfield Central area are low due to the increased pressure of arterial, commercial and medium-density residential developments within the area coupled with future approvals yet to commence development. Consequently, the population is expected to have low viability within the site due to surrounding urban approvals, regardless of whether this development gains approval.

Due to surrounding land uses, the First Nine development does not contain significant tracts of vegetation or form part of a corridor to support Koala refuge or movement. While the site does not propose to retain any areas of Koala habitat, suitable habitat for the species will be retained along the Opossum Creek Corridor to the north which is zoned as Conservation (refer **Plan 1**). Retention and rehabilitation of this corridor will, over time, greatly improve the habitat values for the species with the broader landscape to facilitate the persistence of the local Koala population. **ICC**, however, should be pro-active in managing other threats, apart from habitat loss, such as disease, roads and dogs to ensure population viability is maintained or improved in the local area. Provision of safe movement options across/under major roadways in the local landscape is paramount in ensuring the species long term presence on the local landscape.



6 Proposed Avoidance, Management and Mitigation Measures

DEE request the following information in relation to Item 4: Proposed Avoidance, Management and Mitigation Measures:

4.1 The preliminary documentation must provide information on measures proposed to avoid, mitigate and manage impacts to the protected species and ecological community addressed at Section 2 resulting from the proposed action.

4.2 Specific measure should be presented in the form of a management plan, such as a Fauna Management Plan for MNES and Vegetation Clearing and Management Plan (and/or relevant document/s). At a minimum the plan must include details of key commitments and measures to ensure that impacts to the species and communities addressed for Section 2 are avoided and minimised. The Plan should be in a form that is clear and easy to understand, including clearly annotated maps and diagrams, in colour. Locations of proposed conservation and management measures within the proposed project site should be included.

4.3 The plan must incorporate conservation advices, recovery plans and threat abatement plans, where relevant. In particular, the plan must demonstrate how the mitigation measures are consistent with the following documents (and other related policies);

- Approved Conservation Advice for *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory (Koala Northern Designatable Unit) 2012
- National Koala Conservation Management Strategy 2009-2014
- EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory), Commonwealth of Australia, 2014

4.4 The effectiveness of mitigation measures must be appropriate to the scale, risk, duration and severity of the impact.

4.5 Documentation should clearly set out the following measures for each environmental issue and MNES likely to be impacted by the proposed action (e.g. in the form of a schedule). Measures including, but not be limited to, the following items must be outlined in the documentation to:

- (a) Address all project phases (pre-construction, construction and operation) or the proposed action;
- (b) State the environmental and conservation objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue;
- (c) Describe contingencies for events such as the identification of protected matters during pre-construction searches (e.g. translocation management protocols for specific species);
- (d) Include an assessment of the expected or predicted effectiveness of the mitigation measures;
- (e) Include any statutory or policy basis for the mitigation measures;
- (f) Include a description of any rehabilitation of temporarily disturbed areas or retained open spaces (e.g. habitat improvement works within conservation buffer zones). This should also address management, methodology, timing, duration and effort of rehabilitation works;
- (g) Include maps that illustrate the location of any proposed construction exclusion zones or buffer zones, and details on how these areas will be excluded, or protected;



- (h) Details of the vegetation or habitat to be retained, must include the location and quantification of the total area, presence of protected matters, protection measures such as fencing and road underpasses, management measures and their suitability with respect to any protected matters present and any conservation arrangements;
- (i) A discussion of the likely residual impacts to protected matters after proposed avoidance and/or mitigation measures are taken into account;
- (j) Provide details of ongoing research and monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed mitigation measures;
- (k) Provide details of protocols along with the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program, and
- (l) Describe long term funding for management measures.

(DoE Preliminary Documentation Decision- pages 4 & 5)

6.1 Introduction

Chapter 4 provides details of relevant impacts associated with the development of First Nine on MNES, specifically the Koala. Impacts can be summarised as:

Construction

- Removal of 46.2 ha of vegetation defined as critical habitat to the survival of the Koala.
- Risk and injury or mortality to Koalas during vegetation clearing and construction.
- Fragmentation of habitat restricting dispersal.
- Hydrological changes.

Operational

- Risk of injury or death caused by:
 - Vehicle Strike
 - Dog attack
 -

The First Nine Conceptual Phasing Plan (refer **Plan 4**) sequences the removal of vegetation for the proposed development precincts to occur in line with demand for the new allotment areas and to be staged over the life of the project (i.e. 5-8 years). Within each stage of clearing a specific Vegetation Clearing and Fauna Management Plan (VCFMP) will be prepared and lodged for further Council endorsement.

In addition to Vegetation Clearing Controls, First Nine will adopt the **DRAFT Code of Practice for the welfare of animals affected by land-clearing and other habitat impacts** prepared by the **Australia Zoo Wildlife Warriors** and **Voiceless** (The Code). A copy of The Code is included as Attachment 2 of **Attachment C**. The Code is not mandatory, however, is advocated by various environmental organisations as the leading practice method for minimising impacts of native wildlife during construction processes. The Code has also been adopted and referenced throughout the First Nine Koala Management Plan (KMP) (refer **Attachment C**).

6.2 Vegetation Clearing and Fauna Management Plan

VCFMPs will be prepared for each precinct of clearing proposed within the First Nine referral area. This documentation needs to be submitted to and approved by **ICC** ahead of the booking of any pre-start for the commencement of works on-site. Additional VCFMPs will be prepared and lodged for each development



stage so that clearing mechanisms and management procedures are precise. Final VCFMPs will include the following details:

- Clearly show all trees to be removed and retained
- Include details of all civil works likely to impact on existing vegetation
- Temporary and permanent exclusion and protection fencing for riparian corridors and parklands
- Roles and responsibilities for site contractors, developer and the consultant group
- Stockpiling and site access locations
- A clearing sequencing plan showing the commencement of clearing and direction of removal (this should be in conjunction with the Wildlife Protection and Management Plan to allow for the appropriate flushing of fauna towards surrounding safe haven areas).
- Links to weed management and revegetation proposals
- The stock piling and reuse of cleared vegetation
- Specific details on the removal of previously identified potential fauna habitat trees
- Where trees are shown to be retained occur within disturbance zones they should be accompanied by necessary arborist specifications incorporated into the VCFMPs.
- The VCFMPs will designate trees to be protected for the on-going life of the proposal which may require both immediate remedial works (crown thinning, coppicing) and long term monitoring for the potential of future works.

6.2.1 Role of QPWS Registered Fauna Spotter Catchers

It is the role of the **EHP** approved Fauna Spotter/Catcher to take all reasonable steps to protect wildlife that may be impacted by vegetation clearing. These steps include:

- Undertaking wildlife load reduction measures through the pre-clearing trapping and relocation of wildlife 1-2 weeks prior to the approved clearing being conducted. Sequential clearing cannot be used as a primary fauna management measure as the remaining vegetation is insufficient to sustain the displaced fauna;
- Conducting a site inspection the night before and the morning that the clearing will commence to identify fauna species and fauna habitat, using binoculars or a spotting scope when observing trees larger than 4.0m tall;
- Clearly marking (flag) vegetation found to contain fauna or fauna habitat (such as tree hollows, arboreal termite mounds, stick nests or possum drays with flagging tape) and visually and verbally communicate this information to the tree feller to ensure flagged trees are not felled until authorised by the fauna manager;
- Managing any Koalas identified on site in accordance with the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016*;
- Managing fauna habitat identified during the site inspection using the protocols discussed within the approved VCFMPs and the KMP (refer **Attachment C**);
- Working in conjunction with a professional tree feller in the removal of any vegetation;
- Scheduling vegetation clearing to ensure that the impacts on nesting and hatching avifauna and herpetofauna are minimised, the likelihood of detection and capture of herpetofauna is maximised and wildlife load reduction measures are productive;
- Ensuring vegetation and rubbish piles are not left to serve as refuge for displaced or roaming wildlife through the implementation of the following measures:
 - Immediately (within 12 hours) remove or destroy such material
 - Erect wildlife proof barriers. Fencing surrounding stockpiles to prevent wildlife use



- Ensure old (>12 hours) piles of felled vegetation are treated as potential wildlife habitat and inspected by a wildlife spotter/catcher prior to removal or destruction
- Limiting the felling of habitat and hollow bearing trees to the following methods:
 - Segmental removal of tree, with hollow bearing limbs being checked by the wildlife spotter/catcher and cleared of fauna using a cherry picker
 - Segmental removal of the tree, with hollow bearing limbs plugged and lowered to the ground for inspection by wildlife spotter
 - Use of an excavator with vertical grab to lower the main trunk (only after the removal of lateral limbs) and
 - A combination of the above methods.

6.2.2 Adoption of WW Draft Code for Fauna Spotting

The **DRAFT Code of Practice** for the welfare of animals affected by land-clearing and other habitat impacts prepared by the **Australia Zoo Wildlife Warriors** and **Voiceless** (refer **Attachment C** – Attachment 2) will be adopted to ensure that fair, reasonable and appropriate measures are undertaken to minimise the adverse impacts on wildlife as a result of vegetation clearing. The code provides standards and guidelines for the humane treatment of wild animals affected by land clearing by detailing the general responsibilities of people involved in land clearing and the specific roles of wildlife spotter/catchers. As emphasised within the Code, it will be the responsibility of all relevant parties to:

- *Take all reasonable steps necessary to prevent cruelty or suffering to animals;*
- *Minimise the loss of wildlife caused directly or indirectly by development or land clearing; and*
- *Conserve, as much as possible, the ecological values of the development site and their surrounding natural environment.*

(The Code, pp.5)

For First Nine the components of the code are to be adopted into the following actions for any clearing works:

Action 1 – Developer to Engage Fauna Spotter / Catcher

Action requires that the developer engage a Wildlife Fauna Spotter / Catcher with full registrations and licences provided in accordance with **EHP**.

Action 2 – Fauna Spotter to Prepare a Wildlife Protection and Management Plan (WPMP)

The WPMP should be submitted to **EHP** and include the following information:

- Description of the project with reference to impacts on wildlife or wildlife habitat;
- Pre development plan of the site showing habitat areas, features, corridors, riparian habitats and adjacent areas;
- Results of any fauna surveys including pre-clearance surveys; and
- A wildlife and habitat impact assessment based on the proposed development works.

Action 3 – Prepare a Wildlife and Habitat Impact Mitigation Plan

Following completion and approval of the WPMP the fauna spotter should prepare a more specific Wildlife and Habitat Impact Mitigation Plan, which will include details on:

- Measures required to be completed to minimise wildlife and habitat impacts during operational works;
- Wildlife capture and removal plan;



- Contingency plan for wildlife requiring euthanasia, other veterinary procedures or captive care;
- Wildlife storage and housing plan;
- Wildlife release and disposal plan; and
- Post works measures to minimise impacts on wildlife.

Action 4 – Fauna Spotter Role at Pre-Start Meeting

Prior to the commencement of any construction works, a pre-start meeting is to be held between the project manager, site foreperson, plant operators and Local and State Government representatives. At the pre-start meeting, the Fauna Spotter is to outline the clearing process and the requirements of the approved WPMP.

Action 5 – During Construction

The Fauna Spotter is to be on-site during all phases of construction which involve potential impacts on wildlife or habitat. This will enable the Fauna Spotter to make any necessary adjustments to the approved VCFMP and WPMP to cater for any specific issues encountered during the clearing works.

Action 6 – Post Works Reporting

During the course of all site works, including the pre-clearance surveys, the fauna spotter is to keep an accurate record of all animals encountered, captured, incidents and disposals for each stage of the project. The records should form part of the Wildlife Management Report to be issued under licence requirements to the State Government. The Wildlife Management Report should consist of the following 3 sections:

1. ***Wildlife Habitat Management Plan*** – Aspects of the planning, design, construction and ongoing operation of the project in which risks to wildlife have been identified. This plan should also include recommendations and outline the type, frequency and timeframes for monitoring.
2. ***Wildlife Capture and Disposal Plan*** – Should contain the following details for each captured animal:
 - a. Species
 - b. Identification name or number
 - c. Sex (M, F or unknown)
 - d. Approximate Age or Age Class (neonate, juvenile, sub-adult, adult)
 - e. Time and date of capture
 - f. Method of capture
 - g. Exact point of capture (GPS coordinates)
 - h. State of health
 - i. Incidents associated with capture likely to affect health
 - j. Veterinary intervention or treatments
 - k. Time held in captivity
 - l. Disposal method (euthanasia, translocation, re-release)
 - m. Date and time of disposal
 - n. Detailed of disposal (GPS points of release)
 - o. For released animals, location relative to point of capture
3. ***Animal Injury and Euthanasia Report*** – similar details for the Wildlife Capture and Disposal Plan should be included in this report.



6.3 Koala Management Plan

To avoid and mitigate the direct and indirect impact from the proposed action on the Koala, a project specific KMP has been prepared. The objectives of the KMP are:

- 1) To highlight the existing flora and fauna values on the subject site and in surrounding areas;
- 2) Describe key results from survey data, including Koala occurrence and the availability and quality of habitat;
- 3) Identify key direct and indirect impacts on the Koala and describe proposed avoidance and mitigation measures;
- 4) List out actions and legislative requirements to be put in place to manage construction impacts;
- 5) Provide a framework for a number of operational management measures including:
 - a. Conservation areas set aside for Koala usage;
 - b. Incorporation of education and prohibition signage within open space and road reserves;
 - c. On-lot education campaigns to raise consumer awareness of local Koala populations; and
 - d. Provide ongoing resources and facilities for monitoring the success of this management plan.

The KMP includes details on:

- Ecological values found on site;
- Identifies direct and indirect impacts on Koalas at the construction and operational phases of the project;
- Provides a risk assessment to identify risk ratings of identified impacts
- General management measures, including:
 - Site design and identification of conservation corridors
 - Statement of KMP objectives
 - Identification of key management personnel
 - Details on environmental training of site contractors and sub-contractors
- Construction management measures, including:
 - Use of a Fauna Spotter/Catcher and adoption of the *Code of Practice for the Welfare of Animals Affected by Land Clearing and Other Habitat Impacts*
 - Sequential clearing plan and clearing restrictions
 - Use of fauna exclusion fencing
- Operational management measures, including:
 - Maintenance of ecological corridors
 - Distribution of Lifestyle Guidelines to new residents
 - Planting and rehabilitation
 - Wildlife Crossings
- Monitoring and reporting procedures;
- Risk assessment and management plan review.

The KMP is included as **Attachment C** provides details on the management measures and procedures that will be adopted throughout the project. A summary of how potential impacts identified in **Chapter 5** above will be avoided and mitigated as per the KMP are provided in **Tables 3 & 4**.



Table 3: Construction Impacts

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Residual Impact
<p>Loss of 46.2 hectares of critical habitat.</p>	<ul style="list-style-type: none"> ▪ Areas to be cleared are relatively disturbed and contained no significant or unique values. Approximately 46.2 hectares was identified to contain habitat critical to the survival of the Koala however was noted to be isolated from large tracts of vegetation or wildlife corridors due to surrounding development (including the encompassing golf greens). ▪ The loss of 46.2 hectares of critical habitat is unavoidable and cannot be mitigated. 	<p>Ecological surveys and habitat assessment conducted across the site led to the precise spatial analysis of vegetation and habitat qualities. The project will result in the unavoidable loss of 46.2 hectares of critical habitat.</p>	<p>Loss of 46.2ha of critical habitat for the Koala.</p>
<p>Risk of injury or mortality to Koalas from vegetation clearing and construction</p>	<ul style="list-style-type: none"> ▪ All clearing will be undertaken in accordance with approved <u>Vegetation Clearing and Fauna Management Plans</u> and the <u>Koala Management Plan</u>. ▪ As discussed Attachment C and Section 5 of this Preliminary Documentation Report, the proponent will engage a qualified Fauna Spotter/ Catcher to participate in all stages of vegetation clearing. The Fauna Spotter/Catcher will be required to adopt the Draft Code of Practice endorsed by the Australia Zoo Wildlife Warriors and Voiceless. ▪ The role of the Fauna Spotter/ Catcher is to ensure that no injury or deaths occur to Koalas or other fauna species. ▪ Vegetation will be cleared sequentially. Clearing will be conducted so that fauna are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. ▪ Fauna exclusion fencing will be erected to prevent fauna dispersing into construction areas. 	<p>The use of a Fauna Spotter throughout clearing is an effective tool to:</p> <ol style="list-style-type: none"> 1. Identify the types of species on site prior to clearing; and 2. Identify and flag habitat features that require thorough examination before clearing. <p>Fauna Spotters have a primary role to ensure no fauna are in vegetation before it is cleared. Given the size of Koalas and their utilisation of tree branches, they can quite easily be observed from the ground. As such, it is extremely unlikely that a Koala will be killed or injured during vegetation clearing, particularly given the onerous and thorough procedures set out in the Fauna Spotter Draft Code of Practice.</p> <p>The sequential clearing of vegetation will allow for the gradual loss of vegetation, giving fauna time to naturally disperse away from the disturbance. The use of fauna exclusion fencing around construction areas will ensure fauna do not disperse into unsafe, hostile areas, again minimising the risk of injury or death.</p>	<p>No residual impact</p>



Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Residual Impact
		Each of these measures will ensure that the risk of injury or death to Koalas as a result of construction are avoided and mitigated. The aim of these procedures is to support zero injuries or death to Koalas as a result of construction.	
Fragmentation of Habitat during Construction	<ul style="list-style-type: none"> Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow fauna to disperse from construction areas. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the <u>VCFMPs</u>. Clearing will be done in a way that flushes fauna into connected areas of habitat and will avoid flushing fauna into fragmented or hostile areas. 	<p>Habitat isolation and fragmentation is a primary concern due to its impacts on fauna. In order to avoid the fragmentation of habitat on and surrounding the site.</p> <p>Koalas are able to disperse through a variety of environs, including bushland and cleared areas. The provision of designated corridors is considered sufficient to facilitate ongoing connectivity which avoids the fragmentation of habitat. In particular, the corridors will ensure that habitat located to the east of the site is not fragmented from large areas of connected habitat to the west.</p> <p>The directional clearing of vegetation in accordance with the <u>VCFMPs</u> will ensure that clearing does not create fragmented habitat islands that could trap fauna. Rather, procedures will be in place to ensure clearing flushes fauna away from construction areas into surrounding habitat areas that are connected to the wider landscape.</p>	No residual impact
Hydrological changes	<ul style="list-style-type: none"> The project footprint avoids development in defined watercourses. Stormwater detention technologies will be utilised to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. All work will be undertaken in accordance with appropriate management plans to ensure the hydrological changes across the site do not impact on surrounding vegetation. 	The implementation of <u>Stormwater Management Plans</u> as designed by engineers ensures that hydrological change are appropriately accounted for and managed. These management measures will reduce impacts from higher levels of surface water flow caused by hardstand areas and ensures natural drainage lines continue to function as they naturally would have. Stormwater detention basins prevent localised flooding of drainage lines and waterways caused by increased runoff over hardstand areas and also contribute to maintaining water quality levels.	No residual impact



Table 4: Operational Impacts

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Residual Impact
<p>Risk of injury of death from vehicle strike</p>	<p>A number of measures will be imposed to avoid and mitigate the risk of Koalas being hit by vehicles. These measures include:</p> <ul style="list-style-type: none"> ▪ Koala food trees will not form part of the primary landscaping of the development footprint so that Koalas are not enticed to enter residential areas. ▪ Imposition of low vehicle speeds to reduce the risk of collisions. Under Queensland traffic laws, vehicle speed limits are restricted to 50km/h on built up residential roads. ▪ Erection of Koala awareness signage in parks to raise awareness of the species' presence in the area. ▪ New residents will be issued with a "Lifestyle Guideline" to raise awareness about local wildlife and to educate residents about the protection of Koalas in the area. 	<p>The purpose of these avoidance and mitigation measures is to minimise the risk of injury or death to Koalas from vehicle strike. It will be important to minimise the incentive for Koalas to enter residential areas by restricting the availability of habitat in these areas. As such, street scaping will not be planted with suitable Koala habitat, which will in turn encourage Koalas to stay away from the development area. Importantly, low vehicle speeds will be imposed along residential roads, minimising the risk of high-speed vehicle strikes which were identified in the literature review as accounting for a large proportion of vehicle related deaths.</p> <p>In addition, awareness signage will ensure motorists are aware that Koalas have potential to occur in the area, making them more conscious of potentially dispersing Koalas and encouraging them to maintain a low vehicle speed.</p> <p>The distribution of "Lifestyle Guidelines" has the purpose of instilling stewardship of the issue amongst residents, encouraging them to actively protect native wildlife and making them aware of the types of fauna that could disperse onto roads.</p> <p>Overall, these tools are considered to be effective measures to reduce the risk of injury or death of Koalas from vehicle strike. The have been officially adopted numerous times by the Queensland State Government in similar road conflict scenarios and are espoused as one of the effective solutions. The purpose of these measures is to enable the objective of no injury or death to Koalas as a result of vehicle strike. No residual impacts can be identified.</p>	<p>No residual impact</p>



Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Residual Impact
<p>Risk of injury or death from dog attack</p>	<ul style="list-style-type: none"> New residents will be issued with a “Lifestyle Guideline” to raise awareness about local wildlife and to educate residents about the protection of Koalas in the area and appropriate dog management. 	<p>While dogs already occur within the local area, and have historically occupied the site as part of the rural land uses, the project is likely to increase dog ownership numbers in the area. As such, the education of residents has been identified as a key management tool in reducing the risk or injury of dog attacks on Koalas. The Lifestyle Guidelines will make residents aware of the risk dogs pose to Koalas and other native fauna and will clearly identify “off leash” parks in the area. The guidelines, along with awareness signage throughout the estate, will make it clear that dogs should be left on a lead at all other times when they are outside of residential housing lots, particularly when in or adjacent to conservation areas. Again, instilling stewardship and ownership of the issue amongst residents is an effective way of ensuring compliance with dog on-lead restrictions. The Lifestyle Guidelines will allow residents to become aware of the issue and will encourage them to pro-actively manage and protect native fauna in the local area.</p>	<p>No residual impact</p>



6.4 Other Koala Management Commitments

While the KMP, included as **Attachment C**, has been prepared to form an overarching commitment to wildlife management, specifically Koala management, for the life of the project a number of other compensatory measures for Koala will be adopted as part of the development.

Education and Awareness Signage

Education and awareness signage along waterway corridors / pedestrian links and esplanade roads will be installed, detailing the importance of the corridors, their potential to be used by Koalas, and how residents can support this use.

Landscaping

A non-Koala tree landscape mix to be used in estate landscaping. Ensure street and park trees while being planted out with non-invasive native trees don't specifically include any primary or secondary Koala food trees. The goal of this approach is to minimise the attraction for Koalas to enter the development area.

Traffic Management

Fauna movement solutions will be integrated into the road design where roads crosses conservation areas. In addition, speed limits will be limited to 50 km/h within residential areas, as per Queensland's traffic laws. Traffic calming such as speed humps, signage and median strips will be deployed throughout the estate.

Lifestyle Guidelines

The First Nine Lifestyle Guideline documentation will be issued to each new resident and is designed to help promote a range of ecological sustainable living principles. The guideline will be used to directly educate and raise awareness of a large audience towards the management of the waterway corridors. Topics included within the education documents include:

- Appropriate plant selection on allotments
- Inappropriate planting species (known local or declared weed species)
- Management of house hold scale run-off
- Protection of native animals and the types of native animals residents could expect to see, including the Koala
- Understanding storm water devices
- Appropriate management of domestic animals
- Location of dog on-leash and off-leash areas
- Interpretation of fauna control signage
- Key local and state phone numbers to contact if distressed or orphaned fauna is located.

Through raising awareness, the lifestyle guidelines will help new residents take direct ownership of the local streetscapes and the existing vegetated and recently rehabilitated portions of the waterway corridor as well as an appreciation of conservation land for local wildlife within the broader landscape.

6.5 Residual Impacts

The assessment of construction and operational impacts shows that while the majority of identified impacts and can avoided and mitigated through proposed management measures, residual impacts will be created through the unavoidable loss of critical habitat for the Koala. Vegetation and habitat assessments conducted



across the site have provided results to support that the site contains 46.2 hectares of *habitat critical to the survival of the Koala*. The development of First Nine will result in the direct removal and fragmentation of 4.6.2 hectares of *critical habitat* for the Koala with a habitat score of 6.

Residual Impacts: **Removal of 46.2 hectares of critical habitat for Koala**



7. Proposed Offsets

DEE request the following information in relation to Item 5: Proposed Offsets:

5.1 The preliminary documentation must include an assessment of the likelihood of residual impacts occurring, after mitigation measures relating to the project have been applied. This includes direct impacts such as habitat clearing and indirect impacts such as degradation of retained habitat.

5.2 Please provide:

- a) Details of an offset package (this may be in the form of an offset management plan) proposed to be implemented to compensate the residual impacts of the project, such as how, when and where the offsets will be delivered and managed;
- b) Details of how the offset(s) will compensate for the significant residual impacts upon MNES, resulting from the action;
- c) A description of how the offset(s) will ensure the protection, conservation and management of the relevant matters of NES for the life of the impact
- d) A description of how the offset(s) are consistent with relevant Commonwealth policies and guidance documents on offsets under the EPBC Act.
- e) The anticipated cost (financial and other) of delivery of the offset(s).

5.3 The offset proposal should include, but not be limited to, the following:

- a) The location, description and suitability of the proposed offset site, including baseline conditions, environmental values and connectivity with other relevant habitat;
- b) The extent to which the proposed offset actions correlate to, and adequately compensate for, the impacts on MNES and habitat critical to the survival of the MNES.
- c) A description of the conservation gain to be achieved by the offset (i.e. positive management strategies that improve the site or avert future loss, degradation or damage of the ecological community and MNES habitat;
- d) Information on current land tenure of any proposed offset and the method of legally securing the offset for the long term;
- e) Measures to protect, and/or manage and rehabilitate the ecological community and MNES habitat at the offset site, including timing, frequency and longevity for each measure and performance criteria that must be met;
- f) Detail of monitoring and reporting activities to assess the success of the offset; and
- g) An assessment of the proposed offset, using the Department's *Offsets Assessment Guide*, and clear justification of each input entered.

5.4 The offset package can comprise of a combination of direct offsets and other compensatory measures, so long as it means the requirements of the EPBC Act *Environmental Offsets Policy*. Offsets should align with conservation priorities and be tailored specifically to the attribute of the protected matter that is impacted, in order to deliver a conservation gain.

5.5 Offsets should compensate for an impact for the full duration of the impact.

5.6 Offsets must directly contribute to the ongoing viability of MNES and deliver an overall conservation outcome that improves or maintains the viability of the ecological community and habitat for MNES, as



compared to what is likely to have occurred under the status quo (i.e. if neither the action nor the offset had taken place).

5.6 Note that offsets do not make an unacceptable impact acceptable and do not reduce the likely impacts of a proposed action. Rather, offsets compensate for any residual significant impact resulting from the proposed action.

5.7 Offsets required by the State can be applied if those offsets meet the Department's *EPBC Act Environmental Offset Policy*.

(DoE Preliminary Documentation Decision- Pages 5- 7)

7.1 Background of Environmental Offset

Detailed discussions on the topic of environmental offsets were undertaken between the **DEE** and **SLC** as part of the Spring Mountain Precinct (EPBC 2013/7057) **Lendlease Communities** referral and approval. Generally, these discussions were focussed on the existing conservation land previously dedicated by **SLC** over 2006 and 2011 to cater for the environmental impacts associated with the development of the Springfield Structure Plan area. These environmental impacts included the loss of Koala habitat within the development footprint, and thus considered offset via the conservation land dedication which was, at the time, 7 years prior to the Commonwealth listing of the Koala as Vulnerable under the EPBC Act.

As part of these discussions, the **DEE** acknowledged the value of land already provided to compensate for environmental impacts and agreed to consider the previously dedicated Conservation Land as a retrospective 'advanced offset' under the *EPBC Act Environmental Offset Policy*. It is noted that the Draft policy statement "Advanced Environmental Offsets under the EPBC Act" was in the process of being prepared at the time of this discussion and subsequently an official registration of the advanced offset was not made.

It is noted, that as part of the First Nine referral, the **DEE** have the opportunity to reinterrogate their previous assessment of the EPBC Act calculator attribute values for the offset land. A number of discussions have been held with the **DEE** to progress the application of offsets under this assessment.

This Offsets section (**Section 7**) of the Preliminary Documentation Submission uses values relative to the site from the 2006 dedication date and predominately adopts the values already approved over the Conservation Land Offsets (of which First Nine proposes to use a portion of this offset land) under the **Lendlease Communities** (EPBC 2013/7057) permit, with the exception of where revised assessment on the attributes was discussed with the **DEE**.

7.2 SLC's Greater Springfield Conservation Land Offset

The Offset Land for the Greater Springfield area is characterised by the following land descriptions in **Table 5** and displayed as **Plan 9**.



Table 5: Springfield Conservation Land RPD

RPD	Area	Date of Dedication
Lot 705 on SP151175	29 hectares	29 March 2006
Lot 740 on SP179412	28 hectares	27 June 2006
Lot 11 on S31533	46 hectares	29 March 2006
Lot 745 on SP242282	172 hectares	28 March 2011
Lot 747 on SP189043	21 hectares	27 June 2006
Lot 748 on SP189044	38 hectares	27 June 2006
Lot 751 on SP189053	37 hectares	27 June 2006
Lot 753 on SP189054	25 hectares	27 June 2006

The land dedicated by **SLC** is considered to be critically important for regional scale fauna movement given its location within the state wide significant Flinders-Karawatha Bioregional Corridor. The dedicated land now forms the only publically owned linkage between conservation areas to the north and south. Prior to this dedication, the north-south connectivity was reliant on fragmented rural residential land holdings with a high degree of clearing, roads, fencing and dog ownership.

Significant financial investments have been made in the dedication of this land to support conservation uses in a strategically important location that at the time included necessary ownership, resourcing and designations to enable more profitable land development to occur. The strategic location of the dedicated conservation land provides regional to state wide ecological benefits well beyond the extents of the Greater Springfield Project. None of this would be achieved if the land had been developed and a significantly smaller financial investment had been made in a parcel of land external to the Urban Footprint and substantially departed from the area of impact.

7.2 Remaining Conservation Land (Available Offset)

As part of the detailed negotiations for the **Lendlease Communities** Spring Mountain EPBC Referral (2013/7057) the 396 ha of Conservation Land dedicated by **SLC** in 2006 was acknowledged as an “advanced offset” for all practical purposes under the *EPBC Environmental Offset Policy*. Further, it was acknowledged by the **DEE** that the value of this offset is two-fold; the first being in the value of dedication of the land by **SLC** to **ICC** for conservation and the second being in the enhancement works proposed over this land for Koala habitat value uplift.

The value of the land, however, is likewise two-fold, as follows. Two EPBC Environment Offsets Calculator Sheets have been provided with respect to this offset. The varying values are reflective of the zoning of the land at the time of dedication (in 2006) under the South East Queensland Regional Plan 2005-2026 (SEQRP 2005). Subsequently, the portion of the Conservation Land zoned for ‘Urban Development’ under the SEQRP2005 was considered to have a higher risk of loss (being suitable for urban development) opposed to the land zoned as Regional Landscape and Rural Production Area under the SEQRP 2005 (refer **Section 7.3** for further detail).



Of the 396 ha of Conservation Land (available offset) dedicated by **SLC**, 293 ha was conditioned as the offset for the Spring Mountain EPBC Act permit (2013/7057). Of the remaining 103 ha of Conservation Land, 8.5ha is zoned within the Urban Footprint and the remainder Regional Landscape and Rural Production.

7.3 Environmental Offsets Assessment for the Koala

7.3.1 Residual Impacts

As discussed above in **Chapter 7**, the development of First Nine will result in the clearing of 46.2 ha of critical habitat to the survival of the Koala. The site has been assessed using the Habitat Assessment Tool as retaining habitat with a critical habitat score of 6. The proposed offset for First Nine has been identified as **81.5 ha** of the remaining 103 ha of Conservation Land (made up of 8.5ha zoned as Urban Footprint and 73 ha zoned as Regional Landscape and Rural Production Area (Non-Urban Footprint) under the SEQRP 2005) (refer **Plan 10**).

Residual Impact: Removal of 46.2 hectares of critical habitat for the Koala

8.1.1 Offset Assessment Guide

The protection of conservation land will provide an offset of residual impacts, as per the offsets calculator. An assessment against the EPBC Act Environmental Offsets Policy is provided below.

A. Annual probability of extinction

The *annual probability of extinction* is an estimate of the average chance that a species or ecological community will be completely lost in the wild each year, given recent rates of decline. The *annual probability of extinction* is incorporated into the impact and offset calculation process as a discounting factor for aligning activities that occur at different points in time. This figure is derived from the International Union for the Conservation of Nature (IUCN) Red List for threatened species, as shown:

Conservation status of MNES	IUCN criteria for probability of extinction in the wild	Annual probability of extinction (geometric mean)	Annual probability of extinction (geometric mean) + probability of catastrophe
Critically Endangered	At least 50% in 10 yrs	6.7%	6.8%
Endangered	At least 20% in 20 yrs	1.1%	1.2%
Vulnerable	At least 10% in 100 yrs	0.1%	0.2%

As the Koala is listed as 'Vulnerable' under the EPBC Act, an annual probability of extinction for the species, based on ICUN category definitions, is 0.2%.

B. Protected matter attributes

The Protected Matter Attribute relates to *habitat critical to the survival of the Koala*. A total of 46.2 hectares of critical Koala habitat will be directly removed as a result of the action.

Protected matter attribute: Area of critical habitat removed – 46.2 hectares



C. Quality

The quality score for *area of habitat* or *area of community* is a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability. There are three components that contribute to the calculation of habitat quality: site condition, site context, and species stocking rates. Each of these components has been considered to determine the quality of habitat in the:

- Impact calculator: quality of habitat at the time of assessment
- Offset Calculator:
 - Future quality of offset site without the offset; and
 - Future quality of the offset site with the offset.

Quality of Habitat in Impact Area

Vegetation surveys were carried out by **SHG** in of the impact area in September 2015, as part of the referral and May 2016, for the external fill site. Overall, the vegetation on the impact site was categorised by a proportion of Koala food trees as defined within the **Australia Koala Foundation's Koala Food Tree Protection List**. This includes *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark), *Eucalyptus siderophloia* (Grey Ironbark), *Corymbia citriodora* (Spotted Gum) *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus major* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus fibrosa* (Red Ironbark). While the majority of the site is mapped as containing remnant vegetation, disturbances in the form of invasive weeds, fire, dumped rubbish, dogs and vehicle tracks were observed throughout the area. Several dominant weed species including *Eragrostis curvula* (African Lovegrass), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton) were recorded.

Further, as the site is surrounded by existing and proposed development to the east, south and west and is encompassed by the existing Brookwater Golf Course, the referral area is highly disturbed and subject to edge effects. The referral site is fragmented from Opossum Creek by the existing golf greens severing connectivity east-west to larger patches of vegetation within the broader landscape.

The impact site value has been determined using the Critical Habitat Assessment Tool methodology from the Koala Referral Guidelines. This is consistent with how the guideline seeks assessment on the impact site relative specifically to Koala matters. This is also consistent with other referrals completed by this office and Koala referrals viewed on the referrals portal. Using the Critical Habitat Assessment Tool (refer **Section 5**) the impact area received a **critical habitat score of 6**.

However, in accordance with the EPBC Act Environmental Offsets Policy, it is understood that the same methodology to assess the habitat quality for the offset area must be adopted for the impact area, to ensure an accurate comparison. Habitat quality assessments using the Queensland Government's 'Guide to Determining Terrestrial Habitat Quality – A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy (V1.2 April 2017)' (Terrestrial Habitat Quality Assessment Guideline) were undertaken over the offset area in November 2016 and July 2017 and over the impact area in July 2017. A summary of assessment methods and findings of this assessment in relation to the impact area is provided below. A copy of the First Nine Impact Area Habitat Assessment Memo, prepared by **SHG**, dated July 2017, is provided as **Attachment D**.



Survey Methods – Impact Sites / Offset Land:

To supplement the Critical Habitat Assessment Tool assessment and provide a comparative assessment methodology for both the impact area and the offset area, the proposed First Nine Offset site has been assessed using a variety of more rigorous survey techniques including:

- Primary Surveys
 - Habitat Quality Assessments as per the Guide to Determining Terrestrial Habitat Quality DEHP
- Supporting Surveys
 - Spot Assessment Technique surveys and scat meanders as per Phillips and Callaghan 2011 and the Referral Guidelines for the Vulnerable Koala, providing:
 - Canopy species composition
 - Inferred Koala activity levels
- Quaternary site assessments as per Neldner et al 2012

The Habitat Quality Scores (measured) for the Impact Area was derived for the two assigned assessment units. Using the DEHP assessment template, the Habitat Quality Score for the Offset Area on site was determined to be 6.45, which is rounded to 6 (refer **Attachment D**). The Terrestrial Habitat Quality Assessment scored 6 for the impact area (**Attachment D**).

Impact Area Habitat Quality:	6
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Habitat Quality of the Offset Area

It is acknowledged that the attribute scores for the offset land have been previously assessed and approved by **DEE** for the offset site as part of the Spring Mountain approval (EPBC 2013/7057), which identified the **habitat quality of the offset area as an 8**.

Regardless, to satisfy the **DEE's** reassessment of the EPBC Act Offset Calculator attributes and provide a comparative assessment of habitat quality for both the impact area and the offset area, the following technical surveys have been completed on the land proposed for the Frist Nine Project environmental offset:

Primary Surveys

- Habitat Quality Assessments as per the Guide to Determining Terrestrial Habitat Quality DEHP

Supporting Surveys

- Spot Assessment Technique surveys and scat meanders as per Phillips and Callaghan 2011 and the Referral Guidelines for the Vulnerable Koala, providing:
 - - Canopy species composition
 - Inferred Koala activity levels
- Extensive ground-rectified field polygons of weed infestation
- Quaternary site assessments as per Neldner et al 2012

Start Quality of Offset Area

Despite the habitat quality of the proposed offset having been previously assessed by the **DEE**, contemporary habitat quality surveys of the offset land were undertaken by **SHG** in November and July 2017, using the same methodology to assess the impact area in compliance with the EPBC Act Environmental Offsets Policy.



The Habitat Quality for the offset area is scored as an 8 (refer **Attachment D** – Containing an extracted Habitat Quality Technical Memo in which the land is assigned a Habitat Quality Score of 7.6 utilising the Queensland Government’s ‘Terrestrial Habitat Quality Assessment Guideline’ – rounded to 8 as required by the guideline and to suit the EPBC Offset Calculation).

Start Quality: 8

Future Quality without the Offset

There are no requirements linked to the progression of the Greater Springfield development that require **SLC** to undertake any works within the previously dedicated and proposed environmental offset land. Improvement works would be completely reliant on **ICC’s** budget allowances with no major works scheduled or having been undertaken since the 2006 dedication and transfer of ownership. No historical or even contemporary surveys or data have been collected on the land for utilisation in accurately measuring a decline in habitat quality. Rather estimates on calculating the reduction in quality are based on observations and evidence collected on threats influencing the current quality and challenges these propose to the future quality if unmanaged. These include:

- Large and small weed infestations, extensive in locations, primarily of Lantana (*Lantana camara*) listed as a Weed of National Significance (WONS).
- Consistent coverage of small juvenile patches of Lantana evenly spread through the proposed offset area.
- Evidence of wild dog usage – as confirmed by **ICC** as considered a major pest issue within the estate along with Foxes and Cane Toads.
- Existing and expanding sources of domestic dogs (new housing) adjoining the conservation land with no regulatory controls on access.
- Existing and expanding sources of unrestricted pedestrian, vehicle and motorbike access.

Based on Terrestrial Habitat Quality Assessment Guideline methodologies, it is likely that the strongest drivers in the reduction of Habitat Quality in the absence of an offset and related management plans would be an increase in weed, primarily Lantana, infestation and the ongoing presence or increase in wild and domestic dogs. Weeds such as Lantana suppress native flora growth and recruitment and impede Koala movement, and dogs are recognised as significant threats to Koala persistence. Assuming no management and that these deleterious factors worsen over a 15 year timeframe, under the Terrestrial Habitat Quality Assessment matrix, the following specific factors would likely drive down Habitat Quality from 8 to at least 6 (noting only a drop from 7.6 to <6.5 is required):

Site Condition

- Recruitment of native woody species – suppressed by weed coverage
- Native shrub species richness – suppressed by increased weed numbers
- Native grass species richness – suppressed by weeds
- Native forb species richness – suppressed by weeds
- Native shrub canopy cover – suppressed by weed coverage
- Native perennial grass cover – suppressed by weeds
- Weed cover – exacerbated

Species Habitat Index

- Threats to species – exacerbated primarily by increased wild dog caused by lack of active pest management and potential increase in domestic dogs with additional residential housing.



- Quality and availability of food and foraging habitat – decreased by weed coverage and also increased wild dog abundance caused by lack of active pest management and potential increase in domestic dogs with additional residential housing.
- Quality and availability of shelter – decreased by weed coverage and also increased wild dog abundance caused by lack of active pest management and potential increase in domestic dogs with additional residential housing.
- Species mobility capacity – decreased primarily by weed coverage and increased wild dog abundance caused by lack of active pest management and potential increase in domestic dogs with additional residential housing.

Future Quality:

6

Future Quality with the Offset

The quality of the offset area is likely to slightly enhance in the future as it continues to be protected and managed through initially development controls and ultimately weed management and bushland regeneration. The importance of the offset area as a critical linkage area within the Flinders-Karawatha Bioregional Corridor will increase in the future should development pressures encroach into existing rural areas. As the offset area provides the only publically owned land within this portion of the corridor, its protection is crucial in order to maintain long term connectivity to the north and south, particularly for cryptic and specialised species that are not adapted to urban environments.

As part of this offset proposal and the EPBC Act approval, land within the offset area will be proactively managed in order to enhance its ecological value. This will include reinstatement works within heavily degraded areas, extensive weed removal and a comprehensive pest management program. Note, these works will occur over the entire Conservation Land as part of commitments for **Lendlease**, under the Spring Mountain Estate V-Dec Management Plan. Agreement has been made between **Lendlease** and **SLC** for **Lendlease** to undertake the offset improvement works on **SLC's** behalf. Importantly, a holistic approach to management of the conservation area (Spring Mountain and First Nine Offset), particularly in relation to pest management, will ensure results yield the conservation outcomes for the Koala, opposed to if the offsets were managed separately, limited to the extent of their respective EPBC Act approvals.

Overall, the future quality of the offset area with the offset occurring is considered to be 9. This increase is justified through two key measures being:

1. Implementation of direct weed removal, ongoing weed control and direct reinstatement of native vegetation, including new koala food tree species, and
2. An active pest management program funded by the proponent implemented within both the First Nine Project and broader approved offset lands.

Through the designation of an offset, associated management plans will diminish the influence of weed and wild dog impacts on Koala persistence as drivers of habitat quality. The implementation of management plans is intended to return the offset area to optimal 'biocondition', as reflected in the benchmarks applied to the Terrestrial Habitat Quality Assessment matrix. It is probable the following specific factors would likely drive up the Habitat Quality of the offset area from a score of 8 to 9 (noting only an increase from 7.6 to ≥ 8.5 is required) via effective weed management and wild dog monitoring and reduction:

Site Condition

- Recruitment of native woody species – improves with weed suppression
- Native shrub species richness – improves with weed suppression



- Native grass species richness – improves with weed suppression
- Native forb species richness – improves with weed suppression
- Native shrub canopy cover – improves with weed suppression
- Native perennial grass cover – improves with weed suppression
- Weed cover – diminished significantly

Species Habitat Index

- Threats to species – mitigated via dog and weed management
- Quality and availability of food and foraging habitat – improved by weed management and also wild dog control, though not beyond current attribute threshold in the calculation
- Quality and availability of shelter – improved by weed management and also wild dog control, though not beyond current attribute threshold in the calculation
- Species mobility capacity – improved by weed management and wild dog control

1. Weed Management Program

Broadly, this increase is justified through:

- 1) An overall increase of the land from a rounded score of 8 (7.6) to a 9 (≥ 8.5) within the Terrestrial Habitat Quality Assessment Guidelines through a number of minor and moderate improvements in scoring factors for:
 - a. Reduced weed cover
 - b. Increased recruitment of woody species
 - c. Increased, tree, shrub and grasses richness
 - d. Improvements in the quality of available food and foraging
 - e. Quality of available shelter
 - f. Improved species mobility capacity
- 2) Weed management combining with pest management proposals to deliver a 10% improvement of the offset land within the context of the EPBC Act Environmental Offset Policy Calculator.

Within the approved offset for **Lendlease** EPBC 2013/7057 a detailed management plan connected to the Voluntary Declaration (VDEC) lists a range of measures to occur on the 293 ha portion of the land holding. A copy of the [Spring Mountain Estate V-Dec Management Plan](#) is included in **Attachment E** and broadly provides for:

- Primary Weed Removal – direct weed removal of existing weed sources, including major infestations
- Secondary Weed Management – Ongoing maintenance of weed removal areas to manage weed reinstatement.
- Revegetation of native species, including Koala food tree species, where weed removal results in cleared areas greater than 5 square metres.
- Assisted natural regeneration – utilised weed removal techniques that minimise disturbance in areas where weeds coexist with recruiting native species.
- Establishes benchmarks, monitoring and reporting measures.

The same measures in the [Spring Mountain Estate V-Dec Management Plan](#) are proposed within the First Nine environmental offset land, however, are based on more detailed foundations of the existing conditions of the land extracted from further site surveys and investigations. Theory supporting evidence of weed removal to enhancing ecosystem quality was researched as part of preparation of the [Spring Mountain Estate V-Dec Management Plan](#), and the commitments therein. A summary of key research findings is presented in the following sections.



Attachment D includes the First Nine Habitat Quality Assessment Technical Memo, prepared by **SHG**, dated July 2017, inclusive of detailed maps of Lantana species and infestations through the environmental offset land. Lantana is listed as a WONS. Additionally, it has been nominated by the **NSW Government Office of Environment and Heritage** to be listed as a key threatening process under the EPBC Act:

"The invasion, establishment and spread of Lantana camara impacts negatively on native biodiversity including many EPBC listed species and communities."

(Source: Key Threatening Process Nomination Form)

"Lantana is a Weed of National Significance. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts. Lantana forms a dense, impenetrable thickets that take over native bushland."

(Source: Weed Management Guide – Weeds of National significance – Lantana – National heritage Trust)

"L. camara may change soil microhabitat through shading, self-mulching, and altered water and nutrient balances. Lamb (1988, cited in Swarbrick et al. 1995) identified an increase in soil nitrate in eucalypt woodland following Lantana invasion, to the benefit of the Lantana and other weeds, and to the detriment of some native species, and a decline in other nutrients. Gentle and Duggin (1998) point to Lantana's ability to aggressively compete for and sequester surface-soil nutrients, such as are made available by disturbance episodes, and verified experimentally Lantana's ability to out-compete and suppress an analogous native coloniser of mesic forests (Choricarpia leptopetala, Myrtaceae)."

(Source: Lantana camara - key threatening process listing – NSW Government
<http://www.environment.nsw.gov.au/determinations/LantanaKtp.htm>)

"Its invasion of natural ecosystems put at risk more than 1400 native plant and animal species, including 279 plant and 93 animal species listed as rare and/or threatened under state and federal legislation."

(Source: Lantana Camera National Strategic Plan 2008-2009 – National Lantana Management Group)

"Lantana forms dense thickets that exclude native species, leading to its complete dominance of the understorey and eventually the canopy."

(Source: NSW Government <http://www.environment.nsw.gov.au/pestsweeds/LantanaFactsheet.htm>)

Core management actions to be employed on the offset land include the removal and management of Lantana allowing for an improvement in overall ecosystem resilience.

Ecosystem resilience is defined by Mc Donald (2011) as, "the capacity of a species or community to 'bounce back' (i.e. recover its fundamental structure and function) after stress". Mc Donald goes on to state:

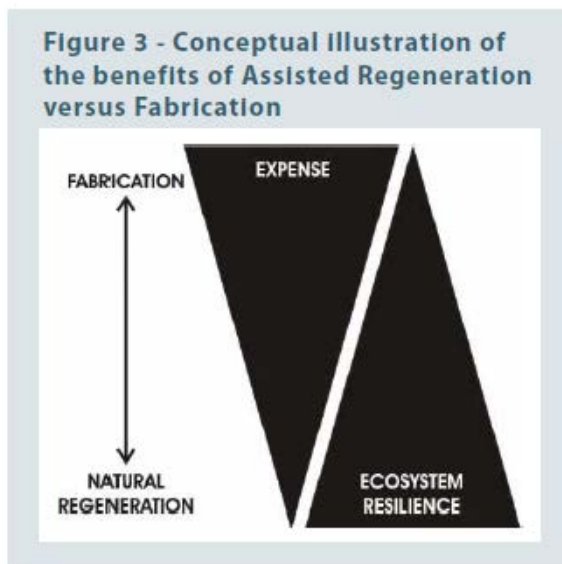
- This capacity is based on biological mechanisms or 'recovery traits' that the plants have developed over millennia of adaption to natural stresses (e.g. resprouting and soil seed store); and
- Many of the traits of species occurring in similar vegetation communities are similar (because those areas have undergone similar stresses). This can help us generalise and more easily predict resilience on damaged sites.

Fundamental to the concept of ecosystem resilience is that the less damaged a site (or part of a site) is, the higher will be its natural resilience (i.e. capacity to recovery naturally once healthy conditions are re-established). The South East Queensland Ecological Restoration Guidelines (SEQ Ecological Restoration Guidelines), prepared by Chenoweth EPLA & Bushland Restoration Services (2012), p. 32, states:



"Often, a vegetation remnant that has already been recognised as having values worthy of protection status will be best suited to the assisted natural regeneration approach. A protected ecosystem will usually have at least some native vegetation cover, with the strong likelihood of assisted natural regeneration occurring. This is primarily accomplished through the control of environmental weed species present, which may have reduced the function and structure of the ecosystem by suppressing native plant regeneration and competition for light, nutrients, space and water. Natural regeneration may take place due to the presence of a stored seed bank in the soil, or by easy reintroduction of native seeds through the actions of birds, bats and other animals, and/or by wind and water dispersal of seeds."

The SEQ Ecological Restoration Guidelines goes on to state (p.32), *"in practice, where there is likelihood that native species will occur, the preferred option should always be assisted natural regeneration. The ecological benefits of assisted natural regeneration when compared with planting can often include the recruitment of species directly from local communities, recruitment of species that are not traditionally propagated and greater structural complexity in a shorter period of time."* And that, *"planting should be used only where it can be demonstrated that the soil seed bank is insufficient to allow natural regeneration to occur"*. Refer to extracted Figure 3 for the SEQ Restoration Guidelines (p.33) below:



Source: Figure 3 for the SEQ Restoration Guidelines (p.33)

The offset site is comprised of predominately remnant Least Concern vegetation with smaller areas of Endangered Regional Ecosystem. The proposed offset area includes both large areas and a consistent number of smaller establishing patches of dense infestations of *Lantana camara*, listed as a WONS. Removal of weeds from the offset area in accordance with the methods described in the South East Queensland Ecological Restoration Manual, prepared by Chenoweth EPLA & Bushland Restoration Services (2012) to allow for natural regeneration of bushland is considered to be the most appropriate, effective and immediate method to support Koala bushland habitat restoration. The [Spring Mountain Estate V-Dec Management Plan](#) (which includes the First Nine offset land) details weed removal and natural regeneration in accordance with the SEQ Ecological Restoration Framework (i.e. Phase 1) and where this is not plausible (e.g. large cleared areas left after weed removal), assisted natural regeneration through direct planting of endemic species.

There are two other inferred benefits directly relating to Koala Habitat and use of the land achieved through weed removal:



- 1) A number of Spot Assessment Techniques (SAT) surveys were completed on the proposed offset land to determine both species composition and provide an estimate of Koala occurrence. SAT Surveys were completed throughout the offset area as per Phillips & Callaghan 2011. Field ecologists undertook a number of detailed searches within the weed infested areas in an effort to locate Koala scats and commence a SAT survey as per the recognised protocol. The purpose of this methodology was to collect site evidence that greater Koala usage was occurring in areas where Koala tree species existed in an undisturbed area containing a native understorey versus Koala food trees located amongst dense weed infestations (namely, Lantana clumps). Rather, no scats were located during field surveys under Known Koala tree species where occurring amongst dense weed infestations.
- 2) Further to the absence of Koala scats within weed infestations, the largest and most difficult to traverse patch of Lantana (by ecologists completing surveys) is located within the north south drainage line directly adjacent to the bridge structure that provides the only safe fauna movement passage between the north and south portions of the Conservation Land. This location represents the funnel point of the Queensland Government's Karawatha – Greenbank – Flinders bioregional corridor. Removal of weeds in this location while maintaining and increasing the native vegetation cover should increase the capacity of fauna, inclusive of the Koala, to safely mobilise past the road.

Investment in weed management and natural regeneration works will occur immediately and concurrently with similar works being completed on contiguous land by **Lendlease** as part of their existing environmental offset approval. Upon further review, the time until ecological benefit for overall improvement, inclusive of weed removal and management, has been increased from 2 years to 15 years. This timeframe aligns with the weed management responsibilities outlined in the [Spring Mountain Estate V-Dec Management Plan](#).

2. Pest Management Program

Broadly, this increase is justified through:

- 1) An overall increase of the land from a rounded score of 8 (7.6) to a 9 (≥ 8.5) within the Terrestrial Habitat Quality Assessment Guidelines through a number of minor and moderate improvements in scoring factors for:
 - a. Reduction in threats to the species
 - b. Role of the site in overall population
 - c. Improved species movement capacity
- 2) Pest management combining with weed management proposals to deliver a 10% improvement of the offset land within the context of the EPBC Act Environmental Offset Policy Calculator.

On average, approximately 110 Koalas are attacked and killed by dogs each year in South East Queensland. Records indicate that between 1997 and 2008 the **Queensland Department of Environment and Heritage Protection's** Moggill Koala Hospital and the Australian Wildlife Hospital at Beerwah admitted around 1,400 koalas that had been attacked by dogs (<https://data.qld.gov.au/dataset/qld-wildlife-data-api/resource/30e1f709-3de2-4d5b-9969-3f0341e438b9>)

A submission to the Senate Committee Inquiry into the status, health and sustainability of Australia's Koala population made by the **Australian Koala Foundation (AKF)** in relation to wild dogs as a key threatening process to the Koala, however, outlines that contrary to public assumption, wild dogs are the primary cause of dog attacks not domestic dogs. The submission was based on review by the **AKF** of numerous studies, latest research data and Koala death statistics. The **AKF** state that SEQ wild dog populations are predominate in bushland areas on the outskirts of Brisbane, to the north and west. The submission points out that wild dogs are often mistaken for domestic dogs without collars and thus domestic dogs are often incorrectly recorded



for Koala attacks. Importantly, wild dogs are not subject to the same controls and confinements as domestic dogs and because these feral animals live in bushland areas exclusion elements are considered less effective than coordinated wild dog control programs and management.

While no measurable base line data on numbers was available, information provided by **ICC** for the land and the adjoining White Rock Spring Mountain Conservation Estate states that major pest animals within the estate include:

- Wild dogs (*Canis familiaris*)
- European Red Foxes (*Vulpes vulpes*)
- Feral Pigs (*Sus Scrofa*)
- Cane Toads (*Rhinella marina*)

(Source: Section 6.3 Pest Animals - White Rock Spring Mountain Conservation Estate – Tier 2 Management Plan – ICC – June 2015)

Key locations within the Conservation Estate where significant pest animals exist include the creek lines, along access tracks and at any permanent or periodic water bodies.

As part of the legally securing of the land and implementation of an offset management plan, agreement has been reached between **ICC**, **Lendlease** and **SLC** for increased investment and commitment towards the management of domestic and wild dogs within the conservation land. These actions include:

- Increased monitoring of pest animal usage and populations within key locations where animals have been observed or indirect evidence recorded.
- For the life of the offset the proponent will fund a licensed feral pest management contractor to actively monitor, capture and remove both domestic and wild dogs from the conservation area.
- Under the Spring Mountain Estate V-Dec Management Plan, **ICC**, **Lendlease** and **SLC** have agreed to prohibit domestic animals from the Conservation Land.
- The introduction of regulatory prohibition signage for domestic animals at key entry points and residential interfaces along the existing access barrier fencing.
- Signage to include information and contacts for the reporting of domestic or wild dogs within the conservation land.
- Mail outs to residents with local law dog permits within proximity of the conservation land regarding the prohibition and impending pest management actions.

Active works for wild and domestic dog reduction and control within the conservation land forming part of the environmental offset will tailor into an overall broader management plan being prepared by **ICC** for land, including and, adjoining the conservation area. Importantly, the same pest management contractor is engaged over the area of land within the **Lendlease** offset allowing for the monitoring and capture of a larger area.

Some edges of the existing land holdings retain barrier fencing to preclude unauthorised access. Fencing is not considered to achieve a Koala exclusion specification. Where fencing does not exist the conservation land displays evidence of:

- 1) New tracks, unauthorised and uncontrolled vehicle and pedestrian access
- 2) Unlawful dumping of garden and domestic waste – weed sources

While these aspects are minor in terms of the overall impacts and potential benefits to Koalas and Koala habitat, the proponent has committed to preclude further access issues through the completion and reinstatement of barrier fencing.



In summary, proposed weed management and pest management measures will result in an overall increase of the land from a rounded score of 8 (7.6) to a 9 (≥ 8.5) within the Terrestrial Habitat Quality Assessment Guidelines.

Future Quality: 9

D. Time over which loss is averted

The foreseeable timeframe over which changes in the level of risk to a proposed offset site can be considered and quantified is 20 years. It is noted that this timeframe was originally 20 years in the Spring Mountain Referral (2013/7057) and after discussion with the **DEE** has been maintained.

Time over which loss is averted: 20 years

E. Time until ecological benefit

The offset site is already covered in remnant vegetation containing Least Concern and Endangered remnant vegetation. As the offset site is already established, its ecological benefits are predominantly realised immediately and in fact has been performing its current ecological function for at least the last 7 years since dedication. While works proposed to improve the quality of the offset area from its current score of 8 to 9 the majority and most important of these will occur in the first 2 years (covenant, approval and implementation of management plans, fencing, etc.). This timeframe was approved as part of the calculator attributes given to the land for the Spring Mountain offset approval.'

However, upon further review the time until ecological benefit for overall improvement, inclusive of weed removal and management, has been increased from 2 years to 15 years..

Time until ecological benefit: 15 years

F. Risk of loss (%)

The Risk of Loss attributes for the First Nine Proposed Offset Areas are:

- 1) Area 1 – 80% (85% with / 5% without) for land designated as Urban Footprint in the SEQ Regional Plan 2005-2026 (*Area 1 makes up 8.5ha of the total 81.5 ha offset area*)
- 2) Area 2 – 10% (15% with / 5 without) for land designated as Rural Landscape and Rural production Area in the SEQ Regional Plan 2005-2026 (*Area 2 makes up 73 ha of the total 81.5 ha offset area*)

Refer to **Plan 10** for areas making up the First Nine Offset and completed calculation sheets on the following pages.



Area 1 is identical to the Risk of Loss Value (RIL) applied in the adjoining **Lendlease** Environmental Offset approval. Area 2 has been reduced by 70% (80% to 10%) in its Risk of Loss Value based on its exclusion from the Urban Footprint in the SEQ Regional Plan 2005-2026.

Urban Footprint RIL Value = 85% - Explanation

The risk of loss value for land within the SEQ Regional Plan 2005-2026 Urban Footprint is 85%. This value was established and accepted by **DEE** for the land with the same designation in EPBC 2013/7057. As highlighted through previous submissions, the 85% RIL value was justified within EPBC 2013/7057 through:

- The **DEE** recognising the land was owned in freehold by **SLC** and dedicated to **ICC** for environmental and conservation outcomes between 2006 and 2011.
- The **DEE** acknowledging the RIL value of the land at the time it was dedicated – e.g. 2006 when the land was owned as freehold by **SLC** with Urban Footprint designations.
- At the time of dedication, **SLC** were in control of the freehold land with the dedicated land occurring on the same cadastral allotment as the now substantially commenced town centre and near complete Springfield Lakes Residential Community. Should the conservation land have not been dedicated, **SLC** would have had the option to develop it as part of the Springfield master planned community.
- The land retains the same topography, vegetation types, State and Local Government mapping layers (e.g. Remnant Vegetation Status) as the adjoining land now covered in housing.
- The dedicated area retained a high land value due to its Urban Footprint use rights.

In summary, the high Risk of Loss value was assigned by **DEE** because the land was owned by a developer, developing on the same and adjoining land with like State Government use rights as land now covered in housing (refer **Attachment G** – Letter from the **Queensland Department of Infrastructure, Local Government and Planning** – Noting amendments to Regional Plan designates reflects dedications made by **SLC**)

Risk of loss without offset (Urban Footprint): 85%

Non-Urban Footprint RIL Value = 15% - Explanation

Within the negotiations of the EPBC 2013/7057 a number of revisions of offset calculation sheets were exchanged and this land always retained a low RIL value (shown as 15%). None of the land outside of the Urban Footprint designated area from the 2005-2026 SEQ Regional Plan is included within the approved offset for EPBC 2013/7057, and thus precedence on a value is not relied upon.

Through discussion with the **DEE**, it is understood that without a VDEC, or similar instrument, the land is not secured. Discussions around this position were based on:

- The land was dedicated to **ICC** as freehold owned by **ICC**. The majority of environmental and conservation land in Queensland is dedicated to the State Government and then entrusted to Council's through trustee agreements. Thus Council is the sole administrator of the use of the land.



- While considered unlikely all of the land was at risk of being cleared, the potential for a change in **ICC** to implement non complimentary uses on the land including more active recreational parks, a lookout café with access road, other infrastructure remained.

The securing of the VDEC under the VMA sets the land aside for a specific suite of environmental purposes and makes **NRM** a direct decision maker in the future use of the land.

The benefit of the VDEC in locking in the environmental purpose of the land and bringing the State Government into the decision making process thus the relatively low RIL value of 15% is assigned to Non-Urban Footprint designated land.

Refer to **Attachment F** for registration certificates for dedication of the land occurring from 2006 to 2011.

Risk of loss without offset (Non-Urban Footprint): 15%

i) With Offset

As a result of the advanced offset and conservation land dedication, it is highly unlikely that the areas natural values will be lost because:

- The land is now held under public ownership by **ICC** and as such, is not susceptible to the same development pressures under a private land holding.
- Under the Springfield Structure Plan, the offset area has been designated as ‘conservation land’ and is protected at the local scale from urban development.
- Negotiations will be undertaken with **ICC** to legally secure the offset site so that land uses cannot be compromised under possible future amendments to structure plans.
- The offset land is substantial in size and width and robust enough to withstand periodical impacts of bushfire, weed incursion, native and feral species impacts. Furthermore, the offset land adjoins (forms part) of a 65,000 hectare tract of connected bushland forming the Flinders-Karawatha Bioregional Corridor.

Overall, the risk of loss with the offset is considered to be 5%.

Risk of loss with offset: 5%

G. Confidence in result (%)

A confidence result of 90% has been given to both the risk of loss and future quality attributes. This level of confidence is derived from the consideration of relevant planning instruments, mapped ecological values and on ground field surveys. Additionally, **SLC** is a large, viable, experienced and award winning business whose track record and livelihood is derived from achieving development commitments outlined in master plans, plans of development and compliance with approval conditions. Works approved through the EPBC Act process will also entail more detailed approvals by **ICC** who retain the local compliance resources to ensure completion of works in accordance with approved management plans. ICC will be especially vigilant in ensuring compliance given the benefits and substantial cost savings they achieve through the enhancement works to an existing Council land asset.

Confidence in Results: 90%



Overall, the commitment of **81.5 hectares** (made up of the remaining 8.5 ha of Urban Footprint land and 73 ha of Non-Urban Footprint Land within the Conservation Land will provide a **100%** direct offset for the loss of 46.2 hectares of critical Koala habitat within the site. Refer to the Offset Calculation below and **Plan 10** for the First Nine Offset Receive Site.

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	First Nine	Area	46.2	Hectares
			Quality	6	Scale 0-10
			Total quantum of impact	27.72	Adjusted hectares
<i>Threatened species</i>					
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																			
							Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)																				
<i>Threatened species habitat</i>																													
Area of habitat	Yes	27.72	Adjusted hectares	Urban Footprint	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	8.5	Risk of loss (%) without offset	85%	Risk of loss (%) with offset	5%	Raw gain	6.80	Confidence in result (%)	90%	Adjusted gain	6.12	Net present value	5.88	% of impact offset	20.30%	Minimum (90%) direct offset requirement met?	No	Cost (\$ total)		Information source		
					Time until ecological benefit	15	Start quality (scale of 0-10)	8	Future area without offset (adjusted hectares)	1.3	Future area with offset (adjusted hectares)	8.1	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	9	Raw gain	3.00	Confidence in result (%)	90%	Adjusted gain	2.70	Net present value	2.62					
<i>Threatened species</i>																													
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	27.72	5.63	20.30%	No	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	First Nine	Area	46.2	Hectares	
			Quality	6	Scale 0-10	
			Total quantum of impact	27.72	Adjusted hectares	
<i>Threatened species</i>						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g. Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator																			
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source			
<i>Ecological Communities</i>																			
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset	0.0										
							Future area without offset (adjusted hectares)	Future area with offset (adjusted hectares)											
							Time until ecological benefit	Start quality (scale of 0-10)									Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)	
<i>Threatened species habitat</i>																			
Area of habitat	Yes	27.72	Adjusted hectares	Outside Urban Footprint	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	73	Risk of loss (%) without offset	15%	Risk of loss (%) with offset	5%	7.30	90%	6.57	6.31	21.94	79.15%	No
									Future area without offset (adjusted hectares)	62.1	Future area with offset (adjusted hectares)	69.4							
									Time until ecological benefit	15	Start quality (scale of 0-10)	8							
<i>Threatened species</i>																			
Number of features e.g. Nest hollows, habitat trees	No																		
Condition of habitat Change in habitat condition, but no change in extent	No																		
Birth rate e.g. Change in nest success	No																		
Mortality rate e.g. Change in number of road kills per year	No																		
Number of individuals e.g. Individual plants/animals	No																		

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	27.72	21.94	79.15%	No	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!



7.4 Offset Requirements (EPBC Act Offsets Policy Objectives)

The offset will be managed in accordance with the [Spring Mountain Estate V-Dec Management Plan](#) which has been prepared in accordance with the requirements of the *EPBC Act Biodiversity Offset Policy* and **NRM's** template plan for Voluntary Declarations and covers the entire 396ha of conservation land dedicated by **SLC** to **ICC**. The [Spring Mountain Estate V-Dec Management Plan](#) was prepared and approved as part of securing the VDEC on title and addressing offset conditions of approval for Spring Mountain (EPBC2013/7057).

The main **objective** of the offset is to:

Provide a high quality, functioning ecosystem containing Koala habitat that facilitates ongoing dispersal between habitat patches in the landscape.

It is anticipated that this objective will be achieved through its fulfilment of the performance requirements set out in the *EPBC Act Environmental Offset Policy*, as demonstrated in **Table 6**.

Table 6: EPBC Act Offset Policy Requirements

Policy Requirement	✓/x	Strategy
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter.	✓	<p>The project will result in the loss of 46.2 hectares of vegetation identified as containing critical habitat for the Koala. This report has identified that 81.5 hectares of vegetation within the Conservation Land will be rehabilitated to offset impacts associated with clearing of Koala habitat. This offset area forms part of the Flinders –Karawatha Bioregional Corridor and thus will deliver a conservation outcome that maintains the extent (for perpetuity) of critical Koala habitat in the landscape. The vegetation within the Conservation Land will undergo weed removal and will be replanted with native species consistent with the naturally occurring Regional Ecosystems as part of the rehabilitation proposal. The offset will ensure connectivity between adjoining vegetation patches is maintained for the long term for local site scale koala usage. This offset seeks to ensure that Koalas prevail in the landscape in which the action is occurring.</p> <p>Management of this offset will be in accordance with the Spring Mountain Estate V-Dec Management Plan which has been approved as part of securing the VDEC on title and addressing conditions for approval for Spring Mountain (EPBC2013/7057).</p> <p>The offset will improve or maintain Koala habitat in the landscape and facilitate long term connectivity between vegetation patches. Additionally, the securing of land within the Flinders- Karawatha Bioregional Corridor will contribute to the broader South East Queensland Koala Conservation.</p>
Suitable offsets must be built around direct offsets but may include compensatory measures.	✓	<p>As discussed above, the offset includes the direct rehabilitation, restoration and protection of habitat within the 81.5 ha within the Conservation Land which forms part of the Flinders-Karawatha Bioregional Corridor. The Offsets Calculator shows that this will achieve</p>



Policy Requirement	✓/x	Strategy
		<p>a 100% direct offset of residual impacts. Management of this offset will be in accordance with the Spring Mountain Estate V-Dec Management Plan which has been approved as part of securing the V-Dec on title and addressing conditions for approval for Spring Mountain (EPBC2013/7057).</p> <p>The offset is built around direct offsets in a suitable location.</p>
<p>Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.</p>	<p>✓</p>	<p>Assessment against the EPBC Act Offsets Assessment Guide utilised the International Union for Conservation of Nature data to determine the probability of annual extinction for different categories of threatened species. As the Koala is listed as Vulnerable, the annual probability of extinction used was 0.2%. This measurement was used within the Offset Calculator, ensuring that the level of statutory protection that applies to the protected matter was taken into account.</p> <p>The level of statutory protection was taken into account.</p>
<p>Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.</p>	<p>✓</p>	<p>Then proposed 81.5 ha of offset was calculated to provide a 100% direct offset to compensate for the impacts on Koala habitat.. Management of this offset will be in accordance with the Spring Mountain Estate V-Dec Management Plan which has been approved as part of securing the V-Dec on title and addressing conditions for approval for Spring Mountain (EPBC2013/7057). As such, the offset is considered to be appropriate and proportionate to the residual impacts identified above.</p> <p>The offset is proportionate to the impact.</p>
<p>Suitable offsets must effectively account for and manage the risks of the offset not succeeding.</p>	<p>✓</p>	<p>A 90% confidence in the risk of loss for the offset is considered appropriate as at the time of dedication this land was within the urban footprint and thus was positioned for future urban development. It is noted that an 85% risk of loss was agreed to for Conservation Land within the urban footprint as part of the Spring Mountain approval (EPBC 2013/7057). A 10% averted loss (or 15% risk of loss) has been attributed to the value uplift for areas outside the urban footprint. This score is considered suitable as significant weed infestations are scattered throughout the offset land, particularly throughout drainage lines where Koalas prefer to move</p> <p>Management of this offset will be in accordance with the Spring Mountain Estate V-Dec Management Plan which has been approved as part of securing the V-Dec on title and addressing conditions for approval for Spring Mountain (EPBC2013/7057).</p> <p>Risks have been appropriately considered and managed.</p>
<p>Suitable offsets must be additional to what is already required,</p>	<p>✓</p>	<p>The proposed offset will be provided in response to the <i>EPBC Act Offsets Policy</i>. It does not have a purpose of offsetting other matters of state or</p>



Policy Requirement	✓/x	Strategy
determined by law or planning regulations, or agreed to under other schemes or programs.		<p>local government levels. While there is some overlap between agreed site conservation areas through Council negotiations these are not considered offsets and have been factored into the Risk of Loss attributes, respective of areas that fell within the urban footprint and outside the urban footprint at the time of dedication.</p> <p>The offset is additional to what is already required.</p>
Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable.	✓	<p>A number of management strategies will be in place to ensure that the 81.5 ha offsite offset achieves these desired outcomes:</p> <p><u>Efficient and Effective</u></p> <ul style="list-style-type: none"> ▪ The proponent will directly provide funding to facilitate rehabilitation works in the conservation corridors; ▪ The rehabilitation plan will be developed in consultation with Ipswich City Council ▪ The design of the offset has focused on recreating Koala habitat-replanting works will focus on ensuring there is a high mix of Koala food trees to ensure the rehabilitation is efficiently and effectively recreating the habitat lost as a result of the development. <p><u>Timely</u></p> <p>To reduce time-lag between the loss of vegetation and the establishment of offset vegetation, rehabilitation works are scheduled to commence in line with the first stage of development.</p> <p><u>Transparent</u></p> <p>Monitoring and reporting of the rehabilitation areas will be undertaken and results will be made available to Council. In addition, results from the fauna-spotter catcher report will be made available to the Department of Environment and Heritage Protection. Details of rehabilitation works will be made available within annual reports so that the general public have access to up-to-date information relating to the project.</p> <p><u>Scientifically Robust</u></p> <p>The rehabilitation program has been designed in collaboration between qualified landscape architects, ecologists and environmental managers with experience in vegetation rehabilitation within South East Queensland. It is this experience that ensures the rehabilitation program will successfully achieve short and long term outcomes to appropriately compensate for the loss of Koala habitat. In addition, the rehabilitation plans will be checked and approved by Ipswich City Council and the Department of Natural Resources and Mines, providing another layer of review and assessment.</p> <p>The aim of rehabilitation works will be to establish an ecosystem with the physical structure and function of woodland dominated by Koala food trees.</p>



Policy Requirement	✓/x	Strategy
		<p>Reasonable</p> <p>The offset design has been based upon achieving conservation outcomes for the Greater Springfield area. The Conservation Land was dedicated by SLC in 2006 and 2011 for the purpose of achieving conservation outcomes within the Flinders Karawatha Bioregional I Corridor and is reflected in the Springfield Structure Plan and subsequently Council's planning scheme.</p> <p>The offset is efficient, effective, timely, transparent, scientifically robust and reasonable.</p>



8. Environmental Outcomes

DEE request the following information in relation to Item 6: Environmental Outcomes:

6.1 If the proponent wishes to pursue outcomes-based conditions in the event that the action is approved with conditions, the preliminary documentation must provide information on the outcomes that the proponent will achieve as outlined in Section 2.

6.2 Outcomes need to be specific, measurable and achievable and must be based on robust baseline data. Outcomes must be developed in consideration of the *Outcomes based Conditions Policy 2016* and *Outcomes-based Conditions Guidance 2015*, with suitable justification for considerations identified in the policy and guidance.

6.3 To allow application of outcomes-based conditions, the preliminary documentation should include the specific environmental outcomes to be achieved and the reasoning for these in reference to any Recovery Plan, Conservation Advice or Threat Abatement Plan that may be relevant to MNES.

6.4 For each proposed outcome, the information must include:

- a) the risks associated with achieving the outcome;
- b) the measurability of the outcome, including all suitable performance measures;
- c) appropriate baseline data upon which the outcome has been defined and justified;
- d) the likely impacts that the proposed outcome will address;
- e) demonstrated willingness and capability of achieving the outcome;
- f) commitments to independent and periodic audits of performance towards achieving outcomes;
- g) assessment of the likely level of control that the proponent will have over achieving the outcome; and
- h) details of proposed management to achieve the outcome, including but not limited to, performance indicators, periodic milestone, proposed monitoring and adaptive management, recording keeping, publication and reporting processes.

(DoE Preliminary Documentation Decision- Pages 7)

The following outcomes have been developed in consideration of the *Outcomes-based Conditions Policy 2015* and *Outcomes-based Conditions Guidance 2015* and residual impacts to Koala as discussed throughout this report (refer **Table 7** and **Table 8**).



Table 7: Suitability for Outcomes Based Conditions

Considerations	Requirements	Yes/No	Comment
Step 1: Confirm that the Project is Suitable for Outcomes Based Conditions			
All environmental risks are well understood and can be adequately managed	Multiple, detailed, site surveys have been completed including contemporary surveys specific to locating, describing and assessing EPBC Act <i>Matters of National Environmental Significance</i> (MNES). Methods completed for survey are in accordance with the Department of the Environment and Energy (DEE) guidelines and requirements.	Yes	Information regarding the existing environmental features and proposal are understood and risks have been outlined and presented throughout the referral and this First Nine Preliminary Documentation Report.
High quality baseline data about the protected matter or something that directly supports the protected matter (e.g. habitat) is available or could be obtained	As above; relevant information with respect to MNES has been collated, described and quantified in accordance with DEE requirements.	Yes	As above; relevant information with respect to MNES has been collated, described and quantified in accordance with DEE requirements.
There is a good understanding of and consensus about the likely impacts of an action on the protected matter	The First Nine Preliminary Documentation Report outlines the exact impacts based on EPBC Act requirements and Guidelines (specifically the Koala Referral Guideline).	Yes	The project and field results have been discussed with Departmental Officers through a post lodgement meeting. Assessment of impacts were reviewed, commented on and agreed for inclusion in the referral application.
The approval holder has demonstrated capability and willingness to achieve the outcome	The proponent has been involved in numerous discussions as part of the Lendlease application for Spring Mountain (EPBC 2013/5075) and recognition of the 396ha of Conservation land dedicated by SLC for use as an environmental offset. In addition, the proponent has held a post lodgement meetings with the DEE for this project to discuss environmental outcomes.	Yes	The proponent has been involved in numerous discussions with the DEE in regards to the proposed offset and environmental outcomes for the project.

environmental management
preliminary documentation report



<p>A sufficient level of knowledge and information on the protected matter is available to define an outcome</p>	<p>Contemporary site surveys have been completed specific to locating, describing and assessing EPBC Act MNES. Methods completed for survey are in accordance with the DEE guidelines and requirements.</p>	<p>Yes</p>	<p>Information regarding the existing environmental features and proposal are understood and risks have been outlined and presented throughout Application.</p>
<p>The outcome for the protected matter or something that directly supports the protected matter is measurable, able to be enforced and appropriately monitored,</p>	<p>Contemporary site surveys have been completed specific to locating, describing and assessing EPBC Act MNES. Methods completed for survey are in accordance with the DEE guidelines and requirements. Relevant information with respect to MNES has been collated, described and quantified in accordance with DEE requirements.</p>	<p>Yes</p>	<p>Information regarding the existing environmental features and proposal are understood and risks have been outlined and presented throughout the referral and this First Nine Preliminary Documentation Report. As above; relevant information with respect to MNES has been collated, described and quantified in accordance with DEE requirements.</p>
<p>The performance towards achievement of the outcome is capable of independent and periodic audit</p>	<p>Yes. Outcomes outlined in each of the conditions are capable of being audited both internally and externally from the project.</p>	<p>Yes</p>	<p>Yes. Outcomes outlined in each of the conditions are capable of being audited both internally and externally from the project.</p>



Table 8: Proposed Outcomes Based Conditions

No.	Topic	Proposed Condition	Background to Condition	Legislative Basis	Metric / Milestones	Monitoring and Method for Demonstrating Compliance	Condition Currency
1	Koala Protection, safety and Management During Construction	The Approval Holder must demonstrate all leading practice measures have been employed to avoid a Koala being injured, orphaned or killed during the removal of vegetation from the project site.	<p>Koala management will occur in accordance with the Koala Management Plan (KMP) and approved Vegetation Clearing and Fauna Management Plans.</p> <p>Koalas will be flushed towards vegetated areas during sequential clearing and under supervision of a registered Fauna Spotter Catcher.</p>	Koala is a Scheduled matter under the EPBC Act and NCA.	<p>Avoid to the greatest extent possible injury, death or orphaning of a Koala during any of the clearing events –</p> <ul style="list-style-type: none"> ▪ Reported through Registered Fauna Spotters mandatory post works ▪ Audits on all species encountered (inclusive and exclusive of MNES status). 	Registered Fauna Spotters with relevant State Government Permits are a requirement by local government approvals and within the submitted VCFMPs of Register Fauna Spotters include post work audits on all species (inclusive and exclusive of MNES) encountered, how they were treated and the ongoing safety. Permit reports will provide real time evidence of achievement of this outcome.	During vegetation clearing.
2	Monitoring of Outcomes Based Conditions and Koala Safety	The Approval Holder must ensure adequate data are collected to ensure site activities can be compared to performance indicators, milestones and other listed outcomes of the KMP and VCFMPs.	<p>The KMP includes actions which require monitoring and reporting:</p> <p>Prior to the commencement of clearing, when retained areas on-site cannot safely cater for Koalas, individuals, if present, will be relocated</p>	Koala is a Scheduled matter under the EPBC Act and NCA.	Prior, during and post-works reporting in accordance with the KMP.	The KMP includes actions and specific monitoring events. Data will need to be collected prior, during and post the completion of individual clearing events. Collected Data will be utilised in compliance both pro-actively where stated in the KMP and indirectly where possible called on by a post works audit.	Prior to commencement, during clearing events, up until land is dedicated to the Local Government Authority.



			from the site in accordance with approved methods deemed most suitable by the registered Fauna Spotter Catcher.				
3	Publication of Compliance	<p>The Approval Holder must maintain a dedicated section of the project website on the compliance of these conditions and the KMP. The web page must include a copy of:</p> <ol style="list-style-type: none"> 1) The EPBC Approval or NCA Notice 2) All Final Management Plans 3) All pre-clearance Reports 4) Up to Date Fauna Spotter Reports 5) Compliance Reports on Outcomes Based Conditions 	<p>Reporting of compliance and noncompliance measures will be required to meet EPBC conditions.</p> <p>Transparency to approved documents, plans and management for the project.</p>	Transparency of monitoring and reporting to comply with Council and EPBC standard reporting requirements.	Prior to the commencement of the action for the life of the approval.	The publically accessible dedicated webpage will be active prior to the commencement of the action for the life of the approval.	For the currency specified in the KMP.
4	Monitoring and Reporting	The Approval Holder must ensure an independent audit of compliance with the conditions of approval is undertaken annually. The audit report must be submitted to the Department and uploaded on the dedicated webpage,	Monitoring and reporting will be required as part of the development to meet Council and EPBC conditions.	Annual monitoring and reporting to comply with Council and EPBC standard reporting requirements.	The annual audit report must be submitted to the Department within three (3) months of the date of completion of each development stage.	The annual audit report will be uploaded on the dedicated webpage, identifying any remedial actions outlined by the independent auditor, with any proposed changes to any management plans to be included.	During the construction of each precinct and or as specified in the KMP.

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		identifying any remedial actions outlined by the independent auditor, with any proposed changes to any management plans to be included.				The approval holder must provide full details to the Department in writing of any non-compliance with any condition.	
5	Offsets	The Approval Holder must provide an offset for the loss of Koala habitat deemed critical to the survival of the species.	46.2 hectares of Koala Habitat deemed critical to the survival of the species will be cleared for the proposed development.	Koala is a Scheduled matter under the EPBC Act and NCA.	Provide obligations in accordance with the EPBC Act Offset Policy and Spring Mountain V-Dec Management Plan.	Provide the Department with evidence of obligation being met.	Offsets have been secured and secured prior to the commencement of the action via a legally binding mechanism.



9 Social and Economic

DEE request the following information in relation to Part 7 - Social and Economic:

7.1 The preliminary documentation must address the economic and social impacts (both positive and negative) of the proposed action. Matters of interest may include:

- a) Details of any public consultation activities undertaken and their outcomes;
- b) Details of any consultation with indigenous stakeholders;
- c) Any monitoring programs to monitor ongoing changes to economic and social characteristics potentially affected by the proposed action;
- d) Projected costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies; and
- e) Employment opportunities expected to be granted by the project (including construction and operational phases)

7.2 Economic and social impacts should be considered at the local, regional and national levels.

(DoE Preliminary Documentation decision- pages 7 & 8)

9.1 Greater Springfield

Greater Springfield is fast becoming Brisbane's second CBD and is already the business heart of the high-growth Western Corridor. The Springfield CBD, occupying some 390ha, will provide an employment base for 30,000 workers within an area of 1.4 million m² of office, retail, educational, health and technology facilities. Significant projects, including the \$1.2 billion Springfield Rail project which officially opened at the end of 2013, are planned for the area.

The First Nine proposal is an essential component of the Greater Springfield development and will provide housing options for part of the growing population needed to make existing State and local investment in infrastructure viable. If First Nine did not proceed to there would be detrimental impacts on government funded assets.

To date there has been substantial investment in Greater Springfield. Projected estimates are as follows:

- Project Investment to date - \$9.7 billion
- Estimated cost on completion - \$23 billion
- Project completion to date - approximately 13%
- Total land area - 2,860 hectares
- CBD land area (Springfield Central) – 390 hectares (963 acres) or twice the land area of Brisbane CBD
- Approval for over 1.4 million square metres of mixed use space in the CBD
- Access to 86% of Brisbane's metropolitan workforce in a 32 minute drive
- Population of over 560,000 within a 22 minute drive of the CBD
- Commitment by State Government to deliver two train stations (Springfield Central and Springfield Lakes) by 2013
- Planned 2030 equivalent population - 105,000 residents (comparable to Darwin)
- Job creation target for 2030 - 30,000 (one for every three residents)



9.2 Economic Matters

The Ipswich region has been recognised as a crucial ‘growth area’ in South East Queensland for both economic development and population growth. The population of Ipswich is expected to double from 170,000 to 435,000 by 2026, creating a demand for a further 120,000 jobs within the Ipswich area. The development and construction industry plays an important role within the local economy by supporting local retailers and employing local skilled and unskilled labour. Long term investment in new housing and facilities, like that offspring Mountain, will provide vital opportunities for local firms and suppliers and help build the City’s skill base in building and construction by maximising local employment during the construction of First Nine.

The construction and operation of the First Nine will provide a number of economic benefits to the local and regional community. Firstly, the construction of the project is expected to take approximately 5-8 years. This will allow for the engagement of a number of trades and services from the local area. Not only will this provide employment opportunities to the community, but it will provide an economic boost to local retailers and suppliers who are engaged to supply materials and goods for the project.

On completion, First Nine is expected to support a residential base of around 2,400 people. This will create long term economic benefits for local retailers as demand for goods and services within the Greater Springfield area increase. The increased economic activity generated by the development will therefore flow into the local and broader community.

9.3 Social Matters

The overarching Springfield Structure Plan was adopted as part of the *Ipswich Planning Scheme 2006* and was subject to extensive public consultation during its design phase in accordance with the *Integrated Planning Act 1997*. The development intent of Greater Springfield has incorporated public opinions and addressed public concerns.

As part of the Greater Springfield development, consultation was undertaken with indigenous stakeholders and cultural heritage experts which included a walk over of the First Nine development site. During this walk over, an arrow artefact (arrow head) was identified within the south-western corner (refer **Figure 3 in Attachment A**). The existing cultural heritage area has been disturbed by an old logging trail through the site. It is proposed under the Brookwater South Master Area Development Plan (refer **Plan 3**) to retain this area as Open Space in the form of a community interactive park which will acknowledge the cultural significance of the site. It is noted that this artefact of cultural heritage significance is not protected under any Local, State or Commonwealth heritage registers.

The First Nine estate represents a unique residential and commercial development enhanced by the Brookwater Golf Course and the quality associated with the Greg Norman name as the golf course architect. First Nine seeks to contribute additional prestige residential opportunities to the Brookwater community, matching the established quality landscaped environment and integration with the golf course with a mix of low to medium density residential living opportunities. A strong awareness of the surroundings is highlighted by the visual and physical nexus with the golf course, the Springfield Town Centre, and natural vegetation along the linear corridor of Opossum Creek.

The residential development within First Nine achieves a transition between the established Brookwater community comprising low density residential, attached housing and a world class resort and neighbourhood activity centre, and the Springfield Town Centre expected to facilitate high density mixed use development



supported by the Springfield Central train station. A mix of detached dwellings and attached housing forms are peppered with apartment buildings up to 8 storeys to ensure a range of desirable living options that both reflect the physical context of the precinct and complement the Brookwater lifestyle. The precinct will ensure a high quality of design in building appearance and landscaping, including streetscaping, through the inclusion of development within the community title schemes for Brookwater and the Brookwater Home Owners Club.

A small scale local activity centre provides convenience retail and community facilities, supporting a walkable catchment for First Nine that also reflects the proximity to the Brookwater Urban Village and the Springfield Town Centre. The precinct facilitates the continuation of Brookwater Drive toward the Town Centre, responding to the natural topography as it meanders through the precinct, and framed by high quality medium density dwellings that reinforce a sense of arrival to both the Town Centre and to Brookwater.

First Nine represents the final step in the creation of the most exclusive residential community in Australia within a truly integrated world class residential golfing and resort development focussing on leisure, recreation, and attention to building design and landscape detail unmatched in South East Queensland.

The project facilitates an integrated residential community that promotes a variety of housing options and a range of lot sizes in order to meet the diverse needs of different community members. The project balances the needs of the community by providing:

- Open space and recreational areas, including neighbourhood parks and pocket parks
- Bus routes
- Shops, cafes and restaurants to meet day to day needs
- Pedestrian and cycle paths to encourage an active lifestyle

Further, First Nine is closely located to the Springfield Town Centre which encompasses amongst other things:

- Retail offering – Orion Shopping Centre, plus other various retail offerings
- Health – Health City, Mater Hospital, planned aged care facility and other medical services
- Schools and Universities (University of Southern Queensland, plus a variety of public and private primary and secondary schools existing and planned)
- Employment Hub

First Nine is also readily accessible by the Centenary Highway linking to Brisbane City (to the east) and Ipswich City (to the west), and Logan and Gold Coast to the south. The site is also serviced by train in close proximity (Springfield Central).

There are sufficient mechanisms in place as part of broader Greater Springfield planning provisions to monitor ongoing changes to economic and social characteristics through cost/benefit analysis of similar studies.



10. Ecologically Sustainable Development

DEE request the following information in relation to Part 8 – Ecologically Sustainable Development (ESD):

8.1 Provide a description of the proposed action in relation to the principles of ecologically sustainable development, as defined in the EPBC Act:

- a) the long-term and short-term economic, environmental, social and equitable considerations;
- b) the precautionary principle which states that a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation where there are threats of serious or irreversible environmental damage;
- c) the principle of inter-generational equity which states that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations,
- d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making, and
- e) improved valuation, pricing and incentive mechanisms should be promoted.

(DoE Preliminary Documentation decision- Pages 7 & 8)

First Nine will be delivered as an ecologically responsible project through the implementation of a series of interrelated strategies and demonstration projects that cover the planning, design, construction and life of the development.

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) has a key objective to 'promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resource,' (EPBC Act section 3). Ecologically Sustainable Development (ESD) is defined within the Commonwealth Government's National Strategy for Ecologically Sustainable Development as 'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'.

The goal of the National Strategy for Ecologically Sustainable Development is:

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The core objectives include:

1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
2. To provide for equity within and between generations; and
3. To protect biological diversity and maintain essential ecological processes and life-support systems

These objectives are accompanied by seven guiding principles of ESD. Each of these is listed in **Table 9** and is accompanied by a discussion on how the proposed action will achieve these objectives and principles.



Table 9: ESD Principles

ESD Core Objectives	
1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations	<p>The project will benefit individuals and the community as a whole by providing a wide range of housing options, employment opportunities and recreational activities. The construction and operation of the project will enhance the local and regional economy and in turn the Greater Springfield Area. The project has been designed to provide a visual amenity that is appealing and promotes a sense of community, while facilitating active lifestyles by providing cycle paths and footpaths. Ecological values have been taken into account during the design of the project, with areas containing significant ecological values or functions protected within conservation and open space areas. The project will safeguard the needs of future generations.</p>
2. To provide for equity within and between generations	<p>The project will safeguard the needs of future generations while meeting the demands of current generations. Management measures will be imposed to avoid and mitigate potential impacts, while an offset will compensate for the residual impacts on critical habitat. This will ensure that the habitat which is lost will be recreated to achieve no net loss of critical habitat for the Koala. The development has taken into account the diverse needs of the community by proposing a range of housing types and densities. This will ensure that appropriate housing is available to current and future generations.</p>
3. To protect biological diversity and maintain essential ecological processes and life-support systems	<p>The site has been subject to environmental surveys and reporting. The ecological values of the site have been identified and recorded. While the project will impact on 46.2 hectares of critical habitat for the Koala, the dedication of 81.5 hectares of land within the Flinders Karawatha Bioregional Corridor which will ensure that biological diversity is maintained in the local area and ecological processes will be maintained.</p>
ESD Guiding Principles	
1. Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations	<p>The design of the project has taken both long-term and short-term economic, environmental, social and equitable considerations into account. High level regional planning has been considered for the development of Greater Springfield, including its proximity to existing infrastructure including highways and rail, which provides efficient transport routes for community members. Access to transport will allow commuters to reach Brisbane, Logan and Gold Coast business districts for employment. In addition, the project site is in proximity to existing residential development and the Springfield Town Centre which will provide residential, commercial and educational development.</p> <p>A variety of housing types and densities will be made available, ensuring that a diverse range of people will have access to appropriate housing that suits their particular needs. Open space areas in the form of recreational parks will be made available throughout the project area, ensuring equitable access of open space areas to all community members.</p> <p>The designation of 81.5 hectares of vegetation as conservation within the Flinders Karawatha Bioregional Corridor will provide for the short and long-term protection of ecological functions and processes across the site. Not only will this enhance the visual amenity of the development area, but it will facilitate the dispersal of wildlife and provide habitat to a range of fauna species. The retention of conservation areas will contribute to the retention of biodiversity in the local area.</p>



2. If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

The implementation of precautionary measures in decision making is used where there is a threat of serious or irreversible harm and where there is scientific uncertainty as to the extent of possible environmental damage. There are a number of factors which help determine whether an action might cause serious or irreversible environmental damage, including:

- I. The spatial scale;
- II. The magnitude of possible impacts;
- III. The perceived value of the threatened environment;
- IV. The complexity and connectivity of possible impacts;
- V. The manageability of possible impacts;
- VI. The level of public concern and the rationality or scientific basis for the concern; and
- VII. Reversibility of possible impacts.

Impacts to the Koala and associated habitat have been identified as the primary environmental concern on a level of National Environmental Significance. The site's utilisation by Koalas and its ability to provide critical habitat for both the Koala have been discussed in detail throughout this report. The site has been recognised to support low level Koala activity and an area of 46.2 hectares has been identified as containing habitat critical to the survival of the Koala. In total, the project will result in the removal of 46.2 hectares of critical habitat for both the Koala.

A number of possible impacts have been identified as a result of the project, however these are all considered to be localised impacts. The magnitude of impact is small and restricted to the referral site and immediately adjoining areas. Impacts can be summarised as those arising from the loss of habitat, barriers to movement, injury or death from vehicle strike or dog attack and dispersal into residential areas. A number of management measures will be imposed to avoid and mitigate these impacts as detailed within the KMP and phase specific VCFMPs. The identified impacts are considered mostly to be manageable through imposition of low vehicle speeds and education of new residents about local wildlife management. The impacts from the project have been identified and management measures have been subsequently developed.

The proposed action is not considered to pose a threat of serious or irreversible damage to the local Koala population or the broader environment. Potential impacts have been considered and management plans will be in place to ensure that any impacts are minimised and offset.

3. The global dimension of environmental impacts of actions and policies should be recognised and considered.

The project is not considered to have a global impact, however, it is recognised that the principles of ESD are enshrined within many international treaties and national policies. This development proposal demonstrates ESD by taking into account environmental, social and economic considerations in the decision making process. The purpose of relevant international agreements on ESD is to promote the consideration of ESD principles for a variety of actions at all levels across the globe. By taking ESD into account, this project has satisfied global objectives. The overall global environmental impact however will be extremely minimal.

4. The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.

The relationship between economic development and environmental protection has been continuously identified within international agreements and national policies. In particular, the Kuznets Curve shows a link between economic development and environmental protection, whereby once a society reaches a particular level of development, it starts to recognise and invest in environmental conservation.



Economic development and prosperity allows for a greater financial resource base to be dedicated to conservation outcomes. This can be demonstrated at global, national and localised scales. Individual landholders are not generally in a position to be undertaking significant rehabilitation projects on their land. This project presents an important opportunity to rehabilitate and protect 81.5 hectares within the Flinders-Karawatha Bioregional Corridor through the proposed offset and results in an important conservation function by increasing the availability of large, connected areas of habitat free of threats caused by weeds, fences, dogs and vehicles through the dedication of ecological corridors.

5. The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.

The project will not cause significant residual adverse impacts to the environment. This project will increase housing availability and affordability within South East Queensland, which will contribute to Australia's overall property market. Further, the site is located within the Greater Springfield which has been strategically planned for urban growth.

6. Cost effective and flexible policy instrument should be adopted, such as improved valuation, pricing and incentive mechanisms.

This project has taken into account the EPBC Act Offsets Policy, which provides for the cost effective analysis of proposed offsets.

7. Decisions and actions should provide for broad community involvement on issues which affect them.

The overarching Springfield Structure Plan was adopted as part of the *Ipswich Planning Scheme 2006* and was subject to extensive public consultation during its design phase in accordance with the *Integrated Planning Act 1997*. The development intent of Greater Springfield has incorporated public opinions and addressed public concerns.

As part of the Greater Springfield development, consultation was undertaken with indigenous stakeholders and cultural heritage experts which included a walk over of the First Nine development site. During this walk over, an arrow artefact (arrow head) was identified within the south-western corner. The existing cultural heritage area has been disturbed by an old logging trail through the site. It is proposed under the Brookwater South Master Precinct Plan (refer **Plan 2**) to retain this area as Open Space in the form of a community interactive park which will acknowledge the cultural significance of the site. It is noted that this artefact of cultural heritage significance is not protected under any Local, State or Commonwealth heritage registers.

Additionally, this preliminary documentation will be made available for public comment during the notifications stage of the EPBC Act assessment process. Again, any submissions by the community will be taken into account in the final design of the project.



II. Environmental Record of Person(s) Proposing to take the action

DEE request the following information in relation to Part 8: Environmental Record:

9.1 The information provided must include details of an proceedings under the Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

- a) the person proposing to take the action, and
- b) for an action for which a person has applied for a permit, the person making the application.

9.2 If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

(DoE Preliminary Documentation decision- Page 8)

Springfield Land Corporation (SLC) as the master developer of the Greater Springfield Project has an excellent record of environmental management and sustainability recognised at a local, state, national and international levels **SLC** has worked closely with partners, stakeholders and community as well as local and state authorities to ensure a variety of environmental management and sustainability outcomes are delivered through the Greater Springfield Project.

The unique scale and timeframe associated with the propagation of the Greater Springfield Project has afforded **SLC** the opportunity to establish a framework that delivers a range of initiatives at a strategic and local project level that deliver environmental management and sustainability benefits. For example, at a strategic level the Greater Springfield master plan has identified the environmental attributes of the site and included the protection of these attributes through the designation of these areas within the open space network. This has resulted in some 32% of the land holding being retained.

Other environmental initiatives at a local project level include recycled water reuse and returned effluent treatment reuse systems across projects such as the Brookwater golf course and residential projects, weed and pest management programs with both Landcare and Greening Australia, undertaking HIA Green Smart programmes across a number of projects, provision of site based management plans across facets of the project such as residential development, utility facilities such as data centres, retail centres, hospitals, university all communities, generation of site based urban design outcomes (in consultation with the local authority), water recycling programmes, waterway and corridor management and builder's water recycling programmes. Additional to this, **SLC** through it partners undertakes community education and interaction programmes with its community to in creating a high level of social capital.

SLC has won numerous state and national Urban Development Institute of Australia awards as a master planned community. These awards are recognition for the comprehensive planning and implementation of site specific outcomes in working with all constraints including the provision of environmental and sustainability initiatives. **SLC** as the master developer of the Greater Springfield project also won the global Prix d'Excellence awarded by the International Real Estate Federation for best master planned community.



12. Other Approvals and Conditions

DEE request the following information in relation to Part 8 – Other Approvals and Conditions:

The preliminary document must include information on any other requirements for approval or conditions that apply, to that the proponent reasonably believes are likely to apply to the proposed action. This must include:

- a) A description of any approval that has been obtained or is required to be obtained from a State, territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including conditions that apply (or are reasonably expected to apply) to the action, and
- b) A description of the monitoring, enforcement and review procedures that apply or are proposed to apply to the action.

(DoE Preliminary Documentation decision- Page 8)

The Greater Springfield statutory planning approval included the preparation of a comprehensive EIA that dealt with environmental matters, amongst other things. As outlined in previous chapters within the Preliminary Documentation Report, statutory planning approval (in the form of the SSP) for Greater Springfield was obtained from the Queensland State Government on 24 January, 1997 before the provisions of the EPBC Act existed.

First Nine will be developed in accordance with the SSP (refer **Plan 2**) and Brookwater South Master Preinct Plan (refer **Plan 2**) which forms part of the Brookwater South Precinct Plan.

In addition to these 'tier one' approvals, **SLC** anticipate that the following approvals will be required from **ICC**

- Reconfiguration of a Lot Application to **ICC** – This is an application to subdivide the land.
- Operational Works Application to **ICC** – This is an application to gain approval of the engineering details for the subdivision.

The majority of State Government assessment and permits are obtained through compliance with the SPP which went through rigorous Queensland Government interest checks prior to approval.

In 2007, investigations by the **Commonwealth Department of the Environment and Water Resources** (as it was then known) about an earlier stages of the Springfield Lakes Precinct of the development concluded that no referral was required under the EPBC Act. This was prior to the 2012 scheduling of the Koala species.

First Nine is the subject of this EPBC Act assessment. A number of subsequent development areas within Greater Springfield will also require assessment against the provisions of the EPBC Act as they sequence through approval and development phases.



13. Conclusion

The *Environmental Management Division* of **Saunders Havill Group** act on behalf of **Springfield Land Corporation** in the coordination and production of the response to *Environment Protection and Biodiversity Conservation Act* (EPBC Act) Controlled Action Assessment (2016/7676) for the First Nine Master Planned Residential Development project located at Brookwater Drive, Brookwater within Greater Springfield.

On the 30th March 2016 a referral under the EPBC Act was made to the **Department of the Environment and Energy** for controlled action assessment. On the 13th May 2016 this application was deemed a Controlled Action requiring assessment by "Preliminary Documentation." The Controlled Action decision was based on the following Matters of National Environmental Significance (MNES)

- Listed threatened species and communities (sections 18 & 18A), more specifically defined in the request for further information on the:
 - Koala (*Phascolarctos cinereus*) combined populations of QLD, NSW and the ACT

This First Nine Preliminary Documentation Report provides information requested by **DEE** to assist the assessment manager in determining whether the development of First Nine should be approved. As detailed in previous referral documentation and this report, we believe that proposed offset measures will adequately address any potential impacts to the Koala, as a result of clearing 46.2 ha of critical habitat for the species for the development.



