LENDLEASE COMMUNITIES

SPRING MOUNTAIN

SITE BASED MANAGEMENT PLAN - HAUL ROAD

saunders havill group

01 CONTENTS

02 INTRODUCTION

Introduction

This phase specific Site Based Management Plan (SBMP) has been prepared for the construction of the 'Haul Road" associated with Springfield Rise at Spring Mountain Estate and incorporates the management intent, objectives and specifications detailed within the overarching environmental management plans prepared for the development.

The aim of this SBMP is to set out and guide the implementation of effective measures to ameliorate any impacts, and to ensure and manage the long term sustainability of the project and its natural environment, specifically for Matters of National Environmental Significance (MNES) listed species known to occur within the Spring Mountain project site namely:

- Phascolarctos cinereus (Koala)
- Pteropus poliocephalus (Grey-headed Flying-fox)
- Plectranthus habrophyllus

The document has been developed in accordance with the Spring Mountain SMBP, prepared by **Yurrah**, as an updated and re-issued phase specific management plan.

The purpose of this SBMP is to provide a single, consolidated management document which incorporates requirements of numerous ecological management plans prepared for Spring Mountain. From these documents, this SBMP extracts management objectives, implementation requirements, performance indicators and monitoring and auditing actions relevant to the specific the development of Haul Road for both the construction and operational phase.

Environmental Pre-Start Checklist

This Site Based Management Plan has been prepared to create an on-site working document with easy to find references to management measures without the comprehensive details of the assessment and approval. Core to contractors working under this SBMP is completion of the Spring Mountain Pre-Start Environmental Checklist. Completion and sign off of this checklist, inclusive of attachments should will warrant compliance with this SBMP and broader approval parameters.

Details on this SBMP can be found within the following documents:

- Site Based Management Plan for Spring Mountain Community, prepared by **Yurrah** (July 2015)
- Threatened Flora Management Plan for Spring Mountain, prepared by **Yurrah** (July 2015)
- Fauna Management Plan for Spring Mountain, prepared by **Saunders Havill Group** (July 2015)
- Code of practice for Welfare of Animals effected by Land Clearing and Other Habitat Impacts, and Wildlife/ Spotter Catchers (Draft) prepared by **Wildlife Warriors and Voiceless** (2009)
- Offsets Management Plan prepared for Spring Mountain, prepared by **Saunders Havill Group** (July 2015)
- Bushfire Management Plan for Spring Mountain, prepared by **Cardno** (2016)

TThis SBMP should also be read in conjunction with all planning approvals and conditions for the Haul Road including approved civil, landscape, vegetation management and rehabilitation plans and specifications. This SBMP has also been prepared to meet compliance and auditing requirements of the Spring Mountain Commonwealth Department of the Environment (DoE) approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC) (Ref: 2013/7057), specifically Conditions 3-6.

This SBMP-V13 outlines construction measures specific to V13 to manage of impacts to native flora and fauna.

Construction

- Vegetation Management (Clearing & Protection)
- Protection of MNES Fauna (Koala and Grey-headed Flying Fox) and Native Wildlife
- Maintenance of Safe Wildlife Movement Opportunities
- Fauna Habitat Rehabilitation
- Threatened Flora Management
- Pest Management
- Fire Management
- Education and Awareness

03 SITE DESCRIPTION

Site Description

The Haul Road is a major collector street, connecting Village6, 8, 10, 11, 12 and 13. The Haul Road is accommodated within a 20m road reserve inclusive of a 9m pavement and two 5.5m verges. The proposed road will accommodate a cycle lane but will not propose pedestrian access.

Natural Features

The Haul Road traverses throughout a number of regional ecosystem communities situated on Landzone 9-10 defined as fine to coarse grained sedimentary rocks. The general description of the topography from which the Haul Road is proposed is typical of undulating country, with the steeper slopes experiencing some levels of erosion. The vegetation structure observed throughout the assessment included typical dominance of canopy trees including *Corymbia citriodora (Spotted Gum), Eucalyptus siderophloia (Grey Ironbark) and Eucalyptus crebra (Narrow Leaf Ironbark)* and a sub-canopy layer dominated by a number of Acacia species including *Acacia disparrima (Hickory Wattle), Acacia concurrens (Black Wattle) and Acacia leiocalyx (Early Flowering Black Wattle),* as well as *Alphitonia excelsa (Soap Tree)* and scattered *Allocasuarina littoralis (Black She Oak)*. The shrub layer is relatively sparse however included similar species observed throughout the canopy and sub-canopy layer. The ground layer contained both native and exotic species with the introduced species increasing in dominance throughout and adjacent to disturbed areas, including old vehicle and motorbike tracks, and throughout drainage and overland flow paths. Very few trees retained hollows and nests observed throughout the survey were of very common highly mobile avifauna. Although some exposed rock was observed, no areas contained dens or rock overhangs that potentially support small mammals and other native fauna.

Photo: Grey-headed Flying-fox (listed as Vulnerable under EPBC Act (Cth))

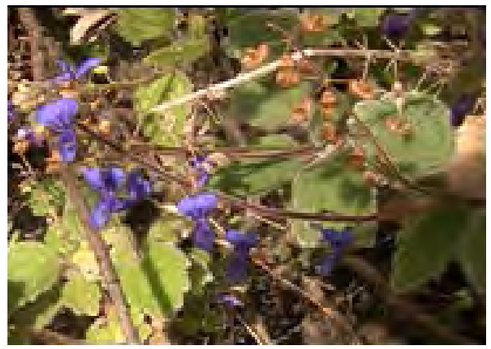


Photo: Plectranthus habrophyllus (listed as Endangered under EPBC Act (Cth))

Extract: Haul Road and surrounding development site from the Spring Mountain Precinct Plan

Photo: Koala (listed as Vulnerable under EPBC Act (Cth) and NCA (Qld))

04 ECOLOGICAL VALUES - SUMMARY

Ecological Values

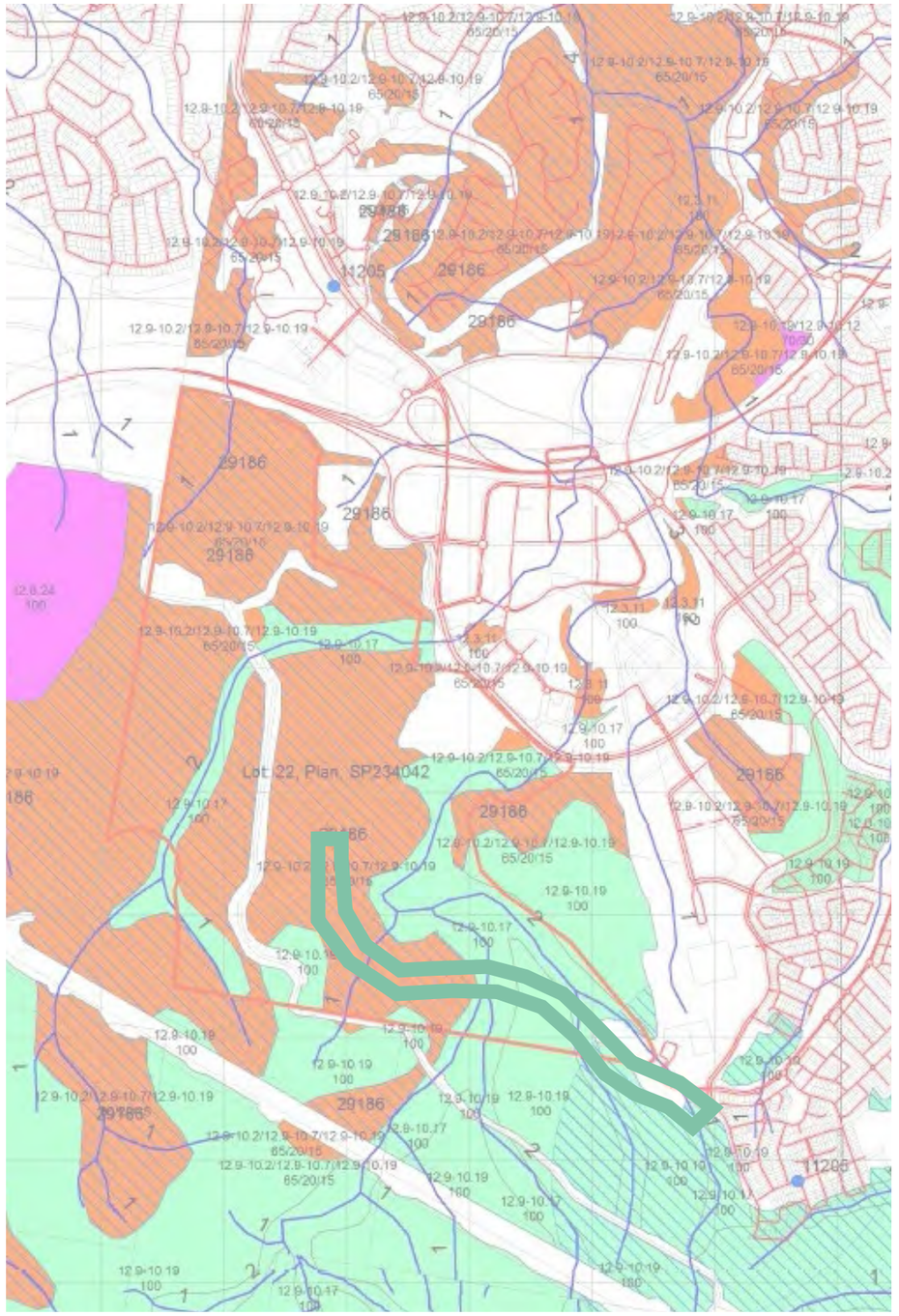
Numerous ecological surveys were undertaken over the site as part broader concept planning for the Spring Mountain project. Pre-clearance flora and fauna surveys have been undertaken by **Saunders Havill Group** and **Queensland Fauna Consultancy**, respectively, over the Haul Road alignment The following comments summarise the ecological values:

- The Haul Road is mapped as containing vegetation comprised of composite Of Concern RE12.9-10.2/12.9-10.7/12.9-10.19 and Least Concern RE12.9-10.17a.
- Species recorded within the canopy included ***Angophora leiocarpa (Smooth Bark Apple), Corymbia intermedia (Pink Bloodwood), Corymbia trachyphloia (Brown Bloodwood), Eucalyptus microcorys (Tallowwood), Eucalyptus seeana (Narrow Leaf Red Gum), and Eucalyptus siderophloia (Grey Ironbark).***
- Disturbances within this transect were restricted to some introduced species within the ground layer which were mainly concentrated along the vehicle access tracks. Some evidence of logging and fire were also recorded throughout the survey. Species recorded within the shrub layer were dominated by Acacia species including ***Acacia leiocalyx (Early Flowering Black Wattle), Acacia concurrens (Black Wattle) and Acacia disparrima (Hickory Wattle.***
- The ground layer was relatively dense with the occasional rocky outcrop and small patches of leaf litter and bare earth.
- No State or Commonwealth threatened flora or fauna species were identified within V13 as part of historical and pre-clear surveys.

<u>Regional Ecosystem Descriptions</u>

Least Concern RE12.9-10.17	*Eucalyptus acmenoides, E. major, E. siderophloia +/- Corymbia citriodora subsp. variegata woodland on sedimentary rocks*
Least Concern RE 12.9-10.19a	*Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegata, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments.*
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, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*
Of Concern RE 12.9-10.7	*Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Evidence of fire with greater densities of Acacia regrowth.



Extract: Regional Ecosystem Mapping

05 ENVIRONMENTAL MANAGEMENT

Management – General

This SMBP sequences through details on a number of site specific outcomes for fauna, vegetation management and operational controls associated with the development of the Haul Road. Logically, the document works through construction processes and has been prepared as a sub-plan to the SBMP for Spring Mountain prepared by **Yurrah**.

Environmental Training

TThis SBMP is to be issued to all site contractors (and sub-contractors) and kept within site construction offices. Elements of compliance with the document will form part of the responsibility of the Principle Site Contractor. Training on the management measures outcomes in this SBMP will occur as part of the broader site environmental management and workplace health and safety procedures. This will include the following steps:

1. A copy of this SBMP to be made available to all site contractors (and sub-contractors)
2. Outline of the SBMP and its requirement relative to the site and / or particular scope of a contract forming part of the site induction requires contractors to read, acknowledge and sign the document prior to commencement of site works.
3. Requirements of this SBMP to be incorporated into workplace checklists, work method statements and toolbox talks.
4. Weekly review and report on compliance with the SBMP by the Principle Contractor.

Spring Mountain Risk Management Process

Adaptive Management

Adaptive management refers to a way of managing natural resources where management actions are regularly revised and, if necessary, modified based on monitored changes in environmental condition and/or changes in base knowledge which underpins the original management approach. This SBMP has been based on, as far as practical, the current state of knowledge of the species ecology and best practice habitat management approaches. When new facts emerge from future research, they should be immediately integrated into the plan so it remains consistent with the current state of knowledge (and best practice).

Statutory Requirements

Activities associated with this SBMP will comply with the relevant provisions of legislation and regulations and policies of the following:

- *Environment Protection and Biodiversity Conservation Act 1999 (Cth)* with regard to species listed under the provisions of this Act;
- *Nature Conservation Act 1992 (Qld)* with regard to species listed under the provisions of this Act;
- *Land Protection (Pest and Stock Route Management) Act 2002 (Qld)* with regard to weeds and pests; and
- The requirements of the Commonwealth, State and /or Local Government decision notices including any relevant "conditions of approval".

Roles and Responsibilities

Proponent	**Lendlease Communities Pty Ltd**	**Lendlease Communities Pty Ltd** Contact: John Kibble
Contractor	Appointed party or company that performs the construction works on site and included all employees of the Contractor and sub-contractors.	**Shadforth Civil** Contact: Tony Hopper
Site Supervisor	Appointed party contracted by the Proponent to oversee daily site operations and site management.	**Arcadias** Contact: Christo Louw
Environmental Representative	Appointed party contracted by the Proponent to oversee environmental compliance.	**Saunders Havill Group** Contact: Andrew Craig
Fauna/Spotter Catcher	Appointed Contractor employed to implement fauna welfare responsibilities with vegetation clearing operations. The Fauna Spotter Catcher is a person who holds a rehabilitation permit with an extended authority issued by **EHP** specifying the gilder may take, keep or use an animal whose habitat is about to be destroyed by a human activity.	**Queensland Fauna Consulting** Contact: Bryan Robinson
Koala Spotter	Appointed Contractor employed to implement Koala welfare responsibilities associated with vegetation clearing operations. The Koala Spotter is a person who holds a tertiary qualification in Biology or Zoology, or who is demonstrably experienced in the identification and location of Koalas in their natural habitat and has an authorisation from **EHP** to conduct such activities. For example, demonstrably experienced may include a Koala keeper employed by a licensed wildlife exhibitor (i.e. zoo) may be capable of demonstrating competence in locating Koalas.	**Queensland Fauna Consulting** Contact: Bryan Robinson
Council	**Ipswich City Council (ICC)**	**Ipswich City Council (ICC)** Contact: Tim Foote

06 PRE-CLEARANCE - VEGETATION MANAGEMENT

P1– Vegetation Management (General)

Vegetation clearing must be undertaken in accordance with approved plans to ensure protection of areas of ecological significance and agreed retained linear open space corridors. Habitat trees where marked for retention must not be damaged as a result of tree clearing and or are to be removed at the specification and control of the appointed Fauna Spotter.

Table 1 describes the relevant management requirements to address this issue.

<u>Objective</u>

1. To identify clearing in the plans and specification, trees to be retained and trees to be cleared. Areas of retention should be clearly marked and fenced.
2. To ensure that all contractors understand the requirements of protection and retention and install protective devices to ensure no additional clearing occurs.
3. To ensure that the work program is such as to minimise the time between when clearing occurs and the cleared ground is stabilised.
4. To ensure that cleared material is mulches or wood-chipped as appropriate for recycling
5. To protect linear open space from construction damage and run-off.

<u>Management Strategy</u>

- Clearing to be undertaken in accordance with measures outlined in the EPBC Management Plans.
- Install stormwater management devices as per V13- Stormwater Management Plan.

<u>Performance Indicators</u>

- Integrity of protective devices.
- Existing vegetation and trees retained in good health, with no scars from earthworks machinery and no erosion and sediment deposited within linear open space/retention areas.

Clearing activities should be undertaken in accordance with the with all management plan requirements and associated approval conditions. It is acknowledged this clearing line is offset 10m from the ultimate clearing line. Additional lineal clearing will be completed as part of phase 2 works.

Photo: Control clearing of vegetation

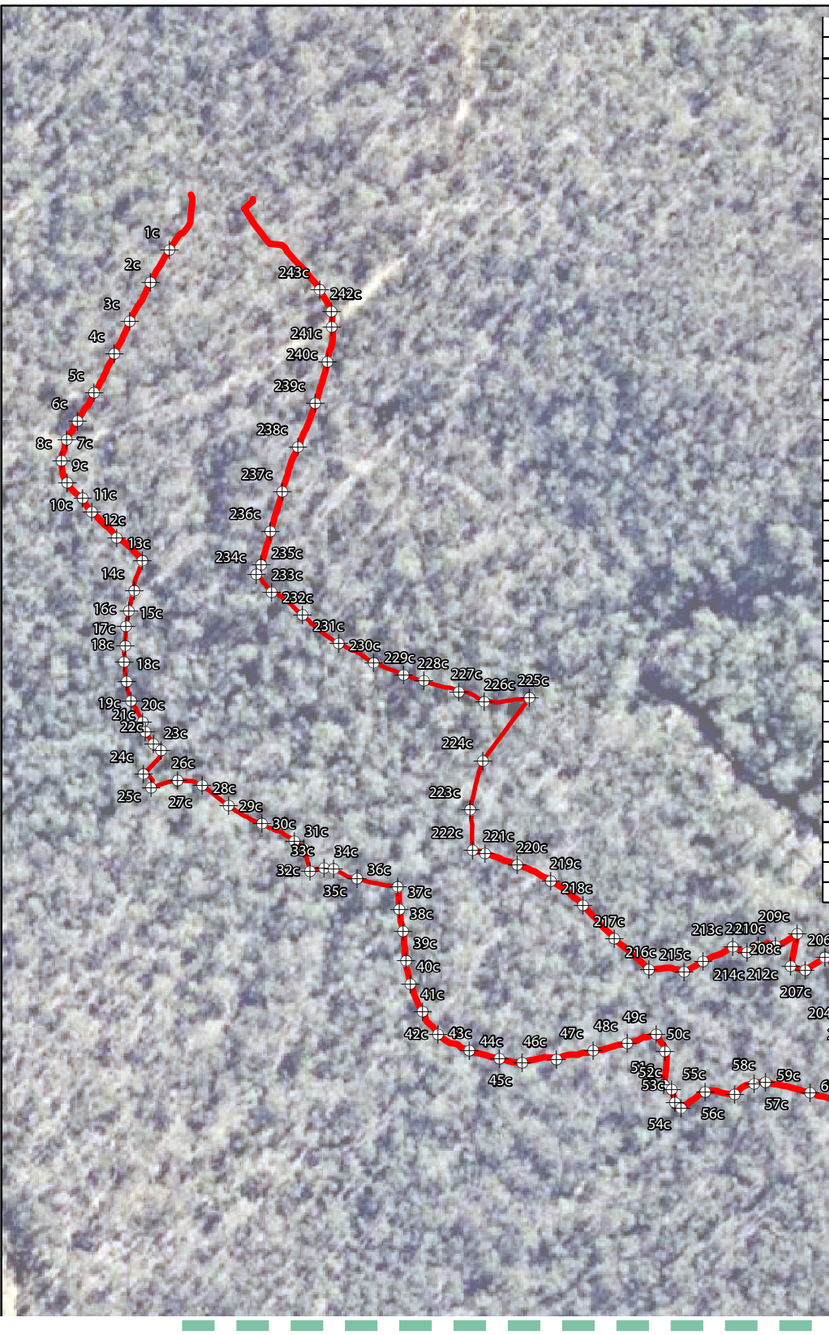
Photo: Erosion control to cleared batter