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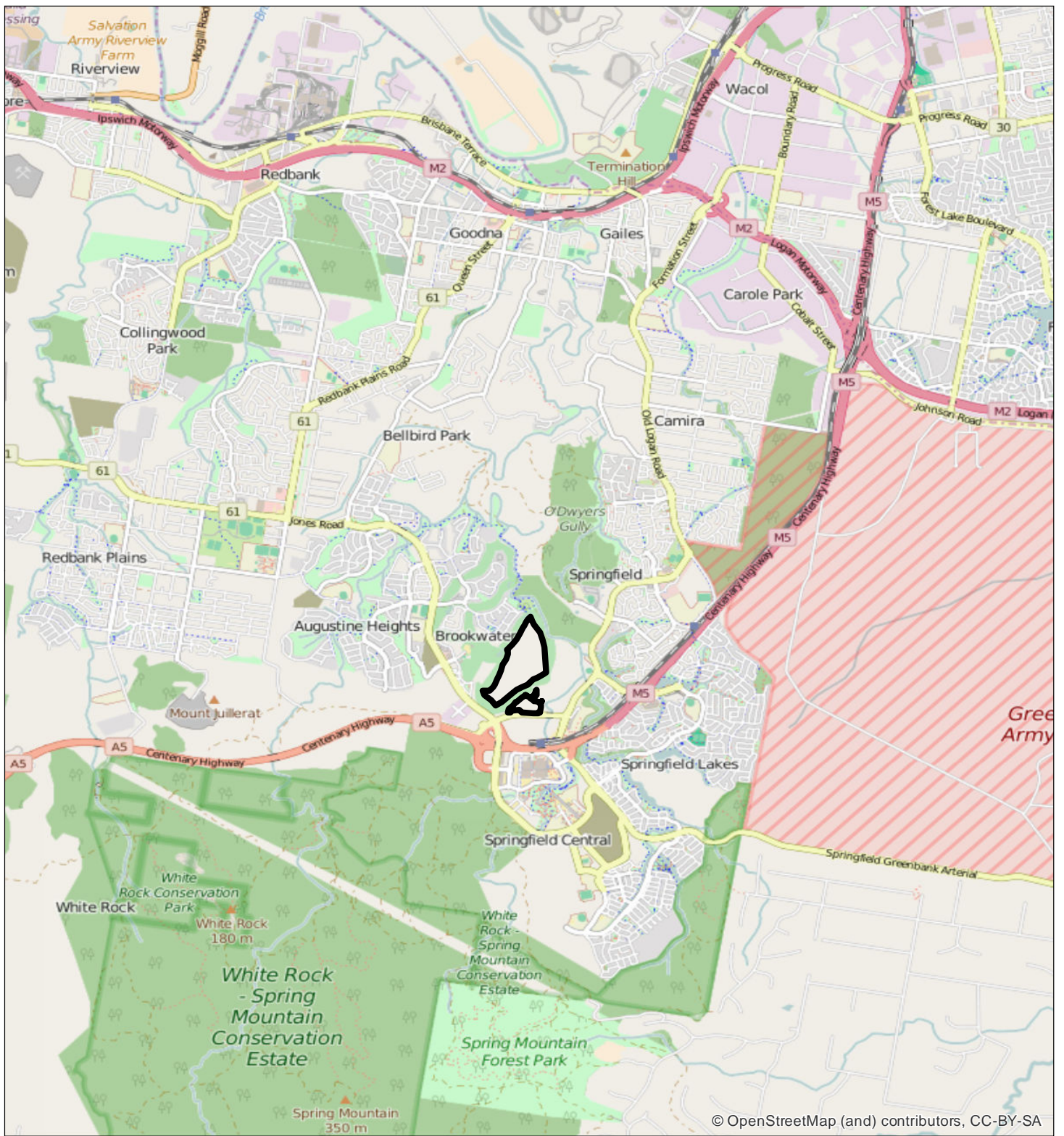
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Figures

- Figure 1:** Site Context
- Figure 2:** Site Aerial
- Figure 3:** QLD Contours
- Figure 4:** Regulated Vegetation Management Map (Supporting)
- Figure 5:** ASRIS Soil Classification
- Figure 6:** Koala Habitat Values Map



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Legend


 First Nine referral area

Figure 1
Site Context

File ref. 7399 E F9 Figure 1 Site Context A
Date 24/06/2016
Project First Nine

0 500 1,000 2,000 m
Scale (A4): 1:75,000 [GDA 1994 MGA Z56]



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Legend


 First Nine referral area

Figure 2

Site Aerial

File ref. 7399 E F9 Figure 2 Site Aerial A
Date 24/06/2016
Project First Nine

0 50 100 200 300 m

Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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Legend



-  First Nine referral area
-  Contour line (35m-100m)

Figure 3
 Topography - QLD 5m Contours

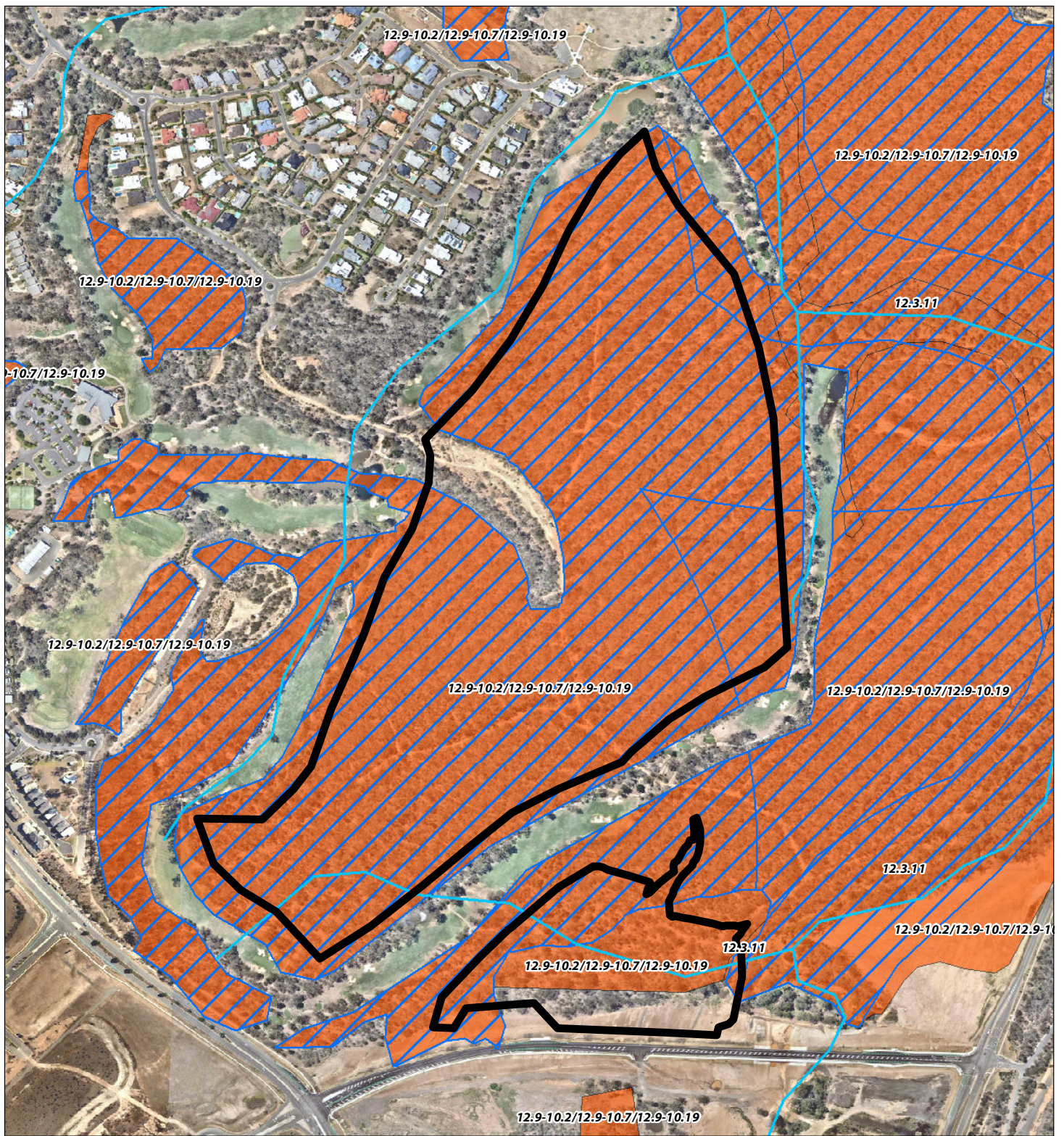
File ref. 7399 E F9 Figure 3 QLD Contours A
Date 27/06/2016
Project First Nine

0 50 100 200 300 m

Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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Legend



First Nine referral area

VM Watercourses

VM Essential Habitat

VM Wetland

Regional Ecosystems mapping

Category A or B area containing endangered regional ecosystems

Category A or B area containing of concern regional ecosystems

Category A or B area that is a least concern regional ecosystem

Figure 4

VMA Regulated Vegetation - Supporting Map

File ref. 7399 E F9 Figure 4 REs A

Date 24/06/2016

Project First Nine

0 50 100 200 300 m

Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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Legend



-  First Nine referral area
-  Dermosols

Figure 5

ASRIS Soil Classification

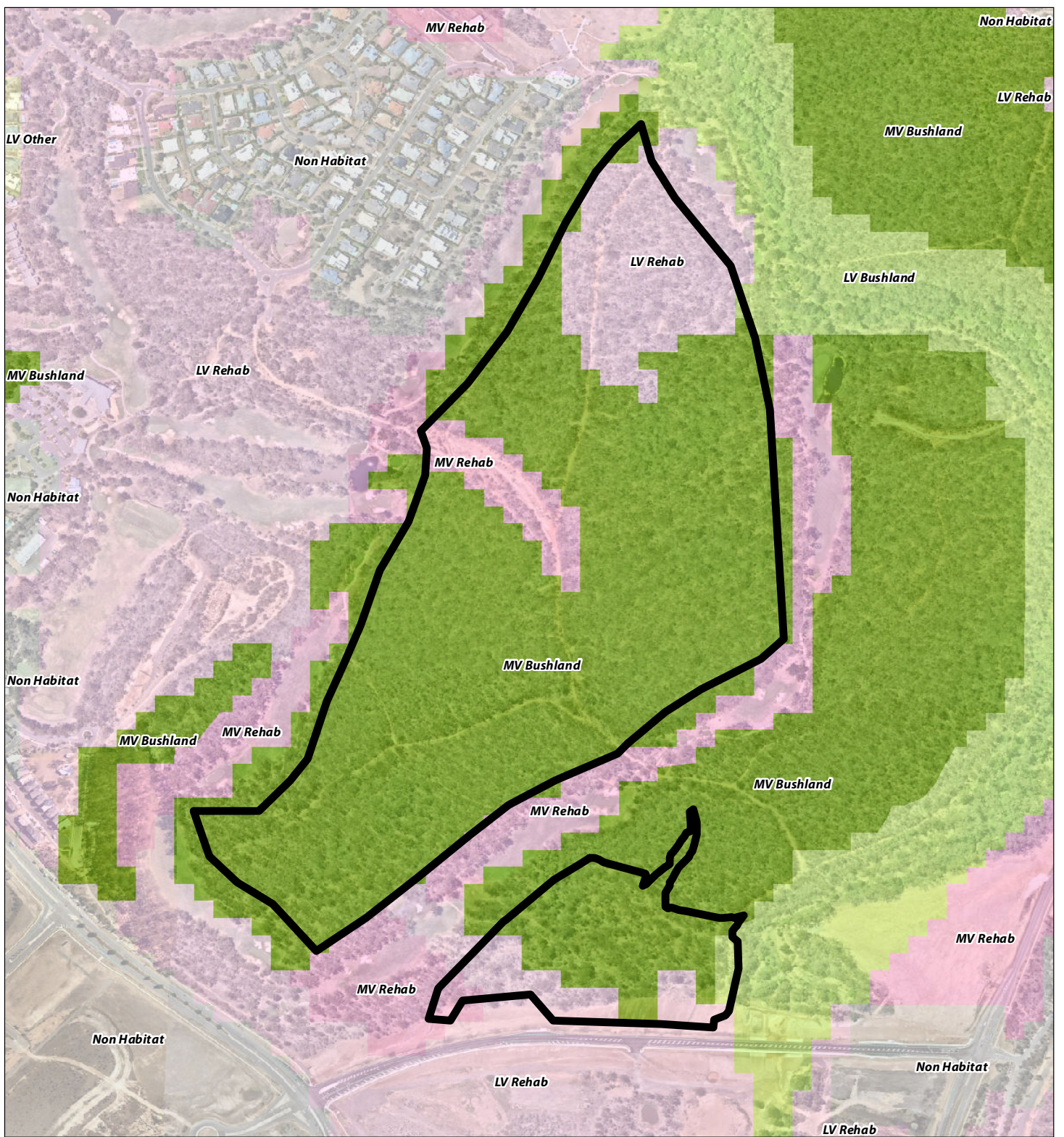
File ref. 7399 E F9 Figure 5 ASRIS Soils A
Date 24/06/2016
Project First Nine



Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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Legend

- First Nine referral area
- Koala Habitat Values**
- Bushland Habitat*
- High Value Bushland
- Medium Value Bushland
- Low Value Bushland
- Suitable for Rehabilitation*
- High Value Rehabilitation
- Medium Value Rehabilitation
- Low Value Rehabilitation
- Other Areas of Value*
- High Value Other
- Medium Value Other
- Low Value Other
- Non-habitat
- Water

Figure 6
 SEQ Koala Habitat Values
 Mapping

File ref. 7399 E F9 Figure 6 Koala Habitat A
Date 24/06/2016
Project First Nine

0 50 100 200 300 m
 Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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Plans

- Plan 1:** First Nine Referral Area
- Plan 2:** Springfield Structure Plan
- Plan 3:** Brookwater South Master Precinct Plan
- Plan 4:** Conceptual Phasing Plan
- Plan 5:** Field Assessment Zones
- Plan 6:** Koala Field Survey Effort
- Plan 7:** Connectivity
- Plan 8:** Critical Habitat
- Plan 9:** Springfield Conservation Land (Offset Allocation)
- Plan 10:** First Nine Offset Receive Site

1. FIRST NINE PROJECT - REFERRAL AREA





NOTES
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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Nearmap 2016)

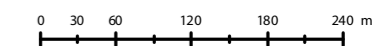
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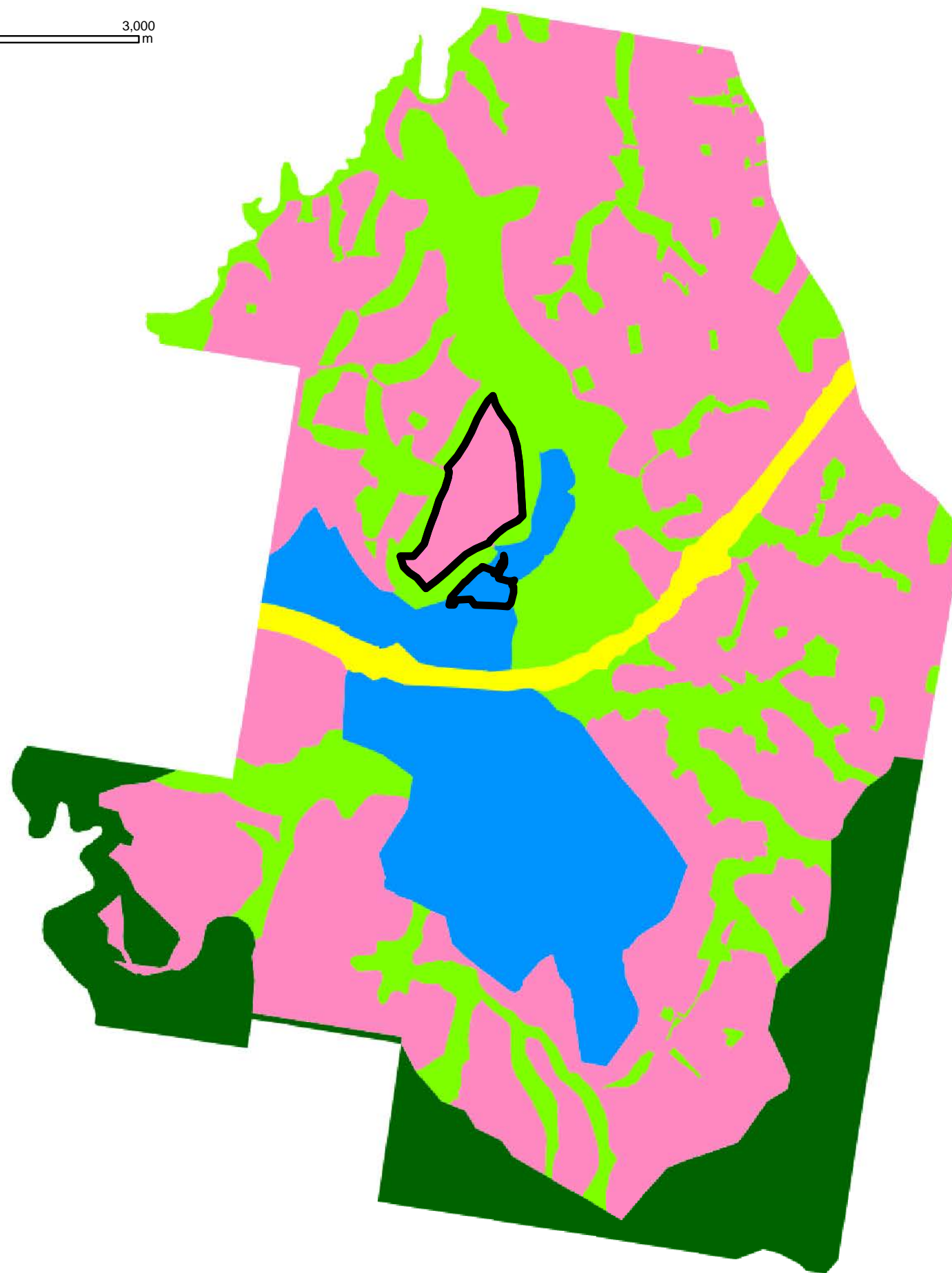
LEGEND

-  Qld DCDB
-  Referral area (47.25 ha)



Issue	Date	Description	Drawn	Checked
A	19/07/2017	Preliminary	TC	MS

Transverse Mercator | GDA 1994 | Zone 56 | 1:6,000 @ A3





Legend

-  First Nine Referral Area
-  Community residential
-  Town centre
-  Regional transport corridor
-  Open space
-  Conservation



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

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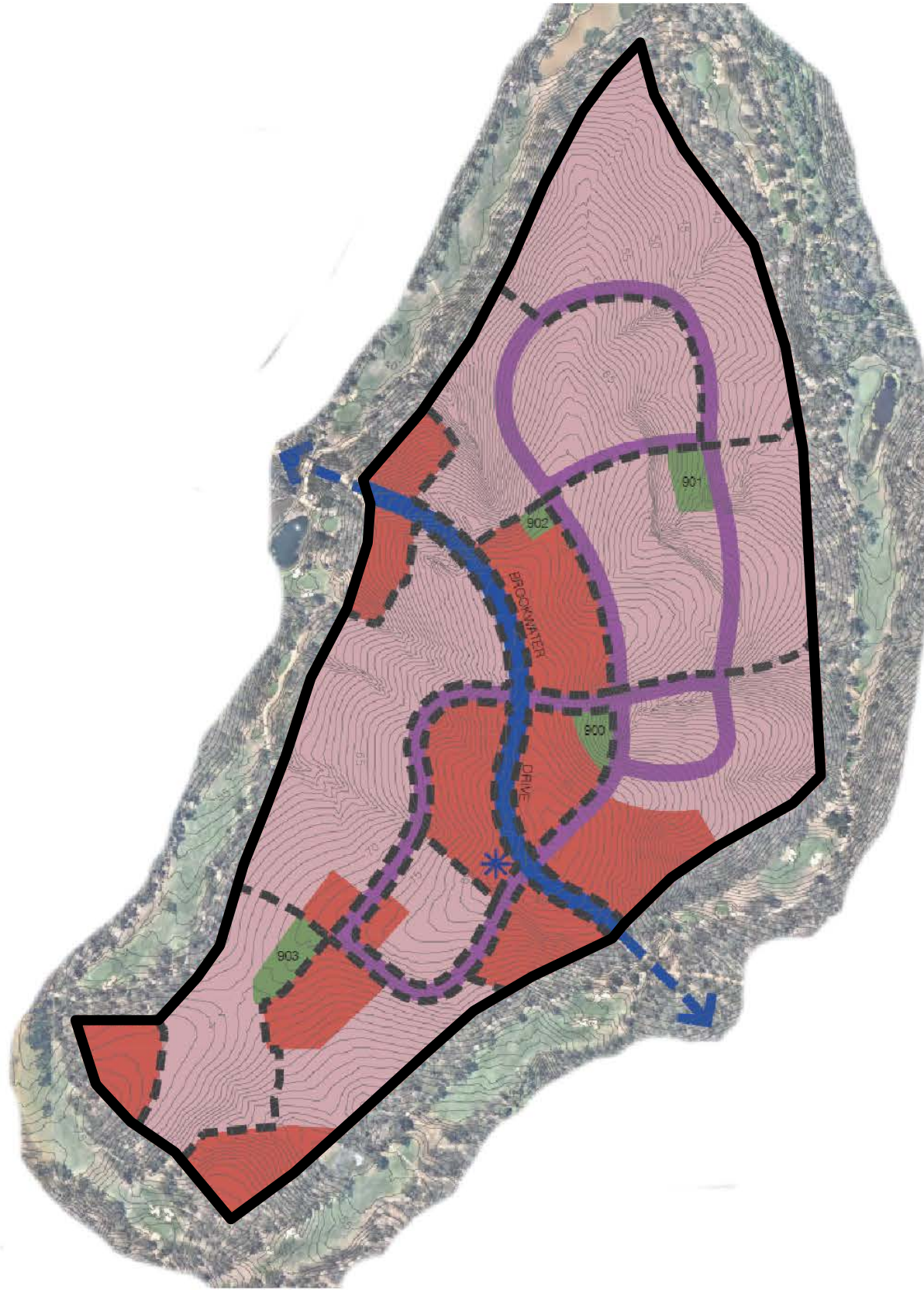
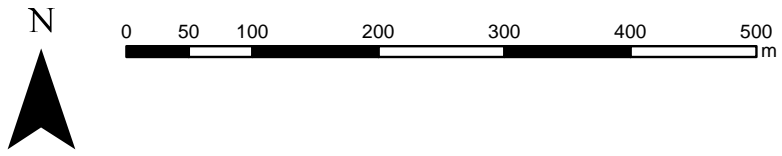
First Nine

Springfield Structure Plan







Date | 24/06/2016
 Scale | 1:32,500 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Referral area (DNRM 2015, Springfield Land Corp 2014), Structure Plan (Springfield Land Corp 2014)

Plan 2

SHG File
 7399 E 02 F9 Springfield Structure Plan A



Legend

-  First Nine Referral Area
-  Residential Precinct
-  Medium density precinct
-  Local parks
-  Trunk collector street
-  Collector street



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

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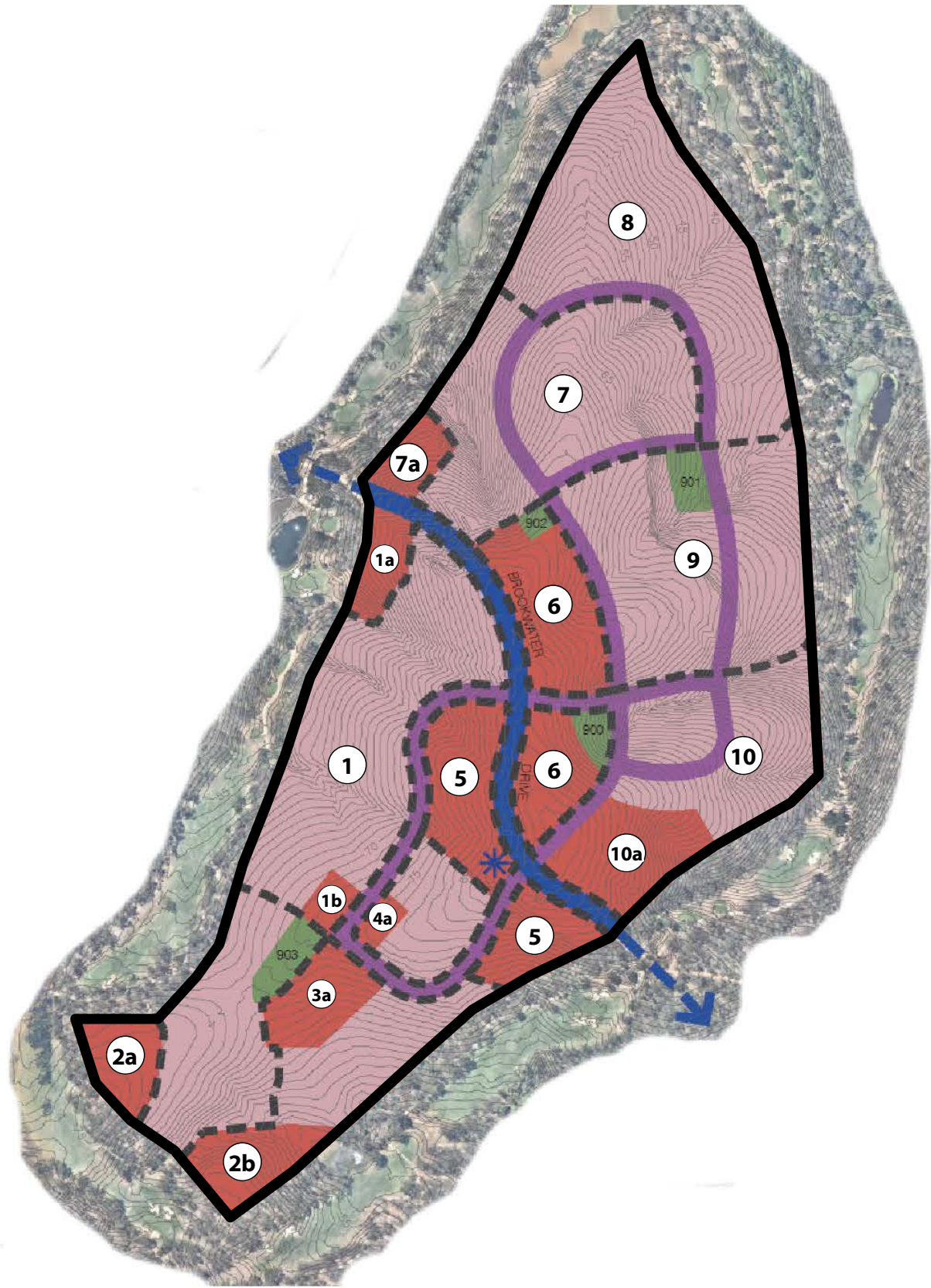
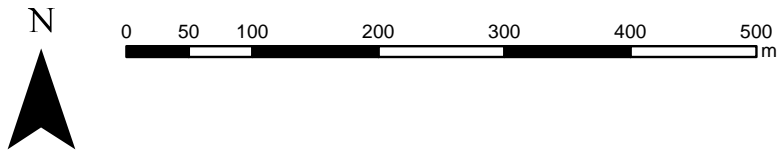
First Nine

Brookwater South MADP

Date | 24/06/2016
 Scale | 1:6,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Referral area (DNRM 2015, Springfield Land Corp 2014), Structure Plan (Springfield Land Corp 2014)

Plan 3

SHG File
 7399 E 03 F9 BS MADP A



- Legend**
- First Nine Referral Area
 - Residential Precinct
 - Medium density precinct
 - Local parks
 - Trunk collector street
 - Collector street



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine

Brookwater South MADP - Phasing Plan

Date | 24/06/2016
 Scale | 1:6,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Referral area (DNRM 2015, Springfield Land Corp 2014), Structure Plan (Springfield Land Corp 2014)

Plan 4

SHG File
 7399 E 04 F9 B5 MADP Phasing A

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Legend

- First Nine referral area
- Zone 1 - Eucalyptus Woodlands
- Zone 2 - Cleared access/fire trail (15m-60m wide) & existing road works
- Cleared & Maintained fire trails
- Overland flow



First Nine

Field Assessment Zones

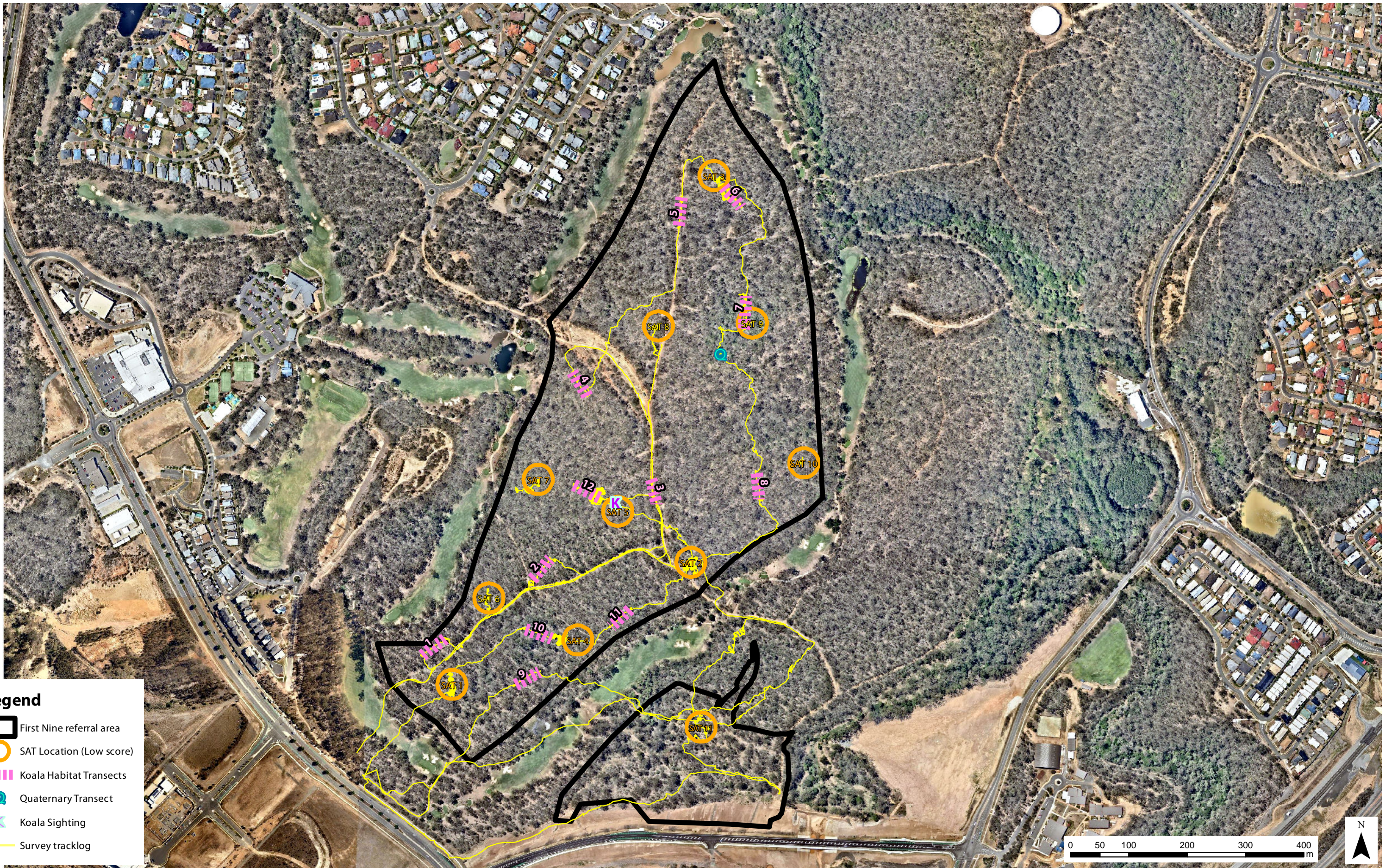
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 GDA 1994 MGA Zone 56
 Client: Springfield Land Corporation
 Project: Brookwater South
 Address/RPD: Springfield
 Source: DCBD (DNR, 2013), Aerial (QLD Globe, 2013)
 Referral area (DNR 2015, Springfield Land Corp 2014)

Plan 5

SHG File
 7399 E 05 F9 Field Assessment Zones B

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ISSUES:	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	BM



Legend

- First Nine referral area
- SAT Location (Low score)
- ▬▬▬ Koala Habitat Transects
- ▬▬▬ Quaternary Transect
- K Koala Sighting
- Survey tracklog



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine

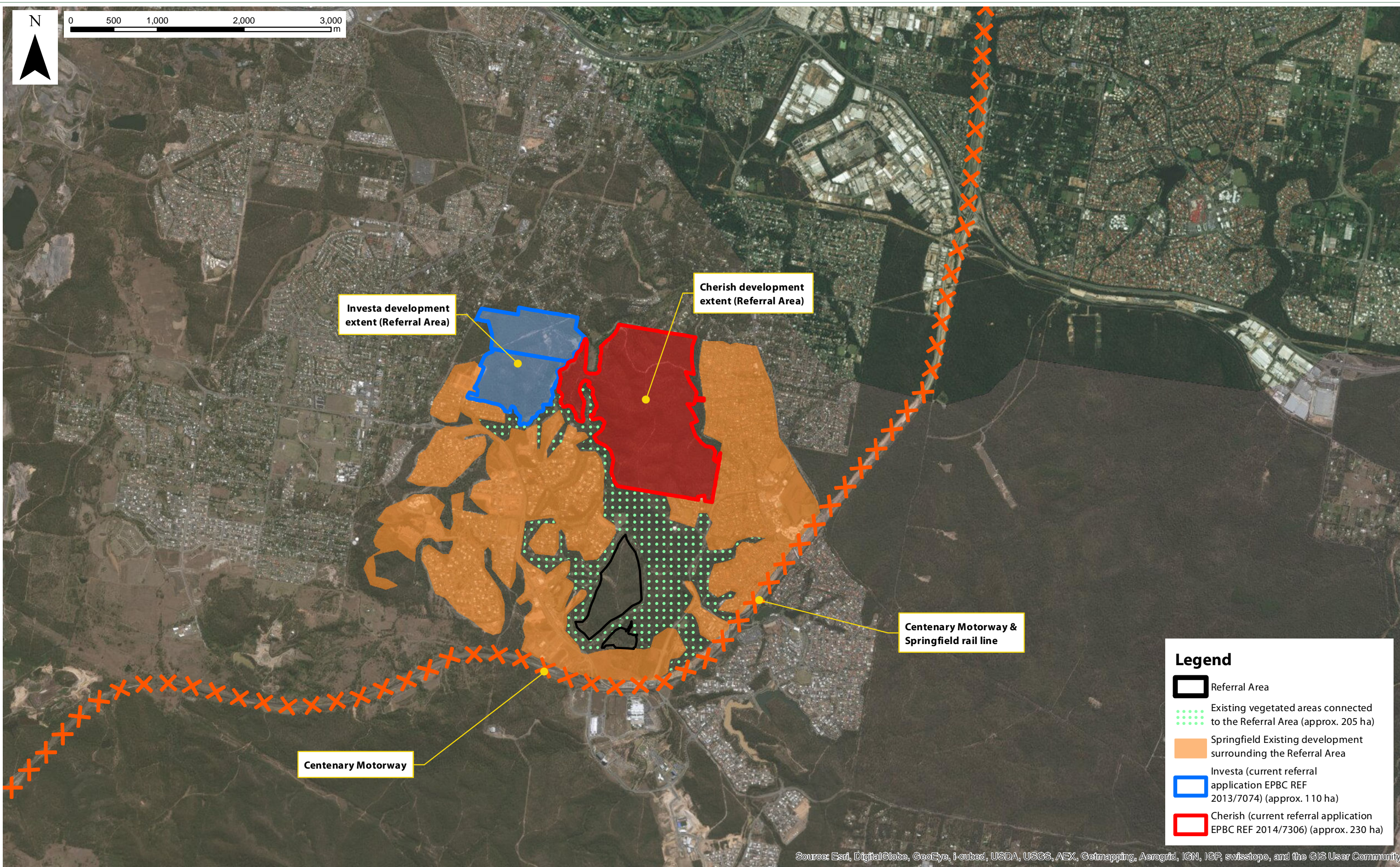
Ecological Field Survey

Date | 24/06/2016
 Scale | 1:6,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNR, 2015), Aerial (Nearmap, 2015)
 Referral area (DNR 2015, Springfield Land Corp 2014)

Plan 6

SHG File
 7399 E 06 F9 Field Survey Effort B

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Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM



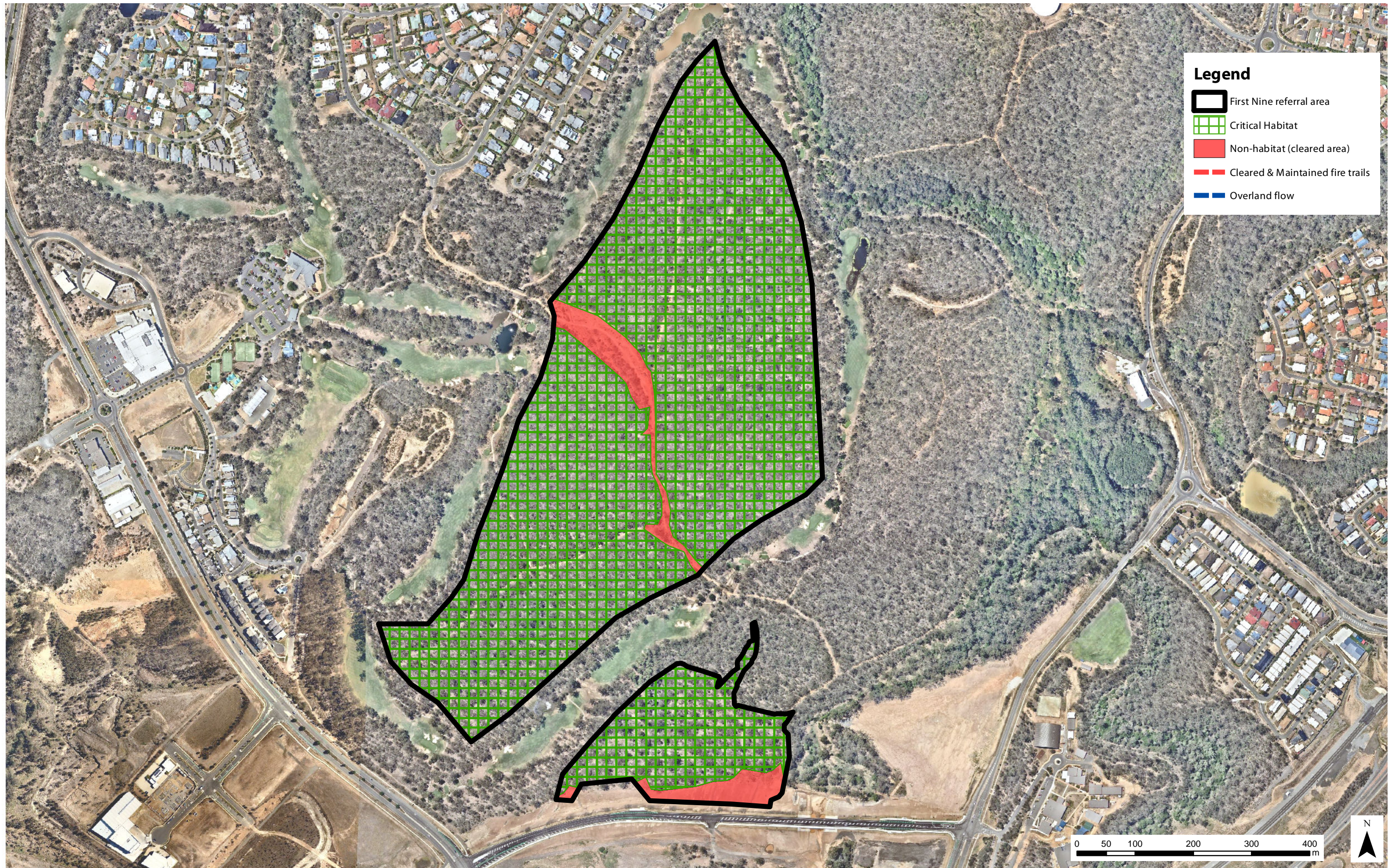
First Nine

Connectivity Assessment

Date | 24/06/2016
 Scale | 1:40,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2015),
 Referral area (DNRM 2015, Springfield Land Corp 2014)

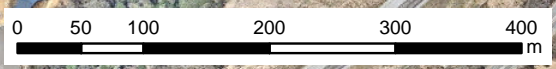
Plan 7

SHG File
 7399 E 07 F9 Connectivity A



Legend

- First Nine referral area
- Critical Habitat
- Non-habitat (cleared area)
- Cleared & Maintained fire trails
- Overland flow



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

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 PRIOR TO ANY DE-MOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDERGROUND SERVICES AND DE-BUILD LOCATIONS OF ALL SERVICES.

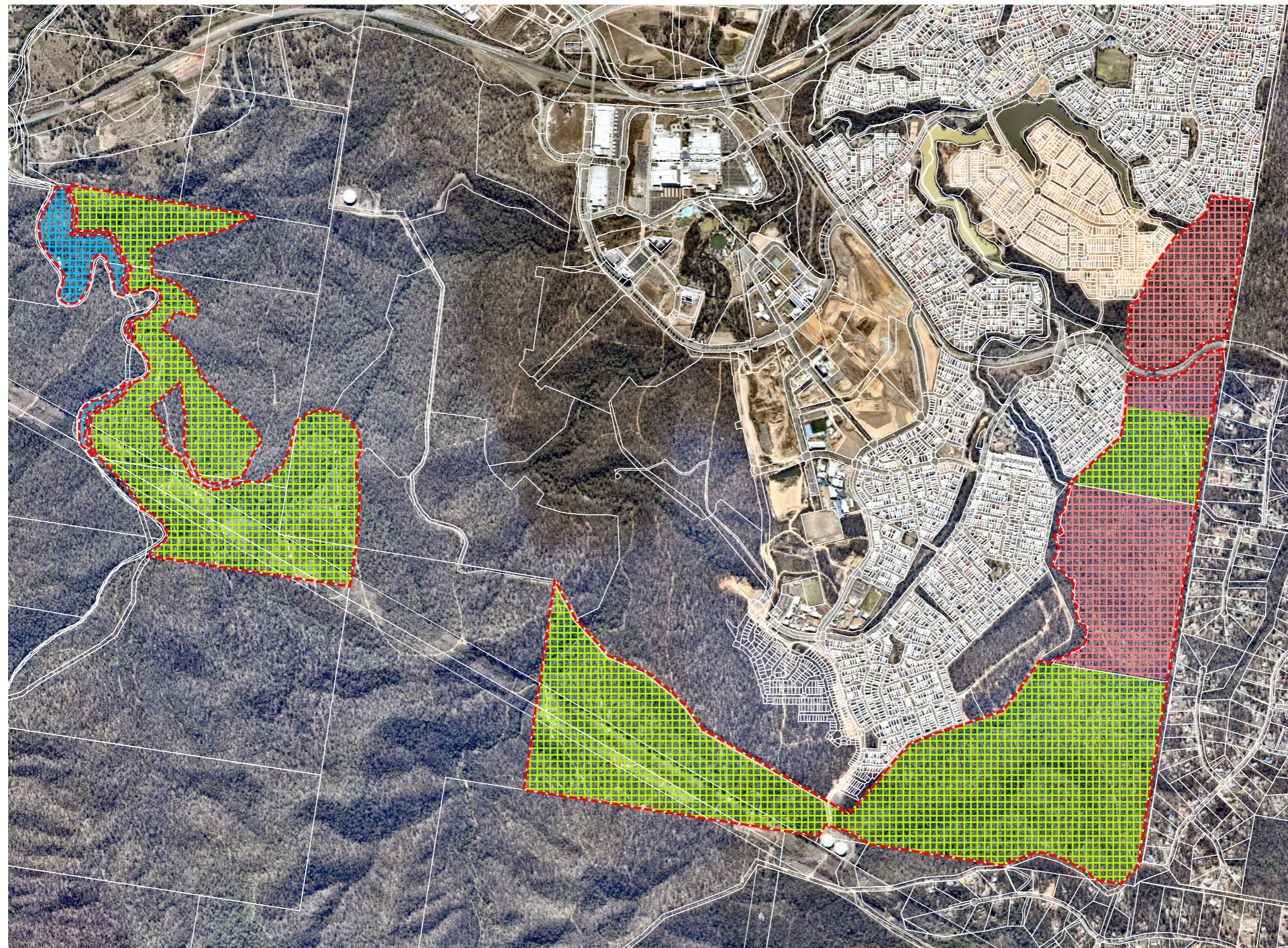
First Nine Critical Habitat

Date 27/06/2016
 Scale 1:6,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client Springfield Land Corporation
 Project Brookwater South
 Address/RPD Springfield
 Source DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)
 Referral area (DNRM 2015, Springfield Land Corp 2014)

Plan 8

SHG File
 7399 E 08 F9 Critical Habitat A

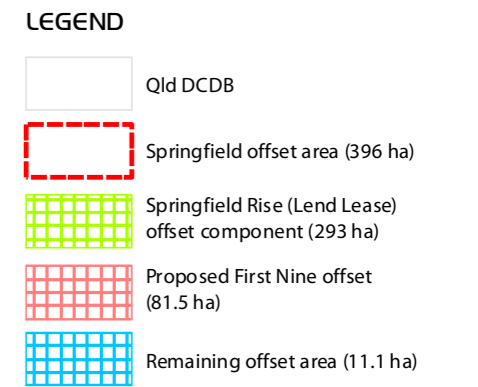
9. SPRINGFIELD CONSERVATION LAND (ALLOCATION OFFSET)



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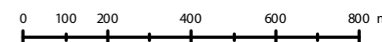
Layer Sources: Qld GIS Layers (Qld Gov. Information Service 2016), Aerial (Nearmap 2016)

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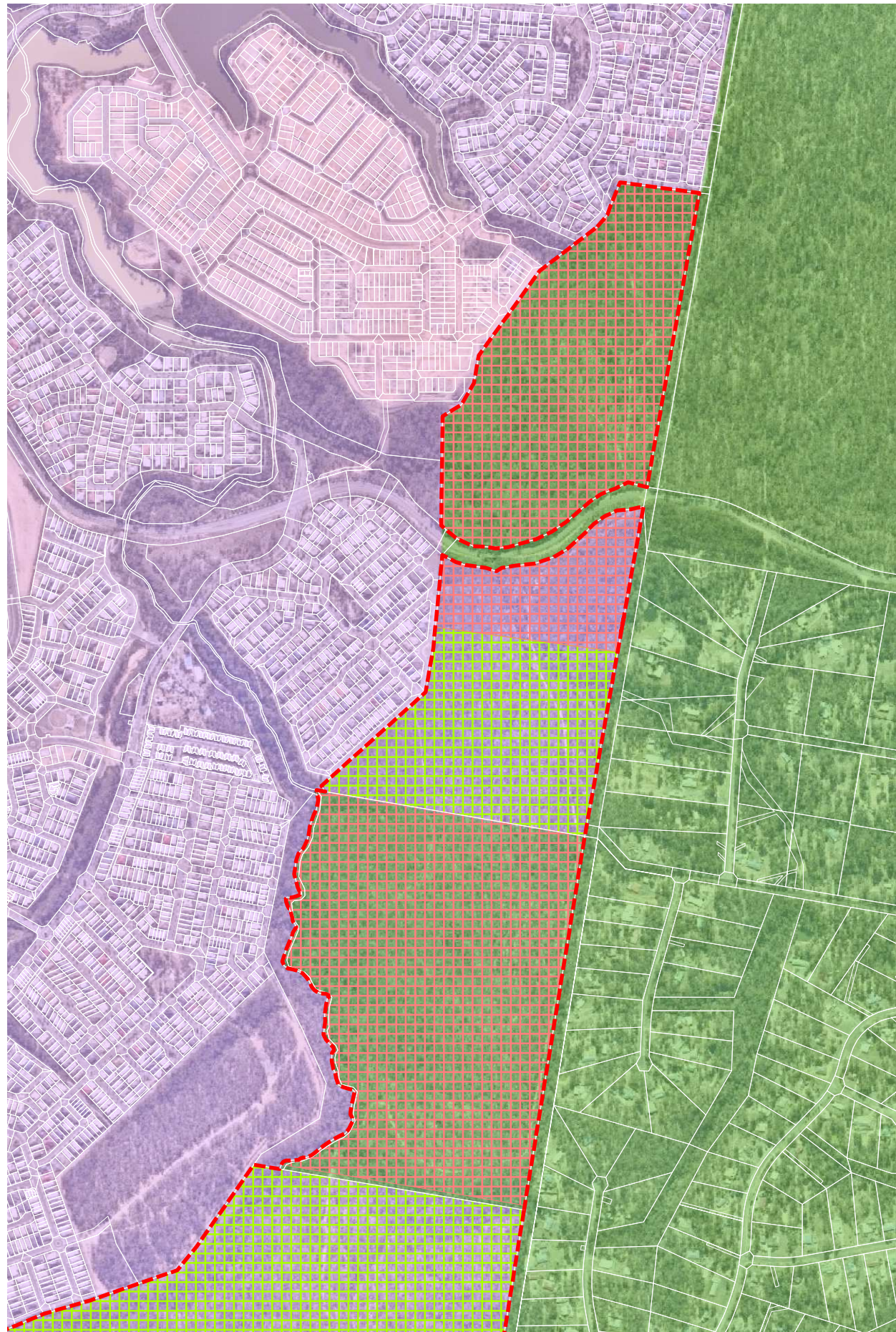
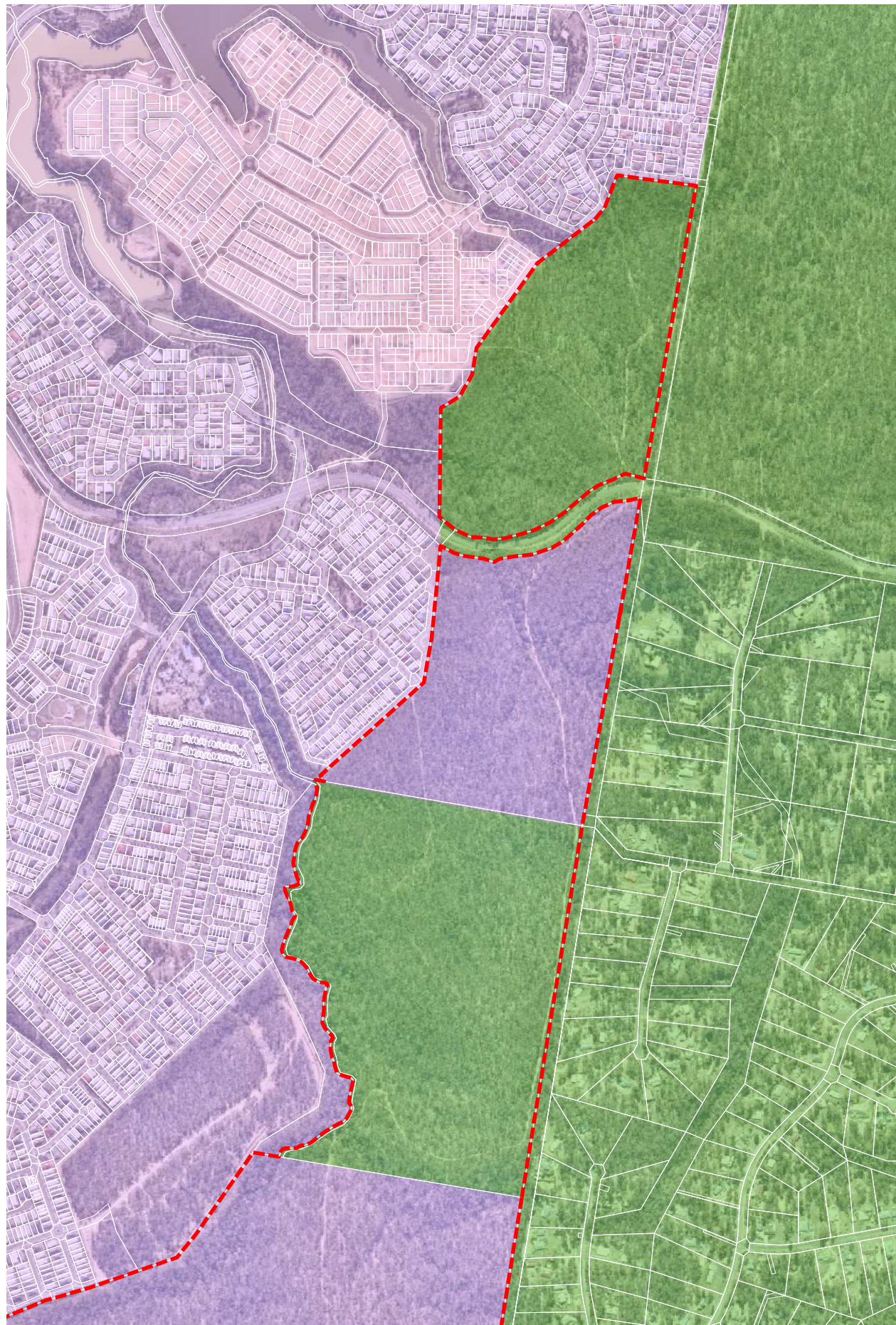


Issue	Date	Description	Drawn	Checked
A	9/06/2017	Preliminary	TC	MS
B	13/06/2017	Area Calc. updated	TC	MS
C	19/07/2017	Remaining offset	MC	KG

Transverse Mercator | GDA 1994 | Zone 56 | 1:18,000 @A3



10. FIRST NINE OFFSET RECIEVE SITE



NOTES
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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Nearmap 2016)

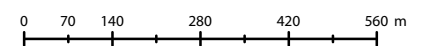
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LEGEND

- Qld DCDB
- Springfield offset area (396 ha)
- Springfield Rise (Lend Lease) offset component (293 ha)
- Proposed First Nine offset (81.5 ha)
- SEQ Regional Plan 2005-2029**
- Urban Footprint
- Rural Living Area
- Regional Landscape & Rural Production Area
- Investigation Area

Issue	Date	Description	Drawn	Checked
A	8/06/2017	Preliminary	TC	MS
B	13/06/2017	Area Calc. updated	TC	MS

Transverse Mercator | GDA 1994 | Zone 56 | 1:12,000 @ A3



FIRST NINE, SPRINGFIELD





Attachments

Attachment A:

First Nine Referral Submission Package,

Attachment B:

Additional Information Requested by DEE

Attachment C:

Koala Management Plan

Attachment D:

First Nine Habitat Quality Assessment Technical Memo

Attachment E:

Spring Mountain V-Dec Management Plan

Attachment F:

Registration certificates for dedication of the land occurring from 2006 to 2011

Attachment G:

Letter from the DILGP Noting amendments to SEQRP 2005 though dedications made by SLC



Attachment A

First Nine Referral Package (SHG 2016)

environmental
management



First Nine Residential Development

EPBC Act Referral Submission



Springfield Land Corporation
Brookwater Drive, Brookwater
7399
March 2016

Referral of proposed action

Project title: First Nine Residential Development

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) and associated geographic information system (GIS) vector (shapefile) dataset showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(i).

1.1 Short description

The proposed action relates to the development of 'First Nine', a master planned residential development located to the east of the existing Brookwater community and more broadly within the Greater Springfield Master Planned Development Area. Main uses include medium density and low density residential, roads and parks. The development will be generally in accordance with the approved Greater Springfield Structure Plan and Brookwater South Precinct Plan.

The short title of the project is: 'First Nine Residential Development, Lot 161 on SP271657, Springfield for Springfield Land Corporation Pty Ltd'.

1.2

Latitude and longitude

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

Table 1: Referral Area Coordinates

ID	Longitude		Latitude	
1	152°54'6"	E	27°39'31"	S
2	152°54'7"	E	27°39'33"	S
3	152°54'8"	E	27°39'35"	S
4	152°54'10"	E	27°39'38"	S
5	152°54'11"	E	27°39'42"	S
6	152°54'12"	E	27°39'45"	S
7	152°54'13"	E	27°39'56"	S
8	152°54'12"	E	27°39'57"	S
9	152°54'9"	E	27°39'58"	S
10	152°54'7"	E	27°39'59"	S
11	152°54'5"	E	27°40'1"	S
12	152°54'2"	E	27°40'3"	S
13	152°53'60"	E	27°40'4"	S
14	152°53'58"	E	27°40'5"	S
15	152°53'55"	E	27°40'7"	S
16	152°53'53"	E	27°40'9"	S
17	152°53'51"	E	27°40'11"	S
18	152°53'49"	E	27°40'8"	S
19	152°53'47"	E	27°40'7"	S
20	152°53'46"	E	27°40'6"	S
21	152°53'45"	E	27°40'4"	S
22	152°53'48"	E	27°40'4"	S
23	152°53'49"	E	27°40'3"	S
24	152°53'50"	E	27°40'1"	S
25	152°53'51"	E	27°39'59"	S
26	152°53'52"	E	27°39'57"	S
27	152°53'53"	E	27°39'55"	S
28	152°53'54"	E	27°39'53"	S
29	152°53'55"	E	27°39'50"	S
30	152°53'56"	E	27°39'48"	S
31	152°53'56"	E	27°39'47"	S
32	152°53'56"	E	27°39'46"	S
33	152°53'58"	E	27°39'44"	S
34	152°53'60"	E	27°39'41"	S
35	152°54'1"	E	27°39'39"	S
36	152°54'2"	E	27°39'36"	S
37	152°54'3"	E	27°39'35"	S
38	152°54'4"	E	27°39'34"	S
39	152°54'5"	E	27°39'33"	S

1.3	<p>Locality and property description Provide a brief physical description of the property on which the proposed action will take place and the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).</p> <p>Response 1.3 The referral area is located within the larger Greater Springfield urban expansion area which is identified at State and Local government levels as a primary growth area to support SEQ's population targets. It is governed by the approved Springfield Structure Plan (refer Plan 1) which has facilitated past and future urban growth in the area. Nearby features include Springfield Town Centre, Springfield Central Rail Station, Brookwater Golf Course, St Augustine's College and a number of local, regional and civic parks.</p> <p>The First Nine development site is encompassed by the first nine holes of the existing Brookwater Golf Course and remains one of the last isolated patches of undeveloped land between Opossum Creek and Centenary Highway.</p>					
1.4	<p>Size of the development footprint or work area (hectares)</p>	<p>The referral area covers 40.8 hectares.</p>				
1.5	<p>Street address of the site</p>	<p>Brookwater Drive Brookwater. QLD 4300</p>				
1.6	<p>Lot description Describe the lot numbers and title description, if known. Part of Lot 161 on SP271657</p>					
1.7	<p>Local Government Area and Council contact (if known) If the project is subject to local government planning approval, provide the name of the relevant council contact officer.</p> <p>Ipswich City Council- Contact: Garath Wilson Senior Planner (Development) Development and Planning Branch p. GWilson@ipswich.qld.gov.au</p>					
1.8	<p>Time frame Specify the time frame in which the action will be taken including the estimated start date of construction/operation.</p> <p>Response 1.8 The project has all necessary State and local government approvals and to commence post confirmation of EPBC requirements and will start construction in line with market demand.</p>					
1.9	<p>Alternatives to proposed action Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?</p>	<table border="1"> <tr> <td>X</td> <td>No There are no feasible alternatives to the proposed action. This is primarily based on the site's strategic designation within the Springfield Structure Plan as community residential. The proposal has been designed in accordance with planning and land use intent for the site by Ipswich City Council and is influenced by surrounding land uses including its proximity to existing and approved infrastructure. Any alternatives would depart from high level urban planning for the area and be beyond the extents of the proponent's ownership.</td> </tr> <tr> <td></td> <td>Yes, you must also complete section 2.2</td> </tr> </table>	X	No There are no feasible alternatives to the proposed action. This is primarily based on the site's strategic designation within the Springfield Structure Plan as community residential. The proposal has been designed in accordance with planning and land use intent for the site by Ipswich City Council and is influenced by surrounding land uses including its proximity to existing and approved infrastructure. Any alternatives would depart from high level urban planning for the area and be beyond the extents of the proponent's ownership.		Yes, you must also complete section 2.2
X	No There are no feasible alternatives to the proposed action. This is primarily based on the site's strategic designation within the Springfield Structure Plan as community residential. The proposal has been designed in accordance with planning and land use intent for the site by Ipswich City Council and is influenced by surrounding land uses including its proximity to existing and approved infrastructure. Any alternatives would depart from high level urban planning for the area and be beyond the extents of the proponent's ownership.					
	Yes, you must also complete section 2.2					
1.10	<p>Alternative time frames etc Does the proposed action include alternative time frames, locations or activities?</p>	<table border="1"> <tr> <td>X</td> <td>No There are no alternative timeframes proposed.</td> </tr> <tr> <td></td> <td>Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).</td> </tr> </table>	X	No There are no alternative timeframes proposed.		Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
X	No There are no alternative timeframes proposed.					
	Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).					

1.11	State assessment Is the action subject to a state or territory environmental impact assessment?	X	No The action is not subject to a state environmental impact assessment. A number of State Government approvals were required to be achieved as part of endorsement of the Springfield Structure Plan, however these are mutually exclusive to the EPBC process or any bilateral agreements.
			Yes, you must also complete Section 2.5
1.12	Component of larger action Is the proposed action a component of a larger action?	X	No The action is not related to other proposals in the area. While the referral area is located within the broader Greater Springfield development area and development approvals existing surrounding the development, these are the subject of different uses, separate approvals and different land ownership.
			Yes, you must also complete Section 2.7
1.13	Related actions/proposals Is the proposed action related to other actions or proposals in the region (if known)?	X	No The action is not related to other proposal in the area. Development approvals exist surrounding the development, however they are the subject of different uses, separate approvals and different land ownership.
			Yes, provide details:
1.14	Australian Government funding Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	X	No The proponent has not received Commonwealth Government funding for the project.
			Yes, provide details:
1.15	Great Barrier Reef Marine Park Is the proposed action inside the Great Barrier Reef Marine Park?	X	No The proposed action is not inside or adjoining to the Great Barrier Reef Marine Park.
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

Response 2.1

The proposed action relates to the construction and operation of the First Nine Residential Development, which is located within Greater Springfield. The development is subject to provisions of the approved Springfield Structure Plan (refer **Plan 1**) and Brookwater South Master Area Development Plan (refer **Plan 2**). The following land uses are proposed across the site

- Residential
- Medium Density Residential
- Local Centre (local shops)
- Local park
- Trunk and non-trunk roads and other infrastructure

The referral area adjoins the existing and completed Brookwater Community residential development and is immediately encompassed by the existing greens of Brookwater Golf Course (Holes 1 to 9). More broadly the site is surrounded by residential development, including Augustine Heights to the west, Springfield Town Centre to the south and Springfield Lakes to the east and Brentwood through the north. Environmental features adjoining the site include Opossum Creek to the north and a patch of vegetation to the east which is identified within the Springfield Structure Plan as future Town Centre.

The First Nine Residential Development, while adjoining the existing Brookwater Community, will be developed under a separate and approved planning instrument being the Brookwater South Precinct Plan. The development will complement the existing pattern of development in Brookwater.

The Brookwater South Master Area Development Plan (refer **Plan 2**) shows the First Nine Residential Development (formally known as Brookwater South) will provide for a range of residential densities and the alignment of major roads have been designed to be consistent with surrounding development. The project will involve the extension of Brookwater Drive which will provide an essential east-west connection for residents through to the future Town Centre and Transport Precinct at Springfield Central.

The First Nine Residential Development is anticipated to be developed over multiple stages across an 8-10 year timeframe.

The key statistics for the action are:

Referral Area = 40.8 hectares

Development Footprint = Approximately 39.8 hectares

Open Space = The precinct will include approximately **1 hectare of parkland** recreational space. *Other areas of open space will be provided at the interfaces with the golf course and take the form of 'golf windows' allowing a visual connection between First Nine roads and the golf course, providing retained natural areas throughout the precinct and reinforcing the Brookwater character.*

Total Allotments = 800-900 dwellings

For the purposes of impacts on MNES the action is summarised as:

- Clearing of 40 hectares of vegetation which achieves the Koala Referral Guideline criteria to be considered critical habitat for the survival of the Koala
- Vegetation clearing (predominately remnant)
- Loss of habitat and increased fragmentation
- New roads and other infrastructure
- Increase in domestic animal ownership
- Increase in hardstand and stormwater run-off in close proximity to Opossum Creek

2.2 Alternatives to taking the proposed action

Response 2.2

There are no alternatives to the proposed action- refer to **Response 1.9**.

2.3 Alternative locations, time frames or activities that form part of the referred action

Response 2.3

There are no alternative locations, time frames or activities proposed- refer to **Response 1.10**.

2.4 Context, planning framework and state/local government requirements

Response 2.4

The proposed action is governed by the Springfield Structure Plan (refer **Plan 1**), which is administered by **Ipswich City Council** and sets out the broader planning framework for land within the structure plan boundary. First Nine Residential Development will be developed in accordance with the approved Brookwater South Master Area Development Plan (refer **Plan 2**) and complement the existing development pattern and character of the Brookwater Community. The necessary development approvals are in the process of being obtained at local and state government levels for the project.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

Response 2.5

The project has not been subject to an environmental impact assessment- refer to **Response 1.11**.

2.6 Public consultation (including with Indigenous stakeholders)

Response 2.6

The overarching Springfield Structure Plan was adopted as part of the Ipswich Planning Scheme 2006 and was subject to extensive public consultation during its design phase in accordance with the *Integrated Planning Act 1997*. The development intent of Greater Springfield has incorporated public opinions and addressed public concerns.

As part of the Greater Springfield development, consultation was undertaken with indigenous stakeholders and cultural heritage experts which included a walk over of the First Nine development site. During this walk over, an arrow artefact (arrow head) was identified within the south-western corner (refer **Figure 3**). The existing cultural heritage area has been disturbed by an old logging trail through the site. It is proposed under the Brookwater South Master Area Development Plan (refer **Plan 2**) to retain this area as Open Space in the form of a community interactive park which will acknowledge

the cultural significance of the site. It is noted that this artefact of cultural heritage significance is not protected under any Local, State or Commonwealth heritage registers.

2.7 A staged development or component of a larger project

Response 2.7

The proposed action is not part of a staged development or a component of a larger project. Refer to **Responses 1.12 & 1.13**. While the First Nine project area is within the broader planning area of Greater Springfield and adjoins the existing Brookwater Community and golf course, the referral area will be developed under a separate planning instrument (i.e. Brookwater South Precinct Plan) does not form a stage of the completed Brookwater Community.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description

Not applicable. The site does not contain and is not located within close proximity to listed World Heritage Properties.

Nature and extent of likely impact

Not applicable.

3.1 (b) National Heritage Places

Description

Not applicable. The site does not contain and is not located within close proximity to listed National Heritage Places.

Nature and extent of likely impact

Not applicable.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

Response 3.1 (c)

The site is located upstream of Moreton Bay, a Ramsar Wetland.

Nature and extent of likely impact

The extent of impacts is likely to be extremely minimal given the site's location approximately 35 kilometres west of Moreton Bay. The site has no direct connection to the bay. Opossum Creek is located to the north of the site. Two drainage features run parallel to the referral boundaries within the encompassing existing golf greens. Any water that flows from the site ultimately into Moreton Bay must first go through a large and complex catchment containing extensive suburbs of urban housing. Given the compounding impacts from the broader Brisbane, Logan and Redlands local council areas that exist between the site and Moreton Bay, any stormwater flowing from the site into the bay would have an extremely minimal cumulative impact. In addition, the project will comply with stormwater management plans relative to the site to ensure stormwater is managed appropriately and meets regulatory standards which mandate no-worsening of water quality prior to exiting the site.

3.1 (d) Listed threatened species and ecological communities

Description

Response 3.1(d)

MNES Desktop Assessment

A Protected Matters Search Tool using a 2 kilometre radius around the site identified the following matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as having potential to occur on the site. A copy of the search results is contained within **Attachment A**.

- Two listed Threatened Ecological Communities:
 - *Lowland Rainforest of Subtropical Australia* (critically endangered)- community may occur in the area
 - *White Box-Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (critically endangered)- community likely to occur within the area
- 10 listed threatened flora species
- 20 listed threatened fauna species

Two senior ecologists from **Saunders Havill Group** conducted a field survey across the referral site on the 28th and 29th September 2015 with weather conditions fine and sunny. A copy of the field survey results is contained within the First Nine Ecological Technical Memo included as **Attachment B**. The purpose of the assessment was to identify any Matters of National Environmental Significance and to assess habitat features, vegetation structure and species occurrence. Survey methods included:

- General Searches & Species Identification – The site was walked to ensure all vegetation communities and species were recorded and identified. Particular attention was paid to any threatened species that were listed as possibly occurring on or within the vicinity of the application site and specific micro assemblages which may support these threatened species.
- Observational Survey – Detailed observational surveys of the vertebrate fauna present on or that may utilise the study area, including faunal lists and significance status of species under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that includes the Japan – Australia Migratory Bird Agreement and the Bonn Convention; and Queensland's *Nature Conservation Act 1992* (NCA).
- Surveys targeting Koala were conducted, including:
 - Direct observational surveys
 - SAT – The Spot Assessment Technique
 - Koala Food Tree habitat assessments as per **Australian Koala Foundation** guidelines
- Identification – Identification of habitat values within the area relevant to terrestrial vertebrate fauna, including ecological corridors; and
- Description – A description of the major fauna habitats present

- Opportunistic searches and deployment of fauna cameras

The results of the field assessment, along with desktop searches and review of previous consultant studies for the Greater Springfield Area have been used to inform the likelihood of occurrence schedule in **Table 2**.

Table 2: Likelihood of Occurrence Schedule

Listed Threatened Ecological Communities						
Name	Status	Type of Presence	Description of Community	Likelihood of Occurrence	Site	
<i>Lowland rainforest of Subtropical Australia</i>	Critically Endangered	This Threatened Ecological Community is listed as a community that may occur within the area.	Typically there is a relatively low abundance of species from the genera <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Casuarina</i> . Buttresses are common as is an abundance and diversity of vines. This community is usually associated with Regional Ecosystems 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1, and 12.12.16.	No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. TEC is unlikely to occur.	Not recorded	
<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>	Critically Endangered	This Threatened Ecological Community is listed as a community likely to occur within the area.	This threatened community is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs and the dominance of White Box, Yellow Box, or Blakely's Red gum trees. This community is usually associated with Regional Ecosystem 11.8.2a, 11.8.8, 11.9.9a, 13.3.1, 13.11.8, and 13.12.9. It can also be a small component of Regional Ecosystem 11.3.23, 12.8.16, 13.3.4, 13.11.3 and 13.11.4.	No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. TEC is unlikely to occur.	Not recorded	
Birds						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Anthochaera phrygia</i>	Regent Honeyeater	Endangered	82338	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes.	The Regent Honeyeater has been recorded at 15 sites across Queensland, primarily south of the Sunshine Coast and Chinchilla. These records have been on Bribie Island and in the Granite Belt. Regular records in the Gore-Karara area suggest a small breeding population may have been present in the mid-1990s. Given the disturbed nature of the site and the lack of specific recordings of the species in the immediate surrounding area, it is unlikely to occur on site. The species is unlikely to occur.	Not observed

<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	1001	The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate southeast and southwest. It 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. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Cyclopsitta diophthalmacoxeni</i>	Coxen's Fig Parrot	Endangered	59714	The Coxen's fig Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest. Food is mainly taken from figs however other species fruit have been recorded in their diet including <i>Elaeocarpus grandis</i> , <i>Syzygium corynanthum</i> , <i>Litsea reticulata</i> and <i>Grevillea robusta</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	Endangered	533	The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Erythrotriorchis radiatus</i>	Red Goshawk	Vulnerable	942	A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey.	Due to a lack of records within the local area, it is unlikely that this species will occur. However, possible foraging habitat occurs throughout some of the mapped remnant areas. There is no evidence of visitation or permanent residence on site. Species is unlikely to occur.	Not observed
<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern)	Vulnerable	64440	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture.	No confirmed local records. The species is now very rarely observed in southern Queensland. Not expected onsite and no direct impact from proposed actions. Species is unlikely to occur.	Not observed

<i>Lathamus discolor</i>	Swift Parrot	Endangered	744	Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations. While the species is very uncommon in south-east Queensland, its occurrence cannot be completely discounted. There are suitable winter flowering species present on the site which may attract birds during flowering (eg <i>E. tereticornis</i>).	Due to a lack of records within the local area, it is highly unlikely that this species will occur. Species is unlikely to occur.	Not observed
<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	470	The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The species inhabits 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. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes.	Due to a lack of records within the local area, it is highly unlikely that this species will occur. Species is unlikely to occur.	Not observed
<i>Peophila cincta cincta</i>	Black-throated Finch (southern)	Endangered	64447	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water. It 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; and at scattered sites in central-eastern Queensland (between Aramac and Great Basalt Wall National Park). It has been absent from Brisbane and its surrounds since the 1930s.	Due to a lack of records within the local area, it is unlikely that this species will occur. Species is unlikely to occur.	Not observed
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	77037	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Turnix melanogaster</i>	Black-breasted Button-quail	Vulnerable	923	Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However the species has also been recorded in a variety of low coastal heathlands around Frazer Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured.	Little to no suitable habitat for this species occurs and it has not been recorded in the area. Species is unlikely to occur.	Not observed

Insects						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Phyllodes imperialis smithersi</i>	Pink Underwing Moth	Endangered	86084	The Pink Underwing Moth is found below the altitude of 600m in undisturbed, subtropical rainforest. It occurs in association with the vine <i>Carronia multisepealea</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
Mammals						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Vulnerable	183	The Large-eared Pied Bat roosts on sandstone cliffs and fertile woodland valley habitat within close proximity of each other. However in South-east Queensland habitat includes rainforest and moist eucalypt forest habitats at high elevations.	No confirmed local records of this uncommon species. Inhabits mesic vegetation. Not expected to occur and no impact expected. Species is unlikely to occur.	Not observed
<i>Dasyurus hallucatus</i>	Northern Quoll	Endangered	331	The Northern Quoll is known to occur as far south as Gracemere and Mr Morgan, south of Rockhampton and as far north as Cooktown. There have also been occasional records as far south as Maleny on the Sunshine coast hinterland. The species occupies rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grassland and desert. Preferred habitat in Queensland suggests the Northern Quoll are more likely to be present in high relief areas that have shallower soils, greater cover of boulders, less fire impact and were close to permanent water.	Due to the large amount of disturbances and impacts from fire, no suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	75184	The Spot-tailed Quoll has a preference for mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This predominantly nocturnal species rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage.	Due to the large amount of disturbances and lack of suitable rocky outcrops, no suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	Vulnerable	225	This species prefers rocky habitat, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. Although rocky outcrops are crucial, vegetation structure and composition is also considered to be important. This species appears closely associated with dense arboreal cover, especially fig trees however dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophyll forest and open forests are important.	No suitable habitat or evidence was observed throughout the assessment area. Species is unlikely to occur.	Not observed

<i>Phascolarctos cinereus</i>	Koala	Vulnerable	85104	They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the surrounding area and evidence has been recorded on-site.	Areas of suitable habitat were observed on site. Species known to occur on site.	Evidence of Koalas in the form of observations and scats.
<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	Vulnerable	186	Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feed on commercial fruit crops. The primary food source is blossom from Eucalyptus and related genera.	No camps were observed throughout the assessment area however food resources cover the site. This species is highly likely to occur when the Eucalypts are in flower and is known to occur in the broader area. Species has potential to occur.	Not observed
Other						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Cycas ophiolitica</i>	Marlborough Blue	Endangered	55797	Inhabits eucalypt open forest and woodland communities with a grassy understorey. They occur on hill tops or steep slopes, at altitudes of 80-620m above sea level. It grows on shallow, stoney, red clay loams or sandy soils.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
Plants						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Bosistoa selwynii</i>	Heart-leaved Bosistoa	Vulnerable	13702	The Heart-leaved Bosistoa is similar to the Three-leaved Bosistoa and is conserved within Mt Warning National Park, Numbinah Nature Reserve, Limpinwood Nature Reserve and When Whian State Forest. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. It is commonly associated with <i>Argyrodendron trifoliolatum</i> , <i>Syzygium hodgkinsoniae</i> , <i>Endiandra pubens</i> , <i>Dendrocnide photinophylla</i> , <i>Acmena ingens</i> , <i>Diploglottis australis</i> and <i>Diospyros mabacea</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Bosistoa transversa</i>	Three-leaved Bosistoa	Vulnerable	16091	The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinah Nature Reserve, Limpinwood Nature Reserve and Whian Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 meters in altitude. It is commonly associated with <i>Argyrodendron trifoliolatum</i> , <i>Syzygium hodgkinsoniae</i> , <i>Endiandra pubens</i> , <i>Dendrocnide photinophylla</i> , <i>Acmena ingens</i> , <i>Diploglottis australis</i> and <i>Diospyros mabacea</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded

<i>Notelaea ipsviciensis</i>	Cooneana Olive	Critically Endangered	81858	The Cooneana Olive is known to only occur within three closely clustered sub-populations within Ipswich, those being, Murphy's Gully (111km west), a site adjacent to the Cunningham Highway (closest point of Cunningham Highway from the site is 23.6km west) and Bergin's Hill (15km west). Given the very specific locations of this plant and its distribution away from the site, it is likely that the Cooneana Olive does not occur.	The Cooneana Olive occurs in specific locations around Ipswich. The plant has never been recorded on or in close proximity to the site. Species is unlikely to occur.	Not recorded
<i>Notelaea lloydii</i>	Lloyd's Olive	Vulnerable	15002	Lloyd's Olive is known at five locations in south-east Queensland, those being Mt Crosby (31km north-west), Boonah (50km south-west), Moggill State Forest (17km north), an unnamed state forest and Moogerah Peaks National Park (73km south-west). It occurs in hilly terrain in moist gullies with shallow, well drained and stoney to very rocky soils. Given the specific and known location of this species' occurrence, it is unlikely that it occurs on the site.	The Lloyd's Olive has not been recorded on or in close proximity to the site. Its distribution is restricted to the five identified locations. Species is unlikely to occur.	Not recorded
<i>Phaius australis</i>	Lesser Swamp Orchid	Endangered	5872	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (<i>Lophostemon suaveolens</i>), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (<i>Archontophoenix cunninghamiana</i>) or Cabbage Tree Palm (<i>Livistona australis</i>).	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Phebalium distans</i>	Mt Berryman Phebalium	Critically Endangered	81869	Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period. Vegetation associations in which Mt Berryman Phebalium occur include microphyll to notophyll vine forest with or without <i>Araucaria cunninghamii</i> and low microphyll vine forest and semi-evergreen vine thicket with or without <i>Araucaria cunninghamii</i> which can be divided further into regional ecosystems depending on substrate, geography and associated vegetation species.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded

<i>Plectranthus habrophyllus</i>		Endangered	64589	<i>Plectranthus habrophyllus</i> is a woody, square stemmed herb with scented foliage and is known to occur in only 6 locations across South East Queensland. This includes Oxley Creek in Greenbank (10km east), Opposum Creek, Springfield (1.5km east), White Rock Conservation Park (3km south) and Ormeau (50km east). Opposum Creek and White Rock Conservation Park are both located in close proximity to the site, suggesting that there is potential for the herb to occur on the subject site. Given the specific known locations of the herb, it is likely that the herb does not occur on the site. It occurs on rock outcrops of sandstone or chart in shaded situations in Eucalypt woodland often close to vine forest.	<i>Plectranthus habrophyllus</i> has been recorded in the local area in very niche habitat locations. These niche habitat attributes (i.e. north facing rock outcrops) do not occur on site and the species was not observed during flora surveys. Species is unlikely to occur.	Not recorded
<i>Sophera fraseri</i>		Vulnerable	8836	<i>Sophera fraseri</i> grows in moist habitats, often in hilly terrain at altitudes form 60-660m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest comminties.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Streblus pendulinus</i>	Siah's Backbone	Endangered	21618	On the Australian mainland, Siah's Backbone is found in warmer rainforests, chiefly along watercourses. The altitudinal range is from near sea level to 800 m above sea level. The species grows in well-developed rainforest, gallery forest and drier, more seasonal rainforest.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Thesium australe</i>	Austral Toadflax	Vulnerable	15202	Austral Toadflax is semi-parasitic on roots of a range of grass species notably Kangaroo Grass (<i>Themeda triandra</i>) (Scarlett et al. 1994). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
Reptiles						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Delma torquata</i>	Collared Delma	Vulnerable	1656	The Collard Delma inhabits eucalypt-dominated woodlands and open-forests in Land Zones 3 (Alluvium), 9 (undulating country or fine-grained sedimentary rocks), 10 (sandstone ranges). Common Regional Ecosystems (RE) include RE 11.3.2, RE 11.9.10, RE 11.10.1 and RE 11.10.4. These REs are located in Bioregion 11 (Brigalow Belt), located to the north and west of South East Queensland. The species is also known in the Toowoomba Ranges in habitats associated with exposed rocky outcrops on ridges or slopes in vegetation communities dominated by Narrow-Leaf Ironbark (<i>Eucalyptus crebra</i>). Other areas where the species has been	Important populations of the species are associated with important habitats found in the Brigalow Belt (Bioregion 11). Larger population records of the species west of Brisbane include Kenmore, Pinjarra Hills, Anstead, Mt Crosby, Lake Manchester and Karana Downs. The species has not been recorded on, or in close proximity to the site. Species is unlikely to occur.	Not recorded

				recorded is the Mt Crosby and Moggill State Forest sites, as well as Anstead and Pinjarra Hills.		
<i>Furina dunmalli</i>	Dunmall's Snake	Vulnerable	59254	Dunmall's Snake has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow other Wattles, native Cypress or Bull-oak, and various Blue Spotted Gum, Ironbark, White Cypress Pine and Bulloak open forest and woodland associations on sandstone derived soils. Dunmall's Snake occurs primarily in the Brigalow Belt region in the South-eastern interior of Queensland. Records indicate sites at elevations between 200–500 m above sea level. The snake is very rare or secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed

MNES Threatened Species and TECs Assessment

As summarised in **Table 2**, a review of specific habitat niches and distribution of these listed flora and fauna species and TECs using the SPRAT database, Queensland's Wildlife Online Search Tool, previous reporting in the local area and Queensland's Regional Ecosystem and Essential Habitat mapping ruled out the potential for most listed species to occur. The position on the potential occurrence of species was supported by field survey results. This was primarily due to combined impacts from:

- Lack of suitable niche habitat across the site, such as large waterbodies and coastal habitats.
- Influences from surrounding development, particularly expanding residential developments, roads and the railway line, as well as surrounding major commercial development and education facilities such as the Springfield Central.
- Fragmentation of the site, adjoining existing residential and arterial roads to the immediate west and south and more broadly Springfield Town Centre to the east.
- Evidence of disturbance from maintained and fertilised encompassing golf greens.
- Evidence of exotic weeds throughout the site.
- Evidence of site usage by domestic dogs from surrounding residential areas.
- Consistent usage of the site for unlawful land uses including motorbikes and 4wd.

Overall, desktop surveys described above identified potential for the Grey-headed Flying-fox (*Pteropus poliocephalus*) and Koala (*Phascolarctos cinereus*), both of which are listed as Vulnerable under to EPBC Act, to occur on site due to the availability of suitable habitat and recordings for the species in the local area. No other scheduled species or TECs were observed during field surveys or considered likely to occur on site.

Assessment of Occurrence and Field Survey Results

On the 28th and 29th September 2015, senior ecologists from **Saunders Havill Group** (SHG) conducted field assessments across the site to survey for MNES flora as well as potential habitat and evidence of MNES fauna. Overall, the site was found to be highly disturbed as a result of maintained access tracks, unlawful activities including motorbike and 4wd impacts, weed infestations, evidence of dogs, dumping of domestic rubbish and edge effects from surrounding development, in particular edge effects from the encompassing golf course. The results of this assessment by **SHG** in combination with findings and conclusions from consultant's reports for the Greater Springfield Area (refer to **Section 8** for references) have been used to inform the baseline ecological conditions for the site permanently or even seasonally.

Grey-headed Flying-fox (*Pteropus poliocephalus*)

The Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act, however is it not listed as a threatened species under Queensland legislation. The Grey-headed Flying-fox is a canopy-feeding frugivore and nectarivore, which uses vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. Its primary food source is Eucalypt blossom and related genera. It roosts in aggregations of various sizes on exposed branches, typically near water, however colonies can utilise highly modified vegetation in urban environments.

A search of the Atlas of Living Australia returned one (1) known record of the Grey-headed Flying-fox approximately 10km from the referral site within the suburb of Warcol, however it is noted that this record was made in 1992. Surveys undertaken by **Biodiversity and Assessment Management** (BAAM) during winter 2005 for the Greater Springfield area, noted numerous individuals feeding within the area, however did not detect any colonies or camps within close proximity to the subject site. Of relevance to the site, **BAAM** noted that there are four (4) stable, long-term camps which are located within the recognised typical nightly commuting distance of flying-foxes from the site. These camps are located at Goonda and Indooroopilly (to the north), Slacks Creek (to the east) and Woodend (to the west). It is also important to note that **BAAM** state that the abundance of winter flowing resources in relation to each of the camps (over 35km from the site) indicates that the site is unlikely to be utilised by Grey-headed Flying-fox as part of frequent visitation.

Site specific surveys by **SHG** over the application area in September 2015 did not record any individuals or roosting camps and concluded that the proposed referral area does not contain suitable habitat for the species, such as wetter gully and drainage lines or ridges where flowing eucalypts are predominately located. Survey noted that suitable habitat for the species

was identified within the Opossum Creek corridor to the north. Opossum Creek is separated from the referral area by the existing Brookwater Golf Course and is designated within the Springfield Structure Plan as Open Space (refer **Plan 1**). Further, suitable habitat for the species has been identified within the Springfield Conservation Land to the south (refer **Plan 1**). This land will be retained and rehabilitated for environmental conservation as part of the development of Greater Springfield and has been dedicated previously by **Springfield Land Corporation** to Council.

Overall, it is considered that the abundance of suitable foraging habitat in the surrounding landscape suggests the retention of open space and conservation areas in close proximity to the proposed development, in particularly Opossum Creek corridor to the north, would likely mitigate any potential reduction of suitable habitat for Grey-headed Flying-fox.

The following provides a brief description of the species and assessment against the *Significant Impact Guidelines 1.1*:

Distribution and Population

The Grey-headed Flying-fox occurs between Rockhampton in Queensland to Melbourne in Victoria. The species will usually selectively forage where food is available and as such, its patterns of occurrence and relative abundance vary between seasons and years. There are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout its geographic range.

Threats

The primary threat to the Grey-headed Flying-fox is shooting and culling to protect commercial fruit farms. In addition, habitat loss and fragmentation creates competition for food sources and the loss of roosting camps is also considered to be a threat.

Field Survey Results

Given the availability of eucalypts throughout the site, 2015 field survey by **SHG** concluded that the site has potential to provide marginal foraging habitat to the Grey-headed Flying-fox as part of a broader home range. No individuals were observed on-site and more importantly, no roosting camps were observed. Further, as the site is highly disturbed by surrounding land uses, it is considered likely that the species would opt to utilise Opossum Creek corridor to the north over the degraded referral area.

Significant Impact Assessment

To determine whether the proposed action is likely to have a significant impact on the Grey-headed Flying-fox, an assessment against the *Significant impact Guidelines 1.1* is provided in **Table 3**.

Table 3: Significant Impact Assessment – Vulnerable Grey-Headed Flying-Fox

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While the site does contain potential foraging habitat for the Grey-headed Flying-fox, no individuals were observed on site and no roost camps were seen on or near the site. South East Queensland has a permanent and abundant population of Grey-headed Flying-fox and available habitat is spread throughout the region given the high prevalence of Eucalypts including land designated as open space within the Opossum Creek corridor to the north. The site is not considered to support an important population of the species and the proposed action is unlikely to lead to a long term decrease in the size of any local Grey-headed Flying-fox populations.	No significant impact
2. Reduce the area of occupancy of an important population.	No roost camps or individuals were observed across the site. The project will not have a significant impact on any population	No significant impact

	of the species. While the proposed action will remove available foraging habitat, given the abundant availability of eucalypts in the surrounding landscape and the greater SEQ region, the development proposal is unlikely to have a significant impact on any area of occupancy of the species. It is noted that areas of desirable Grey-headed Flying-fox habitat is to be retained within existing conservation corridors within the Greater Springfield area, including Opossum Creek corridor to the north.	
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that while there are spatially structured colonies of Grey-headed Flying-fox, there are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout the species' geographic range. In addition, given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations.	No significant impact
4. Adversely affect habitat critical to the survival of a species.	While the proposed action results in the removal of potential foraging habitat, this habitat is highly disturbed and subject to edge effects from surrounding development. Further, this habitat is not considered to be unique or of special value. The SEQ landscape provides abundant eucalypt and similar genera which are available for foraging. The habitat on site is not considered to be critical to the survival of the Grey-headed Flying-fox.	No significant impact
5. Disrupt the breeding cycle of an important population.	The site surveys did not identify any evidence of breeding Grey-headed Flying-fox. Mating normally occurs within autumn, and females generally give birth in October, where they carry their young to feeding sites for four to five weeks after giving birth. As no roosting camps were observed on or near the site, the proposed action is unlikely to disrupt the breeding cycle of an important population.	No significant impact
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on site did not contain any special or unique values. Its removal is unlikely to have a significant impact on the availability of habitat in the landscape, given the vast quantity and availability of eucalypts in the surrounding area.	No significant impact
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is unlikely to result in the introduction of invasive species.	No significant impact
8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area.	No significant impact
9. Interfere substantially with the recovery of the species.	Recovery of the species has specifically targeted the broad scale culling of the species. In addition, conservation efforts have led to the protection of known roosting sites and important habitat. The site has not been identified as an important habitat or roost site and the action is unlikely to interfere with the recovery of the species.	No significant impact

The above assessment against the *Significant Impact Guidelines 1.1* indicates the proposed action is unlikely to have a significant impact on the Grey-Headed Flying-Fox.

Koala (*Phascolarctos cinereus*)

Conservation Status

Under the EPBC Act, Koala populations in Queensland, New South Wales and the Australian Capital Territory are listed as Vulnerable. The Koala is also listed as Vulnerable under Queensland's *Nature Conservation Act 1999* (NCA). The site is located within the modelled distribution of the Koala, within the "coastal context" as per the EPBC Act Referral Guidelines for the Vulnerable Koala (Koala Referral Guidelines).

Habitat

As described in the Koala SPRAT species profile, Koalas inhabit a wide range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species. Under the Koala Referral Guidelines (p.5), Koala habitat is defined as:

"any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees. This can include remnant and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present".

Distribution

Koalas are endemic to Australia and have a known distribution from north-eastern Queensland to south-east South Australia. The species is widespread within coastal and inland areas, however densities of Koalas are higher within coastal areas with higher average annual rainfalls. South East Queensland is known to support Queensland's highest density of Koalas.

Threats

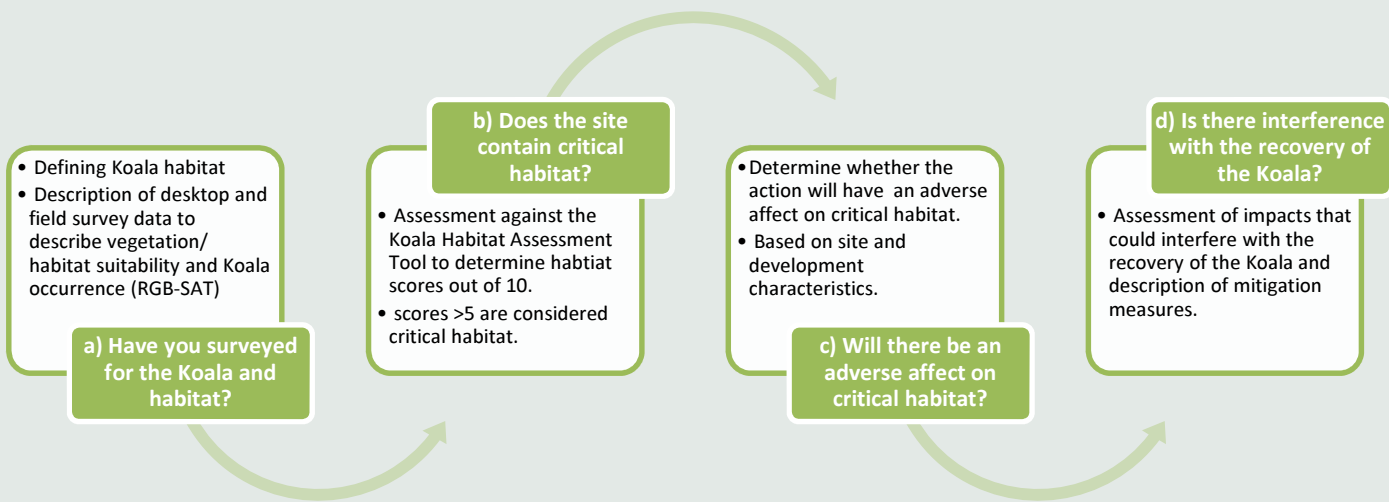
The three (3) main threats to Koala have been identified within the SPRAT profile as:

- Habitat loss and fragmentation,
- Vehicle strike, and
- Predation by domestic and/or feral dogs.

In addition, the prevalence of disease such as the *Chlamydia* virus in many Koala populations has led to symptoms such as infections of the eyes, urinary tract, respiratory tract and reproductive tract, with the later having the potential to head to infertility in females. More recently, Koala Retrovirus (KoRV) has had an increasing impact on most of Queensland's Koala populations. While most Koalas carry the disease, environmental stresses such as poor nutrition and overcrowding lead to conditions caused by KoRV such as leukaemia and immunodeficiency syndrome.

Assessment Against the EPBC Act Referral Guidelines for the Vulnerable Koala

The referral site is located within the Koala Referral Guidelines modelled distribution as 'known/likely to occur' and within the 'coastal context'. As stated above, South East Queensland is known to support Queensland's highest density of Koalas and the animal is known to occur within the broader Greater Springfield area. As such, the following provides a detailed assessment against the Koala Referral Guidelines to determine whether the proposed action, being First Nine Residential Development, will result in a significant impact on the Koala or Koala habitat. The Koala Referral Guidelines provides an assessment approach using the following processes displayed in the flow chart below:



Flow Chart: EPBC Koala Assessment Process

- **Koala Occurrence and Habitat Surveys**

Site Surveys

The site was assessed by two Senior Ecologists from **SHG** on the 28th and 29th September 2015 with weather conditions fine and sunny. The purpose of the survey was to determine the level of Koala usage across the site and to assess the availability of suitable Koala habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) development by Philips and Callaghan (2011)
- Quaternary Assessments (Habitat Surveys)
- Opportunistic Searches

SAT Survey Results

The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a non-juvenile tree of any species within the site that is either observed to have a Koala or scats or known to be food trees or otherwise important for Koalas and recording any evidence of Koala usage (including any Koalas, identifiable scratches, or scats). The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within 1 m radius of the trunk. After approximately 1 minute of searching for scats, the base of the trunk is observed for scratches.

Site specific searches observed the presence of one (1) Koala individual within the centre of the site as well as several scats across the site. Ten (10) SAT surveys were conducted across the application area, as shown by the field survey effort presented in **Plan 3** and summarised in **Table 4**. Four (4) of the ten (10) SAT surveys recorded evidence consistent with the “high” usage category for Koala Use (>12.59% of trees with scats) in coastal regions as defined by the **Australian Koala Foundation’s** Koala Activity Level Classification Table, extracted below as **Table 5**. This assessment has been based using the East Coast (Low) Density Area. Additionally, two (2) of the SATs recorded evidence consistent with the medium “normal” use category (≥9.47 but ≤12.59 of trees with scats) while the remaining four (4) SAT recorded evidence with the “low” use category (<9.47% of trees with scats).

Table 4: SAT Survey Results- Summary

SAT Survey	Scats	%of Trees with Scats	Usage Level
SAT 1	Yes	13.3	High
SAT 2	Yes	10	Normal
SAT 3	Yes	16.7	High
SAT 4	Yes	6.7	Low
SAT 5	Yes	10	Normal
SAT 6	Yes	6.7	Low
SAT 7	Yes	16.7	High
SAT 8	Yes	6.7	Low
SAT 9	Yes	6.7	Low
SAT 10	Yes	16.7	High

Table 5: AKF Koala Activity Level Classification Table

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
East Coast (low)	< 9.47%	≥ 9.47% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western areas (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

Flora and Koala Habitat Searches

Queensland's Koala Habitat Values Map, attached as **Figure 4**, shows the site has been identified as containing areas of Medium Value Bushland and Medium and Low Value Rehabilitation. A patch of vegetation identified as future Town Centre and Opossum Creek corridor are mapped as containing areas of Medium and Low Value Bushland. Surrounding development areas are mapped as Medium Value and Low Value Rehabilitation as well as Generally Not Suitable for the species.

Regulated Vegetation Management Mapping, attached as **Figure 5**, shows the majority of the site is mapped as containing Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19 which is also mapped as essential habitat for Koala. The existing extent of Brookwater Drive within the central western portion of the site is mapped as Category X (non-remnant) as a result of clearing.

Field surveys confirmed the site contained a high abundance of invasive weeds, including four (4) species declared under the *Land protection (Pest and Stock Route Management) Act 2002*. These include *Celtis sinensis* (Chinese Celtis) – Class 3, *Cinnamomum camphora* (Camphor Laurel) – Class 3, *Lantana camara* (Lantana) – Class 3 and *Opuntia stricta* (Prickly Pear) – Class 2.

Overall, the site is dominated by Eucalypt Woodland:

- **Eucalypt Woodland**

- The site contained high density of Eucalyptus and Corymbia species. The vegetation observed was consistent with the Regional Ecosystem mapping within the area containing species consistent with the composite RE 12.9-10.2/12.9-10.7/12.9-10.19.
- Dominant flora species consisted of *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark), *Eucalyptus siderophloia* (Grey Ironbark), *Corymbia citriodora* (Spotted Gum) *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus major* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus fibrosa* (Red Ironbark).

- Vegetation within the understorey and shrub layer was moderately disturbed with numerous tracks noted throughout the assessment area. Some evidence of historical logging was also observed throughout the area.
- Weeds found within the assessment area included *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton).

Summary of Findings

- **Does the site contain critical habitat to the survival of the Koala?**

In accordance with the Koala Referral Guidelines, habitat which receives a score of **5 or more** using the Koala Habitat Assessment Tool is considered to be critical habitat. An assessment of the site using the Koala Habitat Assessment Tool has been undertaken in **Table 6** which indicates the site has been given a critical habitat score of **5**.

Table 6: Koala Habitat Assessment Summary

Attribute	Score	Comment
Koala occurrence	2	<p>The EPBC Act Protected Matters Search Tool identified the Koala as having potential to occur on site. A search of Queensland's Wildlife Online Search Tool using a 10 kilometre radius found 568 records for the Koala. However, a search of the Atlas of Living Australia using a 10km radius returned no records for the species and a search of the Australian Koala Foundation Koala Map using a 10km radius found 1 record for a dead individual on Augusta Parkway in 2010.</p> <p>A single koala was observed on the site during the September 2015 field survey. In addition, scats were observed in several locations across the site corresponding with "high", "normal" and "low" levels of use.</p> <p>As there is evidence of Koala occurrence in the previous two years, this attribute has been scored 2.</p>
Vegetation composition	2	<p>A detailed description of the vegetation composition on site is provided in Response 3.1, based on the results from 2015 ecological field survey. Overall, the site was found to be dominated by species that achieve the definition of 'woodland' as referenced in the Koala Referral Guidelines. Ecological survey of the site shows the referral area is predominately dominated by Eucalyptus and Corymbia species. Specifically, these species included <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus siderophloia</i> (Grey Gum), <i>Eucalyptus fibrosa</i> (Red Ironbark), <i>Eucalyptus moluccana</i> (Gum-topped Box), <i>Corymbia intermedia</i> (Pink Bloodwood), <i>Corymbia citriodora</i> (Spotted Gum), Broad-leaved Ironbark (<i>Eucalyptus fibrosa</i>) and Grey Ironbark (<i>E. siderophloia</i>). Further, there was a high dominance of <i>Allocasuarina littoralis</i> (Black She-oak) and <i>Acacia spp.</i> throughout the shrub layer and a number of weed species were identified. As vegetation composition of canopy species on site is made up of more than two species considered to be Koala food trees, this attribute has been given a score of 2.</p> <p>Two or more Koala food trees were identified in the canopy, resulting in an attribute score of 2.</p>
Habitat connectivity	1	Contextually, the site is bound by three (3) large 4-lane roads - Augusta Parkway to the south west, Eden Station Road to the south and Springfield Greenbank Arterial to

		<p>the east. These major arterials and ultimately, Centenary Highway approximately 500m to the south, sever connectivity for Koala movement from the site to areas of suitable Koala habitat to the south (refer Plan 4).</p> <p>Locally, the site is disconnected from these habitats by the Brookwater Golf Course. The referral area occurs as a cul-de-sac of vegetation completely fragmented in all directions with the exception of Opossum Creek. Opportunities for connectivity are impeded as a result of properties to the south being cleared of vegetation for industrial, commercial and retail purposes, existing development of the Brookwater Community residential estate to the west, and zoning for future Town Centre on land to the east. Further no viable movement corridors or retention of Koala habitat has been planned for the referral area under the Springfield Structure Plan (refer Plan 1).</p> <p>Opportunities for Koala movement and wildlife connectivity remain along the Opossum Creek, which has been zoned for open space under the structure plan, and to the large patch of vegetation to the north. It is however noted that the majority of this remaining vegetation to the north is proposed to be cleared by current EPBC applications for Investa (EPBC Ref: 2013/7074) and Cherish (EPBC Ref: 2014/7306) (refer Plan 4). Ignoring all surrounding developments and EPBC applications, the site forms part of a contiguous landscape of vegetation >500ha however once these approvals are in place, this vegetated landscape will be reduced to a contiguous landscape of approximately 210ha (i.e. <300ha) which falls below the medium habitat assessment score for coastal regions.</p> <p>While the site will be reduced to a contiguous landscape <300ha, as the site retains connectivity to Opossum Creek this attribute has been scored a 1.</p>
Key existing threats	0	<p>Given the site's proximity to trunk roads that provide vehicle connectivity to the Centenary Motorway and nearby high density residential development, the threat of vehicle strikes is considerably high. A search of the Australian Koala Foundation Koala Map using a 10km radius found 1 record for a dead individual on Augusta Parkway in 2010. In addition, increases in dog ownership due to the rapid expansion of residential development in the Brookwater area also pose a significant threat to Koalas. Evidence of dogs within surrounding residential areas was observed. Given the existence of key threats to Koalas from vehicle strikes and dog attack, as well as the combined impacts from development in the surrounding area, the attribute has been scored 0.</p> <p>Due to the existence of key threats, the attribute has been scored 0.</p>
Recovery value	0	<p>The interim recovery objective for coastal areas is based upon protecting and conserving large, connected areas of Koala habitat, particularly where Koalas are genetically diverse/ distinct, free of disease or have a low incidence of disease or where there is evidence of breeding. None of these elements are considered to be present on the referral site. This is primarily due to:</p> <ul style="list-style-type: none"> ▪ Surrounding development to the west and south and high density residential development proposed to the east. ▪ The proximity of existing residential development to the west and major arterials to the south. ▪ The prevalence of disease within the local population ▪ The insufficient size of the site in isolation to support a genetically robust sub-population. ▪ Absence of dedicated conservation areas or habitat linkages within the referral site.

		<ul style="list-style-type: none"> ▪ No evidence of breeding was observed. ▪ Suitable habitat will be retained along Opossum Creek corridor to the north of the site which provides wildlife movement and connectivity within the broader landscape. <p>Further, while majority of the site is identified under the Koala Habitat is South East Queensland mapping as containing Medium Value Bushland, surrounding areas are mapped as Medium and Low Value Rehabilitation or generally not suitable for the species. This is because the site is largely encompassed by existing development which restricts movement of to the west, south and east of the site. Further, as shown in Plan 1 -Springfield Structure Plan, planning intent is for the area to be completely developed with no conservation linkages to be retained within the referral area. Planned areas of retained open space have been dedicated along Opossum Creek corridor directly north of the site. This corridor is mapped as Low Value Bushland under the Koala SPRP and provides suitable habitat and wildlife movement for the Koala, and common fauna in the area, within the broader landscape.</p> <p>As discussed previously, the local Koala population is not considered to be genetically distinct and no evidence of Koala breeding was recorded on or near the site. Disease is known to be prevalent across all South East Queensland populations in the form of Chlamydia and Koala Retrovirus. The local Koala population is extremely unlikely to be free of disease.</p> <p>In addition, the site makes up a central portion of the Greater Springfield development area, adjoining existing residential to the west and Town Centre to the south and east. If the development does not go ahead, it will significantly affect existing and proposed development in the Greater Springfield area, specifically in its role providing a trunk collector from the Town Centre to the east to the existing development of Brookfield to the west.</p> <p>Overall, the site does not meet the interim recovery objectives for coastal regions a</p> <p>As the referral site does not meet the interim recovery objectives, this attribute has been scored 0.</p>
Total	5	Critical Habitat

▪ **Will there be adverse impacts on critical habitat?**

Assessment of the site using the Habitat Assessment Tool identified the site achieves a **habitat score of 5** which meets the definition of critical habitat under the Koala Referral Guidelines (≥ 5). Potential impacts to the species under the Koala Referral Guidelines have been considered through the “yes/no” flowchart provided within the Koala Referral Guidelines as Figure 2, to determine if the action will adversely affect habitat critical to the survival of the species.

1. Does your impact area contain habitat critical to the survival of the koala (habitat score ≥ 5)?

Yes, as demonstrated using the Habitat Assessment Tool, the site achieved a critical habitat score of 5. Therefore, the site is considered to support habitat critical to the survival of the Koala.

2. Do the area(s) proposed to be cleared contain known koala food trees?

Yes. Overall the site was found to be dominated by species that achieve the definition of ‘woodland’ as referenced in the Koala Referral Guidelines. Field survey identified canopy species within the referral area are dominated by Eucalyptus and Corymbia specimens which are considered Koala food trees.

3. Are you proposing to clear ≤ 2 ha of habitat containing known koala food trees in an area with a habitat score of 5?

No. the action requires clearing approximately 40 hectares of vegetation which is considered to provide critical habitat for the Koala.

4. Are you proposing to clear ≥ 20 ha of habitat containing known koala food trees in an area with a habitat score of ≥ 8 ?

No. The action requires clearing approximately 40 hectares of vegetation which achieved a critical habitat score of 5 using the Habitat Assessment Tool. This score is at the lowest end of the spectrum for critical habitat, due to noted disturbance of the site and impacts from surrounding development.

5. Assessment on Characteristics

The proposed action displays a number of characteristics and measures that reduce the adversity of effects on the Koala. These include:

- The site is moderately disturbed as a result of historical land use and surrounded development, and reflects only a very a small isolated area of vegetation surrounded by existing development and roads.
- The proposal does not result in the fragmentation of other vegetation areas, as it reflects a disturbed pocket which extends from areas of higher ecological values associated with Opossum Creek corridor. This corridor is designated as open space and retains preferable habitat for the species as well as movement opportunities for the species within the broader landscape.
- Should the action not proceed, the site will be further surrounded by development which will evidently increase threats to the species including roads and domestic pets.
- The site is considered to reflect a combination of "high", "normal" and "low" level of usage by the Koala, with only one individual sighted during field survey.
- As per **ICC** conditions, no clearing can occur on site without direct involvement of a registered Fauna Spotter Catcher.
- Each of these characteristics restricts the site's ability to achieve the interim recovery objectives for coastal areas. As such, the retention of site vegetation will not advance the objective of the Commonwealth to protect large and continuous areas of Koala habitat.
- Given these factors, the short and long term impacts on Koalas as a result of the proposed action are not considered to be significant.

Overall, the adversity of impacts as a result of the proposed development are minimal given existing barriers to Koala dispersal to and from the site, coupled with current Local, State and Commonwealth approvals around the referral area, drastically influence the long term ecological function of the site within the broader landscape.

6. Could the action interfere substantially with the recovery of the Koala?

In addition to considering adverse impacts on critical habitat, the potential for the action to interfere with the recovery of the Koala must also be considered as per the Koala Referral Guidelines. Possible impacts listed in the guidelines that must be considered include:

- Introducing or increasing the risk of vehicle strike.
- Introducing or increasing koala fatalities due to dog attacks.
- Creating a barrier to movement.
- Facilitating the introduction or spread of disease.
- Increasing the risk of high-intensity fires.
- Degrading critical habitat due to hydrological changes.

These impacts, as well as mitigation measures to address impacts, are discussed in **Table 7**. In summary, the project is unlikely to interfere substantially with the recovery of the species.

Table 7: Potential Impacts

Impact	Likelihood	Comments
Dog attack	Potential	<p>No specific survey for dogs was completed over the referral site, however evidence of dogs was recorded on the site. The project occurs within a fragmented urban setting with existing dog ownership to the north-west. The type of housing proposed to be constructed in the First Nine Residential Development project will mirror that in the immediate landscape. Interestingly, the surrounding of the referral area by a private owned and operated golf course should assist in retaining dogs to new allotment areas. Within ICC, all animals must be tagged and registered with stay or wandering animals within the golf course likely to be replanted.</p> <p>No significant residual impacts are identified.</p>
Vehicle Strike	Potential	<p>The proposed action will increase vehicle use on and surrounding the site through the construction of trunk collector and local roads. Again, in the context of existing and proposed development, specifically arterials to the west and east and Centenary Highway to the south, this increase will be relatively minor and risk of vehicular strike in the area is already high. Nevertheless, an increase in vehicle usage adjacent to bushland areas does create the potential for vehicle strike. Vehicle speeds will be limited to 50/60km per hour, in accordance with Queensland traffic laws. This reduces the risk of high speed vehicle collisions with Koalas. Further, impacts will be mitigated through road design principles and signage techniques encouraging high visibility and low speeds.</p> <p>Importantly, the First Nine Residential Development does not propose external roads or roads in locations which sever existing or future bushland areas.</p> <p>No significant residual impacts are identified.</p>
Barriers to Dispersal	Unlikely	<p>The site is already surrounded by development to the west, south and east with connectivity to Opossum Creek corridor to the north. This corridor has been designated for open space under the Greater Springfield Structure Plan (refer Plan 1). The site reflects a small disturbed area in the broader landscape of this open space which is separated from Opossum Creek by the existing greens of Brookwater Golf Course. Ecological values associated with Opossum Creek are considered to provide optimal habitat for the species over the referral site as it forms a wildlife corridor for fauna movement within the broader landscape. While the referral site adjoins this area, it reflects a disturbed and fragmented patch on the edge of this corridor. Clearing of this patch will not result in further fragmentation of the corridor or further barriers to dispersal.</p> <p>No significant residual impacts are identified.</p>
Hydrological change	Potential	<p>All activities will be subject to management plans which minimise changes to hydrological regimes on the site. Regulated Vegetation Management Mapping shows mapped waterways encompassing the referral site, over the existing golf course. Field survey confirmed that these drainage lines have been modified as a result of surrounding development and no natural watercourse extend over the referral site. While the development will result in an increase in impervious surfaces, detailed hydrological modelling, Bulk Earthworks Plans, Stormwater Management Plans and Erosion and Sediment Control Plans will be prepared to manage and mitigate impacts associated with run-off from the development to maintain water quality in accordance with as State and Local water quality objectives and standards. Potential changes to hydrology are extremely unlikely to result in the degradation of critical habitat external to the referral area.</p>

		No significant residual impacts are identified.
Fire	Unlikely	<p>The project will be undertaken in accordance with an approved Bushfire Management Plan. This will increase the management and mitigation of bushfire risks in the area.</p> <p>No significant residual impacts are identified.</p>
Spread of Disease	Unlikely	<p>One of the primary threats to Koalas is the spread of disease, which makes up a significant proportion of overall mortality in Koalas. Most of South East Queensland's Koala populations already have a high prevalence of <i>Chlamydia</i> and Koala Retrovirus. The symptoms of these diseases are often observed within Koala populations undergoing environmental stresses such as overcrowding and poor nutrition. The project is unlikely to cause pressure on the local Koala population to the point where these diseases manifest and the project is extremely unlikely to introduce or spread disease or pathogens into Koala habitat areas.</p> <p>No significant residual impacts are identified.</p>

Nature and extent of likely impact

Grey Headed Flying Fox

The nature of impacts on the Grey-Headed Flying-Fox is restricted to the loss of potential or marginal foraging habitat throughout the site. This is unlikely to have a notable impact given the extensive availability of habitat throughout South East Queensland. No roost camps or individuals were recorded and thus it is unlikely that the proposed action will cause the displacement of individuals. An assessment against the Grey-headed Flying-fox significant impact criteria is included in **Table 3**.

Koala

Ecologists from **SHG** undertook field assessments across the site during September 2015 to determine the level of Koala usage and assesses vegetation composition to determine the value of the site in terms of providing Koala habitat. One (1) individual was identified during the first day of field survey, as well as a number of scats in several locations. Ten (10) SAT surveys were conducted across the site. Of the 300 trees searched, scats were recorded at the base of 32 trees, which equates to 10.6% and correlates to an overall "medium/normal" usage of the site by Koalas. Of the ten (10) SAT surveys, four (4) recorded "high" usage, four (4) recorded "low" usage and two (2) recorded "normal" usage.

Overall, the site was dominated by species that achieve the definition of 'woodland' as referenced in the Koala Referral Guidelines. Ecological survey of the site identified canopy species within the referral area are dominated by Eucalyptus and Corymbia species including *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark), *Eucalyptus siderophloia* (Grey Ironbark), *Corymbia citriodora* (Spotted Gum), *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash). Infestations of weeds were noted particularly around disturbed edges and along access tracks, predominantly to the west of the site where clearing of Brookwater Drive has commenced to the west. Survey noted several dominant weed species including, *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton).

The Habitat Assessment Tool derived a score of 5, which is at the lowest end of the critical habitat threshold (≥ 5) under the Koala Referral Guidelines. Impacts to MNES from the proposed action have been identified as:

- Removal of 40 hectares of critical habitat for the survival of the Koala as a result of direct clearing;
- Potential injury or mortality caused by vegetation clearing and construction; and
- Increased vehicle use and dog ownership, which pose a threat to Koalas.

As discussed above, a number of factors diminish the adversity of these potential impacts. These are summarised as:

- The site is moderately disturbed as a result of historical land use and surrounded development, and reflects only a very a small disturbed area in the broader landscape of retained vegetation to the north and its associated ecological values and function.
- The proposal does not result in the fragmentation of other vegetation areas, as it reflects a disturbed pocket which extends from areas of higher ecological values associated with Opossum Creek corridor which is designated as open space and retains preferable habitat for the species.
- Should the action not proceed, the site will be surrounded by development which will evidently increase threats to the species including roads and domestic pets.
- Normal levels of Koala usage was recorded overall across the site. One (1) individual was observed within the central portion of the site, on day one of the two day survey.

- No residual impacts on the Koala were identified. As such, the project will not substantially interfere with the recovery of the Koala. In the context of surrounding development, the project will have only a minor contribution to the overall vehicle use and dog ownership in the local area.
- As the site is surrounded by existing and proposed development to the east, south and west and is encompassed by the existing Brookwater Golf Course, the referral area is predominately modified and subject to edge effects. Retention of any areas of vegetation on site are not considered to achieve the interim recovery objectives for coastal areas.
- All clearing will be undertaken in accordance with the site specific Fauna Management Plan. This includes the engagement of a Fauna Spotter Catcher who will undertake pre-clearance surveys, attend pre-start meetings and be present during all clearing activities. The purpose of using a Fauna Spotter is to ensure no clearing occurs where Koalas or other fauna species are in trees and to identify any potential habitat features that require checking before clearing occurs.
- Clearing impacts will be offset by within Springfield Conservation Land. This land will be legally secured for conservation and include weed management and rehabilitation (refer **Section 5.2** for further detail).
- The First Nine Residential Development is to be developed by the principal land owner at Greater Springfield, **Springfield Land Corporation** (SLC). As part of extensive negotiations and assessment for a recently determined EPBC Act referral in the broader area (EPBC 2013/7057) as completed by **Lendlease Communities**, the dedication of 396ha of land by **SLC** to **ICC** for Conservation purposes was acknowledged by the **DoE** as an advanced offset. Approximately 70% of this advanced offset was provided by **SLC** to **Lendlease Communities** to satisfy offset requirements for the Spring Mountain Project. **SLC** intent to utilise a balance portion of this offset land as compensation/mitigation for impacts associated with the First Nine Residential Development. A separate [First Nine Offset Proposal](#) is attached to this referral as **Attachment C**, which outlines utilisation of this offset land.

Overall, due to proposed fauna management controls and offsets, the proposed action is unlikely to have a significant impact on Matters of National Environmental Significance (MNES).

3.1 (e) Listed migratory species

Description

Response 3.1(e)

The EPBC Act Protected Matters Search Tool identified a number of migratory species as having potential to occur. **Table 8** provides a description of the habitat requirements of each of these species and assess their likelihood of occurrence. Refer to **Attachment A** for a copy of the EPBC PMST search results.

Table 9: Likelihood of Occurrence Schedule (Migratory Species)

Migratory Marine Birds						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Apus pacificus</i>	Fork-tailed Swift	Migratory	678	This species is almost exclusively aerial and mostly occur over inland palins but sometimes above foothills or in coastal areas.	Possible as a fly over species however no impact to this species is likely to occur. Species is unlikely to occur.	Not observed
Migratory Terrestrial Species						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Hirundapus caudacutus</i>	White-throated Needletail	Migratory	682	The White-throated Needletail is almost exclusively aerial. This species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests.	Low potential to occur on site within roosting periods. Species is unlikely to occur.	Not observed
<i>Merops ornatus</i>	Rainbow Bee-eater	Migratory	670	The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Habitat available on site and species recorded throughout field survey. Species known to occur.	Observed

<i>Monarcha melanopsis</i>	Black-faced Monarch	Migratory	609	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Monarcha trivirgatus</i>	Spectacled Monarch	Migratory	610	The Spectacled Monarchs natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Migratory	612	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Rhipidura rufifrons</i>	Rufous Fantail	Migratory	592	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as <i>Eucalyptus microcorys</i> , <i>Eucalyptus pilularis</i> , <i>Eucalyptus resinifera</i> and a number of other Eucalyptus species.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed

Migratory Wetland Species

Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Ardea alba</i>	Great Egret	Migratory	59541	The Great Egret has been recorded in a wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Ardea ibis</i>	Cattle Egret	Migratory	59542	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands and is commonly found in cattle fields and other farm areas that contain livestock.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Gallinago hardwickii</i>	Latham's Snipe	Migratory	863	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed

<i>Pandion haliaetus</i>	Osprey	Migratory	952	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
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A search using the EPBC Act Protected Matters Search Tool with a 2 kilometre radius identified eleven (11) migratory species as having potential to occur on site (refer **Table 8**). Field surveys of the site in 2015 observed only one (1), *Merops ornatus* (Rainbow Bee-eater), of the eleven (11) listed migratory species on site. Rainbow Bee-eater has a wide distribution across most of Australia and eastern Indonesia. Its population has been estimated to be reasonably large and it is unlikely that there are genetically distinct populations, given its high mobility. It occupies open forests and woodlands, shrublands and cleared and semi-cleared habitats such as farmland and urban areas. The species is common throughout most of South East Queensland and there is extensive habitat available for the species throughout the landscape. Its high mobility mitigates any potential fragmentation from other habitat or populations. It is noted that no evidence of breeding was observed on the subject site, however an individual was observed.

Nature and extent of likely impact

The proposed action is unlikely to have a significant impact on the Rainbow Bee-eater given its wide distribution, high mobility and the extensive availability of habitat throughout South East Queensland. No roosting sites were observed during field survey and the site is considered only be utilised by the species as part of a broader home range. Preferable habitat will be retained within Opossum Creek corridor, outside of the referral area, which is zoned for conservation.

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

Not applicable- the project is not located within a Commonwealth marine area.

Nature and extent of likely impact

Not applicable.

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

Not applicable- the project site is not located on Commonwealth land.

Nature and extent of likely impact

Not applicable.

3.1 (h) The Great Barrier Reef Marine Park

Description

Not applicable- the project site is not located within the Great Barrier Reef Marine Park.

Nature and extent of likely impact

Not applicable.

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

Not applicable.

Nature and extent of likely impact

Not applicable.

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area;
- will be taken on Commonwealth land; or
- will be taken in the Great Barrier Reef marine Park.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	Is the proposed action a nuclear action?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	X	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))			
3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	X	No
			Yes (provide details below)
If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))			

3.3 Other important features of the environment

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

Response 3.3(a)

Ecological surveys were completed by **Saunders Havill Group** on 28th and 29th September 2015. The survey effort is shown in **Plan 3**. A copy of the field results is contained within the First Nine Ecological Technical Memo included as **Attachment B**. The survey was carried out to address all MNES, however a focus was placed on Koalas as they are known to occur in the region and on site. The following provides a brief description of flora and fauna values found on site.

Flora

Queensland's Regulated Vegetation Management Map shows the site contains areas of Category X (non-remnant) vegetation and Category B remnant vegetation containing composite Of Concern Regional Ecosystems RE12.9-10.2/12.9-10.7/12.9-10.19 (65/20/15) (refer **Figure 5**). The following provides a description of each of these regional ecosystems.

- RE12.9-10.2 (Least Concern)
 - *Corymbia citriodora* subsp. *variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).
- RE12.9-10.7 (Of Concern)
 - *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c) Vegetation communities in this regional ecosystem include: 12.9-10.7a *Eucalyptus siderophloia*, *Corymbia intermedia* +/- *E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas. (BVG1M: 12a).
 - RE12.9-10.7 is an essential habitat factor for Koala.
- RE12.9-10.19 (Least Concern)
 - *Eucalyptus fibrosa* subsp. *fibrosa* woodland +/- *Corymbia citriodora* subsp. *variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major*. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a). Vegetation communities in this regional ecosystem include: 12.9-10.19a: *Corymbia henryi* +/- *Eucalyptus fibrosa*

subsp. fibrosa, *Corymbia citriodora subsp. variegata*, *E. siderophloia*, *E. crebra* open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

Under Queensland's State Planning Policy (SPP), the site has been identified as containing the following Matters of State Environmental Significance:

- Wildlife Habitat (Koala)
- Regulated Vegetation
- Regulated Vegetation intersecting a watercourse

The following general flora observations were made by field survey across the referral area:

- Ten (10) listed threatened flora species under the EPBC Act and two (2) listed Threatened Ecological Communities (TEC) described as *Lowland Rainforest of Subtropical Australia* and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* were considered to have potential to occur on site. None of these protected matters were recorded on or in the immediate vicinity of the site.
- Eight (8) listed threatened plants protected under the *Nature Conservation Act 1992* (Qld) (NCA) were considered to have potential to occur across the site. No specimens were recorded at the time of the assessment.
- Fifty (50) flora species were identified on site during field assessment, of which five (5) of these species are introduced. One (1) Class 2 declared species, *Opuntia stricta* (Prickly Pear) and four (4) Class 3 declared species, *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Cinnamomum camphora* (Camphor Laurel) and *Celtis sinensis* (Chinese Elm) under the *Land Protection (Pest and Stock Route Management) Act 2002* were identified within the referral area. One (1) Local High Priority Species, *Passiflora suberosa* (Corky Passion Vine), listed by **Ipswich City Council** was also found on site (refer **Table 9** for flora species list).
- The majority of the site is mapped as remnant vegetation (refer **Figure 5**) consisting of composite Of Concern RE 12.9-10.2/12.9-10.7/12.9-10.19. Survey confirmed areas mapped as remnant were consistent with on-ground regional ecosystems. Areas not identified as remnant occur in the west over the western extent of Brookwater Drive. Survey confirmed a number of access tracks, including the full extent of Brookwater Drive, are currently mapped as remnant but do not contain vegetation with height and spread requirements to meet the remnant definition.

Table 9: Flora Species List

Species Name	Common Name
<i>Acacia amblygona</i>	Fan Wattle
<i>Acacia concurrens</i>	Black Wattle
<i>Acacia disparrima</i>	Hickory Wattle
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Acacia podalyriifolia</i>	Silver Wattle
<i>Allocasuarina littoralis</i>	Black She-oak
<i>Alphitonia excelsa</i>	Soap Tree

<i>Angophora leiocarpa</i>	Smooth-barked Apple
<i>Aristida</i> sp.	
<i>Celtis sinensis</i>	Chinese Elm
<i>Cinnamomum camphora</i>	Camphor Laurel
<i>Corymbia citriodora</i>	Spotted Gum
<i>Corymbia intermedia</i>	Pink Bloodwood
<i>Corymbia tessellaris</i>	Moreton Bay Ash
<i>Cymbopogon refractus</i>	Barbed Wire Grass
<i>Dianella longifolia</i>	
<i>Dodonea viscosa</i>	Hop Bush
<i>Eragrostis</i> sp.	
<i>Eremophila debilis</i>	Winter Apple
<i>Eucalyptus cloeziana</i>	Gympie Messmate
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark
<i>Eucalyptus major</i>	Queensland Grey Gum
<i>Eucalyptus microcorys</i>	Tallowwood
<i>Eucalyptus moluccana</i>	Gum-topped Box
<i>Eucalyptus resinifera</i>	Red Stringybark
<i>Eucalyptus seeana</i>	Fine-leaved Red Gum
<i>Eucalyptus siderophloia</i>	Grey Ironbark
<i>Eucalyptus tereticornis</i>	Blue Gum
<i>Gahnia aspera</i>	Saw Sedge
<i>Goodenia glabra</i>	Smooth Goodenia
<i>Imperata cylindrica</i>	Blady Grass
<i>Jacksonia scoparia</i>	Dogwood
<i>Lantana camara</i>	Lantana
<i>Lantana montenvidensis</i>	Creeping Lantana
<i>Leucopogon juniperinus</i>	Prickly Heath
<i>Lomandra longifolia</i>	Mat Rush
<i>Lomandra multiflora</i>	Many-flowered Mat Rush
<i>Lophostemon confertus</i>	Brush Box
<i>Lophostemon suaveolens</i>	Swamp Box
<i>Opuntia stricta</i>	Prickly Pear

<i>Parsonsia straminea</i>	Monkey Rope Vine
<i>Passiflora suberosa</i>	Corky Passion Vine
<i>Pennisetum purpureum</i>	Elephant Grass
<i>Petalostigma pubescens</i>	Quinine Berry
<i>Poa labillardieri</i>	Tussock Grass
<i>Smilax australis</i>	Barbed-wire Vine
<i>Themeda triandra</i>	Kangaroo Grass
<i>Xanthorrhoea latifolia</i>	Grass Tree

Overall, the site can be divided into two separate zones, based on vegetation attributes and ecological value (shown in **Plan 5**). These include:

Zone 1: Eucalyptus Woodland

- Zone 1 contained a high density of *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark) and *Eucalyptus siderophloia* (Grey Ironbark), however *Corymbia citriodora* (Spotted Gum) was also found in notable proportions. Sub-dominant species included *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash).
- Vegetation within this zone was mostly undisturbed, with only minor disturbance from fire and track construction observed.
- Overall, this zone contained habitat suitable for the Koala and was relatively undisturbed.



Photos: Zone 1: Eucalyptus Woodland



Photos: Zone 1: Rocky outcrops

Zone 2: Disturbed Areas (Non-remnant)

- Zone 2 reflects non-remnant areas (both mapped and not mapped) which have been previously cleared.
- It is noted that a small portion of land within the western extent of Brookwater Drive has been previously cleared which is mapped as non-remnant.
- In addition, a number of access tracks were noted to have been previously cleared and heavily infested weeds.

- Weeds found within this zone included *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton)
- Consists of areas previously cleared containing existing infrastructure.



Photos: Zone 2: Access tracks



Photos: Zone 2: Disturbed Areas

Fauna

A fauna assessment was conducted by **SHG** in September 2015 in conjunction with the vegetation assessment over the application site. The purpose of the survey was to identify habitat opportunities, observations of species presence and activity, and undertake targeted searches for actual usage by threatened and significant fauna species. A summary of fauna observations is provided below:

- Twenty (20) threatened fauna species listed under the EPBC Act are considered to have potential to occur within the vicinity of the application site. None of these protected matters were observed on or in the vicinity of the site, with the exception of one (1) Koala sighted, on day one of the two day survey period, within the central portion of the site.
- Fourteen (14) threatened fauna species listed under the NCA were considered to have the potential to occur across the site. Again, none of these protected matters were observed on or in the vicinity of the site, with the exception of the observation of one (1) Koala.
- The site's ability to support listed threatened fauna species which are generally highly sensitive, specialised and require particular habitat features is highly unlikely for the majority of the listed EPBC Act or NCA flora species (refer to **Table 2**).
- One (1) migratory species, *Merops ornatus* (Rainbow Bee-eater) was observed on site and is considered to utilise the site as part of a broader home range. No breeding places for the species was observed within the referral area. No other listed migratory species are considered to frequently visit the site (refer **Table 8**).
- The site contains suitable habitat for a variety of mammals, reptiles, amphibians and birds. The majority of fauna observed on site were made up of avi-fauna common to the local area. These species included the Galah, Torresian Crow, Pheasant Coucal, Kookooburra, Noisy Minor, Rainbow Bee-eater, Crested Pigeon, Tawny Frogmouth, Grey Fantail and Willie Wagtail. Other species observed on site included dogs, Beeping Froglet and Blue Tongued Skink. Refer to **Table 10** for observed fauna species list.
- A few small rocky areas were observed within the subject site however contained limited habitat value due to the absence of suitable overhangs, crevices and hollows.
- Extensive areas of eucalypt woodland are available for typical dry sclerophyll species (particularly avi-fauna and Koalas).



Photos: Koala observed on site and rocky outcrops

- Koala surveys were carried out during field assessment, specifically SAT which is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. Ten (10) SATs were carried out over the site in locations shown in **Plan 3**. Evidence of Koala usage was noted in all ten (10) SATs, with four (4) recording evidence consistent with 'high' usage, four (4) consistent with 'low' usage and two (2) consistent with 'normal' usage. Areas of 'high' usage are contained to the northern and southern extents of the referral area outside disturbed areas (Zone 2).

Table 10: Observed Fauna Species List

Scientific Name	Common Name
<i>Alectura lathami</i>	Australian Brush-Turkey
<i>Anas superciliosa</i>	Pacific Black Duck
<i>Bufo marinus</i>	Cane Toad
<i>Cacatua roseicapilla</i>	Galah
<i>Canis familiaris</i>	Dog
<i>Centropus phasianinus</i>	Pheasant Coucal
<i>Corvus orru</i>	Torresian Crow
<i>Cracticus nigrogularis</i>	Pied Butcherbird
<i>Cracticus torquatus</i>	Grey Butcherbird
<i>Crinia parinsignifera</i>	Beeping Froglet
<i>Cryptoblepharus virgatus</i>	Wall Skink
<i>Dacelo novaeguineae</i>	Laughing Kookooburra
<i>Diporiphora australis</i>	Tommy Round-head
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater
<i>Grallina cyanoleuca</i>	Magpie-lark
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Hemidactylus frenatus</i>	Asian House Gecko
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Lampropholis delicata</i>	Grass Skink
<i>Lichmera indistincta</i>	Brown Honeyeater
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Malurus cyaneus</i>	Superb Fairywren
<i>Manorina melanocephala</i>	Noisy Minor
<i>Merops ornatus</i>	Rainbow Bee-eater
<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Phascolarctos cinereus</i>	Koala
<i>Philemon corniculatus</i>	Noisy Fiabird
<i>Physignathus lesueurii</i>	Eastern Water Dragon
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Podargus strigoides</i>	Tawny Frogmouth
<i>Pogona barbata</i>	Common Bearded Dragon

<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum
<i>Psophodes olivaceus</i>	Eastern Whipbird
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Specothes viridis</i>	Figbird
<i>Tiliqua scincoides</i>	Blue-tongued Skink
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet
<i>Trichosurus vulpecula</i>	Common Brushtail Possum
<i>Wallabia bicolor</i>	Swamp Wallaby
<i>Vanellus miles</i>	Masked Lapwing
<i>Varanus varius</i>	Lace Monitor

3.3 (b) Hydrology, including water flows

Response 3.3(b)

Three mapped low order (Stream Order 1) tributaries envelope the site (outside the referral extent) within the existing golf greens (refer **Figure 3**). These drainage features are not identified by Fisheries mapping (refer **Figure 4**). Field survey confirmed that these mapped watercourses reflect disturbed drainage lines which have been highly modified as a result of the encompassing Brookwater Golf Course. Unmapped overland flow paths (refer Photos below) drain from the centre of the site towards the Golf Course before ultimately draining into Opossum Creek. These features reflect incised gullies with no riparian vegetation or aquatic value.

Opossum Creek, approximately 50m to the north, is separated from the site by the existing Brookwater Golf Course. Opossum Creek is identified as a Stream Order 4 watercourse (refer **Figure 3**) and high risk (red) waterway by Fisheries (refer **Figure 4**). While outside the referral extent and not part of this assessment, the portion of Opossum Creek adjoining the site was noted by survey to contain relatively in-tact riparian vegetation consistent with mapped Of Concern regional ecosystems. This creek corridor is identified to be retained as open space within the Springfield Structure Plan to retain biodiversity values and maintain connectivity within the broader landscape.



Photos: Gullies within First Nine site

3.3 (c) Soil and Vegetation characteristics

Response 3.3(c)

Regional Ecosystem mapping identifies the site within Land Zones 9 and 10, which are described as:

Land Zone 9

Short description: fine grained sedimentary rocks

General term: undulating country on fine grained sedimentary rocks



Fine grained sedimentary rocks, generally with little or no deformation and usually forming undulating landscapes. Siltstones, mudstones, shales, calcareous sediments, and labile sandstones are typical rock types although minor interbedded volcanics may occur. Includes a diverse range of fine textured soils of moderate to high fertility, predominantly Vertosols, Sodosols, and Chromosols.

Land Zone 10

Short description: coarse grained sedimentary rocks

General term: sandstone ranges



Medium to coarse grained sedimentary rocks, with little or no deformation, forming plateaus, benches and scarps. Includes siliceous (quartzose) sandstones, conglomerates and minor interbedded volcanics, and springs associated with these rocks. Excludes overlying Cainozoic sand deposits (land zone 5). Soils are predominantly shallow Rudosols and Tenosols of low fertility, but include sandy surfaced Kandosols, Kurosols, Sodosols and Chromosols.

Extract: Land Zone definitions, Source: Queensland Government

Soil

Information on the site's soil properties has been obtained from the Australian Soil Resource Information System (ASRIS). Level 4 soil order mapping exists for the region and defines the application area as containing Dermosols (refer **Figure 7**).

Dermosols are moderately deep and well-drained soils, occurring in the mountainous high rainfall zones of southeastern Australia. They may be strongly acidic in the high rainfall areas or highly alkaline if they contain calcium carbonate. Dermosols support a wide range of land uses including cattle and sheep grazing of native pastures, forestry and sugar cane. Cereal crops, especially wheat, are commonly grown on the more fertile Dermosols.

3.3 (d) Outstanding natural features

Response 3.3(d)

No outstanding natural features were observed across the site. While the site remains vegetated with predominately native species, disturbance to the ground layer and surrounding influenced of golf and development result in an open modified balance development site.

3.3 (e) Remnant native vegetation

Response 3.3(e)

Queensland's Regulated Vegetation Management Map shows the site contains areas of Category X (non-remnant) vegetation and Category B remnant vegetation containing composite Of Concern Regional Ecosystems RE12.9-10.2/12.9-10.7/12.9-10.19 (65/20/15) (refer **Figure 5**).

- RE12.9-10.2 (Least Concern)
 - *Corymbia citriodora* subsp. *variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

- RE12.9-10.7 (Of Concern)
 - *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c) Vegetation communities in this regional ecosystem include: 12.9-10.7a *Eucalyptus siderophloia*, *Corymbia intermedia* +/- *E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas. (BVG1M: 12a).
 - RE12.9-10.7 is an essential habitat factor for Koala.

- RE12.9-10.19 (Least Concern)
 - *Eucalyptus fibrosa* subsp. *fibrosa* woodland +/- *Corymbia citriodora* subsp. *variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major*. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a). Vegetation communities in this regional ecosystem include: 12.9-10.19a: *Corymbia henryi* +/- *Eucalyptus fibrosa* subsp. *fibrosa*, *Corymbia citriodora* subsp. *variegata*, *E. siderophloia*, *E. crebra* open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

Response 3.3(f)

The site reflects a low hill, with ridgelines extending northeast to southwest through the centre of the site. Contours range from 80m along the ridgeline to 30m at the lowest point to the north (refer **Figure 7**).

3.3 (g) Current state of the environment

Response 3.3(g)

The site contains a generally consistent cover of vegetation, however as noted above a number of disturbances from edge effects, weed invasion, creation of access tracks and increases in domestic and feral animals from surrounding development have left the site heavily disturbed. Further, the site is devoid of notable ecological features such as waterways. While connectivity to Opossum Creek conservation corridor remains to the north, disturbance from the encompassing Brookwater Golf Course has resulted in edge effects surrounding this vegetated pocket has resulted in heavy infestations of weeds, particularly along access tracks (refer **Response 3.3a** for further detail).

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

Response 3.3(h)

There have been no Commonwealth Heritage Places or other heritage places identified across the site.

3.3 (i) Indigenous heritage values

Response 3.3(i)

An indigenous artefact was identified within the site and will be retained within parkland by the development (refer **Figure 3**).

3.3 (j) Other important or unique values of the environment

Response 3.3(j)

The site is not located near other notable environmental features that are likely to be affected by the proposed action.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

Response 3.3(k)

The site is freehold land.

3.3 (l) Existing land/marine uses of area

Response 3.3(l)

The site is currently vacant land. Surrounding land uses range from residential, commercial, retail, educational transport (rail and bus) and roads.

3.3 (m) Any proposed land/marine uses of area

Response 3.3(m)

Proposed land uses include residential housing, retail and open space.

4 Environmental outcomes

Provide descriptions of the proposed environmental outcomes that will be achieved for matters of national environmental significance as a result of the proposed action. Include details of the baseline data upon which the outcomes are based, and the confidence about the likely achievement of the proposed outcomes. Where outcomes cannot be identified or committed to, provide explanatory details including any commitments to identify outcomes through an assessment process.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the draft *Outcomes-based Conditions Policy 2015* and *Outcomes-based Conditions Guidance 2015* (<http://www.environment.gov.au/epbc/consultation/policy-guidance-outcomes-based-conditions>), including about environmental outcomes to be achieved, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included.

General commitments to achieving environmental outcomes, particularly relating to beneficial impacts of the proposed action, CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, and conditions of approval, if your proposal proceeds to these stages).

Response 4

The development of First Nine will result in the removal of 40ha of habitat considered critical to the survival of the species. As highlighted throughout this referral document, this vegetation is encompassed by the Brookwater Golf Course and surrounded by existing development including Brookwater Community, Augustine Heights and future Town Centre land. Further, the referral site is ultimately fragmented from connectivity to areas of vegetation to the south by Centenary Highway. While evidence of Koala activity (i.e. an individual sighted on day 1 of the 2 day survey period, scats etc.) was recorded on the site, the proposal site remains a disturbed pocket surrounded by urban development which is not large enough to support a local Koala population and does not provide further connectivity than that retained through the Opossum Creek Corridor.

While outside the referral area, connectivity along Opossum Creek will be retained by the Springfield Structure Plan which states:

"To ensure that urban and edge effects are reduced, a minimum of 40 metres either side of the centreline line of the creek and drainage systems will define creekline vegetation areas. In some areas this minimum dimensions will need to be increased to protect appropriate habitat environment or site and areas of significant cultural heritage."

To ensure environmental outcomes are achieved on site, a number of site specific environmental management mitigation measures will be adopted as part of the First Nine development which including (refer to **Response 5** for further detail):

- Vegetation Clearing and Management Plan
- Fauna Management Plan
- Stormwater Management Plan
- Erosion and Sediment Control Plans

While the proposed action is not considered by this assessment to be a Controlled Action and thus is not a candidate for outcomes based conditions, to compensate the loss of critical habitat for the Koala, a portion of the 396ha of Conservation Land to the south previously dedicated by **Springfield Land Corporation (SLC)** to **Ipswich City Council (ICC)** (refer **Plan 5**). Detailed discussions have been held with the **Department of Environment** in regards to this land which has been identified as "Advanced Offset" under the *EPBC Act Environmental Offsets Policy*. This land will be secured via a legally binding mechanism in Queensland (i.e. Voluntary Declaration) and will be rehabilitated to remnant status through targeted weed removal and natural and assisted regeneration (refer **Plan**

6). Further, rehabilitation of the Conservation Land, which forms part of the Flinders Karawatha, will provide enhancement of an area that contributes to regional biodiversity significance for Koala.

5 Measures to avoid or reduce impacts

Note: If you have identified alternatives in relation to location, time frames or activities for the proposed action at Section 2.3 you will need to complete this section in relation to each of the alternatives identified.

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the time frame or workplan for the measure.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

Provide information about the level of commitment by the person proposing to take the action to implement the proposed mitigation measures. For example, if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner), you should state that, that is the case.

Note, the Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, if your proposal proceeds to these stages).

Response 5

Impacts to MNES as a result of the proposed action will be limited to impacts on the Koala. No other MNES are identified as likely to be impacted by the project. A number of measures to avoid and mitigate impacts caused by the removal of vegetation are incorporated into existing approval conditions, which are summarised below.

1. Vegetation Clearing and Management Plan

An approved Vegetation Clearing and Management Plan (VC&MP) must be implemented during Operational Works, which includes details on:

- Locations of protected vegetation, vegetation to be retained and vegetation to be removed
- Details on vegetation types
- Location of significant vegetation (remnant vegetation, city wide significant species etc.)
- Particulars on how vegetation is proposed to be cleared (clearing sequence plan)
- Methods for protecting or relocating plants
- Disposal methods

2. Fauna Management Plan

All works must be undertaken in accordance with the approved Fauna Management Plan. This includes details on:

- Species surveyed as using the site
- A plan showing existing habitat areas

- Details of threats to existing fauna
- Clearing sequence plan
- Management and mitigation measures- e.g. temporary fauna exclusion fencing
- Fauna spotter role, contacts and certification:
 - Pre-clearance surveys
 - Attendance at pre-start meeting
 - Attendance throughout vegetation clearing period
 - Continued monitoring and reporting
- Specific fauna management procedures for potential or known habitat trees

The primary purpose of engaging a Fauna Spotter Catcher during all stages of clearing is to ensure that no injury or death comes to Koalas during vegetation clearing.

3. Stormwater Management Plan

All works must be carried out and completed in accordance with the approved Stormwater Management Plan. This provides details on:

- Stormwater quality improvement devices
- Mechanisms for monitoring and reporting

The implementation of the Stormwater Management Plan will ensure that water quality standards set by State and Local governments are achieved.

4. Erosion and Sediment Control Plan

Operational works applications must be accompanied by an Erosion and Sediment Control Plan and must contain details on:

- Catchment boundary and overland flow path
- Estimated soil loss from each catchment
- Length, width and depth of each sediment basin
- Spillway details and levels
- Energy dissipation/ scour protection
- High flow bypass
- Cross section, capacity and spacing of each catch/ diversion drain
- Location and spacing of silt fences
- Frequency and location of water quality monitoring
- Maintenance requirements and frequency
- Maintenance access and
- Contingency measures in case of failure to achieve water quality objectives.

5. Environmental Offsets

The First Nine Residential Development is to be developed by the principal land owner at Greater Springfield, **Springfield Land Corporation** (SLC). As part of extensive negotiations and assessment for a recently determined EPBC Act referral in the broader area (EPBC 2013/7057) as completed by **Lendlease Communities**, the dedication of 396ha of land by **SLC** to **ICC** for Conservation purposes was acknowledged by the **DoE** as an advanced offset. Approximately 70% of this advanced offset was provided by **SLC** to **Lendlease Communities** to satisfy offset requirements for the Spring Mountain Project. **SLC** intent to utilise a balance portion of this offset land as compensation/mitigation for impacts associated with the First Nine Residential Development. A separate [First Nine Offset Proposal](#) is attached to this referral as **Attachment C**, which outlines utilisation of this offset land.

Summary

Each of these management measures are specifically designed to avoid and reduce impacts on the natural environment as a result of the development. In particular, the use of a fauna-spotter catcher during clearing and construction phases will ensure that impacts to Koalas, if present, are avoided.

6 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

6.1 Do you THINK your proposed action is a controlled action?

- | | |
|-------------------------------------|---------------------------|
| <input checked="" type="checkbox"/> | No, complete section 5.2 |
| <input type="checkbox"/> | Yes, complete section 5.3 |

6.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

Response 6.2

The proposed action being the development of First Nine Residential Development is not considered to be a controlled action as the project has not been identified as having a significant impact on Matters of National Environmental Significance (MNES).

Strategically, the First Nine residential referral area occurs as part of a small remaining cul-de-sac of vegetation hemmed in by major roads, a rail line, expanding development and the Greater Springfield Town Centre. Prior development decisions for surrounding infrastructure and development have not incorporated any strategic of even local fauna connectivity with surrounding threats not supported by fauna sensitive infrastructure (i.e. exclusion fencing, road crossing solutions). Locally, the entire project is encompassed by the privately owned and operated Brookwater Golf Course. This use is not an impenetrable barrier for movement, however does disconnect existing site trees with regularly maintained and utilised turf areas. The Golf Course also provides a non-vegetated edge to the referral area for access by predators and other disturbances.

Desktop and field surveys have ruled out the occurrence of most listed MNES, with potential impacts limited to the clearing of potential habitat for the Koala (*Phascolarctos cinereus*) which is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999*. As such, field surveys placed focus on identifying the level of usage of the site by Koalas and to identify areas of critical habitat. **Section 3.1(d) – Listed Threatened Species and Ecological Communities** of this form provided a detailed assessment against the provisions of the *EPBC Act Referral Guidelines for the Vulnerable Koala* (January 2015) which showed that while evidence of Koala use was found on site, the construction of First Nine is not likely to have a significant impact on Koala because of the following:

- The SAT assessment results indicated results for 'high', 'normal' and 'low' usage by Koala over the site, with overall usage considered to be 'normal'.
- Approximately 40 hectares of vegetation of varying quality will be removed. This is made up of 38.9 hectares of remnant vegetation and 0.1 hectares of non-remnant vegetation.
- The site was assessed as having a habitat score of 5 using the Koala Habitat Assessment Tool which is at the lower end of the spectrum (≥ 5) for critical habitat as defined by the Koala Referral Guidelines. These results were derived from the existence of Koala food trees, evidence of Koala usage in the last two years and proximity to Opossum Creek which provides connectivity for the species. The habitat assessment derived a 0 for key existing threats and 0 for recovery value as the site is broadly surrounded by existing urban development and encompassed by Brookwater Golf Course. The expansion of surrounding development in accordance with existing approvals is expected to result in further encroachment and edge effects fragmenting the site from habitat areas which currently exist along Opossum Creek.

- The site is modified as a result of historical land use and surrounded development, and reflects only a very a small disturbed area in the broader landscape of retained vegetation to the north and its associated ecological values and function.
- The proposal does not result in the fragmentation of other vegetation areas, as it reflects a disturbed pocket which extends from areas of higher ecological values associated with Opossum Creek corridor which is identified preferable habitat for the species and will be retained as open space.
- Should the action not proceed, the site will be surrounded by development which will evidently increase threats to the species including roads and domestic pets.
- No residual impacts on the Koala were identified. As such, the project will not substantially interfere with the recovery of the Koala. In the context of surrounding development, the project will have only a minor contribution to the overall vehicle use and dog ownership in the local area.
- As the site is surrounded by existing and proposed development to the east, south and west and is encompassed by the existing Brookwater Golf Course, the referral area is highly disturbed as a result of edge effects from surrounding vegetation. While the vegetated site adjoins Opossum Creek corridor to the north, the site itself reflects a highly disturbed patch which contains no significant ecological features or planned conservation areas. As such, retention of vegetation on site would not achieve the interim recovery objectives for coastal areas.
- All clearing will be undertaken in accordance with a Fauna Management Plan as approved by Council. This includes the engagement of a Fauna Spotter Catcher who will undertake pre-clearance surveys, attend pre-start meetings and be present during all clearing activities. The purpose of using a Fauna Spotter is to ensure no clearing occurs where Koalas or other fauna species are in trees and to identify any potential habitat features that require checking before clearing occurs.

Springfield Conservation Land

As per the attached Offset Proposal (refer **Attachment C**) and specified throughout sections of this referral, clearing of 40 ha of critical habitat with a value of 5 will be offset within the 396ha of Conservation Land to the south previously dedicated by **Springfield Land Corporation** (SLC) to **Ipswich City Council** (ICC) to cater for environment impacts associated with development in the Springfield Structure Plan Area. Detailed discussions have been held with the **Department of Environment** in regards to this land which has been identified as "Advanced Offset" under the *EPBC Act Environmental Offsets Policy*.

As this project is not recommended as a Controlled Action, the offset is provided as a compensatory measure. In support of the impacts created through this project, **50.25 hectares** within the Conservation Land will be legally secured via voluntary declaration and enhanced through weed management and assistant regeneration.

6.3 Proposed action IS a controlled action

Type 'X' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

Matters likely to be impacted

<input type="checkbox"/>	World Heritage values (sections 12 and 15A)
<input type="checkbox"/>	National Heritage places (sections 15B and 15C)
<input type="checkbox"/>	Wetlands of international importance (sections 16 and 17B)
<input type="checkbox"/>	Listed threatened species and communities (sections 18 and 18A)
<input type="checkbox"/>	Listed migratory species (sections 20 and 20A)
<input type="checkbox"/>	Protection of the environment from nuclear actions (sections 21 and 22A)

	Commonwealth marine environment (sections 23 and 24A)
	Great Barrier Reef Marine Park (sections 24B and 24C)
	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

7 Environmental record of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

	Yes	No
<p>7.1 Does the party taking the action have a satisfactory record of responsible environmental management? Springfield Land Corporation (SLC) as the master developer of the Greater Springfield Project has an excellent record of environmental management and sustainability recognised at a local, state, national and international levels.</p> <p>Provide details SLC has worked closely with partners, stakeholders and community as well as local and state authorities to ensure a variety of environmental management and sustainability outcomes are delivered through the Greater Springfield Project. The unique scale and timeframe associated with the propagation of the Greater Springfield Project has afforded SLC the opportunity to establish a framework that delivers a range of initiatives at a strategic and local project level that deliver environmental management and sustainability benefits. For example, at a strategic level the Greater Springfield master plan has identified the environmental attributes of the site and included the protection of these attributes through the designation of these areas within the open space network. This has resulted in some 32% of the land holding being retained. Other environmental initiatives at a local project level include recycled water reuse and returned effluent treatment reuse systems across projects such as the Brookwater golf course and residential projects, weed and pest management programs with both Landcare and Greening Australia, undertaking HIA Green Smart programmes across a number of projects, provision of site based management plans across facets of the project such as residential development, utility facilities such as data centres, retail centres, hospitals, university all communities, generation of site based urban design outcomes (in consultation with the local authority), water recycling programmes, waterway and corridor management and builder's water recycling programmes. Additional to this, SLC through it partners undertakes community education and interaction programmes with its community to in creating a high level of social capital. SLC has won numerous state and national Urban Development Institute of Australia awards as a master planned community. These awards are recognition for the comprehensive planning and implementation of site specific outcomes in working with all constraints including the provision of environmental and sustainability initiatives. SLC as the master developer of the Greater Springfield project also won the global Prix d'Excellence awarded by the International Real Estate Federation for best master planned community</p>	X	
<p>7.2 Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>If yes, provide details</p>		X

7.3	<p>If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p> <p>If yes, provide details of environmental policy and planning framework SLC seeks to deliver outcomes through its activities and those of its partners that support its commitment to delivering sustainable environmental management outcomes consistent with its planning framework. SLC development partners such as Lendlease and Mirvac undertake development activities on SLC behalf in accordance with their Corporate environmental management policy and planning framework.</p>	X	
7.4	<p>Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?</p> <p>Provide name of proposal and EPBC reference number (if known)</p>		X

8 Information sources and attachments

(For the information provided above)

8.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

Austecology 2013, MNES Vertebrate Fauna Assessments Land at Spring Mountain, commissioned by **Lendlease Communities**.

Australian Koala Foundation, *The Spot Assessment Technique: determining the importance of Habitat Utilised by Koalas (Phascolarctos cinereus)*, available online:

<https://www.savethekoala.com/sites/default/files/docs/consERVE/The%20Spot%20Assessment%20Technique.pdf>

Australian Koala Foundation 2012, *National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat*.

Australian Soil Resource Information System, <http://www.asris.csiro.au/>

BAAM 2011, Planning Review of Springfield Wildlife Corridor for Significant Fauna Species, prepared for **Ipswich City Council**.

DERM 2010, Koala Coast Koala Population Report 2010, Department of Environment and Resource Management, Brisbane.

Dique DS, de Villiers DL and Preece HJ 2003, *Evaluation of line-transect sampling for estimating Koala abundance in the Pine Rivers Shire, south-east Queensland.* **Wildlife Research** **30**: 127-133.

Hill & Curran 2003, *Area, shape and isolation of tropical forest fragments: effects on tree species diversity and implications for conservation.* **Journal of Biogeography**, **30**: 1391-1403.

Phillips S & Callaghan J 2011, *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus.* **Australian Zoologist** **35(3)**: 774-780.

Saunders Havill Group 2016, *Ecological Assessment Report EPBC Act Referral* commissioned by **Springfield Land Corporation**.

8.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

Refer to **Section 8.1 References**.

8.3 Attachments

Indicate the documents you have attached. All attachments must be less than three megabytes (3mb) so they can be published on the Department's website. Attachments larger than three megabytes (3mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Included at the end of this referral.
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Included at the end of this referral.
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)		N/A
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		N/A
	copies of any flora and fauna investigations and surveys (section 3)	✓	Ecological Technical Memo – MNES Flora and Fauna by SHG (2016) (refer Attachment B).
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	✓	Ecological Technical Memo – MNES Flora and Fauna by SHG (2016) (refer Attachment B). EPBC Offset Proposal by SHG (2016) (refer Attachment C).
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		N/A

9 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action¹.

Project title: First Nine Residential Development

9.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act², this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action³.

1. Name and Title: Raynuha Sinnathamby – Director

2. Organisation (if applicable): Springfield Land Corporation Pty Limited
Organisation name should match entity identified in ABN/ACN search

3. EPBC Referral Number (if known):

4: ACN / ABN (if applicable): ACN: 055 714 531

5. Postal address: PO Box 4167, Springfield QLD 4300

6. Telephone: (07) 3819 9999

7. Email: r.luhrs@springfieldland.com.au

8. Name of designated proponent (if not the same person at item 1): Springfield Land Corporation Pty Limited

¹ If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Gateway (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

² If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A, EPBC Act). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.

³ If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Gateway (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

above and if applicable):
9. ACN/ABN of
designated proponent (if
not the same person
named at item 1 above):

ACN: 055 714 531

COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE

I qualify for exemption
from fees under section
520(4C)(e)(v) of the
EPBC Act because I am:

- an individual; OR
- a small business entity (within the meaning given by section 328-110 (other than subsection 328-119(4)) of the *Income Tax Assessment Act 1997*); OR
- not applicable.

If you are small business
entity you must provide
the Date/Income Year
that you became a small
business entity:

Note: You must advise the Department within 10 business days if you cease to be a small business entity. Failure to notify the Secretary of this is an offence punishable on conviction by a fine (regulation 5.23B(3) *Environment Protection and Biodiversity Conservation Regulations 2000 (Cth)*).

COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO APPLY FOR A WAIVER

I would like to apply for a
waiver of full or partial
fees under Schedule 1,
5.21A of the EPBC
Regulations. Under sub
regulation 5.21A(5), you
must include information
about the applicant (if
not you) the grounds on
which the waiver is
sought and the reasons
why it should be made:

- not applicable.

Declaration

I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.
I understand that giving false or misleading information is a serious offence.
I agree to be the proponent for this action.
I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature



Date

16 March 2016.

9.2 Person preparing the referral information (if different from 9.1)

Individual or organisation who has prepared the information contained in this referral form.

Name Murray Saunders

Title Director

Organisation Saunders Havill Group Pty Ltd

ACN / ABN (if applicable) 24 144 972 949


Postal address 9 Thompson Street, Bowen Hills, QLD 4006

Telephone (07) 3251 9415

Email murraysaunders@saundershavill.com

Declaration I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.
I understand that giving false or misleading information is a serious offence.

Signature



Date: 16/03/2016

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- Completed all required sections of the referral form?
- Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- Provided a map showing the location and approximate boundaries of the project area?
- Provided a map/plan showing the location of the action in relation to any matters of NES?
- Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at [Attachment A](#)) delineating the boundaries of the referral area?
- Provided complete contact details and signed the form?
- Provided copies of any documents referenced in the referral form?
- Ensured that all attachments are less than three megabytes (3mb)?
- Sent the referral to the Department (electronic and hard copy preferred)?

Geographic Information System (GIS) data supply guidelines

If the area is less than 5 hectares, provide the location as a point layer. If the area greater than 5 hectares, please provide as a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer.

GIS data needs to be provided to the Department in the following manner:

- Point, Line or Polygon data types: ESRI file geodatabase feature class (preferred) or as an ESRI shapefile (.shp) zipped and attached with appropriate title
- Raster data types: Raw satellite imagery should be supplied in the vendor specific format.
- Projection as GDA94 coordinate system.

Processed products should be provided as follows:

- For data, uncompressed or lossless compressed formats is required - GeoTIFF or Imagine IMG is the first preference, then JPEG2000 lossless and other simple binary+header formats (ERS, ENVI or BIL).
- For natural/false/pseudo colour RGB imagery:
 - If the imagery is already mosaiced and is ready for display then lossy compression is suitable (JPEG2000 lossy/ECW/MrSID). Prefer 10% compression, up to 20% is acceptable.
 - If the imagery requires any sort of processing prior to display (i.e. mosaicing/colour balancing/etc) then an uncompressed or lossless compressed format is required.

Metadata or 'information about data' will be produced for all spatial data and will be compliant with ANZLIC Metadata Profile. ().

The Department's preferred method is using ANZMet Lite, however the Department's Service Provider may use any compliant system to generate metadata.

All data will be provide under a Creative Commons license ()

Figures

Figure 1: Site Context

Figure 2: Site Aerial

Figure 3: Cultural Heritage Survey

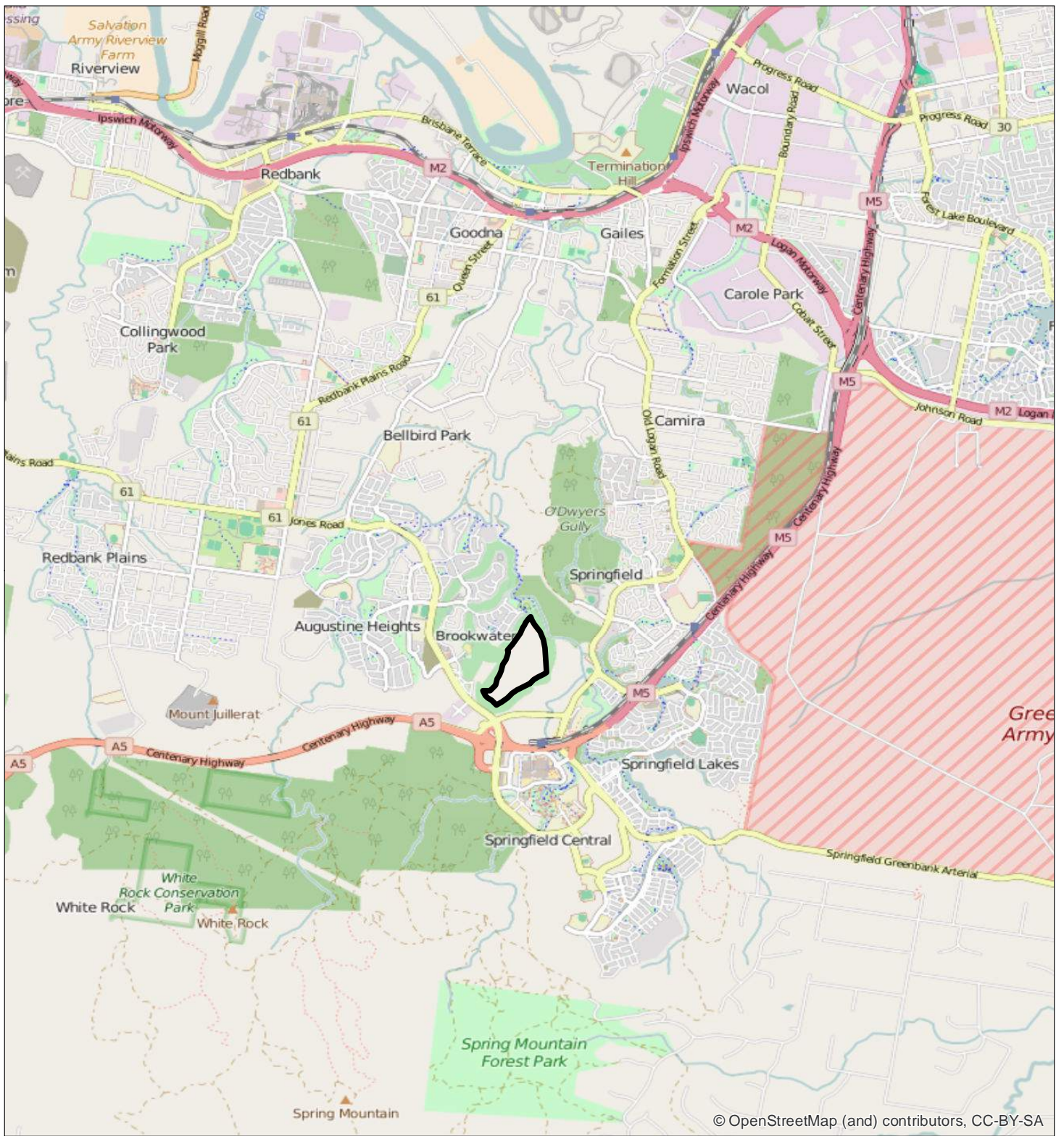
Figure 4: Koala Habitat Values Map (EHP)

Figure 5: Regulated Vegetation Management Map (NRM)

Figure 6: Fisheries WWBW Map (DAF)

Figure 7: ASRIS Soils

Figure 8: Contours



© OpenStreetMap (and) contributors, CC-BY-SA

Legend

 First Nine referral area

Figure 1
Site Context

File ref. 7399 E F9 Figure 1 Site Context A
Date 23/03/2016
Project First Nine

0 500 1,000 2,000 m
Scale (A4): 1:75,000 [GDA 1994 MGA Z56]



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Legend


 First Nine referral area

Figure 2

Site Aerial

File ref. 7399 E F9 Site Aerial A

Date 22/03/2016

Project First Nine

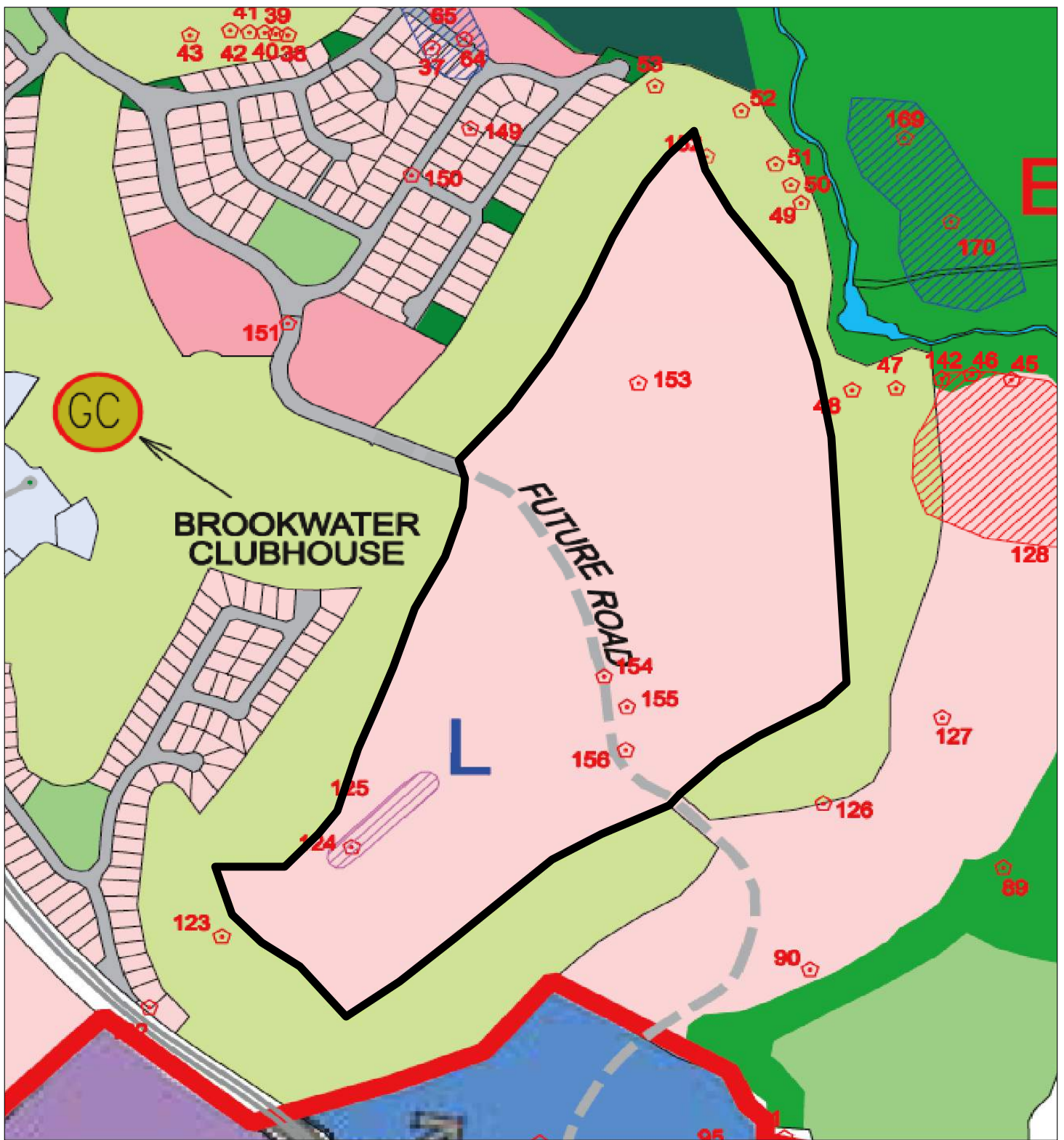


0 50 100 200 300 m

Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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Legend






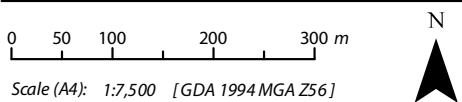
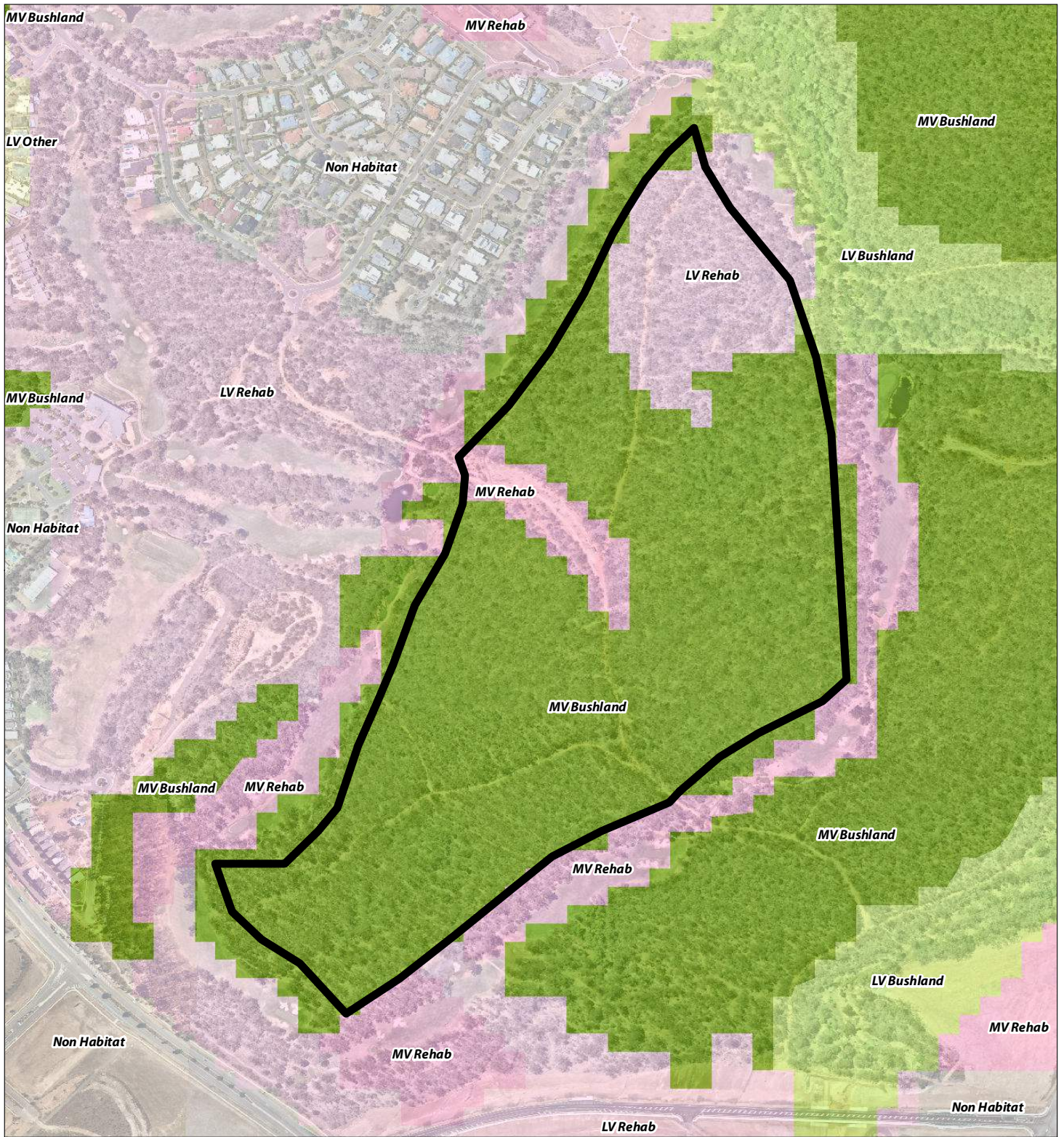
-  First Nine referral area
-  Individual Artefact site
-  Artefact Sites EPA consider requiring additional protection
-  Artefact Sites EPA consider not requiring additional protection
-  Artefact Sites EPA consider adequately protected within public open space

Figure 3
Cultural Heritage Survey

File ref. 7399 E F9 Figure 3 CH A
Date 22/03/2016
Project First Nine



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Legend













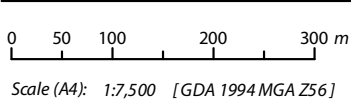
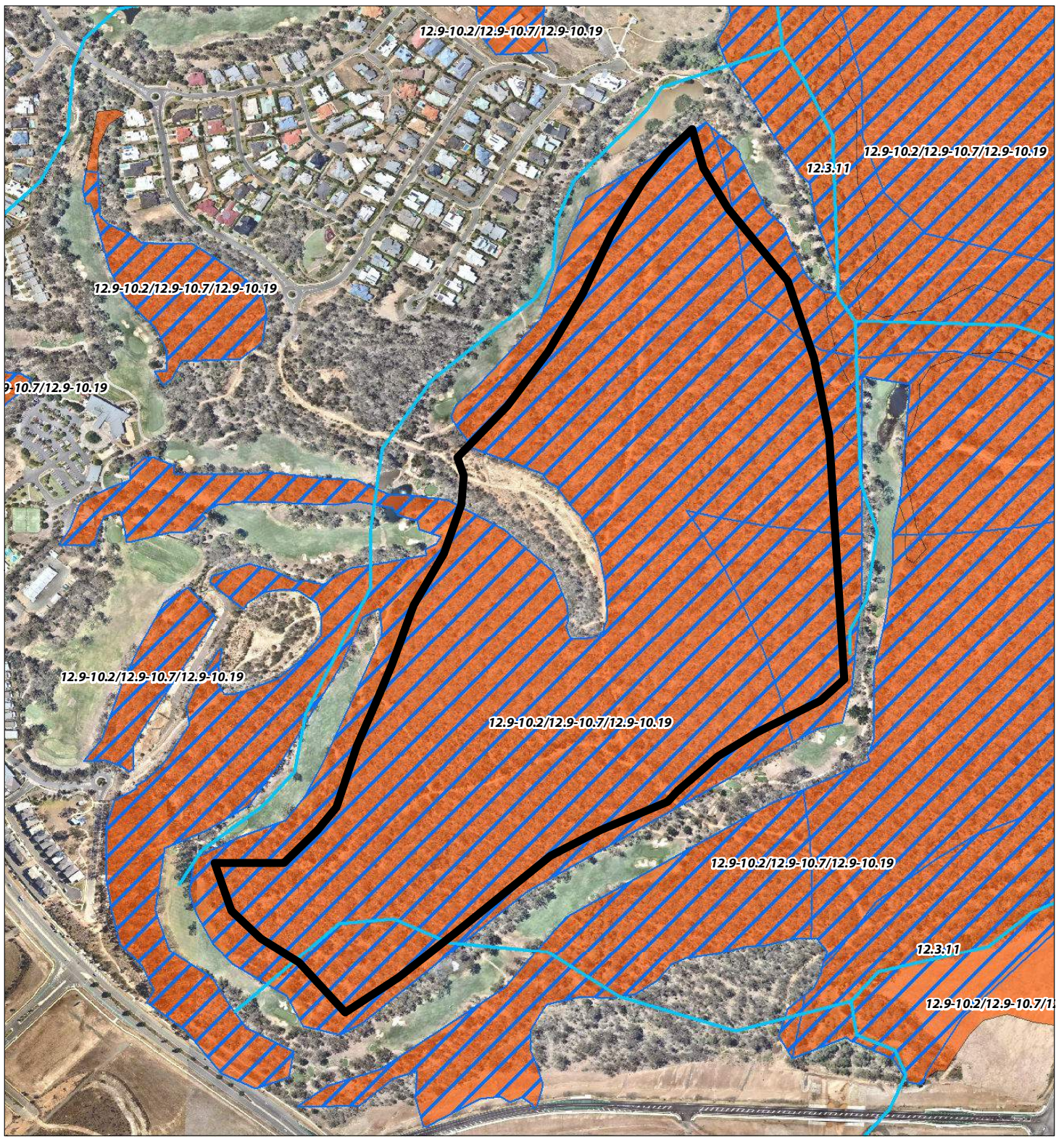
-  First Nine referral area
- Koala Habitat Values**
- Bushland Habitat*
-  High Value Bushland
-  Medium Value Bushland
-  Low Value Bushland
- Suitable for Rehabilitation*
-  High Value Rehabilitation
-  Medium Value Rehabilitation
-  Low Value Rehabilitation
- Other Areas of Value*
-  High Value Other
-  Medium Value Other
-  Low Value Other
-  Non-habitat
-  Water

Figure 4
 SEQ Koala Habitat Values
 Mapping

File ref. 7399 E F9 Figure 4 Koala Habitat A
Date 22/03/2016
Project First Nine



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Legend



First Nine referral area

VM Watercourses

VM Essential Habitat

VM Wetland

Regional Ecosystems mapping

Category A or B area containing endangered regional ecosystems

Category A or B area containing of concern regional ecosystems

Category A or B area that is a least concern regional ecosystem

Figure 5

Regulated Vegetation - Supporting Map

File ref. 7399 E F9 Figure 5 REs A

Date 22/03/2016

Project First Nine

0 50 100 200 300 m


Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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Legend


 First Nine referral area

Waterways

Risk of Impact

 1 - Low

 2 - Moderate

 3 - High

 4 - Major

 Tidal waterway


 Fish habitat area

Figure 6

Fisheries - Waterways for Waterway Barrier Works

File ref. 7399 E F9 Figure 6 Fisheries WWBWs A

Date 22/03/2016

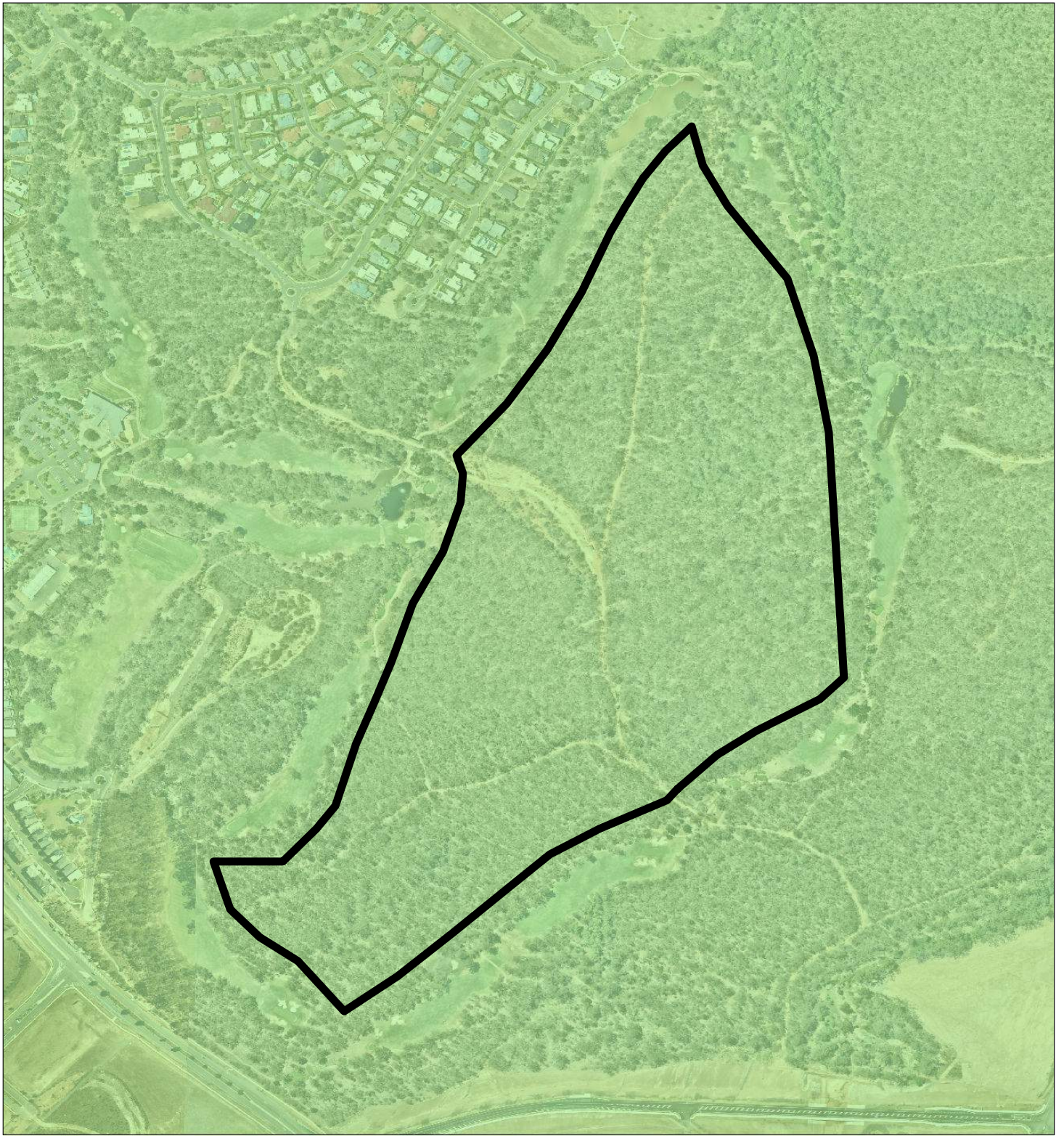
Project First Nine

0 50 100 200 300 m

Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT. SAUNDERS HAVILL GROUP CANNOT ACCEPT RESPONSIBILITY FOR ANY USE OF OR RELIANCE UPON THE CONTENTS OF THESE DRAWING BY ANY THIRD PARTY.



Legend



-  First Nine referral area
-  Dermosols

Figure 7
ASRIS Soil Classification

File ref. 7399 E F9 Figure 7 ASRIS Soils A
Date 23/03/2016
Project First Nine

0 50 100 200 300 m
 Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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Legend



-  First Nine referral area
-  Contour line (35m-100m)

Figure 8
 Topography - QLD 5m Contours

File ref. 7399 E F9 Figure 8 QLD Contours A
Date 23/03/2016
Project First Nine



Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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Plans

Plan 1: Springfield Structure Plan

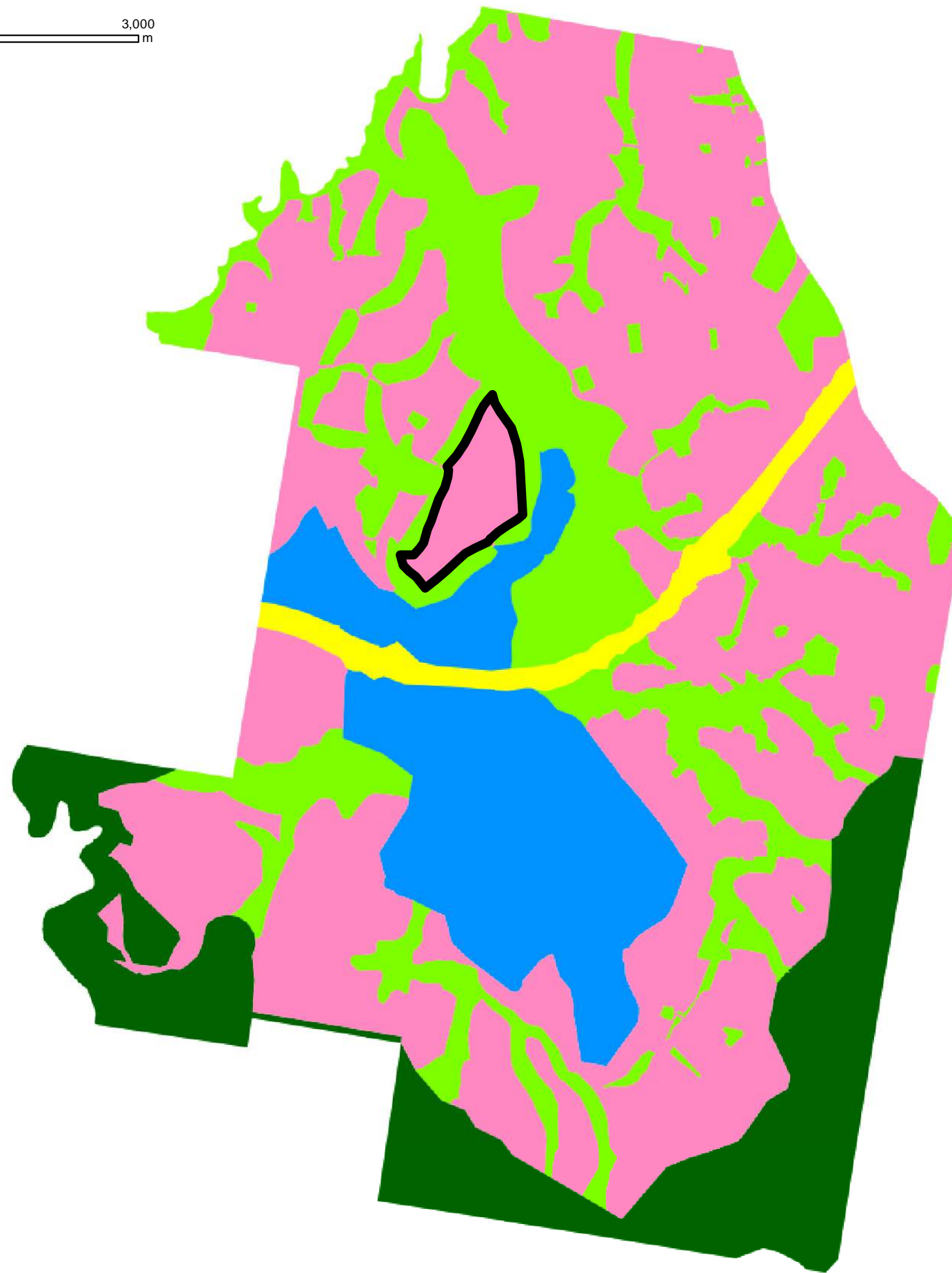
Plan 2: Brookwater South Master Area Development Plan

Plan 3: Field Survey Effort

Plan 4: Connectivity

Plan 5: Field Assessment Zones

Plan 6: First Nine Offset Area



Legend

-  First Nine Referral Area
-  Community residential
-  Town centre
-  Regional transport corridor
-  Open space
-  Conservation



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine

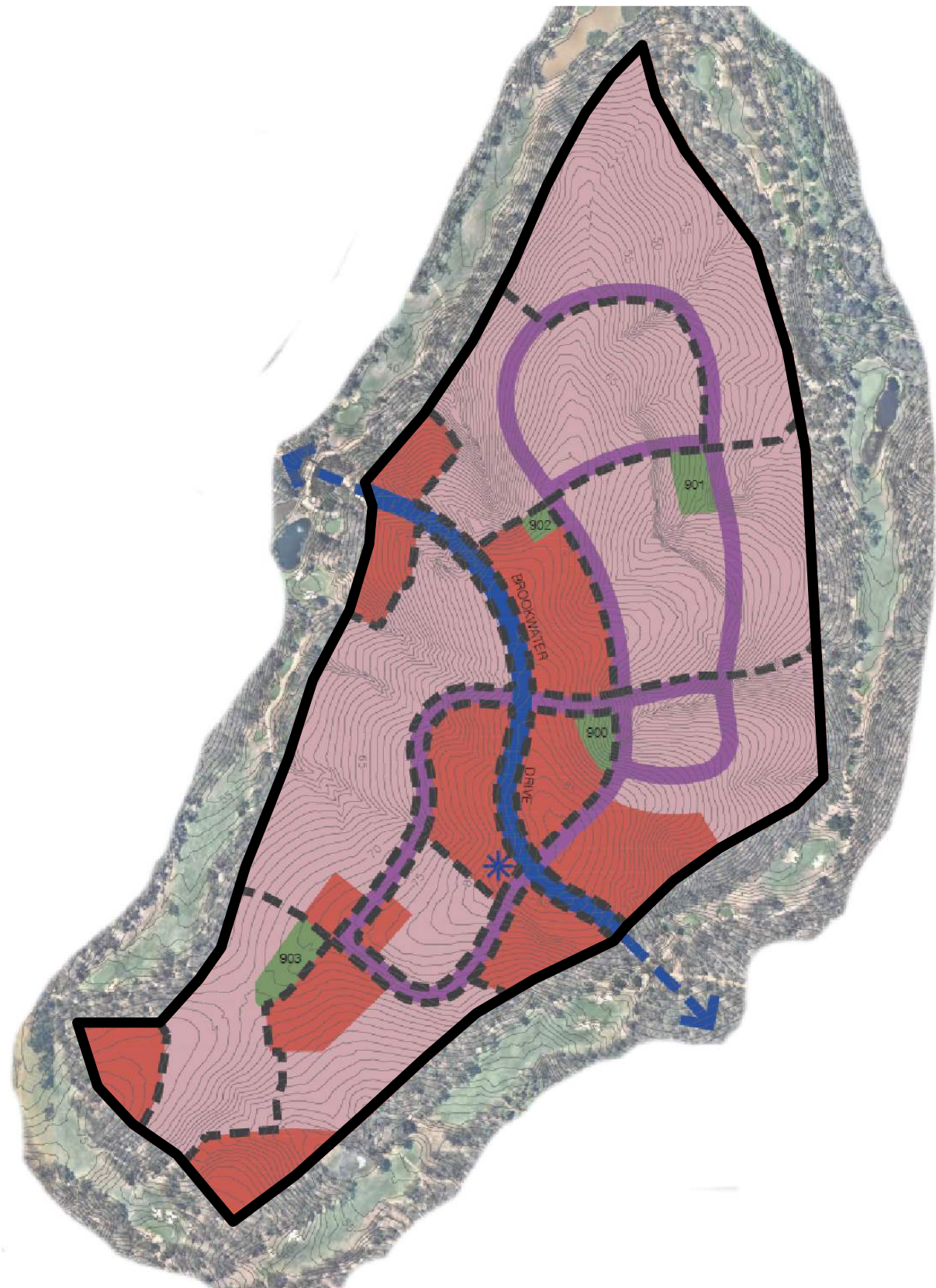
Springfield Structure Plan

Date | 22/03/2016
 Scale | 1:32,500 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Referral area (DNRM 2015, Springfield Land Corp 2014), Structure Plan (Springfield Land Corp 2014)

Plan 1

SHG File
 7399 E 01 F9 Springfield Structure Plan A

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- Legend**
- First Nine Referral Area
 - Residential Precinct
 - Medium density precinct
 - Local parks
 - Trunk collector street
 - Collector street



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine

Brookwater South MADP

Date | 23/03/2016
 Scale | 1:6,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Referral area (DNRM 2015, Springfield Land Corp 2014), Structure Plan (Springfield Land Corp 2014)

Plan 1

SHG File
 7399 E 02 F9 B5 MADP A

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Legend

- First Nine referral area
- SAT Location (Low score)
- SAT Location (Medium score)
- SAT Location (High score)
- Koala Habitat Transects
- ⊕ Quaternary Transect
- K Koala Sighting
- Survey tracklog



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ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

APPROVED COMPANY
ISO 9001
Quality Management Systems
QMS Certification Services

APPROVED COMPANY
ISO 14001
Environmental Management Systems
QMS Certification Services



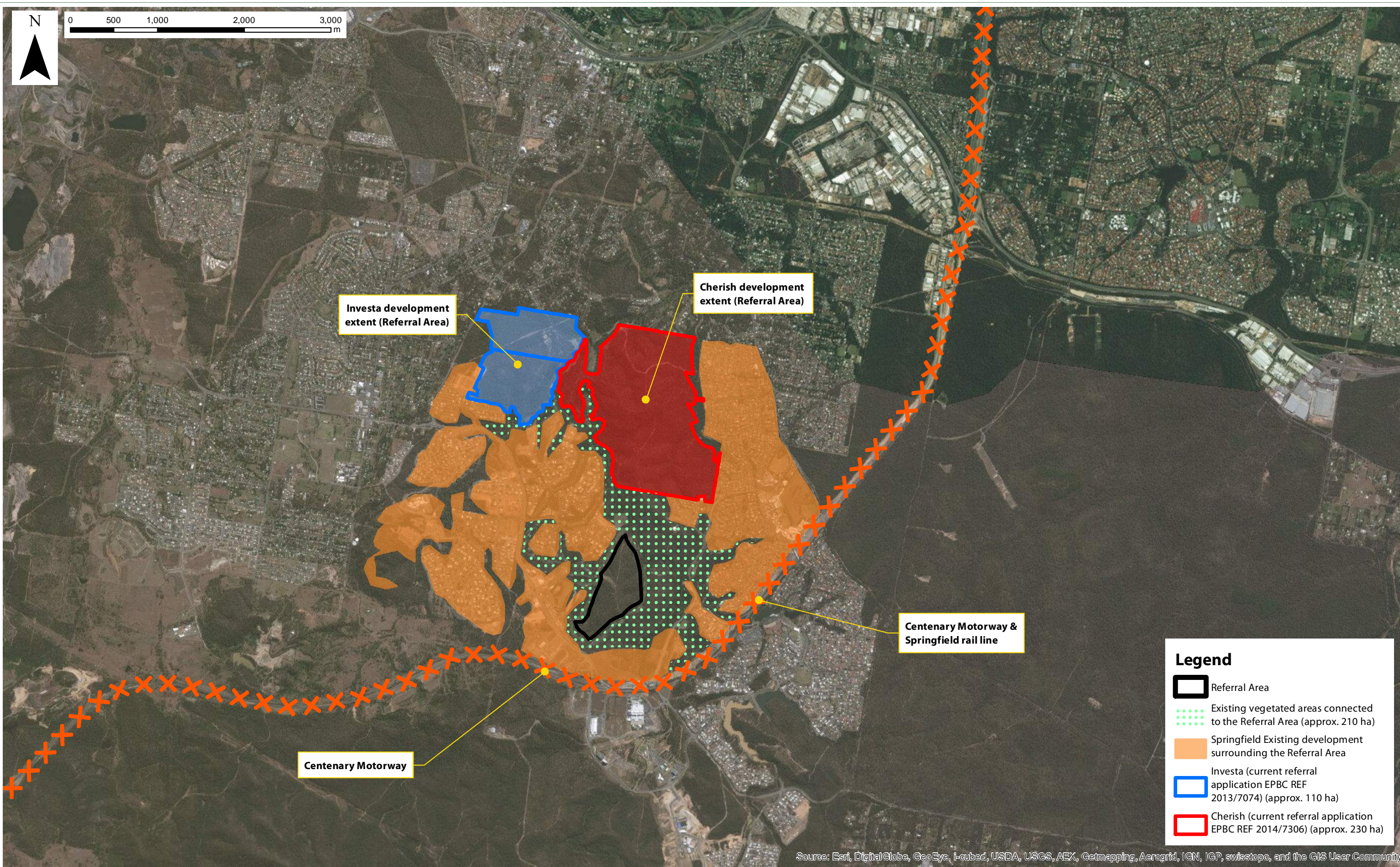
First Nine

Ecological Field Survey

Date | 23/03/2016
 Scale | 1:5,500 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2015), Aerial (Nearmap, 2015)
 Referral area (DNRM 2015, Springfield Land Corp 2014)

Plan 3

SHG File
7399 E 03 F9 Field Survey Effort A



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Legend

- Referral Area
- Existing vegetated areas connected to the Referral Area (approx. 210 ha)
- Springfield Existing development surrounding the Referral Area
- Investa (current referral application EPBC REF 2013/7074) (approx. 110 ha)
- Cherish (current referral application EPBC REF 2014/7306) (approx. 230 ha)



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

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First Nine

Connectivity Assessment

Date | 23/03/2016
 Scale | 1:40,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2015),
 Referral area (DNRM 2015, Springfield
 Land Corp 2014)

Plan 4

SHG File
 7399 E 04 F9 Connectivity A



Legend

- First Nine referral area
- Zone 1 - Eucalyptus Woodlands
- Zone 2 - Cleared access/fire trail (15m-60m wide)
- Cleared & Maintained fire trails
- Overland flow



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ISSUES:	Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM	

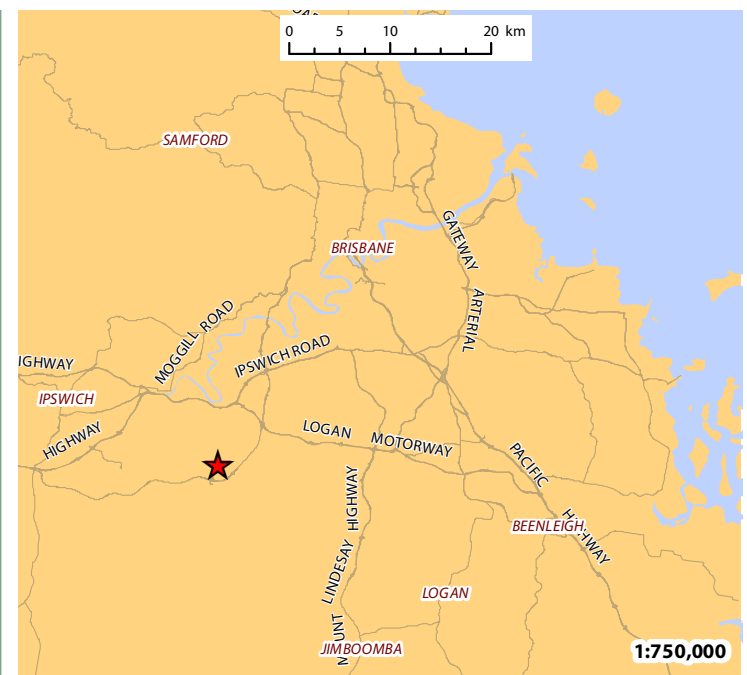
First Nine

Field Assessment Zones

Date | 23/03/2016
 Scale | 1:5,500 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | Brookwater South
 Address/RPD | Springfield
 Source | DCBD (DNR, 2013), Aerial (QLD Globe, 2013)
 Referral area (DNRM 2015, Springfield Land Corp 2014)

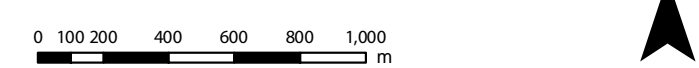
Plan 5

SHG File
 7399 E 05 F9 Field Assessment Zones A



Legend

- Spring Mountain referral area
- First Nine Offset Receive Area



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SPRINGFIELD LAND CORPORATION

ISSUES:

Issue	Date	Description	Drawn	Checked
A	23/03/2016	Prelim Draft	AL	RM

APPROVED COMPANY
ISO 9001
Quality Management Systems
QMS Certification Services

APPROVED COMPANY
ISO 14001
Environmental Management Systems
QMS Certification Services

First Nine

First Nine Offset Receive Site

Date | 23/03/2016
Scale | 1:23,000 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Springfield Land Corporation
Project | First Nine EPBC
Address/RPD | Springfield
Source | DCBD (DNRM, 2015), Aerial (Neemap, 2015)

Plan 6

SHG File
7399 E 06 F9 Offset areas A

Attachments

Attachment A

Environment Protection and Biodiversity Conservation Act 1999 Protected Matters Database Search

Attachment B

First Nine Ecological Technical Memo

Attachment C

First Nine Offset Propsoal

Attachment A

Environment Protection and Biodiversity Conservation Act 1999
Protected Matters Database Search



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: 16/03/16 17:05:35

[Summary](#)

[Details](#)

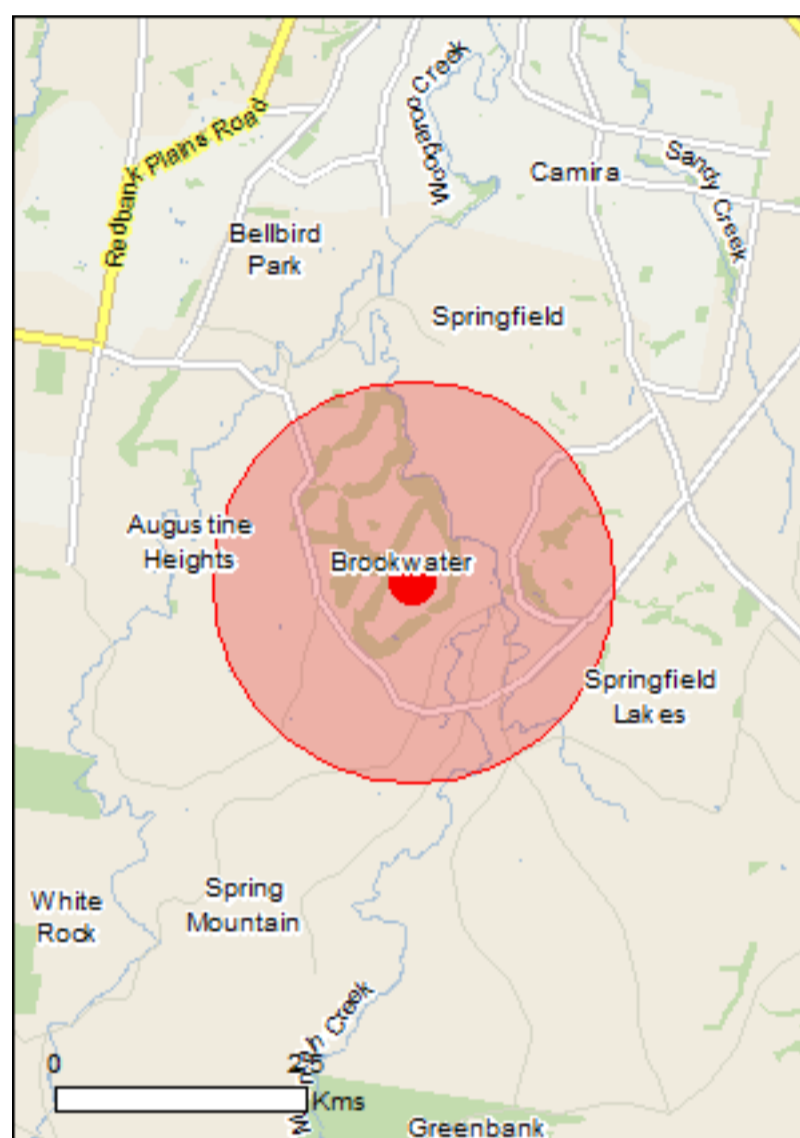
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



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

[Coordinates](#)

Buffer: 2.0Km



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:	29
Listed Migratory Species:	14

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:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	32
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 may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may 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 likely to 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 likely to occur within area
Erythrorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known 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]	Endangered	Species or species habitat may occur within area
Poephila cincta cincta Black-throated Finch (southern) [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Insects		
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	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 hallucatus Northern Quoll [331]	Endangered	Species or species habitat may 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 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
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Other		
Cycas ophiolitica [55797]	Endangered	Species or species habitat likely to occur within area
Plants		
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Notelaea ipsviciensis Cooneana Olive [81858]	Critically Endangered	Species or species habitat may occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Phebalium distans Mt Berryman Phebalium [81869]	Critically Endangered	Species or species habitat may occur within area
Plectranthus habrophyllus [64589]	Endangered	Species or species habitat likely to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		

Name	Status	Type of Presence
Delma torquata 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

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 known 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 known to occur within area
--	--	---

Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
---	--	---

Migratory Wetlands Species

Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
--	--	--

Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
--	--	--

Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		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		
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
Cuculus saturatus		
Oriental Cuckoo, Himalayan Cuckoo [710]		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 known to occur within area
Lathamus discolor		
Swift Parrot [744]	Endangered	Species or species habitat may 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 known to 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

Name	Threatened	Type of Presence 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 Resources 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 likely to occur within area
Mammals		

Name	Status	Type of Presence
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		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		
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		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]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		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

Name	Status	Type of Presence within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species 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

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.

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-27.66469 152.90035

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](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-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, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

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

Please feel free to provide feedback via the [Contact Us](#) page.

Attachment B

First Nine Ecological Technical Memo

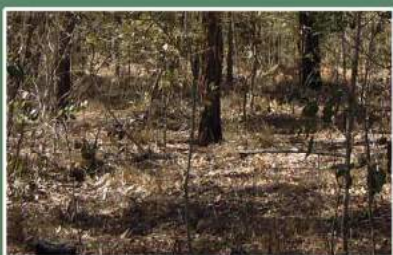
environmental management



First Nine Residential Development

Ecological Technical Note –
MNES Flora and Fauna

EPBC Act Referral Submission



Springfield Land Corporation
Brookwater Drive, Brookwater
7399

23 March 2016



Document Control

Title	Ecological Technical Note – MNES Flora and Fauna
Address	Brookwater Driver, Brookwater, Greater Springfield
Job Number	7399
Client	Springfield Land Corporation

Document Issue

Issue	Date	Prepared By	Checked By
Draft	05. 10.2015	Keira Grundy	Murray Saunders
Final	24.03.2016	Keira Grundy	Murray Saunders

Disclaimer

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Reports and/or Plans by Others

Reports and/or plans by others may be included within this report to support the document.



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- Plan 2: Vegetation Zones



I. Introduction

The *Environmental Management Division* of **Saunders Havill Group** (SHG) was engaged by **Springfield Land Corporation** (SLC) to prepare an undertake ecological investigations in relation to the proposed First Nine Residential Development located at located at Brookwater Drive, Brookwater within Greater Springfield (Part of Lot 161 on SP271657) This technical note is intended to support a referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and provides a summary of the field investigations.

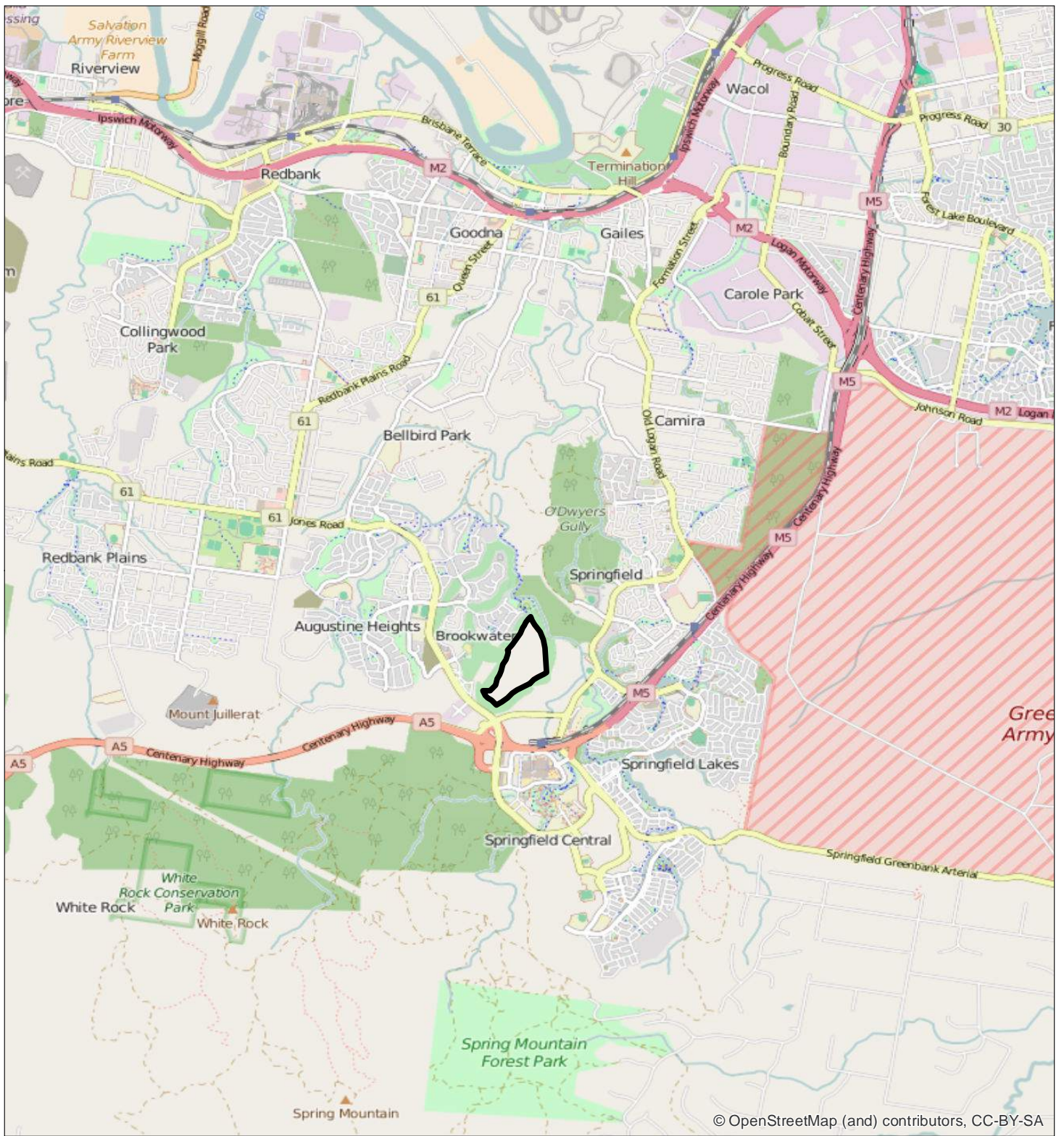
Contextually, the First Nine project site forms part of the larger Greater Springfield urban expansion area in Ipswich, Queensland. The proposed master-planned development covers approximately 40.8ha encompassed by the first nine golf holes of the established Greg Norman designed 18-hole championship Brookwater Golf Course. First nine adjoins the existing and completed Brookwater Community residential development and Augustine Heights to the west and proposed Springfield Town Centre to the south and east. The surrounding landscape contains a mixture of existing and future urban residential, commercial and educational facilities. Centenary Highway, approximately 500m to the south divides the Greater Springfield area.

The proposed First Nine development site occurs within non-remnant and remnant mapped vegetation. The site is dominated by Eucalypt Woodland/Open Forest is subject to a number of disturbances including edge effects, weed invasion, creation of access tracks and impacts from domestic and feral animals. Opossum Creek borders the site to the north, with two low order drainage lines running parallel to the golf course. The site context is displayed in **Figure 1** and site aerial in **Figure 2**.

The site has been subject to contemporary ecological survey by **SHG**, with a specific focus on Matters of National Environmental Significance (MNES). The Koala (*Phascolarctos cinereus*) was the only listed threatened Matters of National Environmental Significance (MNES) recorded, or considered likely to occur, on the project site.

I.I. Key Site Details

Address	Brookwater Dive, Brookwater, Greater Springfield
RPD	Part of Lot 161 on SP271657
Area	40.8ha
VMA 1999	Category B remnant vegetation, made up of Least Concern and Of Concern remnant vegetation and Category X non-remnant vegetation.



© OpenStreetMap (and) contributors, CC-BY-SA

Legend


 First Nine referral area

Figure 1
Site Context

File ref. 7399 E F9 Figure 1 Site Context A
Date 23/03/2016
Project First Nine

0 500 1,000 2,000 m
Scale (A4): 1:75,000 [GDA 1994 MGA Z56]



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Legend


 First Nine referral area

Figure 2

Site Aerial

File ref. 7399 E F9 Site Aerial A

Date 22/03/2016

Project First Nine



0 50 100 200 300 m

Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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2. MNES Flora and Fauna Survey

2.1. Field Survey Methodology

To identify existing ecological values at the site, on ground survey by two senior ecologists from **SHG** occurred on the 28th and 29th of May 2015 with conditions fine and sunny. These surveys were carried out to address EPBC issues in relation to potential Matters of National Environmental Significance, however, a focus was placed on Koalas as they are known to occur in the region. The survey effort is shown on **Plan 1**.

Survey activities undertaken on-site have included:

- General Searches & Species Identification – The site was walked to ensure all vegetation communities and species were recorded and identified. Particular attention was paid to any threatened species that were listed as possibly occurring on or within the vicinity of the application site and specific micro assemblages which may support these threatened species.
- Observational Survey – Detailed observational surveys of the vertebrate fauna present on or that may utilise the study area, including faunal lists and significance status of species under the Commonwealth’s *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that includes the Japan – Australia Migratory Bird Agreement and the Bonn Convention; and Queensland’s *Nature Conservation Act 1992* (NCA).
- Surveys targeting Koala were conducted, including:
 - Direct observational surveys
 - SAT – The Spot Assessment Technique
 - Koala Food Tree habitat assessments as per **Australian Koala Foundation** guidelines
- Identification – Identification of habitat values within the area relevant to terrestrial vertebrate fauna, including ecological corridors; and
- Description – A description of the major fauna habitats present
- Opportunistic searches and deployment of fauna cameras



Legend

- First Nine referral area
- SAT Location (Low score)
- SAT Location (Medium score)
- SAT Location (High score)
- Koala Habitat Transects
- ⊙ Quaternary Transect
- K Koala Sighting
- Survey tracklog



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ISO 14001
Environmental Management Systems
QMS

ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

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PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDERGROUND SERVICES AND DETAIL LOCATIONS OF ALL SERVICES.

First Nine

Ecological Field Survey

Date | 23/03/2016
Scale | 1:5,500 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Springfield Land Corporation
Project | First Nine
Address/RPD | Springfield
Source | DCBD (DNRM, 2015), Aerial (Nearmap, 2015)
Referral area (DNRM 2015, Springfield Land Corp 2014)

Plan 1

SHG File
7399 E 03 F9 Field Survey Effort A



2.2. Flora Assessment

The following general flora observations were made across the proposed development site:

- A Protected Mattes Search generated under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) using a 10km radius of the site, identified eleven (11) threatened plants and two (2) listed Threatened Ecological Community (TEC) described as *Lowland Rainforest of Subtropical Australia* and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* as having potential to occur on-site (refer to **Appendix A** for search results). None of these protected matters were observed on or in vicinity to the site refer to **Appendix C** for likelihood assessment). Due to disturbances and nature of site in the broader area, it is unlikely that the subject site contains areas consistent with the habitat requirements of listed flora species and TECs.
- A search of the Wildlife Online database using a 10km radius of the site, identified nine (9) listed threatened plants protected under the *Nature Conservation Act 1992* (Qld) (NCA) which were considered to have potential to occur across the site (refer to **Appendix B** for search results). No specimens were observed at the time of assessment or considered likely to occur (refer **Appendix C**).
- Fifty (50) flora species were identified on site during field assessment, of which five (5) of these species are introduced (refer **Table 1**). One (1) Class 2 declared species, *Opuntia stricta* (Prickly Pear) and four (4) Class 3 declared species, *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Cinnamomum camphora* (Camphor Laurel) and *Celtis sinensis* (Chinese Elm) under the *Land Protection (Pest and Stock Route Management) Act 2002* were identified within the referral area. One (1) Local High Priority Species, *Passiflora suberosa* (Corky Passion Vine), and one (1) Local Medium Priority Species *Gomphocarpus physocarpus* (Balloon Cotton) listed by **Ipswich City Council** was also found on site
- The majority of the site is mapped as remnant vegetation consisting of composite Of Concern RE 12.9-10.2/12.9-10.7/12.9-10.19 and as containing essential habitat for the Koala (refer **Figure 3**). Survey confirmed areas mapped as remnant were consistent with on-ground regional ecosystems. Areas not identified as remnant occur in the west over the western extent of Brookwater Drive. Survey confirmed a number of access tracks, including the full extent of Brookwater Drive, are currently mapped as remnant but do not contain vegetation with height and spread requirements to meet the remnant definition.
- The site was found to be highly disturbed as a result of maintained access tracks, unlawful activities including motorbike and 4wd impacts, weed infestations, evidence of dogs, dumping of domestic rubbish and edge effects from surrounding development, in particular edge effects from the encompassing golf course greens.
- Subsequently, the site can be broadly divided into two separate zones, based on their different vegetation attributes and ecological value (refer **Plan 2**).

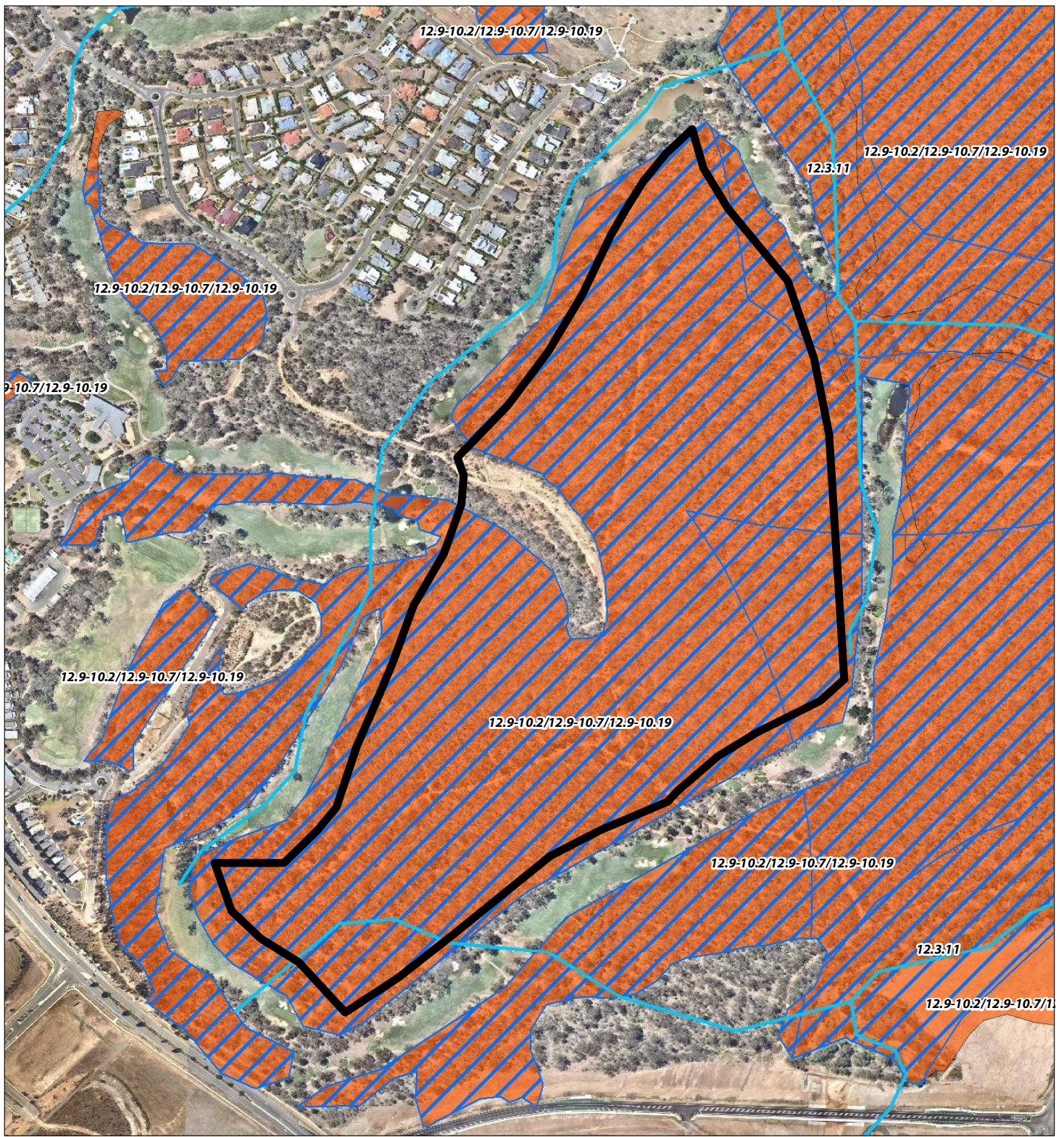


Table 1: Flora List

Species Name	Common Name	Declared Weed
<i>Acacia amblygona</i>	Fan Wattle	
<i>Acacia concurrens</i>	Black Wattle	
<i>Acacia disparrima</i>	Hickory Wattle	
<i>Acacia fimbriata</i>	Fringed Wattle	
<i>Acacia leiocalyx</i>	Early Black Wattle	
<i>Acacia podalyriifolia</i>	Silver Wattle	
<i>Allocasuarina littoralis</i>	Black She-oak	
<i>Alphitonia excelsa</i>	Soap Tree	
<i>Angophora leiocarpa</i>	Smooth-barked Apple	
<i>Aristida sp.</i>		
<i>Celtis sinensis</i>	Chinese Elm	Class 3
<i>Cinnamomum camphora</i>	Camphor Laurel	Class 3
<i>Corymbia citriodora</i>	Spotted Gum	
<i>Corymbia intermedia</i>	Pink Bloodwood	
<i>Corymbia tessellaris</i>	Moreton Bay Ash	
<i>Cymbopogon refractus</i>	Barbed Wire Grass	
<i>Dianella longifolia</i>		
<i>Dodonea viscosa</i>	Hop Bush	
<i>Eragrostis sp.</i>		
<i>Eremophila debilis</i>	Winter Apple	
<i>Eucalyptus cloeziana</i>	Gympie Messmate	
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	
<i>Eucalyptus major</i>	Queensland Grey Gum	
<i>Eucalyptus microcorys</i>	Tallowwood	
<i>Eucalyptus moluccana</i>	Gum-topped Box	
<i>Eucalyptus resinifera</i>	Red Stringybark	
<i>Eucalyptus seeana</i>	Fine-leaved Red Gum	



Species Name	Common Name	Declared Weed
<i>Eucalyptus siderophloia</i>	Grey Ironbark	
<i>Eucalyptus tereticornis</i>	Blue Gum	
<i>Gahnia aspera</i>	Saw Sedge	
<i>Gomphocarpus physocarpus</i>	Balloon Cotton	Environmental Weed
<i>Goodenia glabra</i>	Smooth Goodenia	
<i>Imperata cylindrica</i>	Blady Grass	
<i>Jacksonia scoparia</i>	Dogwood	
<i>Lantana camara</i>	Lantana	Class 3
<i>Lantana montenvidensis</i>	Creeping Lantana	Class 3
<i>Leucopogon juniperinus</i>	Prickly Heath	
<i>Lomandra longifolia</i>	Mat Rush	
<i>Lomandra multiflora</i>	Many-flowered Mat Rush	
<i>Lophostemon confertus</i>	Brush Box	
<i>Lophostemon suaveolens</i>	Swamp Box	
<i>Opuntia stricta</i>	Prickly Pear	Class 2
<i>Parsonsia straminea</i>	Monkey Rope Vine	
<i>Passiflora suberosa</i>	Corky Passion Vine	Environmental Weed
<i>Pennisetum purpureum</i>	Elephant Grass	
<i>Petalostigma pubescens</i>	Quinine Berry	
<i>Poa labillardieri</i>	Tussock Grass	
<i>Smilax australis</i>	Barbed-wire Vine	
<i>Themeda triandra</i>	Kangaroo Grass	
<i>Xanthorrhoea latifolia</i>	Grass Tree	



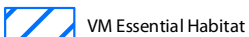
Legend



First Nine referral area



VM Watercourses





VM Essential Habitat



VM Wetland

Regional Ecosystems mapping

 Category A or B area containing endangered regional ecosystems

 Category A or B area containing of concern regional ecosystems


 Category A or B area that is a least concern regional ecosystem

Figure 3

Regulated Vegetation - Supporting Map

File ref. 7399 E F9 Figure 5 REs A

Date 22/03/2016

Project First Nine

0 50 100 200 300 m

Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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Legend

- First Nine referral area
- Zone 1 - Eucalyptus Woodlands
- Zone 2 - Cleared access/fire trail (15m-60m wide)
- Cleared & Maintained fire trails



ISSUES:				
Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine

Field Assessment Zones

Date | 23/03/2016
 Scale | 1:5,500 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | Brookwater South
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)
 Referral area (DNRM 2015, Springfield Land Corp 2014)

Plan 2

SHG File
 7399 E 05 F9 Field Assessment Zones A

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2.2.1 Zone 1: Eucalyptus Woodland

Zone 1 is largely reflective of mapped composite Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19. These are described as:

- Least Concern RE 12.9-10.2: *Corymbia citriodora* subsp. *variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)
- Of Concern RE 12.9-10.7: *Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c)
- Least Concern 12.9-10.19: *Eucalyptus fibrosa* subsp. *fibrosa* woodland +/- *Corymbia citriodora* subsp. *variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major*. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a)

Zone 1 contained a high density of *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark) and *Eucalyptus siderophloia* (Grey Ironbark), however *Corymbia citriodora* (Spotted Gum) was also found in notable proportions. Sub-dominant species included *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash).

Vegetation within this zone was mostly undisturbed, with only minor disturbance from fire and track construction observed (refer photos).



Photos: Zone 1: Rocky outcrops



Photos: Zone 1: Eucalyptus Woodland



2.2.2 Zone 2: - Disturbed Areas

Zone 2 reflects non-remnant areas (both mapped and not mapped) which have been previously cleared.

It is noted that a small portion of land within the western extent of Brookwater Drive has been previously cleared which is mapped as non-remnant (refer photos).

In addition, a number of access tracks were noted to have been previously cleared and heavily infested weeds.

Weeds found within this zone included *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton)

Consists of areas previously cleared containing existing infrastructure.



Photos: Zone 2: Disturbed Areas



Photos: Zone 2: Access tracks

2.3. Waterways and Drainage Features

Three mapped low order (Stream Order 1) tributaries envelope the site (outside the referral extent) within the existing golf greens (refer **Figure 3**). These drainage features are not identified by Fisheries mapping (refer **Figure 4**). Field survey confirmed that these mapped watercourses reflect disturbed drainage lines which have been highly modified as a result of the encompassing Brookwater Golf Course. Unmapped overland flow paths (refer Photos below) drain from the centre of the site towards the Golf Course before ultimately draining into Opossum Creek (refer **Section 3.3**). These features reflect incised gullies with no riparian vegetation or aquatic value.


Opossum Creek, approximately 50m to the north, is separated from the site by the existing Brookwater Golf Course. Opossum Creek is identified as a Stream Order 4 watercourse (refer **Figure 3**) and high risk (red) waterway by Fisheries (refer **Figure 4**). While outside the referral extent and not part of this assessment, the portion of Opossum Creek adjoining the site was noted by survey to contain relatively in-tact riparian vegetation consistent with mapped Of Concern regional ecosystems. This creek corridor is identified to be retained as open space within the Springfield Structure Plan to retain biodiversity values and maintain connectivity within the broader landscape.



Photos: Gullies within First Nine site




Legend


 First Nine referral area

Waterways


Risk of Impact

 1 - Low

 2 - Moderate

 3 - High

 4 - Major

 Tidal waterway


 Fish habitat area

Figure 4

Fisheries - Waterways for Waterway Barrier Works

File ref. 7399 E F9 Figure 6 Fisheries WWBWs A

Date 22/03/2016

Project First Nine



Scale (A4): 1:7,500 [GDA 1994 MGA Z56]



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2.4. Fauna Assessment

A fauna assessment was conducted in conjunction with the vegetation assessment over the application site and was designed to build on the knowledge of extensive surveys already completed by **Biolink** as part of broader surveys of the Greater Springfield area. The purpose of the survey was to identify habitat opportunities, observations of species presence and activity, and undertake targeted searches for actual usage by threatened and significant fauna species.

Site specific observations are as follows:

- A Protected Matters Search generated under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) using a 10km radius of the site, identified forty-two (42) threatened fauna listed under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) are considered as having the potential to occur within the vicinity of the application sites (refer to **Appendix A** for search results). None of these protected matters were observed on or in the vicinity of the site, with the exception of one (1) Koala (*Phascolarctos cinereus*) sighting, nor were they considered likely to occur (refer to **Appendix C** for likelihood assessment).
- A search of the Wildlife Online database using a 10km radius of the site, identified fifteen (15) listed threatened fauna species protected under the *Nature Conservation Act 1992* (Qld) (NCA) as having potential to occur across the site (refer to **Appendix B** for search results). No specimens were observed at the time of assessment. Again, none of these species, with the exception of the Koala, were considered likely to occur.
- One (1) migratory species, *Merops ornatus* (Rainbow Bee-eater) was observed on site and is considered to utilise the site as part of a broader home range. No breeding places for the species was observed within the referral area. No other listed migratory species are considered to frequently visit the site.
- The site's ability to support listed threatened fauna species which are generally highly sensitive, specialised and require particular habitat features is highly unlikely for the majority of the listed EPBC Act or NCA protected species.
- The site is considered to contain suitable habitat for a variety of mammals, reptiles, amphibians and birds. The majority of fauna observed on site were made up of avi-fauna common to the local area. These species included the Galah, Torresian Crow, Pheasant Coucal, Kookooburra, Noisy Minor, Rainbow Bee-eater, Crested Pigeon, Tawny Frogmouth, Grey Fantail and Willie Wagtail. Other species observed on site included dogs, Beeping Froglet and Blue Tongued Skink. Refer to **Table 2** for observed fauna species list.
- A few small rocky areas were observed within the subject site however contained limited habitat value due to the absence of suitable overhangs, crevices and hollows.
- Areas of eucalypt woodland is available for typical dry sclerophyll species (particularly avi-fauna and Koalas).



- Survey did not locate any large or unusual nests associated with migratory, rare birds or birds of prey on site.



Photos: Common birds on site captured by fauna cameras

Table 2: Fauna List

Scientific Name	Common Name
<i>Alectura lathami</i>	Australian Brush-Turkey
<i>Anas superciliosa</i>	Pacific Black Duck
<i>Bufo marinus</i>	Cane Toad
<i>Cacatua roseicapilla</i>	Galah
<i>Canis familiaris</i>	Dog
<i>Centropus phasianinus</i>	Pheasant Coucal
<i>Corvus orru</i>	Torresian Crow
<i>Cracticus nigrogularis</i>	Pied Butcherbird
<i>Cracticus torquatus</i>	Grey Butcherbird
<i>Crinia parinsignifera</i>	Beeping Froglet
<i>Cryptoblepharus virgatus</i>	Wall Skink
<i>Dacelo novaeguineae</i>	Laughing Kookooburra
<i>Diporiphora australis</i>	Tommy Round-head
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater
<i>Grallina cyanoleuca</i>	Magpie-lark
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Hemidactylus frenatus</i>	Asian House Gecko
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Lampropholis delicata</i>	Grass Skink
<i>Lichmera indistincta</i>	Brown Honeyeater



<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Malurus cyaneus</i>	Superb Fairywren
<i>Manorina melanocephala</i>	Noisy Minor
<i>Merops ornatus</i>	Rainbow Bee-eater
<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Phascolarctos cinereus</i>	Koala
<i>Philemon corniculatus</i>	Noisy Fiarbird
<i>Physignathus lesueurii</i>	Eastern Water Dragon
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Podargus strigoides</i>	Tawny Frogmouth
<i>Pogona barbata</i>	Common Bearded Dragon
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum
<i>Psophodes olivaceus</i>	Eastern Whipbird
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Specothes viridis</i>	Figbird
<i>Tiliqua scincoides</i>	Blue-tongued Skink
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet
<i>Trichosurus vulpecula</i>	Common Brushtail Possum
<i>Wallabia bicolor</i>	Swamp Wallaby
<i>Vanellus miles</i>	Masked Lapwing
<i>Varanus varius</i>	Lace Monitor

2.4.1 SAT Surveys

In May 2015, Senior Ecologists from **Saunders Havill Group** conducted field surveys in accordance with EPBC Act Guidelines for the Koala across the site with weather conditions fine and sunny. The purpose of the survey was to determine the level of Koala usage across the site and to assess the availability of suitable habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) developed by Phillips and Callaghan (2011)
- Habitat Assessments
- Opportunistic searches

The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves meandering transects in search of Koalas or Koala scats beneath trees. Once a Koala or scat is located, the associated habitat tree is identified and recorded as the centre of the SAT. The nearest tree is then identified and the same data recorded. The next closest tree is then assessed and so on until the 30 trees nearest to the original tree in a radial survey have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree



involves a systematic search for Koalas in the canopy and Koala scats beneath the tree within 1 m radius of the trunk. After approximately 1 minute of searching for scats, the base of the trunk is observed for scratches.

Site specific searches observed the presence of one (1) Koala individual within the centre of the site as well as several scats across the site. Ten (10) SAT surveys were conducted across the application area, as shown by the field survey effort presented in **Plan 1** and summarised in **Table 3**. Copies of the SAT raw data is contained within **Appendix C**.

The assessment has been based using the East Coast (Low) Density Area. Four (4) of the ten (10) SAT surveys recorded evidence consistent with the “high” usage category for Koala Use (>12.59% of trees with scats) in coastal regions as defined by the **Australian Koala Foundation’s** Koala Activity Level Classification Table, extracted below as **Table 5**, while four (4) SAT recorded evidence with the “low” use category (<9.47% of trees with scats). The remaining two (2) of the SATs recorded evidence consistent with the medium “normal” use category (≥ 9.47 but ≤ 12.59 of trees with scats). On average, SATs indicate a normal level of usage by Koala across the site.