Photo: Tree protection and erosion fence

<u>Table 1: P1: Vegetation Management (Clearing and Protection)</u>

Issue	Vegetation Management – Clearing and Protection	Responsible Person	Timing
Implementation Requirements	Ensure protective devices are installed and maintained in functional condition.	Contractor	During Clearing & Construction
	Monitor and report on the success, protection and retention, and integrity of protective devices such as fences and sediment fences through		
Monitoring	Weekly inspection and log.	Contractor	During Clearing & Construction
Reporting	Monthly (until operation).	Contractor	During Clearing & Construction
Corrective Action	Repair, replace or reinstate protective devices.	Contractor	During Clearing & Construction
	Appropriate treat any damage to trees or vegetation marked for retention as required.	Contractor	During Clearing & Construction

06 PRE-CLEARANCE - VEGETATION MANAGEMENT



Haul Road - Flagging Coordinates Table (GDA94 MGA z56)

ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.
1	489376.731536	6937299.13413	C	42	489519.173710	6936883.34929	C	84	489939.974186	6936776.95855	C	126	490416.143691	6936553.37403	C	168	490176.289454	6936820.36281	C	210	489698.069370	6936930.18283	C
2	489366.716913	6937282.01414	C	43	489535.693740	6936874.93209	C	85	489950.876735	6936786.06175	C	127	490423.850448	6936546.50828	C	169	490161.291929	6936832.71399	C	211	489688.845697	6936930.23382	C
3	489355.686319	6937261.12352	C	44	489551.599992	6936870.55566	C	86	489960.804936	6936795.57509	C	128	490431.734371	6936541.70371	C	170	490145.665990	6936832.50933	C	212	489682.912896	6936926.84486	C
4	489347.643338	6937243.95226	C	45	489563.769080	6936868.35282	C	87	489963.361996	6936815.70487	C	129	490427.508895	6936534.69751	C	171	490128.532060	6936835.14498	C	213	489675.368809	6936929.64780	C
5	489336.872425	6937223.25257	C	46	489581.959721	6936870.30296	C	88	489970.070660	6936819.11338	C	130	490423.247981	6936524.75976	C	172	490122.471533	6936838.73523	C	214	489659.459768	6936922.16032	C
6	489328.012647	6937208.30216	C	47	489601.348932	6936874.76524	C	89	489980.202227	6936822.37347	C	131	490427.168384	6936515.16676	C	173	490111.601721	6936840.85850	C	215	489649.469689	6936916.49179	C
7	489322.233476	6937198.50966	C	48	489619.531219	6936878.83025	C	90	489988.653121	6936831.09963	C	132	490435.163118	6936508.87258	C	174	490110.946168	6936857.19613	C	216	489630.874549	6936917.76665	C
8	489319.742066	6937187.31096	C	49	489634.808837	6936883.30008	C	91	490000.042792	6936821.07328	C	133	490447.279665	6936510.62204	C	175	490106.309733	6936873.82936	C	217	489612.669589	6936934.06061	C
9	489322.677450	6937175.65053	C	50	489639.349811	6936874.36850	C	92	490011.177460	6936812.38775	C	134	490458.060632	6936507.06109	C	176	490090.457501	6936866.18088	C	218	489595.899832	6936951.66229	C
10	489330.805990	6937167.75847	C	51	489638.783271	6936856.58143	C	93	490022.198931	6936804.76423	C	135	490467.223543	6936512.56129	C	177	490087.695388	6936856.22400	C	219	489578.849860	6936964.74997	C
11	489335.587587	6937160.27118	C	52	489643.079914	6936854.14545	C	94	490033.148372	6936803.07465	C	136	490476.780787	6936506.29298	C	178	490067.569195	6936852.79637	C	220	489561.172666	6936973.32458	C
12	489348.864566	6937146.60229	C	53	489644.639104	6936847.46406	C	95	490046.161464	6936801.67662	C	137	490486.303645	6936501.84470	C	179	490062.445678	6936856.38986	C	221	489544.091614	6936979.18137	C
13	489362.453097	6937134.21810	C	54	489647.938765	6936844.06243	C	96	490057.074676	6936809.02162	C	138	490502.026658	6936485.76065	C	180	490055.345325	6936874.67894	C	222	489537.454458	6936980.93734	C
14	489358.193916	6937118.35314	C	55	489660.713301	6936853.01545	C	97	490067.474066	6936812.21221	C	139	490504.964985	6936548.73259	C	181	490051.044609	6936883.08601	C	223	489536.175203	6937002.36876	C
15	489355.275200	6937107.71694	C	56	489676.299577	6936851.82296	C	98	490084.705521	6936807.48450	C	140	490493.785791	6936565.20171	C	182	490027.402915	6936885.16107	C	224	489542.902367	6937028.54046	C
16	489353.826759	6937099.66276	C	57	489686.627237	6936857.35725	C	99	490080.844107	6936800.54734	C	141	490484.908667	6936576.35748	C	183	490003.601241	6936886.14013	C	225	489567.589212	6937061.66853	C
17	489353.486888	6937089.12434	C	58	489692.651684	6936858.17607	C	100	490081.928195	6936787.20157	C	142	490476.975219	6936583.00093	C	184	489993.420698	6936887.11287	C	226	489543.738283	6937059.46233	C
18	489352.676639	6937080.77411	C	59	489716.337821	6936852.38554	C	101	490092.426748	6936780.11052	C	143	490475.347148	6936563.73677	C	185	489984.077311	6936883.17787	C	227	489530.236552	6937064.98770	C
19	489354.212847	6937070.42009	C	60	489738.139061	6936846.91040	C	102	490098.355996	6936778.39382	C	144	490470.863755	6936560.34012	C	186	489974.080955	6936875.18086	C	228	489511.623206	6937070.67520	C
20	489356.423664	6937060.14807	C	61	489749.794120	6936843.00934	C	103	490110.049759	6936789.50108	C	145	490464.509507	6936568.49257	C	187	489964.478202	6936877.22136	C	229	489500.874478	6937073.80375	C
21	489364.079590	6937043.80117	C	63	489763.718550	6936841.08921	C	105	490126.472675	6936786.45150	C	147	490449.839060	6936585.29984	C	189	489926.920860	6936877.32288	C	231	489466.435101	6937090.61889	C
22	489368.335251	6937037.33590	C	64	489777.424616	6936827.57576	C	106	490148.938312	6936781.99172	C	148	490447.276689	6936598.64676	C	190	489916.784841	6936875.14979	C	232	489447.384944	6937105.57946	C
23	489372.342615	6937033.80471	C	65	489785.940861	6936838.75145	C	107	490172.967579	6936780.10282	C	149	490445.705559	6936611.72604	C	191	489903.114285	6936869.82027	C	233	489430.924812	6937117.67380	C
24	489363.056822	6937021.18431	C	66	489797.080791	6936839.21122	C	108	490183.660706	6936766.02301	C	150	490436.588855	6936611.62327	C	192	489894.695193	6936861.86968	C	234	489422.892328	6937126.96806	C
25	489366.970585	6937013.97204	C	67	489811.902234	6936834.77954	C	109	490198.116274	6936752.31885	C	151	490432.629704	6936593.48431	C	193	489880.662683	6936865.51527	C	235	489425.294317	6937132.03458	C
26	489381.245849	6937018.04621	C	68	489820.670867	6936823.89426	C	110	490215.982396	6936733.89764	C	152	490430.880500	6936599.93410	C	194	489864.849552	6936865.62677	C	236	489430.339505	6937150.02216	C
27	489394.053694	6937015.26487	C	69	489823.121226	6936827.29998	C	111	490230.467831	6936721.06641	C	153	490417.704555	6936603.30592	C	195	489846.620327	6936864.86355	C	237	489436.668328	6937170.83682	C
28	489408.101722	6937004.51672	C	70	489827.989219	6936820.74544	C	112	490241.878695	6936709.07722	C	154	490406.295562	6936614.95237	C	196	489835.379722	6936863.50993	C	238	489444.868413	6937194.63610	C
29	489425.914966	6936995.06041	C	71	489834.823356	6936814.96485	C	113	490252.456958	6936699.92566	C	155	490390.553145	6936632.39648	C	197	489823.270463	6936872.25873	C	239	489454.051973	6937217.85016	C
30	489442.989805	6936985.79491	C	72	489842.538157	6936807.30276	C	114	490265.452099	6936685.36682	C	156	490374.850227	6936652.19323	C	198	489810.765064	6936874.73455	C	240	489460.606034	6937239.68385	C
31	489448.026821	6936981.88151	C	73	489846.494153	6936794.53000	C	115	490279.747263	6936670.48772	C	157	490359.604192	6936670.03948	C	199	489794.488965	6936877.16075	C	241	489462.838573	6937258.17457	C
32	489451.326482	6936969.74563	C	74	489854.699218	6936783.09765	C	116	490291.330143	6936655.81159	C	158	490340.946164	6936689.77620	C	200	489774.511711	6936884.01756	C	242	489462.567470	6937266.53599	C
33	489458.799245	6936971.71181	C	75	489859.117718	6936779.01231	C	117	490303.415384	6936640.07073	C	159	490324.495320	6936705.79683	C	201	489756.175901	6936887.72375	C	243	489456.448485	6937277.74228	C
34	489463.811364	6936971.00501	C	76	489862.915056	6936769.80748	C	118	490314.883462	6936625.57389	C	160	490305.124273	6936726.42488	C	202	489747.266946	6936893.35041	C				
35	489476.213529	6936966.10211	C	77	489870.275916	6936757.65721	C	119	490327.813902	6936609.19538	C	161	490285.987078	6936745.28373	C	203	489748.597284	6936907.57326	C				
36	489497.727095	6936961.51268	C	78	489882.042916	6936752.87374	C	120	490341.875041	6936594.57936	C	162	490258.799214	6936770.95961	C	204	489736.948091	6936906.09211	C				
37	489498.632459	6936949.55598	C	79	489888.907688	6936753.77595	C	121	490353.878524	6936583.34302	C	163	490239.729715	6936787.61442	C	205	489731.324332	6936914.22976	C				
38	489500.573264	6936938.09821	C	80	489898.572995	6936750.96874	C	122	490369.938658	6936570.57673	C	164	490223.438920	6936801.97153	C	206	489724.182320	6936924.04331	C				
39	489502.198368	6936922.37793	C	81	489911.230083	6936754.09224	C	123	490383.993480	6936566.00011	C	165	490210.188920	6936809.35987	C	207	489713.798744	6936917.57180	C				
40	489504.446910	6936910.07677	C	82	489925.275885	6936759.26300	C	124	490394.784310	6936565.08814	C	166	490196.765505	6936807.89303	C	208	489706.083446	6936919.48812	C				
41	489510.971429	6936895.39435	C	83	489934.183725	6936766.36105	C	125	490409.332243	6936552.32833	C	167	490183.454962	6936807.72609	C	209	489709.435490	6936936.70902	C				

Adjoin Plan next page

06 PRE-CLEARANCE - VEGETATION MANAGEMENT

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07 PRE-CLEARANCE - FAUNA MANAGEMENT

P2 – Protection of MNES Fauna (Koala and Grey-headed Flying Fox) and Native Wildlife (Vegetation Clearing)

Clearing of native vegetation has the potential to result in direct injury or death to fauna. Clearing of vegetation for the purposes of preparing development areas also has the potential to result in incidental damage to adjacent habitats to be retained.

Development protocols to respond to injured wildlife must be prepared prior to vegetation clearing operations. It is expected that some of these protocols are likely to be applicable to responses required for all injured fauna (including Koala) and must be included within the Animal Welfare Plan (AWP) to be prepared by the appointed fauna spotter catcher.

Table 2 describes the relevant management requirements to address the protection of terrestrial fauna, specifically Koala, during vegetation clearing and

Objective

1. To minimise and mitigate adverse direct and indirect effects of vegetation clearing on terrestrial including Koala and Grey-headed Flying-fox, during clearing and construction.
2. Prevent mortality or injury to terrestrial wildlife, specifically Koala.

Management Strategy

- Prevent damage and/or disturbance to native vegetation and associated habitats outside clearing areas.
- Clearing and construction operations are employed to maximise animal welfare and reduce fauna mortality.
- Informal all personnel of site environmental responsibility.
- Reuse hollows and large rocks for habitat in retained habitat areas/linear open space.
- Safe fauna movement opportunities are provided within linear open space to prevent fauna moving through construction areas.
- Direct clearing activities from open area to less open areas allowing fauna to natural seek shelter in conservation land and linear open space/retained habitat
- Provision of permanent and temporary fencing in accordance with the V13- Vegetation Management Clearing Plan
- Undertake works in accordance with V13 –Direction of Clearing Plan and install fencing in accordance with V13- VMCP

Performance Indicators

- Prevent fauna mortality and disturbance to terrestrial fauna.
- No injury or death of Koala.
- No damage to linear open space/retained habitat.
- No disturbance to native vegetation outside permitted clearing footprints.

Fauna Management

Lendlease Communities Pty Ltd ccommits to the use of leading practice methods and processes for the role of Wildlife Spotter Catchers in the engagement of any contractors for native vegetation clearing works. The standards and requirements outlined in this Specification Note are acknowledged as above minimum requirements in most Local Government areas and are applicable despite lessor requirements listed within individual project approval packages.

As a minimum specification Wildlife Spotter Catchers will retain the following Queensland State Government Permits:

1. Animal Ethics
2. Scientific Purposes Permit
3. Scientific User Registration
4. Damage Mitigation Permit
5. Rehabilitation Permit

Wherever practical all clearing works will be coordinated in general accordance with applicable site based components of 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** (and or any contemporary Industry based final version of this Draft Code). This includes mandatory controls on the timing and sequencing of clearing works integrated with a regimented series of fauna management protocols implemented by registered Fauna Spotter / Catchers. The following procedural stages listed in the Draft Code are to be applied to clearing works on all **Lendlease** projects:

Action 1 – Engagement Wildlife Spotter Catcher

Action requires that the developer (and or the developer's representative through the principal contractor) engage a Wildlife Spotter Catcher with full registrations and licences provided in accordance with the Queensland Government's National Parks and Wildlife Services.

A Registered Wildlife Spotter Catcher engaged shall have the minimum permits listed in this specification.

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

The WPMP should be submitted to the **Queensland Department of Environment and Heritage Protection** (EHP) or relevant authority and or stakeholder. The WPMP should 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 endorsement of the WPMP the Wildlife Spotter Catcher 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.

Lendlease Communities Pty Ltd support the use of innovative leading practice methods minimising and mitigating impacts on all native fauna during clearing operations.

Action 4 – Wildlife Spotter Catcher 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 fore-person, plant operators and applicable Local and State Government representatives. At the pre-start meeting, the Wildlife Spotter Catcher is to outline the clearing process and the requirements of the WPMP.

Action 5 – During Construction

The Wildlife Spotter Catcher is to be on-site during all phases of construction which involve potential impacts on wildlife or habitat (unless otherwise specified by the appointed Wildlife Spotter Catcher. This will enable to the Wildlife Spotter Catcher to make any necessary adjustments to the approved Clearing Management Plans 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 Wildlife Spotter Catcher 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, where they are applicable to the project:

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.

07 PRE-CLEARANCE - FAUNA MANAGEMENT

Koala Management & Welfare

While clearing activities aim to protect and minimise impacts to all terrestrial fauna, specific management measure for Koala are required as part of the EPBC approval and have been specified within the Fauna Management Plan, prepared by **Saunders Havill Group** which should be read in conjunction with the plan.

Key outcomes within the FMP for Koala include:

- Koalas on site are protected
- Koala habitats are protected, maintained and their integrity enhanced.
- The abilities for Koalas to move into, within and out of the sit e is maintained.
- All persons involved in construction and operation of the development are aware of the site values, their potential to impact on Koalas and their habitats, and their responsibilities in regard to procedures and strategies within approved management plans.

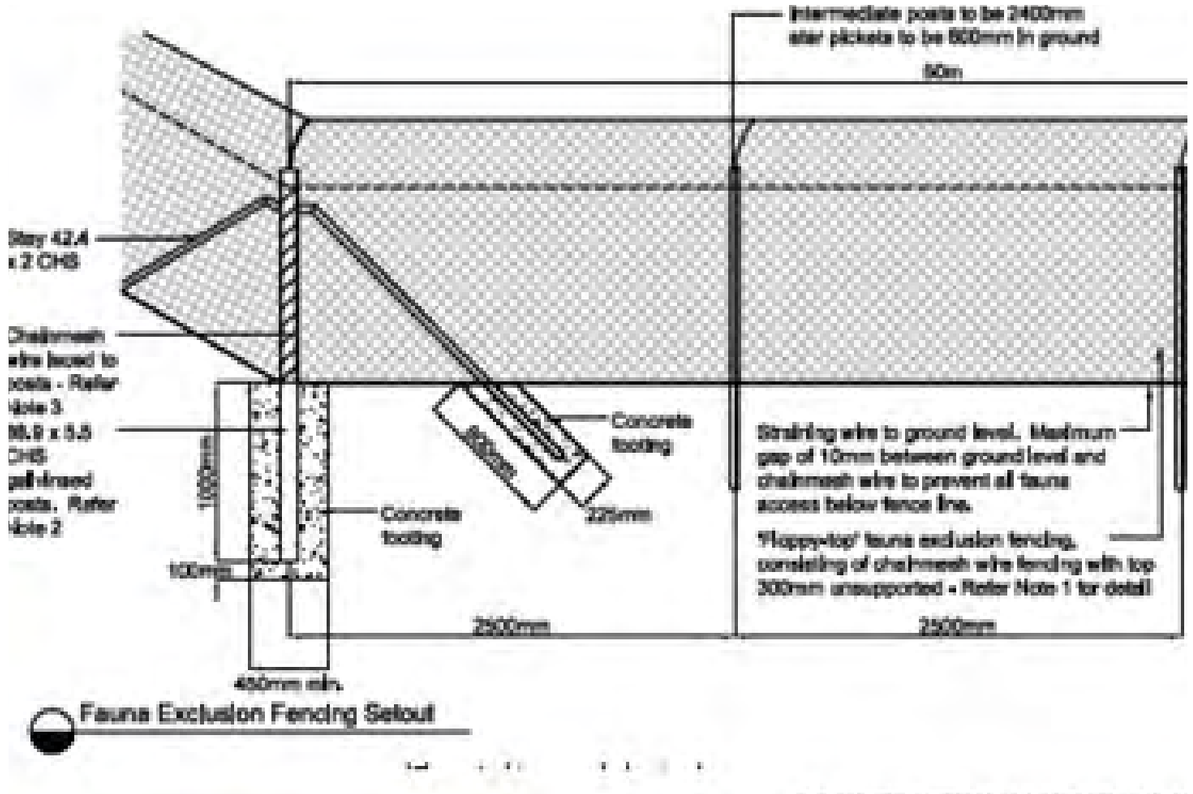
Koala Signage

Significant Tree Protection Fencing

Fauna Spotter During Tree Clearing

Fauna Spotters Retrieving Fauna

Fauna Exclusion Fencing



Construction fencing detail

Fauna Signage

Fauna Exclusion Fencing

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

Issue	P2 - Protection of MNES Fauna and Native Wildlife	Responsible Person	Timing
Implementation Requirements	No vegetation removal shall occur until relevant approvals have been obtained All permit conditions will be followed	Proponent	Prior to Clearing
	To prevent damage and / or disturbance to native vegetation and associated habitats outside clearing areas: a. Clearing boundaries will be delineated on all drawings and in the field to define the authorised clearing extent. b. Installation of vegetation clearance markers (e.g. high visibility poly-web fencing) prior to the commencement of vegetation clearance to identify and protect remnant vegetation for retention. c. Along the interface between clearing precincts and open space / Environmental Corridors, trees are to be felled towards the clearing precinct to avoid damage to these areas. d. Clearing vegetation is to be stockpiled so as not to impede damage to drainage channels.	Contractor	Prior to Clearing & During Clearing
	No clearing of vegetation is to commence without the presence of an EHP approved Fauna Spotter Catcher, or where clearing includes non-juvenile Koala habitat trees, a Koala Spotter. a. An appointed Site Superintendent will be responsible for ensuring that all trees scheduled for removal will be checked on the day of their removal for the presence of fauna by an EHP approved Fauna Spotter Catcher / Koala Spotter as vegetation characteristics dictate. b. The EHP approved Fauna Spotter will check and clear vegetation prior to its felling and, if required, will relocate native wildlife (other than Koala) into appropriate habitat areas within the site which are to be retained. In the case of a Koala being present, translocation of the individual/s must occur in accordance with requirements for Koala. c. Hollow-bearing (habitat) trees are to be identified in the field and by plan prior to commencement of clearing operations. If fauna is present, the tree will either be left standing overnight to allow for the animal to leave via their own volition, or will be encouraged from the tree by staking or other methods deemed suitable by the fauna spotter. Where no signs of fauna are identified, machinery operators will be instructed to fell trees in a manner directed by the fauna spotter to minimise potential risk to fauna.	Fauna Spotter Catcher	Prior to Clearing
	All construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training, all personnel will be instructed on their obligations in regard to vegetation clearing protocols and to protect native fauna. Areas identified for vegetation clearance are to be clearly defined and detailed in site inductions.	Contractor	Prior to Clearing
	Conduct vegetation clearing in sequential stages. Vegetation clearing is to conform with the following: a. The direction of clearing should be away from threatening processes or hostile environments, and towards the clearing precinct to avoid damage to adjacent retained habitat links, ensuring that: i. Fauna are not required to cross roads or move through developed areas or disturbed areas. Such as residential areas or areas that require movement of greater than 100m over cleared ground to reach suitable habitat; ii. Fauna area not left occupying an "island" of habitat between hostile environments, such as a road and a cleared area, unless there are no other more suitable habitat areas in which to direct fauna, and iii. Fauna can safely leave the site of clearing and relocate to adjacent habitat. b. Cleared vegetation is to be stockpiled so as not to impede fauna movement.	Contractor	During Clearing

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

	c. Where vegetation to be cleared includes non-juvenile Koala habitat trees, implement sequential clearing as per the requirements for Koala.		
	Companion animals (e.g. dogs) are to be banned from all construction areas.	Contractor	At all times
	Vehicle access within retained habitat/linear open space will be limited and appropriately signed.	Contractor	Prior to Clearing & During Clearing
	Conduct vegetation clearing in accordance with Section 4 of the Spring Mountain FMP (prepared by **Saunders Havill Group** dated July 2015) which outlines specific implementation requirements for Koala including clearing in sequential stages for sites. For a site more than 6ha vegetation clearing is to conform with the following: a. Is carried out in a way the ensures Koalas on the area being cleared have enough time to move out of the clearing with without human intervention and involves i. Ensuring not more than 3ha or 3% of the sites area (whichever is greater) in any one stage ii. Ensuring that between each stage and the next there is at least one period of 12 hours at starts at 6pm on a day and ends at 6am on the following day, during which no trees are cleared on the site b. Is implanted in a way that ensures, while clearing is being carried out, appropriate habitat links are maintained within the clearing site and between the site and its adjacent areas allowing Koalas living on the site to move out of the site	Contractor / Fauna Spotter Catcher/ Koala Spotter	During Clearing
	c. Ensures that no tree in which a Koala is present, or a tree with a crown overlapping a tree in which a Koala is present, is cleared until the tree is vacated by the Koala. d. Ensures that vegetation clearing is directed away from threatening processes, or hostile environments, and towards any retained vegetation or habitat links, ensuring that: i. Koalas are not pressured, through loss of habitat, to cross roads or move through developed or disturbed areas, such as residential areas or areas that require movement of greater than 100m over cleared ground to reach suitable habitat; ii. Koalas are not left occupying an "island" of habitat between hostile environments, such as road and cleared areas, unless there are no other more suitable habitat areas in which direct Koalas; and iii. Koalas can safely leave the site of clearing and relocate to adjacent habitat. e. The Koala spotter is responsible for ensuring, throughout the duration of clearing operations, that no tree in which a Koala is present, or a tree identified as being a risk to Koalas if felled, should not be felled, damaged or interfered with until the Koala has moved from the felling site of its own volitation. f. Where a Koala is present in a tree scheduled for removal, the tree will be marked with distinctive flagging tape (and other advisory means as required) and machinery operators will be briefed on the location of such trees and it will be clearly confirmed with operators that the subject tree(s) are to remain undisturbed until the Koala has moved of its own volition (where the strategy is to allow the Koala to move of its own accord, overnight). On the following day, such trees are to be checked again prior to their removal and, if necessary, the procedure is to be repeated until the Koala has moved g. A Koala spotter is not to be involved in the clearing of vegetation while they are responsible for identify Koalas on site.		

Table 2: P2 – Protection of MNES Fauna and Native Wildlife (Vegetation Clearing)

	A requirement that a permit to interfere with wildlife from EHP will be mandatory for the wildlife handing activities as will the appropriate Animal Ethics Permit from DAF. Construction personnel shall not attempt to handle any wildlife. a. Fauna / Koala handling and relocation activities must only be undertaken by those identified on a current site-specific Damage Mitigation Permit (Removal and Relocation of Wildlife) from EHP. b. Koala Spotter/Fauna Spotter Catchers are required to relocate injured wildlife to the nearest designated veterinary clinic of wildlife hospital. Full contacts will be provided within the AWP. c. A register of fauna incidents / interactions is to be maintained daily during clearing operations.	Fauna Spotter Catcher/Koala Spotter	During Clearing & Construction
	The timing of vegetation clearance should be selected in order to minimise impacts (direct and indirect) to affected fauna habitats during optimum breeding period.	Contractor	During Clearing
	Avoid clearing of vegetation between the hours of 6pm and 6am.	Contractor	During Clearing
Monitoring	For each day of native vegetation clearing operations, a daily audit log is to be completed by the Contractor either prior to, or on completion of daily operations. Audit of key requirements, e.g. clearing contained within designated limits, integrity of clearing boundary devices, no damage to vegetation outside clearing boundary, Fauna Spotter Catcher present.	Contractor	During Clearing
Reporting	Animal Welfare Plan is prepared prior to clearing operations by the appointed Fauna Spotter Catcher.	Proponent / Fauna Spotter	Prior to Clearing
	Weekly report by the Fauna Spotter Catcher/ Koala Spotter to the Contractor on the clearing of any native vegetation and any animals encountered, injured or relocated is to be submitted.	Contractor	During Clearing
	Monthly report by the Contractor the Site Superintendent on native vegetation operations, including compliance, non-compliance incidents (fauna injury and responses) and corrective actions, outcomes of Fauna Spotter Catcher activities.	Contractor	During Clearing & Construction
	Bi-annual report by the Site Superintendent to the Proponent. Report to consider incident patterns, if any, and provide recommended solutions and a description of the corrective actions taken.	Contractor	During Clearing & Construction
	Annual site audit by the Environmental Representative and report to the Proponent	Environmental Representative	During Clearing & Construction
Corrective Action	In the event that monitoring identifies practices inconsistent with the strategies developed for this FMP, the Contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent.	Contractor	During Clearing & Construction
	In the event that monitoring identifies practices inconsistent with the strategies developed for this SBMP, the Contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent	Contractor	During Clearing & Construction

08 FAUNA MANAGEMENT - CONSTRUCTION

P3 – Maintenance of Safe Wildlife Movement Opportunities (Site Preparation Operations)

The following suite of best practice measures will be employed throughout the site to minimise fauna habitat fragmentation, facilitated fauna movement and reduce related injury and mortality. Management requirements are considered in the context of:

- Site preparation operations (i.e. during vegetation clearing and earthworks phases); and
- Design treatments and strategies for the built phase of the development

Table 3 describes the relevant management requirements in regard to site preparation operations. The following should be read in conjunction with the requirements for Koala design treatments and strategies for the built phase of the development.

Retention and rehabilitation of the Mountain Creek Corridor to the west, in addition to the 293ha of offset land for Conservation to the south, will occur as a result of the Spring Mountain development to maintain fauna movement and connectivity within and between the development site.

Objective

1. To avoid the impact of habitat fragmentation by roads and maintain safe movement opportunities for native wildlife (including Koala and Grey-headed Flying-fox) between linear open space.
2. To maintain fauna movement opportunities within retained habitat areas and minimise fauna movement opportunities through site preparations.

Management Strategy

- Develop a track plan for retained habitat areas/linear open space which allows fauna movement to be maintained
- Restrict access to retained habitat areas/linear open space for environmental management only.
- Reduce road speeds
- Increase driver awareness and education

Performance Indicators

- Minimal fauna mortality.

Temporary Fencing

Prior to the commencement of vegetation clearing a temporary fauna exclusion fence will be erected around the area of clearing and works and be maintained until the completion of major civil works. The purpose of the fence is to minimise any native fauna (including koala) from entering into the clearing and or post clearing construction zone during a time when potential risks of impact are at their highest.

The fencing proposed is a "floppy-top" temporary fauna exclusion fencing as per the details and photos shown on this drawing sheet. This fencing type is preferred as it continues to allow any fauna within the impact zone to exit, however prevents new or re-entry once the fence is erected. The fencing type can also be erected along random alignments and relocated to new areas as the clearing areas expand in future clearing and development events. This fencing type has been successfully used as a temporary barrier on other koala related projects within the vicinity of major roads and housing areas.

Fauna exclusion fencing

Table 3: P3 – Maintenance of Safe Fauna Movement Opportunities – Site Preparation Operations

Issue	P2 – Maintenance of Safe Fauna Movement Opportunities – Site Preparation Operations (Roads and Vehicle Interactions)	Responsible Person	Timing
Implementation Requirements	A site access plan is to be developed for the Environmental Corridors.	Proponent	Prior to Clearing
	Site protocols are to be established which restrict authorised area access to the approved track network identified with the plan.	Contractor	Prior to Clearing
	All construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training, all personnel will be instructed on their obligations in regard to vehicle movement restrictions and construction speed limits.	Contractor	Prior to Clearing
	Erect temporary exclusion fencing around the area of clearing and works and be maintained until the completion of major civil works.	Contractor	Prior to Clearing
	Vehicle movements outside designated operational areas (other than for land management purposes) will be prohibited.	Contractor	During Clearing & Construction
	Road speeds throughout construction areas and through retained habitat areas will be restricted to 50km/hr.	Contractor	During Clearing & Construction
	Strategic use of awareness signage is to be implemented along the interface between operational areas and Environmental Corridors and access restriction signage at all track entry points to Environmental Corridors during construction works.	Contractor	During Clearing & Construction
	Proposed construction access roads will be subject to design treatments to ensure safe fauna crossing opportunities. Construction of an elevated portion (or portions) in the form of bridging structures (culverts) in associated with guide fencing will be incorporated to ensure the provision of safe crossing opportunities.	Contractor	During Clearing & Construction
Monitoring	Weekly inspection and log.	Contractor	During Clearing
Reporting	Monthly report by the Contractor to the Site Superintendent in regard to development / maintenance of structures implemented to facilitate fauna movement, review of fauna / vehicle incident patters, if any, and provide recommended solutions, an a description of corrective actions taken.	Contractor	During Clearing & Construction
	Bi-annual audit report by the Site Superintendent to the Proponent. Report to include compliance with site access restrictions, integrity of structure implemented to facilitate fauna movement, review of fauna/ vehicle incident patterns, if any, and provide recommended solutions, and a description of corrective actions taken.	Contractor	During Clearing
	Annual site audit by Environmental Representative and report to the Proponent.	Environmental Representative	During Clearing & Construction
Corrective Action	In the event that monitoring identifies practices inconsistent with the strategies developed for this SBMP, the contractor shall take the necessary corrective steps and note them in the monthly report to be reviewed by the Site Superintendent.	Contractor	During Clearing & Construction

09 THREATENED FLORA MANAGEMENT

P5 – Threatened Flora Management

Plectranthus habrophyllus, a herb listed as Endangered under the EPBC Act, has been recorded at several locations across the Spring Mountain project site. Core populations have been identified within Core Conservation areas by **Yurrah** (refer **Plan 2**). The majority of these locations are associated with waterways within linear open space and the habitat is to be protected.

Pre-clearance Survey

In accordance with the EPBC approved Threatened Flora Management Plan, prepared by **Yurrah**, pre-clearance surveys for each development precinct must occur by a suitable qualified person prior to the commencement of clearing. An additional individuals must be recorded and translocated where necessary.

Translocation

Where plants are located within the development footprint or near the edge of the footprint, and are at risk of impact, these plants will be translocated to establish a new population in suitable habitat within the proposed Linear Open Space. The habitat for both translocated individuals and in situ individuals will be protected within a Core Conservation Area.

As an added habitat protection measures, Buffer Areas, with an offset width of 20m, will be established around Core Conservation Areas. No Go Zones must be marked out by the 20m buffer around know populations within Core Conservation areas. No work apart from conservation management activities is to be permitted within Core Conservation Areas.

Clearing and Construction

Plectranthus habrophyllus is to be protected from impacts of construction. Stormwater Management Plans, Bushfire Management Plans and Weed Management are to address threatened flora management.

Table 5 describes the relevant management requirements to address this issue.

Objective

1. To encourage the locally resident populations of threatened flora species to increase at a natural rate to a desired level on site.

Management Strategy

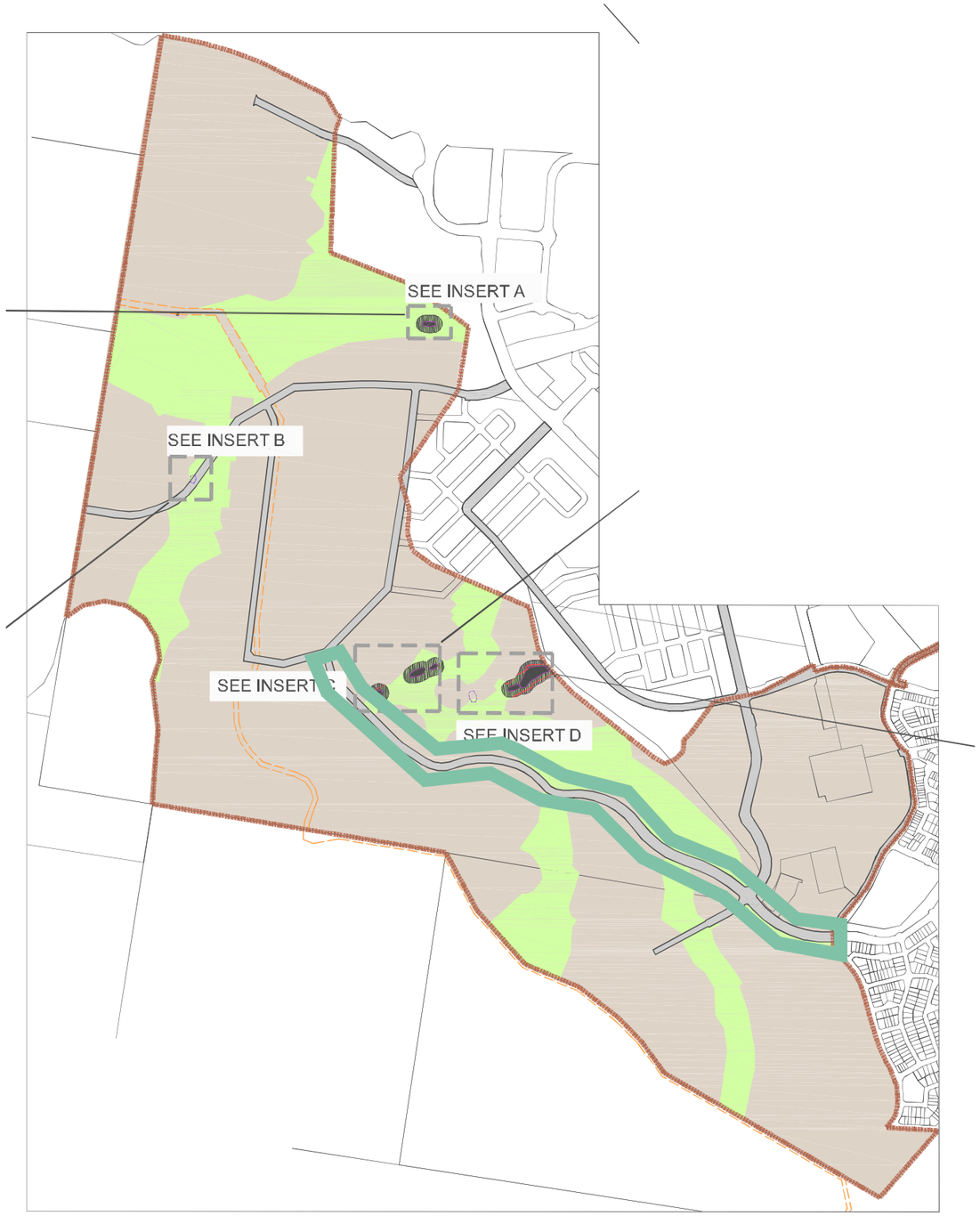
- Threatened flora habitat to be protected through the approved Threatened Flora Management Plan
- Recognise and protect all linear open space through management of interface between linear open space and development for bushfire, weeds and access issues.
- Establish Core Conservation Areas and Buffer Areas at threatened flora locations to target management activities.
- Design a network for fire-trails to defined spatial blocks to prevent damage caused by uncontrolled fire and allow access for maintenance.
- Awareness and education of threatened flora presence.
- Ensure all responsible persons are aware of the significance of this issue and are fully aware of any likely impacts of scheduled works.

Performance Indicators

- 0% weed cover in Core Conservation Areas and Buffers
- No evidence of damage from stormwater run-off construction
- Recruitment of threatened flora seedlings in Core Conservation Area
- No damage from uncontrolled access
- Condition of protective fencing remains undamaged.

Pre-clearance surveys for V13 were undertaken by **Saunders Havill Group** in December 2015. No ***Plectranthus habrophyllus*** individuals were located within the project area.