Table 3: SAT Survey Results

SAT Survey	Scats	%of Trees with Scats	Usage Level
SAT 1	Yes	13.3	High
SAT 2	Yes	10	Normal
SAT 3	Yes	16.7	High
SAT 4	Yes	6.7	Low
SAT 5	Yes	10	Normal
SAT 6	Yes	6.7	Low
SAT 7	Yes	16.7	High
SAT 8	Yes	6.7	Low
SAT 9	Yes	6.7	Low
SAT 10	Yes	16.7	High

Table 4: AKF Koala Activity Level Classification Table

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
East Coast (low)	< 9.47%	$\geq 9.47\%$ but $\leq 12.59\%$	> 12.59%
East Coast (med – high)	< 22.52%	$\geq 22.52\%$ but $\leq 32.84\%$	> 32.84%
Western areas (med – high)	< 35.84%	$\geq 35.84\%$ but $\leq 46.72\%$	> 46.72%

Overall, the site was found to be dominated by species that achieve the definition of ‘woodland’ and ‘forest’ as referenced in the Koala Referral Guidelines. Ecological survey of the site identified canopy species within the referral area are dominated by Eucalyptus and Corymbia species including *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark), *Eucalyptus siderophloia* (Grey Ironbark), *Corymbia citriodora* (Spotted Gum) *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus major* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus fibrosa* (Red Ironbark) many of which are considered Koala food trees. Vegetation within the understorey and shrub layer was moderately disturbed with numerous tracks noted throughout the assessment



area. In addition, declared weeds under the *Land Protection (Stock Route Management) Act 2002* found within the assessment area included *Lantana camara* (Lantana), *Eragrostis curvula* (African Lovegrass), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton).

2.4.2 Habitat Assessments

While no longer required under the EPBC Koala Referral Guidelines, twelve (12) habitat assessments were undertaken across the site to record flora species composition and potential Koala habitat. The location of habitat assessments is presented in **Plan 1** and raw data recorded in **Appendix E**. Overall, suitable Koala habitat was identified across the site however notable disturbance (i.e. cleared vehicle tracks, dumped rubbish, evidence of fire, weeds) were noted at 10 of the 12 transect locations.

2.4.3 Summary

The key findings from the assessment are:

- With the exception of Koala, no other MNES fauna species are considered likely to frequently utilise the site.
- One (1) Koala individual during the survey and scats were observed in several locations across the application area, with four (4) of the ten (10) SAT surveys recording 'low' use', four (4) recording 'high' use and two (2) recording 'normal' use by use by Koala.
- The site is dominated by dominated by Eucalyptus and Corymbia species which are considered Koala food trees under the Koala Referral Guidelines.



3. Conclusions

This technical note presents and summarises the results of ecological field survey undertaken by **Saunders Havill Group** in May 2015 over the First Nine Residential Development site. These surveys were carried out to address EPBC issues in relation to potential Matters of National Environmental Significance, however, a focus was placed on Koalas as they are known to occur in the region.

The following conclusions have been made:

- No EPBC Act listed Threatened Ecological Communities (TECs) considered to have potential to occur were recorded on-site.
- Potential habitat for EPBC Act listed threatened plants was considered lacking from the site, primarily due to the relatively high levels of disturbance.
- Of the threatened fauna species listed under the EPBC Act with the potential to occur on-site, only *Phascolarctos cinereus* (Koala) was recorded and/or considered likely to occur on site. Evidence of Koala activity was recorded on-site in the form of scats, and single siting an individual. Overall, activity levels indicate normal usage of the site by Koalas.
- One (1) migratory species, *Merops ornatus* (Rainbow Bee-eater) was observed on site and is considered to utilise the site as part of a broader home range. No breeding places for the species was observed within the referral area. No other listed migratory species are considered to frequently visit the site.
- The site is mapped as Regulated Vegetation classed as essential habitat for the Koala under the *Vegetation Management Act 1999*. On-ground assessment confirmed the Regional Ecosystems and associated species mix are present on site.
- Overall, the site was disturbed as result of historical land use including logging, slashing and grazing as well as surrounding development which has resulted in the invasion of weeds as a result of the creation vehicle access tracks. Contextually, the site reflects only a very a small disturbed area in the broader landscape of retained vegetation to the north and its associated ecological values and function.
- With regards to flora, fifty (50) flora species were identified on site throughout the field assessment, with the majority being native to the area.
- A number of weeds were identified throughout the site including weeds declared under the *Land Protection (Pest and Stock Route Management) Act 2002*, specifically *Lantana camara* (Lantana) *Eragrostis curvula* (African Lovegrass), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton).
- With regards to fauna, forty-four (44) species composed of twenty-seven (27) birds, seven (7) mammals, eight (8) reptiles and two (2) amphibians were recorded on-site. Limited habitat is available for ground



dwelling fauna as a result of previous clearings, impediments to movement and ongoing slashing. Most areas contained reduced values with sparse cover of grasses and leaf litter. The highest structural diversity of the lower strata was restricted to the gully area which are not regularly slashed.

The site contains a generally consistent cover of vegetation, however as noted above a number of disturbances from edge effects, weed invasion, creation of access tracks and increases in domestic and feral animals from surrounding development have left the site heavily disturbed. Further, the site is devoid of notable ecological features such as significant rocky outcrops and waterways. While connectivity to Opossum Creek conservation corridor remains to the north, disturbance from the encompassing Brookwater golf course has resulted in edge effects surrounding this vegetated pocket has resulted in heavy infestations of weeds, particularly along access tracks

Overall, the site is considered to be disturbed and limited in its ability to provide safe refuge or connectivity for native fauna, particularly when areas of notably preferable habitat for listed and local native species is located along Opossum Creek corridor to the north, outside the development footprint.



4. Appendices

Appendix A

Environment Protection and Biodiversity Conservation Act 1999 Protected Matters Database Search

Appendix B

Nature Conservation Act 1992 (Qld) Wildlife Online Database Search Results

Appendix C

Likelihood of Occurrence Schedule for EPBC Act Listed MNES

Appendix D

SAT Survey Results

Appendix E

Habitat Assessment Results



Appendix A

Environment Protection and Biodiversity Conservation Act 1999
Protected Matters Database Search



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: 16/03/16 16:53:51

[Summary](#)

[Details](#)

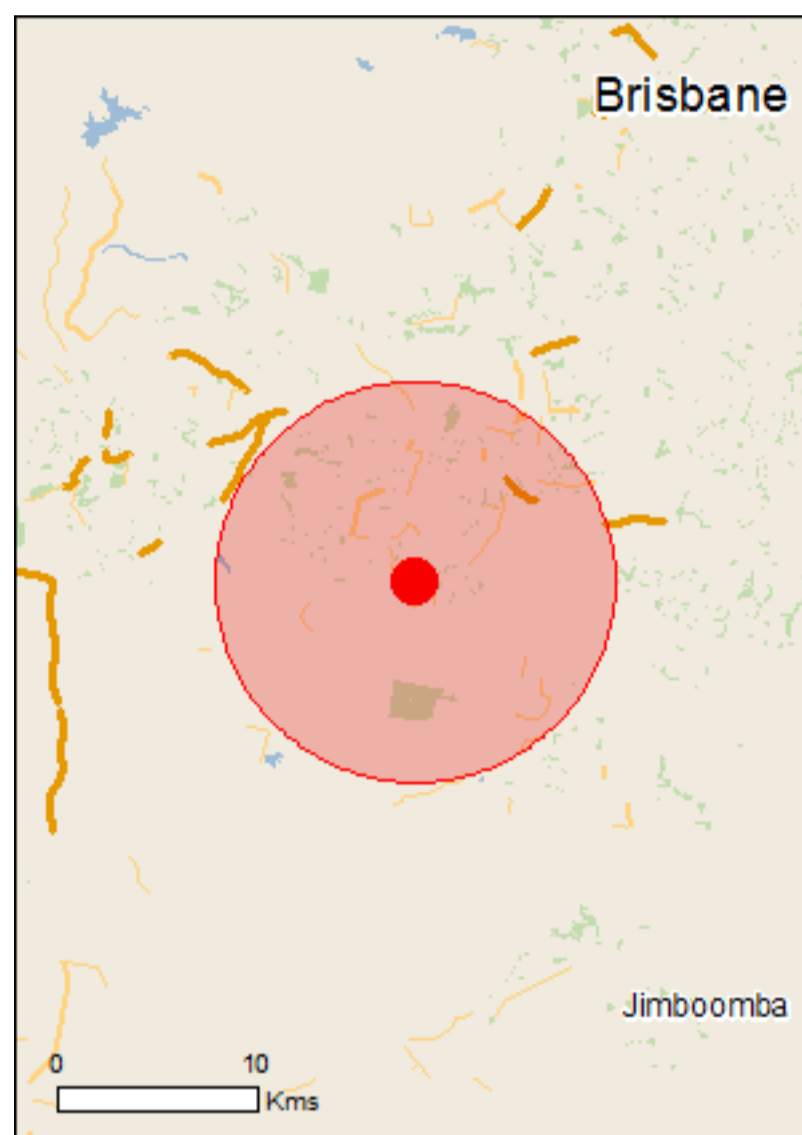
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 10.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	53
Listed Migratory Species:	35

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:	2
Commonwealth Heritage Places:	1
Listed Marine Species:	37
Whales and Other Cetaceans:	1
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	42
Nationally Important Wetlands:	1
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 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 likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to 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 likely to occur within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area
Poephila cincta cincta Black-throated Finch (southern) [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta salvini Salvin's Albatross [82343]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris impavida Campbell Albatross [82449]	Vulnerable	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		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Insects		
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	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 hallucatus Northern Quoll [331]	Endangered	Species or species

Name	Status	Type of Presence
habitat may 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 known to 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
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Other		
Cycas ophiolitica		
[55797]	Endangered	Species or species habitat likely to occur within area
Plants		
Arthraxon hispidus		
Hairy-joint Grass [9338]	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
Corchorus cunninghamii		
Native Jute [14659]	Endangered	Species or species habitat likely to occur within area
Notelaea ipsviciensis		
Cooneana Olive [81858]	Critically Endangered	Species or species habitat known to occur within area
Notelaea lloydii		
Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis		
Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Phebalium distans		
Mt Berryman Phebalium [81869]	Critically Endangered	Species or species habitat may occur within area
Plectranthus habrophyllus		
[64589]	Endangered	Species or species habitat likely to occur within area
Sophora fraseri		
[8836]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta		
Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area
Delma torquata Collared Delma [1656]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Furina dunmali Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to 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
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Macronectes giganteus Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Migratory Marine Species		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat known to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known 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 known to occur

Name	Threatened	Type of Presence within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to 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

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Defence - GREENBANK TRAINING AREA
Defence - SANANANDA BARRACKS - WACOL

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Natural		
Greenbank Military Training Area (part)	QLD	Listed place

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		
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]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Species or species habitat may occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	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 known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may 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 known to 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 known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Reptiles

Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Whales and other Cetaceans

[[Resource Information](#)]

Name	Status	Type of Presence
Mammals		
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Stewartdale	QLD
White Rock	QLD

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 Resources Audit, 2001.

Name	Status	Type of Presence
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Birds

Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
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Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
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Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
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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
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Frogs

Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
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Mammals

Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
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Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
--	--	--

Equus caballus Horse [5]		Species or species habitat likely to occur within area
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Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
--	--	--

Name	Status	Type of Presence
Feral deer Feral deer species in Australia [85733]		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		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
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]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		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
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		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		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Sage, Wild Sage [10892] Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		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
Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		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 Sterile Pussy Willow [68497]		Species or species 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
Nationally Important Wetlands		[Resource Information]
Name		State
Greenbank Army Training Area C		QLD

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.

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

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

- migratory and
- marine

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

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

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

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

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

Coordinates

-27.6649 152.90035

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](#)
- [-Parks and Wildlife Commission NT, Northern Territory Government](#)
- [-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, Atherton and Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- Other groups and individuals

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

Please feel free to provide feedback via the [Contact Us](#) page.



Appendix B

Nature Conservation Act 1992 (Qld)
Wildlife Online Database Search Results



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: All
Latitude: -27.6668
Longitude: 152.9016
Distance: 10
Email: keiragrundy@saundershavill.com
Date submitted: Wednesday 16 Mar 2016 15:52:19
Date extracted: Wednesday 16 Mar 2016 16:00:03

The number of records retrieved = 24

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	Limnodynastidae	<i>Adelotus brevis</i>	tusked frog		V		11
animals	birds	Accipitridae	<i>Erythrotriorchis radiatus</i>	red goshawk		E	V	1
animals	birds	Cacatuidae	<i>Calyptorhynchus lathami lathami</i>	glossy black-cockatoo (eastern)		V		12
animals	birds	Falconidae	<i>Falco hypoleucos</i>	grey falcon		V		1
animals	birds	Psittacidae	<i>Lathamus discolor</i>	swift parrot		E	E	3
animals	birds	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe		V	E	8
animals	birds	Strigidae	<i>Ninox strenua</i>	powerful owl		V		15
animals	birds	Turnicidae	<i>Turnix melanogaster</i>	black-breasted button-quail		V	V	2
animals	cartilaginous fishes	Dasyatidae	<i>Dasyatis fluviorum</i>	estuary stingray		NT		1
animals	mammals	Dasyuridae	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)		V	E	3
animals	mammals	Delphinidae	<i>Orcaella heinsohni</i>	Australian snubfin dolphin		V		2
animals	mammals	Macropodidae	<i>Petrogale penicillata</i>	brush-tailed rock-wallaby		V	V	3
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		V	V	572
animals	mammals	Vombatidae	<i>Vombatus ursinus</i>	common wombat		NT		1
animals	reptiles	Elapidae	<i>Acanthophis antarcticus</i>	common death adder		V		1
plants	conifers	Cupressaceae	<i>Callitris baileyi</i>	Bailey's cypress		NT		1
plants	higher dicots	Apiaceae	<i>Lilaeopsis brisbanica</i>			E		1/1
plants	higher dicots	Apocynaceae	<i>Marsdenia coronata</i>	slender milkvine		V		19/19
plants	higher dicots	Lamiaceae	<i>Plectranthus habrophyllus</i>			E	E	11/11
plants	higher dicots	Myrtaceae	<i>Eucalyptus curtisii</i>	Plunkett mallee		NT		17/16
plants	higher dicots	Myrtaceae	<i>Melaleuca irbyana</i>			E		1/1
plants	higher dicots	Oleaceae	<i>Notelaea ipsviciensis</i>			E	CE	12/12
plants	higher dicots	Oleaceae	<i>Notelaea lloydii</i>	Lloyd's native olive		V	V	6/6
plants	lower dicots	Hernandiaceae	<i>Hernandia bivalvis</i>	cudgerie		NT		2/1

CODES

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

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

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

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).

This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.



Appendix C

Likelihood of Occurrence Schedule for EPBC Listed MNES



Table A: PMST Likelihood of Occurrence Schedule

Listed Threatened Ecological Communities						
Name	Status	Type of Presence	Description of Community		Likelihood of Occurrence	Site
<i>Lowland rainforest of Subtropical Australia</i>	Critically Endangered	This Threatened Ecological Community is listed as a community that may occur within the area.	Typically there is a relatively low abundance of species from the genera <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Casuarina</i> . Buttresses are common as is an abundance and diversity of vines. This community is usually associated with Regional Ecosystems 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1, and 12.12.16.		No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. TEC is unlikely to occur.	Not recorded
<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>	Critically Endangered	This Threatened Ecological Community is listed as a community likely to occur within the area.	This threatened community is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs and the dominance of White Box, Yellow Box, or Blakely's Red gum trees. This community is usually associated with Regional Ecosystem 11.8.2a, 11.8.8, 11.9.9a, 13.3.1, 13.11.8, and 13.12.9. It can also be a small component of Regional Ecosystem 11.3.23, 12.8.16, 13.3.4, 13.11.3 and 13.11.4.		No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. TEC is unlikely to occur.	Not recorded
Birds						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Anthochaera phrygia</i>	Regent Honeyeater	Endangered	82338	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes.	The Regent Honeyeater has been recorded at 15 sites across Queensland, primarily south of the Sunshine Coast and Chinchilla. These records have been on Bribie Island and in the Granite Belt. Regular records in the Gore-Karara area suggest a small breeding population may have been present in the mid-1990s. The Regent Honeyeater is also known as a visitor to the Sundown National Park. Given the disturbed nature of the site and the lack of specific recordings of the species in the surrounding area, it is unlikely to occur on site. The species is unlikely to occur.	Not observed
<i>Botaurus poiciloptilus</i>	Australasian Bittern	Endangered	1001	The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate southeast and southwest. It 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,	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed



				or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate.		
<i>Cyclopsitta diophthalmacoxeni</i>	Coxen's Fig Parrot	Endangered	59714	The Coxen's fig Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest. Food is mainly taken from figs however other species fruit have been recorded in their diet including <i>Elaeocarpus grandis</i> , <i>Syzygium corynanthum</i> , <i>Litsea reticulata</i> and <i>Grevillea robusta</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	Endangered	533	The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Erythrotriorchis radiatus</i>	Red Goshawk	Vulnerable	942	A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey.	Due to a lack of records within the local area, it is unlikely that this species will occur. However, possible foraging habitat throughout some of the mapped remnant areas. There appears to be no evidence of permanent residence on site. Species is unlikely to occur.	Not observed
<i>Geophaps scripta</i>	Squatter Pigeon (southern)	Vulnerable	64440	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture.	No confirmed local records. The species is now very rarely observed in southern Queensland. Not expected onsite and no direct impact from proposed actions. Species is unlikely to occur.	Not observed
<i>Lathamus discolor</i>	Swift Parrot	Endangered	744	Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations. While the species is very uncommon in south-east Queensland, its occurrence cannot be completely discounted. There are suitable winter flowering species present on the site which may attract birds during flowering (eg <i>E. tereticornis</i>).	Due to a lack of records within the local area, it is highly unlikely that this species will occur. Species is unlikely to occur.	Not observed

environmental management
technical note



<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	470	The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The species inhabits 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. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes.	Due to a lack of records within the local area, it is highly unlikely that this species will occur. Species is unlikely to occur.	Not observed
<i>Peophila cincta cincta</i>	Black-throated Finch (southern)	Endangered	64447	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water. It 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; and at scattered sites in central-eastern Queensland (between Aramac and Great Basalt Wall National Park). It has been absent from Brisbane and its surrounds since the 1930s.	Due to a lack of records within the local area, it is unlikely that this species will occur. Species is unlikely to occur.	Not observed
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	77037	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Turnix melanogaster</i>	Black-breasted Button-quail	Vulnerable	923	Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However the species has also been recorded in a variety of low coastal heathlands around Frazer Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured.	Little to no suitable habitat for this species occurs and it has not been recorded in the area. Species is unlikely to occur.	Not observed
Insects						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Phyllodes imperialis smithersi</i>	Pink Underwing Moth	Endangered	86084	The Pink Underwing Moth is found below the altitude of 600m in undisturbed, subtropical rainforest. It occurs in association with the vine <i>Carronia multisepealea</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
Mammals						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site

environmental management
technical note



<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	Vulnerable	183	The Large-eared Pied Bat roosts on sandstone cliffs and fertile woodland valley habitat within close proximity of each other. However in South-east Queensland habitat includes rainforest and moist eucalypt forest habitats at high elevations.	No confirmed local records of this uncommon species. Inhabits mesic vegetation. Not expected to occur and no impact expected. Species is unlikely to occur.	Not observed
<i>Dasyurus hallucatus</i>	Northern Quoll	Endangered	331	The Northern Quoll is known to occur as far south as Gracemere and Mr Morgan, south of Rockhampton and as far north as Cooktown. There have also been occasional records as far south as Maleny on the Sunshine coast hinterland. The species occupies rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grassland and desert. Preferred habitat in Queensland suggests the Northern Quoll are more likely to be present in high relief areas that have shallower soils, greater cover of boulders, less fire impact and were close to permanent water.	Due to the large amount of disturbances and impacts from fire, no suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	75184	The Spot-tailed Quoll has a preference for mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This predominantly nocturnal species rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage.	Due to the large amount of disturbances and lack of suitable rocky outcrops, no suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	Vulnerable	225	This species prefers rocky habitat, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. Although rocky outcrops are crucial, vegetation structure and composition is also considered to be important. This species appears closely associated with dense arboreal cover, especially fig trees however dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophyll forest and open forests are important.	No suitable habitat or evidence was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Phascolarctos cinereus</i>	Koala	Vulnerable	85104	They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the surrounding area and evidence has been recorded on-site.	Areas of suitable habitat were observed on site. Species known to occur on site.	Evidence of Koalas in the form of observations and scats.



<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	Vulnerable	186	Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feed on commercial fruit crops. The primary food source is blossom from Eucalyptus and related genera.	No camps were observed throughout the assessment area however food resources cover the site. This species is highly likely to occur when the Eucalypts are in flower and is known to occur in the broader area. Species has potential to occur.	Not observed
Other						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Cycas ophiolitica</i>	Marlborough Blue	Endangered	55797	Inhabits eucalypt open forest and woodland communities with a grassy understorey. They occur on hill tops or steep slopes, at altitudes of 80-620m above sea level. It grows on shallow, stoney, red clay loams or sandy soils.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
Plants						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Bosistoa selwynii</i>	Heart-leaved Bosistoa	Vulnerable	13702	The Heart-leaved Bosistoa is similar to the Three-leaved Bosistoa and is conserved within Mt Warning National Park, Numbinah Nature Reserve, Limpinwood Nature Reserve and When Whian State Forest. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. It is commonly associated with <i>Argyrodendron trifoliolatum</i> , <i>Syzygium hodgkinsoniae</i> , <i>Endiandra pubens</i> , <i>Dendrocnide photinophylla</i> , <i>Acmena ingens</i> , <i>Diploglottis australis</i> and <i>Diospyros mabacea</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Bosistoa transversa</i>	Three-leaved Bosistoa	Vulnerable	16091	The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinah Nature Reserve, Limpinwood Nature Reserve and Whian Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 meters in altitude. It is commonly associated with <i>Argyrodendron trifoliolatum</i> , <i>Syzygium hodgkinsoniae</i> , <i>Endiandra pubens</i> , <i>Dendrocnide photinophylla</i> , <i>Acmena ingens</i> , <i>Diploglottis australis</i> and <i>Diospyros mabacea</i> .	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded

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<i>Notelaea ipsviciensis</i>	Cooneana Olive	Critically Endangered	81858	The Cooneana Olive is known to only occur within three closely clustered sub-populations within Ipswich, those being, Murphy's Gully (111km west), a site adjacent to the Cunningham Highway (closest point of Cunningham Highway from the site is 23.6km west) and Bergin's Hill (15km west). Given the very specific locations of this plant and its distribution away from the site, it is likely that the Cooneana Olive does not occur.	The Cooneana Olive occurs in specific locations around Ipswich. The plant has never been recorded on or in close proximity to the site. Species is unlikely to occur.	Not recorded
<i>Notelaea lloydii</i>	Lloyd's Olive	Vulnerable	15002	Lloyd's Olive is known at five locations in south-east Queensland, those being Mt Crosby (31km north-west), Boonah (50km south-west), Moggill State Forest (17km north), an unnamed state forest and Moogerah Peaks National Park (73km south-west). It occurs in hilly terrain in moist gullies with shallow, well drained and stoney to very rocky soils. Given the specific and known location of this species' occurrence, it is unlikely that it occurs on the site.	The Lloyd's Olive has not been recorded on or in close proximity to the site. Its distribution is restricted to the five identified locations. Species is unlikely to occur.	Not recorded
<i>Phaius australis</i>	Lesser Swamp Orchid	Endangered	5872	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (<i>Lophostemon suaveolens</i>), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (<i>Archontophoenix cunninghamiana</i>) or Cabbage Tree Palm (<i>Livistona australis</i>).	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Phebalium distans</i>	Mt Berryman Phebalium	Critically Endangered	81869	Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period. Vegetation associations in which Mt Berryman Phebalium occur include microphyll to notophyll vine forest with or without <i>Araucaria cunninghamii</i> and low microphyll vine forest and semi-evergreen vine thicket with or without <i>Araucaria cunninghamii</i> which can be divided further into regional ecosystems depending on substrate, geography and associated vegetation species.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded



<i>Plectranthus habrophyllus</i>		Endangered	64589	<i>Plectranthus habrophyllus</i> is a woody, square stemmed herb with scented foliage and is known to occur in only 6 locations across South East Queensland. This includes Oxley Creek in Greenbank (10km east), Opposum Creek, Springfield (1.5km east), White Rock Conservation Park (3km south) and Ormeau (50km east). Opposum Creek and White Rock Conservation Park are both located in close proximity to the site, suggesting that there is potential for the herb to occur on the subject site. Given the specific known locations of the herb, it is likely that the herb does not occur on the site. It occurs on rock outcrops of sandstone or chart in shaded situations in Eucalypt woodland often close to vine forest.	<i>Plectranthus habrophyllus</i> has been recorded in very specific locations within SEQ. Given that there are no records of the species on the site, it is unlikely that it occurs. Species is unlikely to occur.	Not recorded
<i>Sophera fraseri</i>		Vulnerable	8836	<i>Sophera fraseri</i> grows in moist habitats, often in hilly terrain at altitudes form 60-660m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest comminties.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Streblus pendulinus</i>	Siah's Backbone	Endangered	21618	On the Australian mainland, Siah's Backbone is found in warmer rainforests, chiefly along watercourses. The altitudinal range is from near sea level to 800 m above sea level. The species grows in well-developed rainforest, gallery forest and drier, more seasonal rainforest.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
<i>Thesium australe</i>	Austral Toadflax	Vulnerable	15202	Austral Toadflax is semi-parasitic on roots of a range of grass species notably Kangaroo Grass (<i>Themeda triandra</i>) (Scarlett et al. 1994). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not recorded
Reptiles						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Delma torquata</i>	Collared Delma	Vulnerable	1656	The Collard Delma inhabits eucalypt-dominated woodlands and open-forests in Land Zones 3 (Alluvium), 9 (undulating country or fine-grained sedimentary rocks), 10 (sandstone ranges). Common Regional Ecosystems (RE) include RE 11.3.2, RE 11.9.10, RE 11.10.1 and RE 11.10.4. These REs are located in Bioregion 11 (Brigalow Belt), located to the north and west of South East Queensland. The species is also known in the Toowoomba Ranges in habitats associated with exposed rocky outcrops	Important populations of the species are associated with important habitats found in the Brigalow Belt (Bioregion 11). Larger population records of the species west of Brisbane include Kenmore, Pinjarra Hills, Anstead, Mt Crosby, Lake Manchester and Karana Downs. The species has	Not recorded



				on ridges or slopes in vegetation communities dominated by Narrow-Leaf Ironbark (<i>Eucalyptus crebra</i>). Other areas where the species has been recorded is the Mt Crosby and Moggill State Forest sites, as well as Anstead and Pinjarra Hills.	not been recorded on, or in close proximity to the site. Species is unlikely to occur.	
<i>Furina dunmali</i>	Dunmall's Snake	Vulnerable	59254	Dunmall's Snake has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow other Wattles, native Cypress or Bull-oak, and various Blue Spotted Gum, Ironbark, White Cypress Pine and Bullock open forest and woodland associations on sandstone derived soils. Dunmall's Snake occurs primarily in the Brigalow Belt region in the South-eastern interior of Queensland. Records indicate sites at elevations between 200–500 m above sea level. The snake is very rare or secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed



Table B: Likelihood of Occurrence Schedule (Migratory Species)

Migratory Marine Birds						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Apus pacificus</i>	Fork-tailed Swift	Migratory	678	This species is almost exclusively aerial and mostly occur over inland palins but sometimes above foothills or in coastal areas.	Possible as a fly over species however no impact to this species is likely to occur. Species is unlikely to occur.	Not observed
Migratory Terrestrial Species						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Hirundapus caudacutus</i>	White-throated Needletail	Migratory	682	The White-throated Needletail is almost exclusively aerial. This species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests.	Low potential to occur on site within roosting periods. Species is unlikely to occur.	Not observed
<i>Merops ornatus</i>	Rainbow Bee-eater	Migratory	670	The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Habitat available on site and species recorded throughout field survey. Species has potential to occur.	Observed
<i>Monarcha melanopsis</i>	Black-faced Monarch	Migratory	609	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Monarcha trivirgatus</i>	Spectacled Monarch	Migratory	610	The Spectacled Monarchs natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed

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<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Migratory	612	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Rhipidura rufifrons</i>	Rufous Fantail	Migratory	592	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as <i>Eucalyptus microcorys</i> , <i>Eucalyptus pilularis</i> , <i>Eucalyptus resinifera</i> and a number of other Eucalyptus species.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
Migratory Wetland Species						
Species	Common Name	Status	EPBC Code	Description of Community / Habitat	Likelihood of Occurrence	Site
<i>Ardea alba</i>	Great Egret	Migratory	59541	The Great Egret has been recorded in a wide range of wetland habitats including inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Ardea ibis</i>	Cattle Egret	Migratory	59542	The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands and is commonly found in cattle fields and other farm areas that contain livestock.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Gallinago hardwickii</i>	Latham's Snipe	Migratory	863	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed
<i>Pandion haliaetus</i>	Osprey	Migratory	952	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia.	No suitable habitat was observed throughout the assessment area. Species is unlikely to occur.	Not observed



Appendix D

SAT Survey Results



SAT 1			
Date:	27 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Eucalyptus major</i>	190	Yes
2	<i>Eucalyptus tereticornis</i>	290	
3	<i>Corymbia intermedia</i>	190	
4	<i>Eucalyptus major</i>	210	
5	<i>Corymbia tessellaris</i>	170	
6	<i>Corymbia intermedia</i>	160	
7	<i>Corymbia intermedia</i>	170	
8	<i>Corymbia intermedia</i>	180	
9	<i>Eucalyptus seeana</i>	260	
10	<i>Corymbia intermedia</i>	200	Yes
11	<i>Eucalyptus seeana</i>	160	
12	<i>Corymbia tessellaris</i>	120	
13	<i>Corymbia tessellaris</i>	200	
14	<i>Corymbia tessellaris</i>	200	
15	<i>Corymbia intermedia</i>	120	
16	<i>Corymbia intermedia</i>	210	Yes
17	<i>Eucalyptus tereticornis</i>	160	
18	<i>Eucalyptus major</i>	130	Yes
19	<i>Corymbia intermedia</i>	230	
20	<i>Corymbia intermedia</i>	120	
21	<i>Corymbia intermedia</i>	120	
22	<i>Eucalyptus tereticornis</i>	240	
23	<i>Eucalyptus major</i>	230	
24	<i>Corymbia intermedia</i>	270	
25	<i>Corymbia intermedia</i>	670	
26	<i>Corymbia intermedia</i>	180	
27	<i>Eucalyptus major</i>	170	
28	<i>Corymbia intermedia</i>	330	
29	<i>Corymbia intermedia</i>	310	
30	<i>Eucalyptus seeana</i>	350	



SAT 2			
Date:	27 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Eucalyptus tereticornis</i>	390	Yes
2	<i>Eucalyptus tereticornis</i>	240	
3	<i>Eucalyptus tereticornis</i>	160	
4	<i>Angophora leiocarpa</i>	380	
5	<i>Alphitonia excelsa</i>	120	
6	<i>Eucalyptus tereticornis</i>	120	
7	<i>Eucalyptus tereticornis</i>	450	
8	<i>Eucalyptus siderophloia</i>	420	
9	<i>Eucalyptus siderophloia</i>	310	
10	<i>Eucalyptus tereticornis</i>	600	
11	<i>Acacia concurrens</i>	100	
12	<i>Eucalyptus tereticornis</i>	190	
13	<i>Lophostemon suaveolens</i>	280	
14	<i>Corymbia intermedia</i>	300	
15	<i>Angophora leiocarpa</i>	320	
16	<i>Eucalyptus tereticornis</i>	260	
17	<i>Eucalyptus major</i>	140	
18	<i>Angophora leiocarpa</i>	430	
19	<i>Corymbia intermedia</i>	350	
20	<i>Eucalyptus tereticornis</i>	230	
21	<i>Eucalyptus tereticornis</i>	550	Yes
22	<i>Eucalyptus tereticornis</i>	600	
23	<i>Eucalyptus tereticornis</i>	640	Yes
24	<i>Lophostemon suaveolens</i>	110	
25	<i>Eucalyptus tereticornis</i>	390	
26	<i>Eucalyptus tereticornis</i>	180	
27	<i>Eucalyptus tereticornis</i>	440	
28	<i>Eucalyptus tereticornis</i>	180	
29	<i>Acacia concurrens</i>	160	
30	<i>Acacia concurrens</i>	190	



SAT 3			
Date:	27 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Eucalyptus major</i>	450	Yes
2	<i>Corymbia intermedia</i>	300	
3	<i>Corymbia intermedia</i>	210	
4	<i>Eucalyptus tereticornis</i>	200	
5	<i>Corymbia intermedia</i>	200	
6	<i>Eucalyptus seeana</i>	320	
7	<i>Eucalyptus tereticornis</i>	230	
8	<i>Acacia concurrens</i>	120	
9	<i>Acacia concurrens</i>	150	
10	<i>Corymbia intermedia</i>	280	
11	<i>Lophostemon suaveolens</i>	130	
12	<i>Eucalyptus tereticornis</i>	130	Yes
13	<i>Corymbia intermedia</i>	200	
14	<i>Lophostemon suaveolens</i>	160	Yes
15	<i>Eucalyptus tereticornis</i>	230	
16	<i>Acacia concurrens</i>	240	
17	<i>Acacia disparrima</i>	210	
18	<i>Acacia concurrens</i>	160	
19	<i>Corymbia intermedia</i>	140	
20	<i>Eucalyptus tereticornis</i>	170	Yes
21	<i>Eucalyptus seeana</i>	220	
22	<i>Corymbia intermedia</i>	120	
23	<i>Corymbia intermedia</i>	290	
24	<i>Lophostemon suaveolens</i>	140	Yes
25	<i>Eucalyptus seeana</i>	200	
26	<i>Corymbia intermedia</i>	210	
27	<i>Lophostemon suaveolens</i>	120	
28	<i>Corymbia intermedia</i>	240	
29	<i>Eucalyptus tereticornis</i>	200	
30	<i>Eucalyptus tereticornis</i>	220	



SAT 4			
Date:	27 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Corymbia citriodora</i>	240	Yes
2	<i>Eucalyptus major</i>	290	
3	<i>Angophora leiocarpa</i>	230	
4	<i>Corymbia citriodora</i>	290	
5	<i>Eucalyptus major</i>	200	
6	<i>Corymbia citriodora</i>	270	
7	<i>Eucalyptus major</i>	220	yes
8	<i>Eucalyptus major</i>	120	
9	<i>Eucalyptus major</i>	160	
10	<i>Eucalyptus major</i>	130	
11	<i>Eucalyptus major</i>	160	
12	<i>Corymbia citriodora</i>	170	
13	<i>Corymbia citriodora</i>	200	
14	<i>Corymbia citriodora</i>	220	
15	<i>Corymbia citriodora</i>	220	
16	<i>Eucalyptus major</i>	200	
17	<i>Corymbia citriodora</i>	300	
18	<i>Corymbia citriodora</i>	260	
19	<i>Eucalyptus siderophloia</i>	140	
20	<i>Corymbia citriodora</i>	120	
21	<i>Corymbia citriodora</i>	290	
22	<i>Eucalyptus major</i>	260	
23	<i>Eucalyptus major</i>	220	
24	<i>Corymbia citriodora</i>	260	
25	<i>Eucalyptus tereticornis</i>	190	
26	<i>Corymbia citriodora</i>	240	
27	<i>Corymbia citriodora</i>	310	
28	<i>Corymbia citriodora</i>	240	
29	<i>Eucalyptus major</i>	210	
30	<i>Eucalyptus major</i>	200	



SAT 5			
Date:	27 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Allocasuarina littoralis</i>	130	KOALA
2	<i>Corymbia citriodora</i>	420	
3	<i>Eucalyptus major</i>	230	
4	<i>Lophostemon suaveolens</i>	160	
5	<i>Corymbia citriodora</i>	150	
6	<i>Corymbia citriodora</i>	220	
7	<i>Angophora leiocarpa</i>	200	
8	<i>Angophora leiocarpa</i>	220	
9	<i>Allocasuarina littoralis</i>	170	
10	<i>Angophora leiocarpa</i>	120	
11	<i>Eucalyptus seeana</i>	160	
12	<i>Eucalyptus siderophloia</i>	240	
13	<i>Eucalyptus siderophloia</i>	400	Yes
14	<i>Corymbia citriodora</i>	280	
15	<i>Corymbia intermedia</i>	140	
16	<i>Eucalyptus seeana</i>	280	
17	<i>Corymbia citriodora</i>	270	
18	<i>Eucalyptus major</i>	230	
19	<i>Eucalyptus siderophloia</i>	240	
20	<i>Angophora leiocarpa</i>	300	
21	<i>Angophora leiocarpa</i>	220	
22	<i>Allocasuarina littoralis</i>	130	
23	<i>Eucalyptus siderophloia</i>	380	
24	<i>Corymbia intermedia</i>	320	
25	<i>Corymbia citriodora</i>	240	
26	<i>Eucalyptus major</i>	240	
27	<i>Corymbia citriodora</i>	300	Yes
28	<i>Eucalyptus major</i>	160	
29	<i>Eucalyptus major</i>	240	
30	<i>Eucalyptus major</i>	170	



SAT 6			
Date:	28 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Corymbia intermedia</i>	320	Scats
2	<i>Corymbia intermedia</i>	200	
3	<i>Corymbia citriodora</i>	420	
4	<i>Eucalyptus seeana</i>	210	
5	<i>Corymbia intermedia</i>	210	
6	<i>Corymbia intermedia</i>	300	
7	<i>Eucalyptus seeana</i>	190	
8	<i>Corymbia intermedia</i>	160	
9	<i>Eucalyptus fibrosa</i>	290	
10	<i>Allocasuarina littoralis</i>	150	
11	<i>Corymbia intermedia</i>	200	
12	<i>Corymbia intermedia</i>	120	
13	<i>Corymbia intermedia</i>	300	
14	<i>Corymbia intermedia</i>	240	
15	<i>Eucalyptus seeana</i>	260	Scats
16	<i>Eucalyptus seeana</i>	150	
17	<i>Eucalyptus seeana</i>	160	
18	<i>Corymbia citriodora</i>	280	
19	<i>Corymbia intermedia</i>	100	
20	<i>Angophora leiocarpa</i>	450	
21	<i>Lophostemon sauveolens</i>	100	
22	<i>Corymbia intermedia</i>	240	
23	<i>Angophora leiocarpa</i>	180	
24	<i>Corymbia intermedia</i>	140	
25	<i>Corymbia citriodora</i>	200	
26	<i>Angophora leiocarpa</i>	190	
27	<i>Allocasuarina littoralis</i>	120	
28	<i>Angophora leiocarpa</i>	140	
29	<i>Allocasuarina littoralis</i>	120	
30	<i>Angophora leiocarpa</i>	250	



SAT 7			
Date:	28 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Corymbia intermedia</i>	310	Scats
2	<i>Corymbia intermedia</i>	190	
3	<i>Corymbia intermedia</i>	160	
4	<i>Corymbia intermedia</i>	180	
5	<i>Corymbia intermedia</i>	150	
6	<i>Corymbia intermedia</i>	200	
7	<i>Corymbia intermedia</i>	210	
8	<i>Eucalyptus major</i>	210	Scats
9	<i>Angophora leiocarpa</i>	120	
10	<i>Eucalyptus tereticornis</i>	310	
11	<i>Eucalyptus siderophloia</i>	490	
12	<i>Corymbia intermedia</i>	140	
13	<i>Allocasuarina littoralis</i>	110	
14	<i>Corymbia intermedia</i>	140	
15	<i>Corymbia intermedia</i>	250	
16	<i>Angophora leiocarpa</i>	170	
17	<i>Corymbia intermedia</i>	120	
18	<i>Eucalyptus siderophloia</i>	320	Scats
19	<i>Corymbia intermedia</i>	100	
20	<i>Eucalyptus major</i>	320	Scats
21	<i>Eucalyptus seeana</i>	220	
22	<i>Allocasuarina littoralis</i>	100	
23	<i>Eucalyptus major</i>	210	Scats
24	<i>Eucalyptus seeana</i>	120	
25	<i>Eucalyptus major</i>	240	
26	<i>Corymbia intermedia</i>	210	
27	<i>Eucalyptus major</i>	150	
28	<i>Acacia concurrens</i>	160	
29	<i>Corymbia intermedia</i>	270	
30	<i>Acacia concurrens</i>	110	



SAT 8			
Date:	28 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Corymbia citriodora</i>	210	Scats
2	<i>Eucalyptus moluccana</i>	310	
3	<i>Eucalyptus moluccana</i>	180	
4	<i>Eucalyptus moluccana</i>	220	
5	<i>Eucalyptus moluccana</i>	110	
6	<i>Eucalyptus moluccana</i>	290	Scats
7	<i>Corymbia citriodora</i>	220	
8	<i>Eucalyptus moluccana</i>	110	
9	<i>Corymbia citriodora</i>	290	
10	<i>Eucalyptus moluccana</i>	150	
11	<i>Corymbia citriodora</i>	200	
12	<i>Corymbia citriodora</i>	220	
13	<i>Eucalyptus moluccana</i>	150	
14	<i>Corymbia citriodora</i>	120	
15	<i>Corymbia citriodora</i>	200	
16	<i>Eucalyptus moluccana</i>	240	
17	<i>Corymbia citriodora</i>	170	
18	<i>Corymbia citriodora</i>	120	
19	<i>Eucalyptus siderophloia</i>	100	
20	<i>Angophora leiocarpa</i>	120	
21	<i>Eucalyptus moluccana</i>	150	
22	<i>Eucalyptus moluccana</i>	290	
23	<i>Eucalyptus moluccana</i>	190	
24	<i>Corymbia citriodora</i>	210	
25	<i>Eucalyptus moluccana</i>	300	
26	<i>Corymbia citriodora</i>	190	
27	<i>Corymbia citriodora</i>	170	
28	<i>Corymbia citriodora</i>	110	
29	<i>Corymbia citriodora</i>	100	
30	<i>Corymbia citriodora</i>	160	



SAT 9			
Date:	28 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Eucalyptus siderophloia</i>	290	Scats
2	<i>Corymbia citriodora</i>	560	
3	<i>Eucalyptus fibrosa</i>	640	
4	<i>Eucalyptus seeana</i>	190	
5	<i>Eucalyptus siderophloia</i>	460	
6	<i>Eucalyptus fibrosa</i>	350	
7	<i>Eucalyptus fibrosa</i>	310	
8	<i>Eucalyptus fibrosa</i>	260	
9	<i>Eucalyptus fibrosa</i>	250	
10	<i>Lophostemon confertus</i>	240	
11	<i>Lophostemon confertus</i>	110	
12	<i>Lophostemon confertus</i>	120	
13	<i>Eucalyptus seeana</i>	180	Scats
14	<i>Eucalyptus seeana</i>	200	
15	<i>Eucalyptus fibrosa</i>	180	
16	<i>Eucalyptus major</i>	160	
17	<i>Eucalyptus siderophloia</i>	400	
18	<i>Lophostemon confertus</i>	170	
19	<i>Lophostemon confertus</i>	160	
20	<i>Eucalyptus major</i>	180	
21	<i>Lophostemon confertus</i>	190	
22	<i>Eucalyptus tereticornis</i>	160	
23	<i>Lophostemon confertus</i>	310	
24	<i>Eucalyptus tereticornis</i>	200	
25	<i>Corymbia citriodora</i>	340	
26	<i>Lophostemon sauveolens</i>	180	
27	<i>Eucalyptus siderophloia</i>	400	
28	<i>Eucalyptus siderophloia</i>	360	
29	<i>Corymbia citriodora</i>	360	



SAT 10			
Date:	28 May 2015	Springfield, Brookwater	
No.	Species Name	DBH	Scats
1	<i>Eucalyptus major</i>	220	Scats
2	<i>Eucalyptus major</i>	130	
3	<i>Corymbia citriodora</i>	160	
4	<i>Corymbia citriodora</i>	250	
5	<i>Eucalyptus major</i>	190	
6	<i>Eucalyptus major</i>	200	
7	<i>Corymbia citriodora</i>	220	
8	<i>Eucalyptus major</i>	200	
9	<i>Corymbia citriodora</i>	250	
10	<i>Corymbia citriodora</i>	240	
11	<i>Eucalyptus major</i>	200	
12	<i>Eucalyptus siderophloia</i>	140	
13	<i>Corymbia citriodora</i>	150	
14	<i>Corymbia intermedia</i>	260	
15	<i>Angophora leiocarpa</i>	170	
16	<i>Eucalyptus major</i>	250	
17	<i>Eucalyptus major</i>	170	Scats
18	<i>Corymbia citriodora</i>	190	
19	<i>Eucalyptus major</i>	180	Scats
20	<i>Corymbia citriodora</i>	100	
21	<i>Corymbia citriodora</i>	250	Scats
22	<i>Eucalyptus major</i>	200	
23	<i>Corymbia citriodora</i>	290	
24	<i>Eucalyptus siderophloia</i>	190	Scats
25	<i>Corymbia citriodora</i>	200	
26	<i>Corymbia citriodora</i>	280	
27	<i>Corymbia citriodora</i>	220	
28	<i>Corymbia intermedia</i>	190	
29	<i>Corymbia citriodora</i>	110	
30	<i>Angophora leiocarpa</i>	400	



Appendix E

Habitat Assessment Results



Habitat Assessment 1			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	21	40.38
<i>Eucalyptus moluccana</i>	Gum-topped Box	3	5.77
<i>Corymbia citriodora</i>	Spotted Gum	16	30.77
<i>Eucalyptus tereticornis</i>	Blue Gum	1	1.92
<i>Eucalyptus siderophloia</i>	Grey Ironbark	10	19.23
<i>Corymbia intermedia</i>	Pink Bloodwood	1	1.92
Total Recorded (DBH > 100mm)		52	100.00
Total Koala Food Trees		14	26.92
Total Primary Koala Food Trees		1	1.92
Total Secondary Koala Food Trees		13	25.00
Total Primary & Secondary Koala Food Trees		14	26.92

Other species	
Scientific Name	Common Name
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Acacia podalyriifolia</i>	Silver Wattle
<i>Allocasuarina littoralis</i>	Black She-oak
<i>Alphitonia excelsa</i>	Soap Tree
<i>Dianella longifolia</i>	
<i>Eragrostis sp.</i>	
<i>Eucalyptus major</i>	Queensland Grey Gum
<i>Parsonia straminea</i>	Monkey Rope Vine
<i>Petalostigma pubescens</i>	Quinine Berry
<i>Poa labillardieri</i>	Tussock Grass

Comments
<p>Cleared vehicle tracks</p> <p>Adjacent golfcourse</p> <p>Chopped logs in vicinity - maintenance</p> <p>Dumped sleepers, piping and soil in vicinity</p>



Habitat Assessment 2			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus seeana</i>	Fine-leaved Red Gum	4	8.70
<i>Eucalyptus major</i>	Queensland Grey Gum	23	50.00
<i>Alphitonia excelsa</i>	Soap Tree	2	4.35
<i>Corymbia tessellaris</i>	Moreton Bay Ash	1	2.17
<i>Eucalyptus resinifera</i>	Red Stringybark	4	8.70
<i>Acacia concurrens</i>	Black Wattle	2	4.35
<i>Corymbia intermedia</i>	Pink Bloodwood	5	10.87
<i>Corymbia citriodora</i>	Spotted Gum	5	10.87
Total Recorded (DBH > 100mm)		46	100.00
Total Koala Food Trees		31	67.39
Total Primary Koala Food Trees		0	0.00
Total Secondary Koala Food Trees		31	67.39
Total Primary & Secondary Koala Food Trees		31	67.39

Other species	
Scientific Name	Common Name
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Cymbopogon refractus</i>	Barbed Wire Grass
<i>Dianella longifolia</i>	
<i>Imperata cylindrica</i>	Blady Grass
<i>Gahnia aspera</i>	Saw Sedge

Comments
<p>Sparse understorey</p> <p>Mid-slope</p> <p>1 x large habitat tree with scratches and hollows (E. seeana)</p>



Habitat Assessment 3			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Corymbia citriodora</i>	Spotted Gum	33	48.53
<i>Eucalyptus moluccana</i>	Gum-topped Box	13	19.12
<i>Eucalyptus tereticornis</i>	Blue Gum	2	2.94
<i>Angophora leiocarpa</i>	Smooth-barked Apple	8	11.76
<i>Corymbia intermedia</i>	Pink Bloodwood	1	1.47
<i>Petalostigma pubescens</i>	Quinine Berry	11	16.18
Total Recorded (DBH > 100mm)		68	100.00
Total Koala Food Trees		15	22.06
Total Primary Koala Food Trees		2	2.94
Total Secondary Koala Food Trees		13	19.12
Total Primary & Secondary Koala Food Trees		15	22.06

Other species	
Scientific Name	Common Name
<i>Acacia concurrens</i>	Black Wattle
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Aristida sp.</i>	
<i>Cymbopogon refractus</i>	Barbed Wire Grass
<i>Alphitonia excelsa</i>	Soap Tree
<i>Xanthorrhoea latifolia</i>	Grass Tree

Comments
Top of ridge Cleared vehicle track Logging evidence Fallen logs on ground Sparse ground layer



Habitat Assessment 4			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus moluccana</i>	Gum-topped Box	7	16.67
<i>Corymbia citriodora</i>	Spotted Gum	23	54.76
<i>Eucalyptus siderophloia</i>	Grey Ironbark	3	7.14
<i>Acacia concurrens</i>	Black Wattle	1	2.38
<i>Eucalyptus tereticornis</i>	Blue Gum	2	4.76
<i>Allocasuarina littoralis</i>	Black She-oak	6	14.29
Total Recorded (DBH > 100mm)		42	100.00
Total Koala Food Trees		12	28.57
Total Primary Koala Food Trees		2	4.76
Total Secondary Koala Food Trees		10	23.81
Total Primary & Secondary Koala Food Trees		12	28.57

Other species	
Scientific Name	Common Name
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Cymbopogon refractus</i>	Barbed Wire Grass
<i>Jacksonia scoparia</i>	Dogwood
<i>Lomandra longifolia</i>	Mat Rush
<i>Lomandra multiflora</i>	Many-flowered Mat Rush
<i>Poa labillardieri</i>	Tussock Grass
<i>Xanthorrhoea latifolia</i>	Grass Tree

Comments
Mid-slope No. of large trees Cleared wide track to north Rocky



Habitat Assessment 5			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus siderophloia</i>	Grey Ironbark	1	1.61
<i>Eucalyptus moluccana</i>	Gum-topped Box	14	22.58
<i>Acacia leiocalyx</i>	Early Black Wattle	1	1.61
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	20	32.26
<i>Corymbia citriodora</i>	Spotted Gum	24	38.71
<i>Angophora leiocarpa</i>	Smooth-barked Apple	2	3.23
Total Recorded (DBH > 100mm)		62	100.00
Total Koala Food Trees		15	24.19
Total Primary Koala Food Trees		0	0.00
Total Secondary Koala Food Trees		15	24.19
Total Primary & Secondary Koala Food Trees		15	24.19

Other species	
Scientific Name	Common Name
<i>Alphitonia excelsa</i>	Soap Tree
<i>Imperata cylindrica</i>	Blady Grass
<i>Jacksonia scoparia</i>	Dogwood
<i>Lantana camara</i>	Lantana
<i>Petalostigma pubescens</i>	Quinine Berry
<i>Poa labillardieri</i>	Tussock Grass
<i>Themeda triandra</i>	Kangaroo Grass
<i>Xanthorrhoea latifolia</i>	Grass Tree

Comments
<p>Mid-upper slope Cleared vehicle tracks Evidence of recent logging Sparse groundlayer Minimal weeds present High fuel load - dead branches</p>



Habitat Assessment 6			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus siderophloia</i>	Grey Ironbark	1	1.59
<i>Eucalyptus moluccana</i>	Gum-topped Box	7	11.11
<i>Corymbia citriodora</i>	Spotted Gum	8	12.70
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	42	66.67
<i>Allocasuarina littoralis</i>	Black She-oak	1	1.59
<i>Angophora leiocarpa</i>	Smooth-barked Apple	1	1.59
<i>Eucalyptus major</i>	Queensland Grey Gum	2	3.17
<i>Lophostemon suaveolens</i>	Swamp Box	1	1.59
Total Recorded (DBH > 100mm)		63	100.00
Total Koala Food Trees		10	15.87
Total Primary Koala Food Trees		0	0.00
Total Secondary Koala Food Trees		10	15.87
Total Primary & Secondary Koala Food Trees		10	15.87

Other species	
Scientific Name	Common Name
<i>Acacia amblygona</i>	Fan Wattle
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Cymbopogon refractus</i>	Barbed Wire Grass
<i>Dodonea viscosa</i>	Hop Bush
<i>Gahnia aspera</i>	Saw Sedge
<i>Imperata cylindrica</i>	Blady Grass
<i>Lantana montenvidensis</i>	Creeping Lantana
<i>Leucopogon juniperinus</i>	Prickly Heath
<i>Petalostigma pubescens</i>	Quinine Berry
<i>Smilax australis</i>	Barbed-wire Vine
<i>Themeda triandra</i>	Kangaroo Grass
<i>Xanthorrhoea latifolia</i>	Grass Tree

Comments
Mid-slope Koala scats located Overland flow path at end of transect Minimal weeds

#NAME?



Habitat Assessment 7			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	17	39.53
<i>Corymbia citriodora</i>	Spotted Gum	6	13.95
<i>Eucalyptus siderophloia</i>	Grey Ironbark	2	4.65
<i>Eucalyptus major</i>	Queensland Grey Gum	5	11.63
<i>Eucalyptus moluccana</i>	Gum-topped Box	2	4.65
<i>Lophostemon suaveolens</i>	Swamp Box	1	2.33
<i>Angophora leiocarpa</i>	Smooth-barked Apple	5	11.63
<i>Acacia concurrens</i>	Black Wattle	4	9.30
<i>Lophostemon confertus</i>	Brush Box	1	2.33
Total Recorded (DBH > 100mm)		43	100.00
Total Koala Food Trees		9	20.93
Total Primary Koala Food Trees		0	0.00
Total Secondary Koala Food Trees		9	20.93
Total Primary & Secondary Koala Food Trees		9	20.93

Other species	
Scientific Name	Common Name
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Eremophila debilis</i>	Winter Apple
<i>Poa labillardieri</i>	Tussock Grass
<i>Xanthorrhoea latifolia</i>	Grass Tree

Comments
Some fire evidence (not recent) Dense T2 layer minimal weeds Logging evidence High fuel load



Habitat Assessment 8			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus siderophloia</i>	Grey Ironbark	2	4.08
<i>Corymbia citriodora</i>	Spotted Gum	26	53.06
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	14	28.57
<i>Eucalyptus moluccana</i>	Gum-topped Box	4	8.16
<i>Eucalyptus major</i>	Queensland Grey Gum	3	6.12
Total Recorded (DBH > 100mm)		49	100.00
Total Koala Food Trees		9	18.37
Total Primary Koala Food Trees		0	0.00
Total Secondary Koala Food Trees		9	18.37
Total Primary & Secondary Koala Food Trees		9	18.37

Other species	
Scientific Name	Common Name
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Angophora leiocarpa</i>	Smooth-barked Apple
<i>Dianella longifolia</i>	
<i>Eragrostis sp.</i>	
<i>Goodenia glabra</i>	Smooth Goodenia
<i>Lomandra multiflora</i>	Many-flowered Mat Rush

Comments
<p>Sparse shrub layer moderately sparse ground layer logging and old fire evidence low weed disturbance</p>



Habitat Assessment 9			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Corymbia citriodora</i>	Spotted Gum	1	1.22
<i>Corymbia tessellaris</i>	Moreton Bay Ash	1	1.22
<i>Eucalyptus siderophloia</i>	Grey Ironbark	20	24.39
<i>Eucalyptus fibrosa</i>	Broad-leaved Ironbark	1	1.22
<i>Angophora leiocarpa</i>	Smooth-barked Apple	16	19.51
<i>Corymbia intermedia</i>	Pink Bloodwood	26	31.71
<i>Acacia concurrens</i>	Black Wattle	2	2.44
<i>Acacia leiocalyx</i>	Early Black Wattle	1	1.22
<i>Eucalyptus tereticornis</i>	Blue Gum	5	6.10
<i>Eucalyptus moluccana</i>	Gum-topped Box	1	1.22
<i>Alphitonia excelsa</i>	Soap Tree	1	1.22
<i>Lophostemon suaveolens</i>	Swamp Box	7	8.54
Total Recorded (DBH > 100mm)		82	100.00
Total Koala Food Trees		26	31.71
Total Primary Koala Food Trees		5	6.10
Total Secondary Koala Food Trees		21	25.61
Total Primary & Secondary Koala Food Trees		26	31.71

Other species	
Scientific Name	Common Name
<i>Gahnia aspera</i>	Saw Sedge
<i>Goodenia glabra</i>	Smooth Goodenia
<i>Imperata cylindrica</i>	Blady Grass
<i>Lantana camara</i>	Lantana
<i>Opuntia stricta</i>	Prickly Pear

Comments
<p>Mid-slope Sparse ground layer Patches of Lantana Number of fallen logs Abundant leaf matter</p>



Habitat Assessment 10			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus tereticornis</i>	Blue Gum	22	51.16
<i>Corymbia intermedia</i>	Pink Bloodwood	2	4.65
<i>Allocasuarina littoralis</i>	Black She-oak	2	4.65
<i>Lophostemon suaveolens</i>	Swamp Box	4	9.30
<i>Acacia concurrens</i>	Black Wattle	10	23.26
<i>Alphitonia excelsa</i>	Soap Tree	3	6.98
Total Recorded (DBH > 100mm)		43	100.00
Total Koala Food Trees		22	51.16
Total Primary Koala Food Trees		22	51.16
Total Secondary Koala Food Trees		0	0.00
Total Primary & Secondary Koala Food Trees		22	51.16

Other species	
Scientific Name	Common Name
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Dianella longifolia</i>	
<i>Gahnia aspera</i>	Saw Sedge
<i>Goodenia glabra</i>	Smooth Goodenia
<i>Imperata cylindrica</i>	Blady Grass
<i>Lantana camara</i>	Lantana
<i>Opuntia stricta</i>	Prickly Pear
<i>Passiflora suberosa</i>	Corky Passion Vine

Comments
Mid-slope Sparse ground layer Patches of Lantana Number of fallen logs Abundant leaf matter



Habitat Assessment 11			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Eucalyptus microcorys</i>	Tallowood	1	1.82
<i>Corymbia intermedia</i>	Pink Bloodwood	8	14.55
<i>Corymbia citriodora</i>	Spotted Gum	2	3.64
<i>Acacia concurrens</i>	Black Wattle	1	1.82
<i>Eucalyptus tereticornis</i>	Blue Gum	14	25.45
<i>Allocasuarina littoralis</i>	Black She-oak	1	1.82
<i>Eucalyptus siderophloia</i>	Grey Ironbark	5	9.09
<i>Eucalyptus major</i>	Queensland Grey Gum	1	1.82
<i>Angophora leiocarpa</i>	Smooth-barked Apple	2	3.64
<i>Lophostemon suaveolens</i>	Swamp Box	8	14.55
<i>Corymbia tessellaris</i>	Moreton Bay Ash	3	5.45
<i>Alphitonia excelsa</i>	Soap Tree	1	1.82
<i>Eucalyptus moluccana</i>	Gum-topped Bark	8	14.55
Total Recorded (DBH > 100mm)		55	100.00
Total Koala Food Trees		29	52.73
Total Primary Koala Food Trees		15	27.27
Total Secondary Koala Food Trees		14	25.45
Total Primary & Secondary Koala Food Trees		29	52.73

Other species	
Scientific Name	Common Name
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Dianella longifolia</i>	
<i>Imperata cylindrica</i>	Blady Grass
<i>Lantana camara</i>	Lantana
<i>Lantana montenvidensis</i>	Creeping Lantana
<i>Lomandra multiflora</i>	Many-flowered Mat Rush
<i>Opuntia stricta</i>	Prickly Pear
<i>Passiflora suberosa</i>	Corky Passion Vine
<i>Pennisetum purpureum</i>	Elephant Grass



Comments

In Western Segment
Dense T2 layer
leaf litter
Scattered clumps of lantana



Habitat Assessment 12			
Date:	27-28 May 2015	Site:	Springfield, Brookwater
Canopy Tree Species Composition			
Species	Common Name	Number Recorded (50 x 20m)	Percentage of Canopy Cover
<i>Corymbia citriodora</i>	Spotted Gum	1	1.11
<i>Eucalyptus siderophloia</i>	Grey Ironbark	17	18.89
<i>Eucalyptus tereticornis</i>	Blue Gum	19	21.11
<i>Angophora leiocarpa</i>	Smooth-barked Apple	9	10.00
<i>Lophostemon suaveolens</i>	Swamp Box	6	6.67
<i>Acacia concurrens</i>	Black Wattle	11	12.22
<i>Corymbia tessellaris</i>	Moreton Bay Ash	24	26.67
<i>Acacia leiocalyx</i>	Early Black Wattle	1	1.11
<i>Allocasuarina littoralis</i>	Black She-oak	2	2.22
Total Recorded (DBH > 100mm)		90	100.00
Total Koala Food Trees		36	40.00
Total Primary Koala Food Trees		19	21.11
Total Secondary Koala Food Trees		17	18.89
Total Primary & Secondary Koala Food Trees		36	40.00

Other species	
Scientific Name	Common Name
<i>Acacia fimbriata</i>	Fringed Wattle
<i>Acacia leiocalyx</i>	Early Black Wattle
<i>Alphitonia excelsa</i>	Soap Tree
<i>Aristida sp.</i>	
<i>Dianella longifolia</i>	
<i>Imperata cylindrica</i>	Blady Grass
<i>Lantana montenvidensis</i>	Creeping Lantana
<i>Lomandra multiflora</i>	Many-flowered Mat Rush
<i>Opuntia stricta</i>	Prickly Pear
<i>Passiflora suberosa</i>	Corky Passion Vine

Comments
Mid-slope Scattered Lantana patches Limited large trees Sparse ground layer

Attachment C

First Nine Offset Proposal

environmental management



First Nine Residential Development

Greater Springfield

Offset Proposal



Springfield Land Corporation
Brookwater Drive
7399
March 2016



Document Control

Title	First Nine – Offset Proposal
Address	Brookwater Drive, Springfield Central
Client:	Springfield Land Corporation
Job Number	7399

Document Issue

Issue	Date	Prepared By	Checked By
Draft	30.10.2015	Keira Grundy	Murray Saunders
Client Issue	15.03.2016	Keira Grundy	Murray Saunders
Final	24.03.2016	Keira Grundy	Murray Saunders

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Reports and/or Plans by Others

Reports and/or plans by others may be included within this report to support the document.



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- Plan 2: Flinders Karawatha Corridor Overview
- Plan 3: Flinders Karawatha Corridor Context
- Plan 4: Conservation Land Offsets Allocation
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I. Introduction

The *Environmental Management Division* of **Saunders Havill Group** was engaged by **Springfield Land Corporation Pty Ltd** (SLC) to prepare an Offset Proposal to support the assessment of the First Nine Residential Development project under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

The purpose of this Offset Proposal is to present a proposed offset in accordance with the EPBC Act's *Environmental Offset Policy* to compensate for impacts on habitat critical to the survival of the Koala as a result of the First Nine Residential Development. This proposal includes an analysis of the offset against the EPBC Offsets Assessment Guide and provides justification for the values entered into the Impact Calculator and Offset Calculator.

This report should be read in conjunction with the First Nine Residential Development EPBC Referral Submission prepared by **Saunders Havill Group** which details the methodology and results used to identify the location of, and impacts to, habitat critical to the survival of the Koala as a result of the proposed development. These results have been used to inform this offset proposal.

I.I Site Description and Details

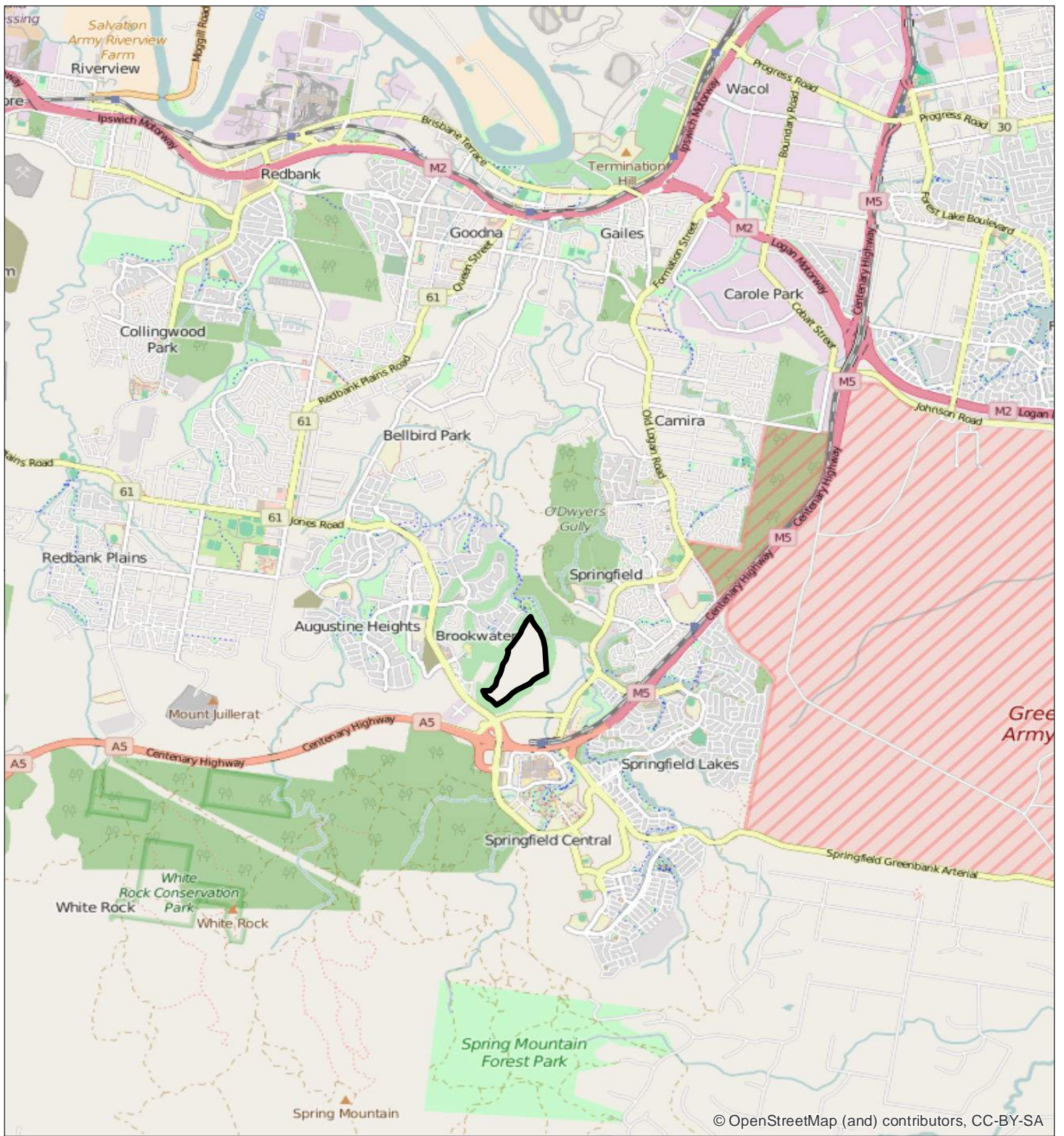
Contextually, the First Nine Residential Development referral area is located within the Greater Springfield Master Planned Development area and is situated amongst existing residential development including Brookwater and Augustine Heights to the west, Springfield Central to the south and Springfield Lakes to the east. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial.

Table 1: Key Site Details

Address	Brookwater Drive, Springfield
RPD	Part of Lot 161 on SP271657
Site Area	40.8ha
Area of Impact	40 ha of the critical habitat for the Koala
Open Space Areas	1ha
Action Summary:	<ul style="list-style-type: none"> ▪ Residential (incl. Local Parks) ▪ Activity Centres (Shops / neighbourhood centres) ▪ Roads and infrastructure ▪ Other
Tenure	Freehold – Owned by Springfield Land Corporation
Local Government Area	Ipswich City Council
Planning Scheme/Local Plan	Greater Springfield portions of the Ipswich Planning Scheme.
Area Classification/Zone	Residential
Existing Approvals:	The Greater Springfield statutory planning approval included in the preparation of a comprehensive Environmental Impact Statement that dealt



with environmental matters including Koala, amongst other relevant planning matters. The Springfield Development Control Plan now known as the Springfield Structure Plan was approved by the Queensland State Government on 24 January 1997, before the provisions of the EPBC Act existed. First Nine's core approvals occur within the approved Springfield Structure Plan and Brookwater South Master Area Development Plan.



© OpenStreetMap (and) contributors, CC-BY-SA

Legend


 First Nine referral area

Figure 1
Site Context

File ref. 7399 E F9 Figure 1 Site Context A
Date 23/03/2016
Project First Nine

0 500 1,000 2,000 m
Scale (A4): 1:75,000 [GDA 1994 MGA Z56]



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Legend


 First Nine referral area

Figure 2

Site Aerial

File ref. 7399 E F9 Site Aerial A

Date 22/03/2016

Project First Nine



0 50 100 200 300 m



Scale (A4): 1:7,500 [GDA 1994 MGA Z56]

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2. Development Impacts

The proposal for First Nine Residential Development was assessed against the provisions of the *EPBC Act Referral Guidelines for the Vulnerable Koala* (January 2015) and identified as containing critical habitat to the survival of the species. In accordance with the Koala Referral Guidelines, habitat which receives a score of **5 or more** using the Koala Habitat Assessment Tool is considered to be critical habitat. An assessment of the site was undertaken using the Koala Habitat Assessment Tool which indicates the site has been given a critical habitat score of **5**. A summary of this assessment is provided in **Table 2**. A full copy of the assessment is contained within the [First Nine Residential Development EPBC Referral Submission](#) prepared by **Saunders Havill Group** dated March 2016.

Table 2: Habitat Assessment Tool Summary

Attribute	Score	Comment
Koala occurrence	2	As there is evidence of Koala occurrence in the previous two years, this attribute has been scored 2.
Vegetation composition	2	Two or more Koala food trees were identified in the canopy, resulting in an attribute score of 2.
Habitat connectivity	1	Once existing approvals are in place the site will form part of a contiguous landscape <300ha, however as the site currently retains connectivity to vegetated areas this attribute has been scored a 1.
Key existing threats	0	Due to the existence of key threats, the attribute has been scored 0.
Recovery value	0	The site is boarded by major infrastructure and surrounded by expanding development. Even without this action, the site would not provide a realistic prospect to support the recovery of the Koala.
Total	5	Critical Habitat

The residual impact on Koalas as a result of the proposed action is the loss of critical habitat. **Table 3** provides an impact summary and shows that overall, the majority of the application area will be cleared and required to be offset in accordance with the EPBC Act.

Table 3: Impact Summary

Description	Area
Site Area	40.8ha
Vegetated Area (remnant and non-remnant)	40ha
Area to be cleared (including parks)	40ha



3. Offset Proposal

Detailed discussions on the topic of environmental offsets were undertaken between the **Department of the Environment** (DoE), **Springfield Land Corporation Pty Ltd** (SLC), as part of the Spring Mountain Precinct (EPBC 2013/7057) **Lendlease Communities** referral and approval. Generally these have focussed on the existing conservation land previously dedicated by **SLC** over 2006 and 2011. As part of these discussions, the **DoE** acknowledged the value of land already provided to compensate for environmental impacts and agreed to consider the previously dedicated Conservation Land as a retrospective ‘advanced offset’ under the *EPBC Act Environmental Offset Policy*. It is noted that the Draft policy statement “Advanced Environmental Offsets under the EPBC Act” was in the process of being prepared at the time of this discussion and subsequently an official registration of the advanced offset was not made.

As per the approach adopted in the **Lendlease Communities** (EPBC 2013/7057) permit, similar offset values are provided in this Offset Proposal.

I.I. SLC Conservation Land Background

The Offset Land for the Greater Springfield area is characterised by the following land descriptions in **Table 4** and displayed as **Plan 1**.

Table 4: Springfield Conservation Land RPD

RPD	Area	Date of Dedication
Lot 705 on SP151175	29 hectares	29 March 2006
Lot 740 on SP179412	28 hectares	27 June 2006
Lot 11 on S31533	46 hectares	29 March 2006
Lot 745 on SP242282	172 hectares	28 March 2011
Lot 747 on SP189043	21 hectares	27 June 2006
Lot 748 on SP189044	38 hectares	27 June 2006
Lot 751 on SP189053	37 hectares	27 June 2006
Lot 753 on SP189054	25 hectares	27 June 2006

Between 2006 and 2011, 396 hectares of land was dedicated by **SLC** to **ICC** to cater for the environmental impacts associated with the development of the Springfield Structure Plan area. These environmental impacts included the loss of Koala habitat within the development footprint, which was to be offset via the conservation land dedication at a time 7 years prior to the Commonwealth listing of the Koala as Vulnerable under the EPBC Act. Discussions with the **DoE** have led to the acknowledgment that the dedicated conservation land constitutes an ‘advanced offset’ and as such a portion of this was approved as the EPBC offset for Spring Mountain (EPBC 2013/7057). Approval of this offset acknowledges the values relative to the site at the time of the 2006 dedication date. Specifically, for the risk of loss attribute which was valued at 85% for areas located within the urban footprint within the *South East Queensland Regional Plan 2005-2026*.



The land dedicated by **SLC** is considered to be critically important for regional scale fauna movement given its location within the state wide significant Flinders-Karawatha Bioregional Corridor. The dedicated land now forms the only publically owned linkage between conservation areas to the north and south, as demonstrated in **Plans 2 & 3**. Prior to this dedication, the north-south connectivity was reliant on fragmented rural residential land holdings with a high degree of clearing, roads, fencing and dog ownership. At the time of first dedication in 2006, the dedicated land retained a high land valuation to **SLC** given its proposed inclusion in the broader Greater Springfield development areas. This high land valuation was derived from the following:

- At the time of dedication, approximately 90% of the 396 hectares was designated as “urban footprint” under the *South East Queensland Regional Plan 2005-2026* (refer **Figure 3**). It is noted that under the current *South East Queensland Regional Plan 2009-2031*, at least 50% continues to have this “urban footprint” designation (refer **Figure 4**).
- **SLC** owned the conservation land as freehold. Prior to reconfiguration and dedication, it occurred as part of the larger cadastral parcel of land currently being development as the Springfield Town Centre and surrounds. Prior to dedication of the land in 2006, the ownership, state land uses designations and environmental constraint layers (State Remnant Mapping / Koala, etc.) of the conservation land was identical to land now developed as the town centre and the Springfield Lakes residential area.
- Land within the “urban footprint” designation of the Regional Plan is set aside as the future growth areas for urban housing based on population pressures being managed by the Queensland State Government. The Urban Footprint of the Regional Plan was created to direct locations for new zonings in Local Government planning schemes and enables the development of priority infrastructure plans and transport planning for major roads. The Regional Plan also includes a prohibition on new applications being lodged for urban purposes external to the designated Urban Footprint. In terms of development acquisitions and bankable land values, the raw cost of this land within the Urban Footprint in monetary terms is more than 100 times the value of land in adjoining rural areas external to the Urban Footprint.

By converting freehold land in the Urban Footprint to dedicated conservation land, **SLC** has provided an offset that is located immediately adjoining the impact, rather than several kilometres away. In addition, the western portion of the conservation land provides a critical linkage of public tenure land connecting the northern and southern portions of the Flinders-Karawatha Bioregional Corridor. Without this dedication, no publically owned land occurs within this portion of the corridor and its connectivity function would be ultimately restricted by residential and rural residential land uses (refer **Plan 2 & 3**).

Furthermore it is important to acknowledge that the land was dedicated in 2006, which is 7 years in advance of the Commonwealth scheduling the Koala as Vulnerable under the EPBC Act. The dedication was also provided in advance of the impacts it is now being measured against (e.g. 7-8 years in advance of major works commencing on First Nine). It is acknowledged that the broader Springfield project has resulted in substantial prior clearing, however, the project commenced over 23 years ago and predominantly occurred at a time when no Local, State or Commonwealth matters were scheduled for the area.

Significant financial investments have been made in the dedication of this land to support conservation uses in a strategically important location that at the time included necessary ownership, resourcing and designations to enable more profitable land development to occur. The strategic location of the dedicated conservation land provides regional to state wide ecological benefits well beyond the extents of the Greater



Springfield Project. None of this would be achieved if the land had been developed and a significantly smaller financial investment had been made in a parcel of land external to the Urban Footprint and substantially departed from the area of impact.

3.1 Remaining Conservation Land

As part of the detailed negotiations for the **Lendlease Communities** Spring Mountain EPBC Referral (2013/7057) the 396ha of Conservation Land dedicated by **SLC** in 2006 was acknowledged as an “advanced offset” under the *EPBC Environmental Offset Policy*. Further, it was acknowledged by **DoE** that the value of this offset is two-fold; the first being in the value of dedication of the land by **SLC** to **ICC** for conservation (i.e. direct offset) and the second being in the enhancement works proposed over this land for koala habitat value uplift (i.e. indirect offset).

DIRECT OFFSETS – A direct offset includes the securing of actual land for the purposes of an environmental offset.

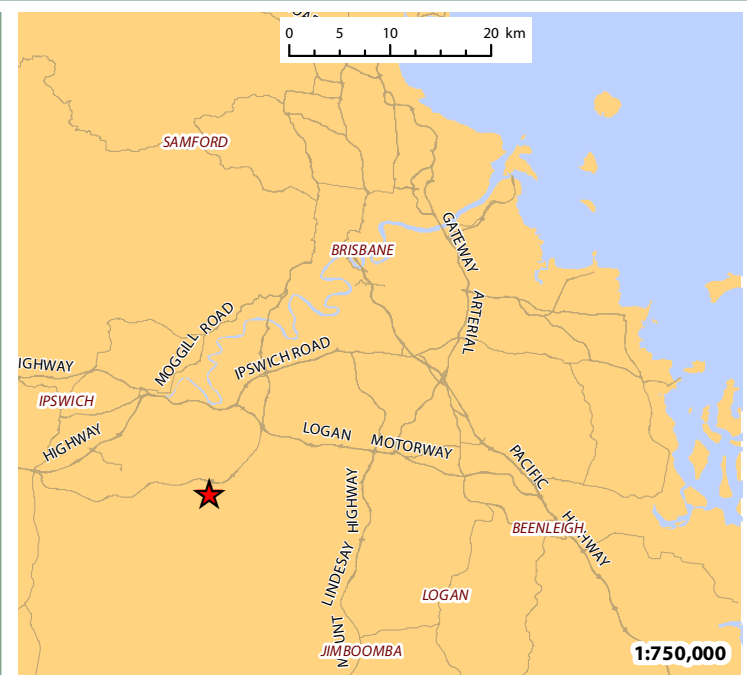
INDIRECT OFFSETS – Indirect offsets are works completed to improve the ecological quality of land which has already been secured via a direct offset (Weed removal / replanting / fencing / signage / covenant). Indirect offsets are substantially less valuable than direct and thus more area is required to balance environmental impacts.



During these negotiations, **DoE** considered a portion of the Conservation Land assigned to clearing which had occurred within Greater Springfield since the date of dedication (i.e. 2006). This was agreed by both the Department and **SLC** to constitute approximately 25% (i.e. 99ha) of the 396 hectares dedicated. Consequently, this left a balance 297ha available for direct offsets. While this 99ha was considered used in terms of a land based offset (direct) although it maintains a usable, albeit less significant, offset value.

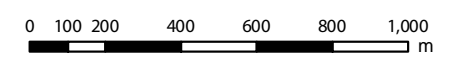
In addition, the EPBC Approval for Spring Mountain (2013/7057) conditions 293ha of conservation land to be used as a direct offset to compensate impacts on MNES.

This results in the following environmental offset reserves remaining in the Conservation Land (refer to **Plan 4**):

- 4 ha available as Direct and Indirect
- 99ha available as Indirect only



Legend	
	Direct Offset (297 ha)
	Indirect Offsets (99 ha)



APPROVED COMPANY
ISO 9001
Quality Management Systems
QMS Certification Services

APPROVED COMPANY
ISO 14001
Environmental Management Systems
QMS Certification Services

First Nine

Greater Springfield Advanced Offset

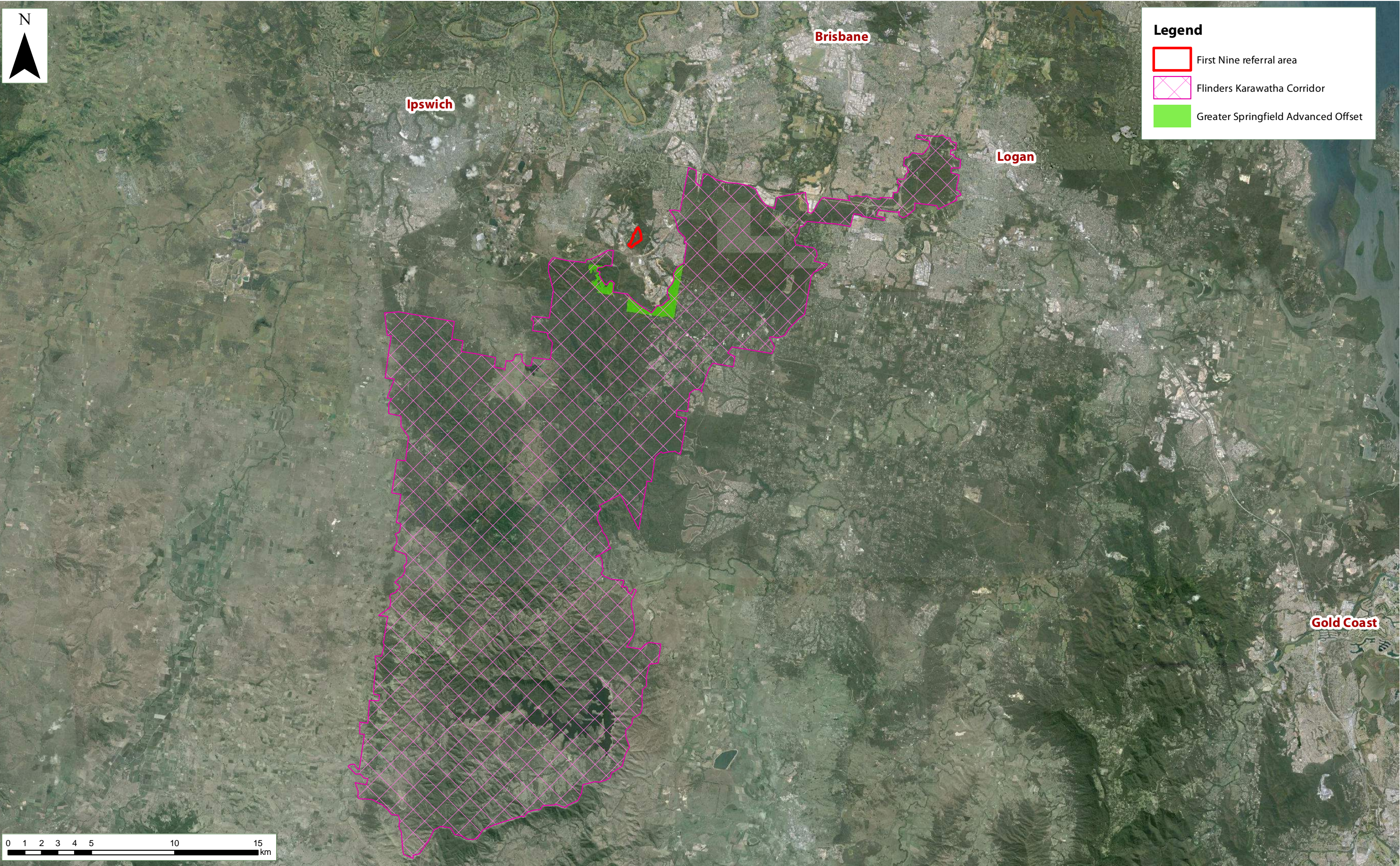
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Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Springfield Land Corporation
Project | First Nine EPBC
Address/RPD | Springfield
Source | DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)

SHG File
7399 E 01 GSAO A




Plan 1

Issue	Date	Description	Drawn	Checked
A	22/03/2016	Prelim Draft	AL	RM

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PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDER-GROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.



Legend

-  First Nine referral area
-  Flinders Karawatha Corridor
-  Greater Springfield Advanced Offset



ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	MS

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PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDER-GROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

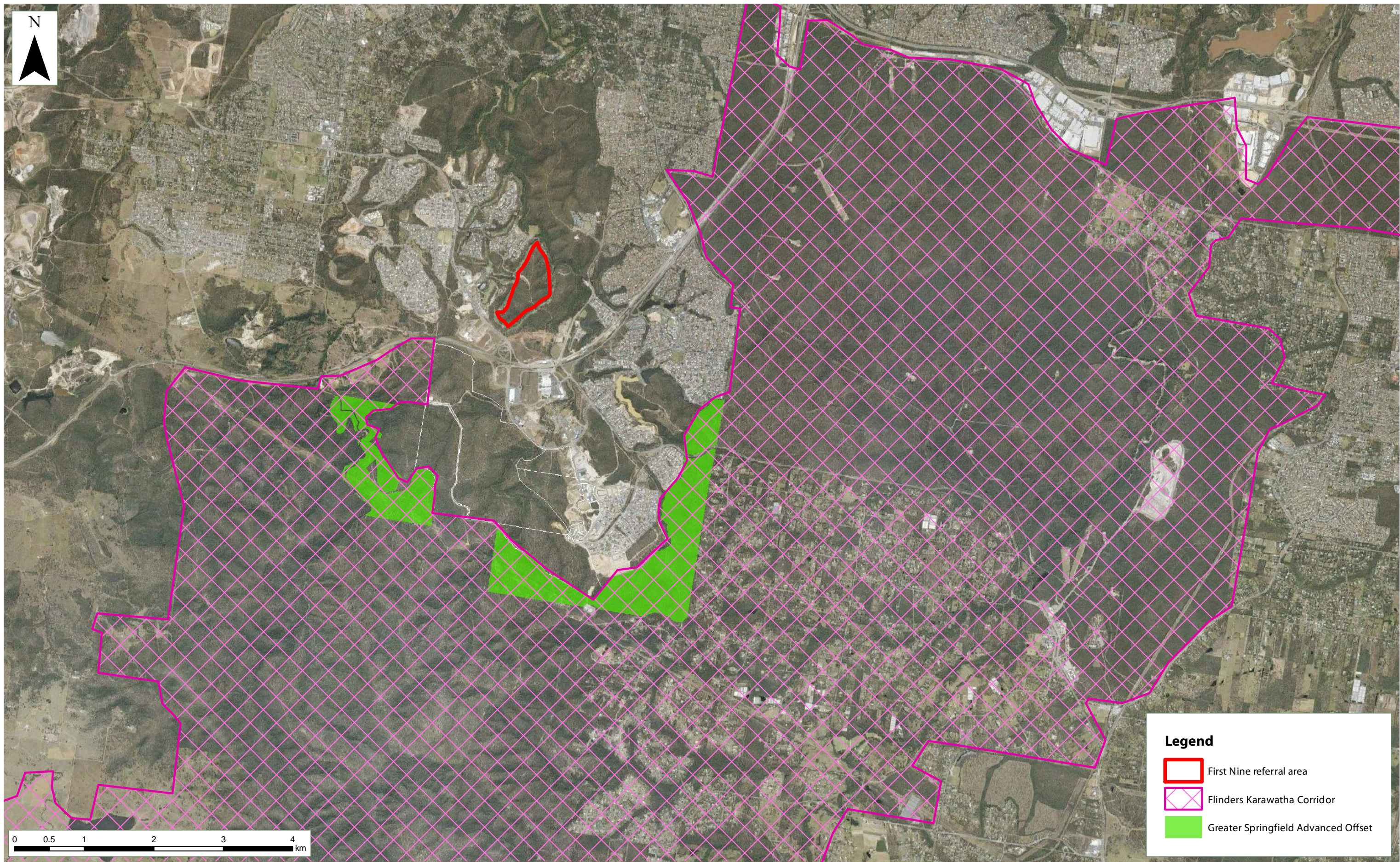
First Nine

Flinders - Karawatha Corridor Overview




Date | 22/03/2016
 Scale | 1:210,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine EPBC Referral
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Aerial (Google, 2013)
 Flinders Karawatha Corridor (EHP, 2013, Rectified)

SHG File
 7399 E 02 Flinders Overview A

Plan 2



Legend

-  First Nine referral area
-  Flinders Karawatha Corridor
-  Greater Springfield Advanced Offset

SH saunders havill group

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SPRINGFIELD LAND CORPORATION

ISSUES:	Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	MS	

APPROVED COMPANY
ISO 9001
Quality Management Systems
QMS Certification Services

APPROVED COMPANY
ISO 14001
Environmental Management Systems
QMS Certification Services

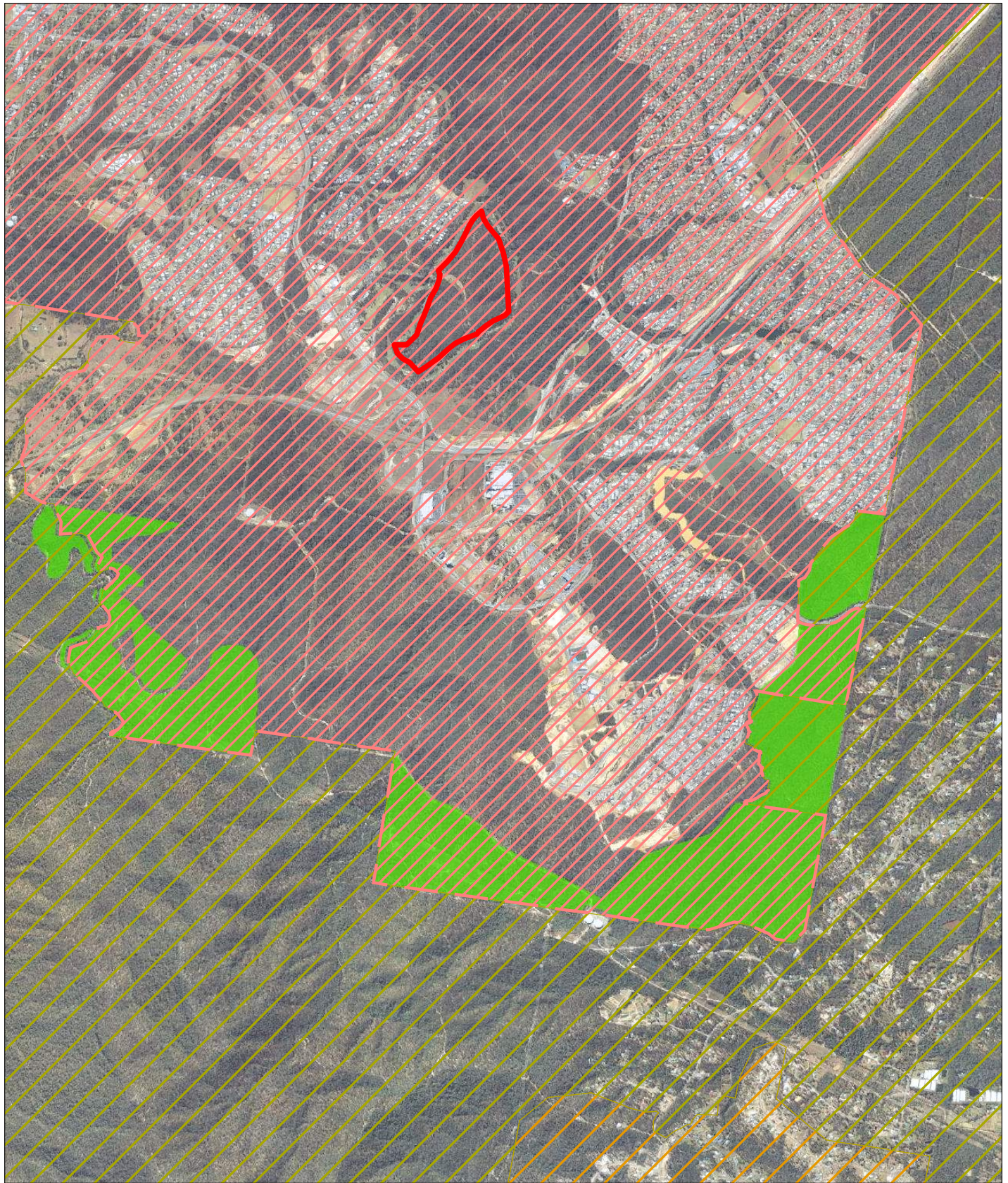
First Nine

Flinders - Karawatha Corridor Context


Date | 22/03/2016
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 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine EPBC Referral
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2014), Aerial (Nearmap, 2014)
 Flinders Karawatha Corridor (EHP, 2013, Rectified)

Plan 3

SHG File
7399 E 03 Flinders Corridor Context A





Legend

 Greater Springfield Advanced Offset

 Referral area

SEQ Regional Plan 2005-2026

 Urban Footprint

 Regional Landscape and Rural Production Area


 Rural Living Area

Figure 3 SEQ Regional Plan
2005-2026 zoning

File ref. 7399 E Figure 3 UFP 2005 B

Date 22/03/2016

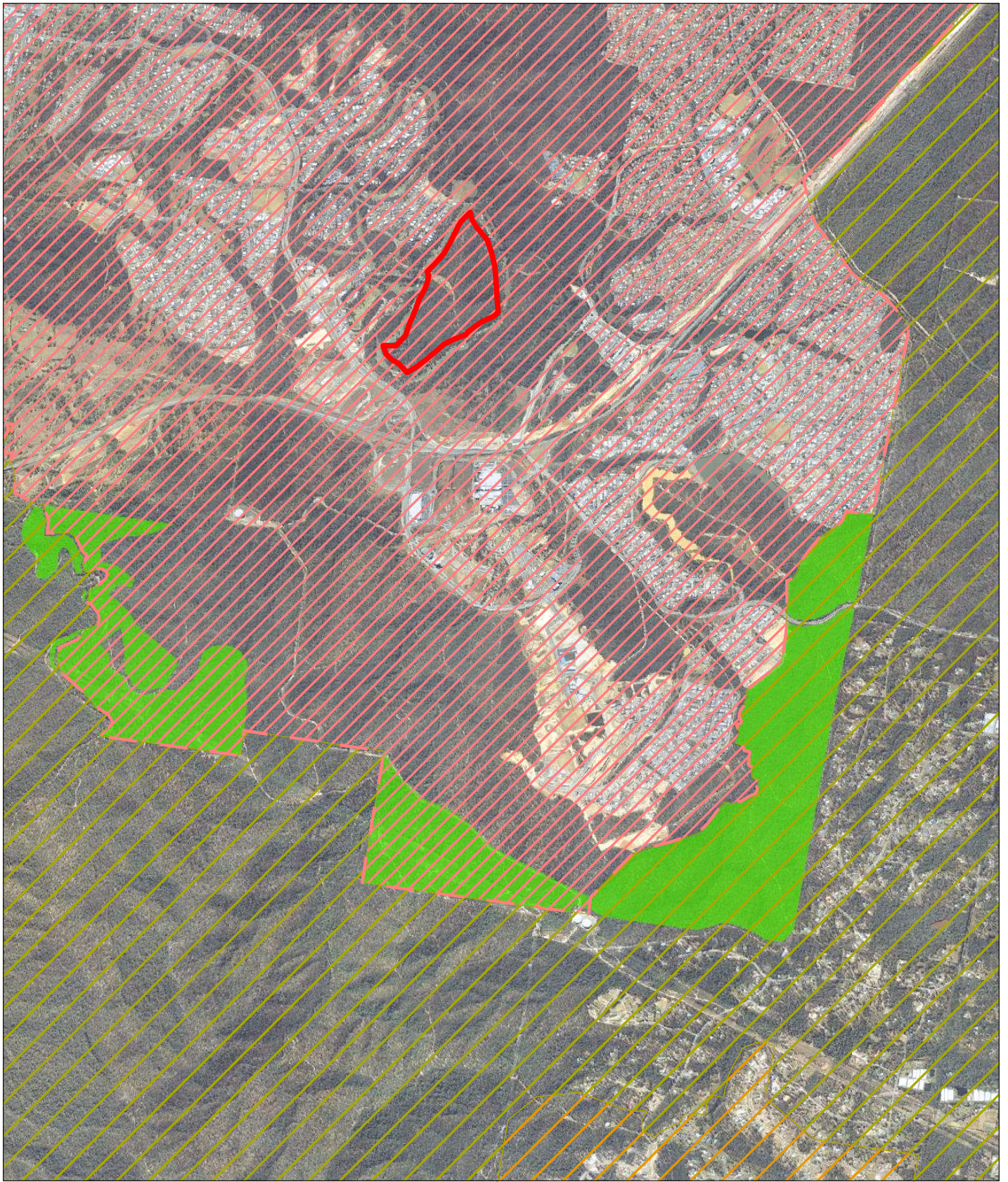
Project First Nine (EPBC)

0 0.5 1 2 km N

Scale (A4): 1:40,000 [GDA 1994 MGA Z56]



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Legend

- Greater Springfield Advanced Offset
- First Nine referral area
- Regional Plan 2009-2031**
- Urban Footprint
- Regional Landscape and Rural Production Area
- Rural Living Area

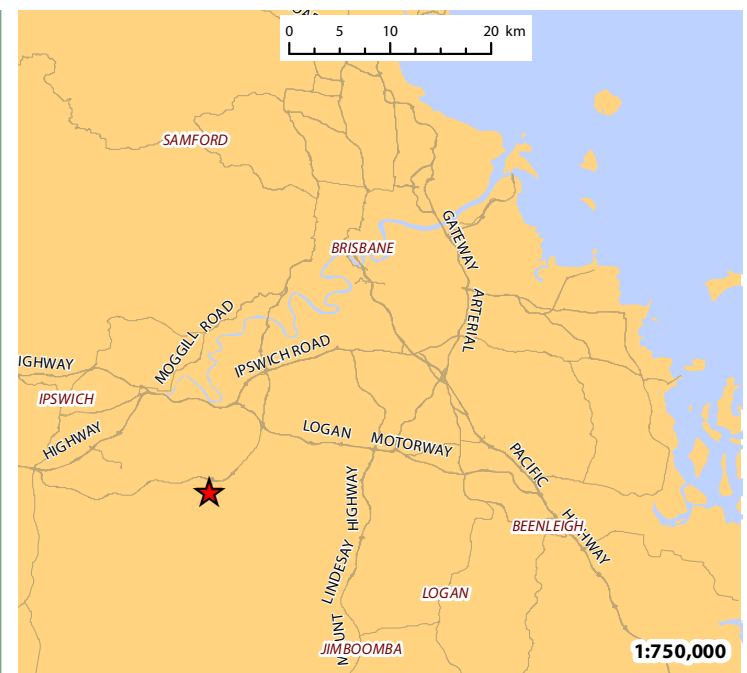
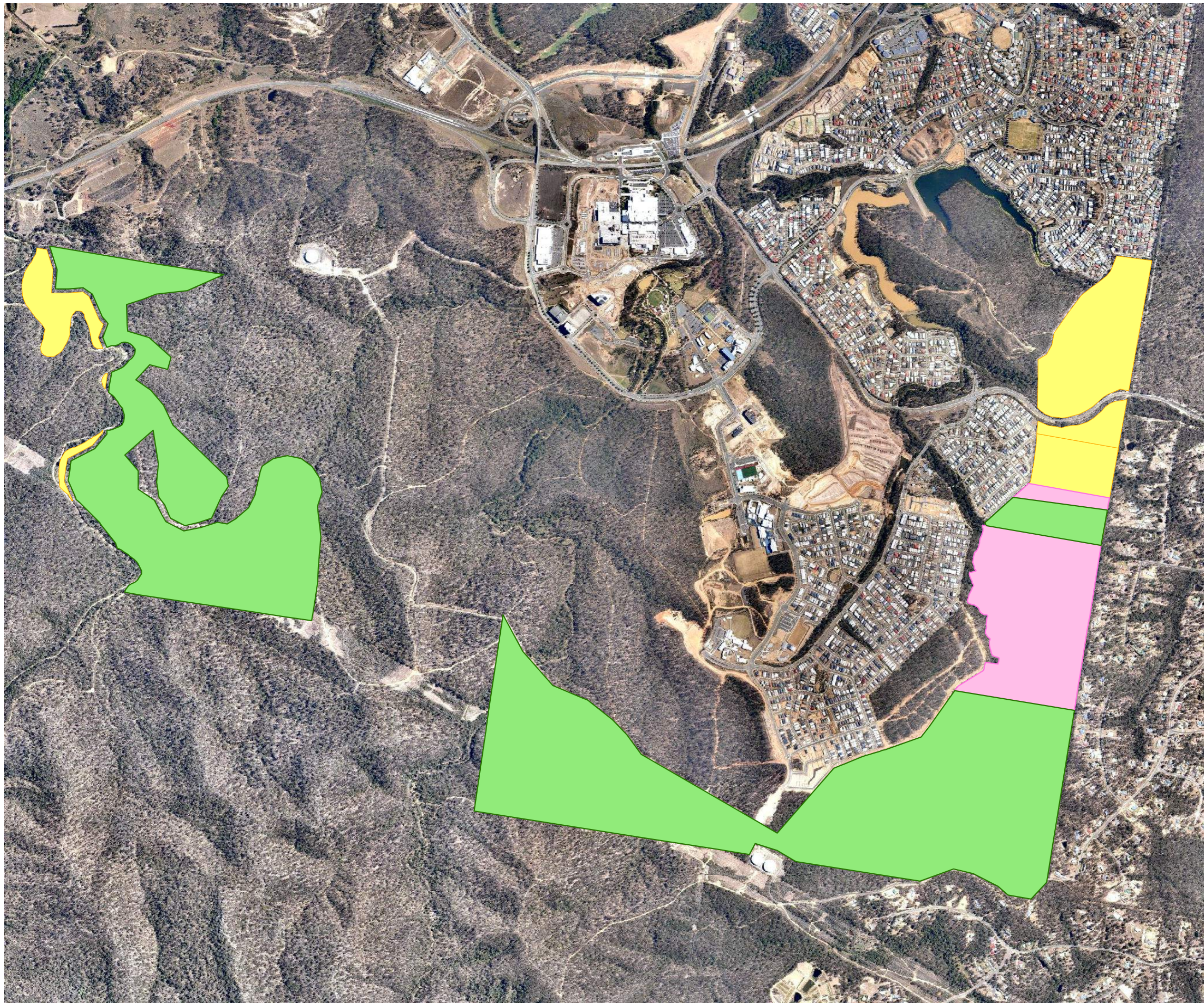
Figure 4 SEQ Regional Plan 2009-2031 zoning

File ref. 7399 E Figure 4 UFP 2009 B
Date 22/03/2016
Project First Nine (EPBC)

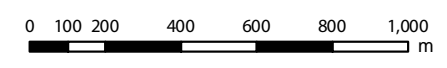
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 Scale (A4): 1:40,000 [GDA 1994 MGA Z56]



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- Legend**
- First Nine Offset Area - 50.25 ha
 - Spring Mountain Offset Area EPBC 2013/7057 - 293 ha
 - Remaining Offset area (unallocated) - 52.75 ha



First Nine

Greater Springfield Advanced Offset Receive Sites

Plan 4

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ISSUES:

Issue	Date	Description	Drawn	Checked
A	22/03/2016	Prelim Draft	AL	RM

Date | 22/03/2016
 Scale | 1:20,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Springfield Land Corporation
 Project | First Nine EPBC
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)

SHG File
 7399 E 04 GS Offsets A



4. Environmental Offsets for Assessment of the Koala

As summarised in **Table 3**, the development of First Nine Residential Development will result in clearing of 40 hectares of habitat critical to the survival of the Koala. The site has been assessed as retaining habitat with a value of 5 within the Habitat Assessment Tool for the Koala. The proposed offsite for First Nine has been identified within a portion of the remaining Springfield Conservation Land identified in **Plan 5**.

Residual Impact: Removal of 40 hectares of critical habitat for the Koala

4.1 Offset Assessment Guide

The protection of conservation land will provide an offset of residual impacts, as per the offsets calculator. An assessment against the EPBC Act Environmental Offsets Policy is provided below.

A. Annual probability of extinction

The *annual probability of extinction* is an estimate of the average chance that a species or ecological community will be completely lost in the wild each year, given recent rates of decline. The *annual probability of extinction* is incorporated into the impact and offset calculation process as a discounting factor for aligning activities that occur at different points in time. This figure is derived from the International Union for the Conservation of Nature (IUCN) Red List for threatened species, as shown:

Conservation status of MNES	IUCN criteria for probability of extinction in the wild	Annual probability of extinction (geometric mean)	Annual probability of extinction (geometric mean) + probability of catastrophe
Critically Endangered	At least 50% in 10 yrs	6.7%	6.8%
Endangered	At least 20% in 20 yrs	1.1%	1.2%
Vulnerable	At least 10% in 100 yrs	0.1%	0.2%

As the Koala is listed as 'Vulnerable' under the EPBC Act, an annual probability of extinction for the species, based on ICUN category definitions, is 0.2%.

B. Protected matter attributes

The Protected Matter Attribute relates to *habitat critical to the survival of the Koala*. A total of 40 hectares of critical Koala habitat will be directly removed as a result of the action.

Protected matter attribute: Area of critical habitat removed – 40 hectares



C. Quality

The quality score for *area of habitat* or *area of community* is a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability. There are three components that contribute to the calculation of habitat quality: site condition, site context, and species stocking rates. Each of these components has been considered to determine the quality of habitat in the:

- Impact calculator: quality of habitat at the time of assessment
- Offset Calculator:
 - Future quality of offset site without the offset; and
 - Future quality of the offset site with the offset.

Quality of Habitat in Impact Area

Vegetation on-site was categorised by a proportion of Koala food trees as defined within the **Australia Koala Foundation's** *Koala Food Tree Protection List*. This includes *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark), *Eucalyptus siderophloia* (Grey Ironbark), *Corymbia citriodora* (Spotted Gum) *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus major* (Grey Gum), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus fibrosa* (Red Ironbark). While the majority of this site is mapped as containing remnant vegetation, disturbances in the form of invasive weeds, fire, dumped rubbish, dogs and vehicle tracks were observed throughout the area.

As the site is surrounded by existing and proposed development to the east, south and west and is encompassed by the existing Brookwater Golf Course, the referral area is highly disturbed and subject to edge effects. Several dominant weed species including *Eragrostis curvula* (African Lovegrass), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton).

While the site adjoins Opossum Creek to the north which provides connectivity east-west within the broader landscape, it is noted that this corridor is subject to edge effects from existing development to the south and approved future development to the north.

Impact Area Habitat Quality:	5
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Offset Area Calculations

While justification has been provided for the scoring of the offset area, it is acknowledged that the attribute scores have been previously assessed and approved by **DoE** for the offset site as part of the Spring Mountain approval (EPBC 2013/7057). The following justification has been extracted from the Spring Mountain Preliminary Documentation report and reflects final values of calculator attributes as agreed with **DoE**.

Start Quality of Offset Area

The Offset site adjoins the White Rock-Spring Mountain Conservation Estate and the Flinders- Karawatha Bioregional Corridor, providing additional bushland along the edge of these regionally significant habitat areas. The area making up the offset is characterised by remnant vegetation made up of Least Concern and Of Concern Regional Ecosystems.

Contextually, the offset area provides the only available public conservation land to form a protected corridor connecting the northern and southern portions. The remaining width of the Flinders-Karawatha Bioregional Corridor is occupied by residential land uses.



While Koala usage studies were not undertaken in the offset area, it can be assumed that the offset area would be utilised by Koalas. It provides habitat and connectivity values and is mostly covered in remnant vegetation.

Some disturbances that do detract from the value of the offset area are the prevalence of invasive weeds and impacts from wild dogs and illegal vehicle and motorbike usage.

Given the site's connectivity to conservation areas, the remnant status of vegetation on site and the existence of disturbances, the offset area start quality score has been assessed as 8.

Start Quality: 8

Future Quality without the Offset

Should the offset not have been provided, the offset area had a high likelihood of being developed for urban uses as part of the Springfield master planned community. This is given the site's "urban footprint" designation under the *South East Queensland Regional Plan* and the fact that this land was held on freehold by **SLC**. **SLC** have shown through the current project that they had at the time of dedication and continuing today the resources and investment required to develop this land in accordance with the same designations and constraints as the now well established town centre. Prior to dedication, the Conservation Land formed part of the same freehold allotment making up areas of the Town Centre and Springfield Lakes Residential Community. If not dedicated for conservation purposes (and or put aside as an Advanced Offset) it is highly likely that this land would have been developed for urban purposes.

As noted development of this land in accordance with the Urban Footprint designations would have been more economically viable in conjunction with the offsite purchase of offset land kilometres away within rural designated land, rather than dedication as it occurred. However, it is also acknowledged that an offsite offset could not result in the same level of ecological connectivity for the adjoining bioregional corridor or occurred in such close proximity to the impacts.

Through discussions with the **DoE** the assigned quality value does not take into account the future development impact of the area which is considered through the averted loss. However regardless if the offset was not to occur no additional State or Local government requirements apply to Springfield Land Corporation for the offset area. Based on this and the fact that new development would be established immediately adjoining the offset area it is considered that the value of the land would degrade to a 6 without offset. It is considered the level of weed and pest infiltration continuing without intervention would degrade the area by a single quality core of 1. With and additional loss of 1 resulting in the uncontrolled bring of development, housing, people, domestic animals, garden plant species, greater unlawful access and dumping points. This sees a total future quality score of 6.

Future Quality: 6

Future Quality with the Offset

The quality of the offset area is likely to slightly enhance in the future as it continues to be protected and managed through initially development controls and ultimately weed management and bushland regeneration. The importance of the offset area as a critical linkage area within the Flinders-Karawatha Bioregional Corridor will increase in the future should development pressures encroach into existing rural areas. As the offset area provides the only publically owned land within this portion of the corridor, its



protection is crucial in order to maintain long term connectivity to the north and south, particularly for cryptic and specialised species that are not adapted to urban environments.

As part of this offsets proposal and EPBC Act approval, land within the offset area will be proactively managed in order to enhance its ecological value. This will include reinstatement works within heavily degraded areas and weed removal. Fencing will be installed to prevent fauna from dispersing into hostile environments and to restrict access to people and stray domestic animals. Extensive weed management will also occur. None of these works are currently required to be completed by **SLC**, however they are prepared to be accepted as part of the conditions of a Commonwealth Government approval. **SLC** have commenced negotiations with **ICC** regarding the establishment of a formal Land Access Agreement for the purposes of undertaking conservation improvement works.

As part of securing the land as an offset for impacts in the First Nine Residential Development, **SLC** will make an application to the State Government to remove the land completely from the Urban Footprint of the Regional Plan and work with Council to put in place either a Covenant on Title, Voluntary Declaration under the *Vegetation Management Act 1999* or establish a Nature Refuge under the *Nature Conservation Act 1992*. The covenant or V-Dec required to legally secure the offset land will be in place prior to the commencement of clearing works on-site. Any of these outcomes will look to legally secure the conservation use on the land in perpetuity.