Photo: Plectranthus habrophyllus (listed as Endangered under the EPBC Act (Cth))



09 THREATENED FLORA MANAGEMENT

Table 5: P5 – Threatened Flora Management

Issue	P4 Threatened Flora Management	Responsible Person	Timing
Implementation Requirements	Core Conservation Areas located within 20m of land proposed for uses other than conservation, identified as areas for additional interface management including: 1. A detailed survey of threatened plant locations by a registered surveyor. 2. Where interfacing with residential, a fence with a minimum 50% transparency to be erected along interface boundary. Signage to be erected identifying area as 'Significant Ecological Area' and 'Dumping of Rubbish Prohibited' and where further information can be obtained. 3. Where interfacing with road verge or park landscaping, design and plant selection considers and avoids any potential impact upon the threatened flora species. Landscape plant species selected will be non-invasive, existing trees to be retained where possible to maintain microclimate, and clear edge formed that discourages access. Mulch to be preferably sourced from the site and is to be weed free.	Proponent	Design /Prior to Clearing &
	Undertake pre- clearing surveys. 1. Once the line of clearing (including construction of parks, pedestrian tracks and fire trails) is marked out by a registered surveyor, an additional survey for threatened species is to be undertaken within the clearing area, and Linear Open Space within 10m of the clearing line. 2. Additional individuals, or groups of individuals located to be recorded with a GPS, given a unique ID number, and flagged with marking tape. Where necessary individuals will be translocated in accordance with protocols in the Threatened Flora Management Plan. 3. The boundary of the Core Conservation Areas will be adjusted as necessary (if not within construction footprint), to include any additional individuals located during of the pre-clearing survey.	Proponent	Prior to Clearing
	Establish No Go Zones. 1. Core Conservation Areas less than 20m from of the clearing and construction footprint will be identified on construction drawings and through signage on site as 'No Go Zones'. Their associated Buffer Areas will be identified as 'Proceed with Caution Zones'. 2. Work within the Buffer Area will require supervision by the Project Ecologist. 3. No work apart from conservation management activities is to be permitted within the Core Conservation Areas.	Contractor	Prior to Clearing
	Erect exclusion fencing and signage. 1. Where Linear Open Space has not been fenced as part of general vegetation protection, temporary fencing must be installed around the Core Conservation Area, where practical, and necessary (i.e. steep terrain may form natural barrier). The temporary fence shall be a minimum of star pickets with 3 strand wire and high visibility mesh attached to the top wire (with minimum gap of 500mm along the bottom) and erected prior to clearing. 2. The required alignment and extent of the fencing is to be undertaken in consultation by the project ecologist and inspected before the start of clearing. 3. Signage is to be attached to fencing clearly identifying the site as a significant ecological area and a 'No Go Zone', and no entry permitted unless approval given by Proponent. Mapping will be produced identifying location of threatened flora and alignment of protective fencing during detailed design for each Phase of the Spring Mountain	Contractor	Prior to Clearing
Implementation Requirements	Core Conservation Areas located within 20m of land proposed for uses other than conservation, identified as areas for additional interface management including: 1. A detailed survey of threatened plant locations by a registered surveyor. 2. Where interfacing with residential, a fence with a minimum 50% transparency to be erected along interface boundary. Signage to be erected identifying area as 'Significant Ecological Area' and 'Dumping of Rubbish Prohibited' and where further information can be obtained. 3. Where interfacing with road verge or park landscaping, design and plant selection considers and avoids any potential impact upon the threatened flora species. Landscape plant species selected will be non-invasive, existing trees to be retained where possible to maintain microclimate, and clear edge formed that discourages access. Mulch to be preferably sourced from the site and is to be weed free.	Proponent	Design /Prior to Clearing &
	Undertake pre- clearing surveys. 1. Once the line of clearing (including construction of parks, pedestrian tracks and fire trails) is marked out by a registered surveyor, an additional survey for threatened species is to be undertaken within the clearing area, and Linear Open Space within 10m of the clearing line. 2. Additional individuals, or groups of individuals located to be recorded with a GPS, given a unique ID number, and flagged with	Proponent	Prior to Clearing

Table 5: P5 – Threatened Flora Management

	marking tape. Where necessary individuals will be translocated in accordance with protocols in the Threatened Flora Management Plan. 3. The boundary of the Core Conservation Areas will be adjusted as necessary (if not within construction footprint), to include any additional individuals located during of the pre-clearing survey.		
	Establish No Go Zones. 1. Core Conservation Areas less than 20m from of the clearing and construction footprint will be identified on construction drawings and through signage on site as 'No Go Zones'. Their associated Buffer Areas will be identified as 'Proceed with Caution Zones'. 2. Work within the Buffer Area will require supervision by the Project Ecologist. 3. No work apart from conservation management activities is to be permitted within the Core Conservation Areas.	Contractor	Prior to Clearing
	Erect exclusion fencing and signage. 1. Where Linear Open Space has not been fenced as part of general vegetation protection, temporary fencing must be installed around the Core Conservation Area, where practical, and necessary (i.e. steep terrain may form natural barrier). The temporary fence shall be a minimum of star pickets with 3 strand wire and high visibility mesh attached to the top wire (with minimum gap of 500mm along the bottom) and erected prior to clearing. 2. The required alignment and extent of the fencing is to be undertaken in consultation by the project ecologist and inspected before the start of clearing. 3. Signage is to be attached to fencing clearly identifying the site as a significant ecological area and a 'No Go Zone', and no entry permitted unless approval given by Proponent. Mapping will be produced identifying location of threatened flora and alignment of protective fencing during detailed design for each Phase of the Spring Mountain	Contractor	Prior to Clearing

SPRINGFIELD RISE AT SPRING MOUNTAIN

CULVERT CROSSING SITE BASED MANAGEMENT PLAN

ISSUE D 03.03.2017
RE-LODGEMENT

INTRODUCTION:

This Culvert Crossing Site Based Management Plan (SBMP) has been prepared at the request of **Lendlease Communities** for the environmental management of the construction of two (2) culvert crossings proposed for the haul road required as part of the Springfield Rise at Spring Mountain project. This submission is provided in support of an engineering application prepared and lodged by **Arcadis** which received a conditional approval from **Ipswich City Council** on the 22nd of September 2016. This SBMP responds directly to the following conditions:

- Condition 9(b) to (f) - Vegetation Retention - Gully & Habitat Areas
- Condition 10 - Tree & Habitat Survey - Gully Crossings
- Condition 11 - Fauna Movement - Crossing Design
- Condition 12 - Fauna Management

This SBMP has been prepared utilising the following process involving representatives from the **Saunders Havill Group**, **Arcadis** and **Lendlease**:

Phase 1 - Detailed Tree Survey completed by **SHG**
Phase 2 - Data Upload Base Plans and Schedules
Phase 3 - Overlay Tree Data with Preliminary Engineering Design Data for Earthworks and Culverts
Phase 4 - Team workshop - realign culvert orientations, levels, earthworks grades etc to minimise impacts
Phase 5 - Update and finalise Engineering Designs
Phase 6 - Lodge Detailed Engineering Drawing Package - **Arcadis**
Phase 7 - Lodge Detailed Environmental Management Package - **SHG**

STRUCTURE & CONTENTS OF SITE BASED MANAGEMENT PLAN

This Site Based Management Plan (SBMP) includes information relative to pre-commencement, construction, and operational management. Based on this the SBMP includes the following sections and drawing sheets:

- Vegetation Management - Construction Phase Notes
- Fauna Management - Construction Phase Notes
- Vegetation Management Plan - Culvert 1
- Vegetation Management Plan - Culvert 2
- Fauna Movement Plan - Culvert 1
- Fauna Movement Plan - Culvert 2
- Fauna Movement - Notes and Details (Sheet 1)
- Fauna Movement - Notes and Details (Sheet 2)
- Detailed Rehabilitation Plan - Culvert 1
- Detailed Rehabilitation plan - Culvert 2
- Rehabilitation Plan - Notes and Specifications
- Rehabilitation Works - Monitoring and Reporting
- Appendix A - Detailed Tree Schedules

DRAWING SCHEDULE

Dwg No.	Drawing Title	Issue	Date
7522 E 101	Cover Sheet	D	03/03/2017
7522 E 102	Vegetation Management Plan - Construction	D	03/03/2017
7522 E 103	Fauna Management Plan - Notes	D	03/03/2017
7522 E 104	Vegetation Management Plan - Culvert 1	D	03/03/2017
7522 E 105	Vegetation Management Plan - Culvert 2	D	03/03/2017
7522 E 106	Fauna Management Plan - Culvert 1	D	03/03/2017
7522 E 107	Fauna Management Plan - Culvert 2	D	03/03/2017
7522 E 108	Fauna Management Plan - Details	D	03/03/2017
7522 E 109	Rehabilitation Management Plan - Notes	D	03/03/2017
7522 E 110	Rehabilitation Management Plan - Culvert 1	D	03/03/2017
7522 E 111	Rehabilitation Management Plan - Culvert 2	D	03/03/20177
7522 E 112	Rehabilitation Management Plan - Monitoring	D	03/03/2017
7522 E 113	Rehabilitation Management Plan - Photo Monitoring	D	03/03/2017
7522 E 114	Rehabilitation Management Plan - Photo Monitoring	D	03/03/2017
7522 E 115	Rehabilitation Species Schedules	D	03/03/2017

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

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NOTE:
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AMENDMENTS:

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A	29/11/2016	Client Comments	MS
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40 YEARS
1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems
APPROVED COMPANY ISO14001 Environmental Management Systems

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Cover Sheet

SCALE: NOT TO SCALE

DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 101 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

VEGETATION MANAGEMENT PLAN - CONSTRUCTION

NOTES

1.0 INTRODUCTION

The *Environmental Management Division* of the **Saunders Havill Group** was engaged by **Lendlease Communities** to prepare a *Vegetation Management Plan* (*VMP*) for the removal and management of tree clearing associated with the construction of two road crossing culverts inclusive of drainage and fauna movement.

This Vegetation Management Section of the Site Based Management Plan is prepared to explicitly minimise the removal of tree species within the drainage gully, retained linear parkland area and most importantly in the led in and exit to purpose built fauna movement culverts. These drawing sheets are prepared to assist with a response to the approval conditions outlined in DA Reference (5881/2015/MA/A)

To assist in the spatial depiction of management zones and better allocate a tree retention and removal status Ecologists from the **Saunders Havill Group** completed a Stadia-metric tree survey using Trimble Antenna based GPS unit. The survey collected the following data on trees within and adjoining the earthworks extent as provided by the project engineer. All trees within and adjoining the linear open space were located within 50m of the extent of the provided earthworks alignment. The following details were collected:

- Reference Point and Location
- Botanical Name / Common Name
- Trunk DBH
- AS4970-2009 - Tree Protection Zone
- Height and Spread
- Canopy and Trunk Condition Comments
- Fauna and Habitat Values and Details

Particular attention and detail was collected at the entry to and exit from the purpose built fauna movement culverts with a view to maximising tree, shrub and ground cover retention. The purpose of this *VMP* is to manage the vegetation removal process and the protection of fauna species over necessary clearing required for the construction of the road and retaining structures. This VMP has been produced by overlaying existing site data with proposed works to determine impacts and disturbance:

1. GPS surveyed tree plot of native trees over the application area
2. Road alignment, inclusive of traffic medians, graded reserves, infrastructure corridors, culvert structures
3. Earthworks batters - combined cut and fill extents
4. Cut of drains and run off swales and other Stormwater infrastructure
5. Drainage works at entry and exit points to culvert and other structures

2.0 PROJECT MANAGEMENT

Vegetation management and its processes is an integral part of the construction and operational phase. The site supervisor is responsible for all onsite works including overseeing vegetation clearing, health and safety of fauna and adhering to both council's conditions and guidelines and Australian Standards - "Protection of Trees on Development Sites AS4970-2009.

Additional site and consulting contacts for queries regarding to the Vegetation Clearing and Management Plans include;

CLIENT CONTACT: LENDLEASE
Mr Graeme Knox Ph 0411 179 432

ENVIRONMENTAL CONTACT: SAUNDERS HAVILL GROUP
Mr Murray Saunders Ph (07) 3251 9444

SITE CONTRACTOR: SHADFORTHS CIVIL

Mr Tony Tony Hooper Ph 0448 008 837

SITE SUPERVISOR: ARCADIS

Mr Christo Loun Ph (07) 3337 0846

NOTES

3.0 CLEARING PHASES AND PROCESS

The following stages are required for clearing to be undertaken on this property and a copy of this *VMP* must be present with the clearing contractor onsite:

PHASE 1 - Tree Protection Fencing to be installed prior to the commencement of any clearing works on the site. Tree protection fencing is to be located at or beyond 12 x diameter at breast height (DBH) unless approved by the appointed Arborist around trees designated for retention or as per the locations shown in this drawing package (refer Fencing Note).

PHASE 2 - Pre-start Meeting

Fencing shall be in place at the time of the official pre-start meeting for inspection.

PHASE 3 - Fauna Inspections and Management

Undertake necessary fauna management requirements prior to clearing works - Refer Fauna Management Specifications

PHASE 4 - Undertake Bulk Clearing

Undertake wholesale removal of vegetation once approved for removal by qualified fauna spotter. Clearing will occur in the direction outlined in this *VMP* and managed by the appointed fauna spotter to allow all fauna unimpeded movement off the site.

4.0 ACCESS AND STOCKPILING

Access will be provided from within the existing access track which traverses the road alignment. No set stockpile locations are proposed on the plans as these are expected to occur external to tree retention zones along the road and road reserve alignment or within adjacent approved allotment areas.

5.0 TREE PROTECTION FENCING

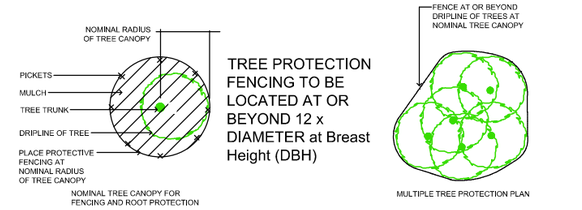
Currently on the drawings Tree Protection Fencing is depicted to the full extent of construction works. This is likely to be required in coordination with construction safety fencing demarcating the extent of the work zone. Temporary tree protection fencing and signage is as depicted on this drawing sheet.

6.0 MAINTENANCE

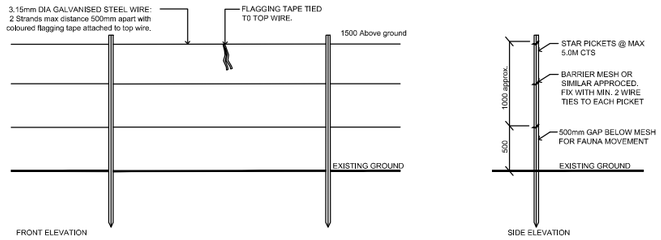
After tree clearing works on site, follow up maintenance works should be carried out on all retained vegetation. An analysis of the vegetation's health and growth should be undertaken to determine specific maintenance needs.

TREE PROTECTION ZONE SIGNAGE

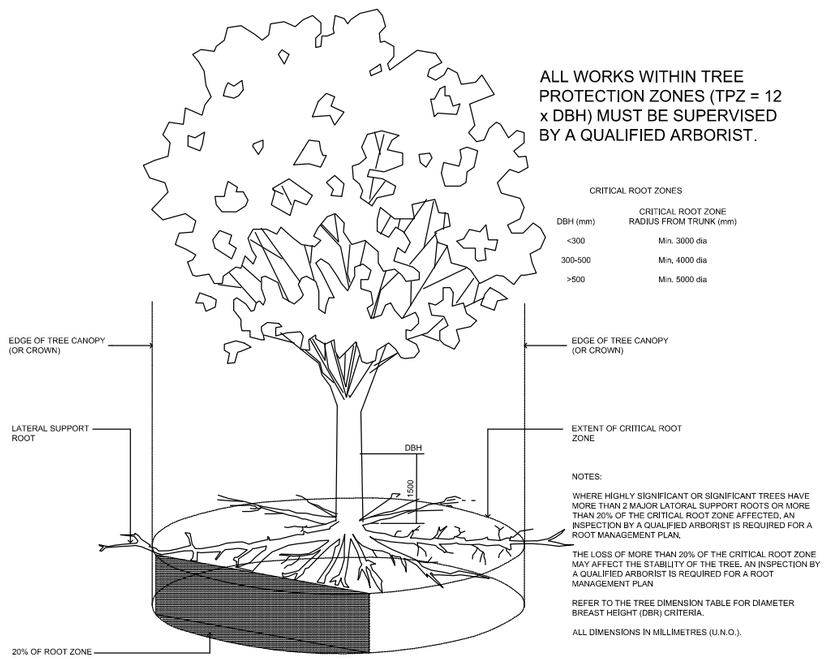
TREE PROTECTION DETAIL (Not to scale)



NOTE:
Temporary protection fencing is to be in place for the pre start meeting prior to the commencement of works and remain until the project achieves on-maintenance - No traffic, stockpiling, or excavation within tree protection zone.
Minor planting works inside fenced area are to be carried out by hand.



CRITICAL ROOT ZONE - DETAIL (Not to scale)



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40 YEARS 1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Construction

SCALE: NOT TO SCALE

DATE: March 17	CHECKED: MS
PROJECT No: 7522	DRAWN: TL

DRAWING No.: 7522 E 102 D

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Land Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

Springfield Rise - Environmental Pre-Start Checklist

Project Area: Haul Road		**Date:**			
Contractor: Shadforths		**Construction Stage/ Activity:** Early works bulk earthworks (Phase 1 – Version 3)			
Date work is to start: 13th March 2017					
Date work is to cease: 17th March 2017		**Compliance**			
#	**Control Measure**	**Yes**	**No**	**N/A**	**Comments**
1	Are clearing extents marked out and fenced? (N.B. Fencing is required as per ICC permits unless instructed otherwise by Council, Fauna Spotter or Environmental Coordinator)	✓			Completed by Wolter Consulting on 2nd March 2017
2	Has the fencing of clearing extents demarcation been inspected by the Environmental Coordinator?	✓			Completed by SHG on 2nd March 2017.
3	Has sign off been provided by the Environmental Coordinator for demarcation areas?	✓			See Attachment 1.
4	Has certification for pre-clearance flora been provided? (N.B. Exemptions/permits for protected plants under the NCA must be obtained by EHP where works occur in a High Risk Area). Please provide date and reference.	✓			See Attachment 2. EHP Reference: AR082999 22 January 2016.
5	Have pre-clearance checks surveys for *Plectanthus habrophyllus* been completed over the clearing area?	✓			Completed by SHG on 3 February 2017. See Attachment 3.
6	Are there 'no-go' zones identified within the clearing area?		✓		
7	If yes, have 'no-go' zones been demarcated, fenced, signed and inspected by the Environmental Coordinator and Contractor?			✓	
8	Has the appointed Fauna Spotter completed pre-clearance surveys and reports?	✓			See Attachment 4. Fauna Spotter Catcher Pre-Clearance and Habitat Values Survey, completed by QFC (March 2017)
9	Has the appointed Fauna Spotter identified any sensitive areas for consideration in clearing methods? Please provide a summary.	✓			See Attachment 4. Fauna Spotter Catcher WHIMP, completed by QFC (March 2017).

10	Have all contractors, subcontractors and associated personnel been instructed on environmental procedures and controls?	✓			See Attachment 5. Environmental Awareness Acknowledgement Notice, signed by Shadforths (Feb 2017).
11	Has a Council pre-start been completed?	✓			Completed with ICC on 14th February 2017. Works are to be completed in accordance with: Arborist report, SH SBMP, ICC approvals, QFC reports.

NOTE: if the answer to any question (1-5, 7-11) above is NO then the clearing activity will not proceed.

Name	Company	Position	Signature	Date
Jack Blinco	Cleartree Australia	Clearing Contractor	Jack Blinco	9.3.17
Graeme Knox	Lend Lease	Client Representative		10.03.17
Dan O'Malley	Arcadis	Project Engineer		10.03.2017

CONTRACTOR COORDINATOR:

Name: Tony Hooper **Position: Project Manager**

Date: 9.3.17 **Signature:**

ENIRONMENTAL COORDINATOR:

Name: Murray Saunders **Position:** Director

Date: 09.03.2107 **Signature:**

FAUNA SPOTTER COORDINATOR:

Name: Bryan Robinson **Position:** Director

Date: 10/3/17 **Signature:**

SPRINGFIELD RISE AT SPRING MOUNTAIN

FANUA MANAGEMENT PLAN - NOTES

NOTES

INTRODUCTION
The Fauna Management specification on this VCFMP are designed to protect native animals and control and manage impacts during clearing activities. The fauna management specifications and principles incorporated in this VCFMP Series applies generically to all native animals and focus on avoiding conflicts and incorporating measures to minimize disturbance. Compliance with this section of the VCFMP is compulsory and incorporates the use of expert consultants including a Fauna Spotter / Relocator as registered with the Queensland Parks and Wildlife Services.

FAUNA IMPACTS
Clearing of vegetation provides an obvious source of impact to existing habitat and animal safety. Although isolated site evidence shows the existing vegetation provides sub optimal habitat for a number of species which use the site infrequently or which have adapted to degraded bushland environments. Koala use of the site is considered infrequent, however its important clearing occurs during a time when this animal is not present on-site. The Fauna Spotters pre-clearance checks prior and on the day of clearing should assist in ensuring this outcome.

CLEARING IMPACTS (through road and allotment areas)
- Direct removal of site vegetation
- Loss of isolated and marginal habitat opportunities at the site based scale
- Noise, vibration and dust
- Erosion and sedimentation
- Threats associated with open cuts etc. and fauna entrapment

Fauna Management Schedule

1.0 PRE CLEARING

REF:	MANAGEMENT ITEM	RESPONSIBILITY	TIMING	REPORTING
1.1	**TEMPORARY FENCING** Prior to the commencement of works and to be inspected by Council or the site Environmental Coordinator AS 4970 Temporary Protection Fencing shall be installed around the 'Tree Protection Zone' designated for retention (as per detail sheets). - Fencing shall be fauna friendly; - No clearing, stockpiling, site access, earthworks, storage, etc. is to occur within the temporary protection fencing area; - Only approved weed management works to occur within the temporary protection fencing area; - Fencing to be reinstated immediately if damaged or knocked down, any damage to retained trees to be immediately reported to Project Arborist; and - Fencing to remain until the completion of all site bulk earthworks and construction.	SITE SUPERVISOR	Prior to the commencement of construction	Inspected by Council or the Environmental Site Coordinator
1.2	**CONTRACTOR EDUCATION & AWARENESS** All site contractors and subcontractors will be made aware of their responsibilities to protect native fauna. The Fauna Management notes on this VCFMP is provided as a working document to assist on-site management and protection of native animals. This generally will form part of education and training on a broader work place health and safety but as a minimum will include: - Copy of VCFMP kept on-site (Site Office). - General education and awareness notification of contractors and sub contractors involved in activities potentially impacting native animals as part of site induction - contractors must know the location of the VCFMP, key phone numbers and who to report to if they breach the VCFMP. - A list of relevant contact phone numbers as listed on these drawings is kept in a visible and accessible location in the site office	SITE SUPERVISOR / THE PROPONENT	Prior to the commencement of construction and as part of the site induction for new staff and sub-contractors	SITE SUPERVISOR

2.0 VEGETATION CLEARING

2.1	**SPOTTER / RELOCATOR** Immediately prior to the commencement of clearing of native vegetation a daily visual inspection of the area must be carried out. In the event of an animal being located and area of 5m radius should be established around the tree excluding machinery from the area until the animal has relocated (usually overnight). Or If an animal requires relocating this must be undertaken by a suitable qualified fauna expert recognized by the Queensland Parks and Wildlife. For some fauna a permit will be required. Any native fauna orphaned or injured by the development process must be reported to the Queensland Parks and Wildlife Service (07 3202 0200). The Site Supervisor is responsible for the safe management of site fauna and implementation of these specific fauna requirements **SPECIFIC KOALA MANAGEMENT NOTES** A Koala Spotter is a person who holds a tertiary qualification in Biology or Zoology, or who is demonstrably experienced in the identification and location of Koalas in their natural habitat. For example, a koala keeper employed by a licensed Wildlife exhibitor (i.e. a zoo) may be capable of demonstrating competence in locating Koala's. Prior to the commencement and during felling operations, it is the responsibility of the Koala spotter to be present at the site of felling operations, identify any tree at the site within which a Koala is present, as well as any tree that has a crown which is intermeshed or overlapping with such a tree; and advise the person who is authorised to conduct the felling operation, or that persons representative, of the precise location of each such tree Management Item. **CLEARING PATTERN / FAUNA FLUSHING** Clearing within each individual area is to occur as per the requirements and sequencing listed on *sheet 6* ensuring native animals are flushed towards the safe haven of larger retained tracts of bushland to west of the site and away from adjoining roads and areas of existing housing. Principles of the clearing plan include: • Clearing occurs once Spotter / Relocator gives sign off the site is clear of significant native species. • Clearing is sequenced in accordance with advice from the Fauna Spotter to ensure adequate timing for fauna to relocate towards retention areas.	SITE SUPERVISOR	Prior to the commencement of construction	Inspected by Council or the Environmental Site Coordinator

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40 YEARS 1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Fauna Management Notes

SCALE: NOT TO SCALE

DATE: March 17 | CHECKED: MS

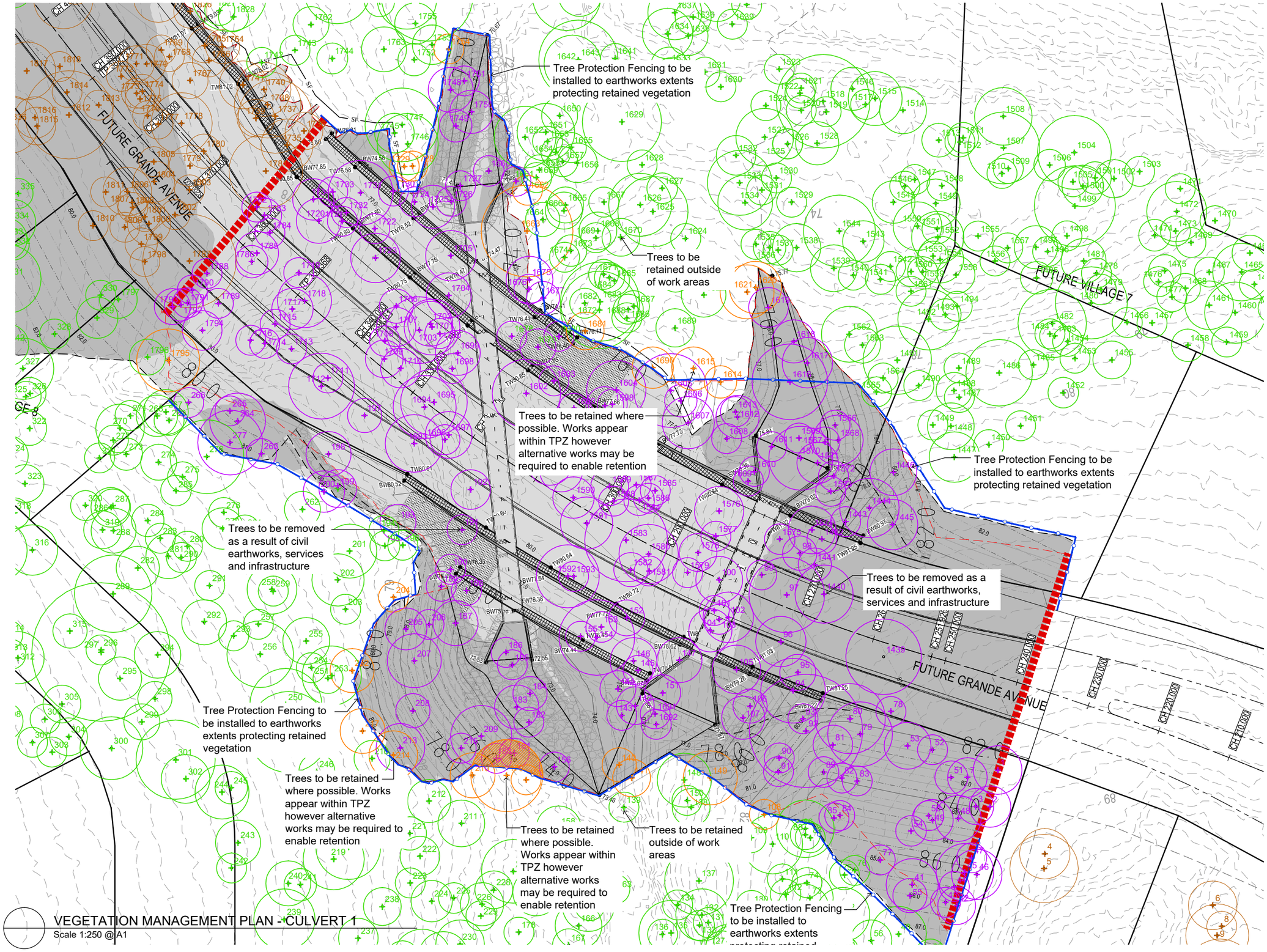
PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 103 D

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

SPRINGFIELD RISE AT SPRING MOUNTAIN

VEGETATION MANAGEMENT PLAN - CULVERT 1



VEGETATION MANAGEMENT PLAN - CULVERT 1
Scale 1:250 @A1

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

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LEGEND

- RETAINED TREES: Trees to be retained and protected
- RETAINED TREES: Trees to be retained where possible. Works appear with TPZ however alternative works may be required to enable retention
- REMOVED TREES: Trees to be removed as a result of civil earthworks, services and infrastructure
- EXISTING VEGETATION: Trees as identified to be removed as part of future works / separate approvals
- EXTENT OF WORKS: Extent of clearing works required for culvert crossings
- TREE PROTECTION FENCE: Extent of tree protection fencing as per detail

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APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 1 VMP

SCALE: 1:250@A1 1:500@A3 (0 2.5 5 12.5m)

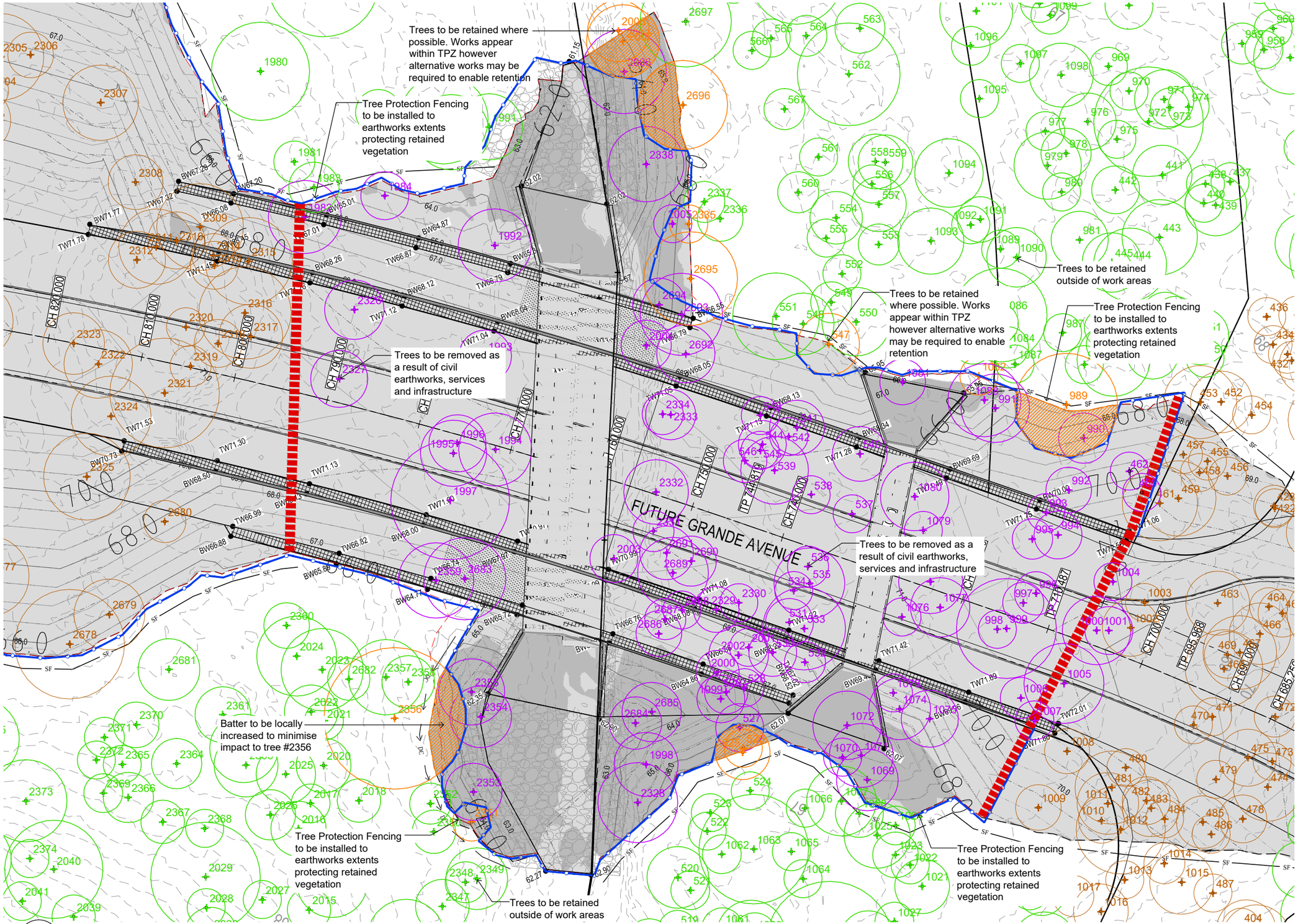
DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 104 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

VEGETATION MANAGEMENT PLAN - CULVERT 2



VEGETATION MANAGEMENT PLAN - CULVERT 2
Scale 1:200 @ A1

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40 YEARS 1975-2015

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APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 2 VMP

SCALE: 1:200@A1 1:400@A3 (0 2 4 10m)

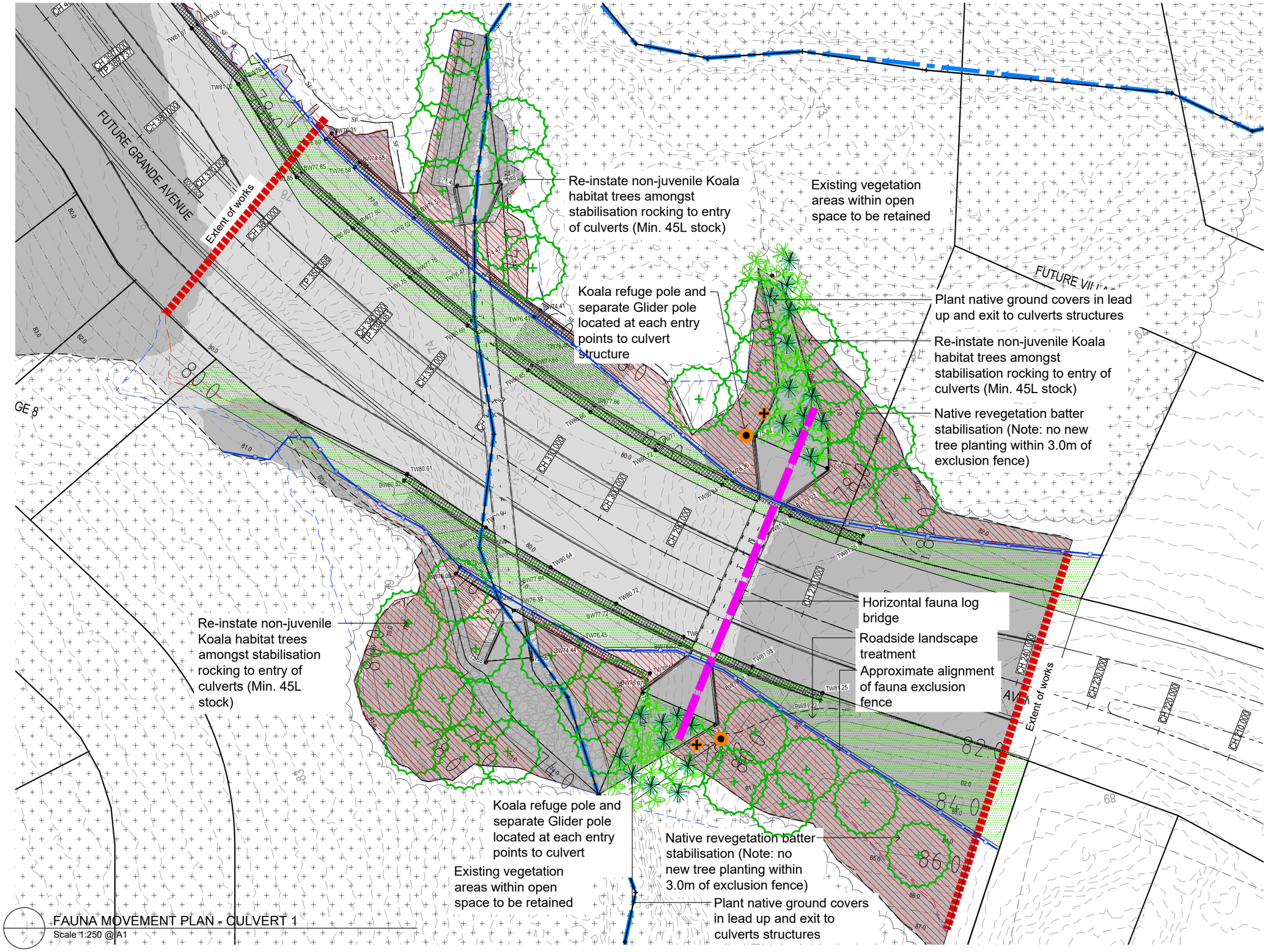
DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 105 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

FAUNA MOVEMENT PLAN - CULVERT I



FAUNA MOVEMENT PLAN - CULVERT 1
Scale 1:250 @ A1

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

landscape architecture

LEGEND

- Roadside landscape treatment - Separate OPW application
- Native revegetation batter stabilisation (Note: no new tree planting within 3.0m of exclusion fence)
- Existing revegetation - refer to notes for detail
- Approximate alignment of fauna exclusion fence
- Horizontal fauna log bridge
- Koala refuge pole and separate Glider pole located at each entry points to culvert structure
- Re-instate non-juvenile Koala habitat trees amongst stabilisation rocking to entry of culverts (Min. 45L stock)
- Plant native ground covers in lead up and exit to culverts

NOTE:
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AMENDMENTS:

Issue	Date	Description	Checked
A	29/11/2016	Client Comments	MS
B	29/11/2016	Lodgement	MS
C	25/01/2017	Re-Lodgement	MS
D	03/03/2017	Re-Lodgement	MS

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40 YEARS 1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 1 Fauna Movement

SCALE: 1:250@A1 1:500@A3 (0 2.5 5 12.5m)