Overall, the future quality of the offset area with the offset occurring is considered to be 9.

Future Quality: 9

D. Time over which loss is averted

The foreseeable timeframe over which changes in the level of risk to a proposed offset site can be considered and quantified is 20 years. The protection of the land as an offset site can be quantified using a 20 year time frame, which is the maximum available. This is due to the conservation zoning of the offset site under the Springfield Structure Plan and the ownership of the land title by a Local Government Authority. The protection of the offset site under the Structure Plan supports the interpretation of a 20 year time frame over which loss is averted with the additional legally binding measures discussed in the future quality response enhancing this security.

Time over which loss is averted: 20 years

E. Time until ecological benefit

The offset site is already covered in remnant vegetation containing Least Concern and Of Concern remnant vegetation. As the offset site is already established, its ecological benefits are predominantly realised immediately and in fact has been performing its current ecological function for at least the last 7 years since dedication. While works proposed to improve the quality of the offset area from its current score of 8 to 9 the majority and most important of these will occur in the first 2 years (covenant, approval and implementation of management plans, fencing, etc.).

Time until ecological benefit: 2 years

F. Risk of loss (%)



i) Without Offset

For the area of Direct Offset, should the offset not have been provided, there is an 85% chance that the site would have been developed for urban purposes. This is due to the following factors:

- In 2005, 90% of the offset land was located within the urban footprint under the *South East Queensland Regional Plan 2005-2026*. This means that at State and Local Government levels, this land was considered highly suitable for urban development.
- Additionally, approximately 50% of the offset site remains within the urban footprint under the more current *South East Regional Plan 2009-2031*. This confirms the site's continued suitability for development.
- At the time of dedication, **SLC** were in control of the freehold land with the dedicated land occurring on the same cadastral allotment as the now substantially commenced town centre and near complete Springfield Lakes Residential Community. Should the conservation land have not been dedicated, **SLC** would have had the option to develop it as part of the Springfield master planned community.
- Given the urban footprint zoning, the site was highly valuable in monetary terms and would have been economically beneficial to develop.

Given each of these factors, it is highly likely that the site would have been developed should the conservation dedication not have been provided. As such, the risk of loss without the offset is considered to be 85%. It is noted that this value is considered to be for the area of Direct offset only and has been previously agreed to by **DoE** as part of the Spring Mountain approval (EPBC Ref: 2013/7057).

Risk of loss without offset (Direct Offset):	85%
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For the area of Indirect offset, the risk of loss without the offset is considered to be 20%. This figure, while low, reflects the value of the offset being legally secured via a Voluntary Declaration under the *Vegetation Management Act 1999* and thus requirements under this declaration for vegetation to be rehabilitated to remnant status.

Risk of loss without offset (indirect Offset):	20%
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ii) With Offset

As a result of the advanced offset and conservation land dedication, it is highly unlikely that the areas natural values will be lost because:

- The land is now held under public ownership by **ICC** and as such, is not susceptible to the same development pressures under a private land holding.
- Under the Springfield Structure Plan, the offset area has been designated as 'conservation land' and is protected at the local scale from urban development.
- Negotiations will be undertaken with **ICC** to legally secure the offset site so that land uses cannot be compromised under possible future amendments to structure plans.
- The offset land is substantial in size and width and robust enough to withstand periodical impacts of bushfire, weed incursion, native and feral species impacts. Furthermore, the offset land adjoins (forms part) of a 65,000hectare tract of connected bushland forming the Flinders-Karawatha Bioregional Corridor.

Overall, the risk of loss with the offset is considered to be 5%.



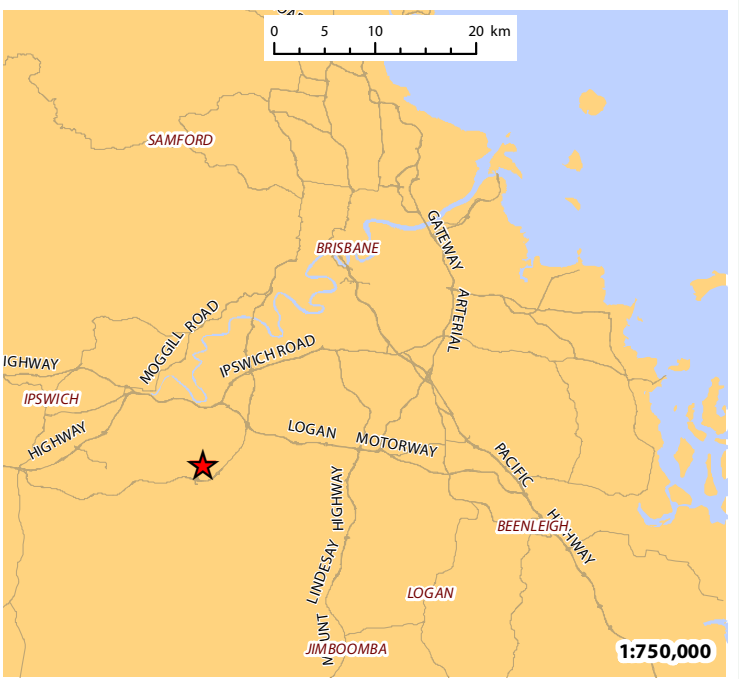
Risk of loss with offset: 5%

G. Confidence in result (%)

A confidence result of 90% has been given to both the risk of loss and future quality attributes. This level of confidence is derived from the consideration of relevant planning instruments, mapped ecological values and on ground field surveys. Additionally, **SLC** is a large, viable, experienced and award winning business whose track record and livelihood is derived from achieving development commitments outlined in master plans, plans of development and compliance with approval conditions. Works approved through the EPBC Act process will also entail more detailed approvals by **ICC** who retain the local compliance resources to ensure completion of works in accordance with approved management plans. Council will be especially vigilant in ensuring compliance given the benefits and substantial cost savings they achieve through the enhancement works to an existing Council land asset.

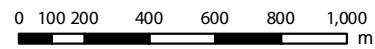
Confidence in Results: 90%

Overall, the commitment of a total of **50.25** hectares (made up of 4ha of direct offset and 46.25ha of indirect offset) within the conservation area will provide a **90%** offset for the loss of 40 hectares of critical Koala habitat within the site. Refer to the Offset Calculation sheets below and **Plan 5** for the First Nine Offset Receive Site.



Legend

- Spring Mountain referral area
- First Nine Offset Receive Area



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ISSUES:

Issue	Date	Description	Drawn	Checked
A	22/03/2016	Prelim Draft	AL	RM

First Nine

First Nine Offset Receive Site

Date: 22/03/2016
 Scale: 1:23,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client: Springfield Land Corporation
 Project: First Nine EPBC
 Address/RPD: Springfield
 Source: DCBD (DNRm, 2015), Aerial (Neemap, 2015)

Plan 5

SHG File
 7399 E 05 F9 Offset areas A

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Grey-headed Flying-fox
EPBC Act status	Vulnerable
Annual probability of extinction <small>Based on IUCN category definitions</small>	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator						
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
<i>Ecological communities</i>						
Area of community	No		Area			
			Quality			
			Total quantum of impact	0.00		
<i>Threatened species habitat</i>						
Area of habitat	Yes	Brookwater South	Area	40	Hectares	
			Quality	5	Scale 0-10	
			Total quantum of impact	20.00	Adjusted hectares	
<i>Threatened species</i>						
Birth rate <small>e.g. Change in nest success</small>	No					
Mortality rate <small>e.g. Change in number of road kills per year</small>	No					
Number of individuals <small>e.g. Individual plants/animals</small>	No					

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																					
<i>Threatened species habitat</i>																													
Area of habitat	Yes	20.00	Adjusted hectares	Conservation Land (Direct)	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	4	Risk of loss (%) without offset	85%	Risk of loss (%) with offset	5%	Raw gain	3.20	Confidence in result (%)	90%	Adjusted gain	2.88	Net present value	2.77	% of impact offset	13.26%	Minimum (90%) direct offset requirement met?	No	Cost (\$ total)		Information source		
					Future area without offset (adjusted hectares)	0.6	Future area with offset (adjusted hectares)	3.8																					
					Time until ecological benefit	2	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	9	3.00	90%	2.70	2.69													
<i>Threatened species</i>																													
Birth rate <small>e.g. Change in nest success</small>	No																												
Mortality rate <small>e.g. Change in number of road kills per year</small>	No																												
Number of individuals <small>e.g. Individual plants/animals</small>	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	20	2.65	13.26%	No	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Grey-headed Flying-fox
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator					
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
<i>Ecological communities</i>					
Area of community	No		Area		
			Quality		
			Total quantum of impact	0.00	
<i>Threatened species habitat</i>					
Area of habitat	Yes	Brookwater South	Area	40	Hectares
			Quality	5	Scale 0-10
			Total quantum of impact	20.00	Adjusted hectares
<i>Threatened species</i>					
Number of features e.g. Nest hollows, habitat trees	No				
Condition of habitat Change in habitat condition, but no change in extent	No				
Birth rate e.g. Change in nest success	No				
Mortality rate e.g. Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator																													
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source													
<i>Ecological Communities</i>																													
Area of community	No				Risk-related time horizon (max. 20 years)	Start area (hectares)	Risk of loss (%) without offset	Risk of loss (%) with offset																					
					Time until ecological benefit	Start quality (scale of 0-10)	Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0																			
					Future quality without offset (scale of 0-10)	Future quality with offset (scale of 0-10)																							
<i>Threatened species habitat</i>																													
Area of habitat	Yes	20.00	Adjusted hectares	Conservation Land (Indirect)	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	46.25	Risk of loss (%) without offset	20%	Risk of loss (%) with offset	5%	Raw gain	6.94	Confidence in result (%)	90%	Adjusted gain	6.24	Net present value	6.00	% of impact offset	15.35	76.75%	Minimum (90%) direct offset requirement met?	No	Cost (\$ total)		Information source	
					Time until ecological benefit	2	Start quality (scale of 0-10)	8	Future area without offset (adjusted hectares)	37.0	Future area with offset (adjusted hectares)	43.9	3.00	90%	2.70	2.69													
					Future value without offset	6	Future quality with offset (scale of 0-10)	9																					
<i>Threatened species</i>																													
Number of features e.g. Nest hollows, habitat trees	No																												
Condition of habitat Change in habitat condition, but no change in extent	No																												
Birth rate e.g. Change in nest success	No																												
Mortality rate e.g. Change in number of road kills per year	No																												
Number of individuals e.g. Individual plants/animals	No																												

Summary							
Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
					Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
Birth rate	0				\$0.00		\$0.00
Mortality rate	0				\$0.00		\$0.00
Number of individuals	0				\$0.00		\$0.00
Number of features	0				\$0.00		\$0.00
Condition of habitat	0				\$0.00		\$0.00
Area of habitat	20	15.35	76.75%	No	\$0.00	#DIV/0!	#DIV/0!
Area of community	0				\$0.00		\$0.00
					\$0.00	#DIV/0!	#DIV/0!



5. Conclusion

The *Environmental Management Division* of **Saunders Havill Group** was engaged by **Springfield Land Corporation Pty Ltd** (SLC) to prepare an Offset Proposal for external offsets required in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC) for the clearing of critical habitat for the survival of the Koala associated with the development of First Nine Residential Development, Brookwater Drive, Springfield.

Of the 396 hectare area, approximately 4 hectares remain available for use as a direct offset and 99 hectares as an indirect offset.

To compensate clearing of 40 hectares critical habitat for First Nine Residential Development, the commitment of a total of **50.25 hectares** (made up of 4ha of direct offset and 46.25ha of indirect offset) within the conservation area will provide a **90%** total offset for the development.



Attachment B

Information Requested by DEE



Attachment A

REQUEST FOR ADDITIONAL INFORMATION REQUIRED FOR ASSESSMENT BY PRELIMINARY DOCUMENTATION

First Nine master planned residential development, Brookwater, Qld (EPBC2016/7676)

It has been determined that the proposed action to build 800-900 dwellings on 40.8 ha in a low to medium density residential development east of the existing Brookwater community and more broadly within the Greater Springfield Master Planned Development Area; is likely to have a significant impact on the following controlling provision, which is protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (section 18 & section 18A).

It has also been determined that the proposed action will be assessed by preliminary documentation. Preliminary documentation for the proposal will include:

- the information contained in your original referral;
- the further information you provide on the impacts of the action and the strategies to mitigate and/or offset that impact (as described below); and
- any other relevant information on the matters protected by the EPBC Act.

The preliminary documentation should be sufficient to allow the delegate to make an informed decision on whether or not to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision.

The preliminary documentation must address the following matters.

GENERAL CONTENT, FORMAT AND STYLE

Information provided must focus primarily on the protected species addressed in Section 2 (below). The preliminary documentation should be contained as one document with attachments and contain sufficient information to avoid the need to search out previous or supplementary reports. This documentation should be in a format that is objective, clear, and succinct and, where appropriate, be supported by:

- The best available scientific literature;
- Relevant maps, plans, diagrams, tables and databases;
- References or other descriptive detail (e.g. addressing how recent the information is); and
- A table indentifying where each requirement above is addressed within the documentation.

The preliminary documentation should be complete and inclusive of appendices. The preliminary documentation must include a copy of this request and a table indicating where the information fulfilling this request is included in the preliminary documentation.

SPECIFIC CONTENT OF THE ADDITIONAL INFORMATION

1. DESCRIPTION OF THE ACTION

1.1. The preliminary documentation must provide a detailed description of the proposed action. The preliminary documentation must include a summary of all components of the action, a description of the activities associated with the potential development, and plans or maps to delineate the position of all activities and components of the action (including retained vegetation). In particular, please clarify the follow proposed activities and impact areas including:

- (a) the location, boundaries and size (in hectares) of the disturbance footprint and of any adjoining areas, which may be indirectly impacted by the proposal including areas proposed for the dumping of excavated material. Information should outline the proposed construction activities associated with each activity (pre-construction, construction, and operational);
- (b) a description of the operational requirements of the action and any anticipated maintenance works;
- (c) the anticipated timing and duration (including start and completion dates) for both construction and operational components;
- (d) an indicative layout plan for the proposed action area, including the location and type of land use, key infrastructure, and the number and location of dwellings, other buildings, open space and conservation areas; and
- (e) details of the proposed excavation including:
 - i. maps of the area to be excavated,
 - ii. detail of the total volume of material to be excavated, and
 - iii. maps showing the location of fill placement on-site or off-site including transport routes.

Where relevant information was provided at the referral stage, incorporate or refer to this information as necessary in the consolidated preliminary documentation.

2. DESCRIPTION OF THE ENVIRONMENT AND MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

2.1 The preliminary documentation must provide a general description of the environment of the development site, as well as the surrounding areas that may be impacted by the action both in the short and long term. This section must specifically address the following matters:

- (a) A description of the matters of national environmental significance (MNES), which may be affected by the proposal. This section must address, but need not be limited to, the following matters:
 - Koala (*Phascolarctos cinereus*) combined populations of Queensland, New South Wales and the Australian Capital Territory – vulnerable.

Where information was provided in the referral information but updated information is now available, please provide the updated information. This may include:

- Information about the resources used to identify and assess the environmental values on site (i.e. was consultation or advice sought from flora and fauna experts in regard to the potential presence of threatened species and ecological communities);
- Information detailing known/recorded populations or habitat for the relevant MNES in the area surrounding the proposed action area and proposed fill dumping sites. Information may include maps with distribution of MNES and associated habitat; and
- An assessment of the adequacy of any surveys undertaken (including survey effort and timing), in particular the extent to which these surveys were appropriate to key MNES and undertaken in accordance with the Department's relevant scientific and policy guidance.

3. RELEVANT IMPACTS

3.1 The preliminary documentation must include an assessment of potential impacts (including direct, indirect, consequential and cumulative impacts) that may occur as a result of all elements and project phases of the proposed action on the MNES protected species addressed at Section 2.

3.2 Consideration of impacts must not be confined to the immediate areas surrounding the proposed action but must also consider the potential of the proposed action to impact on adjacent areas that are likely to contain MNES. For each protected MNES, this must include, but not be limited to, an assessment of:

- (a) The direct and indirect loss and/or disturbance of habitat from the proposed action. This must include the quality of habitat and total area in hectares (and as number of individuals, if available and applicable), and the area of potential habitat for the species and communities likely to be impacted;
- (b) Details on the distance of proposed works to any habitat for, or individuals of, EPBC Act listed threatened species and communities within 500 metres of the disturbance footprint, and analysis of the long term viability of these populations if the proposal was to proceed. The information should consider and describe in detail all possible indirect impacts associated with the action, and should quantify the areas of habitat in hectares (and as number of individuals, if available) which may be indirectly impacted as a result of the proposal;
- (c) An assessment of environmental values at any potential off-site areas where excavated material may be dumped;
- (d) Details on whether any impacts are likely to be unknown, unpredictable or irreversible;
- (e) Analysis of the acceptability of the relevant impacts;
- (f) Any technical data and other information used or needed to make a detailed assessment of the relevant impacts;
- (g) Detailed assessment of the proposed excavation, including:

- i. geological assessments of the excavation area such as acid sulfate soils assessment;
 - ii. hydrological assessments of the excavation area; and
 - iii. sediment and erosion controls to be used within the project area and any off-site fill placement (such as may be within an Erosion and Sediment Control Plan);
- (h) A local and regional scale analysis of the likely impacts. This should include a discussion of connectivity, potential cumulative impacts within the broader regional and information on the long term viability of MNES if the proposed was to proceed.

3.3 All discussions and conclusions drawn regarding the assessment of impacts, direct or indirect, should include a full justification based on the best available information, including relevant conservation advices, recovery plans and threat abatement plans, if applicable. If these are not applicable, a brief statement to this effect must be included.

4. PROPOSED AVOIDANCE, MANAGEMENT AND MITIGATION MEASURES

4.1 The preliminary documentation must provide information on specific measures proposed to avoid, mitigate and manage impacts to the protected species and ecological community addressed at Section 2 resulting from the proposed action.

4.2 Specific measures should be presented in the form of management plans, such as a Fauna Management Plan for MNES and a Vegetation Clearing and Management Plan (and/or relevant document/s). At a minimum the plans must include details of the key commitments and measures to ensure that impacts to the species and communities addressed in Section 2 are avoided and minimised. The plans should be in a form that is clear and easy to understand, including clearly annotated maps and diagrams, in colour. Locations of proposed conservation and management measures within the proposed project site should be included. To assist you, the Department's *Environmental Management Plan Guidelines 2014* are available at:

www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines

4.3 The plans must incorporate conservation advices, recovery plans and threat abatement plans, where relevant. In particular, the plans must demonstrate how the mitigation measures are consistent with the following documents (and other related policies):

- *Approved Conservation Advice for Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory) (koala Northern Designatable Unit) 2012*
(<http://www.environment.gov.au/biodiversity/threatened/species/pubs/197-conservation-advice.pdf>);
- *National Koala Conservation and Management Strategy 2009–2014*
(<http://www.environment.gov.au/biodiversity/threatened/publications/national-koala-conservation-mgt-strategy-2009-2014>); and
- *EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory), Commonwealth of Australia, 2014*

<http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-vulnerable-koala>).

4.4 The effectiveness of mitigation measures must be appropriate to the scale, risk, duration and severity of the impact.

4.5 Documentation should clearly set out the following measures for each environmental issue and MNES likely to be impacted by the proposed action (e.g. in the form of a schedule). Measures including, but not be limited to, the following items must be outlined in the documentation to:

- (a) Address all project phases (pre-construction, construction and operation) of the proposed action;
- (b) State the environmental and conservation objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue;
- (c) Describe contingencies for events, such as the identification of protected matters during pre-construction searches (e.g. translocation management protocols for specific species);
- (d) Include an assessment of the expected or predicted effectiveness of the mitigation measures;
- (e) Include any statutory or policy basis for the mitigation measures;
- (f) Include a description of any rehabilitation of temporarily disturbed areas or retained open spaces (e.g. habitat improvement works within conservation buffer zones). This should also address management, methodology, timing, duration and effort of rehabilitation works;
- (g) Include maps that illustrate the location of any proposed construction exclusion zones or buffer zones, and details on how these areas will be excluded, or protected;
- (h) Details of the vegetation or habitat to be retained must include the location and quantification of the total area, presence of protected matters, protection measures such as fencing and road underpasses, management measures and their suitability with respect to any protected matters present and any conservation arrangements;
- (i) A discussion of the likely residual impacts to protected matters after proposed avoidance and/or mitigation measures are taken into account;
- (j) Provide details of ongoing research and monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed mitigation measures;
- (k) Provide details of protocols along with the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program; and
- (l) Describe long term funding for management measures.

5. PROPOSED OFFSETS

5.1 The preliminary documentation must include an assessment of the likelihood of residual impacts occurring, after mitigation and management measures relating to the project have been applied. This includes direct impacts such as habitat clearing and indirect impacts such as degradation of retained habitat.

5.2 Please provide:

- (a) Details of an offset package (this may be in the form of an offset management plan) proposed to be implemented to compensate for the residual impacts of the project, such as how, when and where the offsets will be delivered and managed;
- (b) Details of how the offset(s) will compensate for the significant residual impacts upon MNES, resulting from the action;
- (c) A description of how the offset(s) will ensure the protection, conservation and management of MNES for the duration of the impact;
- (d) A description of how the offset(s) are consistent with relevant Commonwealth policies and guidance documents on offsets under the EPBC Act. These documents can be found at the following link:

www.environment.gov.au/epbc/publications/environmental-offsets-policy.html; and

- (e) The anticipated cost (financial and other) of delivery of the offset(s).

5.3 The offset proposal should include, but not be limited to the following:

- a) The location, description and suitability of the proposed offset site, including baseline conditions, environmental values and connectivity with other relevant habitat;
- b) The extent to which the proposed offset actions correlate to, and adequately compensate for, the impacts on MNES and habitat critical to the survival of MNES;
- c) A description of the conservation gain to be achieved by the offset, i.e. positive management strategies that improve the site or avert the future loss, degradation or damage of the ecological community and MNES habitat;
- d) Information on current land tenure of any proposed offset and the method of legally securing the offset for the long term;
- e) Measures to protect, and/or manage and rehabilitate the ecological community and MNES habitat at the offset site, including timing, frequency and longevity for each measure and performance criteria that must be met;
- f) Detail of monitoring and reporting activities to assess the success of the offset; and
- g) An assessment of the proposed offset, using the Department's *Offsets Assessment Guide*, and clear justification for each input entered.

5.4 The offset package can comprise a combination of direct offsets and other compensatory measures, so long as it meets the requirements of the *EPBC Act Environmental Offset Policy*. Offsets should align with conservation priorities and be tailored specifically to the attribute of the protected matter that is impacted, in order to deliver a conservation gain.

5.5 Offsets should compensate for an impact for the full duration of the impact.

5.6 Offsets must directly contribute to the ongoing viability of MNES and deliver an overall conservation outcome that improves or maintains the viability of the ecological community and habitat for MNES, as compared to what is likely to have occurred under the status quo, i.e., if neither the action nor the offset had taken place.

5.7 Note that offsets do not make an unacceptable impact acceptable and do not reduce the likely impacts of a proposed action. Rather, offsets compensate for any residual significant impact resulting from the proposed action.

5.8 Offsets required by the State can be applied if those offsets meet the Department's *EPBC Act Environmental Offset Policy*.

6. ENVIRONMENTAL OUTCOMES

6.1 If the proponent wishes to pursue outcomes-based conditions in the event that the action is approved with conditions, the preliminary documentation must provide information on the outcomes that the proponent will achieve as outlined in Section 2.

6.2 Outcomes need to be specific, measurable and achievable and must be based on robust baseline data. Outcomes must be developed in consideration of the *Outcomes-based Conditions Policy 2016* and *Outcomes-based Conditions Guidance 2015*, with suitable justification for considerations identified in the policy and guidance.

6.3 To allow application of outcomes-based conditions, the preliminary documentation should include the specific environmental outcomes to be achieved and the reasoning for these in reference to any Recovery Plan, Conservation Advice or Threat Abatement Plan that may be relevant to MNES.

6.4 For each proposed outcome, the information must include:

- (a) The risks associated with achieving the outcome;
- (b) The measurability of the outcome, including all suitable performance measures;
- (c) Appropriate baseline data upon which the outcome has been defined and justified;
- (d) The likely impacts that the proposed outcome will address;
- (e) Demonstrated willingness and capability of achieving the outcome;
- (f) Commitments to independent and periodic audits of performance towards achieving outcomes;
- (g) Assessment of the likely level of control that the proponent will have over achieving the outcome; and
- (h) Details of proposed management to achieve the outcome, including, but not limited to, performance indicators, periodic milestones, proposed monitoring and adaptive management, record keeping, publication and reporting processes.

7. SOCIAL AND ECONOMIC

7.1 The preliminary documentation must address the economic and social impacts (both positive and negative) of the proposed action. Matters of interest may include:

- (a) Details of any public consultation activities undertaken and their outcomes;
- (b) Details of any consultation with Indigenous stakeholders;
- (c) Any monitoring programs to monitor ongoing changes to economic and social characteristics potentially affected by the proposed action;
- (d) Projected costs and benefits of the project, including the basis for their estimation through cost/benefit analysis or similar studies; and
- (e) Employment opportunities expected to be generated by the project (including construction and operational phases).

7.2 Economic and social impacts should be considered at the local, regional and national levels.

8. ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

8.1 Provide a description of the proposed action in relation the principles of ecologically sustainable development, as defined in the EPBC Act:

- a) the long-term and short-term economic, environmental, social and equitable considerations,
- b) the precautionary principle which states that a lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation where there are threats of serious or irreversible environmental damage,
- c) the principle of inter-generational equity which states that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations,
- d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making, and
- e) improved valuation, pricing and incentive mechanisms should be promoted.

8.2 To assist you, the National Strategy for Ecologically Sustainable Development (1992) is available on the following web site:

<http://www.environment.gov.au/resource/national-strategy-ecologically-sustainable-development>.

9. ENVIRONMENTAL RECORD OF PERSON(S) PROPOSING TO TAKE THE ACTION

9.1 The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

- (a) the person proposing to take the action, and
- (b) for an action for which a person has applied for a permit, the person making the application.

9.2 If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

10. OTHER APPROVALS AND CONDITIONS

10.1 The preliminary documentation must include information on any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action. This must include:

- (a) a description of any approval that has been obtained or is required to be obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply (or are reasonably expected to apply) to the action, and
- (b) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.



Attachment C

Koala Management Plan (SHG 2017)

environmental management



First Nine Master Planned Residential Development Koala Management Plan

EPBC Act Preliminary Documentation Submission
(Publication Issue)



Springfield Land Corporation
Brookwater Drive, Brookwater

7399

EPBC Ref: 2016/7676

July 2017



Declaration of Accuracy

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the regulations. This offence is punishable on conviction by imprisonment for not more than 1 year, a fine not more than 60 penalty units, or both. An extract of section 491 of the EPBC Act is attached.

Signed:

Full Name: Murray Saunders

Organisation: Saunders Havill Group

Date: 24.062016

491 Providing false or misleading information to authorised officer etc.

- (1) A person is guilty of an offence if the person:
 - (a) provides information or a document to another person (the *recipient*); and
 - (b) knows the recipient is:
 - (i) an authorised officer; or
 - (ii) the Minister; or
 - (iii) an employee or officer in the Department; or
 - (iv) a commissioner;
performing a duty or carrying out a function under this Act or the regulations; and
 - (c) knows the information or document is false or misleading in a material particular.
- (2) The offence is punishable on conviction by imprisonment for a term not more than 1 year, a fine not more than 60 penalty units, or both.

Note: Subsection 4B(3) of the *Crimes Act 1914* lets a court fine a body corporate up to 5 times the maximum amount the court could fine a person under this subsection.



Document Control

Title	Koala Management Plan
Address	Brookwater Drive, Brookwater
Client:	Springfield Land Corporation
Job Number	7399
EPBC Reference	2016/7676

Document Issue

Issue	Date	Prepared By	Checked By
Draft	21.06.2016	KG	AD
DoE Lodgement	24.06.2016	KG	AD
Publication 1	18.07.2017	KG	AD
Publication 2			

Disclaimer

This report has been prepared for **Springfield Land Corporation** **Saunders Havill Group** cannot accept responsibility for any use of or reliance upon the contents of this report by any third party.

Reports and/or Plans by Others

Reports and/or plans by others may be included within this Koala Management Report to support the document.



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I. Introduction

The *Environmental Management Division* of **Saunders Havill Group** (SHG) act on behalf of **Springfield Land Corporation** (SLC) (in the coordination and response to *Environment Protection and Biodiversity Conservation Act* (EPBC Act) Controlled Action Assessment (2016/7676) for the First Nine Residential Development project located on Brookwater Drive, Brookwater in Greater Springfield.

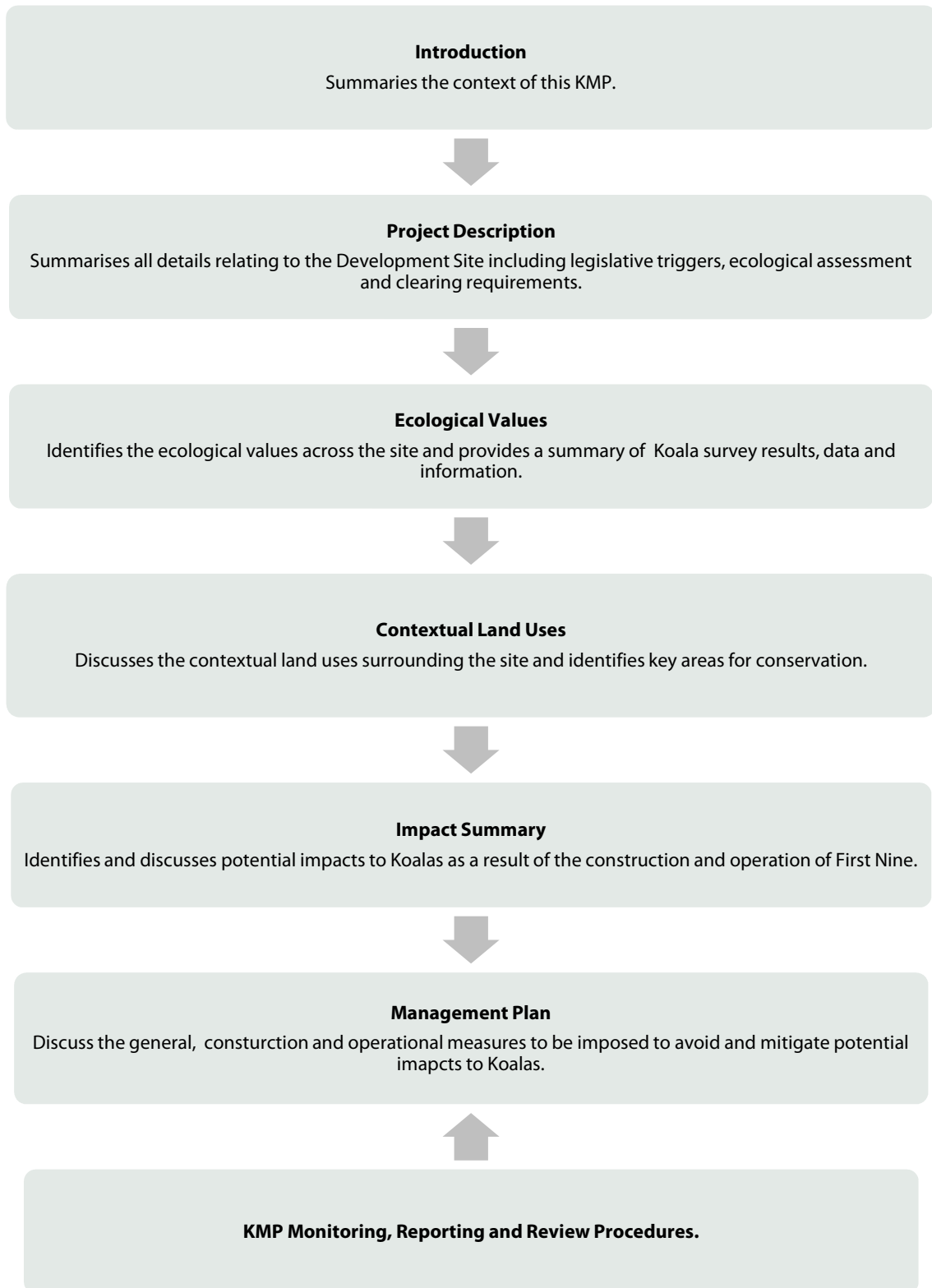
The proposed action, a master planned residential development, was determined to be a Controlled Action due to its potentially significant impacts on the Koala (*Phascolarctos cinereus*), which is listed as Vulnerable under the EPBC Act. This Koala Management Plan (KMP) has been developed in response to the Preliminary Documentation additional information request.

The purpose of this KMP is to provide a single explanatory management document for the inclusion in the design, construction and operation of the master planned residential development. The objectives of this document are:

- 1) To highlight the existing flora and fauna values on the subject site and in surrounding areas;
- 2) Describe key results from survey data, including Koala occurrence and the availability and quality of habitat;
- 3) Identify key direct and indirect impacts on Koalas and describe proposed avoidance and mitigation measures;
- 4) List out actions and legislative requirements to be put in place to manage construction impacts;
- 5) Provide a framework for a number of operational management measures including:
 - a. Conservation areas set aside for Koala usage
 - b. Incorporation of education and prohibition signage within open space and road reserves
 - c. On-lot education campaigns to raise consumer awareness of local Koala populations; and
 - d. Provide ongoing resources and facilities for monitoring the success of this management plan.



I.I. Koala Management Plan Structure





2. Project Description

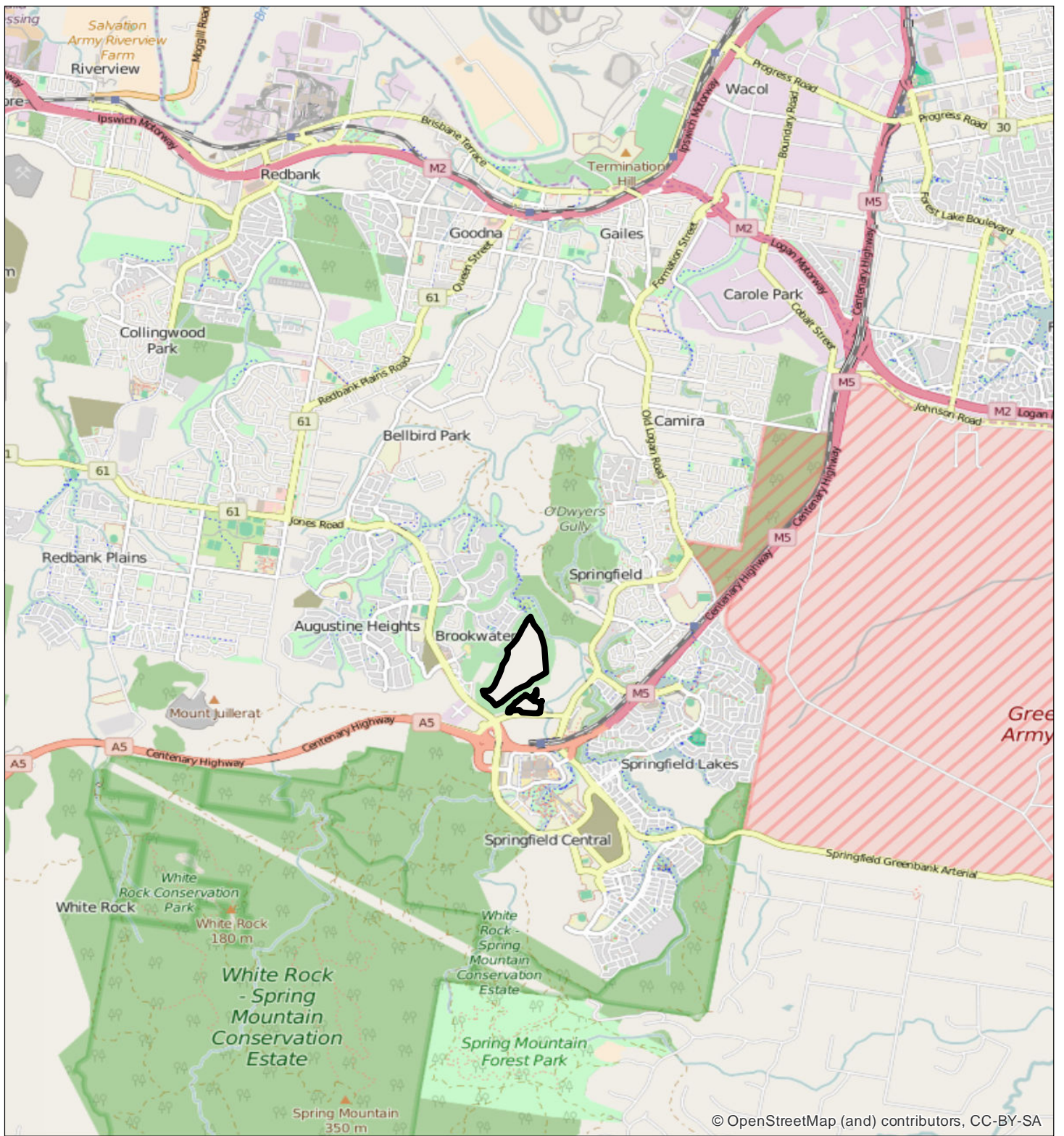
First Nine is located within the broader 2,860ha Greater Springfield development area which is located in Ipswich in South East Queensland. The First Nine development area adjoins the existing and completed Brookwater Community residential development and is immediately encompassed by the existing greens of Brookwater Golf Course (Holes 1 to 9). More broadly the site is surrounded by residential development, including Augustine Heights to the west, Springfield Town Centre to the south and Springfield Lakes to the east and Brentwood through the north. Environmental features adjoining the site include Opossum Creek to the north and a patch of vegetation to the east which is identified within the Springfield Structure Plan as future Town Centre. The subject area includes 4.25ha to the south of the development footprint adjoining the Brookwater Golf Course and Eden's Station Road which will be filled with material from the development footprint. The site context is displayed in **Figure 1** and site aerial in **Figure 2**.

The proposed First Nine development area and external fill site is a predominately vegetated. Regulated Vegetation mapping suggests the site contains Of Concern Regional Ecosystems 12.9-10.2/12.9-10.7/12.9-10.18 and essential habitat for the Koala (refer **Figure 4**). Areas not identified as remnant occur in the west over the western extent of Brookwater Drive. A number of access tracks, including the proposed extension of Brookwater Drive, traverse the site. The site has been subject to contemporary flora and fauna assessments to address various approval requirements including targeted surveys carried out specifically for referral under the EPBC Act.

Overall, the site was found to be disturbed as a result of maintained access tracks, unlawful activities including motorbike and 4wd impacts, weed infestations, evidence of dogs, dumping of domestic rubbish and edge effects from surrounding development, in particular edge effects from the encompassing golf course greens. The Koala (*Phascolarctos cinereus*) and its habitat were the only listed threatened Matters of National Environmental Significance (MNES) recorded on-site. The vast majority of the site contained less suitable Koala habitat.

While the proposal will result in the clearing of suitable Koala habitat, almost 70ha of land within the Flinders-Karawatha Bioregional Corridor will be secured and rehabilitated to offset residual impacts on the species and deliver a conservation outcome that maintains the extent (for perpetuity) of critical Koala habitat in the landscape. The vegetation within the Conservation Land will undergo weed removal and will be replanted with native species consistent with the naturally occurring Regional Ecosystems as part of the rehabilitation proposal. The offset will ensure connectivity between adjoining vegetation patches is maintained for the long term for local site scale koala usage. This offset seeks to ensure that Koalas prevail in the landscape in which the action is occurring. Management of this offset will be in accordance with the Spring Mountain Estate V-Dec Management Plan which has been approved as part of addressing conditions for approval for Spring Mountain (EPBC2013/7057). For these reasons, the proposal is considered to minimise impacts on listed threatened species with potential to utilise the site.

Due to fragmentation of the development site, no areas of Koala habitat will be retained on site. Subsequently, this KMP focuses on to managing and mitigating impacts to the Koala during vegetation clearing, as well as ongoing management and monitoring during construction and operation.



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Legend


 First Nine referral area

Figure 1
Site Context

File ref. 7399 E F9 Figure 1 Site Context A
Date 24/06/2016
Project First Nine

0 500 1,000 2,000 m
Scale (A4): 1:75,000 [GDA 1994 MGA Z56]



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Legend

 First Nine referral area

Figure 2

Site Aerial

File ref. 7399 E F9 Figure 2 Site Aerial A
Date 24/06/2016
Project First Nine

0 50 100 200 300 m

Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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3. Ecological Values

3.1. Vegetation Values

The vegetation values across the site are diverse due to historical land uses and edge effects from surrounding development. A property search of the Regulated Vegetation Management Map identifies that the site contains Category B Regulated Vegetation which is protected under the *Vegetation Management Act 1999* (VMA). The Vegetation Management Supporting Map (refer **Figure 3**) indicates the site is mapped with the following Regional Ecosystems which are described in **Table 1**:

- RE 12.9-10.7 (Of Concern)
- RE 12.9-10.2 (Least Concern)
- RE12.9-10.19 (Least Concern)

Table 1: Regional Ecosystem Descriptions

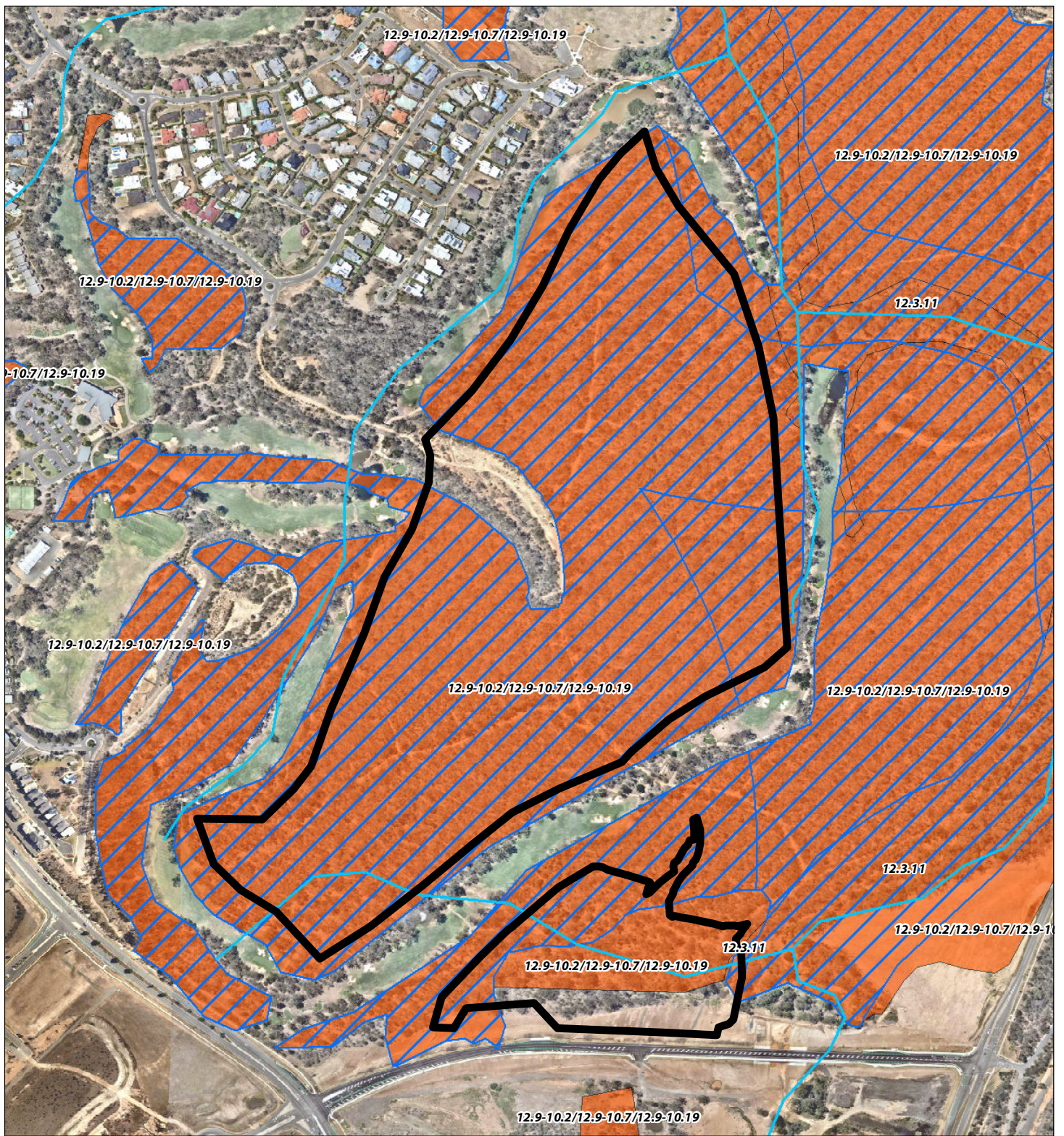
Regional Ecosystem	Status	Description
RE 12.9-10.7	Of Concern	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora leiocarpa</i> , <i>E. melanophloia</i> woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c)
RE 12.9-10.2	Least Concern	<i>Corymbia citriodora subsp. variegata</i> open forest or woodland usually with <i>Eucalyptus crebra</i> . Other species such as <i>Eucalyptus tereticornis</i> , <i>E. moluccana</i> , <i>E. acmenoides</i> and <i>E. siderophloia</i> may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of <i>Lophostemon confertus</i> (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)
RE 12.9-10.19	Least Concern	<i>Eucalyptus fibrosa subsp. fibrosa</i> woodland +/- <i>Corymbia citriodora subsp. variegata</i> , <i>E. acmenoides</i> or <i>E. portuensis</i> , <i>Angophora leiocarpa</i> , <i>E. major</i> . Understorey often sparse. Localised occurrences of <i>Eucalyptus sideroxylon</i> . Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a)

In addition, the majority of site vegetation is mapped as essential habitat for the Koala (*Phascolarctos cinereus*) (**Figure 3**).

3.1.1 Koala SPRP

The *South East Queensland Koala Conservation State Planning Regulatory Provisions* (SEQ Koala Conservation SPRP) came into effect in May 2010, aiming to protect areas of highest priority for Koala conservation action by regulating new development at the assessment stage. It therefore targets areas of the Koala Coast and Pine Rivers (Priority Koala Assessable Development Areas) and prohibits clearing bushland habitat in these areas, as well as areas outside the urban footprint. It also covers Koala Assessable Development Areas which are areas managed under previous state koala conservation initiatives.

The site is not constrained under the SEQ Koala Conservation State Planning Regulatory Provisions (SPRP). The State Planning Policy for Koala Conservation in South East Queensland (SPP 2/10) Koala habitat values mapping identifies the site as containing Medium Value Bushland Habitat and Medium and Low Value Rehabilitation Habitat (**Figure 4**).



Legend



First Nine referral area

VM Watercourses

VM Essential Habitat

VM Wetland

Regional Ecosystems mapping

Category A or B area containing endangered regional ecosystems

Category A or B area containing of concern regional ecosystems

Category A or B area that is a least concern regional ecosystem

Figure 3

VMA Regulated Vegetation - Supporting Map

File ref. 7399 E F9 Figure 4 REs A

Date 24/06/2016

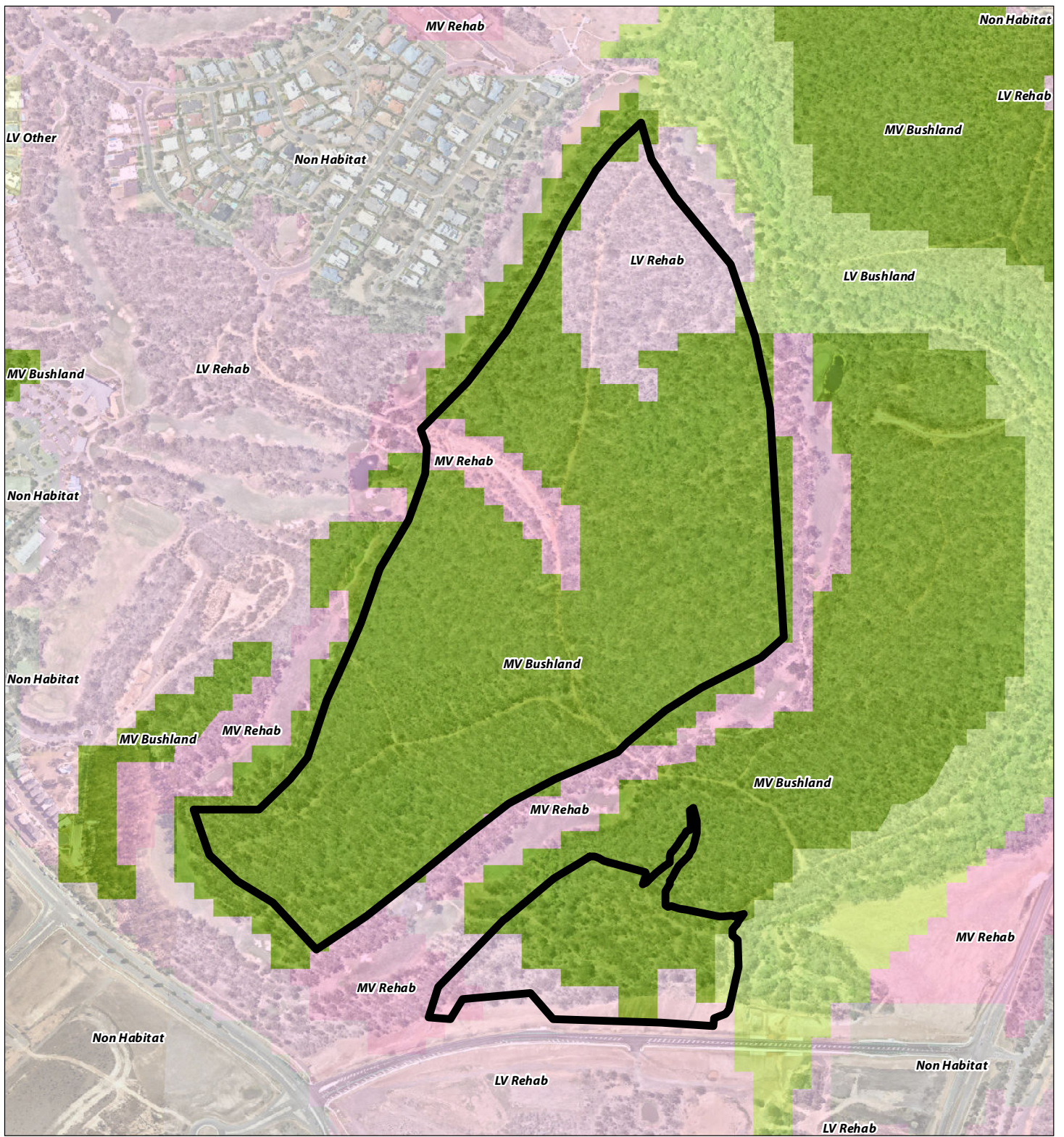
Project First Nine

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








-  First Nine referral area
- Koala Habitat Values**
- Bushland Habitat*
-  High Value Bushland
-  Medium Value Bushland
-  Low Value Bushland
- Suitable for Rehabilitation*
-  High Value Rehabilitation
-  Medium Value Rehabilitation
-  Low Value Rehabilitation
- Other Areas of Value*
-  High Value Other
-  Medium Value Other
-  Low Value Other
-  Non-habitat
-  Water

Figure 4

SEQ Koala Habitat Values Mapping

File ref. 7399 E F9 Figure 6 Koala Habitat A
Date 24/06/2016
Project First Nine

0 50 100 200 300 m
 Scale (A4): 1:8,000 [GDA 1994 MGA Z56]



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3.2. Site Values

In general, the site contained a high density of *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus crebra* (Narrow Leaved Ironbark) and *Eucalyptus siderophloia* (Grey Ironbark), however *Corymbia citriodora* (Spotted Gum) was also found in notable proportions. Sub-dominant species included *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash). A number of access tracks were noted to have been previously cleared and heavily infested weeds including *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Opuntia stricta* (Prickly Pear), *Passiflora suberosa* (Corky Passion Vine) and *Gomphocarpus physocarpus* (Balloon Cotton). Other disturbances included patches of vegetation clearing, creation of vehicle tracks and impacts from surrounding land uses.

Opossum Creek, approximately 50m to the north, is separated from the site by the existing Brookwater Golf Course. Opossum Creek is identified as a Stream Order 4 watercourse (refer **Figure 3**). While outside the referral extent and not part of this assessment, the portion of Opossum Creek adjoining the site was noted by survey to contain relatively intact riparian vegetation consistent with mapped Of Concern regional ecosystems. This creek corridor is identified to be retained as open space within the Springfield Structure Plan to retain biodiversity values and maintain connectivity within the broader landscape.

3.3. Koala Assessment

To identify existing ecological values at the site, surveys were carried out to address EPBC issues in relation to potential Matters of National Environmental Significance. A focus was placed on Koalas as they are known to occur in the region.

An assessment against the *EPBC Act Referral Guidelines for the Vulnerable Koala* was undertaken as part of the referral. The referral site is located within the Koala Referral Guidelines modelled distribution as 'known/likely to occur' and within the 'coastal context'. As stated above, South East Queensland is known to support Queensland's highest density of Koalas and the animal is known to occur within the broader Greater Springfield area.

3.3.1 Koala Specific Surveys

The First Nine development site was assessed by two Senior Ecologists from **SHG** in September 2015 and again on with weather conditions fine and sunny. A supplementary survey was completed in May 2016 for the external fill area. The purpose of these surveys was to determine the level of Koala usage across the site and to assess the availability of suitable Koala habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) development by Philips and Callaghan (2011)
- Quaternary Assessments (Habitat Surveys)
- Opportunistic Searches

SAT Surveys

The regularised-grid SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying the non-juvenile Koala habitat tree nearest to a pre-determined grid point and recording any evidence of Koala usage on that tree including presence, identifiable scratches or scats. The nearest tree is then identified and the same data recorded. The next closest tree is then assessed and so on until the 30 trees nearest to the original tree in a radial survey have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within 1 m radius of the trunk. After approximately 2 minutes of searching for scats, the base of the trunk is observed for scratches.



Site specific searches observed the presence of one (1) Koala individual within the centre of the site as well as several scats across the site. Eleven (11) SAT surveys were conducted across the site in a regularised grid pattern, as shown in **Plan 1. Table 2**, below, summarises Koala usage in the form of scats from SAT surveys.

Usage estimates were taken from the Australian Koala Foundation Koala activity level classification table (ex Phillips & Callaghan 2011) using the East Coast (med-high) Activity Category, which is applicable in habitats dominated by residual, transferal or alluvial type landscapes considered med-high nutrient soils with good water holding capacity (Steve Phillips, personal communication). Dermosols dominate the application area and this soil type, along with vegetation structure, suit this landscape description.

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
East Coast (low)	< 9.47%	≥ 9.47% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western areas (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

Extract: AKF Koala Activity Level Classification Table

▪ **Table 2: SAT Survey Results- Summary**

SAT Survey	Scats	%of Trees with Scats	Usage Level
SAT 1	Yes	13.3	Low
SAT 2	Yes	10	Low
SAT 3	Yes	16.7	Low
SAT 4	Yes	6.7	Low
SAT 5	Yes / Koala	10	Low
SAT 6	Yes	6.7	Low
SAT 7	Yes	16.7	Low
SAT 8	Yes	6.7	Low
SAT 9	Yes	6.7	Low
SAT 10	Yes	16.7	Low
SAT 11	Yes	6.7	Low

3.3.2 Critical Habitat Assessment

In accordance with the EPBC Act Referral Guidelines for the Vulnerable Koala, any habitat which receives a score of 5 or more using the Koala Habitat Assessment Tool is considered to be critical habitat. As assessment against the EPBC Act Referral Guidelines for the Vulnerable Koala identified concluded the site achieved a habitat score of 6.

Table 3 summarises the results of Koala habitat assessments across the site.



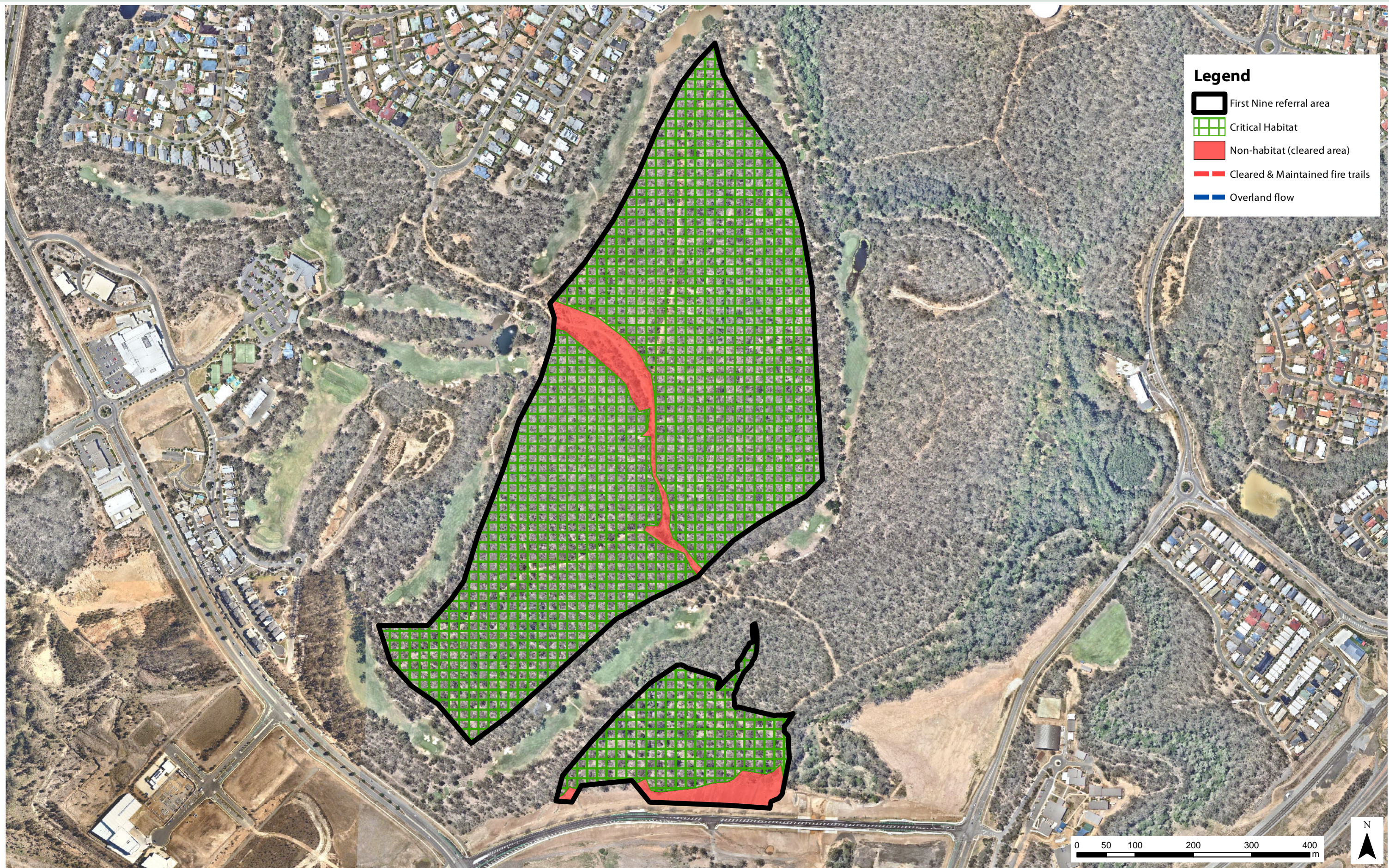
Table 3: Summary of Koala Habitat Assessment Tool Results

Attribute	Score	Comment
Koala occurrence	+2	As there is evidence of Koala occurrence in the previous two years, this attribute has been scored 2.
Vegetation composition	+2	Two or more Koala food trees were identified in the canopy, resulting in an attribute score of 2.
Habitat connectivity	+1	While the site will be reduced to a contiguous landscape <300ha, as the site retains connectivity to Opossum Creek this attribute has been scored a 1.
Key existing threats	+1	Due to the existence of key threats, the attribute has been scored 1.
Recovery value	0	As the referral site does not meet the interim recovery objectives, this attribute has been scored 0.
Total	6	Critical Habitat

The following statistics for Critical Habitat (refer **Plan2**) are summarised below.

Site Area:	47.25 hectares
Area of Critical Habitat:	46.2hectares
Area of Critical Habitat Removed:	46.2 hectares
Area of Critical Habitat Retained:	0 hectares

The proposed development of First Nine will impact on 46.2 ha of habitat critical to the survival of the species, as defined by the Koala Referral Guidelines



Legend

- First Nine referral area
- Critical Habitat
- Non-habitat (cleared area)
- Cleared & Maintained fire trails
- Overland flow



APPROVED COMPANY
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 Quality Management Systems
 QMS

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 ISO 14001
 Environmental Management Systems
 QMS

ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine
Critical Habitat

Date: 27/06/2016
 Scale: 1:6,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client: Springfield Land Corporation
 Project: Brookwater South
 Address/RPD: Springfield
 Source: DCBD (DNR, 2013), Aerial (QLD Globe, 2013)
 Referral area (DNR, 2015, Springfield Land Corp 2014)

Plan 2

SHG File
 7399 E 08 F9 Critical Habitat A

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4. Contextual Land Uses

Contextually, the site is bound by three (3) large 4-lane roads - Augusta Parkway to the south west, Eden Station Road to the south and Springfield Greenbank Arterial to the east. These major arterials and ultimately, Centenary Highway approximately 500m to the south, sever connectivity for Koala movement from the site to areas of suitable Koala habitat to the south (refer **Plan 3**).

Locally, the site is disconnected from these habitats by the Brookwater Golf Course. The referral area occurs as a cul-de-sac of vegetation completely fragmented in all directions with the exception of Opossum Creek. Opportunities for connectivity are impeded as a result of properties to the south being cleared of vegetation for industrial, commercial and retail purposes, existing development of the Brookwater Community residential estate to the west, and zoning for future Town Centre on land to the east. Further no viable movement corridors or retention of Koala habitat has been planned for the referral area under the Springfield Structure Plan.

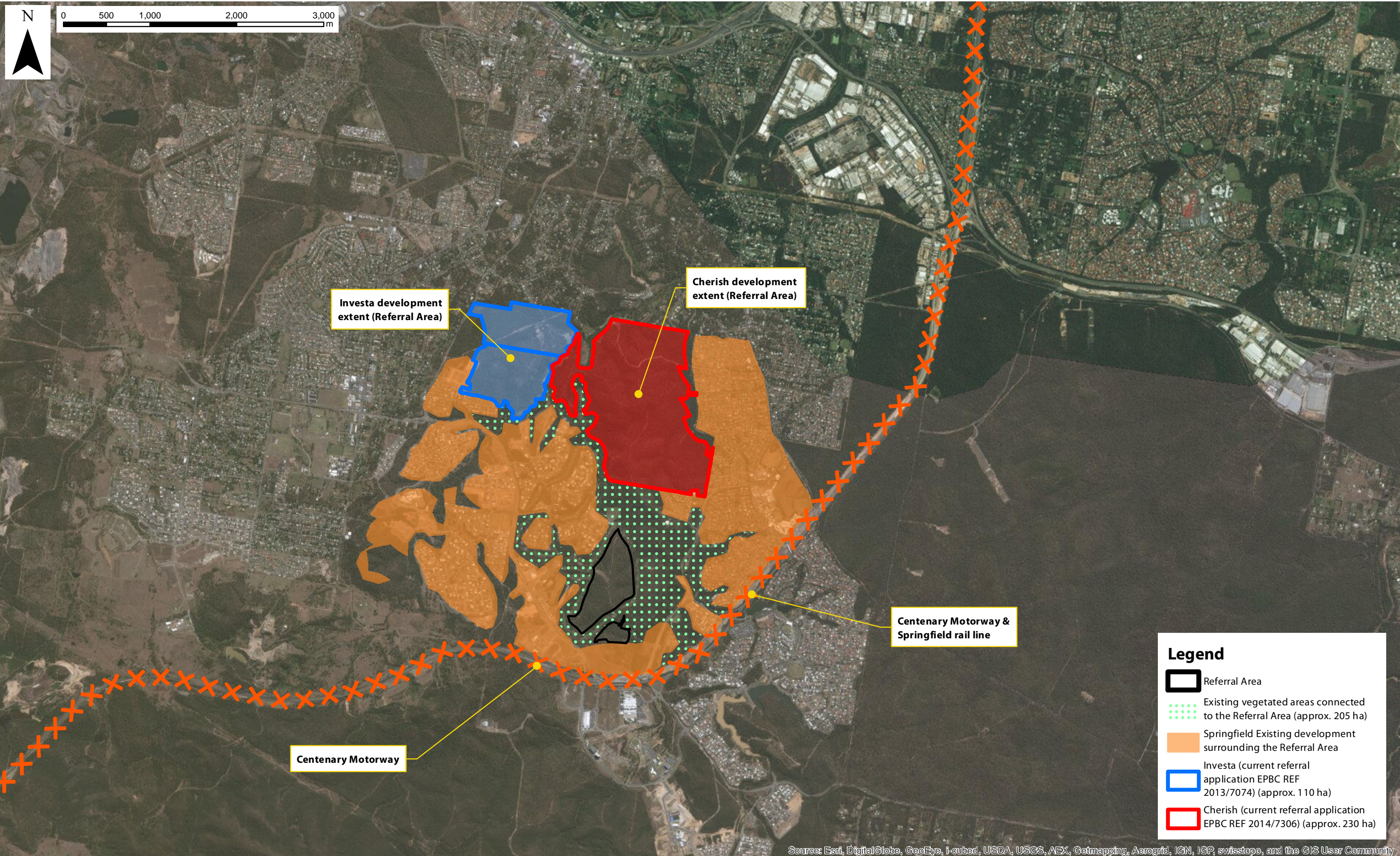
Opportunities for Koala movement and wildlife connectivity remain along the Opossum Creek, which has been zoned for open space under the structure plan, and to the large patch of vegetation to the north. It is however noted that the majority of this remaining vegetation to the north is proposed to be cleared by current EPBC applications for Investa (EPBC Ref: 2013/7074) and Cherish (EPBC Ref: 2014/7306) (refer **Plan 3**).

The site contains a generally consistent cover of vegetation, however as noted above a number of disturbances from edge effects, weed invasion, creation of access tracks and increases in domestic and feral animals from surrounding development have left the site heavily disturbed. Further, the site is devoid of notable ecological features such as a significant rocky outcrops and waterways. While connectivity to Opossum Creek conservation corridor remains to the north, disturbance from the encompassing Brookwater golf course has resulted in edge effects surrounding this vegetated pocket has resulted in heavy infestations of weeds, particularly along access tracks

Overall, the site is considered to be disturbed and limited in its ability to provide safe refuge or connectivity for native fauna, particularly when areas of notably preferable habitat for listed and local native species is located along Opossum Creek corridor to the north, outside the development footprint.

N

0 500 1,000 2,000 3,000 m



Legend

- Referral Area
- Existing vegetated areas connected to the Referral Area (approx. 205 ha)
- Springfield Existing development surrounding the Referral Area
- Investa (current referral application EPBC REF 2013/7074) (approx. 110 ha)
- Cherish (current referral application EPBC REF 2014/7306) (approx. 230 ha)

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



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PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDERGROUND SERVICES AND DEBRIED LOCATIONS OF ALL SERVICES.

ISSUES:

Issue	Date	Description	Drawn	Checked
A	18.06.2013	Prelim Draft	TC	RM

First Nine Connectivity Assessment

Date | 24/06/2016
Scale | 1:40,000 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Springfield Land Corporation
Project | First Nine
Address/RPD | Springfield
Source | DCBD (DNRM, 2015), Referral area (DNRM 2015, Springfield Land Corp 2014)

Plan 3

SHG File 7399 E 07 F9 Connectivity A



5. Impacts to the Koala

The following direct and indirect impacts have been identified as having potential to occur as a result of the development proposal:

Construction Impacts

- Loss of 46.2 hectares of critical habitat
- Potential for injury or mortality caused by vegetation clearing
- Potential for injury or mortality caused by vehicle use during construction
- Species displacement into surrounding areas
- Impacts on breeding

Operational Impacts

- Loss of habitat
- Increase in density of residential roads, which increase the threat of injury and mortality to Koalas from vehicle strike
- Increase in domestic dog ownership, which poses the potential for injury or mortality from dog attacks
- Dispersal of Koalas into residential areas
- Species displacement

5.1. Risk Assessment

Each of the identified potential impacts were analysed in the context of the proposed action within the Risk Assessment Table (refer **Table 4**) to identify where avoidance and mitigation measures should be focused.

Table 4: Risk Assessment

Impact	Likelihood	Consequence	Risk Rating
Construction Phase			
Loss of habitat	Almost certain (A)	Minor (2)	High
Loss of 45.4 hectares of critical habitat	Almost certain (A)	Minor (2)	High
Injury and mortality due to vegetation clearing	Unlikely (D)	Major (4)	High
Injury and mortality due to increased vehicle usage	Unlikely (D)	Major (4)	High
Species displacement into other habitat areas	Possible (C)	Minor (2)	Moderate
Impacts on breeding	Unlikely (D)	Moderate (3)	Moderate
Operational Phase			



Impact	Likelihood	Consequence	Risk Rating
Loss of habitat	Almost certain (A)	Minor (2)	High
Injury and death from dogs	Possible (C)	Major (4)	Extreme
Injury and death from cars	Possible (C)	Major (4)	Extreme
Dispersal of koalas into residential areas	Possible (C)	Moderate (3)	High
Species displacement	Possible (c)	Minor	Moderate

As identified from the risk assessment above, management measures will focus on avoiding and mitigating impacts caused by:

- Loss of habitat
- Risk of injury and death caused by:
 - Vegetation clearing
 - Dog attack
 - Vehicle strike
- Dispersal into residential areas
- Barriers to dispersal into surrounding habitat areas



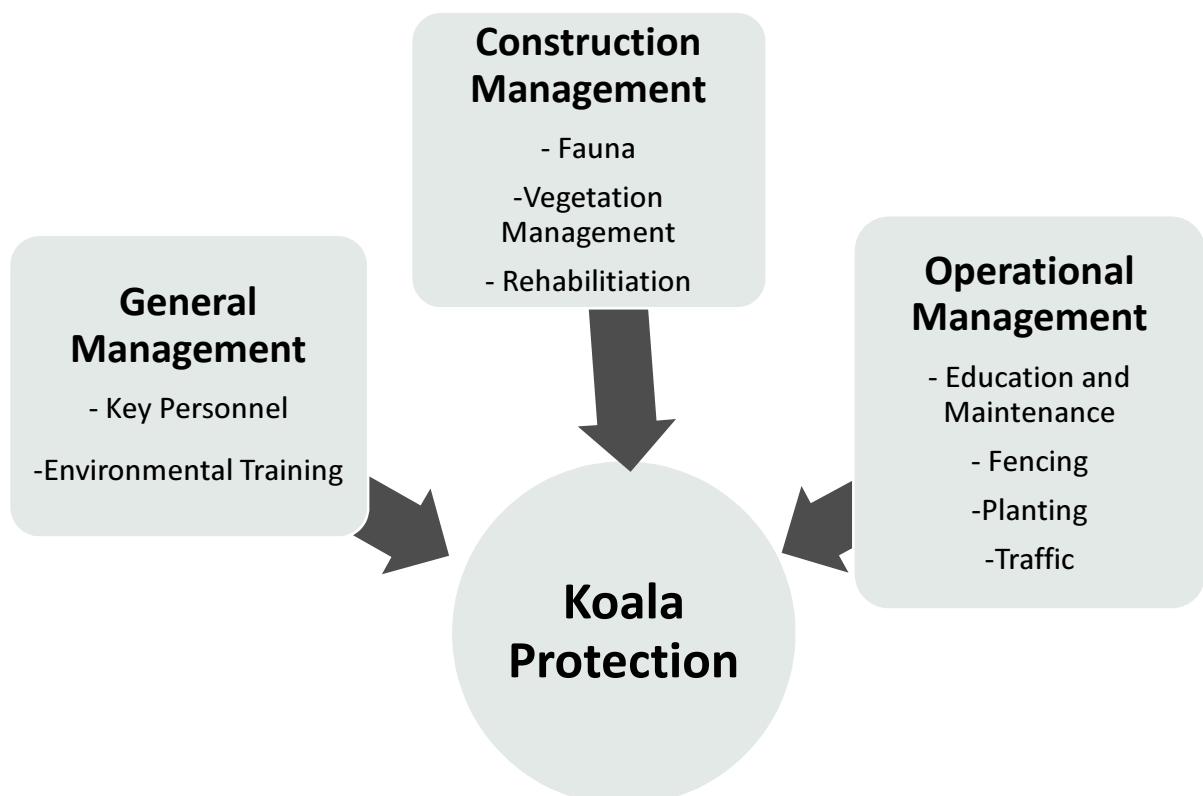
6. Management Plan

This First Nine Koala Management Plan (KMP) focuses on the long term management and safety of Koalas during the final design, construction and operation of the project site. The key objectives of these management measures are:

- 1) No death or injury of Koalas during the sequential construction.
- 2) To control the sequential removal of site vegetation in accordance with leading practice fauna management protocols.
- 3) Provide mandatory management specifications and protocols.
- 4) To comply with all conditions imposed within approvals.
- 5) To integrate community awareness and education about Koalas throughout the development.
- 6) Outline management activities, timing, responsibility, measurable targets, reporting and corrective actions.
- 7) Achieve Koala management expectations of the community, government and the proponent.

These objectives will be achieved through the implementation of a number of actions at each stage of project design, construction and operation.

Components of Management:





6.1. General Management

6.1.1 Key Management Plan Personnel

The successful implementation of this KMP requires a number of key personnel to complete various roles. While the contractors for the project are yet to be appointed, these will be specified within later versions of the KMP (**Table 5**).

Table 5: Key Management Personnel

Role	Person	Company
Proponent/ Project Coordinator	TBA	TBA
Environmental Coordinator	TBA	TBA
Commonwealth Contact	TBA	TBA
Ipswich City Council Contact	TBA	TBA
Principal Site Contractor	TBA	TBA
Registered Fauna Spotter	TBA	TBA

6.1.2 Environmental Training

The approved version of the KMP will be issued to all site contractors and sub-contractors and will be made available within the site construction office. Elements of compliance with the KMP will form part of the responsibility of the Principal Site Contractor. Training on the KMP will be incorporated as part of the broader environmental management and workplace health and safety procedures for the site. This will include:

- 1) Providing a copy of the KMP to all site contractors and sub-contractors;
- 2) Requirements of the KMP discussed during site induction;
- 3) Making available the final copy of the KMP within the site construction office;
- 4) Requirements of the KMP to be incorporated into workplace checklists, work method statement and toolbox talks; and
- 5) Weekly review and report on compliance with the KMP as part of the Principal Contractor's role.

6.2. Construction Management

6.2.1 Fauna

The sequential clearing of site vegetation will be undertaken in accordance with fauna management protocols implemented by a Fauna Spotter/Catcher registered by Queensland's **Department of Environment and Heritage** (DEHP). **SLC** have committed to adopt a leading practice fauna management model to guide works prior, during and post construction. This model is cited as the Draft Code of Practice for the Welfare of Animals Affected by Land-clearing and Other Habitat Impacts, endorsed by the **Australia Zoo Wildlife Warriors** and **Voiceless** (refer **Attachment 1**). Under this Code, the following procedures will apply to all clearing works:

Action 1 – Developer to Engage Fauna Spotter / Catcher

This action requires that the developer engage a Wildlife Fauna Spotter / Catcher with full registrations and licences provided in accordance with the Queensland Department of Environment and Heritage Protection (EHP).



Action 2 – Fauna Spotter to Prepare a Wildlife Protection and Management Plan (WPMP)

The WPMP should be submitted to the **EHP** and include the following information:

- Description of the project with reference to impacts on wildlife or wildlife habitat;
- Pre development plan of the site showing habitat areas, features, corridors, riparian habitats and adjacent areas;
- Results of any fauna surveys including pre-clearance surveys; and
- A wildlife and habitat impact assessment based on the proposed development works.

Action 3 – Prepare a Wildlife and Habitat Impact Mitigation Plan

Following completion and approval of the WPMP the fauna spotter should prepare a more specific Wildlife and Habitat Impact Mitigation Plan, which will include details on:

- Measures required to be completed to minimise wildlife and habitat impacts during operational works;
- Wildlife capture and removal plan;
- Contingency plan for wildlife requiring euthanasia, other veterinary procedures or captive care;
- Wildlife storage and housing plan;
- Wildlife release and disposal plan; and
- Post works measures to minimise impacts on wildlife.

Action 4 – Fauna Spotter Role at Pre-Start Meeting

Prior to the commencement of any construction works, a pre-start meeting is to be held between the project manager, site foreperson, plant operators and Local and State Government representatives. At the pre-start meeting, the Fauna Spotter is to outline the clearing process and the requirements of the approved Fauna Management Plan.

Action 5 – During Construction

The Fauna Spotter is to be on-site during all phases of construction which involve potential impacts on wildlife or habitat. This will enable the Fauna Spotter to make any necessary adjustments to the approved Vegetation Management Plan and WPMP to cater for any specific issues encountered during the clearing works.

Action 6 – Post Works Reporting

During the course of all site works, including the pre-clearance surveys, the fauna spotter is to keep an accurate record of all animals encountered, captured, incidents and disposals for each stage of the project. The records should form part of the Wildlife Management Report to be issued under licence requirements to the State Government. The Wildlife Management Report should consist of the following 3 sections:

1. Wildlife Habitat Management Plan – Aspects of the planning, design, construction and ongoing operation of the project in which risks to wildlife have been identified. This plan should also include recommendations and outline the type, frequency and timeframes for monitoring
2. Wildlife Capture and Disposal Plan – Should contain the following details for each captured animals:
 - a. Species
 - b. Identification name or number
 - c. Sex (M, F or unknown)
 - d. Approximate Age or Age Class (neonate, juvenile, sub-adult, adult)



- e. Time and date of capture
 - f. Method of capture
 - g. Exact point of capture (GPS coordinates)
 - h. State of health
 - i. Incidents associated with capture likely to affect health
 - j. Veterinary intervention or treatments
 - k. Time held in captivity
 - l. Disposal method (euthanasia, translocation, re-release)
 - m. Date and time of disposal
 - n. Detailed of disposal (GPS points of release)
 - o. For released animals, location relative to point of capture
3. Animal Injury and Euthanasia Report – similar details for the Wildlife Capture and Disposal Plan should be included in this report.

6.2.2 Vegetation Management and Clearing

Vegetation clearing over the development footprint will occur in a series of small stages, sequentially in accordance with an approved Vegetation Clearing and Management Plan and Fauna Management Plan. Temporary fauna exclusion fencing will be erected around construction areas to prevent fauna from dispersing into these hostile areas.

6.3. Operational Management

6.3.1 General

The First Nine development incorporates a number of operational fauna management procedures and features to be incorporated into the ongoing role of the project in maintaining wildlife function and movement once development has been completed. The operational measures cover a range of areas including the road reserves and open space areas through to specific on lot advice for new residents. The core concepts and ideas for the operational measures include:

Education and Awareness Signage

Education and awareness signage along waterway corridors / pedestrian links and esplanade roads will be installed, detailing the importance of the corridors, their potential to be used by Koalas, and how residents can support this use.

Landscaping

A non-Koala tree landscape mix to be used in estate landscaping. Ensure street and park trees while being planted out with non-invasive native trees don't specifically include any primary or secondary Koala food trees. The goal of this approach is to minimise the attraction for Koalas to exit the corridor area.

Traffic Management

Fauna movement solutions will be integrated into the road design where roads crosses conservation areas. In addition, speed limits will be limited to 50km/hr within residential areas, as per Queensland's traffic laws. Traffic calming such as speed humps, signage and median strips will be deployed throughout the estate.



Lifestyle Guidelines

The First Nine Lifestyle Guideline documentation will be issued to each new resident and is designed to help promote a range of ecological sustainable living principles. The guideline will be used to directly educate and raise awareness of a large audience towards the management of the waterway corridors. Topics included within the education documents include:

- Appropriate plant selection on allotments
- Inappropriate planting species (known local or declared weed species)
- Management of house hold scale run-off
- Protection of native animals and the types of native animals residents could expect to see, including Koala and Grey-headed Flying-fox
- Understanding storm water devices
- Appropriate management of domestic animals
- Location of dog on-leash and off-leash areas
- Interpretation of fauna control signage
- Key local and state phone numbers to contact if distressed or orphaned fauna is located.

Through raising awareness, the lifestyle guidelines will help new residents take direct ownership of the local streetscapes and the existing vegetated and recently rehabilitated portions of the waterway corridor as well as an appreciation of conservation land for local wildlife within the broader landscape.



7. Monitoring, Reporting & Review

A number of management activities have been identified within this KMP. **Table 6** includes additional details relating to timing, funding, responsible parties, monitoring and reporting for each of these management activities. This KMP will be reviewed annually or at the completion of each phase of the project.

Table 8: Management Roles and Responsibilities

Environmental Management Commitment	Responsibility	Timing	Funding	Monitoring Frequency	Reporting
1. Engagement of Fauna Spotter/Catcher- ensure Fauna Spotter Catcher retains all necessary licences and accreditations	Proponent (or as passed onto Principal contractor)	Before clearing commences on any stage of works and during construction including an post construction reporting	Proponent	Pre-clearance report issued to Council and the DoE prior to commencement of works. Fauna spotter/catcher on site during all works. Issuing of post works audit reports to Council and State Government in accordance with registration requirements.	Pre-construction
2. Develop Wildlife Protection and Management Plan	Fauna Spotter/Catcher	Before construction commences	Proponent	Pre-clearance fauna survey before construction commences	Pre-construction
3. Develop Wildlife and Habitat Impact Mitigation Plan	Fauna Spotter/Catcher	Before construction commences	Proponent	Before construction commences	Pre-construction
4. Guidance from Fauna Spotter/Catcher at Pre-Start Meeting	Fauna Spotter/Catcher	During pre-start meeting	Proponent	N/A	N/A
5. Staged, sequential clearing	Contractors	Clearing of each stage	Proponent	Throughout vegetation clearing phase	Post clearing for each stage
6. Post Works Wildlife Management Report	Fauna Spotter/Catcher	Records to be kept during construction and final report submitted at completion of works	Proponent	Throughout construction phase	Post construction
7. Install temporary fauna exclusion fence around construction areas	Contractors	During construction phase	Proponent	Throughout construction phase	Structures will be maintained and any incidents will be reported

environmental management
Koala Management Plan



Environmental Management Commitment	Responsibility	Timing	Funding	Monitoring Frequency	Reporting
8. Implement Draft Code of Practice for the Welfare of Animals Affected by Land Clearing	Fauna Spotter/Catcher	Prior to and during construction phase	Proponent	Throughout construction phase	Throughout construction phase
10. Establish Lifestyle Guidelines for new residents	Consultant	Post construction, prior to occupation of residents	Proponent	N/A	N/A
11. Reporting incidents	Contractor	At the time of the incident	Proponent	Throughout construction phase	At the time of an incident, it will be recorded. Measures to be imposed to address/manage the incident will also be recorded.



Attachment I

Draft Code of Practice for the Welfare of Animals Affected by Land-clearing and Other Habitat Impacts, endorsed by the Australia Zoo Wildlife Warriors and Voiceless



AUSTRALIA ZOO
**WILDLIFE
WARRIORS**
WORLDWIDE



QUEENSLAND

CODE OF PRACTICE

FOR THE WELFARE OF WILD ANIMALS
AFFECTED BY LAND-CLEARING AND
OTHER HABITAT IMPACTS
AND
WILDLIFE SPOTTER/CATCHERS

Draft



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Australian Wildlife Hospital
(A division of Australia Zoo Wildlife Warriors Worldwide Ltd)

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1. Introduction and Background

1.1 Purpose of the Queensland code of practice for the welfare of wild animals affected by land-clearing and other habitat impacts and wildlife spotter/catchers (The Code).

This code of practice provides standards and guidelines to ensure that fair, reasonable and appropriate measures are used by those involved in the destruction or modification of wildlife habitats to minimise the adverse effects on wild animal welfare and conservation. The principles set out in the Code are for the guidance of developers, town planners, plant and machinery operators, tree loppers and surgeons, farmers, and any other person, entity or agency involved in activities which are likely to cause suffering or death of wild animals, either directly or indirectly, as a result of destruction, modification or disruption of wildlife habitats, including land-clearing.

The Code emphasises the responsibilities of all relevant parties to:

- take all reasonable steps necessary to prevent cruelty or suffering to animals;
- minimise the loss of wildlife caused directly or indirectly by development or land-clearing;
- conserve, as much as possible, the ecological values of development sites and their surrounding natural environment.

The Code also provides standard operating procedures and guidelines for wildlife spotter/catchers, on whom much of the responsibility rests to ensure compliance with this Code, in respect of projects for which they are contracted or employed.

Although the greater community is largely ignorant of the impacts of development on wildlife welfare, there exists, nevertheless, an expectation that animals, whether domestic or wild, should not be treated cruelly. This Code reflects that general societal view by providing standards and guidelines to minimise cruelty to, or suffering of, wild animals as a result of development processes. There is also a rising awareness in the general community of the importance of protecting ecosystems, an expectation of the use of environmentally sustainable practices and minimisation of ecological harm.

1.2 Wildlife loss associated with land-clearing

The clearing of native vegetation, whether remnant or regrowth, represents the most significant cause of mortality of wildlife in Queensland. Based on land clearing rates in the state during 1997-1999, an estimated 100 million native mammals, birds and reptiles died yearly as a result of broad-scale clearing of remnant native vegetation¹. That study did not seek to estimate wildlife loss associated with clearing of non-remnant (regrowth) vegetation, which suggests that the combined total may be significantly higher.

Land-clearing may also isolate populations or individuals in pockets of habitat, leaving them susceptible to misadventure, urbanisation edge effects, natural disasters, overpopulation, genetic degradation through inbreeding, and a range of other deleterious effects.

The concept of “extinction debt” relates to the likelihood of species extinctions sometime in the future as a result of passing a threshold of habitat loss and/or impact². Extinction of rare species from habitat fragments in Queensland has been documented as occurring rapidly from small fragments or more slowly (over decades) from larger habitat fragments^{3,4}.

1.3 Animal welfare issues associated with land-clearing

Aside from the long-term ecological consequences of such a massive loss of wildlife, there are serious animal welfare issues associated with the methods used in the clearing of vegetation while animals are present. Although some animals may be killed instantaneously, it is likely that a much larger proportion suffer painful, distressing or prolonged deaths. Furthermore, displaced animals that survive the process of clearing may be subject to misadventure, motor vehicle trauma, starvation or attack by other animals or predators.

1.3.1 Animal injuries associated with land-clearing

Animals injured directly in the process of vegetation clearing generally suffer from major crushing, deceleration or fall related injuries. Arboreal species may suffer from trauma associated with falling from a tree and/or crushing and avulsive injuries associated with boughs falling on or beside them. Such injuries include severe internal bleeding and organ disruption, multiple bone breaks, eye and head injuries. Animals resting in hollows, similarly, may receive crushing injuries if the hollow bough disintegrates, or suffer internal organ injuries and tearing as a result of rapid deceleration (deceleration injury).

Ground dwelling animals, such as bandicoots, echidnas, snakes and lizards most commonly suffer from crushing and avulsive injuries (such as traumatic limb amputation), or may be buried alive during earthworks.

Highly mobile species such as birds and macropods may avoid direct injury by machinery, but may suffer injuries by running into fences, motor vehicle strike or other misadventure.

Injuries suffered by animals during land-clearing vary from mild to severe and fatal, but these animals are only rarely presented to wildlife hospitals or shelters. This is primarily because they are less likely to be discovered by members of the community and are more usually buried or confined in piles of debris during the process of clearing, which are then subsequently burnt or chipped.

1.3.2 Misadventure and starvation associated with land-clearing

Animals that survive the process of land-clearing may succumb later to starvation, predation, territorial aggression, misadventure (such as drowning in swimming pools, entanglement in fences, and the like) domestic animal attack, motor vehicle strike and maladaptation to new habitat. A small proportion of animals may disperse to adjacent habitat with little ill-effect, but, contrary to popular belief, the proportion of animals successfully doing this is likely to be small.

1.3.3 Isolation of wildlife and habitat fragmentation

Developments or land-clearing that result in destruction or diminishment of habitat corridors or loss of habitat connectivity may result in reduction or loss of the ability of individuals of a species to disperse from the isolated habitat fragment. This may lead to loss of wildlife through overpopulation and starvation, misadventure during dispersal attempts, and loss of individuals through edge effects (such as domestic animal attack), as well as marked diminishment of ecological values generally. Wildlife populations isolated by loss of corridors present larger and more complex management problems for future developments impinging on the remaining habitat, or alternatively may reach a critical population density at which mass mortality occurs, or causes human-animal conflict issues for surrounding communities.

1.4 Removal of wildlife prior to land-clearing and eco-friendly development

The removal of wildlife from sites shortly prior to, and during vegetation clearing represents the most proximate mechanism for reducing wildlife injury and mortality associated with land clearing. This requires the use of personnel skilled in the detection and removal of wildlife from vegetation and other terrestrial habitats, and the adoption of protocols and procedures for the humane handling, housing and disposition of wildlife following removal from their habitats.

The application of ecologically sound design and planning principles to proposed developments represents the most important method of reducing and minimising adverse impacts on wildlife and the ecological values of habitat remnants. These principles should be rigorously applied to all development proposals at an early stage in planning to minimise the requirement for expensive (and less desirable) wildlife and habitat management alternatives, some which are detailed in this code. It is important that all parties involved in urban and rural planning and development projects attempt to adhere to ecologically sound and sustainable development principles.

1.5 Relevant legislation

A number of state and federal statutes provide some degree of legislative protection for wildlife likely to be affected by land-clearing, including the Queensland *Nature Conservation Act 1992*, the Queensland *Vegetation Management Act 1999*, and the Federal *Environmental Protection and Biodiversity Conservation Act 1999*. In respect of animal welfare and the prevention of cruelty, the Queensland *Animal Care and Protection Act 2001* provides legislative protection to animals generally.

¹Cogger, H., Ford, H., Johnson, C., Holman, J. & Butler, D. 2003, Impacts of Land Clearing on Australian Wildlife in Queensland (January 2003): WWF Australia Report, WWF Australia, Brisbane.

²Hanski, I. & Ovaskainen, O. 2002, Extinction Debt at Extinction Threshold, *Conservation Biology*, 16 (3), pp. 666–673.

³Laurence, W.F. 1990, Comparative responses of five arboreal marsupials to forest fragmentation, *Journal of Mammalogy*, 71, pp. 641-653.

⁴Laurence, W.F. 1995, Extinction and survival of rainforest mammals in a fragmented tropical landscape, Ch. 3 in *Landscape Approaches in Mammalian Ecology and Conservation*, ed. by W.Z. Lidecker Jr. University of Minnesota Press, Minneapolis.

2. Scope and Aims of the Code

2.1 Scope

This code of practice provides standards and guidelines for the humane treatment of wild animals affected by the clearing of vegetation or other natural or artificial terrestrial wildlife habitats. The first section deals with the general responsibilities of any person engaged in, or directing, an activity that involves the destruction or modification of wildlife habitats, including artificial habitats. The second section deals with the specific roles and responsibilities of wildlife spotter/catchers.

Many minor activities or development processes relevant to this Code may not require the use of a wildlife spotter/catcher (see Section 1 of the Code below). However, for larger projects or activities in which wildlife is likely to be at risk, the use of accredited wildlife spotter/catchers is required for compliance with this Code.

Responsibility for compliance with the Code, therefore, rests both with the developer and any other person whom, by virtue of their activities or involvement in a development, has a “duty of care” towards animals that may be affected by the development or activity, including wildlife spotter/catchers.

It is not the intent of the Code to provide detailed description of ecological assessment procedures, but rather Standard Operating Procedures (SOPs) for wildlife spotter/catchers, aimed at ensuring consistency and effectiveness of practice; and guidelines to assist developers and others in their legal and ethical obligations to minimise injury, hardship, suffering or death to wild animals, associated directly or indirectly with land-clearing and other development processes.

The Code provides standards and guidelines aimed at protecting the welfare of wildlife affected by land-clearing to a standard consistent with the intent of the Queensland *Animal Care and Protection Act 2001*, and the general views of society. It is the responsibility of any person or entity involved or engaging in relevant activities, to ensure compliance with relevant state and federal statutes, this Code, and other relevant codes of practice.

2.2 Aims

The broad aim of the Code is to provide standards and guidelines to ensure that all reasonable steps are taken to protect the welfare of wild animals affected by land-clearing or other forms of wildlife habitat modification or destruction.

The specific aims of this code of practice are:

- to provide standards and guidelines to prevent or minimise cruelty or harm to wild animals associated with, or resulting from land-clearing and other development processes causing habitat impacts;

- to define the requirements for accreditation and licensing of wildlife spotter/catchers;
- to provide standard operating procedures for wildlife spotter/catchers;
- to provide guidelines on the management of wildlife likely to be affected by land-clearing and other development processes;
- to provide guidelines for minimising the ecological harm caused by land-clearing and development.

3. Important Guiding Principles Underpinning the Code and Definitions

IMPORTANT PRINCIPLES

3.1 Duty of care

“*Duty of care*” obligations to wild animals, in respect of the Code, are similar to those underpinning the Queensland *Animal Care and Protection Act 2001*. However, in respect of this Code the *duty of care* responsibility rests individually and collectively on any and all parties involved with, engaged in, or directing land-clearing or the destruction or modification of wildlife habitats. The duty of care does not require specific knowledge of wildlife presence, only a general awareness of what might constitute a habitat of wild animals.

Furthermore, the *duty of care* exists in respect of any wildlife habitat, irrespective of whether animals are known to use the habitat or not. In other words, wildlife must be *assumed* to be present in potential wildlife habitat unless or until proven otherwise by a person suitably experienced and/or accredited to make that judgment.

Duty of care relates to the legal responsibility of a person, or persons, involved in an activity that may result in harm to or death of an animal or animals, to take all fair, reasonable and appropriate steps to avoid or minimise that risk. Failure to meet *duty of care* responsibilities, that is; failing to take fair, reasonable and appropriate measures to avoid or protect wild animals from harm, may result in prosecution under the Queensland *Animal Care and Protection Act 2001* or the *Nature Conservation Act 1992* irrespective of proof of animal death or injury.

3.2 Due diligence

The term “*due diligence*” relates to the application of sufficient and appropriate techniques to detect the presence of animals, or determine the absence of animals, in a tree, structure or other habitat. It also applies to determination of whether a structure, habitat feature or site is likely to be important or essential to the survival of a wild animal or population. It may also apply to assessment of the risk posed by a development process, activity or structure, to wildlife or their habitats.

Due diligence is a requirement of the Code, and must be performed prior to engaging in an activity or development process relevant to this Code.

3.3 Fair, reasonable and appropriate measures

The principle of “*fair, reasonable and appropriate measures*” includes guidelines, recommendations and standard operating procedures included in this Code, plus any other measure or activity that is available, suitable and appropriate to minimise the risk of harm to animals, or deleterious impacts on the natural environment. This guiding principle recognises that any process that causes significant disruption or destruction of wild animal habitats may result in the death of some animals, (particularly small animals such as skinks, small frogs and the like), in spite of efforts to avoid it.

Current societal attitudes lead to an expectation that fair and appropriate steps are taken to avoid or minimise cruelty or suffering to animals, and that due respect is given to minimising adverse impacts on their habitats. The expertise of wildlife spotter/catchers and other suitably qualified or experienced people is important in determining what constitutes *fair, reasonable and appropriate measures*, in the present circumstances.

DEFINITIONS

For the purposes of this Code:

“**vegetation**” is any native or non-native tree, shrub or plant, including grasses and mangroves, including “remnant vegetation” and “regrowth (non-remnant) vegetation”.

“**animal**”, “**wildlife**” and “**fauna**” are any free-living native or non-native vertebrate animal, including feral animal and declared pest animal species, and any invertebrate animal specifically protected under the *Queensland Nature Conservation Act 1992* or its regulations, or the *Queensland Animal Care and Protection Act 2001* or its regulations.

“**significant wildlife**”, “**significant fauna**”, “**significant species**” are any species listed under federal, state or local statutes or policy as endangered, vulnerable or rare, local significant, critically endangered, or any designation other than common.

“**wildlife habitat**” is any natural terrestrial, subterranean or aquatic habitat, or man-made structure, or other structure known to be, or reasonably likely to be used by wildlife. Wildlife habitats include, but are not necessarily limited to:

- (a) vegetation, or vegetated areas, including forests, plains, mangroves, wetlands, heathlands, dunes, deserts, and marine environments; whether classified as “remnant” or “non-remnant”, and whether native, non-native or artificially created;
- (b) freshwater and marine habitats;
- (c) caves, rocky outcrops, river banks and other natural geological features;
- (d) man-made or artificial structures or habitats, such as drains, buildings, dams, canals, bridges, telecommunication towers, or any other structure known, or reasonably likely to be used by wildlife.

“wildlife corridor” is any section, strip or area of wildlife habitat (whether degraded or not), or cleared area, that is known to be used as, or may reasonably be expected to act as, a corridor for wildlife movement, between, or linking wildlife habitat areas.

“essential wildlife habitat” is any wildlife habitat block or area, or feature that is reasonably likely to be essential to the survival of one or more wild animals, such as a dam that is the only source of water for a wild animal or local wildlife population. (Note: “essential wildlife habitat” has a different meaning and application in respect of the *Vegetation Management Act*.)

“land-clearing”, “development processes”, and “relevant activity” mean any process or activity that involves, causes, or results in, either directly or indirectly, the removal, destruction, or significant modification of natural or man-made wildlife habitats, that are known to contain, or may reasonably be expected to contain, support, or be used by, wildlife, for their survival, movement and reproduction, to an extent that is reasonably likely to cause death, suffering or significant hardship.

“wildlife spotter/catcher” is any person accredited in accordance with this code and licensed under the Queensland *Nature Conservation Act 1992* to conduct and/or supervise the preparation and implementation of Wildlife Protection and Management Plans, and the detection, capture, removal and disposal of wildlife from sites proposed to be developed.

“developer” is any person, corporation, entity, government body or agency conducting or proposing to conduct land clearing, vegetation clearing or other development processes, or any activity that results in the modification or destruction of wildlife habitats or corridors. For the purposes of the Code, this definition includes plant and machinery operators, tree loppers, site foremen, and any other person or persons engaging in, directing or supervising any activity or process involving the destruction or modification of a wildlife habitat, or other development process relevant to this Code.

“standard operating procedures (SOP)” are any documented procedures or protocols required to be routinely applied by relevant personnel to ensure compliance with the Code, or other relevant codes of practice.

“Wildlife Protection and Management Plan (WPMP)” is a document prepared by an accredited and licensed wildlife spotter/catcher, that defines all of the actions and measures, and their timing, in relation to a development or activity, required to protect the welfare of wild animals and minimise the adverse ecological impacts of that development or activity, to a level or standard required by the Code, and consistent with the intent of the Queensland *Animal Care and Protection Act 2001* and the Queensland *Nature Conservation Act 1992*. The WPMP is prepared before the onset of operational works, and must be approved by the Queensland DERM prior to implementation.

“Wildlife Management Report” is a document prepared by an accredited and licensed wildlife spotter/catcher at the completion of a project, which details the wildlife and habitat management procedures used and recommended for the development. It contains detailed returns on animal capture, movement and disposal.

“Department of Environment and Resource Management” or **“DERM”** refer to the Queensland Government Agency responsible for the administration and enforcement of the Queensland *Nature Conservation Act 1992* and its regulations, and the management of wildlife and the natural environment in Queensland.

“Queensland Primary Industries and Fisheries” or “QPI&F” is a part of the Queensland Government Department of Employment, Economic Development and Innovation (DEEDI). The Animal Welfare Unit is a division within that department which is responsible for the administration of the *Animal Care and Protection Act 2001*.

CODE OF PRACTICE

SECTION 1: GENERAL PRINCIPLES FOR THE WELFARE OF WILD ANIMALS LIKELY TO BE AFFECTED BY DEVELOPMENT PROCESSES

Responsibilities of a developer

1.1. A developer must not proceed with any development process or activity (as defined in the previous section) without first:

- (a) determining whether, or not, a site, or portion of a site, or structure, that is proposed to be subject to a development process, is likely to be used as a wildlife habitat; and
- (b) applying due diligence in determining the presence or absence of wild animals (if a site or structure contains a wildlife habitat); and
- (c) determining that the site is *not* an essential wildlife habitat, and is *not* part of a wildlife corridor; and
- (d) determining that any wild animals using the habitat or site are unlikely to suffer any harm, or injury or death as a result of the proposed development process or activity; or
- (e) applying fair, reasonable and appropriate measures to avoid such harm, injury or death, including engaging a wildlife spotter/catcher in circumstances defined by this Code.

1.2. In the case of minor projects or activities, such as minor earth works on previously cleared land, or the removal of one or more small trees, the requirement for due diligence may be satisfied by simple observation.

For example: if a small tree is to be removed, “due diligence” and “fair, reasonable and appropriate measures” may be satisfied simply by close observation of the tree to confirm the absence of nests, hollows, animals under sloughing bark, and the absence of animals in the boughs or canopy.

1.3. A development assessor (usually a local government authority) may approve a development under the provisions of the IPA/IDAS regulatory framework with specific reference or conditions relating to compliance with this Code. However, approval of a development without specific reference to the Code does not relieve a developer of their obligations in respect of this Code.

Requirement for engagement of a wildlife spotter/catcher

1.4. In the case of any proposed project, activity or process, in which a lay person could not reasonably be expected to make the determinations defined in section 1.1 (a-e) above, then a licensed wildlife spotter/catcher or other appropriately qualified or experienced person, must be engaged to perform the same.

1.5. Furthermore, if a site, or portion of a site, or structure, forms part of a wildlife corridor, or forms a significant part of a wild animal's home range or territory, such that its destruction may result in harm or death to the animal, or have a significant adverse ecological effect, then a licensed wildlife spotter/catcher must be engaged to prepare and implement a *Wildlife Protection and Management Plan (WPMP)*, to ensure compliance with this Code.

For example: the removal of a pole or stag used as a nesting site by ospreys must not occur without an appropriate replacement and the involvement of a licensed wildlife spotter/catcher.

1.6. Certain criteria relating to a site or proposed development processes or activities may determine the need for the engagement of a wildlife spotter/catcher, and include, but are not limited to:

- (a) removal of any tree, or trees, containing hollow boughs or trunks, bird or possum nests or dreys, or other features indicative of current or recent use by wildlife;
- (b) removal of all or part of a significant wildlife corridor, or essential wildlife habitat;
- (c) any process or activity that, for compliance with the Code, requires the capture, trapping or removal of native animals;
- (d) removal of any complex structure or habitat feature (such as an old farm shed, or log pile) which cannot, by cursory observation, be determined to be uninhabited by wildlife.

Discharge of a developer's responsibilities under the Code

1.7. If a developer has satisfied the provisions of section 1.1 above, then that is sufficient discharge of their responsibilities under this code, and a development activity or process may proceed, subject to other relevant regulatory approvals.

1.8. If a wildlife spotter/catcher, engaged in that role for a project or activity, makes a determination (in writing) that a development process is *unlikely* to cause significant adverse effects on wild animals, then that will be sufficient discharge of a developer's responsibilities in respect of this Code, and the development activity or process may proceed.

- 1.9. Notwithstanding sections 1.7 and 1.8 above, if new information becomes available regarding the presence of animals on, or using a site, then any determinations regarding the need for engagement of a wildlife spotter/catcher, and/or fair, reasonable and appropriate measures to protect the welfare of animals, must be reviewed.

Removal of wildlife from a site without assistance from a wildlife spotter/catcher

- 1.10. A person, other than an accredited and licensed wildlife spotter/catcher, may not catch, remove, harass or disturb any permanently protected animal (which includes all native vertebrate animals) under the Queensland *Nature Conservation Act 1992* and this Code, unless that person is licensed to do so by DERM. In general, such licensing will be limited to accredited wildlife spotter/catchers.
- 1.11. Notwithstanding section 1.10 above, if an animal has wandered onto a site that has previously been assessed as fulfilling the requirements of this Code, *and* an accredited wildlife spotter/catcher is not immediately available, then the animal may be encouraged to move off the site, with due care and attention paid to minimising the stress or danger to the animal, subject to the following criteria being met:
- (a) the animal can be easily encouraged to move back into safe habitat without capture or undue interference or distress; and
 - (b) suitable habitat is easily able to be reached by the animal; and
 - (c) there are no proximate risks (such as busy roads) to the animal's safety; and
 - (d) there are no other apparent reasons to require the animal's capture (such as significant injury or illness).

For example: if a wallaby or group of wallabies is grazing on grassland (the development site) which is adjacent to an area of secure bushland, and no proximate danger is apparent (such as a busy road), then the animals may be carefully encouraged back into the vegetated area prior to the onset of operational works.

- 1.12. However, if a potential risk or danger to an animal is apparent (such as proximity to a busy road), or an animal would more appropriately be captured and translocated, then a licensed wildlife spotter/catcher must be engaged to manage the situation.
- 1.13. Notwithstanding section 1.12 above, if a wildlife spotter/catcher is not available within a reasonable timeframe, then a developer may contact the local or regional office of DERM, or the local regulatory authority, for direction on an alternative course of action that will comply with the requirements and intent of the Code.

Use of wildlife spotter/catchers for development activities or processes

1.14. Licensed wildlife spotter/catchers must be used in all circumstances requiring, or likely to require, or cause:

- (a) the capture or removal of wildlife as required by the Code (except as exempted by virtue of section 1.11 of the Code, above);
- (b) the preparation of a *Wildlife Protection and Management Plan*;
- (c) the destruction or modification of an essential wildlife habitat or habitat feature, or a wildlife corridor;
- (d) any impact, either through operational works, or by virtue of the design or functioning of a development after completion, that is likely to have a significant adverse effect on a wild animal or wildlife population.

For example: if a development will require the construction of a road (which is likely to become busy) through a wildlife habitat, or if, by virtue of the development, an existing road is likely to bear a significant increase in traffic, then the engagement of a wildlife spotter/catcher and the preparation of a WPMP is required for compliance with the Code, even if the road is not part of the development or site.

1.15. The omission of a “wildlife spotter/catcher must be used” condition, or similar condition, on a local government development approval is not sufficient grounds for exemption from compliance with the requirements of section 1.14 above.

SECTION 2: ACCREDITATION, LICENSING AND RESPONSIBILITIES OF WILDLIFE SPOTTER CATCHERS

Roles of wildlife spotter/catchers

2.1. The proper conduct of wildlife management procedures at land-clearing and development sites involves processes such as:

- fauna and flora assessment;
- species identification;
- animal trapping, capture and handling;
- assessment of animal health and injuries;
- assessment of development risks and impacts on wildlife and ecosystems;
- preparation of *Wildlife Protection and Management Plans*;
- husbandry of captured wild animals;
- identification of suitable wildlife release sites;
- emergency management and/or euthanasia of injured or sick animals.

2.2. It is therefore necessary that personnel conducting these activities are suitably trained in these techniques, and also accredited and licensed by appropriate government authorities.

Licensing of wildlife spotter/catchers

2.3. A person engaged as, or performing the duties of a wildlife spotter/catcher in Queensland must be accredited and currently licensed as such by DERM.

2.4. A person engaged as, or performing the duties of a wildlife spotter/catcher must have knowledge of, or be competent in:

- (a) survey techniques for all vertebrate fauna;
- (b) identification of vertebrate fauna, and significant invertebrate fauna;
- (c) the humane capture, trapping and handling of vertebrate fauna;
- (d) identification of habitat and or habitat resources of significant fauna;
- (e) ecological processes and the relevance for fauna;

- (f) locally occurring species, and those listed specifically under federal, state and local legislation or policy as significant;
- (g) data recording and written reporting;
- (h) humane techniques for emergency euthanasia of vertebrate animals;
- (i) all state, federal and local statutes and laws, and international agreements, relevant to the conduct of activities and responsibilities of wildlife spotter/catchers, including, but not limited to:
 - 1) the Queensland *Animal Care and Protection Act 2001*
 - 2) the Queensland *Nature Conservation Act* and its subordinate legislation
 - 3) the Queensland *Vegetation Management Act*
 - 4) the *Integrated Planning Act* and *Integrated Development Assessment System*
 - 5) JAMBA, CAMBA and other international wildlife agreements
 - 6) the federal *Environment Protection and Biodiversity Conservation Act*

2.5. A person engaged in the role of a wildlife spotter/catcher must have appropriate equipment at their disposal for the detection and humane capture, husbandry and management of vertebrate fauna (*a list of recommended equipment is contained in Appendix 1 to this Code*).

2.6. A person engaged in the role of a wildlife spotter/catcher should maintain currency of vaccination against the following infections or infectious conditions:

- (a) Australian Bat Lyssavirus (ABL) – rabies vaccination
- (b) *Coxiella burnetti* (Q Fever) – Q Fever vaccination
- (c) Tetanus

2.7. A person engaged in the role of a wildlife spotter/catcher should maintain currency of certification and/or competency relating to:

- (a) use of chainsaws
- (b) use of elevated work platform
- (c) construction blue card
- (d) basic first aid

Powers of wildlife spotter/catchers under this Code

2.8. A licensed wildlife spotter/catcher engaged in that role for a development or activity may make an *Animal Welfare Direction* in respect of operations, activities or structures that may impact on the welfare of wild animals. The direction should be made in an approved written format (Appendix 2). This direction may define the timing of and actions or measures required to protect the welfare of animals likely to be affected by such operational works, activities or structures. Any breach of the direction may be considered to be a breach of this Code.

For example: the wildlife spotter/catcher may make a direction that a wildlife-proof fence be constructed along the border of a busy road adjacent to a development site to prevent animals from moving onto the road during clearing activities.

2.9. Such directions may form part of the *Wildlife Protection and Management Plan*, or may be made separately upon identification of a specific risk. An *Animal Welfare Direction* shall be made in writing in an approved form, and copies given to all relevant persons; or, in the case of a clear and present risk to animal welfare, an *Animal Welfare Direction* may be made verbally. In general, an *Animal Welfare Direction* will only be used in circumstances in which the wildlife spotter/catcher considers that there exists a real and proximate risk to animal welfare.

2.10. In circumstances in which an *Animal Welfare Direction* has been breached, or in the opinion of the wildlife spotter/catcher an activity is occurring, or is likely to occur that may result in significant risk of harm to, or death of animals, the wildlife spotter/catcher may make a *Stop Work Order*. This order will remain in force until the wildlife spotter/catcher is satisfied that appropriate measures have been taken to mitigate the risk.

Responsibilities of wildlife spotter/catchers

2.11. The wildlife spotter/catcher has ethical responsibilities guided by the *Animal Care and Protection Act 2001* and *Nature Conservation Act 1992* to ensure the protection of the welfare of wild animals in respect of a development or activity for which they are acting in that role. A wildlife spotter/catcher also has an obligation to comply with this Code.

2.12. In terms of the performance of duties and standard operating procedures required by the Code for each project, the wildlife spotter/catcher's responsibilities include, but are not limited to:

- (a) thorough site assessment and fauna survey (or validation of a previously conducted fauna survey);
- (b) preparation of a *Wildlife Protection and Management Plan* (WPMP);

- (c) ensuring that relevant persons associated with developments and operational works or activities are provided with copies of the WPMP and understand their responsibilities under the *Animal Care and Protection Act 2001*, and the importance of complying with *Animal Welfare Directions*;
 - (d) clearly identifying to all relevant persons the specific wildlife welfare risks associated with the project, and recommended risk mitigation measures;
 - (e) ensuring the timely and appropriate removal and management of animals from development sites prior to and/or during operational works or activities;
 - (f) ensuring the appropriate housing, husbandry, veterinary assessment and care, translocation, euthanasia or other appropriate disposal of animals removed from development sites;
 - (g) preparation of a *Wildlife Management Report* (WMR) on completion of a development project or activity, which is to be submitted in a timely manner to the local regulatory authority, the Animal Welfare Unit of DEEDI and DERM if required;
 - (h) notification of the Director of the Animal Welfare Unit, DEEDI, or his delegate, of breaches of the *Animal Care and Protection Act 2001*.
- 2.13. In addition, the wildlife spotter/catcher should be aware of their own “duty of care” obligations under the Queensland *Animal Care and Protection Act 2001*, as these apply to animals captured, trapped or held in the course of their duties.

Use of unlicensed personnel by a wildlife spotter/catcher

- 2.14. In order to ensure compliance with the Code and other regulations regarding the welfare and protection of wild animals on a site, a licensed wildlife spotter/catcher must ensure that the level of supervision of personnel involved in the capture, management and care of animals takes into account their experience and competence.
- 2.15. Licensed wildlife spotter/catchers are responsible for the proper supervision and direction of their personnel.

Accountability of wildlife spotter/catchers for powers given under this code

- 2.16. Accredited and licensed wildlife spotter/catchers must be accountable for the correct and proper use of any powers given under the Code, and appropriate discharge of their responsibilities in respect of the Code.
- 2.17. Wildlife spotter/catchers are commonly contracted by a developer or developer’s agent to perform services required as a condition of a development approval, and therefore have certain responsibilities towards their employer. They also have important responsibilities to

the community generally to ensure that all reasonable measures are taken to protect the welfare of wild animals likely to be impacted by a development.

- 2.18. Any powers given to a wildlife spotter/catcher under the provisions of the Code must be used strictly in accordance with the intent and provisions of the Code.
- 2.19. This Code confers no specific legal powers to a wildlife spotter/catcher in respect of any Federal or State Act or Regulation. However, breaches of this Code may concurrently breach relevant Acts or Regulations, and as such may lead to investigation and prosecution under the provisions of those Acts, in particular, the Queensland *Animal Care and Protection Act 2001*.

Disagreement between a developer and a wildlife spotter/catcher

- 2.20. In some circumstances there may arise some disagreement between a developer and a wildlife spotter/catcher with regard to what constitutes “fair, reasonable and appropriate measures” to protect the welfare of wildlife. Such disagreements may occur particularly in instances in which a measure, or measures, proposed by a wildlife spotter/catcher, is/are time or resource intensive. In such instances, resolution of disagreements should be attempted by reference to this Code, or some other standard operating procedure or code of practice. In all cases, however, the welfare of animals is of paramount importance and is the primary responsibility of the wildlife spotter/catcher.
- 2.21. Irreconcilable disputes between a developer or their agent, and the wildlife spotter/catcher should be referred, for resolution, to a tribunal consisting of a representative of DERM, a representative of the local regulatory authority and a representative of the Queensland Association of Professional Wildlife Managers.

Termination of a contract by a developer

- 2.22. A developer may wish to terminate the contract of the wildlife spotter/catcher and contract a new wildlife spotter/catcher for completion of a project. However:
 - 2.22.1. If the reason for termination is as a result of disagreement over a measure or measures proposed by a wildlife spotter/catcher in the interests of protecting the welfare of wild animals, then the termination may only occur with the written consent of the Tribunal.
 - 2.22.2. A developer may terminate a contract with a wildlife spotter/catcher without the written consent of the Tribunal if:

- (a) the wildlife spotter/catcher has failed to perform any standard operating procedure or duty reasonably expected to be performed in the course of their duties as a wildlife spotter/catcher; or
- (b) the wildlife spotter/catcher has misused a power given under the Code; or
- (c) the wildlife spotter/catcher has failed to perform their duties to a standard expected, or in accordance with their contract; or
- (d) any other reason, notwithstanding section 2.22.1 above.

Termination of a contract by a wildlife spotter/catcher

- 2.23. A wildlife spotter/catcher may terminate a contract with a developer for any reason, by giving due notice in writing, stating the reasons for termination of the contract, to:
- (a) the developer or developer's nominated agent; and
 - (b) DERM; and
 - (c) the relevant local government authority in respect of developments requiring approval from local government.
- 2.24. Notwithstanding section 2.23 above, a wildlife spotter/catcher may be sued under Common Law for damages resulting from breach of contract.

Misconduct by a wildlife spotter/catcher

- 2.25. A wildlife spotter/catcher may be guilty of misconduct if:
- (a) there has been an abuse of the powers given under the Code; that is, either *Animal Welfare Directions* or *Stop Work Orders* have been issued inappropriately, and/or in circumstances not supported by the Code;
 - (b) he or she has failed to apply due diligence in the detection of wildlife at a site, resulting in injury or death to a wild animal, or the likelihood of injury or death to a wild animal;
 - (c) he or she has failed to apply, or define in the *Wildlife Protection and Management Plan*, fair, reasonable and appropriate measures, resulting in injury or death to a wild animal, or the likelihood of injury or death to a wild animal;
 - (d) he or she has failed to make adequate or appropriate provision for the husbandry and veterinary needs of a captured animal, particularly those that are sick or injured.*

*Note: Under the provisions of the current *Animal Care and Protection Act 2001*, any person “in charge” of an animal has a duty of care to provide for its husbandry and veterinary needs irrespective of ownership of the animal.

STANDARD OPERATING PROCEDURES FOR WILDLIFE SPOTTER/CATCHERS

SECTION 3: SITE ASSESSMENT

General principles

- 3.1. The wildlife spotter/catcher has a significant burden of responsibility to ensure that the animal welfare and ecological impacts resulting from a development or activity, for which they are engaged in that role, are minimised.
- 3.2. The general principles of due diligence in the detection of wildlife, and fair, reasonable and appropriate measures in preventing wildlife loss or ecological damage, apply to the practice of wildlife spotter/catching as they do for any individual engaged in a relevant activity.
- 3.3. Wildlife spotter/catchers are expected to have specialised knowledge in the detection, identification and removal of wildlife; assessment of potential impacts of developments or activities on wildlife; an understanding of basic ecological principles; good animal handling and husbandry skills; local knowledge of appropriate release sites for wildlife; and a good general understanding of local, state, and federal statutes and non-statutory instruments and agreements relating to wildlife, habitat and development issues.
- 3.4. Wildlife spotter/catchers should maintain currency of information in their field of expertise by attendance at workshops, training days and by other means of continuing education.
- 3.5. In order to ensure consistency between, and high standards of practice by, wildlife spotter/catchers, the following minimum Standard Operating Procedures should be applied.

Wildlife Protection and Management Plan (WPMP)

- 3.6. A WPMP should be prepared for any project or activity in which:
 - (a) wild animals are likely to be captured or removed from a site to comply with the Code;
 - (b) an essential wildlife habitat or wildlife corridor will be, or is likely to be impacted by the development or activity; or
 - (c) operational works, or any of the operational aspects or features of the completed development, will have, or are likely to have significant impacts on local wildlife populations.

- 3.7. The WPMP should be in the format shown in Appendix 3 of the Code.
- 3.8. Notwithstanding sections 3.6 and 3.7 above, if a *Vegetation and Fauna Management Plan* has been prepared by other consultants to a project, a separate WPMP may not need to be prepared if:
- (a) The *Vegetation and Fauna Management Plan* describes all of the measures required for wildlife management that would otherwise have been provided for in a WPMP; and
 - (b) The *Vegetation and Fauna Management Plan* makes a provision for all relevant wildlife protection and management measures to be conducted by an accredited and licensed wildlife spotter/catcher; and
 - (c) The wildlife protection and management measures satisfy the requirements this Code of Practice.
- 3.9. The detail in the WPMP should reflect the complexity or scale of wildlife management required for the site or activity.

For example: for a project in which a large area of highly significant wildlife habitat will be cleared the WPMP will be a long, thorough and detailed document, whereas that for the removal of a few small eucalypts would be short and simple.

- 3.10. The WPMP must include the following:
- 1) A description of the project (including timeframes for operational works) with special reference to features likely to affect wildlife or wildlife habitats.
 - 2) A pre-development site plan with recent aerial photograph (if available) showing wildlife habitats, corridors, riparian features, and relevant adjacent habitat. Proposed development site plan should indicate areas of habitat likely to be removed or affected, and structures, roads or other potential hazards that may impact on wildlife after the development is completed.
 - 3) Fauna survey results, including reference to species that were not detected, but are likely to be present (Wildnet, Queensland Museum databases).
 - 4) Wildlife and habitat impact assessment detailing all aspects of development activities, operational works, and features likely to have an impact on wildlife, as well as likely future impacts on wildlife after completion of the development or activity. This section should include reference to adjacent habitat as well as that contained on site.
 - 5) *Wildlife and Habitat Impact Mitigation Plan* indicating:
 - (a) measures required to be taken to minimise wildlife and habitat effects during operational works;
 - (b) wildlife capture and removal plan;
 - (c) contingency plan for wildlife requiring euthanasia, other veterinary procedures or captive care;

- (d) wildlife storage and housing plan;
- (e) wildlife release and disposal plan;
- (f) measures required to be taken to minimise adverse wildlife impacts following completion of works.

Approval of Wildlife Protection and Management Plan

- 3.11. A completed WPMP should be submitted to DERM for approval, prior to implementation.
- 3.12. In the case of a development or activity requiring local government approval, a DERM-approved WPMP should be submitted to the relevant local government authority prior to its implementation.

Wildlife Protection and Management Plan not required

- 3.13. A wildlife spotter/catcher is not required to prepare a WPMP if:
- (a) wildlife are not detected at a site, or will not be impacted by activities proposed for the site; and
 - (b) wildlife will not be required to be captured or moved from the site; and
 - (c) the site is not wholly, or part of, an essential wildlife habitat or wildlife corridor; and
 - (d) operational works, or operational aspects or features of the completed development, are unlikely to have adverse effects on local wildlife populations or individuals.
- 3.14. If an activity or development fulfils the requirements of section 3.12 above and is an activity or development requiring local government approval, then the wildlife spotter/catcher should give notice in writing to the relevant local government authority, that a WPMP is not required, and the reasons for that.

Site and Fauna Surveys

- 3.15. Each site or project must be assessed using fauna survey equipment and methodologies sufficient for the wildlife spotter/catcher to form a reasonably accurate picture of the species diversity and, whenever possible, broad estimates of the number of individuals likely to be present.

- 3.16. Such assessments, along with the project design and operational works plans and schedules, form the basis of the information required for the formulation of the WPMP.
- 3.17. In some instances, site, fauna and flora surveys may have been previously conducted by other consultants to the project. In such cases, duplication is not required by the wildlife spotter/catcher unless discrepancies are suspected or observed.
- 3.18. The use of resource bases such as the Queensland Museum, DERM, and Queensland Herbarium are encouraged in the preparation of fauna and/or flora surveys by wildlife spotter/catchers.

Site Survey

- 3.19. A site survey should be conducted and a basic site plan drawn up indicating terrain features, waterways, vegetation types and other habitat features. DERM regional ecosystem (RE) maps should be consulted to determine if vegetated areas have been mapped as requiring special attention. Detailed site plans may be available from surveyors consulting on larger projects.
- 3.20. Site survey plans should be of sufficient detail to enable easy interpretation of the WPMP.

For example: large habitat/hollow-bearing trees should be individually identified, as should special habitat features likely to contain ground dwelling or burrowing wildlife, known feed trees of significant species, such as Casuarinas with chewed cones, and the like.

Fauna Survey

- 3.21. Fauna survey methodology and effort should reflect the size, biodiversity and ecosystem attributes of the proposed development site. Survey methodology recommendations are provided in Appendix 4.
- 3.22. Fauna surveys must take into account seasonal, temporal and climatic variation in the detectability of fauna species, in particular, those species known to be cryptic.
- 3.23. Specific methodology and/or effort should be employed for the detection of significant fauna, particularly those classified under State or Federal legislation, or those listed as locally significant.
- 3.24. Fauna surveys may have been performed by other consultants to development projects, but it is not uncommon for such surveys to be deficient with respect to fauna present on, or utilising the site. Furthermore, such surveys may give little indication of the numbers of individuals present. Hence, the wildlife spotter/catcher should validate the findings of any previous fauna surveys, by conducting their own inspection of the site and/or performing additional surveys.

- 3.25. The results of the wildlife spotter/catcher's own fauna survey, or discrepancies identified by the wildlife spotter/catcher in previous fauna surveys, should be reported in the *Wildlife Protection and Management Plan*.

Reduction of wildlife load prior to operational works

- 3.26. Significant effort may be required to avoid or minimise the injury to, or death of wild animals from vegetation clearing, habitat damage or other operational works. The measures and timing of such measures should be defined in the *Wildlife Protection and Management Plan*.
- 3.27. Wildlife load reduction measures must be implemented or conducted by the wildlife spotter/catcher for an appropriate period of time immediately prior to the onset of operational works. Such measure may include, but not be limited to:
- (a) thorough fauna trapping using an appropriate range of trapping methods;
 - (b) erection of fauna exclusion fencing;
 - (c) use of fauna aversion techniques;
 - (d) manual or pharmacological capture and removal of fauna.
- 3.28. Wildlife load reduction methods and effort must be appropriate for the diversity and abundance of fauna present, and be guided by the results of prior fauna survey and the extent and nature of proposed operational works.
- 3.29. The seasonal, temporal, climatic and behavioural variation in the detection, and ease of capture of different fauna species must be reflected in the timing and methods used for wildlife load reduction.

Wildlife safety risk mitigation measures

- 3.30. In some circumstances, the removal of wildlife from development sites may not be necessary due to the retention of habitat, and/or minimal impacts of the development or activity on wildlife or habitats. However, operational works may still present hazards to wildlife retained on site or inhabiting areas adjacent to the site.

For example:

- I. Operational works may require the use of heavy earthmoving equipment on a site adjacent to wallaby habitat bounded by a major road. Risk mitigation may require temporary fencing of the road to minimise risk of motor vehicle accident.*

- II. *Operational works may require the construction of deep ditches or footings, presenting risks to wildlife wandering onto the site. Risk mitigation may require the use of temporary wildlife-proof fencing around trenches during operation works.*

3.31. It is the responsibility of the wildlife spotter/catcher to identify significant wildlife safety risks both for wildlife retained on site, as well as wildlife in adjacent areas or widely ranging wildlife that may use, or move through the site during operational works. Measures required for mitigation of such risks should be included in the *Wildlife Protection and Management Plan*.

Pre-works meeting

3.32. After preparation and approval of the WPMP, and prior to the onset of operational works or land-clearing, the wildlife spotter/catcher should have a briefing meeting with the project manager, site foreman and plant operators, for the purposes of discussing the requirements of the plan.

3.33. The wildlife spotter/catcher should clearly detail the sequence of land-clearing and wildlife capture, identify special habitat features, state any requirements for special plant or equipment (such as cherry pickers or cranes), and clearly outline the importance of compliance with any *Animal Welfare Directions*.

3.34. The wildlife spotter/catcher should ensure that the project manager or developer understand fully the requirements of the WPMP, and request their sign-off on the plan.

Vegetation or other habitat clearing or destruction

3.35. A wildlife spotter/catcher must be present during the clearing of any vegetation or damage or disturbance to any structures that may serve as habitat or refugia for wild animals.

3.36. The wildlife spotter/catcher must clearly define the allowable and non-allowable methods of vegetation clearing, such that the risk of harm or death to wild animals is minimised.

3.37. Acceptable and unacceptable methods of vegetation clearing or removal should be explicitly indicated in the *Wildlife Protection and Management Plan*, and should be discussed with the project manager well prior to the scheduled start of operational works.

3.38. Any technique, method or machine that causes, or may cause, an unmitigated risk of harm to wild animals must not be used as the primary method of vegetation removal. Unacceptable methods include, but are not limited to:

- (a) the use of mobile mulching machines (for example: excavator-mounted mulching head or grinder) as the primary vegetation removal technique;
 - (b) the felling of hollow-bearing trees prior to thorough wildlife removal;

 - (c) the mulching or burning of vegetation windrows or other potential wildlife refugia without appropriate level of supervision by a wildlife spotter/catcher;

 - (d) the burning of standing vegetation or other habitat or refugia of wild animals.
- 3.39. Notwithstanding section 3.37 above, if the wildlife spotter/catcher has *positively* determined the absence of wild animals from a section of vegetation, then such methods or machinery may be used to clear that section only; however, the wildlife spotter/catcher must supervise such vegetation removal, and maintain radio communication with machinery operators.
- 3.40. A wildlife spotter/catcher must have, and maintain, a clear view of vegetation or habitat features being cleared by machinery, such that wild animals that are disturbed or uncovered during such activities are rapidly detected.
- 3.41. A wildlife spotter/catcher must, at all times, maintain two-way radio contact with machinery operators during the removal of vegetation or other potential wildlife habitats or refugia.
- 3.42. If wildlife is detected during such activities, the wildlife spotter/catcher must take immediate action to notify the machinery operator to cease work, either verbally using two-way radio or by visual commands, until such time as the wildlife is captured or otherwise removed from danger.
- 3.43. A wildlife spotter/catcher must not authorise, and must, in the WPMP, expressly prohibit, the felling of a tree known to contain, or likely to contain wildlife, including any hollow-bearing tree, by any means or method that is likely to:
- (a) injure or kill any wild animal;
 - (b) result in the unmanaged dispersal or escape of arboreal fauna.
- 3.44. Notwithstanding section 3.42 above, any hollow-bearing tree, stag or other tree that may previously have contained wildlife, may be felled by any method if:
- (a) the wildlife spotter/catcher has determined definitively that no wild animals are present in the tree at the time of felling; or
 - (b) the wildlife spotter/catcher has removed all wild animals from the tree immediately prior to felling.
- 3.45. Methods which a wildlife spotter/catcher may approve and use for the felling of a hollow-bearing tree containing, or likely to contain, wild animals are limited to:
- (a) segmental removal of the tree by a tree surgeon, with hollow-bearing limbs being checked by the wildlife spotter/catcher and cleared of fauna using a cherry picker;

- (b) segmental removal of the tree by a tree surgeon, with hollow-bearing limbs plugged and lowered to the ground for inspection by the wildlife spotter/catcher;
 - (c) use of an excavator with vertical grab to lower the main trunk (after removal of lateral limbs);
 - (d) a combination of the above methods.
- 3.46. For smaller trees, or in circumstances where access of a cherry picker is impossible, an excavator with a vertical tree-grab attachment may be used to lower a tree to the ground for inspection by the wildlife spotter/catcher.
- 3.47. A wildlife spotter/catcher must not authorise or recommend the “bumping” of a hollow-bearing tree with an excavator or other machine as a method of dispersing wild animals.

Timing and sequence of vegetation clearing

- 3.48. Whenever possible, vegetation clearing should be scheduled for mid to late summer so that:
- (a) impacts on nesting and hatching avifauna and herpetofauna are minimized (greatest impacts in spring);
 - (b) likelihood of detection and capture of herpetofauna is maximised;
 - (c) wildlife load reduction measures are most productive.
- 3.49. Clearing of vegetation sequentially or segmentally to encourage natural movement of wild animals into habitat remnants may be appropriate as an adjunctive measure when:
- (a) suitable habitat of sufficient area and resources is adjacent to the vegetation clearing boundary;
 - (b) target wildlife species are able to avoid potential harm caused by vegetation clearing;

For example: sequential clearing may be a sufficient measure to mitigate risk of harm to wallabies where suitable adjacent habitat exists, but is not an appropriate measure for arboreal fauna using tree hollows for nesting, or for herpetofauna, when clearing occurs during cold weather.
 - (c) mitigation measures are in place to avoid or minimise harm to wild animals that do not respond appropriately to sequential clearing.

For example: erection of wildlife-proof fences to prevent wildlife moving on to roads or into built-up areas.
- 3.50. Sequential clearing must not be used as a substitute for wildlife load reduction, when wildlife load reduction is essential for proper management of wildlife in the present circumstance.

*For example: sequential clearing **must not** be used as a primary fauna management measure when remnant habitat is likely to be insufficient to sustain displaced fauna, or is deficient in key resources, such as water sources, food trees or shelter opportunities or refugia.*

Vegetation and rubble piles

- 3.51. It is essential that piles of rubble, felled timber or any other material, proposed to be burnt, buried or chipped, are not left to serve as refugia for displaced or roaming wildlife. Felled vegetation piles and earth often provide attractive habitats for a range of small mammals, birds, reptiles and frogs, presenting a high risk of poor animal welfare outcomes if not managed appropriately.
- 3.52. Appropriate risk mitigation measures include immediate destruction or removal of such materials, or erection of wildlife-proof barriers to prevent wildlife use.
- 3.53. Old (>12 hours) piles of felled vegetation or other material must be treated in the same way as any other potential wildlife habitat, and must be assumed to be inhabited by wildlife, unless proven otherwise.
- 3.54. Cleared vegetation windrows or piles that have been left standing for >12 hours.

Design features and wildlife safety risks

- 3.55. In addition to wildlife risks associated with operational works, the wildlife spotter/catcher must attempt to identify any features of the design or plan of the completed project that may present a significant risk to wildlife, and recommend risk mitigation measures.

For example: swimming pools are a common cause of wildlife death by drowning. Wildlife species that are commonly affected include koalas and bandicoots which may be able to traverse pool fencing. Risk mitigation measures in sensitive areas may include provision of wildlife ramps or exit mechanisms from pools (such as thick ropes) and modification of pool fences to prevent wildlife incursion.

- 3.56. Design features likely to have undesirable impacts on wildlife should be brought to the attention of the developer. Early intervention in terms of recommending design changes may lead to significant reduction in costs associated with wildlife management and impact mitigation measures, caused by poor design.

Notification of unmanageable wildlife risk situations

3.57. In circumstances that result in risks to wild animal welfare or safety that are unable to be adequately managed, the wildlife spotter/catcher has an obligation to notify both DERM and local government regulatory authorities.

For example: an approved development may cause an essential wildlife corridor to be severed or significantly affected, resulting in starvation or misadventure of isolated wildlife.

3.58. Unmanageable wildlife risk situations are *serious* animal welfare issues that may require intervention beyond the scope of the wildlife spotter/catcher contract with the developer, and it is essential that regulatory authorities are appropriately informed of such circumstances.

3.59. Notification of unmanageable wildlife risk situations should be made in writing in the approved form (Appendix 2), and submitted promptly to DERM and local regulatory authority when appropriate. A copy should also be submitted to the developer.

3.60. If possible, the wildlife spotter/catcher should attempt to identify potential unmanageable wildlife risk situations pre-emptively, by developing a sound knowledge of surrounding habitat and important ecological features.

SECTION 4: WILDLIFE MANAGEMENT

General Principles

- 4.1. It is the responsibility of the wildlife spotter/catcher to direct and/or take all reasonable steps to protect the welfare of wildlife that may be impacted by vegetation clearing, construction, operational works or design features of development sites.
- 4.2. In many cases this will necessitate the removal and relocation of wildlife to other suitable habitat, or temporary housing of displaced wildlife during operational works.
- 4.3. It is preferable to remove as much wildlife as possible prior to the commencement of vegetation clearing to minimise the risk of injury to animals during the clearing process (see sections 3.25 to 3.28 above).
- 4.4. Attention must be paid to all habitat strata (arboreal, terrestrial, leaf litter etc), as well as all taxonomic groups in the removal of animals.
- 4.5. Seasonal and temporal variation in the visibility of animals must be taken into account when wildlife detection and capture procedures are being performed.

For example: many herpetofauna are primarily nocturnal, and are less visible and active during winter months. They are therefore much more at risk from earth works and land-clearing during these times, and in colder weather.

- 4.6. Particular attention must be paid to the results of the fauna survey to ensure that the specific methods used to detect and capture animals reflect the diversity of species expected at the site.

For example: in a site identified as habitat for bandicoots, echidnas or other ground-dwelling fauna, it is insufficient to simply concentrate effort on habitat trees. Thorough searching of all strata and wildlife habitats is necessary.

Removal of terrestrial wildlife

- 4.7. Terrestrial wildlife may be removed from the site prior to the onset of vegetation clearing using a variety of trapping methods. These methods will generally have been detailed in the fauna survey report prepared by the wildlife spotter/catcher or by other consultants to the project.
- 4.8. Specific habitat features of interest, such as log piles, rocky outcrops, riparian and wetland areas should be indicated on the site map prepared by the wildlife spotter/catcher and deserve special attention. These areas should be cleared or disturbed only after less

important surrounding habitat areas have been cleared. This is important because it provides opportunity for more intensive trapping around the feature, improved visibility for the wildlife spotter/catcher, and allows more flexibility to apply less destructive clearing methods.

- 4.9. The wildlife spotter/catcher must ensure that he/she has adequate numbers of appropriately trained staff working on habitat features likely to contain high numbers of wildlife that may scatter when the feature is disturbed.
- 4.10. It is the responsibility of the wildlife spotter/catcher to ensure that clearing methods used on terrestrial habitat features of special interest are appropriate to ensure minimal risk of injury or death to wildlife contained therein.

For example: log piles should be gently dismantled one by one, rather than bulldozed en masse. Hollow logs should be carefully inspected using a torch, and may require windows to be cut with a chainsaw for thorough inspection, prior to disposal or burning.

- 4.11. The wildlife spotter/catcher should pay particular attention to observing for the presence of burrows, tracks, scats, or other indications of recent use by wildlife substrates adjacent to rock or log piles or other habitat features.

Removal of arboreal wildlife

- 4.12. Removal of arboreal wildlife should be accomplished initially by thorough trapping efforts. Appropriate use of traps will minimise the risk of injury to wildlife collected by more direct methods, or at the time of clearing.
- 4.13. Trees contain a variety of different habitats for wildlife including hollows in the limbs and primary trunk, under bark, as well as foliage and upper limbs. All such habitats should be thoroughly explored for the presence of wildlife.
- 4.14. It is the responsibility of the wildlife spotter/catcher to ensure that appropriate methods are used to retrieve wildlife from arboreal habitats such that the risk of injury to the resident wild animals is minimised.
- 4.15. Trees containing wildlife *must not* be felled until all reasonable efforts have been made to remove wildlife.
- 4.16. Habitat trees of high importance should be felled last, after surrounding less important vegetation has been cleared to allow easy access of special plant and equipment (such as cherry pickers), traps (such as koala traps), and to allow unhindered lowering of hollow-bearing limbs. It is not acceptable to fell or push over hollow-bearing trees without first removing wildlife, due to the high risk of severe deceleration and/or crushing injuries to wildlife inhabiting such trees.

- 4.17. Hollow-bearing limbs can be cut and lowered gently to the ground using a variety of techniques, such as the use of cranes or special rigging. Prior to any intervention, exit holes should be plugged with rags or newspaper to prevent escape of wildlife during cutting or lowering of hollow-bearing limbs.

Removal of specific arboreal species

Koalas:

- 4.18. Under most circumstances koalas should be removed using koala traps set at or before dusk. It is desirable that traps are fitted with an indicator or transmitter to allow remote monitoring of trap operation. Traps without such remote monitoring devices should be checked a minimum of once every two hours.
- 4.19. Trapping represents the safest option (for both wildlife spotter/catcher and koala) for the capture of koalas. Pole and flagging techniques may be used if koalas are low to the ground and unlikely to be injured by an accidental fall or deliberate jump.
- 4.20. Cherry pickers may be used in circumstances which preclude the use of other methods.
- 4.21. Noosing techniques traditionally used for capture of koalas present unacceptable risks and must not be used under any circumstances.
- 4.22. Notwithstanding section 4.21 above, the use of a solid ring attached to a pole as an adjunct to traditional pole and flagging techniques, is acceptable in some circumstances, as long as the ring is of sufficient diameter to pass freely over the head of a koala (approximately 150mm diameter).

Possums and gliders:

- 4.23. Large possums (common brushtail possum and bobuck) may be captured using similar traps to those used for koalas, conventional baited traps, or manually with the assistance of cherry pickers.
- 4.24. Any noosing technique carries risk and is unacceptable.
- 4.25. The placement of appropriately sized and baited nest boxes in targeted trees may facilitate the removal of larger arboreal mammal species that are not utilising hollows.
- 4.26. Smaller possums and other arboreal species likely to use tree hollows or nest boxes, should be captured during daylight hours by blocking the entrance holes, and gentle removal of the hollow-bearing limb, or nest-box.

Tree kangaroos:

- 4.27. It is recommended that specialist advice is sought by wildlife spotter/catchers in the capture of tree kangaroos.
- 4.28. Notwithstanding section 4.27 above, modified koala traps may be useful in the capture of tree kangaroos from trees with sufficient isolation of their canopy to cause the animal to climb to the ground in order to move to another tree.

Preservation of tree hollows and other habitat features

- 4.29. Whenever possible, the integrity and structure of tree hollows contained in trees which are to be removed should be preserved. These should be relocated to appropriate habitat retained on the site, or to appropriate habitat close to the site.
- 4.30. The wildlife spotter/catcher should aim to ensure that there is no net loss of important habitat features, such as tree hollows.
- 4.31. In the case of tree hollows containing wildlife that are particularly sensitive to translocation (such as greater gliders for example), special efforts should be made to record the height and orientation of the hollow, and tree species from which it was obtained to enable it to be reproduced at the translocation site.
- 4.32. Other valuable habitat features such as large fallen logs, log piles, rock piles or outcrops etc should be preserved as much as possible, and translocated and re-established at appropriate habitat close to their site of removal.
- 4.33. In the interests of “no net loss” of tree hollows, the wildlife spotter/catcher should ensure that in instances in which natural tree hollows are destroyed, the replacement of artificial hollows occurs at a rate of 4 artificial replacements per natural hollow destroyed. This replacement should occur irrespective of whether hollows were used by wildlife at the time, or not.

Species Identification

- 4.34. All species removed or captured for translocation must be properly identified by the wildlife spotter/catcher to the species level.
- 4.35. For correct identification of any specimens that cannot be identified by the wildlife spotter/catcher the Queensland Museum should be consulted.
- 4.36. DERM must be notified within 24 hours of capture of any animal unable to be identified.

- 4.37. Any captured animal must not be disposed of unless its species has been positively identified.

Notification of species of special significance

- 4.38. Any individual animal captured by a wildlife spotter/catcher of a species that is indicated in lists published periodically by the Queensland Museum, or DERM as species of special significance, must be retained by the wildlife spotter/catcher, or retained at an approved wildlife holding facility pending notification by DERM as to its disposal. Species lists may vary according to bio-geographic region.
- 4.39. The finding of specimens of species outside of their known geographic range should be reported to the Queensland Museum, DERM and (when appropriate) the local regulatory authority. Photographs or other confirmatory information should be supplied.

Restraint and holding of captured wildlife

- 4.40. All animals removed from development sites must be captured, restrained and held in a manner that is unlikely to result in injury, unacceptable distress or suffering. Animal welfare is the primary priority and responsibility of the wildlife spotter/catcher.

Capture, restraint and examination

- 4.41. In general, capture methods that utilise netting, bagging, restraint with a blanket, trapping (not including snaring) or (in special circumstances) sedation/anaesthesia, are preferable to direct manual restraint.
- 4.42. As soon as possible after capture, and prior to release, all animals should be examined for signs of injury or illness. Restraint for examination may only require placing an animal into a transport cage for observation, or may require manual restraint using a calico bag, cloth or blanket.
- 4.43. Physical examination of an animal should include observation of normal movement, check for injuries, discharges, lumps, asymmetry, breathing pattern, bleeding or any other lesion indicative of injury or significant illness.
- 4.44. Any animal showing signs of injury or illness, or showing abnormal behaviour should be immediately referred to an experienced wildlife veterinarian or approved wildlife rehabilitation facility.

Capture and restraint of macropods

- 4.45. Capture and restraint of macropods carries a high risk of injury and fatal hyperthermia/myopathy syndrome, and must not be performed by inexperienced personnel, or without appropriate equipment and sedation.
- 4.46. Capture and restraint of healthy macropods (other than pouch young) must be performed using sedation or anaesthesia due to the high risk of development of myopathy, and other capture and restraint-associated conditions. Sedative and anaesthetic drugs may only be used under the direct supervision of a registered veterinarian, or by appropriately licensed persons.

Short-term holding

- 4.47. Captured animals may be held for short periods of time in calico bags, transport cages, box traps or any other appropriate container as long as the following criteria are met, and due regard is given for species differences:
- (a) the animal is protected from extremes of temperature;
 - (b) the animal is protected from accidental trauma by other animals, equipment, machinery and the like;
 - (c) the animal is protected from adverse sensory stimuli such as loud noises;
 - (d) the bag or container provides sufficient airflow to allow normal air exchange and radiation/dispersal of heat;
 - (e) the container, receptacle or bag is protected from direct sunlight, rain, wind or other environmental conditions likely to cause suffering or harm to the animal;
 - (f) the animal is able to hide, or be protected from threatening stimuli (such as providing a hide box, or covering a wire transport cage with a towel or blanket);
 - (g) the animal is checked regularly during its period of confinement;
 - (h) the container, bag or receptacle is clean, hygienic and safe for the animal.
- 4.48. All mammals and birds held in short term containment for more than 4 hours, must be given access to water.
- 4.49. Mammals and birds held in bags of calico or other material for longer than 2 hours must be transferred to appropriate transport or holding boxes or enclosures containing hide spaces or boxes when appropriate for the species.
- 4.50. All neonatal or juvenile animals other than completely independent juveniles must be fed and contained in a manner appropriate for their age and species. Supplemental warmth must be provided to any nestling or juvenile unable to adequately thermoregulate.

4.51. All dependent young unable to be returned to parental care within a reasonable timeframe or unlikely to be accepted back by their parents must be immediately transferred to a licensed wildlife carer or approved wildlife rehabilitation facility.

4.52. The following guidelines should be followed for short to medium term (4-24 hours) containment of adult animals (Table 1). Maximum times are indicated in hours unless otherwise indicated. Animals should be released or transferred to an approved wildlife holding facility for long-term holding at or before the expiry of the times indicated in the last column.

Species	Water	Food	Max. time in bag	Max. time in short-term enclosure (eg transport box)
Macropod	4	12	4 (*)	4 (*)
Koala	4	4	2	4
Echidna	4	8	2	24
Bandicoot	4	8	2	24
Possum/glider	4	8	2	24
Rodent	4	8	2	24
Insect bat	4	4	12 (**)	12
Dasyurid	4	4	2	24
Flying fox	4	8	2 (***)	12
Wombat	4	8	n/a	4
Snake	24	7 days	24	24
Lizard	24	2 days	24	24
Turtle	24	2 days	24	24
Frog	12 (#)	24	8 (#)	24

- * With sedation/anaesthesia only
- ** Only if fed and watered every 4 hours
- *** Calico bags containing flying foxes must be hung rather than laid down.
- # Containers for frogs must prevent drying. Plastic boxes with ventilation are preferred.

Table 1: Guidelines for the short to medium term (4-24 hours) containment of adult animals

Long-term animal holding

- 4.53. Animals may require long-term holding (> 24 hours) for a variety of reasons, such as:
- (a) delayed access to appropriate release sites;
 - (b) accumulation of a number of individuals for group release;
 - (c) treatment of injuries or illness;
 - (d) inclusion in radio-tracking studies or other research;
 - (e) hand-rearing of dependent young;
 - (f) temporary housing during operational works prior to return to site.
- 4.54. Long-term holding of native animals should only occur in circumstances approved by DERM and in facilities approved for such reason by DERM.
- 4.55. Care and husbandry of animals in long-term care should be in accordance with the *Code of Practice - Care of orphaned, sick or injured protected animals by wildlife care volunteers* (DERM), and current best practice.
- 4.56. Facilities used by wildlife spotter/catchers for the holding of native animals awaiting translocation or relocation back to the original development site are restricted to those facilities approved for that express purpose by DERM. *(Such facilities may charge a fee for animal holding services, which the developer should be informed of prior to engagement by the wildlife spotter/catcher.)*

Disposal of wildlife

- 4.57. The ideal outcome for wildlife removed from a site during operational works is to be relocated back to the same site at the completion of works, so long as suitable and sufficient habitat remains. This ensures that any potential adverse ecological consequences associated with translocation and the potential adverse effects (on the individual) of placement in unfamiliar territory are avoided. However, this outcome is generally only achievable if there has been significant retention of habitat, and appropriately “eco-friendly” design and planning.
- 4.58. Translocation of animals is not a preferred option unless retention at, or relocation back to, the original site is inappropriate.
- 4.59. In order of preference, outcomes for removed wildlife are as follows:
- (a) relocation back to suitable and sufficient habitat on original site following operational works;

- (b) translocation to suitable habitat adjacent to site;
- (c) translocation to distant suitable habitat;
- (d) placement in captive institution for educational, conservation or research purposes;
- (e) euthanasia.

4.60. Each of these options is dependent on fulfillment of a number of conditions and criteria which affect its relative suitability under different circumstances.

4.61. In determining the most suitable option for each individual, the wildlife spotter/catcher must ensure that the chosen option is appropriate in terms of both animal welfare and ecological outcomes.

4.62. Any animal showing obvious clinical signs, or behaviour consistent with injury or illness must be treated in an appropriate manner, as detailed in sections 4.100-4.105 below.

Relocation of animals back to original site at completion of operational works

4.63. In some circumstances, the extent of destruction of habitat may not be sufficient to warrant permanent translocation of animals, but operational works or other factors may present unacceptable risks to the health and safety of some animals present on site.

4.64. In such cases, a range of measures may be used by the wildlife spotter/catcher to mitigate or minimise risks, including the temporary removal of animals from the site, with the aim of returning animals back to their habitats at the completion of risk-associated works.

4.65. Important criteria for return of animals to the original development site include:

- (a) sufficient habitat is, or will be retained on site to support the animal population, taking into account factors such as: viability of prey species populations; availability of nesting sites or hollows; availability of clean water; and availability of sufficient food resources;
- (b) habitat corridors retained are of suitable size, topography and vegetation cover to provide effective routes for normal ecological processes such as immigration, emigration, recruitment and dispersal;
- (c) habitat blocks and corridors are of sufficient size to maintain ecological integrity and effectiveness, taking into account likely edge effects;
- (d) long-term risk factors to individual and population survival associated with the development have been (or will be) adequately managed or mitigated.

For example: domestic animal control, motor vehicle/road impacts, swimming pool risk.

- 4.66. The temporary removal of native animals destined for return back to the site of origin, is conditional upon the availability of appropriate long-term holding facilities and resources, and the suitability of the species and individuals for long-term holding.
- 4.67. In some instances (for example: macropods), it may be appropriate to construct temporary holding yards or enclosures on site during operational works, which are removed on completion of risk-associated works.

Translocation of animals to suitable habitat adjacent to development site

4.68. If development of a site occurs adjacent to a large area of similar habitat, with little retention of habitat on site, native animals are most appropriately translocated into adjacent areas. Criteria for use of adjacent habitat are as for 4.65 (a-d) above, but include:

- (a) translocation of animals into adjacent habitat should only occur if the likelihood of significant impacts on resident animals in the recipient habitat is considered to be low (i.e. recipient habitat is not considered to be at maximum carrying capacity for that species);
- (b) recipient habitat is of sufficient size to allow for dispersal of individuals from the point of release, with minimal likelihood of misadventure;
For example: koalas may disperse long distances from the point of release, particularly in already occupied habitat and should not be released into small habitat fragments bounded by busy roads or other hazards.
- (c) recipient habitat is the same or very similar in type to the donor habitat, or is known to be able to support the species proposed to be translocated, and contains appropriate and sufficient sources of food and water;
- (d) the recipient habitat is known to contain, or historically contained, the species proposed to be translocated;
- (e) the recipient habitat is either permanently protected or not likely to be developed in the foreseeable future.

4.69. Additional conditions for translocation of animals to adjacent habitat include:

- (a) appropriate wildlife-proof barriers must be used between adjacent habitat and risk-associated structures, such as swimming pools, busy roads, trenches, canals etc;
- (b) translocated animals show no signs of infectious/contagious disease and must be in good health and body condition;
- (c) species for which there is little or no information regarding efficacy of translocation should be fitted with radio-telemetry devices and radio-tracked for appropriate periods of time;
- (d) for species utilising tree hollows: that appropriate numbers and types of natural or artificial hollows or nest boxes are placed into recipient habitat to provide for the nesting requirements of translocated animals.

Translocation of animals to distant habitat

4.70. If development of a site is such that wildlife habitats are completely removed, or retained habitats (including habitats adjacent to the site) are insufficient to support retention of animals on or adjacent to the site, then animals inhabiting the site may be translocated to other areas of suitable habitat that may be distant to the site.

4.71. Criteria for choice of recipient sites include:

- (a) habitat is suitable for translocated species, either currently or historically inhabited by that species;
- (b) recipient habitat is not considered to be at carrying capacity for that species, and has sufficient food and water to sustain population increase resulting from translocation;
- (c) recipient habitat is of sufficient size, and/or with sufficient habitat corridors and connectivity to allow for expected dispersal of translocated individuals from the release site without significant likelihood of misadventure;
- (d) recipient habitat is either permanently protected or not likely to be developed within the foreseeable future;
- (e) notification of the proposed translocation is provided to DERM prior to translocation of any animals.

4.72. Conditions for translocation of animals to distant habitat sites include:

- (a) animals are not showing signs of infectious/contagious diseases and are in good health and body condition;
- (b) species for which there is little or no information regarding the efficacy of translocation should be fitted with radio-telemetry devices and radio-tracked for appropriate periods of time;
- (c) for species utilising tree hollows: that appropriate numbers and types of natural or artificial hollows or nest boxes are placed into recipient habitat to provide for the nesting requirements of translocated animals;
- (d) translocated animals must be released at a point with sufficient proximity to water and food sources that maximise their chances of survival;
- (e) soft release methods should be used for species that are known to be susceptible to maladaptation syndromes and/or are likely to be exposed to excessive territorial aggression from resident conspecifics or other species;
- (f) written permission from DERM has been obtained prior to translocation to distant site(s).

Placement of animals into permanent care or captivity

- 4.73. In some cases, animals may be captured or acquired by the wildlife spotter/catcher, that are either unsuitable for release back into the wild, or for which there is no suitable or appropriate habitat to be released into.
- 4.74. Unreleaseable native animals may be valuable for education, conservation and research purposes and may be suitable for permanent placement into a captive facility.
- 4.75. The Queensland branch of the Australasian Regional Association of Zoological Parks and Aquaria (ARAZPA) provides mechanisms for the placement of unreleaseable native animals into their member park animal collections.
- 4.76. Other alternatives for captive placement of unreleaseable animals may also be available by negotiation with DERM. These options should only be considered for animals that are unable or unlikely to survive in the wild, or for which no suitable translocation site is available.
- 4.77. Criteria for placement of unreleaseable native animals into captivity include:
- (a) the animal is likely to be given a quality of life sufficient to justify keeping it alive;
 - (b) the proposed recipient person or institution has suitable long-term holding facilities and sufficient resources (including veterinary care) to maintain an acceptable quality of life for the animal for the term of its natural life;
 - (c) the animal provides some educational, conservation or research benefit;
 - (d) the animal is not suffering from incurable disease likely to significantly affect its quality of life now, or in the future;
 - (e) appropriate licences and permits are obtained by the recipient institution or person for the acquisition and keeping of the animal.

Placement of animals into temporary care or captivity

- 4.78. In some cases, a native animal removed from a site may require hand-rearing (in the case of dependent young) or rehabilitation because of injury or illness. In these cases, the responsibility for the ultimate disposal of the animal may be shared by the licensed wildlife carer or care organisation, in accordance with the relevant Code of Practice.
- 4.79. A healthy native animal removed from a development site, may be placed into temporary captive care at a facility approved for that purpose by DERM for the following reasons:
- (a) during operational works, for ultimate relocation back to the original habitat site;
 - (b) the purposes of “soft release” into other appropriate habitat;
 - (c) for the purposes of accumulation of sufficient individuals to allow release of a viable “colony” or family group, for relevant species;
 - (d) pending definitive identification of an unidentified animal, or confirmation of species identification by the Queensland Museum;
 - (e) pending inclusion in an approved radio-tracking or research project;
 - (f) pending approval by DERM for the euthanasia of healthy native fauna (see section 4.84-4.86 below);
 - (g) for any other reason justifiable on animal welfare or ecological grounds.
- 4.80. Notwithstanding section 4.79 above, a healthy native animal should be held in temporary care only for the minimum amount of time required to achieve the relevant objective. Husbandry-related health issues, conditioning/imprinting and loss of survival skills and muscle tone may be consequences of excessive periods in captivity, leading to reduced survival following release.

Notification of intention to keep native animals in temporary or permanent care

- 4.81. The wildlife spotter/catcher should notify DERM, within 72 hours of capture, of a requirement or intention to place a healthy native animal into temporary or permanent care. The wildlife spotter/catcher should retain acknowledgement of the notification by DERM for inclusion in the *Wildlife Management Report* (see section 5.2 below).

Euthanasia of animals

4.82. In some circumstances, the euthanasia of some animals removed from a development site is the most appropriate or humane option. Reasons for euthanasia of animals include:

- (a) the animal is either feral, and/or a declared pest;
- (b) the animal is suffering from injuries or illness sufficient to warrant euthanasia on humane grounds;
- (c) the animal is unlikely to survive if released back into the wild.

4.83. Euthanasia of animals must be conducted in accordance with the provisions of the *Queensland Animal Care and Protection Act 2001*. In most cases, euthanasia should be performed by a registered veterinarian following anaesthesia of the animal.

Euthanasia of healthy protected fauna

4.84. The euthanasia of healthy native animals must be performed only:

- (a) as a last resort if no other approved alternative measure is possible;
- (b) after submission of a euthanasia request to DERM stating the species, number, age group, sex, reason for euthanasia, proposed method of euthanasia and the credentials and experience of the person performing euthanasia;
- (c) only after a written approval is obtained from DERM.

4.85. Dependent neonates of animals being killed must also be killed, or appropriate provision made for their care, in accordance with the relevant Code of Practice.

4.86. The euthanasia of healthy specimens of protected native animals must not be considered as a cheap or convenient alternative to the other preferred options described in previous sections.

Euthanasia of feral or declared pests, or other non-native species

4.87. The euthanasia of feral/non-native animals must be performed:

- (a) only by a suitably qualified and experienced person;
- (b) in accordance with the provisions of the Queensland *Animal Care and Protection Act 2001*;
- (c) only if dependent young are able to be humanely captured and killed, or provision made for their care;
- (d) in the case of domestic species, only if appropriate investigations have been made to rule out ownership of the animal(s).

4.88. In the case of a domestic animal whose status as feral (rather than owned) is not clearly determined, then the animal should be surrendered to the local government animal control authority.

Emergency euthanasia of sick or injured animals

4.89. If an animal is found to be suffering from injuries or illness likely to cause extreme suffering and/or distress, and a high likelihood of death, a wildlife spotter/catcher or other competent person may perform immediate euthanasia if the following conditions are met:

- (a) the assistance of a veterinarian is not available within an appropriate timeframe given the suffering of the animal; and,
- (b) the time taken to transport the animal to a veterinarian would impose undue further suffering on the animal; and,
- (c) the requirements of the *Animal Care and Protection Act 2001* will be met in respect of the method of euthanasia; and,
- (d) the chosen method of euthanasia will cause instant or rapid insensibility (loss of consciousness), followed shortly afterwards, (and before return of consciousness), by death; and,
- (e) the person proposing to conduct the euthanasia procedure is competent at the procedure; and,
- (f) The carcass is not disposed of until death is confirmed.

4.90. It is recommended that all wildlife spotter/catchers are appropriately trained in humane methods of euthanasia.

Use of veterinarians and veterinary services or drugs

- 4.91. Due to the nature of wildlife management, capture and translocation, the use of veterinary drugs and services is occasionally required.
- 4.92. Reasons for veterinary involvement in wildlife management processes include:
- (a) use of restricted drugs for sedation or anaesthesia of animals;
 - (b) examination and veterinary management of sick, injured or orphaned animals;
 - (c) euthanasia of animals;
 - (d) consultation on animal welfare issues;
 - (e) assessment and management of wildlife population health and reproduction.

Nomination of veterinarian on Wildlife Protection and Management Plan

- 4.93. A wildlife spotter/catcher must nominate one or more registered veterinarians, whom they will use in the event that veterinary services are required.
- 4.94. A nominated veterinarian must be able to provide resources and facilities appropriate for responding to wildlife emergencies that may occur in the field.
- 4.95. The nominated veterinarian(s) must be indicated in the *Wildlife Protection and Management Plan* under the section entitled "Contingency plan for wildlife requiring euthanasia, other veterinary procedures or captive care."
- 4.96. It is preferable that nominated veterinarians are experienced with wildlife, although it is recognised that, in some areas of the state, this may not be possible.

Wildlife spotter/catcher to inform client of obligations regarding the provision of veterinary care

- 4.97. It is the responsibility of the wildlife spotter/catcher to inform the client and/or project manager of the potential for requirement of veterinary services, and the expected costs of such services.
- 4.98. The wildlife spotter/catcher must also ensure that the client or authorised representative is aware of their "duty of care" obligations to animals captured or injured in the course of the conduct of relevant activities.
- 4.99. It is recommended that the wildlife spotter/catcher prepare a document detailing the above, to be signed by the client or client's authorised representative.

Provision of veterinary care to sick or injured animals

- 4.100. The wildlife spotter/catcher must make provision for the prompt veterinary examination and treatment of any animal injured, or caused to be sick, as a result of development processes or activities.
- 4.101. If an injured animal has not already been captured, then the wildlife spotter/catcher must make every reasonable attempt to capture the animal for the purposes of veterinary assessment and treatment. This may include the engagement of a veterinarian for the purposes of darting the animal with a tranquilliser or anaesthetic.
- 4.102. The wildlife spotter/catcher must also make provision for the veterinary assessment and treatment of any animal captured or trapped that is showing evidence of any significant injury or illness, irrespective of the cause of the injury or illness.

For example: a captured koala that is showing obvious signs of Chlamydial infection, such as weeping eyes or “dirty tail” should be referred to an approved wildlife rehabilitation facility for veterinary assessment and treatment, rather than being released back into the wild in that condition.

- 4.103. Any native animal requiring in-patient veterinary care must be referred to a recognised wildlife veterinary hospital or facility, or a private veterinary practice that has appropriate wildlife experience and facilities for the housing and treatment of native animals.
- 4.104. A wildlife spotter/catcher has not fulfilled their duty of care obligation to a sick or injured animal simply by delivering it to a veterinarian, unless that veterinarian or veterinary practice fulfils the requirements of section 4.103 above, and agrees to provide an appropriate level of care to the animal.
- 4.105. Similarly, the wildlife spotter/catcher has not sufficiently discharged their duty of care in respect of a sick or injured animal by simply delivering it to a wildlife rehabilitator.

Requirement for presence of veterinarian on site

- 4.106. In rare circumstances, a wildlife spotter/catcher may consider that, despite all reasonable measures being taken, a development process, activity or structure is likely to result in significant harm, injury or death to an animal.
- 4.107. In such circumstances the wildlife spotter/catcher must arrange for a registered veterinarian to be present on site, for the period of time during which the risk is present. If possible, the veterinarian should be experienced in the management and care of wildlife.
- 4.108. If any restricted or controlled drug is proposed to be used by a wildlife spotter/catcher, then this use must be on the direction of, and under the direct supervision of a registered veterinarian, except as allowed by licensing of non-veterinarians under the provisions of the *Queensland Health (Drugs and Poisons) Regulation 1996*, and relevant policy of Queensland Health.

Requirement for monitoring of sedated or anaesthetised animals

- 4.109. Both the wildlife spotter/catcher and on-site veterinarian have a 'duty of care' towards any animal affected by sedative or anaesthetic drugs, and must ensure that an appropriate level and duration of monitoring is applied to prevent injury, predation, drowning or other incident that may result from the impairment of the animal's normal abilities or responses.

SECTION 5: RECORD KEEPING AND REPORTING

Preparation of a Wildlife Management Report

- 5.1. During the course of the development or activity, the wildlife spotter/catcher should keep an accurate record of all animal captures, incidents and disposals for that project.
- 5.2. At the completion of a project, the wildlife spotter/catcher should prepare a *Wildlife Management Report* (WMR) in the approved format (Appendix 5) for submission to the Animal Welfare Unit, Queensland PI&F and DERM.
- 5.3. If the development or activity for which the *Wildlife Management Report* was prepared was subject to local government approval, then the report should also be submitted to the relevant local government authority.
- 5.4. The *Wildlife Management Report* consists of three sections:
 - (a) *Wildlife and Habitat Management Plan*
 - (b) *Wildlife Capture and Disposal Record*
 - (c) *Animal Injury and Euthanasia Report*

Wildlife and habitat management plan

- 5.5. The *Wildlife and Habitat Management Plan* should contain the following information:
 - (a) Aspects of the design or planning of the development identified as risks to wildlife, essential wildlife habitat or wildlife corridors, and the measures taken to mitigate or avoid the risks;
 - (b) Aspects of operational works identified as risks to wildlife health or safety, and the measures taken to mitigate or avoid the risks;
 - (c) Aspects of the operation or function of the finished development (including traffic impacts) identified as posing risks to wildlife health and safety either presently or in the future, and the measures taken, or required to be taken, to mitigate or avoid those risks;
 - (d) Recommendations on the type, frequency and timeframes for monitoring of wildlife and habitat impacts resulting from the development.
 - (e) Requirements for ongoing wildlife, habitat or ecological management measures for the site or development to mitigate or avoid present or future wildlife impacts.

- (f) Any measures taken to replace or improve wildlife or habitat outcomes, including compensatory vegetation planting, nest-box or tree hollow replacement, and the like.
- (g) Recommendations and/or outcomes associated with unmanageable wildlife risks identified as being caused by, or associated with the development or activity (include measures recommended or implemented by government agencies such as DERM and relevant local government authorities).

5.6. The detail contained in the *Wildlife and Habitat Management Plan* should reflect the size and/or likely environmental impacts of the development or activity.

Wildlife capture and disposal record

5.7. The *Wildlife Capture and Disposal Record* must contain the following details for each captured animal classified as *endangered*, *vulnerable* or *rare* under State legislation, classified by the local regulatory authority as *locally significant* or under the federal *EPBC Act* as *critically endangered*, *endangered* or *vulnerable*:

- (a) species;
- (b) identification name or number;
- (c) sex (M, F, or unknown);
- (d) approximate age or age class (neonate, juvenile, sub-adult, adult);
- (e) time and date of capture;
- (f) method of capture;
- (g) exact point of capture (GPS point);
- (h) state of health;
- (i) incidents associated with capture likely to affect the animal;
- (j) veterinary intervention or treatments;
- (k) time held in captivity;
- (l) disposal (euthanasia, re-release, translocation etc);
- (m) date and time of disposal;
- (n) details of disposal (if released, exact point of release GPS);
- (o) for released animals: distance in metres from point of capture to point of release.

- 5.8. For captured animals not listed in legislation as defined in section 5.7 above, such details should be recorded if fewer than 10 individuals are captured, however if greater than 10 individuals are captured, the following details should be recorded in the *Wildlife Capture and Disposal Report*:
- (a) species;
 - (b) total number captured;
 - (c) general location of capture;
 - (d) general location of release site;
 - (e) adverse incidents, mortality or euthanasia report;
 - (f) method of capture.
- 5.9. If any native animals were, or are presently, held in temporary or permanent captive care, then the wildlife spotter/catcher should provide details of the reason for such holding and a copy of DERM acknowledgement of notification (see section 4.78-4.80 above).
- 5.10. Furthermore, the wildlife spotter/catcher should indicate the availability of husbandry and veterinary records for each animal placed into temporary or permanent captive care.

Animal injury and euthanasia report

- 5.11. A separate *Animal Injury and Euthanasia Report* must form part of the *Wildlife Management Report*, detailing the circumstances, management and final outcome of every animal injury or incident, and the circumstances and reason for each animal euthanasia.
- 5.12. For each animal euthanasia requiring a DERM permit or written approval (see section 4.84-4.86), the reference or permit number must be recorded.
- 5.13. A “nil return” *Animal Injury and Euthanasia Report* should be included in the *Wildlife Management Report* if there were no animal injuries or euthanasia.
- 5.14. In tabulated form, the *Animal Injury and Euthanasia Report* should indicate, for each animal:
- (a) species;
 - (b) sex (if identified);
 - (c) unique identification name or code (as used in the *Wildlife Capture and Disposal Record*);
 - (d) age class (neonate, juvenile, sub-adult, adult);
 - (e) nature and details of incident or condition resulting in injury or euthanasia;
 - (f) initial management or intervention (e.g. taken to veterinarian – give details);
 - (g) final outcome;

- (h) method of euthanasia, by whom; or details of disposal;
- (i) current location of animal or details and method of disposal;
- (j) any other relevant information.

Reporting

5.15. The wildlife spotter/catcher should prepare and submit to the Animal Welfare Unit, Queensland PI&F and also DERM the following documents within one (1) month of completion of each project:

- (a) Wildlife Protection and Management Plan;*
- (b) Wildlife Management Report.*

5.16. If a development or activity is subject to approval by a local government, then the wildlife spotter/catcher shall submit a copy of the WPMP and WMR to the appropriate local government authority within one (1) month of completion of the project.

Appendix 1: Recommended Equipment for Wildlife Spotter/Catchers

A wildlife spotter/catcher must have the following essential equipment at his/her disposal at all times:

- 4-wheel drive vehicle
- 2-way radios
- Cages of various sizes and construction
- Various traps for animal capture
- Calico bags of various sizes
- Various nets with extendable handles
- Leather and latex gloves
- Towels
- Blankets
- Spray marking paint
- Flagging tape
- Chain saw
- Extension ladder
- GPS unit
- Digital camera
- Complete set of field guide publications to enable identification of wildlife to species level
- Snake handling equipment
- Binoculars
- Torches
- Waders
- Range of containers to hold and transport aquatic fauna
- Scales
- 10 x lens and vernier calipers
- Full set of PPE

Appendix 2: Form for making an Animal Welfare Direction

ANIMAL WELFARE DIRECTION

This Animal Welfare or Animal Protection Direction is made at:

Location:

Date:

Exact location of development or activity site	
Registered owner of the site	
Responsible person to whom this direction is made	
Position of responsible person (eg site foreman, project manager etc)	
Circumstances in which animal welfare or protection is at risk (describe in detail)	
Specific activity or process that may risk animal welfare or protection	

Activity is to:	<input type="checkbox"/> cease immediately <input type="checkbox"/> continue, but only with mitigation measures in place <input type="checkbox"/> continue with caution and WSC present at all times
Risk mitigation measures required	
Period of time over which activity may occur	

.....
Signature of Responsible Person

.....
Signature of WSC

.....
Position

.....

.....
Name (printed)

.....
Name (printed)

At completion:

Was the activity or process conducted in accordance with this Direction?

- Yes
- No Give details:.....

Did an adverse animal welfare or protection incident occur: Yes No
If yes, an adverse incident report must be completed.

Appendix 3: Wildlife Protection and Management Plan

Appendix 4: Fauna Survey Methodology

The following methodologies are provided as guidelines when conducting fauna surveys prior to wildlife habitat disturbance:

- a) **Diurnal searches** – Intensive investigation of the ground layer (i.e. under logs, rocks, leaf litter) and low vegetation (i.e. under tree bark and tree stumps) and caves targeting amphibians, reptiles, bats and animal traces (i.e. scats, owl pellets, remains and tracks). Minimum effort: approximately 4 person hours per day conducted in the middle of the day.
- b) **Pitfall traps** – This method targets amphibians, reptiles and small mammals, particularly those mammals not readily recorded using other trapping methods (for example: planigales and dunnarts). These traps should be cleared early morning and late afternoon. Minimum effort: Thirty (30) or more pitfall traps divided into four or eight lines comprising approximately four (4) pits (20L bucket) and a 15-20m drift fence. However, the number of buckets per line is often best determined on individual site characteristics and may require 6-20 pits on a 50m drift fence. Trapping duration is a minimum of four (4) days and nights.
- c) **Spotlighting** – Nocturnal observations using both high powered spotlights and head torches. This method targets nocturnal flying, arboreal and terrestrial mammals, birds (owls and nightjars), reptiles (geckos) and amphibians. Call playback can also assist this method when targeting specific species (owls and amphibians). Minimum effort: approximately 3 person hours per day commencing in the early evening.
- d) **Elliot traps** – This method targets small arboreal and terrestrial mammals. These traps should be cleared each morning by 7:00am and reset late in the afternoon after 5:00pm. Trap placement will be influenced by vegetation diversity, the size and shape of the habitat area and by naturally occurring features such as logs, rock outcrops, tree bases and clumping vegetation. As a guide, all distinctly different broad vegetation communities should be surveyed. Minimum effort: 100 traps over four nights, arranged in 5-10 transects with 10 or 20 traps in each transect with trap placement at 5m apart. A variety of baits should be utilised such as rolled oats with peanut butter +/- honey, bacon, tinned fish. When conducting arboreal trapping with this method, a diluted honey and water mixture may be sprayed on the trunk and branches near the trap to act as an attractant to species such as sugar and squirrel gliders.
- e) **Cage traps** - This method targets medium to large arboreal and terrestrial mammals. These traps should be cleared each morning by 7:00am and reset late in the afternoon after 5:00pm. Trap placement will be influenced by vegetation diversity, the size and shape of the habitat area and by naturally occurring features such as logs, rock outcrops, tree bases and clumping vegetation. As a guide, all distinctly different broad vegetation communities should be surveyed. Minimum effort: 20 traps over four nights, arranged in 5 transects with trap placement at 5-20m apart. A variety of baits should be utilised such as rolled oats with peanut butter +/- honey, bacon, tinned fish.

-
- f) **Hair tubes** – This method is additional to the above methods which target mammal species. Hair tubes of different sizes should be baited with a variety of baits (i.e. rolled oats with peanut butter +/- honey, bacon, tinned fish) and left *in situ* for a minimum of two (2) weeks. Upon collection, hair samples should be identified by a suitably qualified person with demonstrated experience in identifying mammal species from hair samples.
- g) **Bird surveys** – Fixed or random transects are walked with five (5) minutes spent stationary at designated locations along the transects. Birds are recorded indicating the method of identification (i.e. call or visual observation) and the type and location of habitat. Minimum effort: 30-60 minutes commencing prior to and during dawn to early morning and prior to dusk.
- h) **Harp traps, mist nets and sonic bat detectors** - These methods target insectivorous bats. Trap and sonic detector (i.e. ANABAT) should be located within suitable habitat where insectivorous bats are likely to frequent (i.e. natural flyways between vegetation and narrow forest tracks). Calls recorded from a sonic detector (i.e. ANABAT) should be analysed by a suitably qualified person to ensure accurate species identification.



Attachment D

First Nine Habitat Quality Technical Memo (SHG 2017)

Habitat Quality Technical Memo

This Habitat Quality Technical Memo provides an assessment of the habitat quality within both the impact and proposed offset areas for the First Nine Master Planned Residential Development (EPBC 2016/7676) and is intended to support calculator attributes applied to determine attributable offset obligations.

The First Nine development area adjoins the existing and completed Brookwater Community residential development and is immediately encompassed by the existing greens of Brookwater Golf Course (Holes 1 to 9). More broadly, the site is surrounded by residential development, including Augustine Heights to the west, Springfield Town Centre to the south and Springfield Lakes to the east and Brentwood through the north. Environmental features adjoining the site include Opossum Creek to the north and a patch of vegetation to the east, which is identified within the Springfield Structure Plan as future Town Centre.

As discussed in the Preliminary Documentation, the development of First Nine will result in the clearing of 46.2 ha of habitat critical to the survival of the Koala. The site was assessed using the Habitat Assessment Tool as retaining critical habitat with a score of 6. The habitat quality field results contained within this technical memo support this assessment.

The proposed offset area forms part of the Springfield 369 ha Conservation Land that was dedicated by **SLC** in 2006 prior to the listing of the Koala under the EPBC Act. Dedication of the land for conservation purposes by **SLC** was intended to compensate for clearing associated with the development of Greater Springfield. The act of this dedication, for environmental offset purposes, has previously been acknowledged by the **Department** as part of the Spring Mountain Referral (2013/7057). Importantly, it is noted that this land was also previously assessed by the **Department** as part of 2013/7075 to have a 'start quality of the offset' score of 8. This was based on the fact that the adjoining Spring Mountain land (2013/7057) was given an 'impact score' of 8, which was determined using the Koala Habitat Assessment Tool in the EPBC Act Koala Referral Guidelines and detailed field survey of the impact area

The start quality of the offset has been given a score of 8 based on the above and supported by the following field survey results.

Field Surveys

All field surveys were supervised by experienced Senior Ecologists and included:

Primary Surveys

- Habitat Quality Assessments as per the Guide to Determining Terrestrial Habitat Quality DEHP

Supporting Surveys

- Spot Assessment Technique surveys and scat meanders as per Phillips and Callaghan 2011 and the Referral Guidelines for the Vulnerable Koala, providing:

- Canopy species composition
- Inferred Koala activity levels
- Extensive ground-rectified field polygons of weed infestation
- Quaternary site assessments as per Neldner et al 2012

Vegetation Composition

Field Ecologists verified Regional Ecosystem status based on observed species composition and structure and more than 12 years experience in mapping amendments under Queensland's *Vegetation Management Act* (VMA). Notably, there is no requirement under the VMA for empirical data to support an application to accept the mapping when applying for a Property Map of Assessable Vegetation, with structured transects only required when contesting the mapping.

Based on field observations and species recorded in Quaternary site assessments, SAT surveys and Habitat Quality Assessments, the following remnant or regrowth Regional Ecosystems were observed:

Impact Area

Least Concern Regional Ecosystem 12.9-10.2

Corymbia citriodora subsp. *variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

Of Concern Regional Ecosystem 12.9-10.7

Eucalyptus crebra +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).

Offset Area

Least Concern Regional Ecosystem 12.9-10.19a

Corymbia henryi and/or *Eucalyptus fibrosa* subsp. *fibrosa* open forest. Other commonly associated species include, *Corymbia citriodora* subsp. *variegata*, *E. carnea*, *E. siderophloia*, *E. crebra* and *E. major*. Occurs in coastal areas on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

Endangered Regional Ecosystem 12.9-10.12

Corymbia intermedia, *Angophora leiocarpa*, *Eucalyptus seeana* +/- *E. siderophloia*, *E. tereticornis*, *E. racemosa* subsp. *racemosa*, *C. citriodora* subsp. *variegata* woodland to open forest. *Lophostemon suaveolens* is often present as a sub-canopy or understorey tree. Occasional *Melaleuca quinquenervia* on lower slopes. Does not include areas dominated by *Eucalyptus racemosa* subsp. *racemosa*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).

Least Concern Regional Ecosystem 12.9-10.17a

Lophostemon confertus or *L. suaveolens* dominated open forest usually with emergent *Eucalyptus* and/or *Corymbia* species. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments. (BVG1M: 28e).

This vegetation is consistent with woodland vegetation and contains a number of species identified as Koala food trees (refer Field Survey Plan and Habitat Quality Assessment data in **Attachments 1 to 4**).

Weed Infestation

Comprehensive ground survey of weed infestations across the offset site by experienced Ecologists on-foot mapped 13.89 ha (or approximately 17% of the area) as weed infested, with small patches and individual weed specimens spread across the entire site (refer **Attachment 2** for Plan). This is a direct empirical survey of actual weed infestation levels on-ground that is, by definition, more accurate than could be achieved via an inference based on sub-sampling.

The predominant weed species mapped on site was *Lantana camara* (Lantana) with varying densities of associated *Lantana montevidensis* (Creeping Lantana) *Megathyrsus maximus* (Guinea Grass), *Passiflora suberosa* (Corky Passionflower) *Asparagus aethiopicus* (Asparagus Fern), *Opuntia tomentosa* (Prickly Pear), *Cuscuta campestris* (Golden Dodder), *Senna pendula* (Easter Cassia), *Setaria sphacelata* (African Bristlegrass), *Ageratum houstonianum* (Blue Billygoat Weed), *Ambrosia artemisiifolia* (Annual Ragweed), *Bidens pilosa* (Cobblers Pegs), *Pinus elliottii* (Slash Pine), *Melinis repens* (Red Natal Grass) and an assortment of exotic pastoral grasses.

Terrestrial Habitat Quality Assessment

As per the relevant **DEHP** Guideline, to accurately assess the site, the impact and offset areas need to be broken into Habitat Assessment Units based on prevailing Regional Ecosystems and other ecological and topographical features. The impact area was broken in two assessment units and the offset area into three Assessment Units, being mapped Endangered, Of concern, Least Concern and non-remnant vegetation polygons (refer **Attachments 1 & 2**).

Within each Habitat Assessment Unit, Site Condition, Site Context and the Species Habitat Index are determined based on field transects and observations and desktop studies. In a general sense, it is the scores for each of these attributes that are combined to determine the site's overall Habitat Quality Score.

Nine Terrestrial Habitat Quality Transects were completed between 25th November 2016 and 5th July 2017 within the proposed impact and offset areas, as per **Attachments 1 & 2**.

Site Condition

Assessing Site Condition is an integral step in determining whether an offset site is suitable to establish its capacity to support the prescribed environmental matters requiring an offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community, compared to the expected range for a relatively undisturbed community.

The following components of Site Condition were assessed, compared to benchmarks and assigned a score within each Habitat Assessment Unit on-site:

1. Recruitment of Woody Species
2. Tree Species Richness
3. Shrubs Species Richness
4. Grasses Species Richness
5. Forbs Species Richness
6. Tree Canopy Height
7. Tree Canopy Cover
8. Shrub Canopy Cover
9. Native Perennial Grass Cover
10. Organic Litter
11. Large Trees
12. Coarse Woody Debris
13. Weed Cover

Site Context

The surrounding landscape and adjacent land uses can directly influence the quality and security of habitat through edge effects, environmental buffering, or threatening processes. An offset site with limited threats and a complementary environmental setting (such as highly vegetated surroundings) will have greater potential for success in achieving the desired management outcomes. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors.

As the assessment site is mapped within 'Moreton Basin', which is considered a 'fragmented' subregion of Queensland, the following attributes of Site Context were assessed and a score derived within each Habitat Assessment Unit on-site:

1. Size of Patch
2. Connectedness
3. Context
4. Ecological Corridors

Species Habitat Index

The Species Habitat Index measures the capacity of a site to support a species and requires field survey data, available modelling and current species records. The index represents an analysis of the quality and availability of habitat for the species, and the likelihood of continued existence of the species at the site.

The Species Habitat Index consists of the following attributes assessed and assigned a score within each Habitat Assessment Unit on-site:

1. Threats to Species
2. Quality and Availability of Food and Foraging Habitat
3. Quality and Availability of Shelter
4. Species Mobility Capacity
5. Role of Site Location to Overall Population

Habitat Quality Score Method



To determine each assessment area’s Habitat Quality Score, the scores for each attribute listed above are summed to provide the Habitat Quality Score (measured) for each of the Habitat Assessment Units. These scores are then compared to the maximum attainable (Habitat Quality Score max) to calculate the Assessment Unit Habitat Quality Score for each assessment unit. These scores are then weighted according to the relative size of each Habitat Assessment Unit before being summed to give the overall Area Habitat Quality Score rounded to the nearest whole number.

Impact Area Habitat Quality Assessment

The Habitat Quality Scores (measured) for the Impact Area was derived for the two assessment units. Impact Assessment Unit 1 was determined on-ground to be representative of regrowth RE 12.9-10.7 and, given the relatively small area and prohibitive dimensions, only one transect was utilised to determine habitat quality, as per accepted **DEHP** protocols (T1, refer to **Attachment 1** and **Table 1**, below).

Impact Assessment Unit 2 was based on two transects averaged to provide the basis for the Habitat Quality Score (measured) as per accepted **DEHP** protocols (T2 & T3, **Attachment 1, Table 1**). Given the assessment unit was determined to be a composite Regional Ecosystem as mapped, transects were conducted in portions representative of the dominant Regional Ecosystem, being RE 12.9-10.2, in order to facilitate comparison to a benchmark as required under the methodology.

Table 1: Impact Area Sample Sites

Sample Site	Photos	
T1	 <p>North</p>	 <p>South</p>
	 <p>East</p>	 <p>West</p>

Sample Site	Photos		
T2			
			
	T3		
			

North

South

East

West

North

South

East

West

Impact Area Species Habitat Index

1. Threats to Species

As per the **DEHP** Guideline, this should be based on the number and severity of threatening processes observed at or adjacent to the site, including:

- clearing associated with development
- creating a barrier to movement within or between habitat critical to the survival of the species
- the introduction or spread of disease or pathogens to an area (where this is known)
- increasing the risk of high-intensity fires
- degradation of habitat from hydrological change
- introducing or increasing mortality to a species due to vehicle strike or dog attacks.

Appendix 11.5 of the **DEHP** Guideline provides examples of how the level of threat can be measured for the Koala.

“The main threats to koalas are habitat loss and fragmentation, car strike, dog attacks, and disease. The threat level scoring should take into account the home range of individual koalas in the relevant bioregion.

An offset site may have a low threat level if it is located more than approximately 1500m from roads, or if there is a koala exclusion fence between the site and the road to prevent koala death and injury.

The highest level of threat may be scored if the site is isolated from other koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1500m of the site boundary, causing increased risk of contact with cars and dogs.”

Give the relative fragmentation and proximity of the impact area to residential development, including being encompassed by a golf course, and roads, the impact area scores a ‘1’ (high) for this attribute.

2. Quality and Availability of Food and Foraging Habitat

As per the **DEHP** Guideline, consider these parameters relative to the essential habitat requirements for the species. These attributes should realistically reflect how much of a sustainable population of a species could be supported. For example, a site with no or very few food and foraging opportunities would score 1. A site with abundant food and foraging opportunities, with the ability to support a viable population of the species, would score a 9 or 10.

Due to the influence of high disturbance, regrowth characteristics and site fragmentation, the impact site scores a ‘5’ (moderate) for this attribute.

3. Quality and Availability of Shelter

As per the **DEHP** Guideline, an assessment of a species’ shelter requirements must take into account the relative abundance and condition of habitat features that could be used within a site. The site’s shelter habitat is necessarily species specific and includes, but is not limited to an assessment of: hollows, logs, cracking clays, large trees, leaf litter, caves, rocky outcrops, slopes or other microhabitat requirements.

As for the previous attribute where vegetation represents both food and shelter for the Koala, due to the influence of high disturbance, regrowth characteristics and site fragmentation, the impact site scores a '5' (moderate) for this attribute.

4. Species Mobility Capacity

As per the **DEHP** Guideline, this attribute should be measured in consideration of the presence and severity of factors that would contribute to a reduction in the mobility of the species. For example, when a barrier to movement is created within or between habitats that is likely to result in a long-term reduction in genetic fitness or access to important resources.

The site is compromised by weeds and encompassed by existing and future development in the form of extant residential areas, roads and the first nine holes of a golf course. The impact site scores a '4' (highly restricted) for this attribute, which is not the maximum (= severely restricted '1').

5. Role of Site Location to Overall Population

As per the **DEHP** Guideline, this score should be based on the observed role of the site in relation to the overall population of the species in Queensland. This should take into account the species' use of the site – such as whether it is used for feeding and/or nesting and the effect that damage to or removal of the site would have to the likelihood of the species' overall population survival.

The impact area is considered by the **DEE** to be Habitat Critical to the survival of the species, therefore it scores a '5' for this attribute.

Impact Area Habitat Quality Score

Using the **DEHP** assessment template, the Habitat Quality Score for the Offset Area on site was determined to be 6.45, which is rounded to 6 (refer **Attachment 3** for impact calculation sheets).

The Terrestrial Habitat Quality Assessment scored 6 for the impact area.










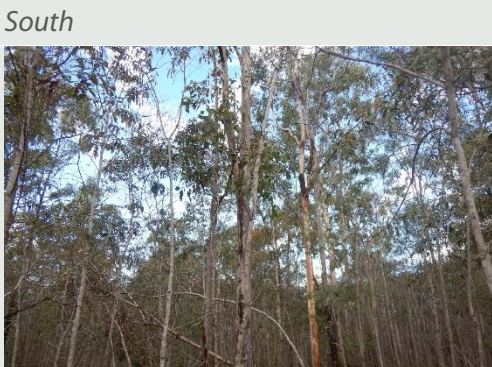
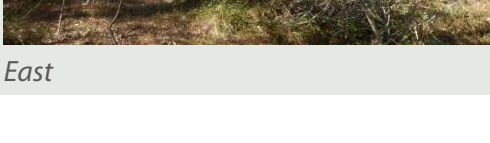
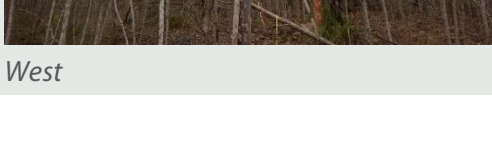




Offset Area Habitat Quality Assessment

The Habitat Quality Scores (measured) for the Offset Area was derived for the three assessment units. Offset Assessment Unit 1 was determined on-ground to be representative of RE 12.9-10.19a and two transects averaged and one observation point were utilised to determine habitat quality as per accepted **DEHP** protocols (T1, T2 & OP1, refer to **Attachment 2** and **Table 2.1**, below).

Offset Assessment Unit 2 was determined on-ground to be representative of RE 12.9-10.12 and two transects were averaged to provide the basis for the Habitat Quality Score (measured) as per accepted **DEHP** protocols (T3 & T4, **Attachment 2**, **Table 2.2**).

Offset Assessment Unit 3 was determined on-ground to be representative of RE 12.9-10.17a and two transects averaged and one observation point were utilised to determine habitat quality as per accepted **DEHP** protocols (T5, T6 & OP2, refer to **Attachment 2** and **Table 2.3**, below).

Table 2.1: Offset Assessment Unit 1 Sample Sites

Sample Site	Photos	
T1		
	<p><i>North</i></p> 	<p><i>South</i></p> 
		
	<p><i>East</i></p> 	<p><i>West</i></p> 
T2		
	<p><i>North</i></p> 	<p><i>South</i></p> 
		
	<p><i>East</i></p> 	<p><i>West</i></p> 

Sample Site	Photos	
OP1		
	<i>North</i>	<i>South</i>
		
	<i>East</i>	<i>West</i>




Table 2.2: Offset Assessment Unit 2 Sample Sites

Sample Site	Photos	
T3		
	<i>North</i>	<i>South</i>
		
	<i>East</i>	<i>West</i>

Sample Site	Photos	
T3		
	<i>North</i>	<i>South</i>
		
	<i>East</i>	<i>West</i>

Table 2.3: Offset Assessment Unit 3 Sample Sites

Sample Site	Photos	
T5		
	<i>North</i>	<i>South</i>
		
	<i>East</i>	<i>West</i>

Sample Site	Photos	
T6		
		
		
		

North

South

East

West

OP2

North

South

East

West

Offset Area Species Habitat Index

1. Threats to Species

As per the **DEHP** Guideline, this should be based on the number and severity of threatening processes observed at or adjacent to the site, including:

- clearing associated with development
- creating a barrier to movement within or between habitat critical to the survival of the species
- the introduction or spread of disease or pathogens to an area (where this is known)
- increasing the risk of high-intensity fires
- degradation of habitat from hydrological change
- introducing or increasing mortality to a species due to vehicle strike or dog attacks.

Appendix 11.5 of the **DEHP** Guideline provides examples of how the level of threat can be measured for the Koala.

“The main threats to koalas are habitat loss and fragmentation, car strike, dog attacks, and disease. The threat level scoring should take into account the home range of individual koalas in the relevant bioregion.

An offset site may have a low threat level if it is located more than approximately 1500m from roads, or if there is a koala exclusion fence between the site and the road to prevent koala death and injury.

The highest level of threat may be scored if the site is isolated from other koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1500m of the site boundary, causing increased risk of contact with cars and dogs.”

Given the relative fragmentation and proximity of the offset area to already approved offset areas, adjoining regional corridors, residential development and roads, the offset area scores a '7' (moderate) for this attribute.

2. Quality and Availability of Food and Foraging Habitat

As per the **DEHP** Guideline, consider these parameters relative to the essential habitat requirements for the species. These attributes should realistically reflect how much of a sustainable population of a species could be supported. For example, a site with no or very few food and foraging opportunities would score 1. A site with abundant food and foraging opportunities, with the ability to support a viable population of the species, would score a 9 or 10.

Due to the offset area being previously approved, of remnant status and less fragmented relative to the impact area, the offset site scores a '10' (high) for this attribute.

3. Quality and Availability of Shelter

As per the **DEHP** Guideline, an assessment of a species' shelter requirements must take into account the relative abundance and condition of habitat features that could be used within a site. The site's shelter habitat is necessarily species specific and includes, but is not limited to an assessment of: hollows, logs, cracking clays, large trees, leaf litter, caves, rocky outcrops, slopes or other microhabitat requirements.

As for the previous attribute where vegetation represents both food and shelter for the Koala, due to the offset area being previously approved, of remnant status and less fragmented relative to the impact area, the offset site scores a '10' (high) for this attribute.

4. Species Mobility Capacity

As per the **DEHP** Guideline, this attribute should be measured in consideration of the presence and severity of factors that would contribute to a reduction in the mobility of the species. For example, when a barrier to movement is created within or between habitats that is likely to result in a long-term reduction in genetic fitness or access to important resources.

Relative to the impact area, the offset site is less severely compromised by weeds and adjoining development including roads, residential and rural residential development. The offset site is part of an area previously approved as an EPBC offset and with demonstrated connectivity to conservation areas. The impact site scores a '7' (moderately restricted) for this attribute.

5. Role of Site Location to Overall Population

As per the **DEHP** Guideline, this score should be based on the observed role of the site in relation to the overall population of the species in Queensland. This should take into account the species' use of the site – such as whether it is used for feeding and/or nesting and the effect that damage to or removal of the site would have to the likelihood of the species' overall population survival.

The offset area is considered by the **DEE** to be Habitat Critical to the survival of the species, therefore it scores a '5' for this attribute.

Offset Area Habitat Quality Score

Using the assessment template, the Habitat Quality Score for the Offset Area on site was determined to be 7.60, which is rounded to 8 (refer **Attachment 4** for offset area calculation sheets).

The Terrestrial Habitat Quality Assessment scored 8 for the offset area.

Species Stocking Rate

Spot Assessment Technique (SAT) surveys were undertaken as per Phillips & Callaghan 2011 to determine offset site utilisation by Koalas. Of the seven (7) SATs conducted, four (4) recorded low usage and three (3) no usage (refer Preliminary Documentation). This suggests that the site is currently utilised at a low level by Koalas that are perhaps transient i.e. moving in and out of the site from adjoining bushland areas. It is important to note that the SAT technique provides an indirect estimate of Koala activity levels and therefore infers rates of usage rather than an estimate of abundance for this highly mobile and reclusive species. As stated, evidence suggests that the area is currently utilised by Koalas in its present state of disturbance.

Site Context

The offset site forms part of the White Rock and Spring Mountain Conservation Estate and Flinders-Karawatha Bioregional Corridor. In terms of its position in the landscape and providing viable opportunities for Koala movement and connectivity, the site forms part an extensive landscape of land dedicated for conservation purposes that has been regarded as providing high quality habitat for SEQ's largest Koala population (refer Flinders-Karawatha Management Strategy 2014-2019, **DEHP**). Importantly, the site is located within the narrowest part of the Flinders-Karawatha Bioregional corridor and, as such, its retention and enhancement is vital to maintaining north-east to south-west connectivity for the species within the regional landscape.

The conservation park and proposed offset area skirt the greater Springfield Development Area as under previously approved offset assessments over these land holdings.

Attachment I – Impact Area Field Survey Plan

I. HABITAT QUALITY ASSESSMENT - IMPACT AREAS







NOTES
 This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2017), Aerial (Nearmap 2017)

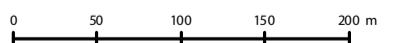
*This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

-  Impact area
 -  Habitat quality transect
- Impact assessment unit**
-  IAU1 (12.9-10.2/12.9-10.7/12.9-10.19)
 -  IAU2 (Non-remnant/12.9-10.7)

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	17/07/2017	Prelim Draft	M.C.	A.D.

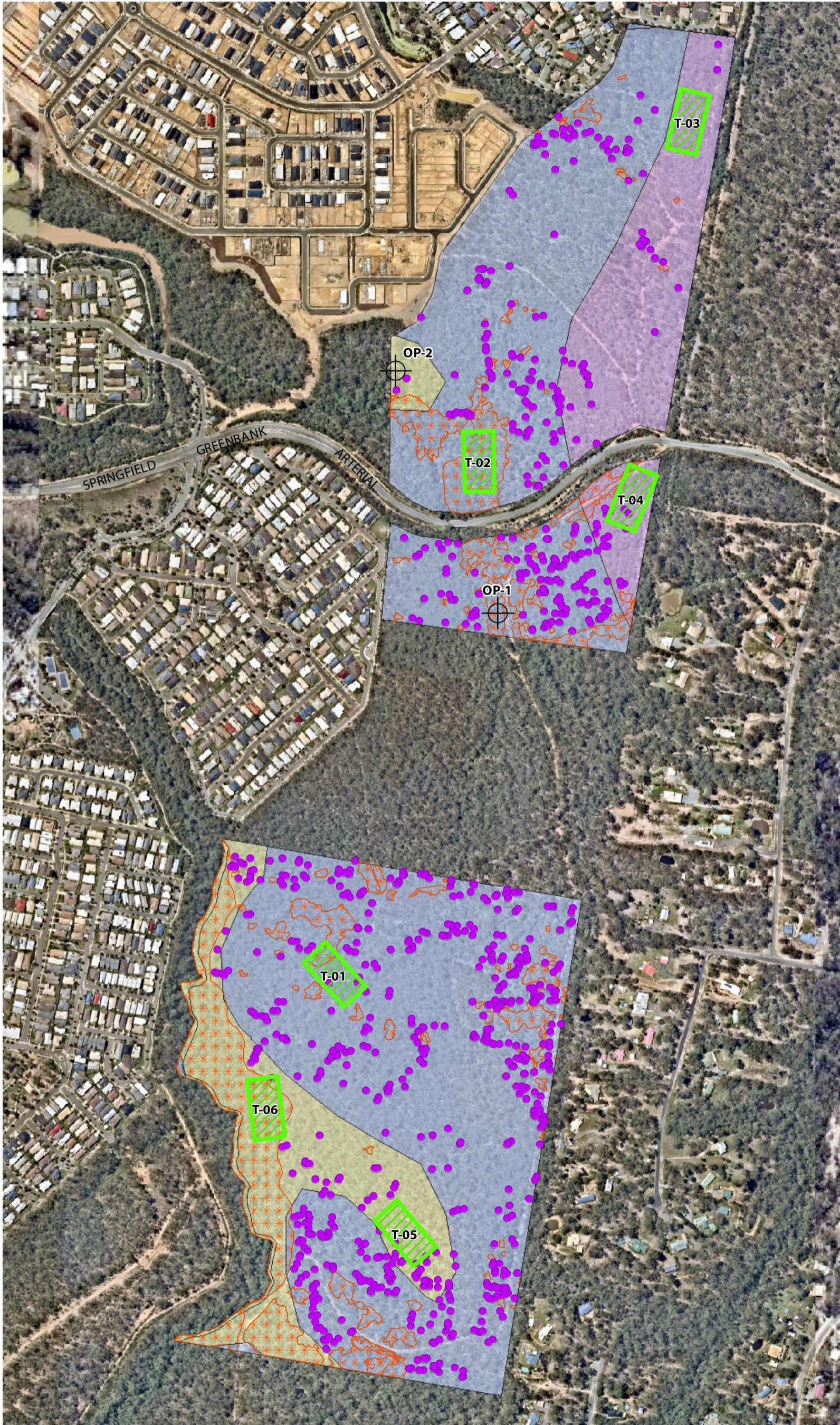


Universal Transverse Mercator GDA 1994 MGA Zone 56 1:4,500 @A3



Attachment 2 – Offset Area Field Survey Plan

2. HABITAT QUALITY ASSESSMENT - OFFSET AREAS



NOTES
 This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2017), Aerial (Nearmap 2017)

*This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Offset area
- Observation Point
- Habitat quality transect
- Weed infestation points
(Total area of weed points = 2,849.0 m²)
- Weed infestation polygons
(Total area of weed polygons = 136,035.6 m²)
- Offset assessment unit**
- OAU1 (12.9-10.19a)
- OAU2 (12.9-10.12 /19.9-10.19a)
- OAU3 (12.9-10.17a)

PLAN ISSUE:				
Issue	Date	Description	Drawn	Checked
A	17/07/2017	Prel Draft	TC	FM



Universal Transverse Mercator GDA 1994 MGA Zone 56 1:6,600 @A3



Attachment 3 – Impact Area Habitat Quality Data Sheets

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.

Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: An Impact Site An Offset Site an Advanced Offset Site

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Case reference	Project Name
-----------------------	---------------------

Part B – Nominated Approach (FOR IMPACT SITE ONLY)

Please Select Your Nominated approach:

Rapid approach Standard Approach

ii) **Standard Assessment** (COMPLETE REMAINDER OF FORM)

Part C - Site Data

Property	Brookewater South	Date	
-----------------	-------------------	-------------	--

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1	6.427	12.9-10.7	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum		0m Mark	Zone	Easting	Northing
			56	490351.0657	6939425.198
WGS 84	<input type="checkbox"/>	50m Mark	Zone	Easting	Northing
			56	490300.4453	6939422.752
GDA 94	<input type="checkbox"/>				
Plot bearing			SWW	Recorders	JG and AC

Site description and Location (including details of discrete polygons within the assessment unit)

High percentage of non-native plant cover in the ground/shrub layer, dominated by creeping lantana and lantana. Historic disturbances include logging, clearing and cattle grazing. Native ground cover percentage is low due to dominance of weeds.

Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	4		
Scientific Name	<i>Eucalyptus tereticornis</i>	Common Name	Forest Red Gum
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Black Wattle
Scientific Name	<i>Acacia disarrima</i>	Common Name	Hickory Wattle
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Shrub species richness:			
Total number of species	2		
Scientific Name	<i>Banksia integrifolia</i>	Common Name	Coast Banksia
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	6		
Scientific Name	<i>Imperata cylindrica</i>	Common Name	Blady Grass
Scientific Name	<i>Heteropogon contortus</i>	Common Name	Black Spear Grass
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Eragrostis brownii</i>	Common Name	Brown's Love Grass
Scientific Name	<i>Artistida spp</i>	Common Name	-
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed-wire Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	4		
Scientific Name	<i>Chyrscephalum apiculatum</i>	Common Name	Yellow Buttons
Scientific Name	<i>Dianella caerulea</i>	Common Name	Blue Flax-lily
Scientific Name	<i>Pimelea linifolia</i>	Common Name	Flax-leaved Riceflower
Scientific Name	<i>Cheilanthes distans</i>	Common Name	Wooly Cloak Fern
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot			
	60.00%		
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana
Scientific Name	<i>Lantana montevirensis</i>	Common Name	Creeping Lantana
Scientific Name	<i>Bidens pillosa</i>	Common Name	Cobbler's Pegs
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Cynodon dactylon</i>	Common Name	Blue Couch
Scientific Name	<i>Opuntia tomentosa</i>	Common Name	Prickly Pear
Scientific Name	<i>Solanum nigrum</i>	Common Name	Black Nightshade
Scientific Name	<i>Senecio madagascariensis</i>	Common Name	Fire Weed
Scientific Name	<i>Oxalis</i>	Common Name	Wood Sorrels
Scientific Name	<i>Emilia sonchifolia</i>	Common Name	Emilia

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):			
	44.00		
1	1.00	26	
2	3.40	27	
3		28	
4		29	
5		30	

6		31	
7		32	
8		33	
9		34	
10		35	
11		36	

12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	5.00%	26.00%	55.00%	1.00%	5.00%	18.40%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	60.00%	30.00%	30.00%	10.00%	80.00%	42.00%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	390mm	Non- Eucalypt Large tree DBH benchmark used:	200mm
Number of large eucalypt trees:	8	Number of large non eucalypt trees:	0
Total Number Large Trees:	8		

Median Tree Canopy Height Measurements	Canopy:	20.00	Sub-canopy:	15.00	Emergent:	
--	---------	-------	-------------	-------	-----------	--

Number of ecologically dominant layer species regenerating:	1
---	---

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	69.00%	Sub-canopy:	25.50%	Emergent:	
Shrub canopy cover %	18.90%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION	5 - >200ha	3 - 50%-75% connection	3 - >30-75% remnant		3 - Within (whole or part)_
SCORE	10	4	4		6

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED

NO PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED

Part K - Species Habitat Attributes

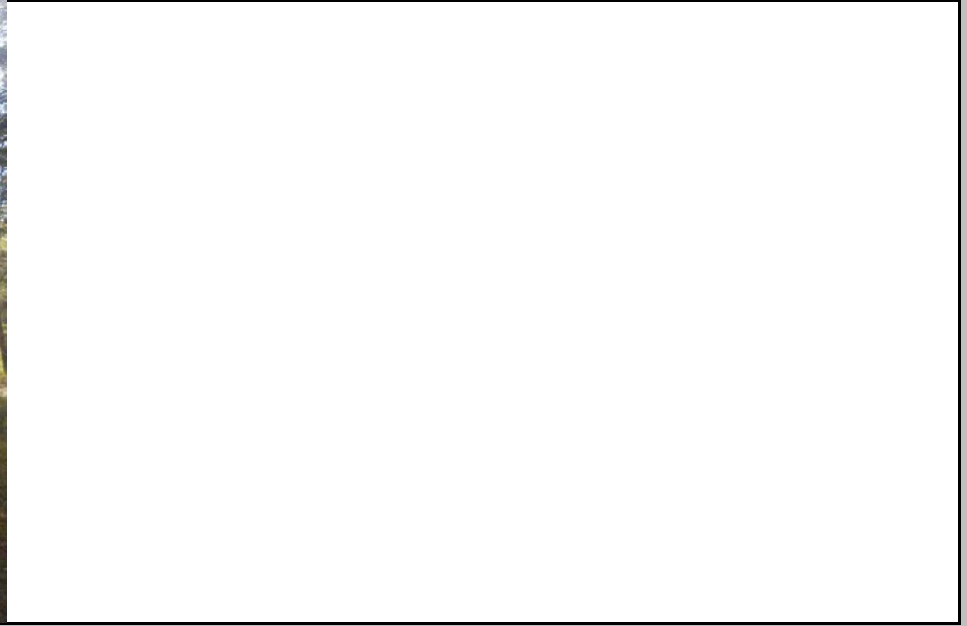
Species Habitat Attributes									
No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1	phascolarctos cinereus	koala	SL	Description	1 - High threat level (ie likely to result in death, irreversible damage)	3 - High	3 - High	2 - Highly restricted (51% - 75% reduction)	3 - Critical for Survival
				Score	1	10	10	4	5
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					

7				Description					
				Score					
8				Description					
				Score					
9				Description					
				Score					
10				Description					
				Score					

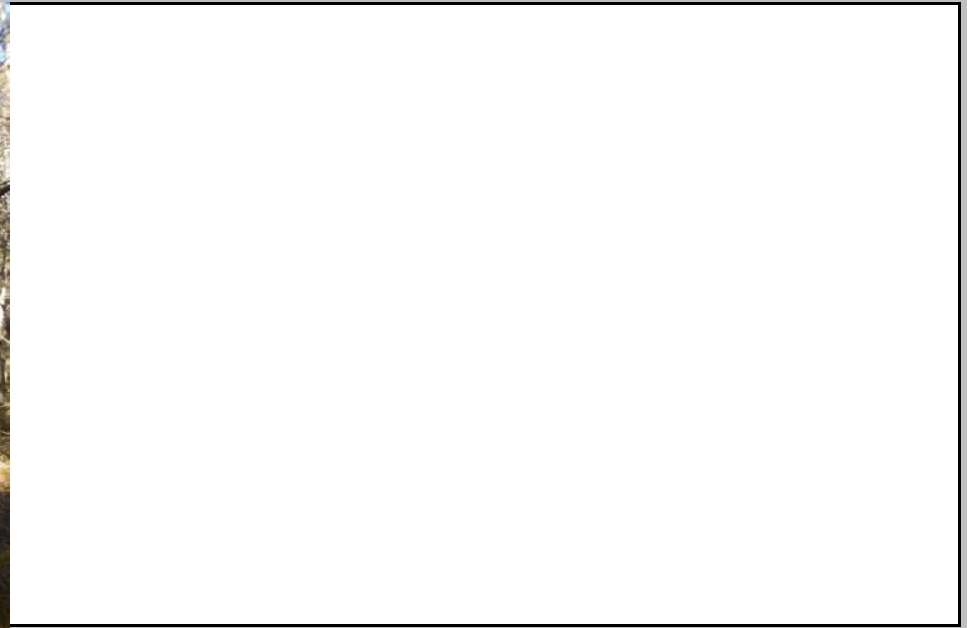
Maximum Score	1.00	10.00	10.00	4.00	5.00
---------------	------	-------	-------	------	------

Attach Landscape Photos Here

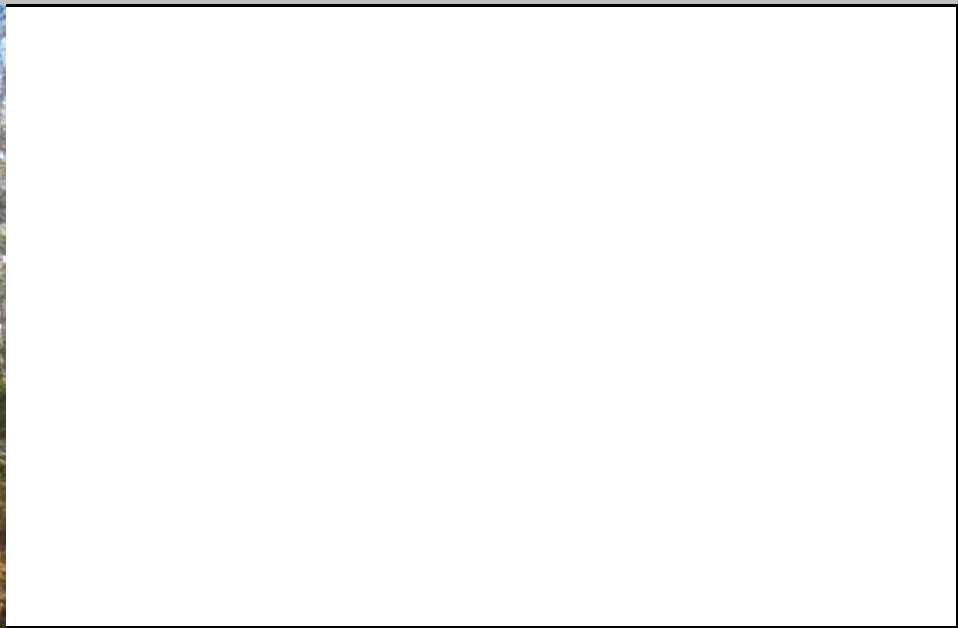
North



South



East



West



(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here:

[QLD Environmental Offsets](#)

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.

Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: An Impact Site An Offset Site an Advanced Offset Site

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Case reference	Project Name
-----------------------	---------------------

Part B – Nominated Approach (FOR IMPACT SITE ONLY)

Please Select Your Nominated approach: Rapid approach Standard Approach

ii) **Standard Assessment** (COMPLETE REMAINDER OF FORM)

Part C - Site Data

Property	Brookwater	Date	
-----------------	------------	-------------	--

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
2	40.8187	12.9-10.2	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum WGS 84 GDA 94	0m Mark	Zone	Easting	Northing
		56	T2 - 490275.807944224	6939749.807
	50m Mark	Zone	Easting	Northing
		56	T2 - 490288.022262933	6939799.446
		56	T3 - 490258.49790713	6940108.992
		Plot bearing	T2 - NNW	Recorders
Plot bearing	T3 - S	Recorders	JG and AC	

Site description and Location (including details of discrete polygons within the assessment unit)

Limited non-native plant cover, representing a relatively intact regional ecosystem. Historic disturbances include selective logging and fire with ver few hollow bearing trees identified. Good coverage of organic litter.



Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species			7
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Eucalyptus moluccana</i>	Common Name	Gum-topped Box
Scientific Name	<i>Eucalyptus propinqua</i>	Common Name	Grey Gum
Scientific Name	<i>Eucalyptus crebra</i>	Common Name	Narrow-leaved Ironbark
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Eucalyptus moluccana</i>	Common Name	Gum-topped Box
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Eucalyptus propinqua</i>	Common Name	Grey Gum
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Allocaeusuarina torulosa</i>	Common Name	Forest She-oak
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Lophostemon suaveolens</i>	Common Name	Swamp Box

Shrub species richness:			
Total number of species			6
Scientific Name	<i>Lophostemon suaveolens</i>	Common Name	Swamp Box
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Black Wattle
Scientific Name	<i>Acacia melanoxylon</i>	Common Name	Australian Blackwood
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Jacksonia scoparia</i>	Common Name	Dogwood
Scientific Name	<i>Acacia fimbriata</i>	Common Name	Fringed Wattle
Scientific Name	<i>Lophostemon confertus</i>	Common Name	Brush Box
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Black Wattle
Scientific Name	<i>Allocaeusuarina littoralis</i>	Common Name	Black She-oak
Scientific Name	<i>Jacksonia scoparia</i>	Common Name	Dogwood

Grass species richness:			
Total number of species			5
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed-wire Grass
Scientific Name	<i>Panicum effusum</i>	Common Name	Hairy Panic
Scientific Name	<i>Themeda triandra</i>	Common Name	Kangaroo Grass
Scientific Name	<i>Eragrostis brownii</i>	Common Name	Brown's Love Grass
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed-wire Grass
Scientific Name	<i>Themeda triandra</i>	Common Name	Kangaroo Grass

Forbs and others (non grass ground) species richness:			
Total number of species			7
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Lomandra multiflora</i>	Common Name	-
Scientific Name	<i>Goodenia rotundifolia</i>	Common Name	Goodenia
Scientific Name	<i>Dianella caerulea</i>	Common Name	Blue-flax Lily
Scientific Name	<i>Xanthorrhoea johnsonii</i>	Common Name	Grass Tree
Scientific Name	<i>Eustrephus latifolius</i>	Common Name	Wombat Berry
Scientific Name	<i>Cheilanthes distans</i>	Common Name	Lip Fern
Scientific Name	<i>Lomandra multiflora</i>	Common Name	-
Scientific Name	<i>Goodenia rotundifolia</i>	Common Name	Goodenia
Scientific Name	<i>Xanthorrhoea johnsonii</i>	Common Name	Grass Tree
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Chrysocephalum apiculatum</i>	Common Name	Yellow Buttons
Scientific Name	<i>Velleia spathulata</i>	Common Name	Wild Pansies
Scientific Name	<i>Eustrephus latifolius</i>	Common Name	Wombat Berry

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot			
			2.50%
Scientific Name		Common Name	White Root
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana
Scientific Name	<i>Lantana montevidensis</i>	Common Name	Creeping Lantana
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana

Scientific Name	<i>Lantana montevidensis</i>	Common Name	Creeping Lantana
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Coarse Woody Debris (Meters):	229.00		
1	3.80	26	
2	1.20	27	
3	5.10	28	
4	0.80	29	
5	2.10	30	
6	2.00	31	
7	1.00	32	
8	8.00	33	
9	4.60	34	
10	1.00	35	
11	1.20	36	

12	0.80	37
13	0.90	38
14	1.40	39
15	4.60	40
16	1.00	41
17	2.10	42
18	3.00	43
19	1.20	44
20		45
21		46
22		47
23		48
24		49
25		50

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	25.00%	27.50%	12.50%	11.00%	10.00%	17.20%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	55.00%	50.00%	67.50%	86.50%	72.50%	66.30%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	1	Number of large non eucalypt trees:	0
Total Number Large Trees:	1		

Median Tree Canopy Height Measurements	Canopy:	19.50	Sub-canopy:	12.50	Emergent:
--	---------	-------	-------------	-------	-----------

Number of ecologically dominant layer species regenerating:	5
---	---

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	66.05%	Sub-canopy:	13.05%	Emergent:
Shrub canopy cover %	38.90%				

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION	5 - >200ha	4 - >75% or >500ha connection	3 - >30-75% remnant		1- Not within
SCORE	10	5	4		0

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED

NO PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED

Part K - Species Habitat Attributes

Species Habitat Attributes									
No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1	phascolarctos cinereus	koala	SL	Description	1 - High threat level (ie likely to result in death, irreversible damage)	3 - High	2 - Moderate	2 - Highly restricted (51% - 75% reduction)	3 - Critical for Survival
				Score	1	10	5	4	5
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					
7				Description					

7				Score						
8				Description						
				Score						
9				Description						
				Score						
10				Description						
				Score						
					Maximum Score	1.00	10.00	5.00	4.00	5.00

Attach Landscape Photos Here

North



South



East



West



(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here:

[QLD Environmental Offsets](#)

SITE ASSESSMENT TEMPLATE SUMMARY SHEET

Case Reference	
Project Name	
Total Area	47.2457

Part	Habitat Quality Attributes
	Assessment Unit Area (ha)
	Regional Ecosystems
	Bioregion

Assessment Unit Number									
1	2	3	4	5	6	7	8	9	10
6.427	40.8187	0	0	0	0	0	0	0	0
12.9-10.7	12.9-10.2								
Southeast Queensland	Southeast Queensland								

1	Site Condition Attributes	1. Recruitment of woody perennial species (Number of ecologically dominant layers regenerating)
		2. Native plant species richness
		- Trees
		- Shrubs
		- Grasses
		- Forbs
		3. Tree canopy height
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
4. Tree canopy cover		
- Canopy Layer		
- Sub-Canopy Layer		
- Emergent Layer		
5. Shrub canopy cover		
6. Native perennial grass cover		
7. Organic litter		
8. Large trees		
9. Coarse woody debris (Meters)		
10. Weed cover		

1.00	5.00								
4.00	7.00								
2.00	5.50								
6.00	5.00								
4.00	7.00								
20.00	19.50								
15.00	12.50								
69.00%	66.05%								
25.50%	13.05%								
18.90%	38.90%								
18.40%	17.20%								
42.00%	66.30%								
8.00	1.00								
44.00	229.00								
60.00%	2.50%								

2	Site Context Attributes	11. Size of patch (fragmented)
		12. Connectedness (fragmented)
		13. Context (fragmented)
		14. Distance from water (intact)
		15. Ecological corridors

10.00	10.00								
4.00	5.00								
4.00	4.00								
6.00	0.00								

dex	16. Threats to species
-----	------------------------

1.00	1.00								
------	------	--	--	--	--	--	--	--	--

3	Species Habitat In	17. Quality and availability of food and foraging habitat
		18. Quality and availability of shelter
		19. Species mobility capacity
		20. Role of site location to overall population in the State.

10.00	10.00								
10.00	5.00								
4.00	4.00								
5.00	5.00								

PLEASE COMPLETE THE BENCHMARK OR BEST ON OFFER SITE DETAILS BELOW AS DIRECTED FOR EACH ASSESSMENT UNIT AND REGIONAL ECOSYSTEM LISTED BELOW

Case Reference	
Project Name	
Total Area	47.2457

SITE ASSESSMENT TEMPLATE - BENCHMARK OR BEST ON OFFER SITE DETAILS - ENTER DETAILS IN CELLS BELOW

INFORMATION ON BENCHMARKS IS AVAILABLE ON THE QUEENSLAND GOVERNMENT WEBSITE THAT CAN BE ACCESSED HERE: [BENCHMARKS](#)
 (NOTE: WHERE THERE IS NO BENCHMARK AVAILABLE FOR THE REGIONAL ECOSYSTEM IN QUESTION A BEST ON OFFER SITE MAY BE USED AS A SURROGATE.)

Part	Habitat Quality Attributes
	Assessment Unit Area (ha)
	Regional Ecosystems
	Bioregion

BenchMark or Best on Offer Site Data									
1	2	3	4	5	6	7	8	9	10
6.427	40.8187	0	0	0	0	0	0	0	0
12.9-10.7	12.9-10.2								
Southeast Queensland	Southeast Queensland								

1	Site Condition Attributes	1. Recruitment of woody perennial species (Number of ecologically dominant layers regenerating)
		2. Native plant species richness
		- Trees
		- Shrubs
		- Grasses
		- Forbs
		3. Tree canopy height
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
		4. Tree canopy cover
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
		5. Shrub canopy cover
		6. Native perennial grass cover
		7. Organic litter
		8. Large trees
		9. Coarse woody debris (Meters)
		10. Weed cover

3.00	6.00								
3.00	6.00								
5.00	7.00								
8.00	7.00								
26.00	13.00								
21.00	21.00								
10.00	12.00								
40.00%	64.00%								
8.00%	20.00%								
3.00%	6.00%								
61.00%	21.00%								
20.00%	48.00%								
18	38								
272.00	506.00								
0.00%	0.00%								

3	Species Habitat Index	16. Threats to species	1.00	1.00																	
		17. Quality and availability of food and foraging habitat	10.00	10.00																	
		18. Quality and availability of shelter	10.00	5.00																	
		19. Species mobility capacity	4.00	4.00																	
		20. Role of site location to overall population in the State.	5.00	5.00																	

[CLICK HERE TO GO TO THE FINAL SUMMARY SHEET](#)

Habitat Quality Final Summary

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1–Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

Note: This document/tool may be used in relation to undertaking a habitat quality analysis of an impact site/offset site and/or advanced offset site and is designed to be attached to Environmental Offsets Delivery Form 5 - Habitat Quality Details as

Case Reference		Habitat Quality Final Summary Template										
Project Name												
Total Area		47.2457										
PART	Habitat Quality Attributes	Requirement	Assessment Unit Number									
	Assessment Unit Area (ha)	Area (ha)	1	2	3	4	5	6	7	8	9	10
	Regional Ecosystems	RE	12.9-10.7	12.9-10.2								
	Bioregion	Bioregion	Southeast Queensland	Southeast Queensland								
1	Site Condition Attributes	1. Recruitment of woody perennial species	Score	3	5							
		2. Native plant species richness	Score	5	5							
		- Trees	Score	3	3							
		- Shrubs	Score	3	3							
		- Grasses	Score	3	3							
		- Forbs	Score	2.5	3							
		3. Tree canopy height	Score	5	5							
		- Canopy layer	Score	5	5							
		- Sub-Canopy Layer	Score	5	5							
		- Emergent Layer	Score									
		Average Score	Average Score	5	5							
		4. Tree canopy cover	Score	5	5							
		- Canopy layer	Score	3	5							
		- Sub-Canopy Layer	Score									
		- Emergent Layer	Score									
		Average Score	Average Score	4	5							
		5. Shrub canopy cover	Score	3	3							
		6. Native perennial grass cover	Score	1	3							
		7. Organic litter	Score	3	5							

	8. Large trees	Score	5	5								
	9. Coarse woody debris	Score	2	2								
	10. Weed cover	Score	5	10								

2	Site Context Attributes	11. Size of patch (fragmented)	Score	10	10							
		12. Connectedness (fragmented)	Score	4	5							
		13. Context (fragmented)	Score	4	4							
		14. Distance from water (intact)	Score									
		15. Ecological corridors	Score	6	0							

3	Species Habitat Index	16. Threats to species	Score	1	1							
		17. Quality and availability of food and foraging habitat	Score	10	10							
		18. Quality and availability of shelter	Score	10	5							
		19. Species mobility capacity	Score	4	4							
		20. Role of site location to overall population in the State.	Score	5	5							

Habitat Quality Score (measured)	98.50	101.00								
Habitat Quality Score (max)	156.00	156.00								
Assessment Unit Area (ha)	6.43	40.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Assessment Unit Habitat Quality Score	6.31	6.47								
Size weighting	0.14	0.86								
Weighted Assessment Unit Habitat Quality Score	0.86	5.59								
FINAL TOTAL HABITAT QUALITY SCORE	6.45									

Administrative Information	
Name of Assessment Officer	Date
Organisation/Company Name	
Project Name	
Phone Number	Email

Attachment 4 – Offset Area Habitat Quality Data Sheets

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.

Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: An Impact Site An Offset Site an Advanced Offset Site


Habitat Quality Assessment Unit Score Sheet

Part C - Site Data

Property		Date	
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Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1	58.322	12.9-10.19	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum	0m Mark	Zone	Easting	Northing
WGS 84 GDA 94		56	T1 - 492360.47517993	6936743.23
		56	T2 - 492563.363185888	6937577.07
	50m Mark	Zone	Easting	Northing
		56	T1 - 492326.109862588	6936776.277
		56	T2 - 492554.577155044	6937624.851
	Plot bearing	T1 - NW	Recorders	JG and MC
	Plot bearing	T2 - NNW	Recorders	JG and MC

Site description and Location (including details of discrete polygons within the assessment unit)

High percentage of non-native plant cover in the ground/shrub layer and regrowth canopy, represented by the lack of large Eucalypt trees. Historic disturbances include logging, clearing and trial *Eucalyptus cloeziana* plantations. Native ground cover percentage is low due to dominance of weeds.

Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	7		
Scientific Name	<i>Eucalyptus seaiana</i>	Common Name	Narrow-leaved Red Gum
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Allocasuarina littoralis</i>	Common Name	Black She-oak
Scientific Name	<i>Corymbia henryi</i>	Common Name	Large-leaved Spotted Gum
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Eucalyptus crebra</i>	Common Name	Narrow-leaved Ironbark
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Corymbia henryi</i>	Common Name	Large-leaved Spotted Gum
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Eucalyptus acmenoides</i>	Common Name	White Mahogany
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Angophora woodsiana</i>	Common Name	Smudgee Apple

Shrub species richness:			
Total number of species	4		
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Wattle
Scientific Name	<i>Acacia disparrima</i>	Common Name	Hickory Wattle
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Wattle
Scientific Name	<i>Acacia disparrima</i>	Common Name	Hickory Wattle
Scientific Name	<i>Petalostigma pubescens</i>	Common Name	Quinene Bush
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	5		
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed Wire Grass
Scientific Name	<i>Imperata cylindrica</i>	Common Name	Blady Grass
Scientific Name	<i>Heteropogon contortus</i>	Common Name	Black Spear Grass
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed Wire Grass
Scientific Name	<i>Imperata cylindrica</i>	Common Name	Blady Grass
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	4		
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Leptospermum laterale</i>	Common Name	Swardsedge
Scientific Name	<i>Lomandra multiflora</i>	Common Name	-
Scientific Name	<i>Goodenia rotundifolia</i>	Common Name	Goodenia
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Leptospermum laterale</i>	Common Name	Swardsedge
Scientific Name	<i>Goodenia rotundifolia</i>	Common Name	Goodenia

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot			
		45.00%	
Scientific Name	<i>Lantana camara</i>	Common Name	Creeping Lantana
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana
Scientific Name	<i>Lantana montevidensis</i>	Common Name	Creeping Lantana
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Eucalyptus cloeziana</i>	Common Name	Gympie Messmate
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Coarse Woody Debris (Meters):	237.00
---	--------

1	1.20	26	1.70
2	0.80	27	
3	2.00	28	
4	1.00	29	
5	3.40	30	
6	1.00	31	
7	1.00	32	
8	1.00	33	
9	1.50	34	
10	1.00	35	
11	1.60	36	

12	3.30	37
13	6.00	38
14	1.00	39
15	1.00	40
16	1.00	41
17	5.00	42
18	1.00	43
19	1.00	44
20	0.90	45
21	1.00	46
22	4.00	47
23	1.80	48
24	1.00	49
25	2.20	50

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	3.50%	6.00%	3.50%	2.00%	3.50%	3.70%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	50.00%	74.00%	74.00%	52.50%	65.00%	63.10%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	440	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	4	Number of large non eucalypt trees:	0
Total Number Large Trees:	4		

Median Tree Canopy Height Measurements	Canopy:	18.00	Sub-canopy:	10.00	Emergent:	NA
--	---------	-------	-------------	-------	-----------	----

Number of ecologically dominant layer species regenerating:	4
---	---

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	44.05%	Sub-canopy:	27.70%	Emergent:	NA
Shrub canopy cover %	26.25%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION	5 - >200ha	4 - >75% or >500ha connection	3 - >30-75% remnant		3 - Within (whole or part)
SCORE	10	5	4		6

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED

NO PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED

Part K - Species Habitat Attributes

Species Habitat Attributes									
No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1	phascolarctos cinereus	koala	SL	Description	2 - Moderate threat level	3 - High	3 - High	3 - Moderately restricted (26 – 50% reduction)	3 - Critical for Survival
				Score	7	10	10	7	5
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					

7				Description					
				Score					
8				Description					
				Score					
9				Description					
				Score					
10				Description					
				Score					

Maximum Score	7.00	10.00	10.00	7.00	5.00
---------------	------	-------	-------	------	------

Attach Landscape Photos Here

North



South



East



West



(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here:

[QLD Environmental Offsets](#)

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

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- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.

Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: An Impact Site An Offset Site an Advanced Offset Site

Habitat Quality Assessment Unit Score Sheet

Part C - Site Data

Property		Date	
----------	--	------	--

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
2	11.0336	12.9-10.12	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum WGS 84 GDA 94	0m Mark	Zone	Easting	Northing
		56	492920.55	6937577.07
	50m Mark	56	492836.6516	6938236.54
		Zone	Easting	Northing
		56	492908.7	6938188.87
		56	492816.595	6937566.785
Plot bearing		SSW	Recorders	MC and LS
Plot bearing		SSW	Recorders	JG and MC

Site description and Location (including details of discrete polygons within the assessment unit)

Limited non-native plant cover, representing a relatively intact regional ecosystem. Historic disturbances include selective logging and fire with ver few hollow bearing trees identified. Good coverage of organic litter.

Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	5		
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Lophostemon suaveolens</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Eucalyptus seeana</i>	Common Name	Narrow-leaved Red Gum
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Eucalyptus fibrosa</i>	Common Name	Broad-leaved Ironbark
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Eucalyptus seeana</i>	Common Name	Narrow-leaved Red Gum
Scientific Name		Common Name	

Shrub species richness:			
Total number of species	6		
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Wattle
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Leucopogon spp.</i>	Common Name	-
Scientific Name	<i>Pultenaea villosa</i>	Common Name	Hairy Pea Bush
Scientific Name	<i>Acacia disparrima</i>	Common Name	Black Wattle
Scientific Name	<i>Allocasuarina littoralis</i>	Common Name	Black She-oak
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Wattle
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Jacksonia scoparia</i>	Common Name	Dogwood
Scientific Name	<i>Petalostigma pubescens</i>	Common Name	Quinene Bush
Scientific Name	<i>Acacia disparrima</i>	Common Name	Black Wattle
Scientific Name	<i>Allocasuarina littoralis</i>	Common Name	Black She-oak

Grass species richness:			
Total number of species	3		
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Themeda triandra</i>	Common Name	Kangaroo Grass
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed-wire Grass
Scientific Name	<i>Heteropogon contortus</i>	Common Name	Black Spear Grass
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	5		
Scientific Name	<i>Lomandra multiflora</i>	Common Name	-
Scientific Name	<i>Leptospermum laterale</i>	Common Name	Swordsedge
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Dianella caerulea</i>	Common Name	Blue-flax Lily
Scientific Name	<i>Eustrephus latifolius</i>	Common Name	Wombat Berry
Scientific Name	<i>Xanthorrhoea johnsonii</i>	Common Name	Grass Tree
Scientific Name	<i>Leptospermum laterale</i>	Common Name	Swordsedge
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Goodenia rotundifolia</i>	Common Name	Goodenia

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot			
	2.50%		
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana
Scientific Name	<i>Lantana montevidensis</i>	Common Name	Creeping Lantana
Scientific Name	<i>Easter cassia</i>	Common Name	Cassia
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):			
1	4.10	26	1.10

2	1.20	27	3.00
3	1.00	28	2.80
4	4.00	29	1.50
5	1.80	30	1.60
6	3.00	31	1.40
7	6.50	32	1.50
8	0.90	33	1.70
9	1.20	34	1.30
10	1.40	35	3.30
11	4.10	36	1.10

12	1.10	37
13	1.50	38
14	1.00	39
15	1.50	40
16	2.00	41
17	1.50	42
18	1.00	43
19	2.50	44
20	2.50	45
21	1.00	46
22	1.00	47
23	1.00	48
24	2.40	49
25	1.00	50

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	12.50%	7.50%	22.50%	27.50%	6.00%	15.20%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	80.00%	90.00%	72.50%	72.50%	90.00%	81.00%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	300	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	18	Number of large non eucalypt trees:	0
Total Number Large Trees:	18		

Median Tree Canopy Height Measurements	Canopy:	19.00	Sub-canopy:	12.00	Emergent:	NA
--	---------	-------	-------------	-------	-----------	----

Number of ecologically dominant layer species regenerating:	4
---	---

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	40.75%	Sub-canopy:	39.25%	Emergent:	NA
Shrub canopy cover %	25.60%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION	5 - >200ha	4 - >75% or >500ha connection	3 - >30-75% remnant		3 - Within (whole or part)
SCORE	10	5	4		6

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED

NO PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED

Part K - Species Habitat Attributes

Species Habitat Attributes									
No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1	<i>phascolarctos cinereus</i>	koala	SL	Description	2 - Moderate threat level	3 - High	3 - High	3 - Moderately restricted (26 – 50% reduction)	3 - Critical for Survival
				Score	7	10	10	7	5
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					
7				Description					

7				Score						
8				Description						
				Score						
9				Description						
				Score						
10				Description						
				Score						
					Maximum Score	7.00	10.00	10.00	7.00	5.00

Attach Landscape Photos Here

North



South



East



West



(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here:

[QLD Environmental Offsets](#)

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Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.

Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: An Impact Site An Offset Site an Advanced Offset Site

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Case reference	Project Name
-----------------------	---------------------

Part B – Nominated Approach (FOR IMPACT SITE ONLY)

Please Select Your Nominated approach:

Rapid approach Standard Approach

i) **Rapid Assessment** (ENTER BVG FROM DROP-DOWN LIST BELOW)

Enter BVG:		Presumed HQ Equals	
-------------------	--	---------------------------	--

ii) **Standard Assessment** (COMPLETE REMAINDER OF FORM)

Part C - Site Data

Property	Date
-----------------	-------------

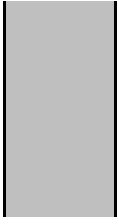
Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
3	12.19	12.9-10.17	Southeast Queensland

Landscape Photo- Please attach or insert north, south, east and west photos in the spaces provided from row 231-355 below and include details such as Time and Mapping Coordinates in the following row.

Datum WGS 84 GDA 94	0m Mark	Zone	Easting	Northing	
		56	T5 - 492405.68463486	6936379.793	
		56	T6 - 492220.857995522	6936511.961	
		Zone	Easting	Northing	
	50m Mark	56	T5 - 492439.61083049	6936343.207	
		56	T6 - 492220.145201004	6936562.067	
		Plot bearing	SE	Recorders	JG and AC
		Plot bearing	T5 & T6 - NNW	Recorders	JG and AC

Site description and Location (including details of discrete polygons within the assessment unit)

High percentage of non-native plant cover in the ground/shrub layer and regrowth canopy, represented by the lack of large Eucalypt trees. Historic disturbances include logging, clearing and trial Eucalyptus cloeziana plantations. Native ground cover percentage is low due to dominance of weeds, particularly within the overland flow path/drainage channel.



Part D - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	8		
Scientific Name	<i>Eucalyptus crebra</i>	Common Name	Narrow-leaved Ironbark
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Eucalyptus moluccana</i>	Common Name	Gum-topped Box
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Corymbia henryi</i>	Common Name	Large-leaved Spotted Gum
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Eucalyptus tereticornis</i>	Common Name	Forest Red Gum
Scientific Name	<i>Angophora leiocarpa</i>	Common Name	Smooth-barked Apple
Scientific Name	<i>Eucalyptus siderophloia</i>	Common Name	Grey Ironbark
Scientific Name	<i>Eucalyptus tereticornis</i>	Common Name	Forest Red Gum
Scientific Name	<i>Eucalyptus moluccana</i>	Common Name	Gum-topped Box
Scientific Name	<i>Eucalyptus propinqua</i>	Common Name	Grey Gum
Scientific Name	<i>Corymbia citriodora</i>	Common Name	Spotted Gum
Scientific Name	<i>Corymbia intermedia</i>	Common Name	Pink Bloodwood
Scientific Name	<i>Lophostemon suaveolens</i>	Common Name	Swamp Box
Scientific Name	<i>Acacia dispartima</i>	Common Name	Hickory Wattle

Shrub species richness:			
Total number of species	6		
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Wattle
Scientific Name	<i>Acacia fimbriata</i>	Common Name	Fringed Wattle
Scientific Name	<i>Allocasuarina littoralis</i>	Common Name	Black She-oak
Scientific Name	<i>Jacksonia scoparia</i>	Common Name	Dogwood
Scientific Name	<i>Lophostemon suaveolens</i>	Common Name	Swamp Box
Scientific Name	<i>Acacia leiocalyx</i>	Common Name	Early Flowering Wattle
Scientific Name	<i>Acacia dispartima</i>	Common Name	Hickory Wattle
Scientific Name	<i>Acacia fimbriata</i>	Common Name	Fringed Wattle
Scientific Name	<i>Alphitonia excelsa</i>	Common Name	Soap Tree
Scientific Name	<i>Breynia oblongifolia</i>	Common Name	Coffee Bush

Grass species richness:			
Total number of species	6		
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida
Scientific Name	<i>Eragrostis brownii</i>	Common Name	Brown's Love Grass
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed-wire Grass
Scientific Name	<i>Panicum effusum</i>	Common Name	Hairy Panic
Scientific Name	<i>Oplismenus imbecillis</i>	Common Name	Creeping Beard Grass
Scientific Name	<i>Themeda triandra</i>	Common Name	Kangaroo Grass
Scientific Name	<i>Entolasia stricta</i>	Common Name	Wiry Panic
Scientific Name	<i>Imperata cylindrica</i>	Common Name	Blady Grass
Scientific Name	<i>Cymbopogon refractus</i>	Common Name	Barbed-wire Grass
Scientific Name	<i>Aristida spp</i>	Common Name	Aristida

Forbs and others (non grass ground) species richness:			
Total number of species	6		
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Lomandra multiflora</i>	Common Name	-
Scientific Name	<i>Goodenia rotundifolia</i>	Common Name	Goodenia
Scientific Name	<i>Cheilanthes distans</i>	Common Name	Lip Fern
Scientific Name	<i>Parsonia straminea</i>	Common Name	Monkey Rope
Scientific Name	<i>Pimelea linifolia</i>	Common Name	Flax-leaved Riceflower
Scientific Name	<i>Pteridium esculentum</i>	Common Name	Bracken Fern
Scientific Name	<i>Lomandra multiflora</i>	Common Name	-
Scientific Name	<i>Lomandra longifolia</i>	Common Name	-
Scientific Name	<i>Gahnia aspera</i>	Common Name	Rough-saw Sedge
Scientific Name	<i>Chrysocephalum apiculatum</i>	Common Name	Yellow Buttons

Part E - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot			
		40.00%	
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana
Scientific Name	<i>Lantana montevidensis</i>	Common Name	Creeping Lantana
Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Pratia purpurascens</i>	Common Name	White Root
Scientific Name	<i>Lantana camara</i>	Common Name	Lantana
Scientific Name	<i>Lantana montevidensis</i>	Common Name	Creeping Lantana

Scientific Name	<i>Passiflora suberosa</i>	Common Name	Corky Passionvine
Scientific Name	<i>Pratia purpurascens</i>	Common Name	White Root
Scientific Name		Common Name	
Scientific Name		Common Name	

Part F - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Coarse Woody Debris (Meters):	357.50		
1	2.00	26	
2	1.00	27	
3	3.50	28	
4	1.20	29	
5	3.40	30	
6	4.00	31	
7	3.60	32	
8	1.50	33	
9	5.50	34	
10	4.10	35	
11	2.00	36	

12	2.40	37
13	1.00	38
14	0.90	39
15	0.80	40
16	6.70	41
17	4.20	42
18	5.40	43
19	2.70	44
20	1.10	45
21	1.40	46
22	2.10	47
23	11.00	48
24		49
25		50

Part G - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Native perennial grass cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	22.50%	13.50%	11.00%	22.50%	22.50%	18.40%

Organic Litter	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
	55.00%	70.00%	40.00%	55.00%	45.00%	53.00%

Part H- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	430	Non- Eucalypt Large tree DBH benchmark used:	200
Number of large eucalypt trees:	1	Number of large non eucalypt trees:	0
Total Number Large Trees:	1		

Median Tree Canopy Height Measurements	Canopy:	22.50	Sub-canopy:	12.00	Emergent:	NA
--	---------	-------	-------------	-------	-----------	----

Number of ecologically dominant layer species regenerating:	4
---	---

Part I - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	53.55%	Sub-canopy:	17.90%	Emergent:	NA
Shrub canopy cover %	49.45%					

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part J - Site Context Score

ATTRIBUTE	Size of Patch	Connectedness	Context	Distance to Permanent Water	Ecological Corridors
DESCRIPTION	5 - >200ha	4 - >75% or >500ha connection	3 - >30-75% remnant		<u>3 - Within (whole or part)</u>
SCORE	10	5	4		6

DOES THIS ASSESSMENT UNIT ALSO CONTAIN A SPECIES HABITAT REQUIREMENT.

YES PLEASE COMPLETE SPECIES HABITAT INDEX DETAILS BELOW AND THEN ATTACH LANDSCAPE PHOTOS AND SUBMIT AS DIRECTED

NO PLEASE ATTACH LANDSCAPE PHOTOS BELOW AND SUBMIT AS DIRECTED

Part K - Species Habitat Attributes

Species Habitat Attributes									
No	Species Name	CommonName	NCA Status	Attributes	Threats to species	Quality and availability of food and foraging habitat	Quality and availability of shelter	Species mobility capacity	Role of site location to overall population
1	phascolarctos cinereus	koala	SL	Description	2 - Moderate threat level	3 - High	3 - High	3 - Moderately restricted (26 – 50% reduction)	3 - Critical for Survival
				Score	7	10	10	7	5
2				Description					
				Score					
3				Description					
				Score					
4				Description					
				Score					
5				Description					
				Score					
6				Description					
				Score					
7				Description					

7				Score						
8				Description						
				Score						
9				Description						
				Score						
10				Description						
				Score						
					Maximum Score	7.00	10.00	10.00	7.00	5.00

Attach Landscape Photos Here

North



South



East



West



(FORM COMPLETE)

Please save and forward completed form/s together with Offsets Delivery Form 5 that can be accessed here:

[QLD Environmental Offsets](#)

Version 1.0 - December - 2014 © - State of Queensland, Department of Environment and Heritage Protection

SITE ASSESSMENT TEMPLATE SUMMARY SHEET

Case Reference	
Project Name	
Total Area	81.5456

Part	Habitat Quality Attributes
	Assessment Unit Area (ha)
	Regional Ecosystems
	Bioregion

Assessment Unit Number									
1	2	3	4	5	6	7	8	9	10
58.322	11.0336	12.19	0	0	0	0	0	0	0
12.9-10.19	12.9-10.12	12.9-10.17							
Southeast Queensland	Southeast Queensland	Southeast Queensland							

1	Site Condition Attributes	1. Recruitment of woody perennial species (Number of ecologically dominant layers regenerating)
		2. Native plant species richness
		- Trees
		- Shrubs
		- Grasses
		- Forbs
		3. Tree canopy height
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
		4. Tree canopy cover
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
		5. Shrub canopy cover
		6. Native perennial grass cover
7. Organic litter		
8. Large trees		
9. Coarse woody debris (Meters)		
10. Weed cover		

4.00	4.00	4.00							
7.00	5.00	8.00							
4.00	6.00	6.00							
5.00	3.00	6.00							
4.00	5.00	6.00							
18.00	19.00	22.50							
10.00	12.00	12.00							
NA	NA	NA							
44.05%	40.75%	53.55%							
27.70%	39.25%	17.90%							
NA	NA	NA							
26.25%	25.60%	49.45%							
3.70%	15.20%	18.40%							
63.10%	81.00%	53.00%							
4.00	18.00	1.00							
237.00	352.50	357.50							
45.00%	2.50%	40.00%							

2	Site Context Attributes	11. Size of patch (fragmented)
		12. Connectedness (fragmented)
		13. Context (fragmented)
		14. Distance from water (intact)
		15. Ecological corridors

10.00	10.00	10.00							
5.00	5.00	5.00							
4.00	4.00	4.00							
6.00	6.00	6.00							

dex	16. Threats to species
-----	------------------------

7.00	7.00	7.00							
------	------	------	--	--	--	--	--	--	--

3	Species Habitat In	17. Quality and availability of food and foraging habitat
		18. Quality and availability of shelter
		19. Species mobility capacity
		20. Role of site location to overall population in the State.

10.00	10.00	10.00							
10.00	10.00	10.00							
7.00	7.00	7.00							
5.00	5.00	5.00							

PLEASE COMPLETE THE BENCHMARK OR BEST ON OFFER SITE DETAILS BELOW AS DIRECTED FOR EACH ASSESSMENT UNIT AND REGIONAL ECOSYSTEM LISTED BELOW

Case Reference	
Project Name	
Total Area	81.5456

SITE ASSESSMENT TEMPLATE - BENCHMARK OR BEST ON OFFER SITE DETAILS - ENTER DETAILS IN CELLS BELOW

INFORMATION ON BENCHMARKS IS AVAILABLE ON THE QUEENSLAND GOVERNMENT WEBSITE THAT CAN BE ACCESSED HERE: [BENCHMARKS](#)
 (NOTE: WHERE THERE IS NO BENCHMARK AVAILABLE FOR THE REGIONAL ECOSYSTEM IN QUESTION A BEST ON OFFER SITE MAY BE USED AS A SURROGATE.)

Part	Habitat Quality Attributes
	Assessment Unit Area (ha)
	Regional Ecosystems
	Bioregion

BenchMark or Best on Offer Site Data									
1	2	3	4	5	6	7	8	9	10
58.322	11.0336	12.19	0	0	0	0	0	0	0
12.9-10.19	12.9-10.12	12.9-10.17							
Southeast Queensland	Southeast Queensland	Southeast Queensland							

1	Site Condition Attributes	1. Recruitment of woody perennial species (Number of ecologically dominant layers regenerating)
		2. Native plant species richness
		- Trees
		- Shrubs
		- Grasses
		- Forbs
		3. Tree canopy height
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
		4. Tree canopy cover
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
		5. Shrub canopy cover
		6. Native perennial grass cover
		7. Organic litter
		8. Large trees
		9. Coarse woody debris (Meters)
		10. Weed cover

4.00	4.00	13.00							
4.00	4.00	13.00							
6.00	8.00	13.00							
7.00	6.00	5.00							
14.00	5.00	31.00							
24.00	27.00	27.00							
10.00	13.00	13.00							
59.00%	77.00%	85.00%							
22.00%	86.00%	27.00%							
11.00%	11.00%	12.00%							
16.00%	15.00%	11.00%							
53.00%	85.00%	45.00%							
24	100	37							
285.00	580.00	553.00							
0.00%	0.00%	0.00%							

Case Reference	
Project Name	
Total Area	81.5456

SITE ASSESSMENT BENCHMARK COMPARISON RESULTS

Part	Habitat Quality Attributes
	Assessment Unit Area (ha)
	Regional Ecosystems
	Bioregion

Assessment Unit Number									
1	2	3	4	5	6	7	8	9	10
58.322	11.0336	12.19	0	0	0	0	0	0	0
12.9-10.19	12.9-10.12	12.9-10.17							
Southeast Queensland	Southeast Queensland	Southeast Queensland							

1	Site Condition Attributes	1. Recruitment of woody perennial species (Number of ecologically dominant layers regenerating)
		2. Native plant species richness
		- Trees
		- Shrubs
		- Grasses
		- Forbs
		3. Tree canopy height
		- Canopy Layer
		- Sub-Canopy Layer
		- Emergent Layer
4. Tree canopy cover		
- Canopy Layer		
- Sub-Canopy Layer		
- Emergent Layer		
5. Shrub canopy cover		
6. Native perennial grass cover		
7. Organic litter		
8. Large trees		
9. Coarse woody debris (Meters)		
10. Weed cover		

100.00%	100.00%	30.77%							
175.00%	125.00%	61.54%							
66.67%	75.00%	46.15%							
71.43%	50.00%	120.00%							
28.57%	100.00%	19.35%							
75.00%	70.37%	83.33%							
100.00%	92.31%	92.31%							
74.66%	52.92%	63.00%							
125.91%	45.64%	66.30%							
238.64%	232.73%	412.08%							
23.13%	101.33%	167.27%							
119.06%	95.29%	117.78%							
16.67%	18.00%	2.70%							
83.16%	60.78%	64.65%							
45.00%	2.50%	40.00%							

2	Site Context Attributes	11. Size of patch (fragmented)
		12. Connectedness (fragmented)
		13. Context (fragmented)
		14. Distance from water (intact)
		15. Ecological corridors

10.00	10.00	10.00							
5.00	5.00	5.00							
4.00	4.00	4.00							
6.00	6.00	6.00							

3	Species Habitat Index	16. Threats to species	7.00	7.00	7.00									
		17. Quality and availability of food and foraging habitat	10.00	10.00	10.00									
		18. Quality and availability of shelter	10.00	10.00	10.00									
		19. Species mobility capacity	7.00	7.00	7.00									
		20. Role of site location to overall population in the State.	5.00	5.00	5.00									

[CLICK HERE TO GO TO THE FINAL SUMMARY SHEET](#)

		8. Large trees	Score	5	5	5								
		9. Coarse woody debris	Score	5	5	5								
		10. Weed cover	Score	5	10	5								

2	Site Context Attributes	11. Size of patch (fragmented)	Score	10	10	10								
		12. Connectedness (fragmented)	Score	5	5	5								
		13. Context (fragmented)	Score	4	4	4								
		14. Distance from water (intact)	Score											
		15. Ecological corridors	Score	6	6	6								

3	Species Habitat Index	16. Threats to species	Score	7	7	7							
		17. Quality and availability of food and foraging habitat	Score	10	10	10							
		18. Quality and availability of shelter	Score	10	10	10							
		19. Species mobility capacity	Score	7	7	7							
		20. Role of site location to overall population in the State.	Score	5	5	5							

Habitat Quality Score (measured)	117.00	126.50	118.50							
Habitat Quality Score (max)	156.00	156.00	156.00							
Assessment Unit Area (ha)	58.32	11.03	12.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Assessment Unit Habitat Quality Score	7.50	8.11	7.60							
Size weighting	0.72	0.14	0.15							
Weighted Assessment Unit Habitat Quality Score	5.36	1.10	1.14							
FINAL TOTAL HABITAT QUALITY SCORE	7.60									

Administrative Information

Name of Assessment Officer		Date	
Organisation/Company Name			
Project Name			
Phone Number		Email	



Attachment E

Spring Mountain V-Dec Management Plan (SHG 2016)

environmental management



Spring Mountain Estate V-Dec Management Plan

Sinnathamby Boulevard, Springfield Central

The Lendlease logo, consisting of a colorful, multi-faceted geometric shape in shades of yellow, green, and blue, with the word 'lendlease' written in white lowercase letters across it.

lendlease

Lendlease Communities Australia Pty Ltd

EPBC Ref: 2013/7057

SHG Ref: 7243

May 2016



Document Control

Title	Spring Mountain Estate V-Dec Management Plan
Address	Sinnathamby Boulevard, Springfield Central
Client:	Lendlease Communities Australia Pty Ltd
Job Number	7243

Document Issue

Issue	Date	Prepared By	Checked By
Internal Draft	07.01.2016	Keira Grundy	Murray Saunders
Client Draft	19.02.2016	Keira Grundy	Murray Saunders
ICC Draft	25.05.2016	Keira Grundy	Murray Saunders
Formal NRM Application	24.08.2016	Keira Grundy	Murray Saunders
Approved	07.10.2016	Keira Grundy	Murray Saunders

Disclaimer

This report has been prepared for **Lendlease Communities Australia Pty Ltd**. **Saunders Havill Group** cannot accept responsibility for any use of or reliance upon the contents of this report by any third party.

Reports and/or Plans by Others

Reports and/or plans by others may be included within this Management Plan to support the document.



Executive Summary

This V-Dec Management Plan has been prepared to accompany an application to have a portion of Conservation Land owned by **Ipswich City Council** (ICC) known as the Springfield Wildlife Corridor declared as a Voluntary Declaration (V-Dec) under the *Vegetation Management Act 1999*. This plan forms one of the mandatory supporting requirements for the V-Dec Application and primarily outlines weed removal and maintenance and improvement works to occur over the declared area as agreed with **ICC** (the land owner and applicant).

The Spring Mountain Estate project was deemed a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on the 18th of December 2013 (EPBC 2013/7057) due to impacts on *listed threatened species and communities* (Section 18 & 18A). The project was assessed by Preliminary Documentation and approved with conditions on the 23rd of December 2015. To compensate for the loss of Koala and Grey-headed Flying-fox habitat, 293ha of MNES habitat (shown in Annex 1 of the approval included as **Appendix B**) is required as an environmental offset. Specifically, Condition 7 of the approval requires the offset to be to be legally secured and Condition 8 requires the proponent to demonstrate a gain in habitat quality across the offset area.

Securing of the offset must occur prior to the commencement of the action (i.e. operational works and/or vegetation clearing) by putting in place a legal mechanisms available through Queensland legislation to secure the land. The chosen mechanism is a Voluntary Declaration (V-Dec). To enhance the habitat quality of the offset for MNES, vegetation management and rehabilitation works are proposed to be carried out by **Lendlease Communities Australia** (Lendlease). These have been coordinated in accordance with **ICC's** Works Parks and Recreation Department and primarily include weed eradication and long term weed control, assisted revegetation and rehabilitation, and monitoring and reporting.

The extent of land to be legally secured by **Lendlease** for offset is 293ha. This V-Dec Management Plan seeks a declaration over 396ha in line with titled dedicated by the former land owner, **Springfield Land Corporation**.

The Voluntary Declaration Area incorporates the entire extent of the following cadastral allotments (Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044). Within these allotments two registered easements occur providing a range of use rights to **Powerlink** and **Seqwater**. This V-Dec Management Plan and the separately proposed Property Map of Assessable Vegetation (PMAV) maintain these rights completely. This is achieved by ensuring the specific easement areas are not listed as Category A under the PMAV, rather remain mapped as Category X. Secondly, the specific easement dealing numbers and documents referenced in this management plan will continue as current.

This V-Dec Management Plan has been prepared to meet components of Conditions 7 and 8 of the EPBC Approval (2013/7057) and provides details of management intent and management outcomes for the offset area which have been developed in accordance with the template management plan for Voluntary Declarations published by the **Department of Natural Resources and Mines**.



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- Figure 1: Site Context
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- Table 1: Rehabilitation Works Indicative Schedule



I. Introduction

The *Environmental Management Division* of **Saunders Havill Group** (SHG) was engaged by **Lendlease Communities Australia Pty Ltd** (Lendlease) to prepare a V-Dec Management Plan for land adjoining Spring Mountain Estate, located at Sinnathamby Boulevard, Springfield Central.

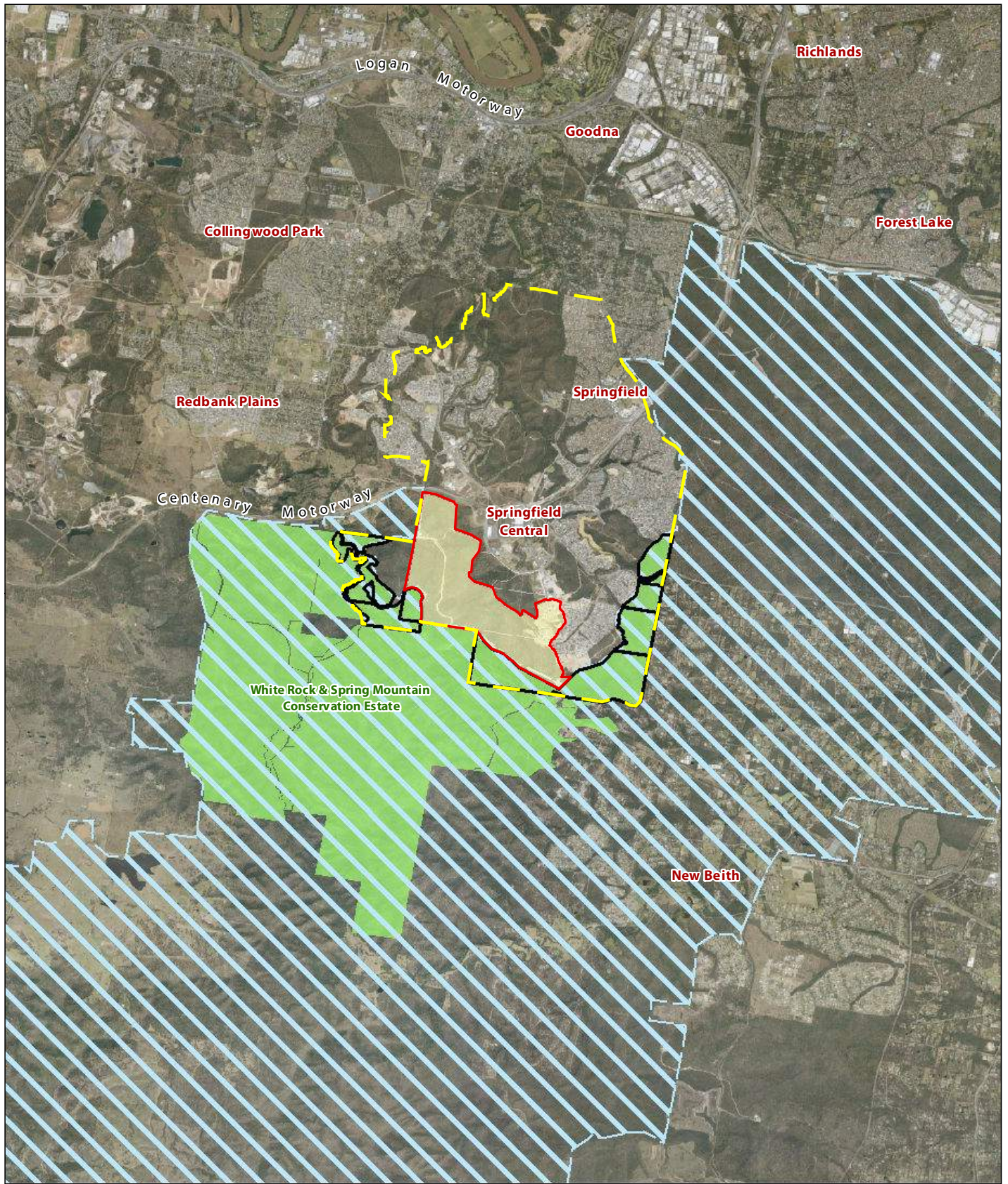
Spring Mountain Estate was referred under the *Environment Protection and Biodiversity Conservation Act* (EPBC Act) on the 19th November 2013 and subsequently declared a “Controlled Action” pursuant to section 18 and 18A (*listed threatened species and communities*) (EPBC Act reference 2013/7057). The trigger for the controlling provision was due to potential impacts on the Koala (*Phascolarctos cinereus*) and Grey-headed Flying-fox (*Pteropus poliocephalus*), which are both listed as Vulnerable under the EPBC Act.

Under the Commonwealth **Department of the Environment’s** (DoE) Preliminary Documentation requests, an offset proposal to compensate for the impacts of clearing 269.5 hectares of habitat critical to the survival of the Koala and 255 hectares of critical habitat for the Grey-headed Flying-fox was prepared in consultation with the DoE. The offset proposal specified using 293ha of the 396ha of remnant vegetation adjoining Flinders–Karawatha Bioregional Corridor which had been previously dedicated by **Springfield Land Corporation** (SLC) to **Ipswich City Council** (ICC) to offset impacts associated with development within the entire approved Springfield Structure Plan (refer **Figure 1**). The impacts compensated for included the development of Spring Mountain Estate.

On the 23rd December 2015, Spring Mountain Estate was approved by the DoE subject to conditions (refer **Appendix B**). Specifically, Condition 7 of the approval requires the approval holder to secure 293ha of MNES habitat for Koala and Grey-headed Flying-fox within the agreed offset proposal site (shown as Annex 1 in the approval included as **Appendix B**) via a legal binding mechanisms available through Queensland legislation; being either by a Covenant on Title, Voluntary Declaration or Nature Refuge. The chosen mechanism in this instance is a V-Dec. In addition, Condition 8 of the approval requires the approval holder to achieve a gain in habitat quality across the offset compared to baseline offset habitat quality and extent.

This V-Dec Management Plan has been prepared to provide details of overarching management intent, actions and outcomes to satisfy the requirements of Condition 7 and Condition 8 of the EPBC Approval and the request for a V-Dec under the *Vegetation Management Act 1999* (VMA). This V-Dec Management Plan has been prepared in accordance with the template management plan for voluntary declarations published by the **Department of Natural Resources and Mines** (NRM). Supporting information is provided in **Appendix A**.

The Voluntary Declaration Area incorporates the entire extent of the following cadastral allotments (Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044). Within these allotments two registered easements occur providing a range of use rights to **Powerlink** and **Seqwater**. This V-Dec Management Plan and the separately occurring Property Map of Assessable Vegetation (PMAV) maintain these rights completely. This is achieved by ensuring the specific easement areas are not listed as Category A under the PMAV, rather remain mapped as Category X. Secondly, the specific easement dealing numbers and documents as referenced in this management plan will continue as current.



Legend

- Spring Mountain Project Area
- Greater Springfield area
- White Rock & Spring Mountain Conservation Estate
- Flinders-Karawatha Corridor
- Declared area DCDB

Figure 1 Site Context

File ref. 7243 E Figure 1 Site Context D
Date 24/08/2016
Project Spring Mountain (EPBC)

0 0.5 1 2 3 4 km
 Scale (A4): 1:100,000 [GDA 1994 MGA Z56]



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The main **objective** of the offset is:

To create a self-sustaining ecosystem that provides habitat critical to the survival of the Koala and Grey-headed Flying-fox within a publically owned, locally significant, conservation area within the Flinders–Karawatha Bioregional Corridor.

I.1. Property and Ownership Details:

V-Dec Proponent	Lendlease Communities Australia Pty Ltd
V-Dec Applicant	Ipswich City Council
Name of registered owners:	Ipswich City Council (registered owners)
Postal address:	C/- Saunders Havill 9 Thompson Street Bowen Hills QLD 4006
Phone:	(07)3251 9400
Email:	murraysaunders@saundershavill.com
Size of declared area:	396 ha
Local Government Area:	Ipswich City Council
RPD	Lot 748 on SP189044 Lot 753 on SP189054 Lot 752 on SP189053 Lot 751 on SP189053 Lot 747 on SP189043 Lot 745 on SP242282 Lot 740 on SP179412 Lot 705 on SP151175 Lot 11 on S31533
Tenure	Freehold
EPBC reference	2013/7057

I.2. Description of declared area

The 396 ha V-Dec area is comprised of Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044 and located adjacent to the Spring Mountain Estate project site off Centenary Highway and Springfield Greenbank Arterial, Springfield. The V-Dec area which will be declared under section 19F(1)(a) of the *Vegetation Management Act 1999* is shown on the *Declared Area Plan* (refer **Appendix C**) attached to this management plan.



I.3. Registered Interests

Written consent for the declaration has been obtained from all persons and companies who have a registered interest in the area (refer to **Section 4.4**). Registered interests include mortgages, leases, subleases, covenants, profit á prendes, easements and building management statements, that have been registered on title under the *Land Act 1994* or the *Land Title Act 1994*. Persons with a registered interest in the declared area are:

Type	Interest Holder	Lot Number	Easement Details
Easement	Powerlink	751 SP189053	<ul style="list-style-type: none"> ▪ 602589417 (D972698), dated 07/07/1999 ▪ 703230867, dated 17/03/1999
		748 SP189044	<ul style="list-style-type: none"> ▪ 602038460 (D972700), dated 07/07/1999 ▪ 703230867, dated 17/03/1999
		745 SP242282	<ul style="list-style-type: none"> ▪ 601668680 (D972706), dated 07/07/1999 ▪ 601668682 (L886473X), dated 08/07/1999
		747 SP189043	<ul style="list-style-type: none"> ▪ 601668679 (D972702), dated 07/07/1999
Easement	Seqwater	745 SP242282	<ul style="list-style-type: none"> ▪ 711922895, dated 19/08/2013 ▪ 712158705, dated 19/08/2013

I.3.I Existing Infrastructure Rights

Management intent for the V-Dec area is to enhance habitat quality for MNES while maintaining existing conservation values and use rights for registered interests. The existing interests and rights of **Powerlink** and **Seqwater** will not be affected by the making of the V-Dec, specifically:

- The proposed Property Vegetation Management Map (PMAV) (refer **Appendix D**) shows existing easements to remain as Category X which ensures rehabilitation and vegetation management outcomes do not apply to the easement corridors and access tracks. (N.B. Weed removal of declared species will occur through easement areas)
- Registered interests will continue to be able to exercise their rights under any laws or approvals to access and carry out works in the easement.
- Any planned activities that may be carried out (by persons other than registered interests (i.e. **Powerlink** and **Seqwater** and their contractors) within an easement, or that may affect easement holder's access requirements, will require written consent by the easement holder before undertaking those activities.
- Registered interests will be consulted and be required to provide consent to any current bushfire management plans and land maintenance practices, and any future changes to these plans which may affect registered easements or access tracks.
- **ICC** will obtain consent from registered interests prior to making any amendments to the V-Dec Management Plan which may affect the exercise of easement holder's rights and interests within their easement corridors or existing access tracks.



- **ICC** will obtain consent from registered interests for agreeing to any replacement PMAV that changes the vegetation category of the easement corridor.
- **ICC** will obtain consent from registered interests before agreeing to a code for the clearing of vegetation within the V-Dec area that will apply to the easement corridor or the access tracks.
- **ICC** will continue to allow the use of, and maintain, access tracks used by easement holders or provide suitable alternatives with consent of registered interests.



2. Flora Values

The Queensland Government's Regional Ecosystem map shows the site contains areas of Category X (non-remnant) and Category B (remnant) vegetation containing Endangered, Of Concern and Least Concern regional ecosystems. Specifically, RE12.8.24 (Endangered), RE12.9-10.7a (Of Concern), RE12.9-10.2 (Least Concern), RE12.9-10.17 (Least Concern) and RE12.9-10.19 (Least Concern). These Regional Ecosystems are shown in **Figure 2** and described below:

Re12.9-10.2 (Least Concern)

Corymbia citriodora subsp. variegata open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis* and *Corymbia intermedia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments.

RE 12.9-10.17 (Least Concern)

Open-forest complex generally with a variety of stringybarks, grey gums, ironbarks and in some areas spotted gum. Canopy trees include *Eucalyptus siderophloia*, *E. propinqua* or *E. major*, *E. acmenoides* or *E. portuensis*, *E. carnea* and/or *E. microcorys* and/or *Corymbia citriodora subsp. variegata*. Other species that may be present locally include *Corymbia intermedia*, *C. trachyphloia*, *Eucalyptus tereticornis*, *E. biturbinata*, *E. moluccana*, *E. longirostrata*, *E. fibrosa subsp. fibrosa* and *Angophora leiocarpa*. *Lophostemon confertus* or Whipstick *Lophostemon confertus* often present in gullies and as a sub canopy or understorey tree. Mixed understorey of grasses, shrubs and ferns. Hills and ranges of Cainozoic and Mesozoic sediments.

12.9-10.17a: *Lophostemon confertus* dominated open forest. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments

RE 12.9-10.19 (Least Concern)

Open-forest of *Eucalyptus fibrosa subsp. fibrosa* +/- *Corymbia citriodora subsp. variegata*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major* open-forest. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments.

12.9-10.19a: *Corymbia henryi* +/- *Eucalyptus fibrosa subsp. fibrosa*, *Corymbia citriodora subsp. variegata*, *E. siderophloia*, *E. crebra* open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments

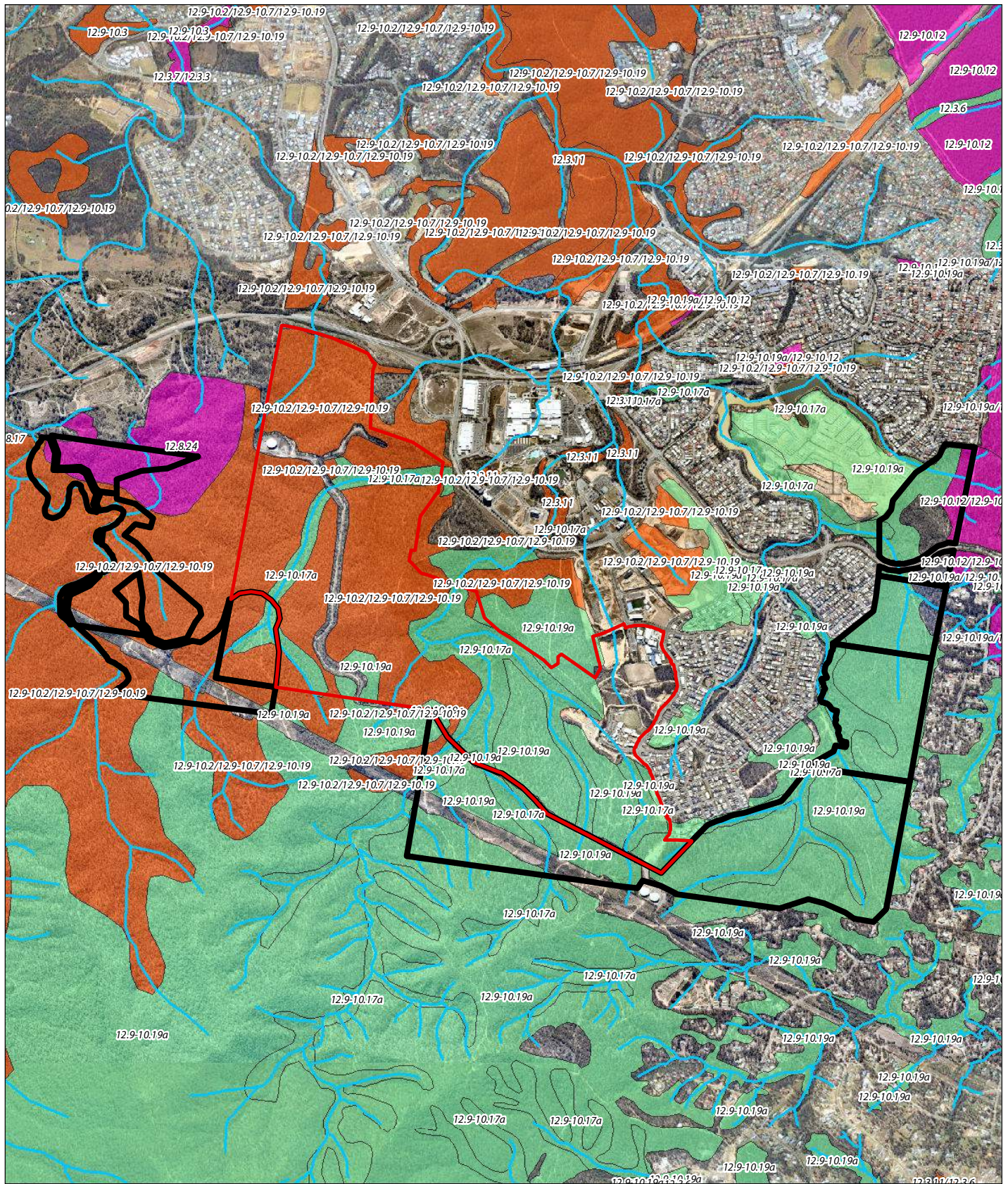
RE 12.9-10.7 (Of Concern)

Eucalyptus crebra +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments.

12.9-10.7a: *Eucalyptus siderophloia*, *Corymbia intermedia* +/- *E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas.

RE12.8.24 (Endangered)

Corymbia citriodora subsp. variegata, *Eucalyptus crebra* +/- *E. moluccana* open forest. Occurs on Cainozoic igneous rocks especially lower slopes of rhyolite and trachyte hills (e.g. Moogerah Peaks).



Legend

-  Spring Mountain referral area
-  Declared area
-  Watercourse v1.3
-  Essential Habitat




- Regional Ecosystem v8**
-  Category A or B area containing endangered regional ecosystems
 -  Category A or B area containing of concern regional ecosystems
 -  Category A or B area that is a least concern regional ecosystem

Figure 2 QLD Regulated Vegetation Management - Supporting Map (Regional Ecosystems)

File ref. 7243 E Figure 3 QLD Regional Ecosystems C
 Date 30/05/2016
 Project Spring Mountain (EPBC)

0 200 400 600 800 1,000 m
 Scale (A4): 1:36,000 [GDA 1994 MGA Z56]



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3. Management Intent

The overarching management intent for the V-Dec area is the removal of weeds and protection of native vegetation within the Flinders-Karawatha Bioregional Corridor to prevent the loss of biodiversity and maintain ecological processes. The successful implementation of proposed management mechanisms will assist with the creation of a self-sustaining, continuous area of high quality Koala and Grey-headed Flying-fox habitat, facilitating their persistence within the local landscape. This will help to achieve **ICC's** vision to create a locally significant conservation area within the Flinders-Karawatha Bioregional Corridor.

The intent is to secure the area by a V-Dec under the *Vegetation Management Act 1999* (VMA), which allows landowners to protect areas of native vegetation otherwise not protected by the VMA, with the exception of registered easements. Revegetated regrowth areas will be managed to achieve 'remnant status' and in particular to exhibit the structural and floristic characteristics of Endangered RE12.8.24, Of Concern RE12.9-10-10.2/12.9-10.7/12.9-10.19 and Least Concern RE 12.9-10.19a and RE12.9-10.17a in their undisturbed state. Areas of remnant vegetation will be managed to enhance and sustain their ecological conditions and local environmental values to reduce their exposure to threatening processes including weed invasion, pollution, clearing and disturbance.

3.1. Criteria for Declaration

The V-Dec area satisfies criteria for declaration under the Guide to Voluntary Declarations under the VMA. The V-Dec area is considered an:

- Area of high nature conservation value, specifically:
 - (d) an area that makes a significant contribution to the conservation of biodiversity

3.2. Management Outcomes

The management outcome for the declared area is that the vegetation within the declared area meets the criteria, thresholds and descriptions outlined in the definition of remnant vegetation in the VMA. Additionally, that the entire declaration area is controlled and managed for the removal and suppression of declared weed species. Management outcomes are consistent with the requirements *EPBC Act Environmental Offsets Policy* and generally in accordance with management outcomes of the *Queensland Environmental Offsets Policy 2014*, specifically in terms of:

- Size of the offset area
- Location
- Regional Ecosystem Type
- Habitat Values
- Condition
- Landscape Features, including connectivity
- Biodiversity Values
- Environmental Values

The management outcome does not apply to existing easement corridors and access tracks used to access these easement corridors.



3.3. Activities to achieve the management outcome

The following activities will occur in the declared area. These are primarily limited to weed removal, pest management and supplementary rehabilitation works as agreed with **ICC**, the landowner of the declared area.

1. With the exception of registered easements and access tracks, clearing of native vegetation may only occur in accordance with an exemption defined by Schedule 24 of the *Sustainable Planning Regulation 2009* or a development approval under the *Sustainable Planning Act 2009*.
2. All reasonable measures must be taken to minimise the introduction, establishment and spread of non-native plants. Where non-native plants already occur in the area, all reasonable measures must be taken to remove and control the non-native plants.
3. All reasonable measures must be taken to remove weeds of national environmental significance as declared by the Commonwealth.
4. All reasonable measures must be taken towards undertaking natural and assisted regeneration.
5. All reasonable measure must be taken towards implementing erosion and sediment control.

N.B. Refer to **Appendix E** for the 'V-Dec Management Plan – Weed Management' which provides specific details and management activities.

3.4. Ongoing Activities

The V-Dec area is currently zoned and maintained by **ICC** as part of the Conservation network. Existing restrictions (e.g. no dogs or motorbikes) which apply in this area remain unchanged by this V-Dec. Ongoing activities anticipated to continue within the V-Dec area include:

- All lawful use rights of Powerlink within the extent of the easement area and access tracks.
- All lawful use rights of Seqwater within the extent of the easement area.
- Public access for passive recreation purposes including:
 - Bushwalking
 - Mountain biking
 - Horse riding
 - Bird and fauna watching
- Maintenance of bushfire access and tracks in accordance with **ICC** approved management plans.
- Track and trail access and construction.
- Nature based recreation style embellishments (i.e. signage, seating, shelters etc.)

3.5. Term

The term of this plan is 10 years to achieve the management outcome. As per conditions of the EPBC approval (refer **Appendix B**), the currency period for management of the declaration area is 20 years from the date of Spring Mountain Estate initial construction.

It is noted that an agreement is in place between **ICC** and **Lendlease** detailing the estimated 10 year maintenance term to achieve the outcomes of this V-Dec Management Plan (refer **Section 4**). **Lendlease** will undertake maintenance works until the management outcomes are considered by **NRM** to be achieved. Post achievement, the the V-Dec area will be transferred to **ICC** as part of their larger conservation land holdings. Council will continue to undertake long term management and maintenance of the land in perpetuity. .



4. Management

4.1. Management Actions - Timing of Delivery

It is intended that the V-Dec Area will be managed in perpetuity. In accordance with EPBC approval the currency period for the management proponent within the offset area is 20 years from the commencement of Spring Mountain Estate. The V-Dec Area will undergo significant, active management works by **Lendlease** for the first 10 years from commencement which will include monitoring and adaptive management. After this time and with all agreed works completed, Council will assume responsibilities for maintenance of the broader V-Dec Area.

The following table (**Table 1**) identifies the actions which will be undertaken for the V-Dec Area, by whom and when.

Table 1: Schedule of Management Actions

Management Action	How the action will be carried out	Where the action will be carried out	When the action will be carried out	Who will be carrying out the action
Vegetation Clearing	<p>Vegetation clearing on the V-Dec Area is restricted to:</p> <ol style="list-style-type: none"> that is necessary for the removal of non-native weeds or declared plants, establishing and maintaining boundary fencing, establishing and maintaining fire breaks, establishing and maintaining nature based recreational trails/tracks; establishing and maintaining easements, and ensuring public safety. <p>Where vegetation clearing is sought for any other purpose, not specified in the V-Dec Management Plan, the landowner or person proposing to undertake the clearing must contact the relevant department administering the VMA.</p>	Where required	As required	Lendlease for the first 10 years, Council thereafter
Fire	<p>Fire is to be, where possible, excluded from the V-Dec Area by:</p> <ol style="list-style-type: none"> maintaining firebreaks relative to the V-Dec Area; and firebreaks are to be co-located with existing roads, fence lines and tracks, where possible. <p>Only fire control works in accordance with an approved bushfire management plan can occur within the V-Dec Area.</p>	Where required	As required	Council (in consultations with Lendlease for the first 10 years)
Pest and Animal Management	<p>Minimise the introduction of pest animals and control of existing population of pest animals within the V-Dec Area.</p> <p>Monitor for the presence of feral cats, dogs and foxes, in accordance with ICC's pest control requirements for the Springfield Wildlife Corridor.</p>	Where required	As required	Council (in consultations with Lendlease for the first 10 years)
Weeds	<p>Keep the introduction, establishment and spread of non-native weeds including restricted invasive plants under the <i>Biosecurity Act 2014</i> to ensure that the non-native weeds do not cover more than 10 % of the V-Dec Area.</p> <p>Control existing infestations of non-native weeds including restricted invasive plants under the <i>Biosecurity Act 2014</i> to ensure that the non-native weeds do not cover more than 10 % of the V-Dec Area.</p>	In accordance with the V-dec Weed Management Plan	In accordance with the V-dec Weed Management Plan	Lendlease for the first 10 years, Council thereafter



4.2. Funding

All upfront costs associated with the weed management and revegetation of the V-Dec area will be the responsibility of the proponent (**Lendlease Communities Australia Pty Ltd**). Detailed weed management plans endorsed by Council are included in **Attachment E**. As part of this agreement between **Lendlease** and **ICC**, timeframes and criteria for the works to be considered complete are outlined. If at any stage the success of the weed management and revegetation works do not achieve the criteria outlined in **Attachment E** then the works remain the responsibility of **Lendlease**.

Lendlease is committed to providing ongoing funding for weed management and rehabilitation as set out in this V-Dec Management Plan.

Post achievement of the commitments in this V-Dec Management Plan the maintenance of the V-Dec area will be transferred to **ICC** as part of their larger conservation land holdings.

4.3. Monitoring and Reporting Procedures

The objective on this V-Dec Management Plan is to maintain and enhance the Koala and Grey-headed Flying-fox habitat values through the declaration area. As agreed with **ICC** this to be primarily achieved through weed management works. As such, monitoring and reporting will be undertaken to confirm if this objective has been or is going to be achieved. This includes both short term and long term criteria to measure success. The V-Dec area, which is already functioning as Koala and Grey-headed Flying-fox habitat, is to be managed through weed removal and native regeneration. Monitoring of weed management and regeneration works allows for:

- A review of the pre-established performance indicators for measuring the success of the weed removal and control;
- Ensure level of protection for existing identified native vegetation inclusive of that which has naturally regenerated;
- Review the rate of spread or contraction of weed infestation within the control program;
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed; and
- Identification of new weed threats or other factors which may be affecting areas designated for rehabilitation.

4.3.1 Benchmarks

The weed management and rehabilitation works aim to improve the flora and fauna values of the V-Dec area through weed removal and promoting native species growth. The following breakdown of works are proposed:

- a) Existing Vegetation Areas:
 - Primary weed removal completed
 - Secondary weed removal completed
 - Minimum 90% weed removal from existing vegetation
 - 10% or less weeds present on-site
 - Any additional revegetation required has 85% success rate



b) Revegetation Areas

- All required planting completed
- Evidence of ongoing weed management
- Maximum of 10% plant failures at time of inspection
- Plants established and free of weeds

4.3.2 Monitoring Timeframes

As per the schedule provided in **Table 1**, initial monitoring and reporting of weed removal and revegetation / regeneration works will be undertaken monthly within the works area. Monthly monitoring is to be completed by **Lendlease** for the first 18 months post weed management works. This will determine whether weed removal and regeneration targets are met. Quarterly joint inspections of the weed management areas are to be held between **ICC** and **Lendlease**.

Once the rehabilitated areas have been established, monitoring will continue regularly until final changeover to Council management. The purpose of this monitoring will be to identify:

- Whether weed invasion has been controlled
- Whether the number of individuals within the vegetation community is being sustained or increased by natural recruitment
- Whether adequate levels of biodiversity (genetic variation) are maintained through generations of flora.
- Occurrence and utilisation by native fauna to assess ecosystem restoration.

4.3.3 Reporting

In accordance with EPBC approval requirements, throughout the monitoring of rehabilitation works, results will be recorded as part of a progress report and be made available via **Lendlease** project website within 10 business days of the monitoring event. This will allow for an assessment of whether the rehabilitation works are achieving set objectives and targets and will trigger corrective actions should results fall short of targets.

4.3.4 Contingency Measures

The following potential risks to the successful implementation of the V-Dec Management Plan have been identified:

- Failure of successful regeneration of juvenile / planted specimens
- Failure of weed management

Should the initial weed removal and revegetation works fail to achieve the objectives for the V-Dec area, monitoring and reporting procedures will facilitate the identification of the cause of failure, whether that be due to flooding, drought, poor soil quality, inadequacy of weed removal techniques, impacts from human disturbance or other causative events. Once the causative event of failure is identified, corrective actions can be imposed to implement new procedures, techniques or management measures.

Potential contingency measures include:

- Use of different plant species or using higher ratios of successful species;
- Implementation of more aggressive weed removal and management techniques;
- Utilising a variety of water sources during drought;
- Replanting where damage has occurred as a result of unexpected events such as flooding and fire;



- Erection of fences or signs where failure has occurred as a result of human disturbance; and
- Maximising surface roughness to slow runoff, which reduces erosion and provides more time for plants to absorb water.

As noted previously, **Lendlease** has provided a commitment to the ongoing funding of rehabilitation works until management handover to Council. In addition, rehabilitation works must be established to an acceptable standard before Council will take on management of V-Dec area. The process of accepting the completed works requires regular monitoring and acceptance by Council that objectives have been achieved. The onus to manage and maintain the V-Dec area lies on the proponent and must be achieved in order to comply with Commonwealth Government approval conditions.



4.4. Consent Agreement

Department of Natural Resources and Mines

Signature: _____

Name:

Position: Natural Resource Management Officer

Date: / / 2016

Owner: Ipswich City Council

Signature: _____

Name:

Date: / / 2016

Easement Owner: Powerlink

Signature: _____

Name:

Date: / / 2016

Easement Owner: Seqwater

Signature: _____

Name:

Date: / / 2016



Appendices

Appendix A

V-Dec Supporting Information Details

Appendix B

EPBC Approval and Conditions

Appendix C

Declared Area Plan

Appendix D

Property Map of Assessable Vegetation

Appendix E

V-Dec Weed Management Plan



Appendix A

V-Dec Supporting Information Details



Section 1 Case details

Name of applicant	Ian Murray
Company (if applicable)	Lendlease Communities Australia Pty Ltd
Lot/plan associated with development	Lot 22 on SP234042 Lot 33 on SP269190
DLGIP case number (e.g. SDA-0815-123456)	N/A

Section 3 Contact details for offset delivery

Name	John Kibble
Company (if applicable)	Lendlease Communities Pty Ltd
Postal Address	GPO Box 2777 Brisbane QLD 4001
Phone	0408 558 808
Fax	
Email address	john.kibble@lendlease.com



Section 4 Environmental offset site particulars

4.1 Offset site property and ownership details

If the offset will be delivered on more than one lot, please duplicate the table below.

Lot on plan details (property description)	Lot 11 on S31533, Lot 705 on SP151175, Lot 740 on SP179412, Lot 745 on SP242282, Lot 747 on SP189043, Lot 751 on SP189053, Lot 752 on SP189053, Lot 753 on SP189054 and Lot 748 on SP189044
Street address	Sinnathamby Boulevard, Springfield 4300
Name of Registered Owner(s)/ Licensee/s or Trustee/s	Ipswich City Council
Tenure Type*	<input checked="" type="checkbox"/> Estate in Fee Simple (freehold) <input type="checkbox"/> Leasehold (agriculture and grazing) <input type="checkbox"/> Other: _____
Property Name (if applicable)	Part of ICC's Springfield Wildlife Corridor
Area of Property (ha)	396ha
Local Government Area	Ipswich City Council
Sub-region/Bioregion	Bioregion 12 – South East Queensland

* For requests on State land (or non-freehold) tenures, the views of the State Land Asset Management unit of DNRM may be sought to ensure the proposal is consistent with the purpose of the tenure. For example, on agricultural and grazing leases the proposal would need to allow a level of agriculture or grazing to occur over the area to be consistent with the tenure, in accordance with the *Land Act 1994*. Please contact DNRM for further information.

4.2 Registered Interests*

Parcel (lot and plan)	Are there any Registered Interests on the lot?	Type of Registered Interest	Registered interest holder's name and contact details
751 SP189053; 748 SP189044; 745 SP242282; 747 SP189043	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Easement	Powerlink 33 Harold St Virginia QLD 4014
745 SP242282	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Easement	Seqwater PO Box 16146, City East QLD 4002

*Registered interests are mortgages, leases, subleases, covenants, profit á prendes, easements and building management statements, that have been registered on title under the *Land Act 1994* or the *Land Title Act 1994*. Please contact DNRM if you are unsure if there are any registered interests on your property.



Section 5 Legal security

<p>How will the offset area be legally secured?</p>	<p><input checked="" type="checkbox"/> Voluntary Declaration for an area of high nature conservation value under the <i>Vegetation Management Act 1999</i></p> <p>*Note that if a Voluntary Declaration is proposed for securing the offset, this offset delivery plan meets the requirements and will be accepted as a declared area management plan.</p> <p><input type="checkbox"/> Environmental offset protection area under the <i>Environmental Offsets Act 2014</i></p> <p><input type="checkbox"/> Under the <i>Nature Conservation Act 1992</i></p> <p><input type="checkbox"/> Other: _____</p>
<p>Why is it considered the best method for securing the offset area?</p>	<p>Provides for management and protection in accordance with Commonwealth approval conditions for Spring Mountain Estate (EPBC Ref: 2013/7057) and allows for registered easement holder's rights and interests to be maintained.</p>
<p>When will the offset area be legally secured?</p> <p>What is the timeframe for securing the offset area? Note that the offset must be legally secured for the duration of the impact.</p>	<p>As per EPBC approval conditions, the currency period for management of the declaration is 20 years from the date of commencement of Spring Mountain Estate. Management obligations have a term of 10 years as per the V-Dec Management Plan.</p>
<p>Why is this timeframe for securing the offset area considered reasonable?</p> <p>Are there any registered interests or other parties that need to be in agreement? Are there any other approvals that need to be given? (e.g. if the application is for a reconfiguration then securing the area may need to wait until an approval is given by the assessment manager)</p>	<p>A high level of tenure security exists on the allotment though mapped remnant, partial exclusion of the land from the regional plan urban footprint and Council zoning of Conservation. The 20 year timeframe of the V-Dec enables the proponent to invest in significant weed management and conservation improvement works over first 10 years in accordance with the V-Dec Management Plan. Further, the V-Dec provides the legal certainty to support this investment and conservation use through the complete removal of urban footprint designations and transitioning of protection in perpetuity.</p>
<p>What is the expected timeframe for the management outcomes of the offset delivery plan to be achieved?</p>	<p>Management will include primary, secondary and maintenance stages which will be completed over 10 years until handover to Council, under which ongoing maintenance will continue as part of the broader conservation estate.</p>



Section 6 Offset site delivery information

Describe the existing land use of the land on which the environmental offset will be undertaken.	Conservation / nature based recreation. The land adjoins a water tower, maintenance tracks and is traversed by easements registered by Seqwater and Powerlink. A number of lawful uses and access occurs in parts of the land.
Describe any impacts that land use (existing use and as a result of any development approval) may have on the delivery of the offset.	Nil. Easement holder rights and access tracks will be maintained. As part of broader agreement between Lendlease and ICC, low scale nature based recreation will be better managed and unlawful access and uses will be controlled.
Is the environmental offset staged?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, please complete offset delivery form EOD6 (Staged Offset Details). This form can be found at http://www.qld.gov.au/environment/pollution/management/offsets/

Section 7 Description of the offset site

The description of the environmental offset site should include, but is not limited to, the following information. This information is required to meet the offsets policy and to secure the offset area through a voluntary declaration under the *Vegetation Management Act 1999*. Please contact DNRM if you require assistance providing this information.

Area (hectares) of environmental offset site
396ha
Brief description of the landscape features e.g. topography, geology, soils, landzone
<p>The Queensland Government's Regional Ecosystem map shows the site contains Endangered, Of Concern and Least Concern regional ecosystems. Specifically, RE12.8.24 (Endangered), RE12.9-10.7a (Of Concern), RE12.9-10.2 (Least Concern), RE12.9-10.17 (Least Concern) and RE12.9-10.19 (Least Concern).</p> <p>The V-Dec area contains steep slopes with elevations of 120m along ridgelines to 80m in gullies. Soils consists of 'sublabile to quartozose sandstone, siltstone, shale, thin coal seams'. The land zone is described as 9 and 10. A number of first order drainage features commence within or traverse the offset area.</p>
Pre-clearing regional ecosystem (if known) for offset sites containing non-remnant vegetation



Pre-clear mapping identifies the V-Dec area as containing composite Endangered RE12.9-10.12/12.9-10.15, Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19 and Least Concern RE12.9-10.19a
Brief description of any existing vegetation – e.g. species, densities, and heights (including pest plants)
<p>Flora field surveys showed that canopy trees in areas within close proximity to the gully lines (waterways and drainage lines) are regularly composed of <i>Eucalyptus tereticornis</i> (Forest Red Gum) and/or <i>Eucalyptus microcorys</i> (Tallowwood), with <i>Eucalyptus siderophloia</i> (Grey Ironbark), <i>Eucalyptus crebra</i> (Narrow leaved Ironbark), <i>Eucalyptus moluccana</i> (Gum-topped Box), <i>Eucalyptus seeana</i> (Narrow leaved Red Gum) and <i>Lophostemon suaveolens</i> (Swamp Box).</p> <p>Overall, the ridgelines and mid to upper slope areas showed greater percentages of non-eucalypt species, such as <i>Corymbia citriodora</i> (Spotted Gum), <i>Corymbia intermedia</i> (Pink Bloodwood) and <i>Angophora leiocarpa</i> (Smooth-bark Apple). Across the site, a number of weed species were identified. Gully lines in particular were areas observed to have a denser shrub layer of <i>Lantana camara</i> (Lantana).</p>
Threatened species - if an environmental offset is required for a threatened species, does it already use/inhabit the offset area?
The V-Dec area is required to compensate for clearing of Koala and Grey-headed Flying-fox habitat as per EPBC approval conditions. Both of these species are considered to utilise the offset area.
Explain why the offset is of sufficient size and scale proportionate to the area that will be cleared
<p><i>It is a requirement that the offset provide a conservation outcome for the prescribed matter that achieves at least an equivalent environmental outcome. This can be achieved by comparing the habitat quality of the offset site with that of the impact site by using the Guide to determining terrestrial habitat quality and the Land-based offset multiplier calculator, both found at http://www.qld.gov.au/environment/pollution/management/offsets/</i></p> <p>The V-Dec area is of sufficient size and scale to meet the EPBC Environmental Offset Policy and required as per EPBC conditions.</p>
Describe the measures that will be taken to minimise any time-lag between the impact and delivery of the offset site?
<p><i>e.g. does your offset site contain regrowth vegetation? Does the threatened species already use, or exist in, the area?</i></p> <p>The V-Dec area will remain as Conservation land and continue to provide habitat for threatened species, in particular Koala and Grey-headed Flying-fox. Significant management works by the proponent will occur over a 10 year term in accordance with the V-Dec Management Plan. No major long term impacts are predicted as the land already provides a base level of habitat. The purpose of this offset is to improve this habitat quality over the development area. Any primary works in the offset area are programmed to be achieved in the first 10 years. The impact of the development</p>



occurs over a 20 year period. As a result, the full benefit of the offset should be realised at the halfway mark of the impact.



Section 8 Offset site management plan

Describe how the environmental offset site will be managed to achieve a conservation outcome/s. To ensure the environmental offset site is capable of delivering a conservation outcome for the impacted prescribed environmental matter, ensure that the offset site contains the relevant characteristics listed in section 2.3.1.6 of the Queensland Environmental Offset Policy.

What is the specific purpose and desired outcomes of the offset site and its management?

- The Category X/C/R areas that form part of the offset area will be managed so that within X years they will have the height, density and species expected of the regional ecosystem and meets remnant status and will be shown as Category B on the Regulated Vegetation Management Map.
- The Category B areas that form part of the offset area will be managed to achieve a conservation outcome in accordance with the management activities of this plan.
- Offset area will be mapped as Category A on the Regulated Vegetation Management Map to ensure visibility of offset area and associated management plan to future property owners.
- The management activities associated with the offset area will continue until all the vegetation reaches remnant status and can be mapped as essential habitat for the Koala and Grey-headed Flying-fox.
- Other: _____

List the benefits the offset delivery plan will have on the prescribed environmental matter e.g. if an environmental offset is required for a fauna species, describe how the environmental offset site will benefit the species. This ensures that a conservation outcome/s for each prescribed environmental matter will be achieved.

The benefits of this V-Dec area to the Koala and Grey-headed Flying-fox will be:

- *Creating and protecting a habitat corridor for these species in the Flinders-Karawatha Bioregional Corridor*
- *Increase in quality of vegetation through removal and control of weeds, rehabilitation of drainage lines and enhancement of regrowth areas*
- *Adaptive management during monitoring and maintenance period*



Describe the land management practices that will be used to achieve the conservation outcome/s. Include details of the location and area of each management practice as necessary (i.e. property scale, paddock, part of watercourse). Ensure these locations are identified on an attached map.

The V-Dec Management Plan proposed activities that will support the natural regeneration and restoration of biodiversity values including weed management (particularly removal of dominate weed infestations and along drainage lines), erosion and sediment control, adaptive management and maintenance.

1. Management actions

Issue	Management action	How will it be carried out	Location	Timing	Who will be doing the activity	Comments
Primary Weed Removal	Initial weed removal / treatment of site weeds involving manual removal, stock piling and disposal, and initial usage of prescribed herbicides.	In accordance with methods detailed in the South East Queensland Ecological Restoration Guidelines	In accordance with Spring Mountain V-Dec Area Management Plan	At the commencement of Spring Mountain (Quarterly)	Contractor – appointed by Lendlease	Initial control of dominant weed infestations. Impacts on watercourses will be managed and mitigated.
Secondary (Follow Up) Weed Removal	Follow up weed removal involving quarterly inspection of areas having undergone Primary Weed Removal and treatment of infestations or outbreaks as required.	In accordance with methods detailed in the South East Queensland Ecological Restoration Guidelines	In accordance with Spring Mountain V-Dec Area Management Plan	Quarterly	Contractor – appointed by Lendlease	Follow up control of weeds. Impacts on watercourses will be managed and mitigated.



Maintenance Weeding	Final stage of weeding which occurs in areas where the majority of weeds have been removed and treated and continues to remove additional outbreaks while fostering for natural regeneration and regrowth seedlings.	In accordance with methods detailed in the South East Queensland Ecological Restoration Guidelines	In accordance with Spring Mountain V-Dec Area Management Plan	Annually	Contractor appointed by Lendlease	–	At completion of site weeding works and agreed maintenance timeframe of 10 years.
<i>2. Restrictions</i>							
Restriction	Details					Comments	
Vegetation Clearing	<p><i>Vegetation clearing on the V-Dec area is restricted to:</i></p> <ul style="list-style-type: none"> • With the exception of registered easements, clearing of native vegetation may only occur in accordance with an exemption defined by Schedule 24 of the <i>Sustainable Planning Regulation 2009</i> or a development approval under the <i>Sustainable Planning Act 2009</i> including maintenance of access tracks and public access for nature based recreation • All reasonable measures must be taken to minimise the introduction, establishment and spread of non-native plants. Where non-native plants already occur in the area, all reasonable measures must be taken to control the non-native plant. • All reasonable measures must be taken to weeds of national environmental significance as declared by the Commonwealth. 						



	<ul style="list-style-type: none"> • All reasonable measures must be taken towards natural and assisted regeneration. • All reasonable measure must be taken towards erosion and sediment control. • Ensure public safety 		
Fauna	<ul style="list-style-type: none"> ▪ Activities in the V-Dec area will not damage, destroy, mark, move, dig up or otherwise interfere with active nests, burrows, roots, caves or other structures used by native animals. 		
Fire	<ul style="list-style-type: none"> ▪ Fire is managed in accordance with the Council's bushfire management plan 		
Waterways	<ul style="list-style-type: none"> ▪ The bed and banks of waterways are not modified unless associated with the requirements of a permit and an approved management plan (refer to Spring Mountain V-Dec Area Management Plan) 		
What are the risks of the offset failing to achieve the conservation outcome and how will these be managed?			
Risk	Level of risk (<i>Extreme, High, Moderate or Low</i>)	Proposed actions to minimise risk	Proposed remedial actions if risk occurs
<p>Failure of successful regeneration of juvenile / planted specimens</p> <p>Failure of weed management</p>	Low.	Should the initial weed removal and revegetation works fail to achieve the objectives for the offset area, monitoring and reporting procedures will facilitate the identification of the cause of failure, whether that be due to flooding, drought, poor soil quality, inadequacy of weed removal techniques, impacts from human disturbance or other causative events.	Once the causative event of failure is identified, corrective actions can be imposed to implement new procedures, techniques or management measures



Describe how will the conservation outcome/s will be measured and monitored? i.e. how will you know when you have achieved the desired outcomes.

Insert general description of monitoring and reporting activities e.g. regular reporting, photo monitoring, surveying, field measurements, recording management activities etc. This can include periodic assessment in accordance with the Guide to determining terrestrial habitat quality to determine gains in quality.

Management will occur over 10 years. Secondary weed management will be undertaken quarterly and adaptive management and monitoring will occur in conjunction with Council until works are completed to the required level of Council handover. Reporting will include a short memo style report responding to agreed criteria including:

- Date, time and weather conditions at the time of inspection
- Changes in weed extent populations (spreading/contracting)
- Changes in weed densities
- Health of existing weed vegetation protected by NRM provisions
- Rate and success of revegetation plantings
- Growths of PFC rates of assisted regeneration areas
- Occurrences of new weed infestations or species outbreaks
- Comments on any indirect changes to the area as a result of weed management (i.e. erosion/change in weed footprints/death to natives, and
- A visual diary of imagery from selected locations at each inspection (including the pre-state and quarterly inspections).
- A plan and descriptions of terrestrial habitat guideline monitoring

Reporting

The V-Dec Area monitoring report will include:

- Name and contact details of landholder/management body
- DLGIP and DNRM case numbers
- Lot/plan and address
- An overview of the progress of the management area in achieving the management outcomes
- Details of the management activities undertaken
- How any risk or threats have impacted the area and activities undertaken to manage these



- Photo monitoring details (photos from identified sites should be included in the report)
- Other monitoring outputs e.g., transect details, Biocondition results, survey details etc.
- If offset is for essential habitat for a species, species presence/absence should be noted
- Any amendments to the management activities/schedule, restrictions or monitoring and reporting requirements
- Other

Reports are due to DNRM and ICC by 30 June and will be provided annually or biannually

It is noted that in accordance with the EPBC development permit Lendlease are required to undertake and publish reports on the offset area.



Appendix B

Spring Mountain EPBC Act Approval (EPBC 2013/7057)



Approval

Spring Mountain Mixed Use Master Planned Community Development, Queensland (EPBC 2013/7057)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

Person to whom the approval is granted Lend Lease Communities (Springfield) Pty Limited

Proponent's ACN (if applicable) ACN 087 876 864

Proposed action To construct a mixed use development (including residential, commercial and community developments and associated infrastructure) on a 387ha site at Spring Mountain, Queensland [See EPBC Act referral 2013/7057].

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	

Conditions of approval

This approval is subject to the conditions specified below.

Expiry date of approval

This approval has effect until 31 December 2040.

Decision-maker

Name and position Deb Callister
Acting First Assistant Secretary
Environment Standards Division

Signature

Date of decision 23 December 2015

CONDITIONS

1. The approval holder must not clear more than 255 hectares of **MNES habitat**.
2. To minimise adverse impacts to **koalas** from **vegetation clearing and construction activities** there must be no **koala** injury or mortality as a result of **vegetation clearing and construction activities** at the **project site**.
3. To minimise adverse impacts to **koalas** from vehicle strike and in order to maintain safe **koala** movement opportunities through the **project site** the approval holder must:
 - a. implement the measures specified in Table 3-3 of the **Fauna Management Plan** prior to **operation**, and maintain these measures for the life of the approval;
 - b. ensure **koala road crossings** are placed in the locations specified at Figure 3-1 of the **Fauna Management Plan** prior to **operation**, and maintain these measures for the life of the approval;
 - c. implement measures sufficient to identify any **koala** injury and mortality at the **project site**; and
 - d. if **koala** injury or mortality occurs, then revise management measures in consultation with a **suitably qualified person** to reduce the likelihood of adverse impacts to **koalas**; and inform the **Department**, either as part of annual compliance reporting required under condition 13 or as a separate notification in writing.
4. To minimise adverse impacts to **koalas** from domestic dog attack and to exclude **koalas** from entering residential areas within the **project site**, the approval holder must:
 - a. implement measures to prevent domestic dog attacks on **koalas**, including limiting the movement of domestic dogs, creating dog exclusion zones and **signage** as specified at section 3.4 of the **Fauna Management Plan**; and
 - b. ensure **koala exclusion fencing** is constructed and located as specified at section 3.4 of the **Fauna Management Plan** prior to **operation**, and maintained for the life of the approval.
5. To minimise adverse impacts to **Plectranthus habrophyllus**, there must be no net loss of **P. habrophyllus** at the **project site** as a result of the proposed action, as defined by the following milestones:
 - a. by six months after the **commencement of the action** and annually for three years thereafter, there must be 0% cover of **weeds of national significance** in the **on-site conservation areas** and **buffer areas**;
 - b. by one year after the **commencement of construction** there must be 80% survival of planted **P. habrophyllus**;
 - c. by three years after the **commencement of construction**, there must be an increase in the number of mature **P. habrophyllus** in the **on-site conservation areas** that is greater than the number of **P. habrophyllus** removed during **construction**; and
 - d. by three years after the **commencement of construction**, there must be evidence of recruitment from planted **P. habrophyllus** individuals.

6. The approval holder must undertake a monitoring program. The monitoring program must be planned and undertaken so that the data gathered is adequate to: inform adaptive management; and demonstrate whether milestones and outcomes described in conditions 2, 5 and 8 have been met. The monitoring program must:
 - a. include daily surveys for injured or dead koalas during **vegetation clearing and construction activities**;
 - b. include pre-clearance surveys of all areas that will be cleared to establish the number of mature *P. habrophyllus* that will be lost as a result of the proposed action;
 - c. establish quadrats within each of the **on-site conservation areas** where *P. habrophyllus* has been planted and at **control sites** that contain remnant *P. habrophyllus* populations where supplemental planting has not occurred; and
 - d. be undertaken by a **suitably qualified person**.
7. To compensate for the loss of **koala habitat** and **grey-headed flying-fox foraging habitat** the approval holder must:
 - a. **secure**, prior to the **commencement of the action**, the **offset** containing 293 hectares of **MNES habitat** within the offset area at **Annex 1**;
 - b. provide the Department with the **offset attributes**, **shapefile** and map(s) clearly defining the location and boundaries of each offset, within 2 weeks of lodgement of the offset with the **Titles Office**; and
 - c. ensure the **Agreement** is registered on the title on which each offset is located, and provide the Department with evidence of lodgement with the **Titles Office**, within 2 weeks of lodgement. Provide a copy of the signed **agreement** within 2 weeks of receipt from the **Titles Office**.

The approval holder must ensure any proposal for alternative offsets is agreed to in writing with the **Department**.

Note: Offsets for different species may overlap where they share the same habitat requirements.

8. To compensate for impacts to **koala habitat** and **grey-headed flying-fox foraging habitat** the approval holder must achieve the following outcomes as compared to baseline **offset** habitat quality and extent, unless agreed in writing with the **Department**:
 - a. by 20 years after the **commencement of construction**, there must be a **gain in habitat quality** across 90% of the **offset**.
9. To mitigate impacts on **koala** and *P. habrophyllus*, the approval holder must develop a fire management strategy for the **project site** and the **offset**, incorporating advice from a **suitably qualified person** regarding the impacts of the fire management strategy on **koala** and *P. habrophyllus*.
10. The approval holder must adaptively manage **koala habitat**, **grey-headed flying-fox foraging habitat** and *P. habrophyllus* to achieve the outcomes described in conditions 1-9. This must include:

- a. developing and implementing a strategy (or strategies) to achieve the outcomes and milestones outlined in conditions 1-9, in consultation with a **suitably qualified person** (noting that the plan does not require approval by the **Minister** and is not an 'action management plan' under the **EPBC Act**);
- b. a documented process of adaptive management and continual improvement, including using data from monitoring and experimentation trials to inform adaptive management; and
- c. where there is a reasonable risk (or evidence) that outcomes or milestones are not likely to be achieved: revising management measures in consultation with a **suitably qualified person**; increasing the level of effort to achieve the outcomes; and informing the **Department**, either as part of annual compliance reporting required under condition 13 or as a separate notification in writing.

Administrative conditions

11. Within 7 days after the **commencement of the action**, the approval holder must advise the **Department** in writing of the actual date of **commencement of the action**.
12. The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the management plan, report or strategy required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be publicised through the general media.
13. Within three months of every 12 month anniversary of the **commencement of the action**, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published, until agreed in writing with the **Department**.
14. The approval holder must notify the **Department** in writing of any non - compliance with conditions as soon as practicable and within no more than 2 business days of becoming aware of the non - compliance.
15. Upon the direction of the **Minister**, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.
16. The approval holder may choose to revise a management plan, program or strategy approved by the **Minister** under conditions 1 - 9 without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised plan, program or strategy would not be likely to have a **new or increased impact**. If the approval holder makes this choice they must:

- a. notify the **Department** in writing that the approved plan, program or strategy has been revised and provide the **Department** with an electronic copy of the revised plan, program or strategy;
 - b. implement the revised plan, program or strategy from the date that the plan, program or strategy is submitted to the **Department**; and
 - c. for the life of this approval, maintain a record of the reasons the approval holder considers that taking the action in accordance with the revised plan, program or strategy would not be likely to have a **new or increased impact**.
17. The approval holder may revoke their choice under condition 16 at any time by notice to the **Department**. If the approval holder revokes the choice to implement a revised plan, program or strategy, without approval under section 143A of the Act, the plan, program or strategy approved by the **Minister** must be implemented.
18. Condition 16 does not apply if the revisions to the approved plan, program or strategy include changes to environmental offsets provided under the plan, program or strategy in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the **Minister**. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised plan, program or strategy would, or would not, be likely to have **new or increased impacts**.
19. If the **Minister** gives a notice to the approval holder that the **Minister** is satisfied that the taking of the action in accordance with the revised plan, program or strategy would be likely to have a **new or increased impact**, then:
- a. Condition 16 does not apply, or ceases to apply, in relation to the revised plan, program or strategy; and
 - b. The approval holder must implement the plan, program or strategy approved by the **Minister**.

To avoid any doubt, this condition does not affect any operation of conditions 16, 17 and 18 in the period before the day the notice is given.

At the time of giving the notice the **Minister** may also notify that for a specified period of time that condition 16 does not apply for one or more specified plans, programs or strategies required under the approval.

20. Conditions 16, 17, 18 and 19 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the approval holder to submit a revised plan, program or strategy to the **Minister** for approval.
21. If, at any time after five years from the date of this approval, the approval holder has not **substantially commenced the action**, then the approval holder must not **substantially commence the action** without the written agreement of the **Minister**.
22. Unless otherwise agreed to in writing by the **Minister**, the approval holder must publish all management plans, reports or strategies referred to in these conditions of approval on their website. Each management plan, report or strategy must be published on the website within 1 month of being approved by the **Minister** or being submitted under condition 1 – 9.

DEFINITIONS

Agreement - the executed agreement between the approval holder and the relevant landowner, to secure the land for long-term protection.

Buffer areas means 20 metre buffers around areas containing remnant or planted *P. habrophyllus*.

Commencement of the action means the date **construction** is first undertaken, excluding fences and signage, associated with the proposed action.

Construction includes any preparatory works required to be undertaken including clearing vegetation, the erection of any onsite temporary structures and the use of heavy duty equipment for the purpose of breaking the ground for buildings or infrastructure including any works for the creation of vegetation buffers.

Control sites means sites to be monitored concurrently with a **project site** or **offset site**, to provide evidence of the relative impacts or improvements as a result of the proposed action.

Department means the Australian Government Department or any other agency administering the **EPBC Act** from time to time.

EPBC Act means the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

EPBC Act Environment Offsets Policy (October 2012) is the Policy guiding the use of offsets under the *Environment Protection and Biodiversity Conservation Act 1999*, published by the then Department of Sustainability, Environment, Water, Population and Communities, October 2012.

Fauna Management Plan means the document titled *Saunders Havill Group's Spring Mountain Fauna Management Plan 17 July 2015* (FMP).

Gain in habitat quality means an improvement in the quality and extent of **koala habitat** and **grey-headed flying-fox foraging habitat** in comparison to baseline environmental conditions at the **offset** and compared with an unmanaged control site.

Grey-headed flying-fox means the native species *Pteropus poliocephalus*, protected under the **EPBC Act**.

Grey-headed flying-fox foraging habitat means the known native food trees, including eucalypts (genera *Eucalyptus*, *Corymbia* and *Angophora*), melaleucas and banksias that are the primary food for the species.

Koala means the native species *Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT), protected under the **EPBC Act**.

Koala habitat means any forest or woodland containing species that are known **koala** food trees or shrubland with emergent food trees. This can include remnant and non – remnant vegetation in natural, agricultural, urban and peri-urban environments and is defined by the vegetation community present and the vegetation structure; **koalas** do not necessarily have to be present.

Koala exclusion fencing is fencing constructed and located to prevent access by **koalas** to residences within the **project site**.

Koala road crossings are road crossings, including underpasses, which are specifically designed to facilitate the movement of **koalas**.

Minister means the Minister administering the EPBC Act and includes a delegate of the Minister.

MNES means matters of national environmental significance.

MNES habitat means **koala habitat** and **grey-headed flying-fox foraging habitat**.

New or increased impact means a new or increased impact on any matter protected by the controlling provisions for the action, when compared to the plan, program or strategy that has been approved by the **Minister**.

Offset attributes means a '.xls' file capturing relevant attributes of the **offset** site, including the EPBC reference ID number, the physical address of the **offset** site, coordinates of the boundary points in decimal degrees, the **EPBC Act** protected matters that the **offset** compensates for, any additional **EPBC Act** protected matters that are benefiting from the **offset**, and the size of the **offset** in hectares.

On-site conservation areas means areas containing remnant or planted *P. habrophyllus* that are managed primarily for conservation.

Operation means the date of commencement of functioning as a residential development.

Plectranthus habrophyllus or *P. habrophyllus* means the native species protected under the EPBC Act.

Project site is the area defined as 'referral area' in the map at **Annex 2**.

Secure means long-term protection under a legal mechanism that is either establishing a covenant on the title as a voluntary declaration under the *Vegetation Management Act 1999* (Qld), or establishing a Nature Refuge under the *Nature Conservation Act 1992* (Qld).

Shapefile means an ESRI Shapefile containing '.shp', '.shx' and '.dbf' files and other files capturing attributes including at least the EPBC reference ID number and EPBC protected matters present at the relevant site. Attributes should also be captured in '.xls' format.

Signage is appropriately located signs designed to raise awareness of the presence of **Koalas** within the **project site** or mitigate against impacts to **Koalas**.

Substantially commence (d) the action means commencement of clearing the land and construction of infrastructure (i.e. sewerage, power, water, stormwater) associated with the action. This does not include preparatory works.

Suitably qualified person means a person with qualifications in environmental science, ecology or biology from a recognised institute and a minimum of 5 years field experience in flora and fauna management, or as agreed in writing by the **Department**.

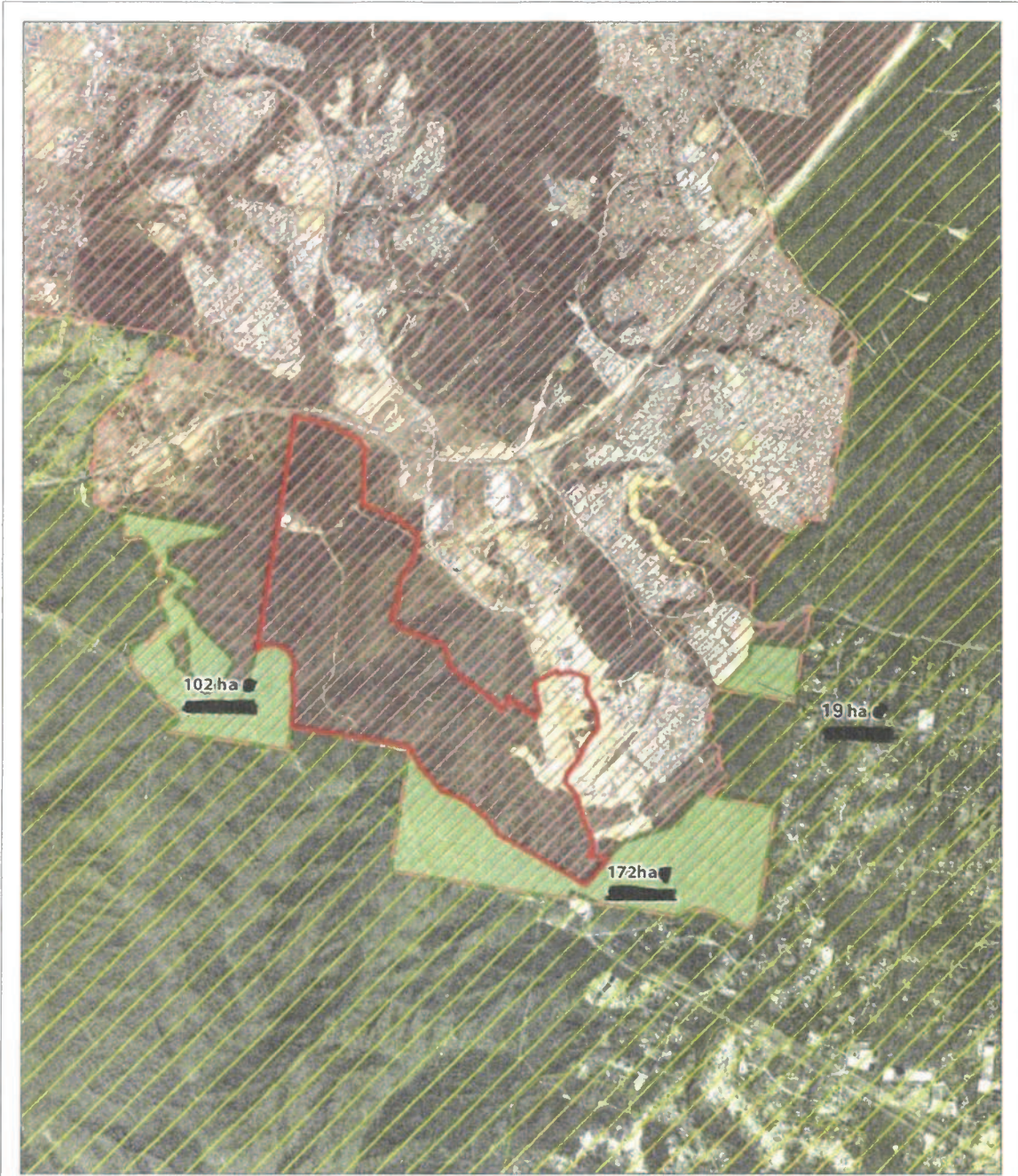
Titles Office means the relevant authority responsible for registering the land title transaction.

Vegetation clearing and construction activities means any activities that destroy, modify or remove vegetation within the **project site**, and those activities required during the construction of infrastructure for the duration of the approval.

Weeds of national significance means the thirty two weeds that have been agreed by Australian governments, based on an assessment process that prioritised these weeds based

on their invasiveness, potential for spread and environmental, social and economic impacts, available at: <http://www.weeds.org.au/docs/WoNS/>.

Annex 1



Legend

- Offset area (293 ha)
- Referral area
- State Controlled Roads
- SEQ Regional Plan 2005-2026**
- Urban Footprint
- Regional Landscape and Rural Production Area
- Rural Living Area

Figure A9 SEQ Regional Plan
2005-2026 zoning

File ref. 7243 E Figure 9 UFP 2005 B
Date 18/12/2015
Project Spring Mountain (EPBC)

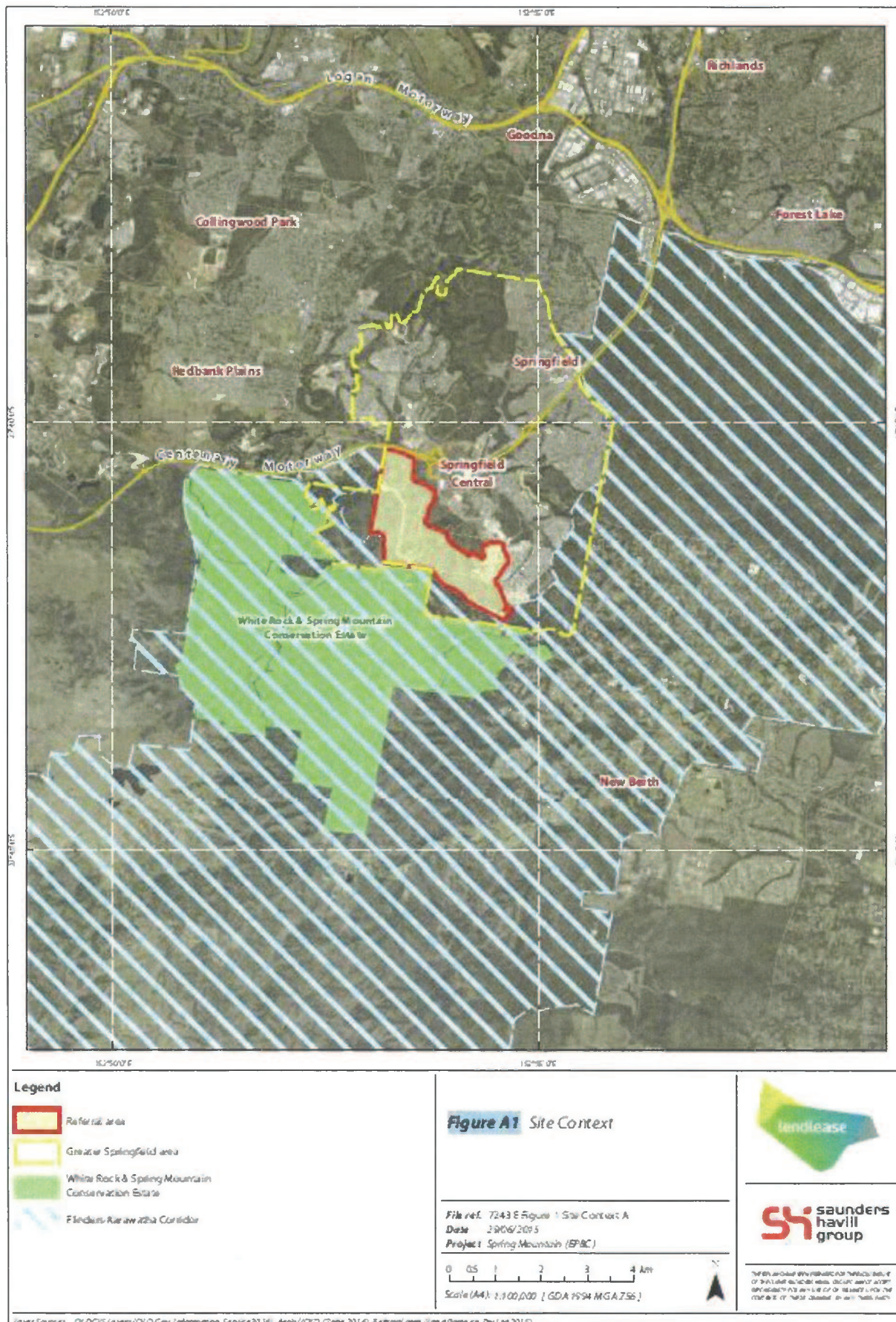
0 0.5 1 2 km
Scale (A4): 1:41,000 (GDA 1994 MGA Z56)



THESE PLANS SHALL BE DEVELOPED FOR THE EXCLUSIVE USE OF THE CLIENT. SAUNDERS HAVILL GROUP CANNOT ACCEPT ANY RESPONSIBILITY FOR ANY LOSS OF OR INJURY TO ANY CONTENTS OF THESE DRAWINGS BY ANY THIRD PARTY.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2014), Aerial (QLD Globe 2014), Referral area (Land Partners Pty Ltd 2015), SEQRP (DSD 2015)

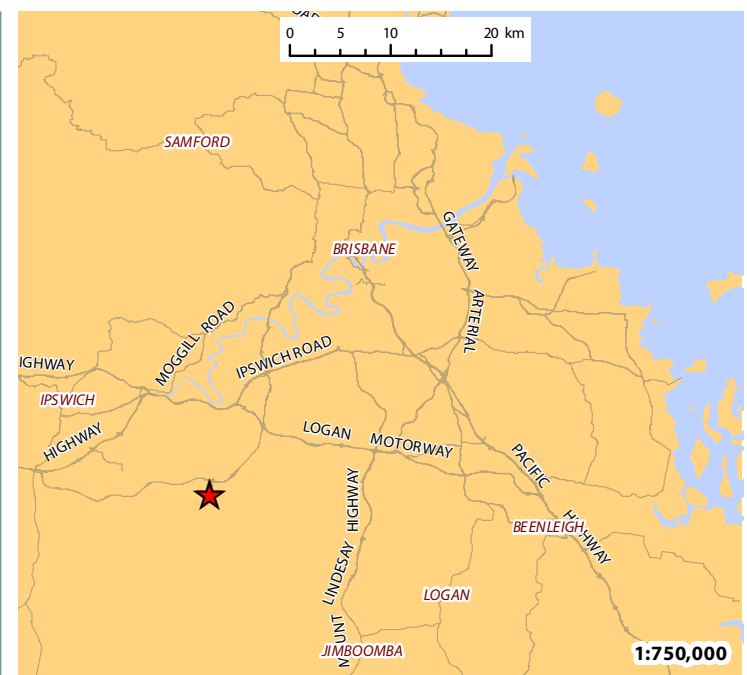
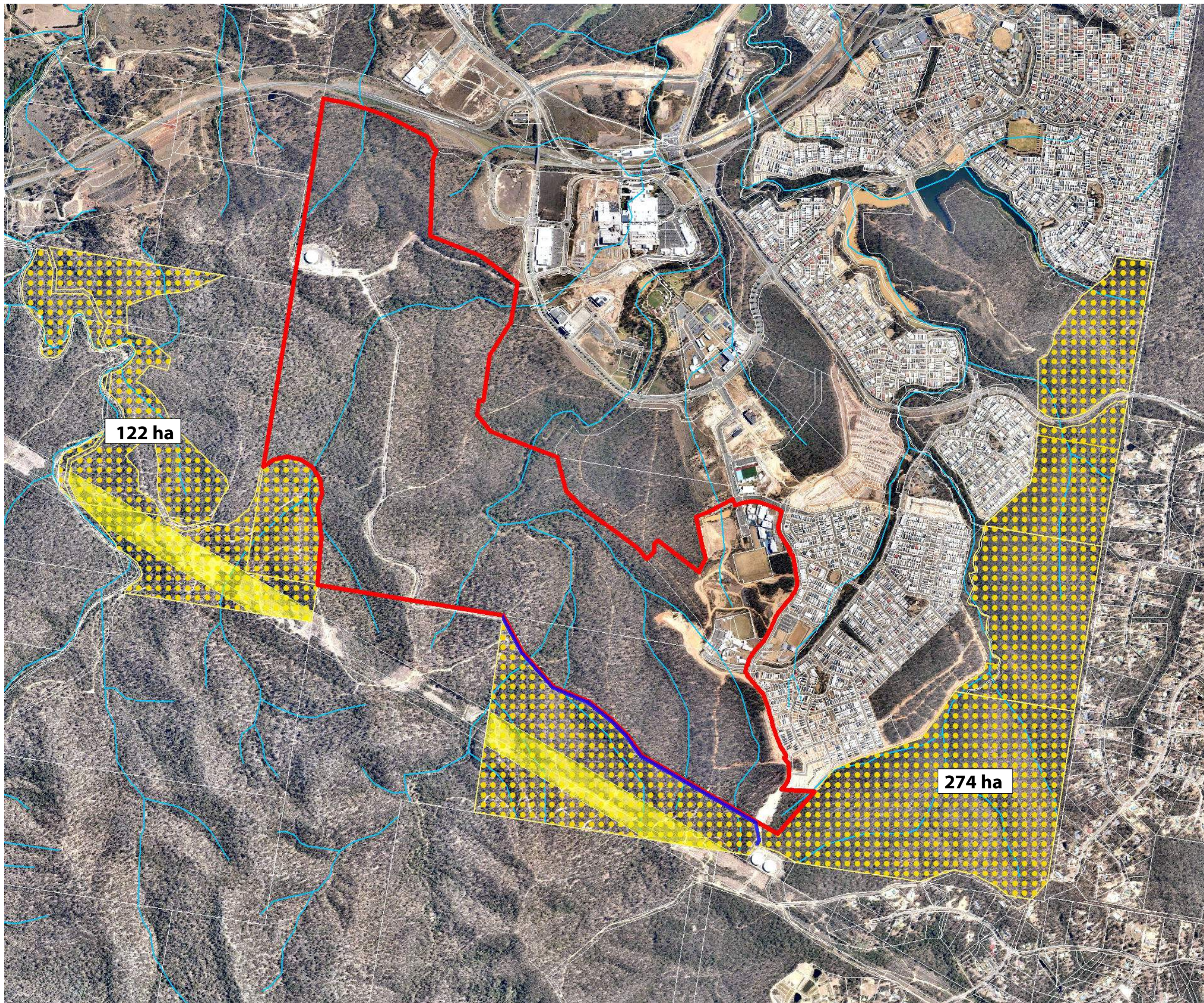
Annex 2





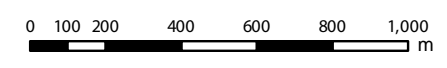
Appendix C

Declared Area Plan



Legend

- Spring Mountain project area
- Qld DCDB
- QLD watercourse mapping (VM)
- Declared Areas
- SEQ Water Easement
- Powerlink Easement



ISSUES:

Issue	Date	Description	Drawn	Checked
B	07/01/2016	Client Draft	AL	KG
C	19/02/2016	Easement Rev	AL	KG
D	30/05/2016	Declared area revision	TC	KG

Spring Mountain

Declared Area Plan

Date | 30/05/2016
 Scale | 1:20,000 @ A3
 Data Information:
 Universal Transverse Mercator
 GDA 1994 MGA Zone 56
 Client | Lend Lease
 Project | Spring Mountain EPBC
 Address/RPD | Springfield
 Source | DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)

Plan A

SHG File
 7243 E 04 Offset areas D

THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT SAUNDERS HAVILL GROUP. SAUNDERS HAVILL GROUP CAN NOT ACCEPT RESPONSIBILITY FOR ANY USE OR RELIANCE UPON THE CONTENTS OF THESE DRAWINGS BY ANY THIRD PARTY.
 CONFIRM ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION AND DO NOT SCALE FROM THE DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETRES. ANY DISCREPANCIES SHOULD BE CLARIFIED IN WRITING WITH SAUNDERS HAVILL GROUP PRIOR TO THE COMMENCEMENT OF WORK.
 PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDERGROUND SERVICES AND DETAIL LOCATIONS OF ALL SERVICES.



Appendix D





Property Map of Assessable Vegetation

Property Map of Assessable Vegetation

Lot on Plan
 748 on SP189044
 753 on SP189054
 752 on SP189053
 751 on SP189053
 747 on SP189043
 745 on SP242282
 740 on SP179412
 705 on SP151175
 11 on S31533

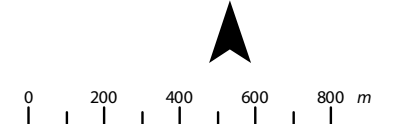
Notes: Property boundaries provided by Dept. of Natural Resources and Mines.

Legend

-  Subject Lot(s)
 -  Area to which the PMAV does not apply
- Vegetation Category Area**
-  Category A area
 -  Category X area

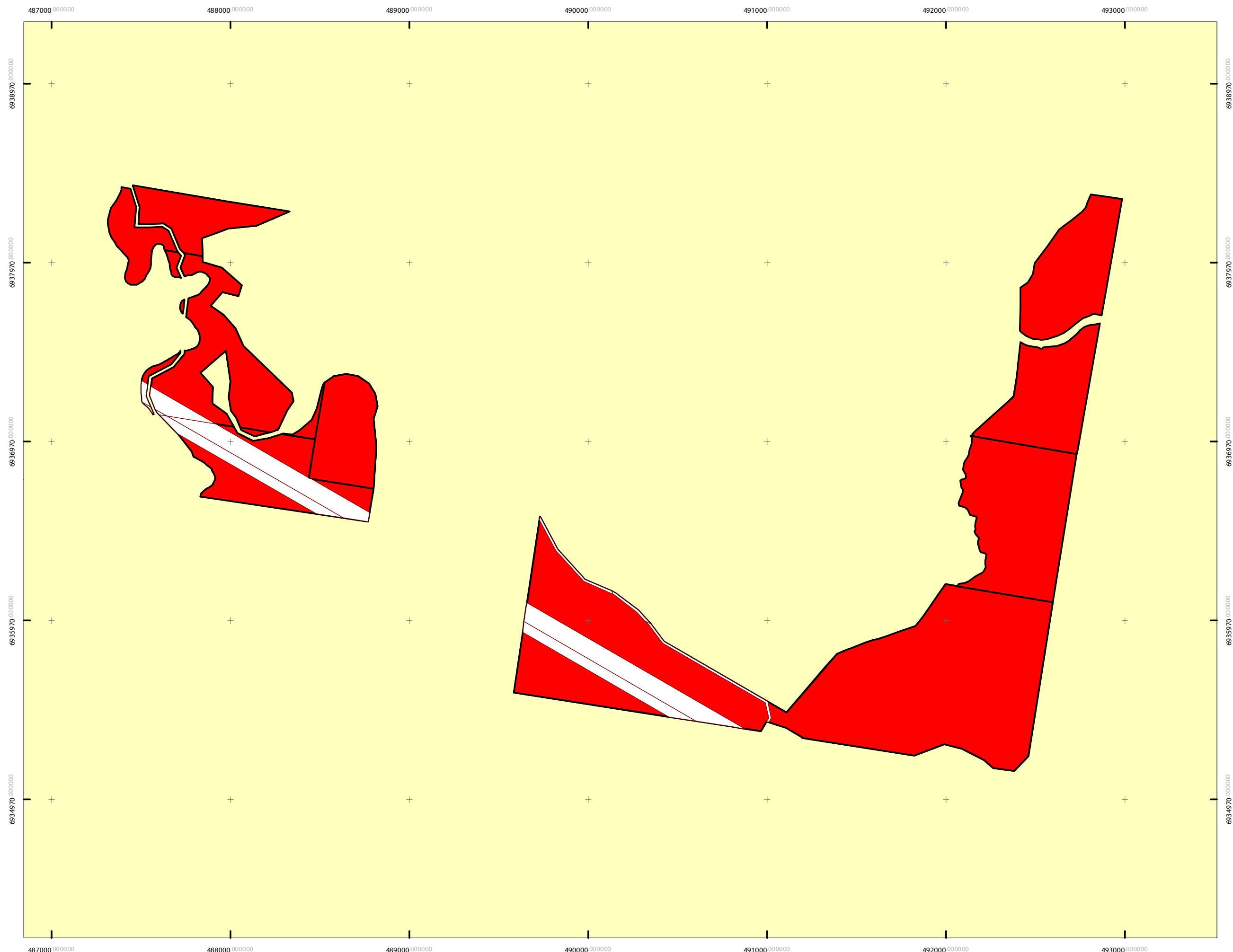


N



Scale (A4): 1:20,000 [GDA 1994 MGA Z56]

File ref. 7522 E 01 Offset Area PMAV A
Date 30/05/2016
Project Springfield (Spring Mountain)



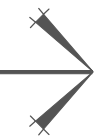


Appendix E

V-Dec Area Weed Management Plan

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - WEED MANAGEMENT



INTRODUCTION

This Voluntary Declaration (V-DEC) Management Plan has been prepared to outline specific weed management works to accompany an application for the registration of a Voluntary Declaration over Council owned conservation land at Spring Mountain. The land is located adjoining the Lend Lease Communities Pty Ltd Spring Mountain Precinct Development within Greater Springfield. The conservation land to which the V-Dec application applies was dedicated to Ipswich City Council (ICC) by Springfield Land Corporation (SLC) between 2006 and 2011. As part of the negotiation and approval of an *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the adjoining Lend Lease Spring Mountain Precinct project the proponent is required to undertake improvement works within the Council owned Conservation Land. The same approval also seeks the land is "legally secured" via the registration of a Voluntary Declaration on title.