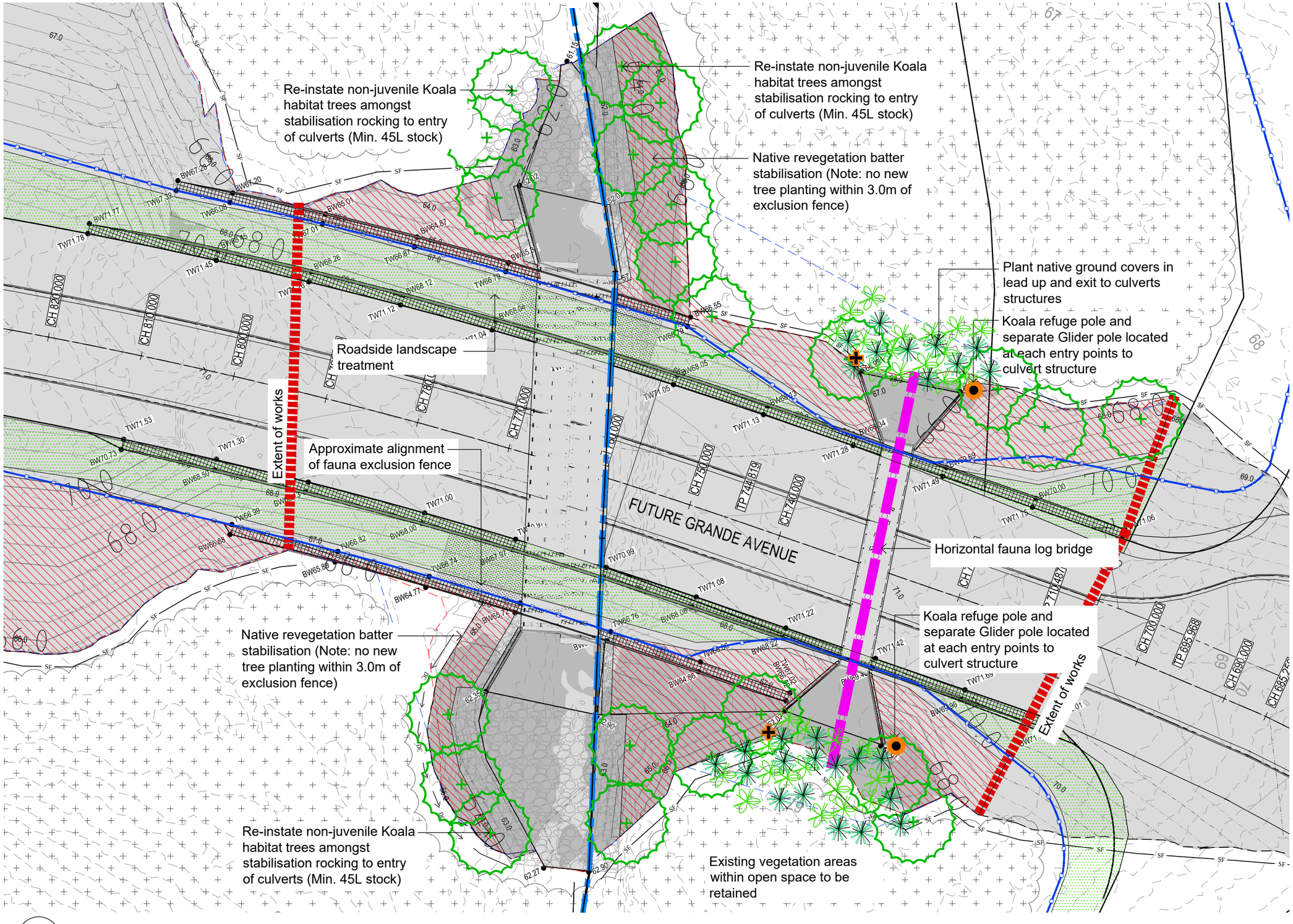
DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 106 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

FAUNA MOVEMENT PLAN - CULVERT 2



FAUNA MOVEMENT PLAN - CULVERT 2
Scale 1:200 @ A1

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

landscape architecture

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40 YEARS 1975-2015

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APPROVED COMPANY ISO14001 Environmental Management Systems

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 2 Fauna Movement

SCALE: 1:200@A1 1:400@A3 (0 2 4 10m)

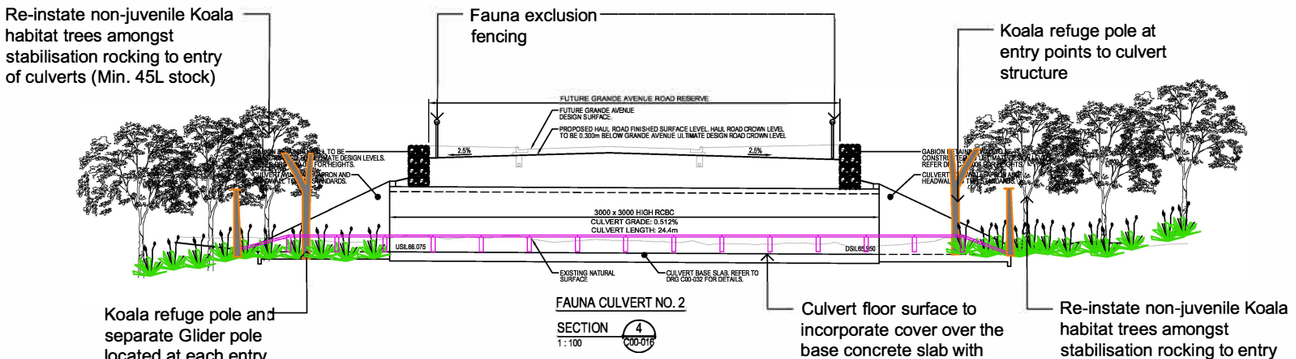
DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 107 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

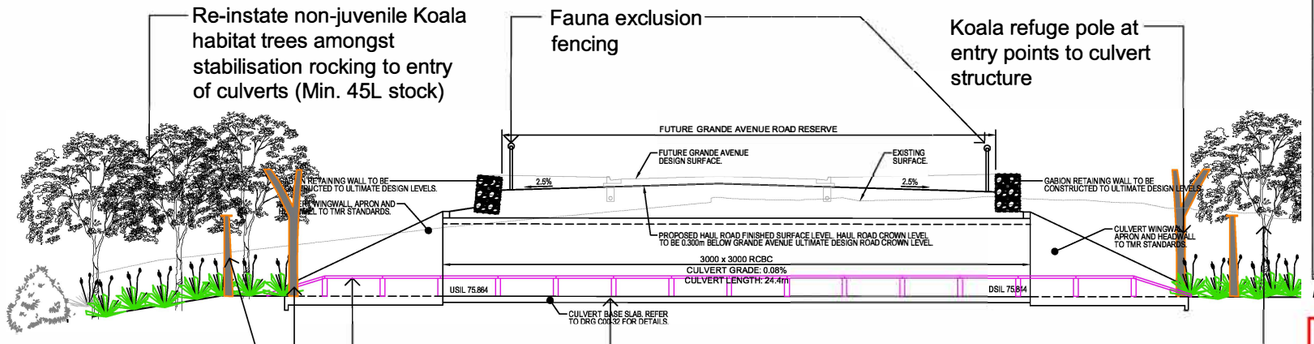
FAUNA MOVEMENT DETAILS



FAUNA CULVERT NO. 2

SECTION 4 / 200-016
1 : 100

FAUNA MOVEMENT DETAILS - CULVERT 2
N.T.S



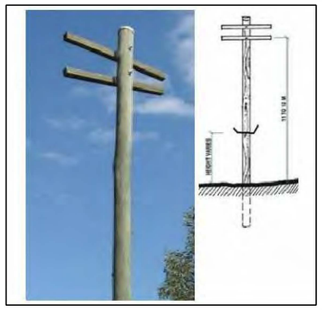
FAUNA MOVEMENT DETAILS - CULVERT 1
N.T.S

FAUNA FURNITURE - GLIDER REFUGE POLES

Glider refuge poles are to be installed in accordance with DTMR "Fauna Sensitive Road Design Manual". Poles to be installed max. 30m apart and and located approximately in locations as shown.

Design requirements:

- Gliders prefer to glide between trees but if a pole is closer they may utilise the pole.
- Can be constructed from used electricity poles or tree trunks salvaged from the site.
- Consider potential conflict with adjacent powerlines and other service infrastructure.
- Consider height of poles, height of crossbars and distance between poles. Use trigonometry to determine the specific requirements.
- Minimum height of 12 metres.
- Cross bars should be provided at various heights. Highest crossbar at least 11 m above the ground.
- Distance between poles:
  - Allow for an average of 1.8 metres flying distance with a one metre loss in elevation.
  - Research on sugar, mahogany and squirrel gliders shows an average glide angle is 30.5º with a one metre loss in height for every 1-2 metres in glide length.
- Attach metal around poles (below launch points and any refuges) to stop gliders from descending to the ground.
- Predation refuges can be added. Presently the design for such refuges consists of: three PVC pipes (110 x 380 mm) attached to each pole at heights of approximately 9, 10 and 11 metres.



Fauna Sensitive Road Design Manual (DTMR 2010)

Species	Average glide lengths	Minimum crossbeam (launch) height	Spacing between structures	Height of structure
sugar glider (Petaurus breviceps)	45 m with a launch height of 25 m[1].	11.96 m (average)[1].	Maximum distance 60 m[3].	Dependent upon length required to glide (ie distance between structures). Use trigonometry to determine.
squirrel glider (Petaurus norfolcensis)	80 m with a launch height of 45 m[1]. Average glide of 30-40 m[2]. Average glide length is one metre with one metre decrease in height.	11.96 m (average)[1].	Maximum distance 60 m[3].	
yellow-bellied glider (Petaurus australis)	Maximum 30 m glide[4].	11.96 m (average)[1].	No more than 30 m.	
mahogany glider (Petaurus gracilis)	Glide length unknown.	11.96 m (average)[1].		
greater glider (Petauroides volans)	25–35 m with a launch height of 20-25 m[1].	11.96 m (average)[1].	Maximum distance 60 m[3].	
feathertail glider (Acrobates pygmaeus)	Maximum glide of 20–30 m[1].	11.96 m (average)[1].	No more than 30 m.	
General	Most species can glide 1.8m with a one metre loss in altitude[1]. Average glide angle is 30.5 degrees.		All Australian gliders (except feathertail and yellow-bellied gliders with a maximum glide of 20–30m[1]) can glide at least 60m[3].	

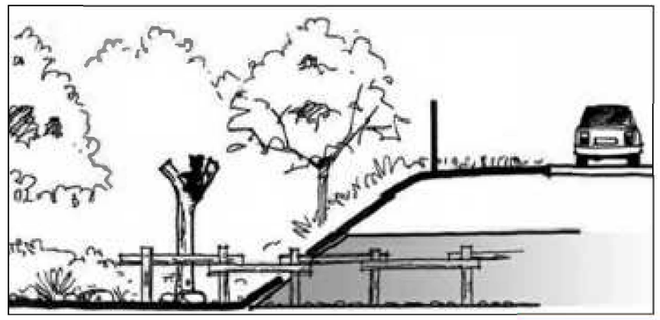
Fauna Sensitive Road Design Manual (DTMR 2010)

FAUNA FURNITURE - KOALA / POSSUM REFUGE POLES

Koala and / or Possum refuge poles to be installed in accordance with DTMR "Fauna Sensitive Road Design Manual". Poles to be installed and located generally in locations as shown.

Design requirements:

- Utilised at the entrance and exit points to fauna culverts to provide resting and predator avoidance points.
- 200 mm diameter is optimum but no more than 500 mm in diameter.
- Sufficient height (between three and six metres) to provide refuge from predators such as dogs.
- Timber or rubberized cement.
- Can be installed in place of suitable vegetation on land bridges, in front of and throughout underpasses and anywhere else they are required.
- Install on the basis of expert advice.



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APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Fauna Movement Details

SCALE: AS NOTED

DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 108 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

REHABILITATION PLAN - NOTES

REHABILITATION DESIGN & LAYOUT

REHABILITATION DESIGN & LAYOUT

This Rehabilitation Plan has been prepared for Lendlease and is designed to enhance the existing native vegetation areas on completion of the culvert construction and weed management process within the open space areas of Spring Mountain as required for culvert crossing within Mountain Creek and Village 6 and 8. This plan set has been produced by overlaying existing site data with proposed works to determine impacts and disturbance.

This Rehabilitation Plan is to identify and control necessary site disturbance as provided for the site plan layout. Where existing native vegetation has established, low impact weed removal and rehabilitation techniques are required. In patches that have undergone clearing and major disturbances (Road batters etc), a more aggressive approach to weed removal can be applied, in consultation with the Assessment Manager.

Therefore, Revegetation occurs in five (5) distinct zones throughout the rehabilitation area. Refer to Drawing sheets for a full description of proposed plant species, sizes, densities and numbers.

Zone 1 - Open Space Interface Rehabilitation Area (Reconstruction)

As a result of civil earthworks for construction of internal roads, culvert crossings and services, these areas have been identified as being highly disturbed which will require full reconstruction rehabilitation approaches. Rehabilitation works to occur along the disturbed edges and batters of the open space areas following the civil construction of the internal road network. These areas will be highly disturbed and will require immediate rehabilitation upon completion of civil works. The entire area is to be topsoiled, mulched to specification and planted with endemic species at densities of 1 plant per square metre. Where batters are steeper than 1:3 these shall have Coir netting installed to manufactures specifications insitu of mulch.

Zone 2 - Roadside Landscape Treatment Area (Reconstruction)

As a result of civil earthworks for construction of internal roads and services, these areas have been identified as being highly disturbed which will require full reconstruction. As an interim treatment until final landscape works are completed, the area must be hydromulched with locally indigenous groundcover species to stabilise the area. Visual amenity along the road will be increased over rehabilitation Approaches, as such these areas will be detailed within the operational works landscape design. Various landscape treatment / approaches may be undertaken to achieve the desired landscape outcome, which may consist of turf to verges, feature landscape planting areas, various mulch types (organic, inorganic) and embellishments. These works are to be designed as apart of separate operational works applications.

Zone 3 - Fauna Culvert Rehabilitation Area (Reconstruction)

The entry and exit points to the fauna crossing area to be rehabilitated to allow for safe fauna passage. Works involved will be mulching / Coir netting to stabilise and dense revegetation planting at minimum 1 plant per square metre utilising endemic species.

Zone 4 - Stormwater Culvert Rehabilitation Area (Reconstruction)

These areas are to have dense planting of sedge and grass species throughout the rock scour protection areas. No mulch or Coir netting to be installed within this zone. Dense revegetation planting at minimum 2 plants per square metre utilising endemic species.

Zone 5 - Existing Vegetation Area (Natural Regeneration)

These balance areas of existing vegetation are to be retained. Disturbance to these areas will only be to fringing areas where earthworks to construct batters may encroach which are to be rehabilitated via techniques described within zone 1. Due to the existing seed bank being undisturbed it is recommended that no revegetation works are undertaken allowing for natural regeneration to occur throughout the area.

TYPES OF REHABILITATION

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.

RECONSTRUCTION

Applies:

- Where the site is highly degraded or altered.
- When the degree of disturbance has been so great and long-standing that the pre-existing native plant community cannot recover by natural means.
- To sites such as areas of fill, sites affected by stormwater flow, and areas that have been drastically cleared, either mechanically or by stock even though there may be a few remaining native trees or shrubs.
- When a greater degree of human intervention is required, such as weed removal, cessation of grazing and/or slashing, amelioration of soil conditions such as importation of soils, drainage works or reshaping of the landscape.
- When a major component is the importation of native species through planting.

The re-establishing planted community should be similar to the original vegetation in structure, composition and diversity.

FABRICATION (Type Conversion)

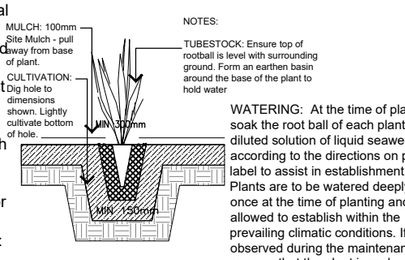
Applies:

- Where site conditions have been irreversibly changed.
- When it is not possible to restore the original native plant community.
- Where a better-adapted local plant community can be planted that will function within the changed conditions.
- In situations such as the construction of a wetland plant community to mitigate increased urban stormwater run-off.
- N.B Revegetation (planting) is the major component in a fabrication program.

The re-establishing planted community should be similar to the naturally occurring plant community of the same type e.g. freshwater wetlands in structure, composition and diversity.

CULTIVATION AND PLANTING

Each individual planting location should be spot cultivated to at least 2 times the depth and twice the width of the plant stock size. Refer detail for more specifications:



WATERING: At the time of planting soak the root ball of each plant in a diluted solution of liquid seaweed according to the directions on product label to assist in establishment. Plants are to be watered deeply only once at the time of planting and then allowed to establish within the prevailing climatic conditions. If it is observed during the maintenance process that the plant is under stress then a subsequent watering is allowed to assist in establishment.

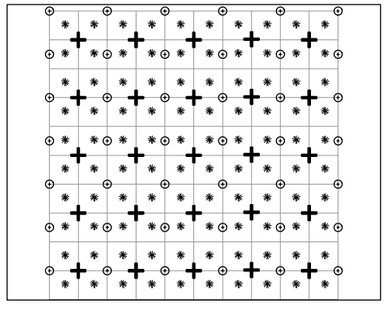
MULCHING & MATTING

Areas to be blanket mulched to a minimum depth of 100mm leaving a 50mm gap surrounding the trunk of planted stock. Areas which are too steep or where overland flows may occur, a combination of mulch and Coir netting and / or suitably anchored natural fibre weed mat installed to manufactures specifications have been specified.

PLANTING STOCK

All planting species to be selected in accordance with the species sizes and numbers setout on the species schedules on this drawing sheet.

Revegetation planting locations shall be generally setout in accordance with a typical random grid pattern as shown on this drawing sheet below.



All stock shall be true scheduled nomenclature, well formed, hardened off to suit final revegetation location, nursery stock. The root system should be well formed without being tube bound or large roots extruding from the tube container.

The landscape coordinator has the right to inspect and reject stock prior to planting.

INSTALLATION METHODOLOGY

The following outlines the preferred installation methodology for revegetation works within the rehabilitation areas. It has been designed to maximise plant establishment success rates and minimise plant mortality. Revegetation works shall be either undertaken or directly supervised by an experienced and qualified bush regenerator. All works shall be in accordance with the provisions of this Site Based Rehabilitation Plan, and local government policies and Australian Standards.

Plant installation methods shall include:

- Plants are to be vigorous, well established, hardened off, consistent with species or variety, free from disease and insect pests, with large root systems and no evidence of having been restricted or damaged.

INSTALLATION METHODOLOGY (Continued)

- Plants are to be planted immediately after delivery to the planting site. If not possible, they should be stored in the shade and watered sufficiently during the day.
- Excavate planting medium to a depth suitable for the installation of tube or pot specimens. In areas where planting substrate is deemed to be very poor (compacted, nutrient depauperate, hydrophobic etc.) and above areas of potential frequent inundation and water flow, topsoil may be used or the ground mechanically ripped where access is feasible.
- Pre-water plant hole, if soil is dry, to decrease root stress upon planting and assess the infiltration of water through the soil.
- Incorporate into the planting substrate the appropriate quantity of prepared water crystals or other suitable hydrating product such as Hortex 'Rainsaver' or 'Moisturaid'.
- Place plant into hole and backfill ensuring that the plant is upright and the stem is not covered in any less than 10mm or any more than 20mm of planting medium.
- Plants are to be watered thoroughly immediately after planting (ensure deep irrigation) and thereafter as required during the construction phase of the development depending on climatic conditions. Creation of a concave hollow around the base of each plant will aid water infiltration to the plant roots.
- A complete, slow release fertiliser is recommended, and is to be administered appropriately during planting. Top dressing with slow release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots.
- To ensure successful establishment, all planting surfaces must be covered in:
  - a 100mm layer of high quality weed-free composted chip mulch (site mulch) - Note: to avoid possible stem rot in some 'drier' species ensure mulch is 'dished' and not covering plant stem by more than 20mm.
  - suitable individual anchored natural fibre weed mat; or
  - as presented within other section, where available mulch material will be sourced from cleared vegetation material if adequately seasoned.
- A long term slow release fertiliser, such as Nutricote or similar product should be used for all plantings after initial plant establishment.
- Seedlings and saplings are to be encouraged and maintained throughout the establishment period.

MAINTENANCE SCHEDULE

MAINTENANCE SCHEDULE	
Maintenance schedule for revegetation areas of the proposed development as specified on the Landscape Plans	
ESTABLISHMENT	*Establishment is to occur at the completion of the primary and secondary weed removal phases and any rehabilitation planting. During this period any failed stock are to be replaced and/ or defects identified then reparations are to be made to site works.*
1. Watering	Watering shall be carried out to ensure establishment of revegetation.
	At the time of planting soak the root ball of each plant in a diluted solution of liquid seaweed according to the directions on product label to assist in establishment.
	Plants are to be watered deeply only once at the time of planting and then allowed to establish within the prevailing climatic conditions. If it's observed during the maintenance process that the plant is under stress then a subsequent watering is allowed
2.Weed Removal	Weeds evident during the Establishment period but should be removed as part of a monthly weed management program. Best Practice weed management techniques should be employed for weed removal amongst revegetation areas.
	Where grass seeding or turf establishes within planted areas it should be treated with approved herbicide for waterways.
MAINTENANCE	*(Weeks 13- 2 years)*
1. Watering	No specified watering regime is provided during the maintenance period. The intent is for the area to become self sufficient in utilising natural rain patterns and run off. Watering should occur during extended dry periods to ensure continued establishment
2. Weed Removal	Weeds should be tended to on a monthly program. Treatment techniques vary within the landscape planted areas versus revegetation and retention areas.
3. Management	Throughout the establishment and maintenance periods areas where planting stock has not achieved a 90% success survival additional planting shall be installed.
4. Erosion Control	Prior to the commencement of works and to remain throughout the establishment and maintenance period an erosion and sediment control measures shall be employed over the rehabilitaion area of the site.

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40 YEARS 1975-2015

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CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Rehabilitation Notes

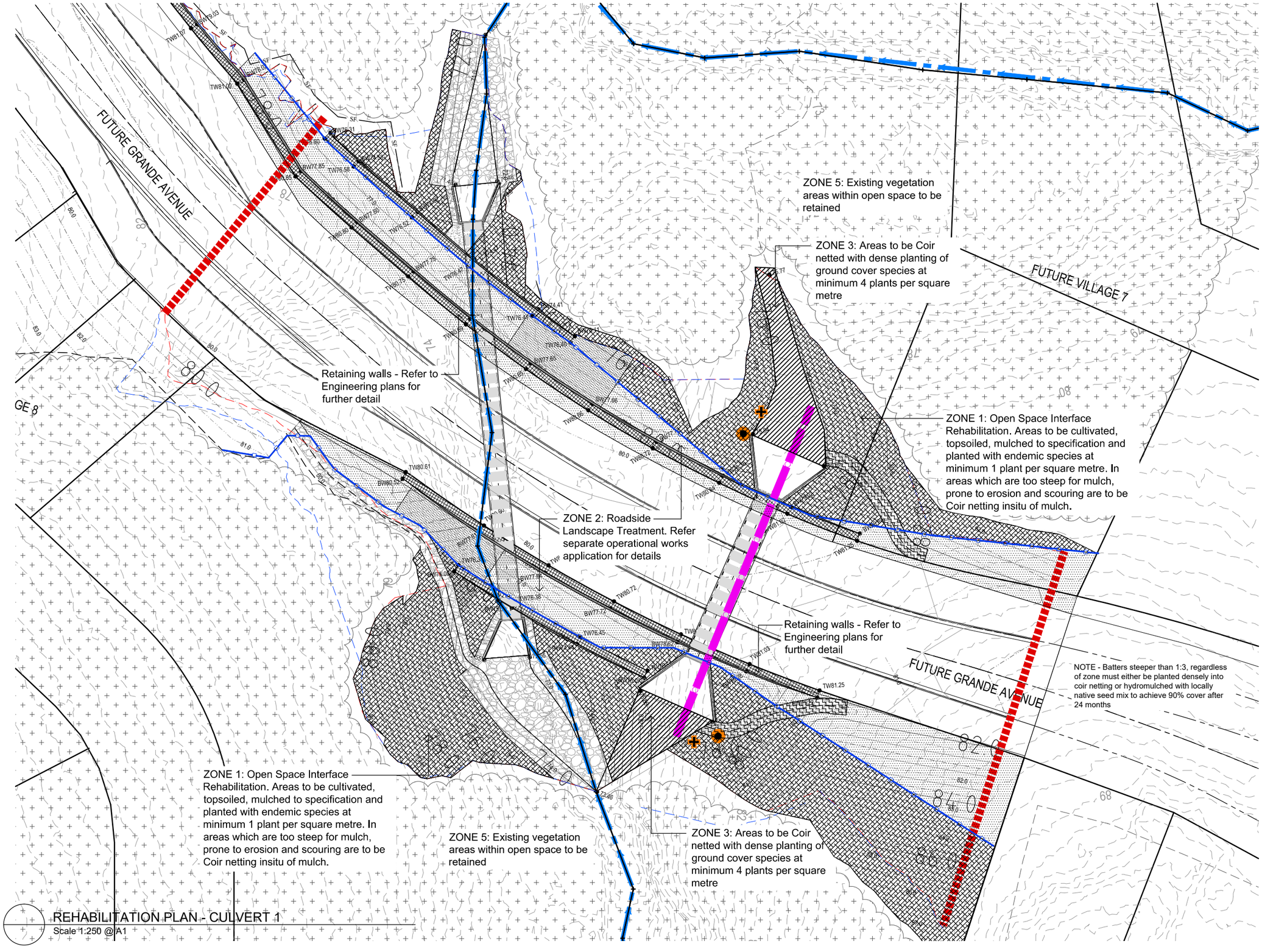
SCALE: NOT TO SCALE

DATE: March 17	CHECKED: MS
PROJECT No: 7522	DRAWN: TL
DRAWING No.: 7522 E 109 D	

J:\7522 Stages 15,16 and 17. Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

SPRINGFIELD RISE AT SPRING MOUNTAIN

REHABILITATION PLAN - CULVERT 1



REHABILITATION PLAN - CULVERT 1
Scale 1:250 @ A1

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landscape architecture

LEGEND

- ZONE 1: Open Space Interface Rehabilitation - Refer to notes for detail
- ZONE 2: Roadside Landscape Treatment - Refer to notes for detail
- ZONE 3: Fauna Culvert Rehabilitation - Refer to notes for detail
- ZONE 4: Stormwater Culvert Rehabilitation - Refer to notes for detail
- ZONE 5: Existing revegetation - refer to notes for detail
- Approximate alignment of fauna exclusion fence
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CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 1 Rehabilitation Plan

SCALE: 1:250@A1 1:500@A3 (0 2.5 5 12.5m)

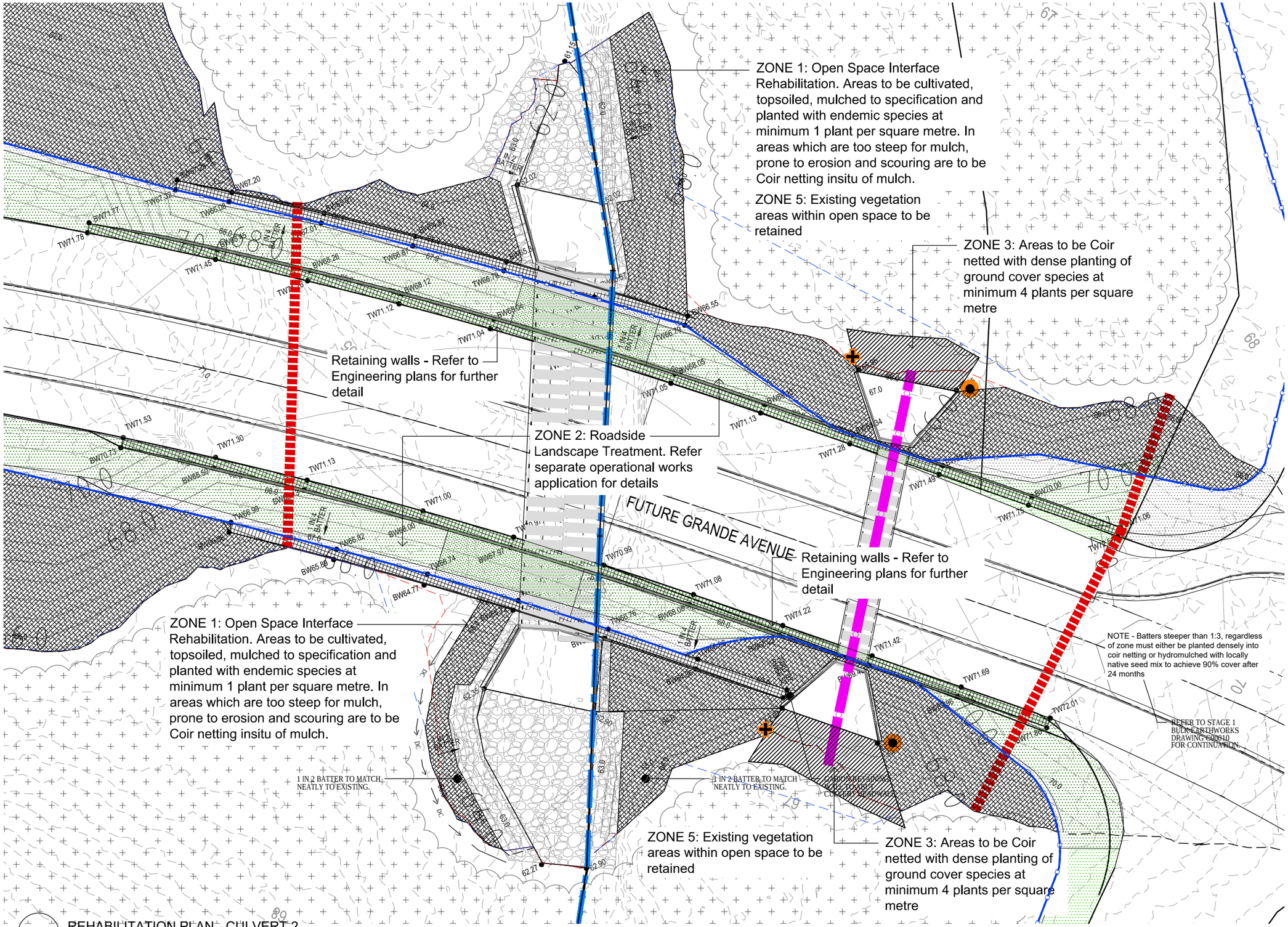
DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 110 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

REHABILITATION PLAN - CULVERT 2



REHABILITATION PLAN - CULVERT 2
Scale 1:200 @ A1

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCADIE - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

landscape architecture

LEGEND

- ZONE 1: Open Space Interface Rehabilitation - Refer to notes for detail
- ZONE 2: Roadside Landscape Treatment - Refer to notes for detail
- ZONE 3: Fauna Culvert Rehabilitation - Refer to notes for detail
- ZONE 4: Stormwater Culvert Rehabilitation - Refer to notes for detail
- ZONE 5: Existing revegetation - refer to notes for detail
- Approximate alignment of fauna exclusion fence
- Horizontal fauna log bridge
- Koala refuge pole at entry points to culvert structure

NOTE:
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AMENDMENTS:

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B	29/11/2016	Lodgement	MS
C	25/01/2017	Re-Lodgement	MS
D	03/03/2017	Re-Lodgement	MS

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surveying town planning urban design environmental management landscape architecture

40 YEARS 1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 2 Rehabilitation Plan

SCALE: 1:200@A1 1:400@A3 (0 2 4 10m)

DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 111 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

REHABILITATION PLAN - NOTES

NOTES

MONITORING

Monitoring and maintenance of vegetation, both adjacent to proposed works and within the rehabilitation planting area, is a vital component to the success of both the Approved VMP, and this Rehabilitation Plan set.
An ongoing maintenance schedule, detailing the monitoring program, management intervals, methodologies, and corrective actions for contractors undertaking rehabilitation works within the ecological area is provided below. It is the responsibility of the rehabilitation landscape contractor to ensure the ongoing maintenance and monitoring schedule is actioned.

Maintenance Actions and Methodologies

Tree Retention - Construction Phase
- Ecologist / Arborist to assess tree exclusion zones are adhered to;
- Trees assessed for signs of stress or die back; and
- Implementation of VMP if retained tree roots Critical Root Zone (CRZ) is impacted upon.

Initial Establishment - Rehabilitation Planting
Initial 12 week establishment period applies to all rehabilitation planting works. During this period weekly maintenance is to occur that involves the following:
- Watering;
- Ongoing weed control;
- Fertilising; and
- Replacement of dead or damaged stock.

Ongoing Maintenance - Rehabilitation Planting
After this period, it is recommended that the ecological planting site be maintained on a monthly basis over a 24 month period to ensure that the planting has been successful. The following is to occur:
- Conduct weed spraying, plant watering, plant replacement of losses as necessary to maintain >95% survival rate;
- All other areas of non-use / limited access or steep terrain areas are to be hydro seeded to maintain a minimum 90% ground cover;
- All planting species will be disease free and supplied from an accredited nursery supplier;
- Assess condition of sediment control devices and replace if necessary; and
- Removal of excess sediment from erosion control devices as required.

Management Intervals
Weekly for first 12 weeks and monthly for the remaining duration of the 24 months monitoring program.

Monitoring Parameters
The monitoring should address the following issues:
- Maintained health and vigour of retained Remnant Trees adjacent to the corridor;
- Plant growth, percentage cover and survival rates;
- Plant losses through herbivores, disease, vandalism, storm damage or other factors;
- Weed re-growth and control measures;
- Plant replacement;
- Maintenance watering regime; and
- Erosion prevention.

It is also essential to keep an accurate photo record of the retained trees and progress of the rehabilitation planting by setting fixed photo monitoring points across the site. Photos should be taken by a digital camera and recorded in the project file by date and discrete photo monitoring point number. Photo monitoring point locations should be clearly marked on site and mapped by a surveyor or by GPS.

NOTES

Corrective Actions
If trees adjacent to the sewer alignment disturbance are dying or impacted upon:
- Monitor construction activity;
- Educated construction team on tree retention measures;
- Review and / or respond to tree retention mitigation measures ie. exclusion zones;
- Review VMP for particular trees;
- Remove if necessary unsafe tree;
- Compensation by planting;
- If soil erosion is still occurring in planting zones the following is to occur:
- Review rehabilitation techniques conducted by contractor;
- Assess the potential for disturbance to occur;
- Assess other potential sources or causes of disturbances to occur; and
- Maintain planting regimes to a minimum of 95% survival rate.

If weed infestations occur in planting zones or in disturbed construction area, the following is to occur:
- Review weed removal and weed management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used;
- Assess the potential for weeds to occur;and
- Assess other potential sources or causes of weeds to occur.

If there is poor regeneration of plants occurring in ecological areas, the following is to occur:
- Review planting and direct seeding management techniques conducted by contractor;
- Assess the appropriate use and amounts of herbicides are being used in planting areas;
- Assess the potential for weeds to occur in ecological areas; and
- Assess other potential sources or causes of weeds or limited re-growth of native plants to occur, ie. plant pests and disease monitoring.

Reporting
Report prepared after each maintenance and monitoring visit documenting the following:
Neighboring tree health and VMP if impacted upon;
New planting areas health including plant growth rates;
Plant survival rates;
Areas of weed establishment including species;
Weed spraying, plant watering or plant replacement of losses completed; and
Condition of erosion control devices and maintenance works completed. ie removal of sediment, replacement of device.

Annual reporting to determine the success of trees retained adjacent to construction corridor and within ecological planting areas against structural criteria provided above and contain recommendations by the contractors to the client in regard to issues affecting the ongoing success of the trees retained, ecological works, and the potential need for additional activities that may be required outside the normal maintenance program.

During the 24 month maintenance period. weed management should be attended to on a monthly basis to ensure a successful management program of invasive weeds and to promote the growth of planted species. This is anticipated to involve manual weed removal and spot spraying. Periodic inspections of the chosen ecological rehabilitation planting site should be carried out to record health of tube stock planted, weed control, and plant survival rates. To aid in evaluating the success of the weed management and rehabilitation a number of photo monitoring points can be established throughout the site. Photos are to be taken and included in an annual report to provide an indication of the survival of tube stock planted. A 24 month maintenance period applies as part of the overall rehabilitation planting works for this scope of works.

NOTES

ESTABLISHMENT, MAINTENANCE & REPORTING SCHEDULE	
Maintenance schedule for revegetation areas of the proposed development as specified on the Landscape Plans	
ESTABLISHMENT (Weeks 1-12)	*Establishment is to occur at the completion of the primary and secondary weed removal phases and any rehabilitation planting. During this period any failed stock are to be replaced and/ or defects identified then reparations are to be made to site works.*
1. Watering	Watering shall be carried out to ensure establishment of revegetation.
	All watering to be in compliance with water restrictions in place at time.
	At the time of planting soak the root ball of each plant in a diluted solution of liquid seaweed according to the directions on product label to assist in establishment.
	If it is observed during the maintenance process that the plant is under stress then a subsequent watering is allowed.
2. Watering Regime	*This Guideline may vary according to rainfall and soil conditions*
First Week	Three times a week
2cnd to 4th Weeks	Twice a week watering
5th to 8th Weeks	Twice a week watering
8th to 12th Weeks	Once a week watering
3.Weed Removal	Weeds evident during the Establishment period but should be removed as part of a monthly weed management program. Best Practice weed management techniques should be employed for weed removal amongst revegetation areas.
	Where grass seeding or turf establishes within planted areas it should be treated with approved herbicide for waterways.
MAINTENANCE	*(Weeks 12-104)*
1. Watering	No specified watering regime is provided during the maintenance period. The intent is for the area to become self sufficient in utilising natural rain patterns and run off. Water as needed depending on rainfall.
	Watering should occur during extended dry periods to ensure continued establishment of planted stock.
2. Weed Removal	Weeds should be tended to on a monthly program. Treatment techniques vary within the landscape planted areas versus revegetation and retention areas.
3. Management	Throughout the establishment and maintenance periods areas where planting stock has not achieved a 90% success survival additional planting shall be installed.
4. Erosion Control	Prior to the commencement of works and to remain throughout the establishment and maintenance period an erosion and sediment control measures shall be employed over the rehabilitaion area of the site.
PROGRESS STATUS REPORTS	*To be Provided to the Ecologist - Development Assessment BCC to include the following:*
	The reports are to be sent every 6 months for the first two years of the maintenance period and then yearly to the end of the maintenance period.
1.Stage Progress	Detailing what works are complete and remaining items due for completion.
2.General Issues	Limitation, issues encountered and conditions of planting (weed infestation, plant survival, replacement, etc.)