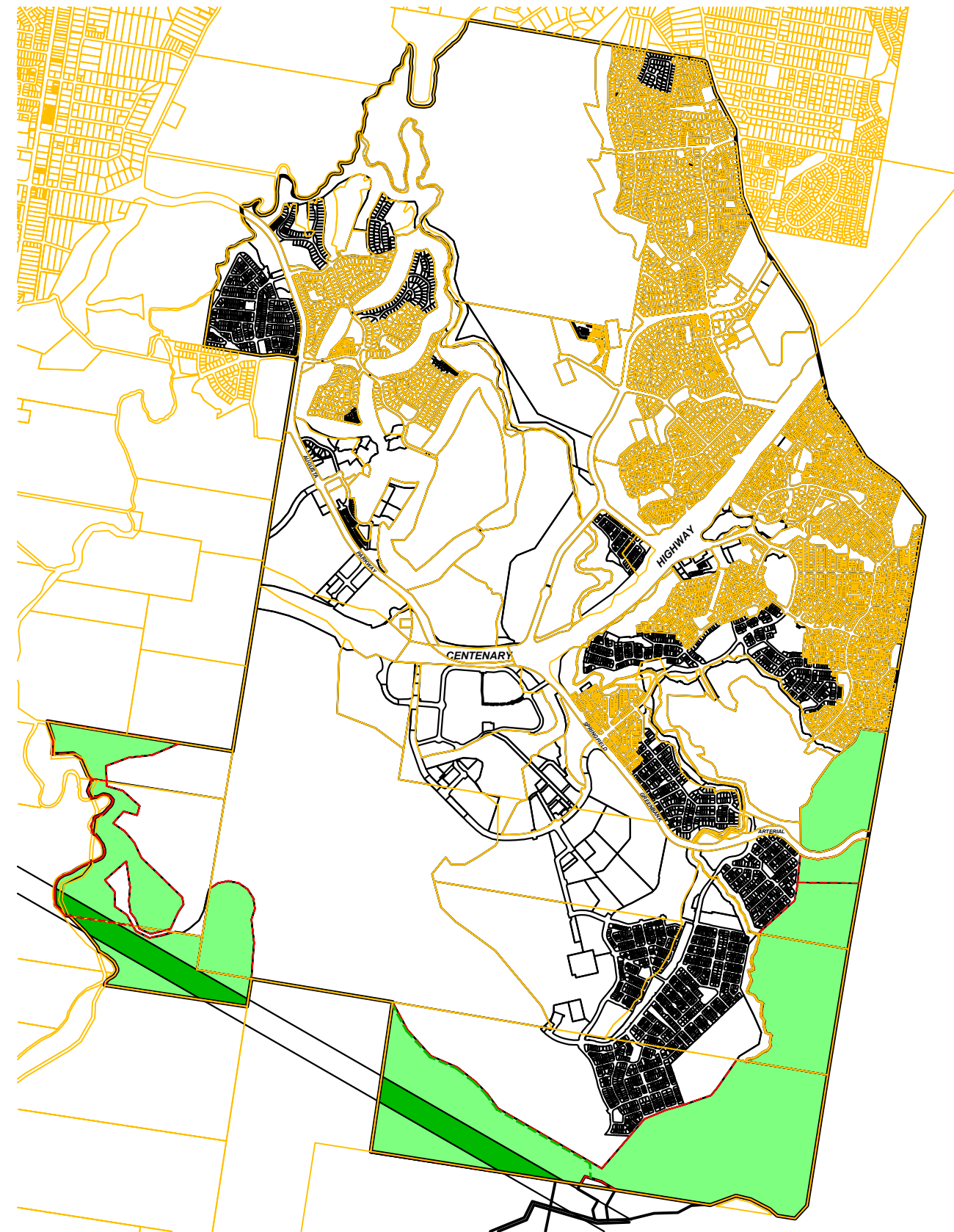
To complete this registration the V-Dec requires consent from the land owner (Ipswich City Council) and registered interests (Powerlink and SEQ Water). As part of the process a management plan which outlines the improvement works proposed must also be prepared and submitted. A number of rolling meetings have been held with ICC Parks and Environment Staff. ICC already retain a management plan for the conservation land which covers a range of improvement works and activities. As agreed with ICC the primary purpose of this V-Dec Management Plan is to bring forward weed management works within the designated area. This plan series provides details on proposed weed management.

ISSUE D 24.08.2016

EDITS TO DNRM SUBMISSION ISSUE

DRAWING SCHEDULE

Dwg No.	Drawing Title	Issue	Date
7243 E 01	Cover Sheet	D	24/08/2016
7243 L 02	Weed Management Plan - Notes	D	24/08/2016
7243 L 03	Weed Management Plan - Weed Techniques	D	24/08/2016
7243 L 04	Weed Management Plan - Weed Techniques	D	24/08/2016
7243 L 05	Weed Management Plan - Weed Techniques	D	24/08/2016
7243 L 06	Weed Management Plan - Sheet 1	D	24/08/2016
7243 L 07	Weed Management Plan - Sheet 2	D	24/08/2016
7243 L 08	Weed Management Plan - Sheet 3	D	24/08/2016
7243 L 09	Weed Management Plan - Sheet 4	D	24/08/2016
7243 L 10	Weed Management Plan - Sheet 5	D	24/08/2016
7243 L 11	Weed Management Plan - Sheet 6	D	24/08/2016
7243 L 12	Weed Management Plan - Sheet 7	D	24/08/2016
7243 L 13	Weed Management Plan - Sheet 8	D	24/08/2016



Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - WEED TREATMENT & REHABILITATION

NOTES

page 5
This Voluntary Declaration (V-DEC) Management Plan links specific weed removal and management measures with spatial areas within the declared area included with the voluntary declaration application. This V-DEC management plan covers the 396ha of land previously dedicated by Springfield Land Corporation (SLC) to Ipswich City Council (ICC). This is inclusive of the 293ha area forming the basis of an environmental offset for Lendlease.

WEED CONTROL PROGRAM TIMING

The primary stage of manual weed removal, treatment and disposal for the V-DEC area is to commence upon the registering of the V-DEC document. Weed removal and maintenance is to occur in 4 staged areas and continue over a 10 year period.

Primary Weed Removal Stage - Consists of the initial weed removal / treatment of site weeds via the methods detailed within the South East Queensland Ecological Restoration Guidelines. Essentially involves the manual removal, stock piling and disposal and initial usage of prescribed herbicides. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing: primary weed removal phase is considered to be completed when all existing weeds within the stage for the declared area have been removed or treated. Both the secondary phase and the primary phase of weed removal can occur concurrently in different stage areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Secondary or Follow-up Weeding - for all areas will involve the quarterly inspection of areas having undergone Primary Weed Removal and treatment of infestations or outbreak as required. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing: primary weed removal phase is considered to be completed when all existing weeds within the declared area have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Maintenance Weeding Phase - final stage of weeding which occurs in areas where the majority of weeds have been removed and treated. Maintenance weeding continues to remove additional outbreaks but also allows for the fostering of natural regeneration and regrowth seedlings. Additional notes below include:

- Implemented weed control method according to this plan.
- Weed trees located within 20M zone of the existing trail network are to be removed where trunk is cut down to ground level and vegetative matter removed.
- Program timing: primary weed removal phase is considered to be completed when all existing weeds within the designated Park have been removed initially. Both the secondary phase and the primary phase of weed removal can occur concurrently in different work areas over time.
- A key map is to be provided logging the progress of areas from primary to secondary phases of weed removal and areas of rehabilitation as part of the reporting progress.

Revegetation occurs in two (2) distinct zones throughout the management area. Refer to Drawing sheets for a full description of proposed plant species, sizes, densities and numbers.

NATURAL REGENERATION

- Applies:
- To relatively large, intact and weed-free areas of native vegetation.
 - Where the native plants are healthy and capable of regenerating without human intervention.
 - When native plant seed is stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
 - Where the plant community has a high potential for recovery after any short-lived disturbance, such as a fire or cyclonic winds.
 - When preventative action is all that is required to avert on-going disturbance, e.g. erection of fencing to prevent intrusion from cattle.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

ASSISTED NATURAL REGENERATION

- Applies:
- To natural areas where the native plant community is largely healthy and functioning.
 - When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
 - Where the natural regeneration processes (seedling germination, root suckering etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing etc.
 - When limited human intervention, such as weed removal, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration.
 - When major component is weed control.

Planting in such sites can work against the aims of restoration by interfering with natural regeneration.

The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.

NOTES

MONITORING AND REPORTING PROCEDURES

Monitoring of the parkland weed management and revegetation works allows for:

- A review of the pre-established performance indicators for measuring the success of the weed removal and control;
- Ensure the level of protection for existing identified native vegetation inclusive of that which has naturally regenerated;
- Review the rate of spread or contraction of weed infestation within the control program;
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed; and
- Identification of new weed threats or other factors which may be effecting areas designated for ecological rehabilitation.

Monitoring is required for weed eradication, revegetation and assisted regeneration.

MONITORING TIME FRAMES

For weed removal and revegetation three (3) Council determined timeframes form the anchor of the monitoring process. These include:

Council Pre-Start - On-site meeting prior to the initial commencement of work within each stage of weed management. Will involve Consultant, Contractor and Council to work through weed treatment areas and clarify works approved and appointed.

On-Maintenance - At the completion of the Primary Weed Removal Stage and Secondary weeding an On-Maintenance meeting will be held with Council to inspect the works on-site in relation to the approved plans and previously agreed on-maintenance criteria.

Off-Maintenance - At the completion of all site weeding works and the agreed maintenance timeframe a final inspection will be held by Council to determine if works have been completed to the required level for Council hand over.

REPORTING

Reporting to Ipswich City Council will occur on a six (6) month interval during the total period. Council will physically attend the Pre-Start, On-maintenance and Off-maintenance meetings. For this project it is recommended reporting include a short memo styled report responding to agreed criteria. As part of the monitoring a number of pre-determined transect and quadrant sampling sites have been allocated. At these locations a number of baseline studies have been completed and will be repeated post weed removal and maintenance to measure the success of the programmed works. It is also recommended this include a visual diary of imagery from selected locations at each inspection (including the pre-start and monthly inspections). The imagery for the six (6) month period will be included with the report to Council.

In addition to the photo monitoring the biannual report to Council should include sufficient information on:

- Date, time and whether conditions at time of inspection
- Changes in weed extent populations (spreading / contracting)
- Changes in weed densities
- Health of existing vegetation protected by NRM provisions
- Rate of success for revegetation plantings
- Growth and PFC rate of assisted regeneration areas
- Occurrences of new weed infestations or species outbreaks
- Comments on any indirect changes to the area as a result of weed management (ie erosion / change in weed footprints / death to natives)
- Annual reporting is required to be sent to the Department of the Environment (DOE).

RESOURCES / ROLES & RESPONSIBILITIES

All resources required to implement this plan will be provided by the proponent (Lendlease). The following roles are applicable:

PROponent

- Ensure all consultants, contractors, sub contractors or others utilizing the area are aware of the V-DEC Management Plan.
- Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings and conditioned by Ipswich City Council.
- Cover the costs of all necessary resources to ensure works are completed as per the approved documents.

CONSULTANTS

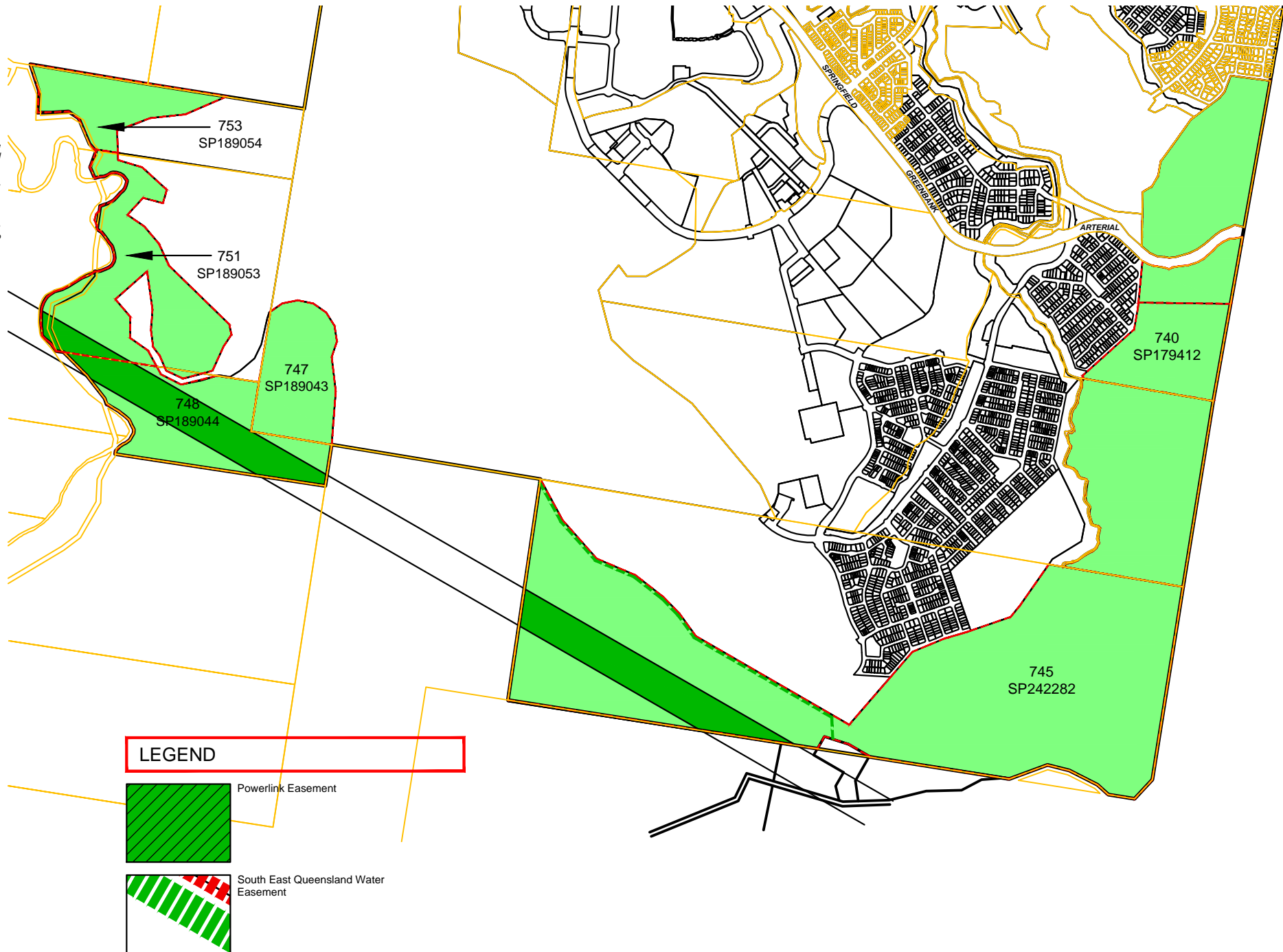
- Brief the proponent on their requirements in implementing and maintaining works as per the V-DEC Management Plan.
- Attend pre start, on maintenance and off maintenance meetings.
- Undertake monitoring and reporting to Ipswich City Council as set up by this document.
- Be available to respond to technical queries or departures to the approved documentation when on-site conditions require changes.
- Liaise with Council throughout all stages of approval, initial works and maintenance of works.

COUNCIL

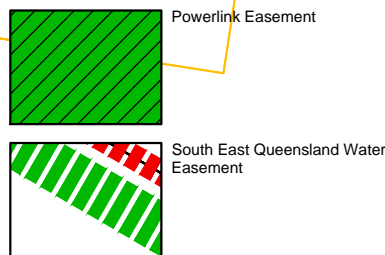
- Provide technical expertise via commentary on the approval of documentation.
- Attend pre-start, on and off maintenance inspections.
- Undertake random inspections through the Secondary weed management and Maintenance weed management phases.
- Accept and review biannual reports as dictated in this document.

CONTRACTOR

- Complete works in strict accordance with the documentation.
- Recommend changes to the documentation when specific experience or on-site conditions require so.
- Attend pre-start, on and off maintenance inspections.



LEGEND



AMENDMENTS:			
Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:	
PROJECT:	Spring Mountain Precinct
SCALE:	AS NOTED

landscape architecture	
DRAWING: V-DEC Management Plan Weed Management Notes	
DATE: August 16	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 02 RP D	

V-DEC MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND								
Rank	Family	Scientific and common names	Subregion	Rec No	Score	Life form & Source	Non-Chemical Control	Chemical Control
1	Verbenaceae	Lantana camara var. camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	Seedlings: CS&P (G1.5); Shrubs: blanket spray G100 or cut down and spray regrowth G100 or splatter gun using 1 part G to 9 parts water - apply only when plant is <i>arowana_not_dormant</i> (ref.1)
2	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	4.8	S/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1)
3	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	38	4.9	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1)
4	Biognoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	4.9	V/O	Tubers: crown or dig up, bag and remove	Regrowth and tubelings: spray G100 + MM or F100 (ref 1)
	Basellaceae	Anredera cordifolia (madder vine)	8	16	4.9	V/O	Small Vines & Tubers: Hand pull. Bag and dispose	Ascending Stems: S&P (GU); Tubers: gouge, scrape and paint (GU); Ground infestations: spray G200 or G200 + MM (ref 1)
6	Asparagaceae	Asparagus africanus (ornamental asparagus, asparagus fern)	7	26	4.9	V/O	dig out roots and dispose of at local council landfill site. remove entire crown and underground stem to prevent regrowth	fluoroxypyr (200 g/L) @ 35 mL per 1 L diesel/kerosene
7	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	4.9	T/O	remove when small hand pull or dig out small seedlings. combine dozing, burning and controlled grazing for large infestations	Stem injection, glyphosate (360 g/L) @ Undiluted @ 1 mL per 2 cm of hole or cut
8	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	4.8	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1 or G1.5) or C&P (G1.5 or GU for stems up to 8 diameter); Seedlings: spray G200 or G200 + MM (ref 1)
9	Anacardiaceae	Schinus terebinthifolius (broad-leaf pepper tree)	6	49	4.8	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1)
	Salviniaceae	Salmnia molesta (salvinia)	8	57	4.9	Ha/F	Mechanical removal of small infestations; Salvinia weevil (Biological control)	Aquatic areas: calcium dodecylbenzene sulphamate (AF-100) @ 1 part to 19 parts kerosene; diquat (vegetol) 50-100L/ha or 4L/100L water; diquat (watro) 50-100L/ha or 4L/100L water; diquat (reglone) 5-10L/ha or 400mL + 150mL Agral / 100L water (see ref 2)
11	Cabombaceae	Cabomba caroliniana (cabomba, fanwort)	4	12	4.9	Ha/F	Mechanical removal of small infestations	2, 4-D N-Butyl Ester (Rubber Vine Spray) @ 12.5L/ML water (see ref 2 for application guide)
12	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	4.9	S/OA	N/A	Stems: C&P or F/I (G1.5); Bushes: spray or cut down and spray regrowth G100 or MM (ref 1)
13	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	4.9	Ha/OF	Mechanical removal of small infestations	Waterways: 2, 4-D acid (AF 300) @ 1200 with water; Aquatic Areas: glyphosate @ 1-1.3L/100L water (see ref 2 for application guide)
14	Acanthaceae	Hygrophila costata (Glash weed)	3	7	5	Ha/F	Hand pull small infestations. Can be controlled by planting competitive native species	Glyphosate known to be effective. Species known to occur in waterways so EPA should be contacted before spraying (ref 4)
	Oleaceae	Ligustrum lucidum (tree privet)	5	9	4.8	T/O	Seedlings: Hand pull	Saplings: CS&P or C&P (G1.5); Trees: F/I (G1 or G1.5) or C&P GU for stems up to 8cm diameter; Seedlings: spray MM or G200 + MM if other weeds such as Lantana or Camphor Laurel are present
16	Asteraceae	Sphagnetocola trilobata (Singapore daisy)	6	34	4.6	H/O	Hand pull	Hand pull and/or spray G200 + MM (ref 1)
17	Asteraceae	Ageratina adenophora (crofton weed)	6	38	4.6	H/O	Hand pull and hang to dry	Spray MM or G200 or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1)
18	Verbenaceae	Lantana montevidensis (creeping lantana)	8	62	4.8	S/O	Fire and/or mechanical control	Spray (march to may): glyphosate 1L/100L water; metsulfuron methyl 10g/100L water; metsulfuron methyls + glyphosate 173g/100L water; Basal bark (anytime): triclopyr 1L/60L Diesel, picloram + triclopyr @ 1L/60L Diesel, Glyphosate, neat application; Splatter Gun: glyphosate 1L/9L water, metsulfuron methyl 2mL water (ref 2)

19	Fabaceae	Neonotonia wightii (glycine)	5	16	4.7	H/A	N/A	Vines: CS&P (1.1.5) or spray G100 + MM or MM (ref 1); Spray: glyphosate @ 13mL/1L water (ref 2)
	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	4.6	H/A	Hand or mechanical removal of small infestations	Saplings: CS&P or C&P (G1.5); Trees: F/I (G1.5); Seedlings: spray MM or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1)
21	Oleaceae	Ligustrum sinense (Chinese privet)	4	11	4.6	T/O	Seedlings: Hand pull	Saplings: CS&P or C&P (G1.5); Trees: F/I (G1.5); Seedlings: spray MM or G200 + MM if other weeds such as Lantana or Camphor Laurel are present (ref 1)
22	Ochnaceae	Ochna serrulata (ochra)	7	33	4.5	S/O	N/A	Stems: CS&P or S&P or F/I (G1.5); Seedlings and Regrowth: spray G200 + MM or MM. Thatch bark F100 or G200 + MM (ref 1)
23	Asparagaceae	Asparagus aethiopicus cv. Sprengeri (asparagus ground fern)	5	35	4.5	H/O	dig out unwanted plants and dispose of at the appropriate council landfill. remove the entire crown of underground stem of plant to prevent regrowth	Spot spray - metsulfuronmethyl (600 g/L) @ 10 g per 100 L water plus wetting agent or 100 g/ha plus wetting agent. Cut stump, spot spray. Apply neat Diesel
24	Poaceae	Sporobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	4.8	H/U?	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15mL/L water, flupropate @ 2mL/L water + ionic wetter @ 1mL/L water. Dense infestations: blanket spraying glyphosate 3L/ha, flupropate 2L/ha (ref 2); Spray G100 or MM (ref 1)
	Asteraceae	Ageratina riparia (mistflower)	5	38	4.6	H/O	Hand pull and hang to dry	Vines: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1)
26	Asclepiadaceae	Araujia sericifera (mothvine)	9	38	4.4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit	Vines: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1)
27	Crassulaceae	Bryophyllum dagremontianum x B. delagoense (hybrid mother-of-millions)	6	15	4.5	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1)
28	Convolvulaceae	Ipomoea carnea (mille-minute)	7	56	4.4	V/O	Vines & Runners: hand pull, roll up and hand up to dry	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM (ref 1)
29	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4.4	V/O	Seedlings & Small Vines: Hand Pull	Stems: CS&P (G1.5); Seedlings or Small vines: spray G200 or G200 + MM (ref 1)
30	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4.4	V/O	Scattered or medium-density infestations: Where possible, repeated slashing close to ground level is recommended	Foliar spray - Follow-up basal bark/cut stump/foliar spray as necessary with Triclopyr + picloram (Grazon DS, Grass-up, etc.) @ 0.35-0.5 L/100 L water
31	Phytolaccaceae	Rivina humilis (boby pepper)	8	61	4.3	H/O	Hand pull and hang to dry	Spray G100 (ref 1)
32	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15mL/L water, flupropate @ 2mL/L water + ionic wetter @ 1mL/L water. Dense infestations: blanket spraying glyphosate 3L/ha, flupropate 2L/ha (ref 2)
33	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	4.5	H/U	Hand or mechanical removal of small infestations	Small infestations: spray glyphosate @ 15mL/L water, flupropate @ 2mL/L water + ionic wetter @ 1mL/L water. Dense infestations: blanket spraying glyphosate 3L/ha, flupropate 2L/ha (ref 2)
34	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4.3	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first	Glyphosate (360 g/L) (e.g. Weedmaster® Duo) @ 10 ml/1 L water
35	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	4.7	Ha/F		Glyphosate and metsulfuron-methyl @ 15mL/L water

36	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	17	3	5	Ha/U	physical removal of plant should not be attempted	Terrestrial plants use Metsulfuron methyl (Brush®) + 1mL/L non-ionic wetter @ 80g/ha + 1mL/L non-ionic wetter or 10g/100L water + 1mL/L non-ionic wetter. Free floating plants: Glyphosate (Roundup Biactive®) 10 mL/L
37	Passifloraceae	Passiflora suberosa (cork passionflower)	8	166	4.2	V/O	N/A	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1)
38	Poaceae	Melinis minutiflora (mookias grass)	5	17	4.5	H/A	Grazing or mowing	Spray: Fluazifop-P 212g/L @ 2L/ha, Glyphosate 360g/L @ 1L/100L water (ref 2)
39	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4.3	V/O	Stems: Hand pull. Fruit: Bag and remove	Stems: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1)
40	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or F100 (ref 1)
41	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4.3	STA	Small plants: Hand pull or mechanical removal	Herbicide Control - Basal Bark application: triclopyr 240g/L + picloram 120g/L @ 1L/60L diesel, C&P; triclopyr 240g/L + picloram 120g/L @ 1L per 60L diesel, spray triclopyr 300g/L + picloram 120g/L @ 350mL per 100L water. Combination of chemical and mecha
42	Poaceae	Brachiaria mutica (para grass)	6	18	4.4	Ha/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/L @ 200mL/15L water; Foliar: glyphosate 360g/L @ 9L/ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2)
43	Hydrocharitaceae	Egeria densa (egeria waterweed)	2	7	4.4	Ha/F	hand pulling, cutting and digging with machines effective	N/A
44	Pinaceae	Pinus eliottii (slash pine)	4	22	4.3	T/A	Seedlings: Hand pull. Saplings and Trees: cut close to ground or ring bark	Saplings and Trees: F/I (G1.5) ensuring thick bark is penetrated (ref 1)
45	Caesalpinaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4.2	ST/O	Seedlings: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM, collect and bag seeds (ref 1)
46	Poaceae	Chionis gayana (Rhodes grass)	9	55	4.3	H/A	Hand pulling and removal and digging of larger clumps	Spray: glyphosate @ 1/100L water
47	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4.2	H/O	Hand pull and dispose	Plantlets: spray G200 + MM or MM (ref 1)
48	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4.2	H/U	hand pulling of small areas is not recommended	Spot spray 2,4-D amine 500 g/L @ 0.4 L/100 L
49	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4.3	V/O	Vines and Runners: hand pull, roll up and hang to dry	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1)
50	Acanthaceae	Thunbergia alata (black-eyed susan)	5	22	4.2	H/O	N/A	CS&P (G1.5); spray G200 or G200 + MM (ref 1)
51	Fabaceae	Macropitium atropurpureum (sirat)	8	39	4.2	V/A	N/A	Vines: CS&P (1.1.5) or spray (G100 + MM or MM (ref 1)
52	Rosaceae	Rubus ellipticus (yellowberry)	4	25	4.1	S/O	slashing hindering growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent
53	Colchicaceae	Gloriosa superba (glory lily)	3	25	4.1	V/O	N/A	Young Shoots: spray G200 or G200 + MM. Best results in Oct-Nov and by using 'Pulse' as surfactant (ref 1)
54	Verbenaceae	Phyla canescens (lippia, Condamine couch)	3	4	4.2	Ha/O	a combined approach of different control methods including chemical and mechanical with land management practices is most effective	Foliar spray 600 g/L Dichlorprop @ 5 ml / 1 L water or 2,4-D amine (500 g/L) + 1% crop oil @ 2-4 L/ha + 1% crop oil
55	Solanaceae	Solanum seaforthianum (Brazilian nightshade)	8	78	4	V/O	Hand pull	Spray G100 (ref 1)
56	Araceae	Pistia stratiotes (water lettuce)	3	8	4.1	Ha/OF	Mechanical removal of small infestations	Glyphosate 360g/L @ 1-1.3L/100L water or 6.9L/ha; diquat 20g/L @ 4L/100L water or 50-100L/ha (see ref 2 for application guide)
57	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4.1	V/O	Rhizomes: crown and hang to dry	Rhizomes: gouge and paint (G1.5). Stems: wind up and spray or cut high and low and spray regrowth G200 or G200 + MM (ref 1)

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

58	Commelinaceae	<i>Tradescantia fluminensis</i> (Old use T. albiflora) (wandering jew)	5	9	4.1	H/O	N/A	Spray F150 (as per label) or G200 or G200 + MM. Collect and bag or roll and rake carefully. Dispose (ref 1).
59	Solanaceae	<i>Cestrum parqui</i> (green cestrum)	6	36	3.9	S/O	Seeds: Hand pull	Stems: CS&P (G1.5) or spray G100 (ref 1).
60	Caesalpiniaceae	<i>Senna septentrionalis</i> (arsenic bush, was S. floribunda)	6	25	4	S/O	Seeds: Hand pull	Shrubs: CS&P or F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
61	Solanaceae	<i>Solanum mauritianum</i> (wild tobacco tree)	8	30	4	S/O	Seeds: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1.5); Seedlings: spray G200 (ref 1).
62	Apocynaceae	<i>Catharanthus roseus</i> (pink periwinkle)	5	22	4	S/O	Hand pull	Spray G100 (ref 1).
63	Passifloraceae	<i>Passiflora subpeltata</i> (white passion flower)	10	60	3.9	V/O	Stems: Hand pull	Stems: CS&P; Seedlings & Regrowth: spray G200 or G200 + MM (ref 1).
64	Fabaceae	<i>Desmodium uncinatum</i> (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200 + MM or MM; collect and bag seeds (ref 1).
65	Poaceae	<i>Melinis repens</i> (red Natal grass)	10	134	4.1	H/A	Grazing or mowing	Spray: Fluazifop-P 212g/L @ 2L/ha. Glyphosate 360g/L @ 1L/100L water (ref 2).
66	Nymphaeaceae	<i>Nymphaea caerulea</i> subsp. <i>zanzibarensis</i> (blue lotus)	4	17	4	Ha/OF	Hand pull small infestations.	Spray with or Diquat. Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5).
67	Onagraceae	<i>Oenothera drummondii</i> subsp. <i>drummondii</i> (beach evening primrose)	3	17	4	H/O	Hand pull	Spray G100 (ref 1).
68	Liliaceae	<i>Triumfetta rhomboidea</i> (Chinese burr)	7	44	4	H/U	Hand pull	Spray G100 (ref 1).
69	Haloragaceae	<i>Myriophyllum aquaticum</i> (parrot's feather)	3	15	4	Ha/F	N/A	Spray glyphosate 360g/L @ 100mL/10L water (ref 1).
70	Passifloraceae	<i>Passiflora foetida</i> (stinking passion flower)	7	50	3.9	V/O	Hand Pull	CS&P (G1.5); spray G200 or G200 + MM (ref 1).
71	Asteraceae	<i>Verbesina encelioides</i> (crownbeard)	7	34	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
72	Poaceae	<i>Paspalum mandiocanum</i> (broad leaf paspalum)	3	6	4	H/A	N/A	Spray G200 - resistant to weaker strength (ref 1).
73	Poaceae	<i>Paspalum dilatatum</i> (paspalum grass)	10	30	3.9	H/A	Hand pull or dig up	Spray G100 (ref 1).
74	Ruppiceae	<i>Ruppia maritima</i> (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	Spray G100 (ref 1).
75	Arecaceae	<i>Syagrus romanzoffiana</i> (queen palm)	47	10	3.9	T/O	Seeds: Hand pull or crown; Trees: cut below growing point	Trees: F/I (G1.5); Seedlings: spray G200 + MM (ref 1).
76	Poaceae	<i>Hymenachne amplexicaulis</i> cv. <i>Olive</i> (hymenachne)	17	1	4	Ha/A	a combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	360 g/L Glyphosate (includes Roundup Biactive & Weedmaster Duo) - 1 L/100L water or 10 L/ha delivered by boom
77	Asteraceae	<i>Senecio tamoides</i> (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
78	Poaceae	<i>Cenchrus ciliaris</i> (buffel grass)	4	15	4.1	H/A	Hand or mechanical removal of young plants	Herbicide Control - Glyphosate 7mL/L water; Dichlobenil 600g/100m ² ; Fluazifop 50-100mL/10L water (ref 2).
79	Acanthaceae	<i>Thunbergia grandiflora</i> (thunbergia, blue thunbergia)	2	3	57	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
80	Cactaceae	<i>Opuntia tomentosa</i> (velvet tree pear)	8	46	3.9	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray: Basal Bark application: Injection: Triclopyr... 8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
81	Euphorbiaceae	<i>Ricinus communis</i> (castor oil plant)	7	20	3.9	S/O	Seeds: Hand pull	Shrubs: S: CS&P or F/I (G1.5); Seedlings: spray G200 (ref 1).
82	Asteraceae	<i>Senecio madagascariensis</i> (fire weed)	6	28	3.8	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	Stems: S&P (GU); Regrowth and seedlings: spray G200 or G200 + MM (ref 1).
83	Cyperaceae	<i>Cyperus involucratus</i> (African sedge)	6	15	3.8	Ha/OF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land-commercial/industrial, rights of way - Glyphosate-ipa, glyphosate-mas, imazapyr

84	Asteraceae	<i>Tithonia diversifolia</i> (Mexican sunflower)	5	11	3.9	H/O	N/A	Stems: CS&P (G1.5) or cut and spray regrowth and seedlings (G100 or MM) (ref 1).
85	Poaceae	<i>Setaria sphaecolata</i> (South African pigeon grass)	9	41	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1).
86	Asclepiadaceae	<i>Gomphocarpus physocarpus</i> (balloon cotton bush)	10	132	3.7	S/O	Slash in winter and burn cuttings. Wanderer Butterfly can also be used.	Spray: glyphosate @ 1,1000 with water, in spring before seeding (ref 3).
87	Poaceae	<i>Digitaria didactyla</i> (Queensland blue couch)	9	70	3.7	H/A	Hand pull or cultivation	Spot Spray: glyphosate or 2,2-DPA (ref 3).
88	Caesalpiniaceae	<i>Gleditsia triacanthos</i> (honey locust)	7	12	3.8	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method.	non-agricultural land floroxypyr (Starane 200®) @ 1.5 L - 75m/100 L diesel
89	Poaceae	<i>Paspalum notatum</i> (bahia grass)	4	10	3.8	H/A	Hand pull or dig up	Spray G100 (ref 1).
90	Cactaceae	<i>Opuntia monacantha</i> (drooping tree pear, syn. <i>O. vulgaris</i>)	2	3	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray: Basal Bark application: Injection: Triclopyr... 8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
91	Poaceae	<i>Paspalum conjugatum</i> (paspalum grass)	7	38	3.8	H/A	Hand pull small infestations.	Spot Spray: glyphosate or 2,2-DPA (ref 3).
92	Malpighiaceae	<i>Hiptage benghalensis</i> (hiprage)	3	5	4	S,V/O	Hand pull small infestations.	Seeds: Foliar spray of dicamba, fluroxypyr, and triclopyr/picloram. Larger plants cut stump application of fluroxypyr and triclopyr/picloram with diesel, glyphosate with water and picloram undiluted (ref 2).
93	Solanaceae	<i>Solanum torquatum</i> (devil's fig)	6	38	3.9	S/O	Seeds: Hand pull	Shrubs: CS&P (G1.5) or F/I (G1.5); Seedlings: spray G200 (ref 1).
94	Caesalpiniaceae	<i>Caesalpinia decapetala</i> (thorny poinciana)	4	20	3.9	S,V/O	Seed-heads: Bag and remove.	Stems: CS&P (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
95	Poaceae	<i>Pennisetum alopecuroides</i> (cousins footfall)	7	29	3.8	H/O	Hand Pull	Spot Spray: glyphosate or 2,2-DPA (ref 3).
96	Verbenaceae	<i>Duranta erecta</i> (duranta)	6	14	3.6	ST/O	Shrubs: CS&P (1.1.5)	Spray: glyphosate @ 200mL/15L water. Follow up spray (ref 3).
97	Brassicaceae	<i>Nasturtium officinale</i> (Old use Rorippa nasturtium-aquaticum) (watercress)	7	19	3.7	Ha/FU	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
98	Polygonaceae	<i>Acetosa sagittata</i> (rambling dock)	4	18	3.7	V/U	Tubers: Dig up, bag and remove.	Tubers: Spray G200 or G200 + MM or MM (ref 1).
99	Poaceae	<i>Cynodon dactylon</i> (couch, Bahama grass introduced cultivars)	10	45	3.6	H/OA	Hand pull small infestations, removing all roots or smother with mulch.	Spray: glyphosate @ 200mL/15L water. Follow up spray (ref 3).
100	Biognoniaceae	<i>Tecoma stans</i> (yellow bell)	4	16	3.6	ST/O	N/A	Stems: CS&P (G1.5) or spray G200. Seeds: collect, bag and remove (ref 1).
101	Rosaceae	<i>Rhaphiolepis indica</i> (Indian Hawthorn)	3	10	3.5	ST/O	Seeds: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM or MM (ref 1).
102	Mimosaceae	<i>Mimosa pudica</i> (common sensitive plant)	4	12	3.7	S/A	N/A	Pastures - Fluroxypyr/Starane 200 @ 1.5 L/ha. Between cropping applications (conservation tillage) - Dicamba/Barvel 200 @ 0.8-1.4 L/ha
103	Comelinaceae	<i>Callisia fragrans</i> (purple succulent)	3	9	3.9	H/O	N/A	Spray F100 or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
104	Scrophulariaceae	<i>Paulownia tomentosa</i> (paulownia)	3	5	4	T/A/O	Seeds: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 (ref 1).
105	Comelinaceae	<i>Tradescantia zebina</i> (zebrina)	3	12	3.7	H/O	N/A	Spray F100 or G200 or G200 + MM; Collect and bag or roll and rake carefully. Dispose (ref 1).
106	Acanthaceae	<i>Ruellia malacoperma</i> (ruellia)	5	16	3.8	H/O	N/A	Spray G200 + MM (ref 1).
107	Poaceae	<i>Pennisetum clandestinum</i> (kikuyu grass)	4	12	3.8	H/A	Hand Pull	Spot Spray: glyphosate or 2,2-DPA (ref 3).
108	Liliaceae	<i>Lilium formosanum</i> (Taiwan Lily)	5	10	3.8	H/O	Hand pull or crown and dispose	Spray G100 + MM or MM (ref 1).
109	Asteraceae	<i>Sigesbeckia orientalis</i> (Indian weed)	10	148	3.6	H/U	Hand pull or cultivation.	Spray with 2,4-D amine or sodium, pr MCPA + dicamba (ref 3).
110	Asteraceae	<i>Erigeron pilosa</i> (cobbler's pegs)	10	110	3.5	H/U	Hand pull or cultivation.	Spray with 2,4-D amine or sodium, pr MCPA + dicamba (ref 3).
111	Cactaceae	<i>Opuntia stricta</i> (common prickly pear)	7	67	3.6	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray: Basal Bark application: Injection: Triclopyr... 8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
112	Poaceae	<i>Echinochloa indica</i> (crowfoot grass)	8	56	3.5	H/A	Put and chip	Spray: glyphosate or 2,2-DPA (ref 3).
113	Poaceae	<i>Axonopus compressus</i> (broad leaved carpet grass)	5	23	3.6	H/OA	Cut stems from roots.	Spot spray with Glyphosate (ref 3).

114	Lamiaceae	<i>Salvia coccinea</i> (red salvia)	9	46	4	H/O	remove small areas by hand or machine	Aquatic areas (drains, channels, margins of streams, lakes and dams) - calcium dodecylbenzene sulphonate (AF-100) @ 1 part in 19 parts kerosene
115	Asteraceae	<i>Ageratum houstonianum</i> (blue billygoat weed)	8	81	3.8	H/O	N/A	Spray G100 or hand pull and spray regrowth G100 (ref 1).
116	Myrtaceae	<i>Podium guajana</i> and <i>P. guineense</i> (yellow guava and West Indies guava)	4	7	3.7	ST/A/O	N/A	Shrubs: CS&P or F/I (G1.5) or spray G200 + MM or MM. Trial basal bark F100 or G200 + MM (ref 1).
117	Rosaceae	<i>Rubus lobobatus</i> (kittatinny blackberry)	5	22	3.5	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1,200 parts water + wetting agent
118	Myrtaceae	<i>Eugenia uniflora</i> (Brazilian cherry)	4	19	3.5	ST/O	N/A	Stems: C&P or F/I (G1.5); Bushes: spray or cut down and spray regrowth G100 or MM (ref 1).
119	Oleaceae	<i>Olea europaea</i> (olive)	2	6	47	T/A	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: F/I (G1.5); Seedlings: spray G200 or G200 + MM (ref 1).
120	Poaceae	<i>Brachiaria decumbens</i> (signal grass)	4	14	3.5	H/A	Grazing	Herbicide Control - Foliar application (Knapsack): glyphosate 360g/L @ 200mL/15L water; Foliar: glyphosate 360g/L @ 8L/ha; Handgun: glyphosate 360g/L @ 1.3L/100L water (ref 2).
121	Fabaceae	<i>Stylosanthes scabra</i> (shubby stylo)	4	4	4.37	H/A	N/A	Vines: CS&P (1.1.5) or spray G100 + MM or MM (ref 1).
122	Comelinaceae	<i>Commelina benghalensis</i> (airy wandering jew)	4	7	3.5	H/O	Collect and Bag	Spray G200 or G200 + MM (ref 1).
123	Poaceae	<i>Pennisetum purpureum</i> (elephant grass)	2	9	3.5	H/O	Grazing or mechanical removal	N/A (ref 2).
124	Zingiberaceae	<i>Hedychium coronarium</i> (wild ginger)	2	2	3.5	H/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200 + MM. Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gouge rhizome - fill hole with G1.5 with injector kit or similar (ref 1).
125	Phytolaccaceae	<i>Phytolacca octandra</i> (inkweed)	10	50	3.4	H/O	Hand pull or crown	CS&P (G1.5) or C&P (G1.5); spray G100 (ref 1).
126	Asclepiadaceae	<i>Asclepias curassavica</i> (red cotton bush)	9	43	3.4	S/O	Hand pull; Slash	Slash and/or spray G100 (ref 1).
127	Solanaceae	<i>Lycium ferocissimum</i> (African boxthorn)	17	5	4.47	S/O	N/A	Stems: C&P (G1.5); Regrowth: spray G200 + MM (ref 1).
128	Mimosaceae	<i>Prosopis pallida</i> (algarroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re-shooting can occur.	Basal bark - triclopyr + picloram Access@ @ 1L/60L diesel. Cut stump - triclopyr + picloram Access@ @ 1L/60L diesel. Overall spray - triclopyr + picloram Grazon DS® @ 350ml/100L water plus a wetting agent if plant is growing actively
129	Juncaceae	<i>Juncus articulatus</i> (jointed rush)	1	2	4	Ha/FO	Hand pull	Spot spray with Glyphosate, 2,2-DPA or MCPA + dicamba (ref 3).
130	Cactaceae	<i>Opuntia aurantiaca</i> (tiger pear)	1	2	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray: Basal Bark application: Injection: Triclopyr... 8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
131	Poaceae	<i>Arundo donax</i> (giant reed)	1	4	3.8	H/O	Physical removal of small infestations.	Spot spray or cut stump and spray with Glyphosate (ref 5).
132	Cactaceae	<i>Opuntia imbricata</i> (rope pear)	1	1	4	H/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray: Basal Bark application: Injection: Triclopyr... 8L/60L diesel. Picloram + Triclopyr: 1L/60L diesel. Amitrole: 1mL/3cm (ref 3).
133	Biognoniaceae	<i>Pyrostegia venusta</i> (flame vine)	1	1	4	V/O	N/A	CS&P (G1.5); spray G200 (ref 1).
134	Poaceae	<i>Cortaderia selloana</i> (pampas grass)	2	1	3.7	H/O	Small Plants: dig out by hand or machine	Stems: C&P (G1.5) or cut back and slash and spray regrowth G100 (ref 1).
135	Solanaceae	<i>Solanum hispidum</i> (giant devil's fig)	5	23	3.6	S/O	Hand pull	Spray G100 (ref 1).
136	Agavaceae	<i>Furcraea foetida</i> (Cuban hemp)	3	4	4.37	S/OA	Dig out by hand or machine	CS&P near ground or spray MM (ref 1).
137	Agavaceae	<i>Furcraea selioa</i> (hemp)	1	2	47	S/OA	Dig out by hand or machine	CS&P near ground or spray MM (ref 1).
138	Agavaceae	<i>Agave americana</i> (century plant)	4	9	3.7	S/OA	Dig out by hand or machine	CS&P near ground or spray MM (ref 1).

V-DEC MANAGEMENT PLAN - WEED TREATMENT & REMOVAL STRATEGY

139	Rutaceae	Murraya paniculata cv. Exotica (murraya)	6	26	3.6	S/O	Seedlings: Hand pull	Shrubs: CS&P or Fil (G1.5); Seedlings: spray G200 (ref 1)
140	Rosaceae	Rubus discolor (R. fruticosus complex, a blackberry)	4	10	3.7	S/OA	Slashing hinders growth, giving some control if plants are slashed before they seed	Grazon DS picloram/triclopyr 1:200 parts water + wetting agent. A variety of herbicides may be used to control this species including (ref 5)
141	Brassicaceae	Cakile edentula (American sea rocket)	4	24	3.7	H/U	Manually grub and destroy.	Spray G100 and replace with local species (ref 1).
142	Balsaminaceae	Impatiens walleriana (balsam)	2	6	3.7	H/O	N/A	Spray G100 (ref 1)
143	Agavaceae	Agave sisalana (sisal)	2	4	3.7	S/OA	Dig out by hand or machine	CS&P near ground or spray MM (ref 1)
144	Agavaceae	Agave vivipara var. vivipara (sisal)	2	3	3.7	S/OA	Dig out by hand or machine	CS&P near ground or spray MM (ref 1)
145	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	3.7	ST/A	Seedlings: Hand pull	Shrubs: CS&P or Fil (G1.5); Seedlings: spray G200 (ref 1)
146	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	3.7	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2.2-DPA (ref 3)
147	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	47	H/O	Hand pull and hang to dry	Spray MM or G200 or G200+MM if other weeds such as Lantana or Camphor Laurel are present (ref 1)
148	Fabaceae	Pueraria lobata (kudzu)	3	4	3.8	V.S/O	Slash: Diminish by shading site	CS&P (G1.5); spray G200 or MM (ref 1)
149	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	3	7	3.5	Ha/FO	Physical removal of small infestations.	Spot Spray with Glyphosate at 1.0L 100L water (ref 5).
150	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	3.7	Ha/OF	Hand pull small infestations.	Spray with or Digout Glyphosate. Occurs in waterways, thus EPA should be notified before any herbicide use (ref 5)
151	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	3.7	S/O	N/A	Stems: cut and fill segment (G1.5); Regrowth: spray G100 (ref 1)
152	Euphorbiaceae	Jatropha gossypifolia (cotton-leaf physic nut, bellyache bush)	1	1	3.7	S/O	Hand pull	Spray G100 (ref 1)
153	Malvaceae	Sida rhombifolia (Paddy's lucerne)	9	69	3.6	S/U	Hand pull or dig out	Spray with 2.4-D amine or fluoxypyr (ref 3)
154	Poaceae	Themeda quadrivalvis (grader grass)	8	25	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2.2-DPA (ref 3)
155	Poaceae	Andropogon virginicus (whisky grass)	6	14	3.6	H/A	Hand pull or dig out small infestations.	Spot spraying with Glyphosate or 2.2-DPA (ref 3)
156	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: Fil (G1.5); Seedlings: spray G200 (ref 1)
157	Acanthaceae	Justicia betonica (squimbletail)	2	4	4	S/O	Hand pull small infestations. Can be controlled by planting competitive native species.	Glyphosate known to be effective. Species known to occur in waterways, DERM should be contacted before spraying in waterways (ref 4)
158	Mimosaceae	Acacia boliviana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L 120L diesel, Triclopyr + Picloram 240 g/L + 120 g/L at 1.0L 60L diesel, Picloram 45 g/kg undiluted (ref 5).
159	Simaroubaceae	Ailanthus altissima (tree of heaven)	1?	3	3.5	T/O	Seedlings: Hand pull	Seedlings: CS&P (G1.5); Trees: Fil (G1.5); Seedlings: spray G200 or MM (ref 1)
160	Poaceae	Echinochloa crotone (awnless barnyard grass)	9	44	3.3	H/A	Hand or mechanical removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2)
161	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	8	53	3.4	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Aquatic areas - Glyphosate-ipa Land-commercial/industrial, rights of way - Glyphosate-ipa glyphosate-mas, imazapyr
162	Moraceae	Morus alba (white mulberry)	3	10	3.4	T/O	N/A	Trees: Fil (G1.5); stack cut branches above the ground to dry; Saplings: CS&P (G1.5); Seedlings: spray G200 (ref 1)
163	Arecaceae	Colocasia esculenta (taro)	3	4	3.4	H/AO	Hand pull.	Out at base and apply glyphosate or metsulfuron methyl. Plant often occurs in waterways so consult DERM prior to application (ref 6)
164	Cannaceae	Canna indica (canna lily)	3	9	3.3	H/O	Dig out entire plant	Cut/Slash and spray regrowth G200 or G200+MM. Collect and bag seeds. Resistant to herbicide (ref 1)

165	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3.4	S.V/O	N/A	Stems: CS&P (1:1.5); Vines: spray or cut down and spray regrowth G200 (ref 1)
166	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	ST/O	N/A	Stems: CS&P (G1.5) or spray G200; Seeds: collect, bag and remove (ref 1)
167	Cactaceae	Harmsia martinii (harmsia cactus)	2?	4	4	S/O	The use of the biological mealy-bug agent is recommended	Triclopyr + picloram at 1.0L 60L diesel, Dichloroprop 600 g/L at 1.0L 60L water, metsulfuron methyl 600 g/L at 2.0L 100L water (ref 5); CS&P (G1.5); spray G200 (ref 1)
168	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	Fil (G1.5) or C&P stumps. Cut and stack branches above ground to dry to prevent resprouting. Fil sprouted branches (G1.5) or spray regrowth G200 + MM or MM (ref 1)
169	Fabaceae	Erythrina cristagalli (cockspur coral tree)	2?	4	3.5	T/O	N/A	Fil (G1.5) or C&P stumps. Cut and stack branches above ground to dry to prevent resprouting. Fil sprouted branches (G1.5) or spray regrowth G200 + MM or MM (ref 1)
170	Sapindaceae	Koeberuteria elegans (Chinese rain tree)	1?	1	3.67	T/O	Seedlings: Hand pull	Trees: Fil (G1.5) or C&P stumps (G1.5); Saplings: CS&P (G1); stack cut branches above ground to dry; Seedlings: spray G200 (ref 1)
171	Zingiberaceae	Hedychium gardnerianum (ginger lily)	1?	3	3.6	H/O	Small Plants: Hand pull and dispose	Small Plants: spray G200 or G200+MM; Large Plants: cut and spray regrowth. If rhizomes are at ground level, cut stem and gouge rhizome - fill hole with G1.5 with injector kit or similar (ref 1)
172	Acanthaceae	Hypoestes phyllostachya (polka-dot plant)	3	5	3.5	H/O	Hand pull or crown and dispose	Spray G200 or G200+MM (ref 1)
173	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3.4	ST/O	Vines and Runners: hand pull; roll up and hang to dry.	Vines and Runners: CS&P (G1.5); Larger Stems, Roots and Nodes: spray G100 + MM or MM (ref 1)
174	Asteraceae	Coryza sumatrensis (tall feabane)	9	45	3.3	H/U	Hand or mechanic at removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2)
175	Fabaceae	Tipuaa tipu (tipuaa)	2	5	3.4	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: Fil (G1.5); Seedlings: spray G200 (ref 1)
176	Asteraceae	Tagetes minuta (stinking roger)	8	32	3.3	H/U	Hand pull and hang to dry	Spray MM or G200 or G200+MM if other weeds such as Lantana or Camphor Laurel are present (ref 1)
177	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	6	14	3.3	ST/A	Seedlings: Hand pull	Shrubs: CS&P or Fil (G1.5); Seedlings: spray G200 or G200+MM or MM, collect and bag seeds (ref 1)
178	Poaceae	Cenchrus echinatus (Mossman river grass)	8	43	3.3	H/A	Hand or mechanic at removal of young plants	Herbicide Control - Glyphosate 7mL/L water; Diclofop 600g/100mL; Fluazifop 50-100mL/10L water (ref 2)
179	Asteraceae	Coryza canadensis (Canadian feabane)	10	55	3.3	H/U	Hand or mechanic at removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2)
180	Euphorbiaceae	Euphorbia cyathophora (parrot's spurge)	8	20	3.3	H/O	Hand pull	Spray G100 (ref 1)
181	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3.3	H/O	Hand pull or dig up	Spray G100 (ref 1)
182	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3.4	H/O?	Hand pull	Spray G100 (ref 1)
183	Fabaceae	Desmodium intortum (greenleaf desmodium)	4	11	3.3	H/A	Hand pull or crown and dispose	CS&P tuberous roots (G1.5); spray G200 or G200+MM or MM; collect and bag seeds; Monitor regrowth over 2-3 years (ref 1)
184	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3.3	H/O	Hand Pull	Spot Spray: glyphosate or 2.2-DPA (ref 5)
185	Asteraceae	Coryza bonariensis (flax-leaf feabane)	7	38	3.3	H/U	Hand or mechanic at removal of small infestations	Seedlings: Atrazine or Chlorosulfuron in combination with competitive native species; Plants: Glyphosate and Tordon 75-D mix. Glyphosate ration depends on other weeds present (ref 2)
186	Solanaaceae	Solanum elaeagnifolium (a tobacco bush)	7	19	3.2	S/O	Hand pull	Spray G100 (ref 1)
187	Poaceae	Stenotaphrum secundatum (buffalo grass)	3	23	3.2	H/AO	Hand or mechanic at removal of small infestations	Spray: glyphosate @ 13mL/1L water (ref 2)

188	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3.1	ST/O	Hand pull small infestations. Slashing can be used but should be followed up by herbicide application.	Basal bark application of fluoxypyr (35mL/L Diesel); Stem injection Glyphosate (1L/2L Water); Cut stump application of fluoxypyr (1L/5L Diesel); Foliar Spray of fluoxypyr 1:100 for larger plants. 1:200 for seedlings (ref 2)
189	Rubiaceae	Coffea arabica (coffee)	3	7	3.2	ST/A	Saplings: Hand pull	Shrubs: Fil (G1) between flower and fruit set; Saplings: CS&P (G1); Seedlings: spray G200 or G200+MM (ref 1)
190	Bignoniaceae	Spathodea campanulata (African tulip tree)	17	1	3.4	T/O	N/A	Saplings: CS&P (G1.5); Trees: Fil (G1.5); Seedlings: spray G200 (ref 1)
191	Fabaceae	Macrotyloma axillare (perennial horse gram)	4	12	3.1	V.HA	N/A	Vines: CS&P (1.5) or spray G100+MM or MM (ref 1)
192	Indicaceae	Watsonia meriana var. bulbilifera (bulbil watsonia)	2	3	3.1	H/O	Dig up, bag and remove	Spray G200+MM (ref 1)
193	Passifloraceae	Passiflora edulis (passion fruit)	6	12	3.2	V/AO	Hand Pull	CS&P (G1.5); spray G200 or G200+MM (ref 1)
194	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3.1	H/O	Seedlings: Hand pull	Shrubs: CS&P or Fil (G1); Seedlings: CS&P (G1.5) or spray G200 (ref 1)
195	Dracaenaceae	Sansevieria trifasciata (snake plant)	2?	7	3.1	H/O	Hand pull or dig up	Spray G100+MM (ref 1)
196	Poaceae	Digitaria enantha (pangola grass)	5	20	3.1	HA	Hand pull or cultivation	Spot Spray: glyphosate or 2.2-DPA (ref 5)
197	Rosaceae	Eriobotrya japonica (loquat)	3	5	3.1	T/O	Seedlings: Hand pull	Saplings: CS&P (G1.5); Trees: Fil (G1.5); Seedlings: spray G200 or G200+MM or MM (ref 1)
198	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3.3	S/O	Biological controls available. cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	Spray: Basal Bark application; Injection: Triclopyr: 8L/60L diesel; Picloram + Triclopyr: 1L/60L diesel; Amitrol: 1mL/3cm (ref 3)
199	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.47	T/A	Mechanical or chain removal.	Basal Bark or cut stump application. Triclopyr 600g/L at 1.0L 120L diesel, Triclopyr + Picloram 240 g/L + 120 g/L at 1.0L 60L diesel, Picloram 45 g/kg undiluted (ref 5).
200	Mimosaceae	Acacia farnesiana (mimosa bush)	6	15	3.1	T/A	Mechanical removal of small plants.	Basal Bark or cut stump application of Triclopyr + Picloram 240 g/L + 120 g/L at 1.0L 60L diesel. Foliar application of Clopyralid 300g/L at 500mL/L water (ref 5)

Explanatory notes:
Sub-region: Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded
Rec no.: Total number of records for species within study area, Queensland Herbarium CORVEG and HERBRECS data.
Scores: Based on panel data of invasiveness, 5 (highest) to 3 (moderate), ? indicate doubtful scores.
Life forms: T-tree (woody plant >5m), ST-small tree (2-5m), S-shrub (woody <2m), H-herb (grasses & forbes), Ha-aquatic herbs.
Source: Agriculture, O-ornamental and landscaping, F-fish aquarium, U-unnintentional introduction and/or contaminant.

Abbreviations: Control Methods

CS&P = cut scrape and paint
S&P = scrape and paint
C&P = cut and paint
Fil = fill or inject stem

Abbreviations: Herbicides

G = Glyphosate, eg Roundup Bioactive, Weedmaster Duo
MM = metsulfuron methyl, eg Brushoff
F = Fluoxypyr, eg Starnae

Abbreviations: Herbicide Dilution Rates for High Concentration Applications

GU = Glyphosate undiluted
G1 = 1 part water to 1 part glyphosate
G1.5 = 1.5 parts water to 1 part glyphosate
G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations

G100 = 100mL glyphosate per 10L of water + surfactant, eg 20mL Li 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfactant, eg 50mL Li 700 per 10L
G200+MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg 2mL Agral per 10L water
G200+MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg 2mL Agral per 10L water
MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg 2mL Agral per 10L water
F100 = 100mL fluoxypyr per 10L water
F150 = 150mL fluoxypyr per 10L water

Other Abbreviations

= Locally non-indigenous native species

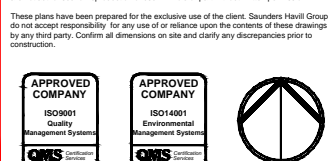
Ref 1. Big Scrub Rainforest Landcare Group (2008). 'Common Weeds of Subtropical Rainforests of Eastern Australia: A practical manual on their'.
Ref 2. Department of Primary Industries and Fisheries (QLD). 'Weeds and pest animals and ants'.
Ref 3. Holland et al. (1996). 'Suburban Weeds', DPI QLD.
Ref 4. Port Stephens Council (NSW). 'Weed Busters'.
Ref 5. Department of Primary Industries (NSW). 'Toxicous and Environmental Weed Handbook, 3rd Edition'.
Ref 6. Department of Environment and Conservation, 'Florabase', (DEC- WA)
Ref 7. Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2009) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1), pp. 64-62.

AMENDMENTS:	Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS	
B	22/02/2016	Submission Issue	MS	
C	25/05/2016	DNRM Submission Issue	MS	
D	24/08/2016	Edits to DNRM Submission Issue	MS	

CLIENT:	
PROJECT:	Spring Mountain Precinct
SCALE:	AS NOTED

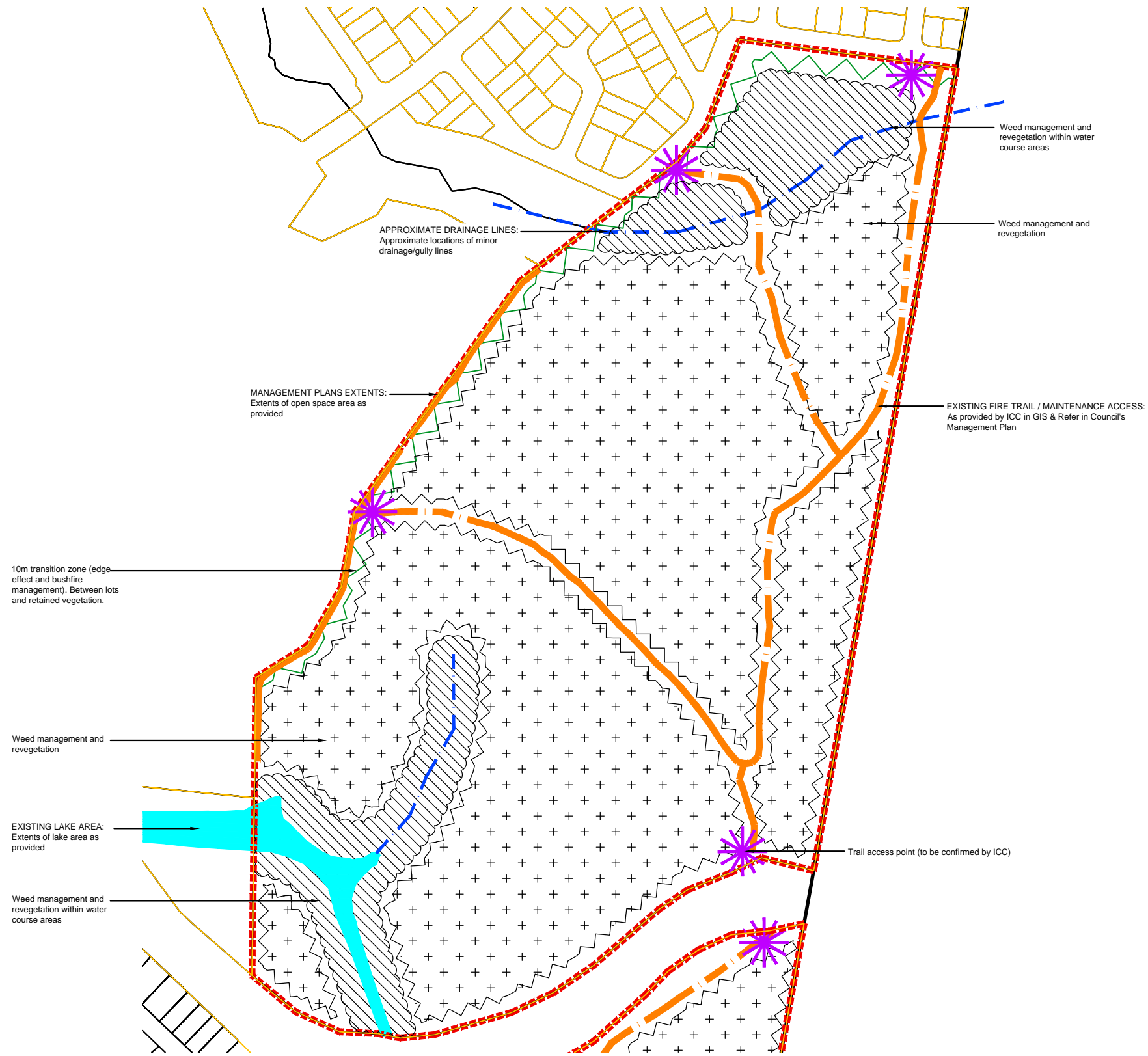
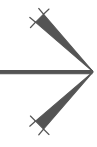
landscape architecture	
DRAWING: V-DEC Management Plan Weed Management Techniques	
DATE: August 16	CHECKED: MS
CLIENT REF.: 7243	DRAWN: TL
DRAWING No.: 7243 L 05 RP D	

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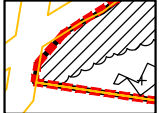
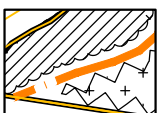

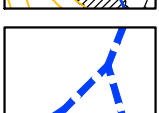

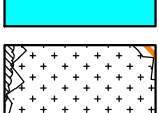
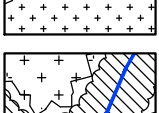
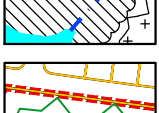



Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 705 on SP151175



LEGEND

-  Extent of management plan area
-  Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
-  Approximate minor drainage lines. Minor drainage / gully lines
-  Approximate mapped major drainage lines
-  Extent of existing lake area
-  Weed management and revegetation
-  Weed management and revegetation within water course areas
-  10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
-  Trail access point (To be confirmed by ICC)

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40 YEARS
 1975 - 2015


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APPROVED COMPANY
 ISO 9001 Quality Management System
 QMS

APPROVED COMPANY
 ISO 14001 Environmental Management System
 QMS



AMENDMENTS:			
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A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNR Submission Issue	MS
D	24/08/2016	Edits to DNR Submission Issue	MS

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: AS NOTED

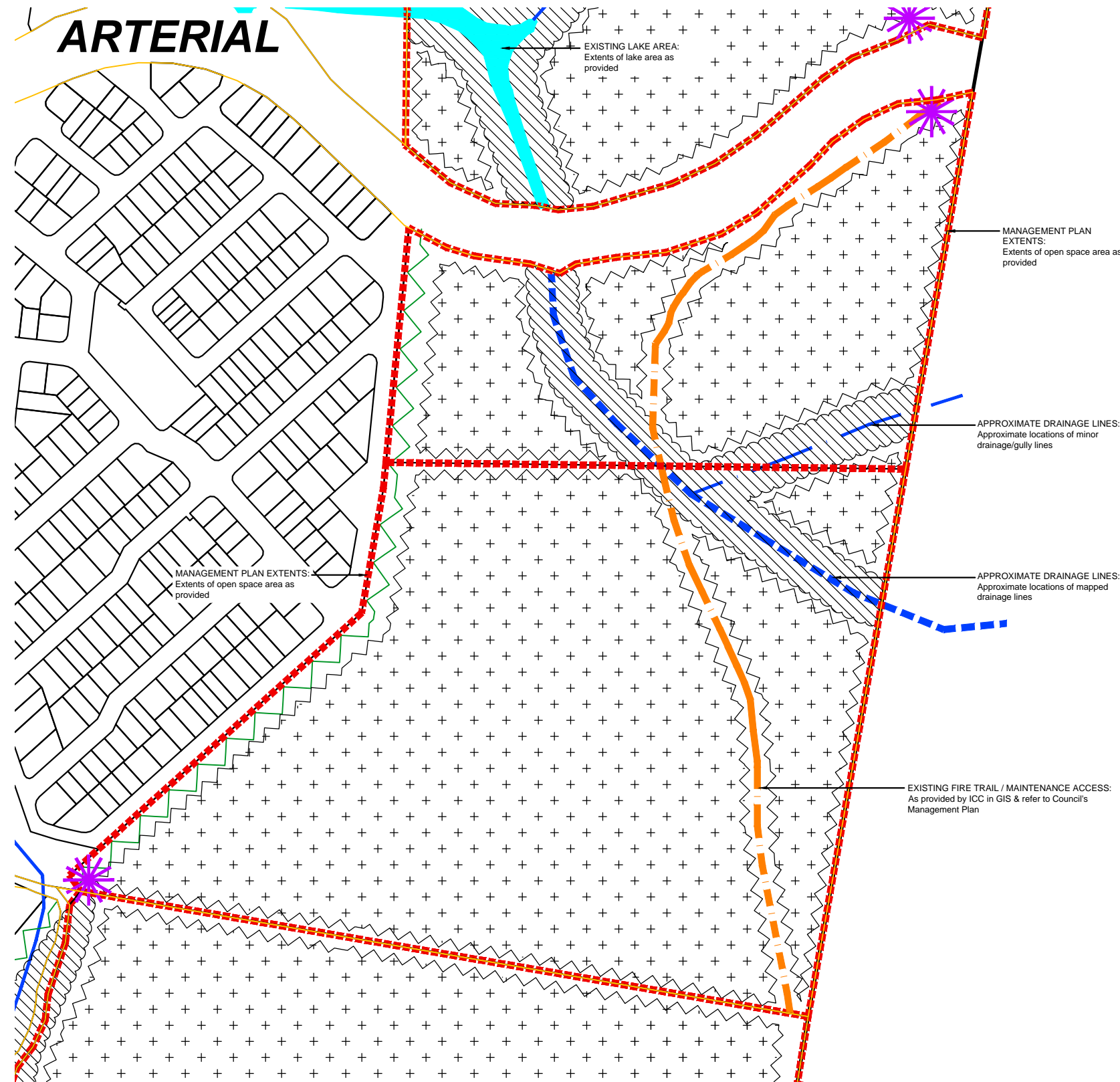
landscape architecture

DRAWING: V-DEC Management Plan
 Lot 75 on SP151175

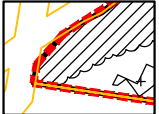
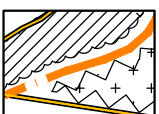

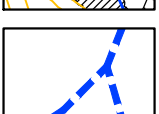



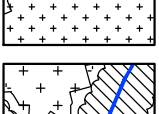

DATE: August 16 CHECKED: MS
 CLIENT REF.: 7243 DRAWN: TL
 DRAWING No.: 7243 L 06 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 740 on SPI79412



LEGEND


-  Extent of management plan area
-  Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
-  Approximate minor drainage lines. Minor drainage / gully lines
-  Approximate mapped major drainage lines
-  Extent of existing lake area
-  Trail access point (To be advised/confirmed by ICC)
-  Weed management and revegetation
-  Weed management (edge of vegetation) in water management. Between lots and retained vegetation
-  Trail access point (To be confirmed by ICC)

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40 YEARS
 1975-2015

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APPROVED COMPANY
 ISO 9001 Quality Management System
 APPROVED COMPANY
 ISO 14001 Environmental Management System


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C	25/05/2016	DNR Submission Issue	MS
D	24/08/2016	Edits to DNR Submission Issue	MS

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: 1:2000@A1 0 20 100m
 1:4000@A3

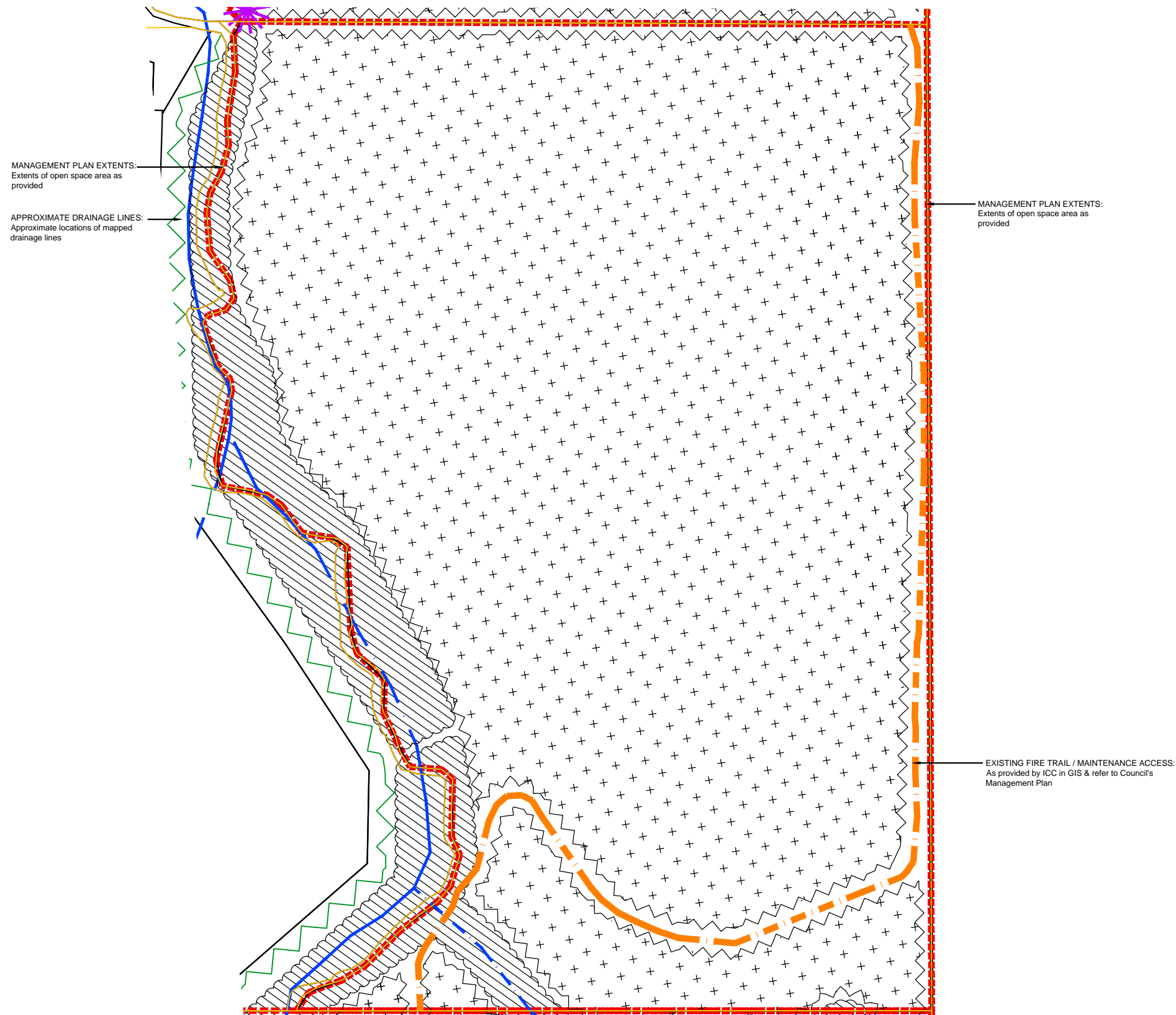
landscape architecture

DRAWING: V-DEC Management Plan
 Lot 740 on SP179412

DATE: August 16 CHECKED: MS
 CLIENT REF.: 7243 DRAWN: TL
 DRAWING No.: 7243 L 07 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT II on S31533



LEGEND

- Extent of management plan area
- Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
- Approximate minor drainage lines. Minor drainage / gully lines
- Approximate mapped major drainage lines
- Extent of existing lake area
- New maintenance tracks throughout revegetation areas. Not part of this management plan. Refer ICC requirements
- Trail access point (To be confirmed by ICC)

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■ surveying ■ town planning ■ urban design ■ environmental management ■ landscape architecture

40 YEARS
 1975-2015

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APPROVED COMPANY
 ISO 9001 Quality Management System
APPROVED COMPANY
 ISO 14001 Environmental Management System

AMENDMENTS:

Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT:

PROJECT: Spring Mountain Precinct

SCALE: 1:2000@A1 0 20 100m
 1:4000@A3

landscape architecture

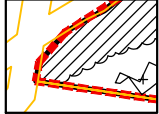
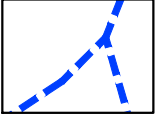
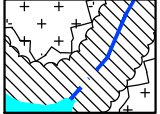
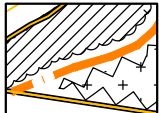



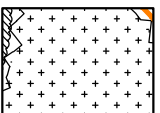


DRAWING: V-DEC Management Plan
 Lot 11 on S31533

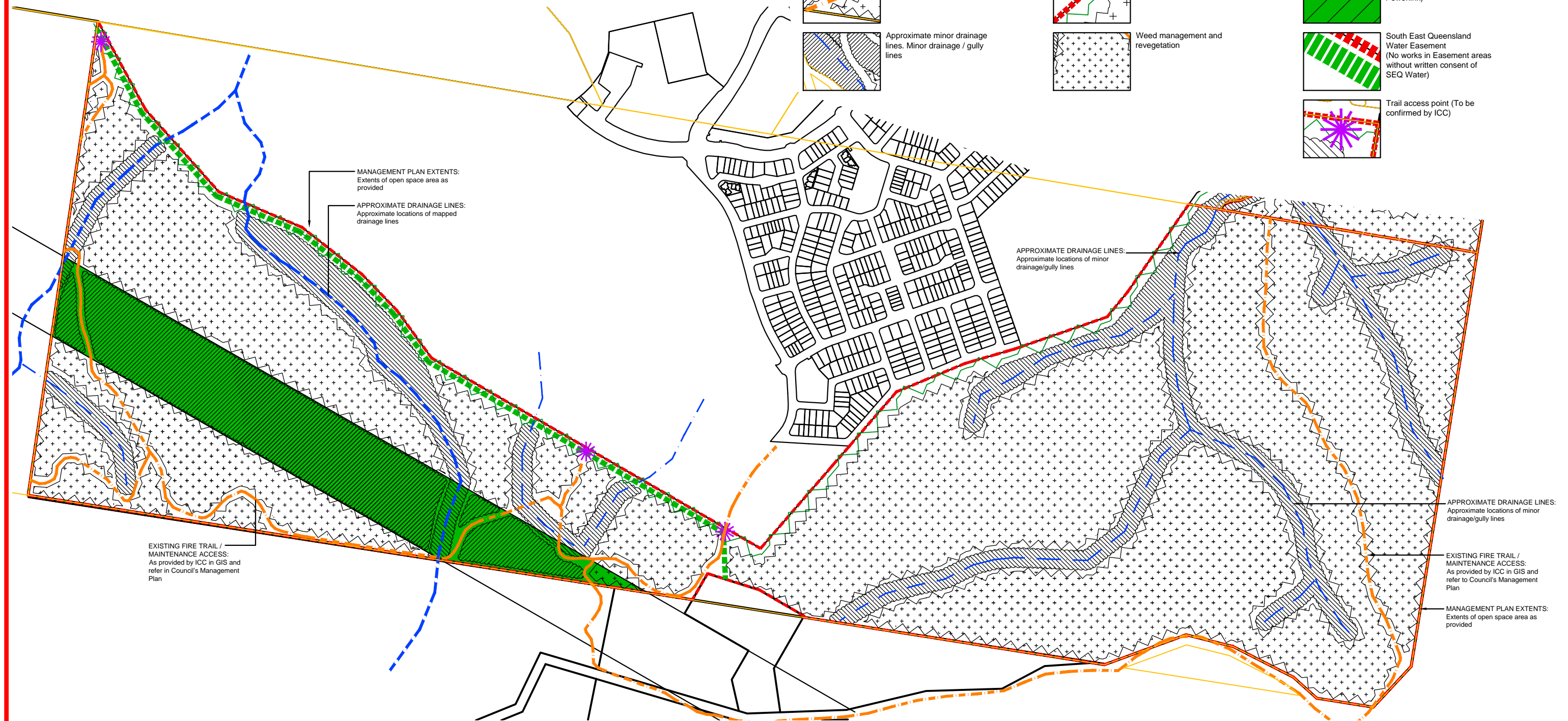
DATE: August 16 **CHECKED:** MS
CLIENT REF.: 7243 **DRAWN:** TL
DRAWING No.: 7243 L 08 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 745 on SP242282

LEGEND

	Extent of management plan area		Approximate mapped major drainage lines		Weed management and revegetation within water course areas
	Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan		Trail access point (To be advised/confirmed by ICC)		Powerlink Easement (No works in Easement areas without written consent of Powerlink)
	Approximate minor drainage lines. Minor drainage / gully lines		Weed management and revegetation		South East Queensland Water Easement (No works in Easement areas without written consent of SEQ Water)
					Trail access point (To be confirmed by ICC)



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40 YEARS
 1975-2015

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APPROVED COMPANY
 ISO9001 Quality Management System
 QMS

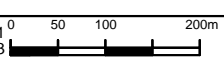
APPROVED COMPANY
 ISO14001 Environmental Management System
 QMS

AMENDMENTS:		
Issue	Date	Description
A	28/04/2015	Preliminary Issue
B	22/02/2016	Submission Issue
C	25/05/2016	DNRM Submission Issue
D	24/08/2016	Edits to DNRM Submission Issue

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: 1:4000@A1
 1:8000@A3



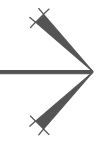
landscape architecture

DRAWING: V-DEC Management Plan
 Lot 745 on SP242282


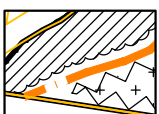

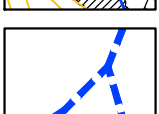



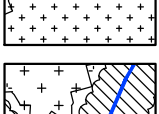

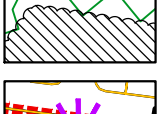
DATE: August 16 CHECKED: MS
 CLIENT REF.: 7243 DRAWN: TL
 DRAWING No.: 7243 L 09 RP D

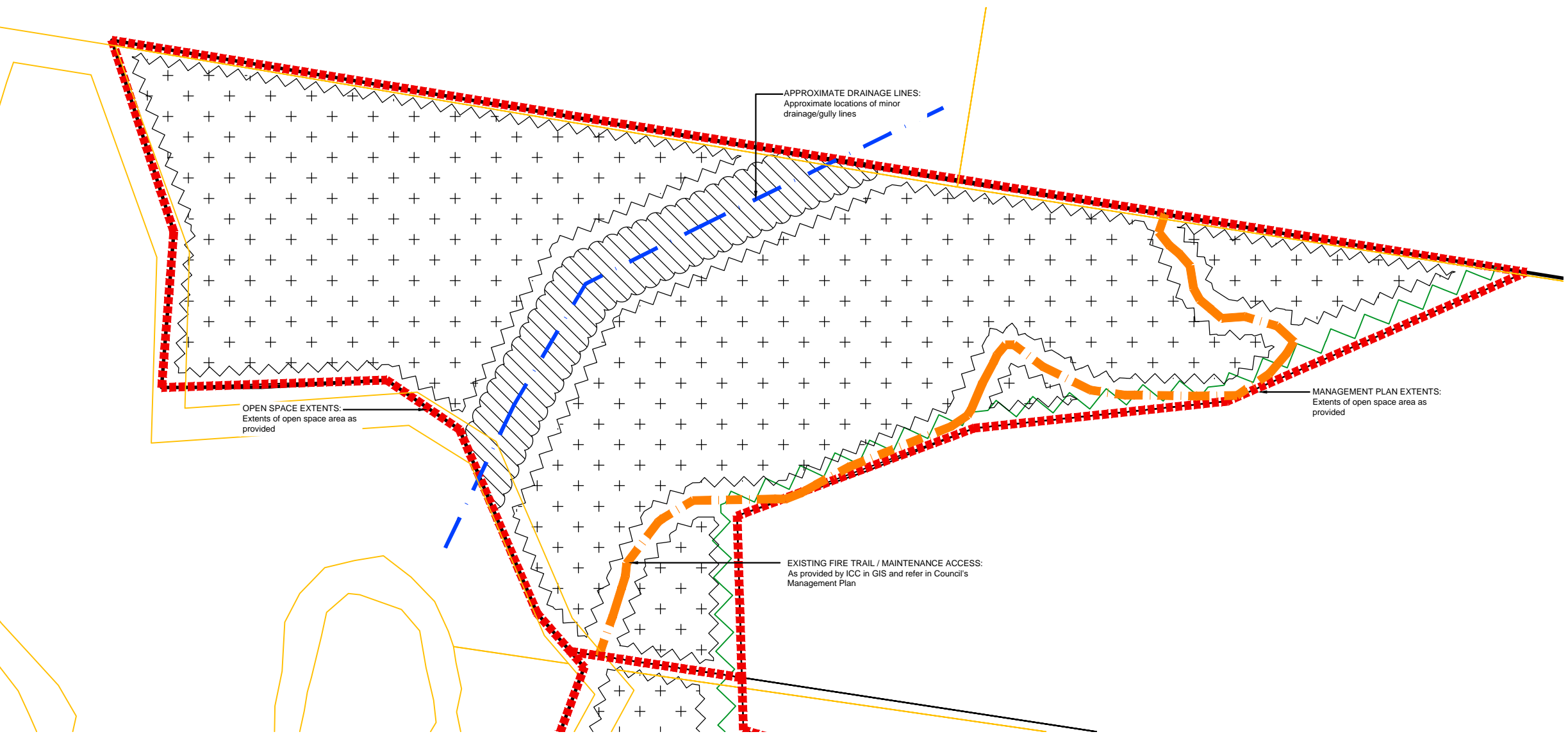
Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 753 on SPI89054



LEGEND

-  Extent of management plan area
-  Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
-  Approximate minor drainage lines. Minor drainage / gully lines
-  Approximate mapped major drainage lines
-  Extent of existing lake area
-  Future fauna management road solution
-  Weed management and revegetation
-  Weed management and revegetation within water course areas
-  10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
-  Trail access point (To be confirmed by ICC)



OPEN SPACE EXTENTS:
Extents of open space area as provided

APPROXIMATE DRAINAGE LINES:
Approximate locations of minor drainage/gully lines


MANAGEMENT PLAN EXTENTS:
Extents of open space area as provided

EXISTING FIRE TRAIL / MAINTENANCE ACCESS:
As provided by ICC in GIS and refer in Council's Management Plan

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AMENDMENTS:			
Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: 1:1500@A1 0 20 80m
1:3000@A3

landscape architecture

DRAWING: V-DEC Management Plan
Lot 753 on SP189054

DATE: August 16 CHECKED: MS
CLIENT REF.: 7243 DRAWN: TL
DRAWING No.: 7243 L 10 RP D

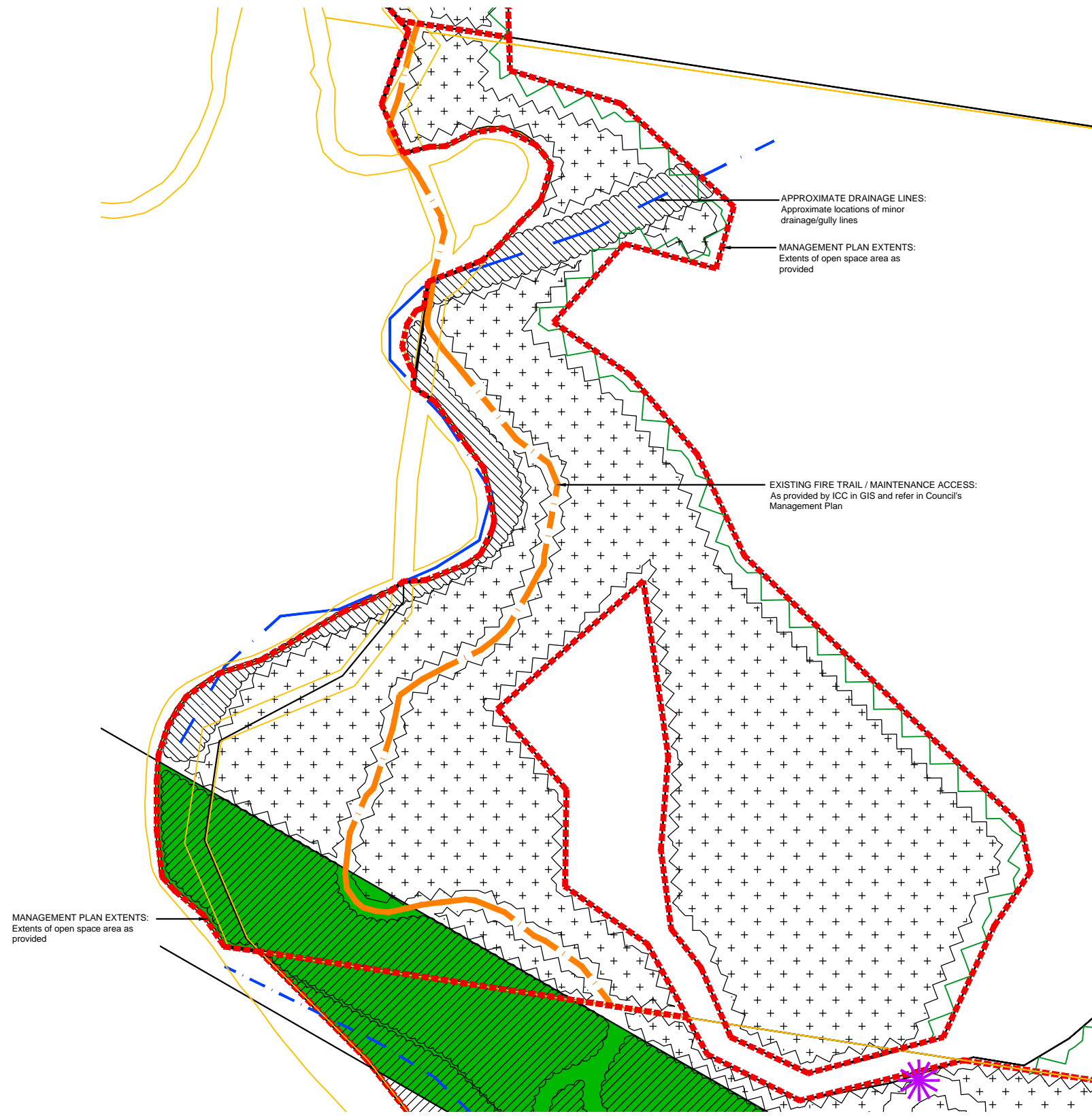
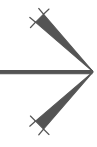
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Brisbane Emerald Gladstone
head office 9 Thompson St Bowen Hills Q 4006
phone 1300 123 SHG web www.saundershavill.com

surveying town planning urban design environmental management landscape architecture

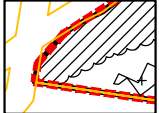
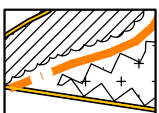

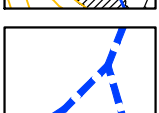

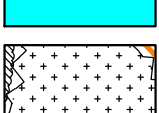
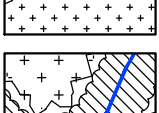
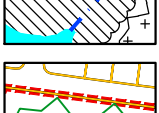




Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 751 on SPI89053



LEGEND

-  Extent of management plan area
-  Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
-  Approximate minor drainage lines. Minor drainage / gully lines
-  Approximate mapped major drainage lines
-  Extent of existing lake area
-  Weed management and revegetation
-  Weed management and revegetation within water course areas
-  10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
-  Powerlink Easement (No works in Easement areas without written consent of Powerlink)
-  Trail access point (To be confirmed by ICC)

MANAGEMENT PLAN EXTENTS:
Extents of open space area as provided

APPROXIMATE DRAINAGE LINES:
Approximate locations of minor drainage/gully lines

MANAGEMENT PLAN EXTENTS:
Extents of open space area as provided

EXISTING FIRE TRAIL / MAINTENANCE ACCESS:
As provided by ICC in GIS and refer in Council's Management Plan

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40 YEARS
1975-2015

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 ISO 9001 Quality Management System
 QMS

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AMENDMENTS:		
Issue	Date	Description
A	28/04/2015	Preliminary Issue
B	22/02/2016	Submission Issue
C	25/05/2016	DNRM Submission Issue
D	24/08/2016	Edits to DNRM Submission Issue

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: 1:2500@A1 0 20 40 120m
 1:5000@A3

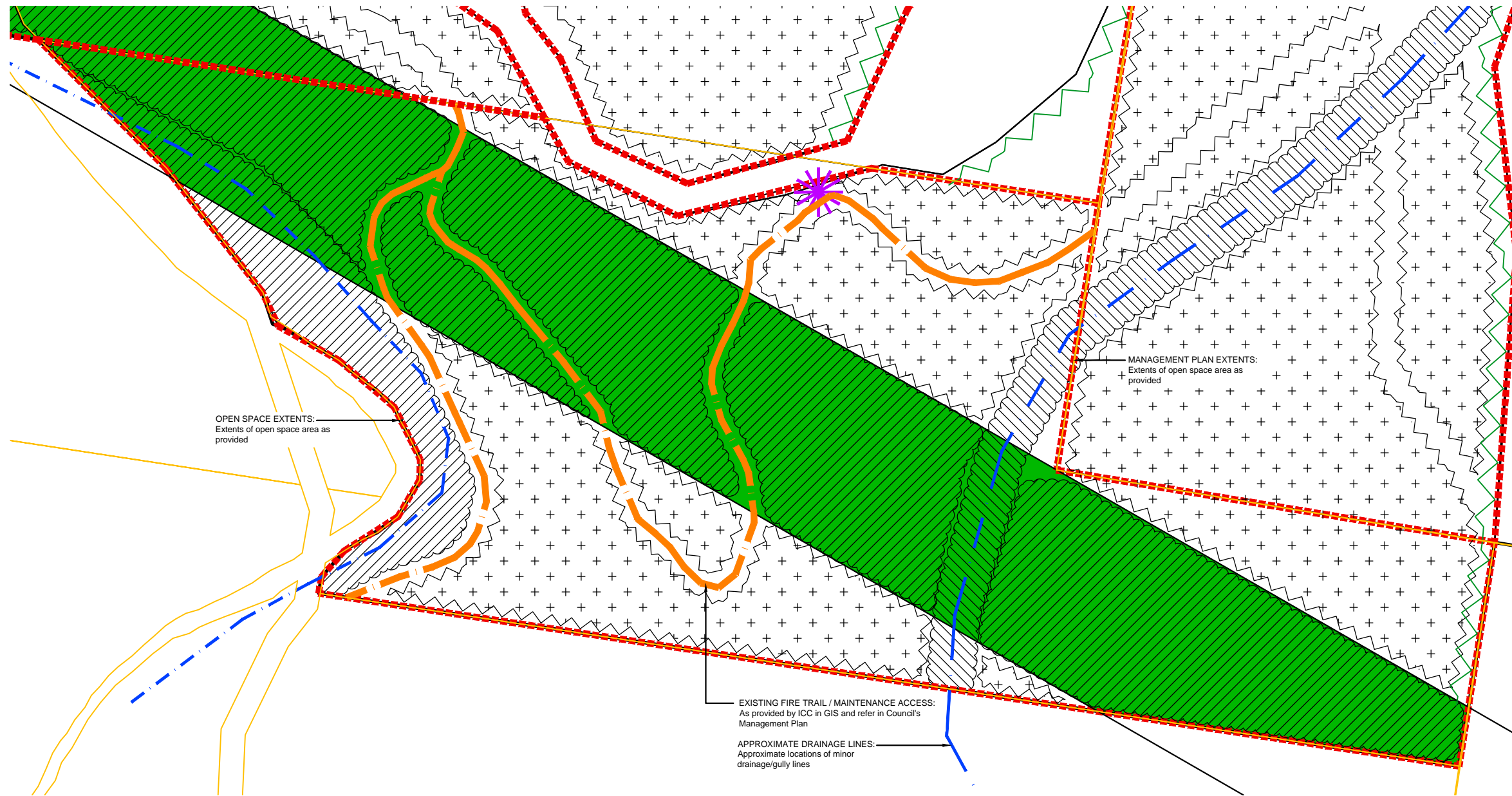
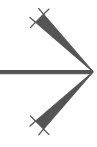
landscape architecture

DRAWING: V-DEC Management Plan
 Lot 751 on SP189053

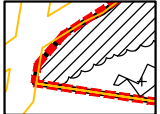
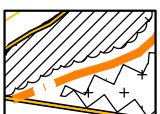

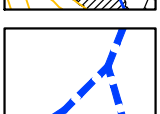

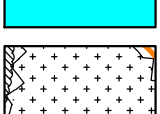




DATE: August 16 CHECKED: MS
 CLIENT REF.: 7243 DRAWN: TL
 DRAWING No.: 7243 L 11 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 748 on SPI89044



LEGEND

-  Extent of management plan area
-  Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
-  Approximate minor drainage lines. Minor drainage / gully lines
-  Approximate mapped major drainage lines
-  Extent of existing lake area
-  Weed management and revegetation
-  Weed management and revegetation within water course areas
-  10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
-  Powerlink Easement (No works in Easement areas without written consent of Powerlink)
-  Trail access point (To be confirmed by ICC)

OPEN SPACE EXTENTS:
Extents of open space area as provided

MANAGEMENT PLAN EXTENTS:
Extents of open space area as provided

EXISTING FIRE TRAIL / MAINTENANCE ACCESS:
As provided by ICC in GIS and refer in Council's Management Plan

APPROXIMATE DRAINAGE LINES:
Approximate locations of minor drainage/gully lines

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40 YEARS
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APPROVED COMPANY
 ISO 9001 Quality Management System
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APPROVED COMPANY
 ISO 14001 Environmental Management System
 QMS



AMENDMENTS:

Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: 1:2000@A1 0 20 100m
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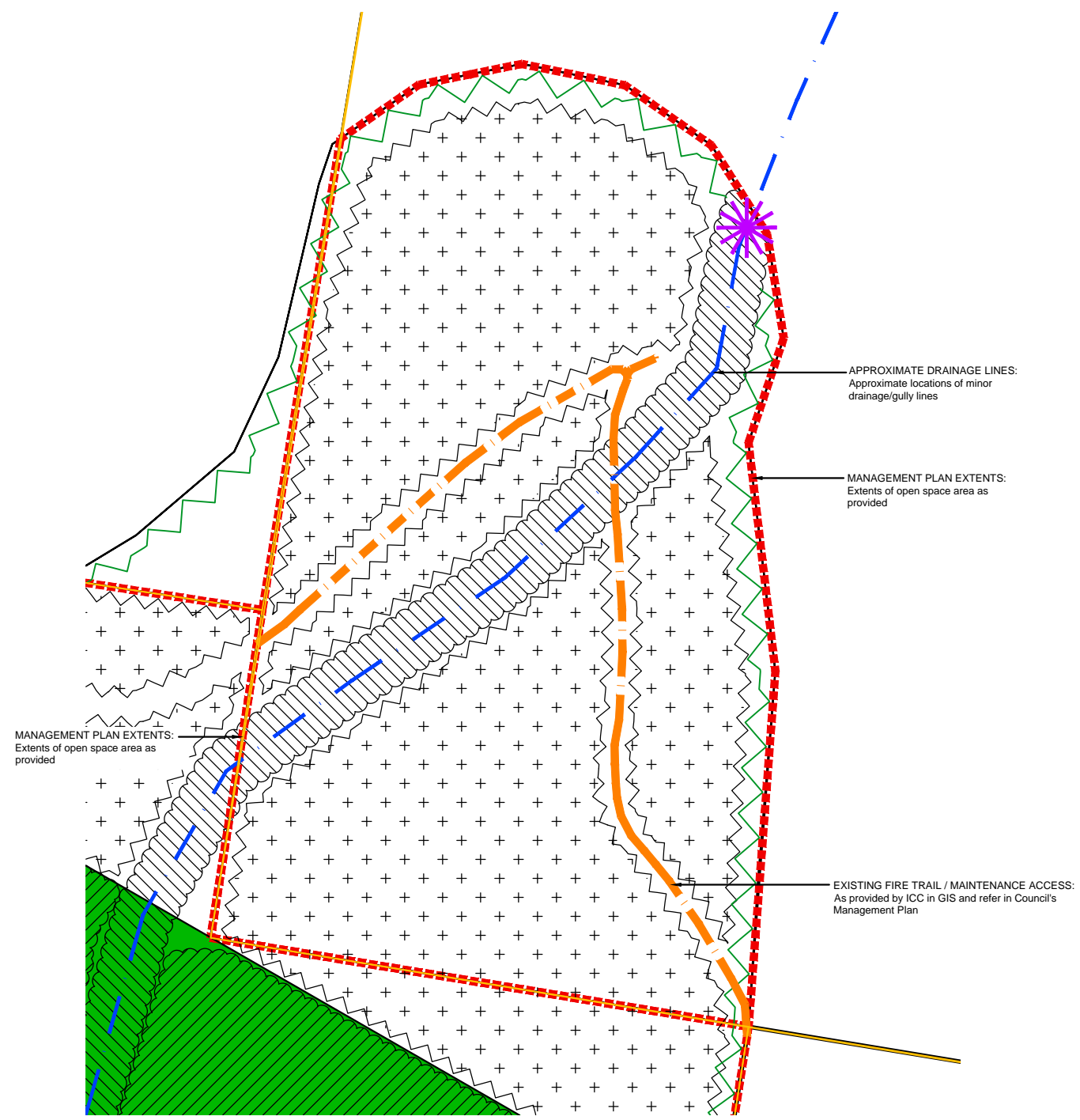
landscape architecture

DRAWING: V-DEC Management Plan
 Lot 748 on SP189044


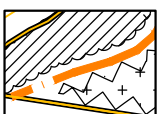

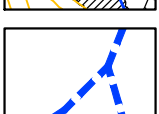

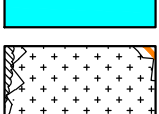




DATE: August 16 CHECKED: MS
 CLIENT REF.: 7243 DRAWN: TL
 DRAWING No.: 7243 L 12 RP D

Spring Mountain Precinct

V-DEC MANAGEMENT PLAN - LOT 747 on SPI89043



LEGEND

-  Extent of management plan area
-  Existing fire trail / maintenance access. As provided by ICC in GIS & Refer to Council's Management Plan
-  Approximate minor drainage lines. Minor drainage / gully lines
-  Approximate mapped major drainage lines
-  Extent of existing lake area
-  Weed management and revegetation
-  Weed management and revegetation within water course areas
-  10m transition zone (Edge effect & bushfire management). Between lots and retained vegetation
-  Powerlink Easement (No works in Easement areas without written consent of Powerlink)
-  Trail access point (To be confirmed by ICC)

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APPROVED COMPANY
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APPROVED COMPANY
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AMENDMENTS:			
Issue	Date	Description	Checked
A	28/04/2015	Preliminary Issue	MS
B	22/02/2016	Submission Issue	MS
C	25/05/2016	DNRM Submission Issue	MS
D	24/08/2016	Edits to DNRM Submission Issue	MS

CLIENT: 

PROJECT: Spring Mountain Precinct

SCALE: 1:2000@A1 0 20 100m
 1:4000@A3

landscape architecture

DRAWING: V-DEC Management Plan
 Lot 747 on SP189043

DATE: August 16 CHECKED: MS
 CLIENT REF.: 7243 DRAWN: TL
 DRAWING No.: 7243 L 13 RP D



Attachment F

Registration certificates for dedication of the land occurring from 2006
to 2011

CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887649

Search Date: 27/11/2014 15:24

Title Reference: 50272230

Date Created: 01/07/1999

Previous Title: 18053014

REGISTERED OWNER

Dealing No: 709476854 29/03/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 11 CROWN PLAN S31533
County of STANLEY Parish of STAPYLTON
Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10304135 (POR 11)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

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CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887649

Search Date: 27/11/2014 15:24

Title Reference: 50272230

Date Created: 01/07/1999

Previous Title: 18053014

REGISTERED OWNER

Dealing No: 709476854 29/03/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 11 CROWN PLAN S31533
 County of STANLEY Parish of STAPYLTON
 Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10304135 (POR 11)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

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CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887455

Search Date: 27/11/2014 15:13

Title Reference: 50418615

Date Created: 06/12/2002

Previous Title: 50272424
50319103

REGISTERED OWNER

Dealing No: 709476854 29/03/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 705 SURVEY PLAN 151175
County of STANLEY Parish of STAPYLTON
Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10300222 (POR 5)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

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CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887467

Search Date: 27/11/2014 15:13

Title Reference: 50614613

Date Created: 29/06/2006

Previous Title: 13530113

REGISTERED OWNER

Dealing No: 709716015 27/06/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 748 SURVEY PLAN 189044
County of STANLEY Parish of STAPYLTON
Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 13530113 (POR 65)
2. EASEMENT IN GROSS No 602038460 (D972700) 22/12/1970
BURDENING THE LAND
TO QUEENSLAND ELECTRICITY COMMISSION
OVER EASEMENT B ON RP125089
3. TRANSFER No 703439374 07/07/1999 at 14:47
EASEMENT IN GROSS: 602038460 (D972700)
QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED
A.C.N. 078 849 233
4. EASEMENT IN GROSS No 703230867 17/03/1999 at 14:06
burdening the land
QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED
A.C.N. 078 849 233
over
EASEMENT JJ ON SP117001

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887463
Search Date: 27/11/2014 15:13

Title Reference: 50846699
Date Created: 25/05/2011

Previous Title: 50812373
50827021

REGISTERED OWNER

Dealing No: 713779352 28/03/2011

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 745 SURVEY PLAN 242282
County of STANLEY Parish of STAPYLTON
Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10821215 (POR 19A)
2. EASEMENT IN GROSS No 601668680 (D972706) 22/12/1970
BURDENING THE LAND
TO QUEENSLAND ELECTRICITY COMMISSION
OVER EASEMENT D ON RP124920
3. TRANSFER No 703439374 07/07/1999 at 14:47
EASEMENT IN GROSS: 601668680 (D972706)
QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED
A.C.N. 078 849 233
4. EASEMENT IN GROSS No 601668682 (L886473X) 18/03/1994
BURDENING THE LAND
TO QUEENSLAND ELECTRICITY COMMISSION
OVER EASEMENT A ON RP818451
5. TRANSFER No 703443113 08/07/1999 at 16:00
EASEMENT IN GROSS: 601668682 (L886473X)
QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED
A.C.N. 078 849 233
6. EASEMENT IN GROSS No 711922895 15/09/2008 at 15:53
burdening the land
SOUTHERN REGIONAL WATER PIPELINE COMPANY PTY LTD A.C.N. 117
898 174
over
EASEMENTS C AND E ON SP216426

CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887462

Search Date: 27/11/2014 15:13

Title Reference: 50614649

Date Created: 29/06/2006

Previous Title: 50418614

REGISTERED OWNER

Dealing No: 709715819 27/06/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 740 SURVEY PLAN 179412
County of STANLEY Parish of STAPYLTON
Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10300222 (POR 5)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

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Requested By: D APPLICATIONS CITEC CONFIRM

CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887466

Search Date: 27/11/2014 15:13

Title Reference: 50614858

Date Created: 30/06/2006

Previous Title: 10385040

REGISTERED OWNER

Dealing No: 709715763 27/06/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 751 SURVEY PLAN 189053

County of STANLEY

Parish of STAPYLTON

Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10385040 (POR 15)
2. EASEMENT IN GROSS No 602589417 (D972698) 22/12/1970
BURDENING THE LAND
TO QUEENSLAND ELECTRICITY COMMISSION
OVER EASEMENTS D & E ON RP125091
3. TRANSFER No 703439374 07/07/1999 at 14:47
EASEMENT IN GROSS: 602589417 (D972698)
QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED
A.C.N. 078 849 233
4. EASEMENT IN GROSS No 703230867 17/03/1999 at 14:06
burdening the land
QUEENSLAND ELECTRICITY TRANSMISSION CORPORATION LIMITED
A.C.N. 078 849 233
over
EASEMENTS FF AND GG ON SP117000

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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Requested By: D APPLICATIONS CITEC CONFIRM

CURRENT TITLE SEARCH

DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 19887465

Search Date: 27/11/2014 15:13

Title Reference: 50614776

Date Created: 30/06/2006

Previous Title: 10385041

REGISTERED OWNER

Dealing No: 709715866 27/06/2006

IPSWICH CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 753 SURVEY PLAN 189054

County of STANLEY

Parish of STAPYLTON

Local Government: IPSWICH

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 10385041 (POR 19)

ADMINISTRATIVE ADVICES - NIL

UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

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Requested By: D APPLICATIONS CITEC CONFIRM



Attachment G

Letter from the DILGP Noting amendments to SEQRP 2005 though dedications made by SLC



Department of Infrastructure,
Local Government and Planning

Our ref: DEPC16/259

19 April 2016

Mr James Barker
Assistant Secretary
Commonwealth Department of the Environment
GPO Box 787
CANBERRA ACT 2600

Email: James.Barker@environment.gov.au

Dear Mr Barker

The Queensland Department of Infrastructure, Local Government and Planning (the Department) is aware that the Commonwealth Department of the Environment (DoE) have been in negotiations with Springfield Land Corporation (SLC) in relation to the impact of the inclusion of koala as a threatened species under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Department is responsible for the South East Queensland Regional Plan (SEQRP). The regional plan is a statutory instrument that establishes the framework that guides the orderly development of the South East Queensland region. The Department wishes to inform DoE that the SEQRP (2005 and subsequent versions) has been prepared on the premises that the land set aside by SLC for conservation purpose was protected for that purpose as:

- 1) the Springfield Structure Plan (SSP) and Springfield Infrastructure Agreement (SIA), which form part of the Ipswich Planning Scheme, were considered during the preparation of the 2005 SEQRP and subsequent amendments;
- 2) the regional plan's land use categories of Urban Footprint and Regional Landscape and Rural Production Areas (RLRPA) within the Greater Springfield project are influenced and reflective of the SSP, SIA and specifically areas designated for conservation; and
- 3) as further areas of conservation land are dedicated these are intended to be reflected in new versions of the SEQRP as RLRPA.

The specific action of designating and protecting the land as conservation by SLC through the Springfield planning framework, which includes the SSP and SIA, has informed the designation by the Department of these lands in the SEQRP under the RLRPA category.

Level 12, Executive Building
100 George Street Brisbane
PO Box 15009 City East
Queensland 4002 Australia
Telephone +61 7 3452 7009
Website www.dilgp.qld.gov.au
ABN 251 66 523 889

I trust this clarifies the importance of SLC actions in preserving this land for conservation purposes and how their actions informed the designation of this land accordingly in the SEQRP.

If you require further information, I encourage you to contact Mr James Ross, Acting Director, Regional and Precinct Planning in the Department on (07) 3452 7608 or by email at James.Ross@dilgp.qld.gov.au.

Yours sincerely



Stuart Moseley
**Deputy Director-General
Planning Group**

cc: Mr Russell Luhrs
Springfield Land Corporation
Email: r.luhrs@springfieldland.com.au

19/04/16