PROJECT 7522 - SPRINGFIELD RISE, SAPRING MOUNTAIN
REVEGETATION AND REHABILITATION WORKS - INDICATIVE SCHEDULE OF WORK ITEMS AND MAINTENANCE SEQUENCING
NOTE: Assumes planting at end of Winter to allow for establishment and maintenance over two growing seasons

COLOUR KEY TO WORK ITEMS: Weed Management; Soil Preparation and Mulching; Planting Works; Watering, Monitoring and Reporting

	SPRING			SUMMER				AUTUMN			WINTER			SPRING			SUMMER			AUTUMN			WINTER			SPRING				
	CONSTRUCTION/ MAINTENANCE PERIOD (3 months)			MAINTENANCE PERIOD (18 months)				ONGOING MAINTENANCE			ONGOING MAINTENANCE			ONGOING MAINTENANCE			ONGOING MAINTENANCE			ONGOING MAINTENANCE			ONGOING MAINTENANCE			ONGOING MAINTENANCE				
	Month 1	Month 2	Month 3	Month 1	Month 2		Month 3	Month 1	Month 2	Month 3	Month 1	Month 2	Month 3	Month 1	Month 2	Month 3	Month 1	Month 2	Month 3	Month 1	Month 2	Month 3	Month 1	Month 2	Month 3	Month 1	Month 2	Month 3	Month 1	
WEEK 1	Pre-start meeting Council, Contractor and Superintendant	Planting and Watering	Watering and Monitoring and reporting (throughout establishment)	Watering and Monitoring and reporting (throughout establishment)	Watering and Monitoring and reporting (throughout establishment)	MILESTONE: COUNCIL "ON MAINTENANCE"	Watering and Monitoring and reporting (throughout establishment)	Monitoring and reporting (watering to replacement plants only)	Monitoring and reporting	Monitoring and reporting	Monitoring (watering to replacement plants only)		Monitoring and reporting	Monitoring and reporting		Monitoring and reporting	Monitoring and reporting		Monitoring and reporting	Monitoring (watering to replacement plants only)		Monitoring and reporting	Monitoring and reporting		Monitoring and reporting	Mulch - top up depths to 100mm and replace / repair Jutematting as required	Monitoring (watering to replacement plants only)	Monitoring (watering to replacement plants only)	Monitoring (watering to replacement plants only)	MILESTONE: COUNCIL "OFF MAINTENANCE" (24MONTHS)
WEEK 2	Initial weed management works - wood weed removal /"knockdown" spray	Watering and Monitoring and reporting (throughout establishment)	Natural regeneration plants staking for identification	Weed management - "knockdown spray" in mulched areas	Weed management - "knockdown spray" re-apply woody weeds		Weed management - "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas		Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas		Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas		Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas		Weed management - rotation "knockdown spray" in mulched areas	Weed management - rotation "knockdown spray" in mulched areas		Weed management - rotation "knockdown spray" in mulched areas	Natural regeneration plants - weed management	Weed management - "knockdown spray" re-apply woody weeds	Weed management - "knockdown spray" in mulched areas	Weed management - "knockdown spray" in mulched areas. Ensure 100% removal of declared weeds & 95% removal of environmental weeds allowing for natural regeneration	
WEEK 3	Soil Preparation and cultivation	Weed management - "knockdown spray"	Watering and Monitoring and reporting (throughout establishment)	Watering and Monitoring and reporting (throughout establishment)	Replacement of Failed Plants		Replacement of Failed Plants	Natural regeneration plants - weed management	Natural regeneration plants - weed management	Replacement of Failed Plants	Natural regeneration plants - weed management		Trees formative pruning			Replacement of Failed Plants				Natural regeneration plants - weed management		Trees formative pruning				Trees formative pruning	Replacement of Failed Plants	Natural regeneration plants - weed management		
WEEK 4	Planting and Watering	Natural regeneration plants staking for identification	Watering and Monitoring and reporting (throughout establishment)	Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		Weed Management - slashing of maintenance access paths	Replacement of Failed Plants	Weed Management - slashing of maintenance access paths	Weed Management - slashing of maintenance access paths		

NOTE: Assumes Coordination Works Carried Out Prior To Council Pre-start Council approval, appointment of suitability of qualified contractor by developer, procurement of all plant stock and materials, establishment of protection fencing around nominated

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40 YEARS
1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Rehabilitation Monitoring

SCALE: NOT TO SCALE

DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 112 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

PHOTO MONITORING PLAN - CULVERT I

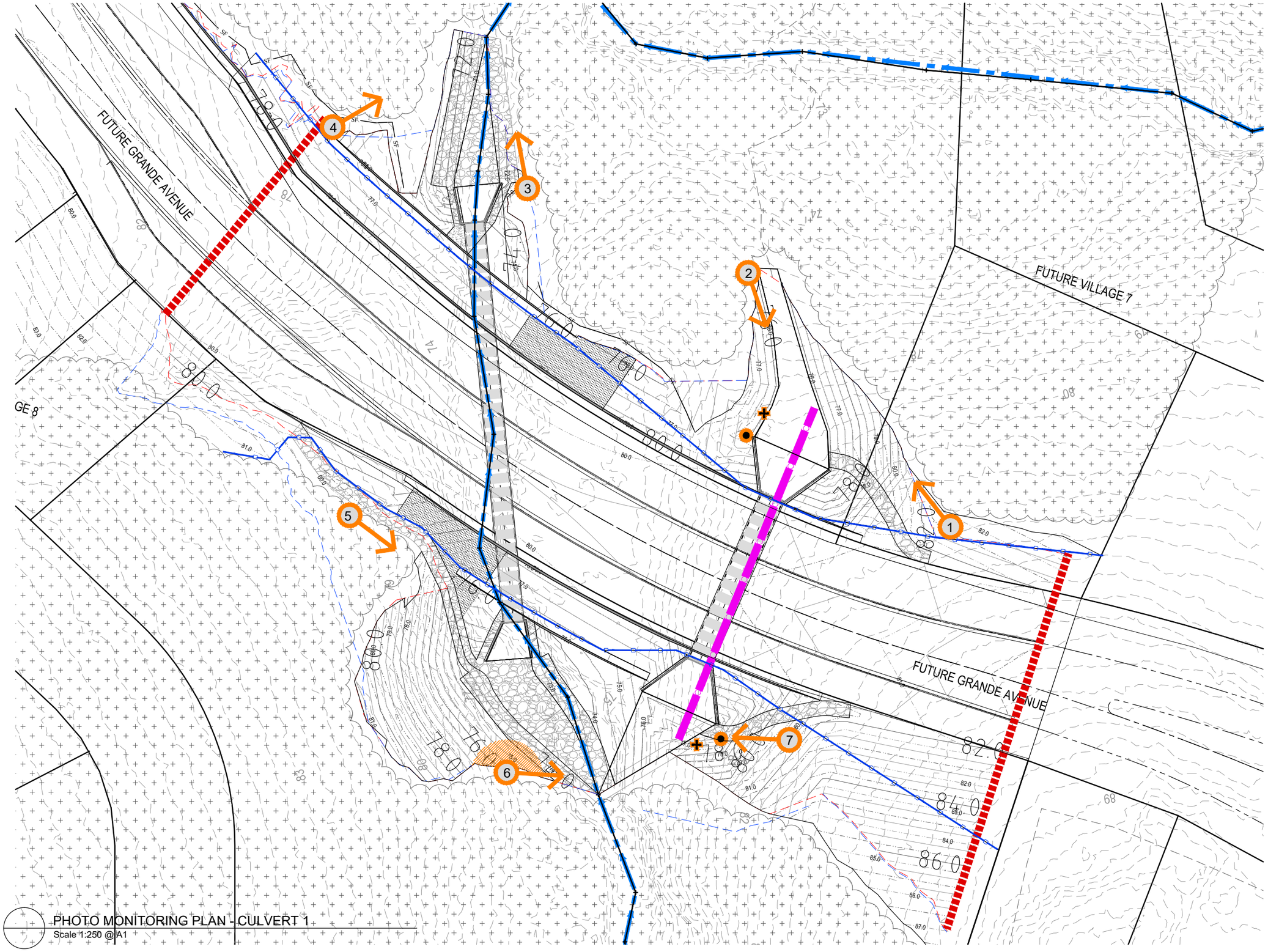

PHOTO MONITORING PLAN - CULVERT 1
Scale 1:250 @ A1

J:\7522 Stages 15,16 and 17, Spring Mountain Estate, Greenbank (Lend Lease Communities (Australia) Limited)\Working Files\AutoCAD\E - Vegetation (Assessment, Management and Rehabilitation) Plans\7522 E 101 Culvert Crossing Site Based Management Plan.dwg

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LEGEND

Photo monitoring location

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surveying ⁄ town planning ⁄ urban design ⁄ environmental management ⁄ landscape architecture

40 YEARS
1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS
APPROVED COMPANY ISO14001 Environmental Management Systems QMS

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 1 Photo Monitoring Plan

SCALE: 1:250@A1 1:500@A3 (0 2.5 5 12.5m)

DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 113 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

PHOTO MONITORING PLAN - CULVERT 2

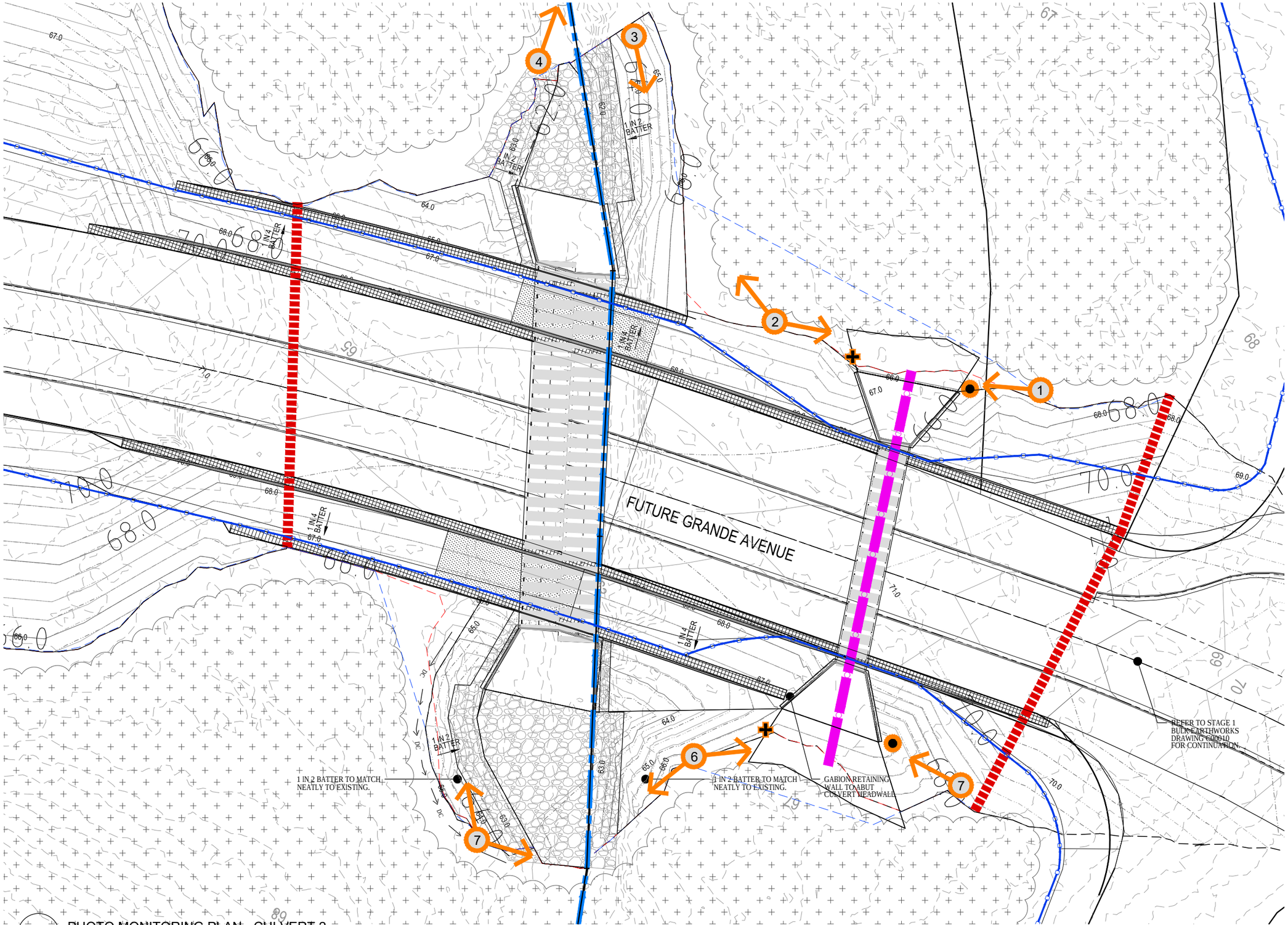

PHOTO MONITORING PLAN - CULVERT 2
Scale 1:200 @ A1

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landscape architecture

LEGEND

Photo monitoring location

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CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Culvert 2 Photo Monitoring Plan

SCALE: 1:200@A1 1:400@A3 (0 2 4 10m)

DATE: March 17 | CHECKED: MS

PROJECT No: 7522 | DRAWN: TL

DRAWING No.: 7522 E 114 D

SPRINGFIELD RISE AT SPRING MOUNTAIN

REHABILITATION SPECIES SCHEDULES

ZONE 1 CORE REHABILITATION AREA
Recommended Species List Total. Approximate Indicative Total Area = 4,350m2

Notes:
1) Minimum density of 1 plants per m2 to Zone 1
2) Tiered, Trees,Shrubs and groundcovers in this zone for dense revegetation.
3) Setback trees 4m min from all property boundaries, services sewer alignments.

SPECIES	COMMON NAME	PLANT FORM	POT SIZE	MATURE HEIGHT (m)	PLANTING DENSITY OVERALL @ 1.2 PER 1M²	QUANTITY - CULVERT 1 (1,650m2)	QUANTITY - CULVERT 2 (2,700m2)
TREES					1 per 8 m2		
ACMENA smithii	Lilly Pilly Satinash	Tree	Tube	8	1/200m2	14	19
ALLOCASUARINA littoralis	Black She-Oak	Tree	Tube	6	1/200m2	14	19
ALLOCASUARINA torulosa	Forest She-oak	Tree	Tube	6	1/200m2	14	19
ALPHITONIA excelsa	Soap Tree	Tree	Tube	6	1/200m2	14	19
ANGOPHORA leiocarpa	Smooth Barked Apple	Tree	Tube	30	1/200m2	14	19
BRACHYCHITON populneus	Kurrajong	Tree	Tube	6	1/200m2	14	19
COMMERSONIA fraseri	Brush Kurrajong	Tree	Tube	30	1/200m2	14	19
CORYMBIA citriodora	Spotted Gum	Tree	Tube	30	1/200m2	14	19
CORYMBIA intermedia	Pink Bloodwood	Tree	Tube	30	1/200m2	14	19
CORYMBIA tesellaris	Moreton Bay Ash	Tree	Tube	30	1/200m2	14	19
CORYMBIA trachyphloia	Brown Bloodwood	Tree	Tube	30	1/200m2	14	19
EUCALYPTUS crebra	Narrow leaved Ironbark	Tree	Tube	30	1/200m2	14	19
EUCALYPTUS major	Grey Gum	Tree	Tube	35	1/200m2	14	19
EUCALYPTUS melanophloia	Silver-leaved Ironbark	Tree	Tube	35	1/200m2	14	19
EUCALYPTUS microcorys	Tallowood	Tree	Tube	35	1/200m2	14	19
EUCALYPTUS seeana	Fine Leaved Red Gum	Tree	Tube	30	1/200m2	14	19
EUCALYPTUS siderophloia	Ironbark	Tree	Tube	30	1/200m2	14	19
EUCALYPTUS tereticornis	Qld Blue Gum	Tree	Tube	45	1/200m2	14	19
FICUS coronata	Creek Sandpaper Fig	Tree	Tube	25	1/200m2	14	19
FICUS microcarpa	Hills Fig	Tree	Tube	25	1/200m2	14	19
FICUS obliqua	Small-leaved Fig	Tree	Tube	25	1/200m2	14	19
FICUS rubiginosa	Port Jackson Fig	Tree	Tube	25	1/200m2	14	19
GLOCHIDION ferdnandi	Cheese Tree	Tree	Tube	25	1/200m2	14	19
LOPHOSTEMON confertus	Brush Box	Tree	Tube	20	1/200m2	14	19
LOPHOSTEMON suaveolens	Swamp Box	Tree	Tube	20	1/200m2	14	19
MELALEUCA quinquenervia	Broad Leaved Paperbark	Tree	Tube	25	1/200m2	14	19
SYZYGIUM australe	Brush Cherry	Tree	Tube	15	1/200m2	14	19
SYZYGIUM oleosum	Blue Lilli Pilly	Tree	Tube	25	1/200m2	14	19
SYZYGIUM paniculatum	Magenta Lilli Pilly	Tree	Tube	20	1/200m2	12	19
					SUBTOTAL	390	532
SHRUBS					1 per 4 m2		
ACACIA complanata	Flat Stemmed Wattle	Shrub	Tube	4	1/50m2	50	108
ACACIA disparrima	Hickory Wattle	Shrub	Tube	4	1/50m2	50	108
ACACIA falcata	Sickle Leaved Wattle	Shrub	Tube	4	1/50m2	50	108
ACACIA fimbriata	Brisbane Fringed Wattle	Shrub	Tube	4	1/50m2	50	108
BANKSIA oblongifolia	Fern-leaved Banksia	Shrub	Tube	3	1/50m2	50	108
DODONAEA triquetra	Forest Hop Bush	Shrub	Tube	3	1/30m2	50	108
HOVEA acutifolia	Purple Pea Bush	Shrub	Tube	2	1/30m2	50	108
LEPTOSPERMUM liversidgei	Tea Tree	Shrub	Tube	4	1/50m2	50	108
LEPTOSPERMUM polygalifolium	Wild May	Shrub	Tube	4	1/50m2	50	108
MELASTOMA malabathricum	Blue Tingue	Shrub	Tube	4	1/30m2	50	108
					SUBTOTAL	500	1080
GROUNDCOVERS					1 per 1m2		
CAREX spp.	Sedges	Ground	Tube	1	1/10m2	80	250
CYMBOPOGON refractus	Barbed Wire Grass	Ground	Tube	1	1/10m2	80	250
DIANELLA caerulea	Flax Lily	Ground	Tube	1	1/20m2	80	250
DIANELLA longifolia	Flax Lily	Ground	Tube	1	1/20m2	80	250
EUSTREPHUS latifolius	Wombat Berry	Ground	Tube	0.4	1/25m2	80	250
GAHNIA aspera	Red Fruited Sawsedge	Ground	Tube	3	1/25m2	80	250
GAHNIA sieberana	Sawsedge	Ground	Tube	3	1/25m2	80	250
HARDENBERGIA violacea	Native Sarsaparilla	Ground	Tube	1	1/50m2	80	250
IMPERATA cylindrica	Blady Gras	Ground	Tube	1.2	1/20m2	80	250
LOMANDRA longifolia	Matrush	Ground	Tube	0.4	1/10m2	80	250
THEMEDA triandra	Kangaroo Grass	Ground	Tube	0.6	1/25m2	80	250
					SUBTOTAL	800	2500
					TOTAL	1690	4112
					OVERALL DENSITY	1.0 PER M2	1.0 PER M2

ZONE 3 REHABILITATION AREA
Recommended Species List Total. Approximate Indicative Total Area = 360m2

Notes:
1) Minimum density of 4 plants per m2 to Zone 3

SPECIES	COMMON NAME	PLANT FORM	POT SIZE	MATURE HEIGHT (m)	PLANTING DENSITY OVERALL @ 4 PER 1M²	QUANTITY - CULVERT 1 (200m2)	QUANTITY - CULVERT 2 (160m2)
GROUNDCOVERS					4 per 1m2		
CAREX spp.	Sedges	Ground	Tube	1	1/20m2	80	64
CYMBOPOGON refractus	Barbed Wire Grass	Ground	Tube	1	1/20m2	80	64
DIANELLA caerulea	Flax Lily	Ground	Tube	3	1/25m2	80	64
DIANELLA longifolia	Flax Lily	Ground	Tube	3	1/25m2	80	64
EUSTREPHUS latifolius	Wombat Berry	Ground	Tube	1.2	1/20m2	80	64
GAHNIA aspera	Red Fruited Sawsedge	Ground	Tube	1.2	1/20m2	80	64
GAHNIA sieberana	Sawsedge	Ground	Tube	0.4	1/20m2	80	64
HARDENBERGIA violacea	Native Sarsaparilla	Ground	Tube	0.4	1/10m2	80	64
IMPERATA cylindrica	Blady Gras	Ground	Tube	0.4	1/10m2	80	64
LOMANDRA longifolia	Matrush	Ground	Tube	0.4	1/25m2	80	64
THEMEDA triandra	Kangaroo Grass	Ground	Tube	0.4	1/25m2	80	64
					SUBTOTAL	880	704
					TOTAL	880	704
					OVERALL DENSITY	4.0 PER M2	4.0 PER M2

ZONE 4 REHABILITATION AREA
Recommended Species List Total. Approximate Indicative Total Area = 360m2

Notes:
1) Minimum density of 2 plants per m2 to Zone 4

SPECIES	COMMON NAME	PLANT FORM	POT SIZE	MATURE HEIGHT (m)	PLANTING DENSITY OVERALL @ 4 PER 1M²	QUANTITY - CULVERT 1 (560m2)	QUANTITY - CULVERT 2 (500m2)
GROUNDCOVERS					2 per 1m2		
CAREX spp.	Sedges	Ground	Tube	1	1/20m2	112	100
CYMBOPOGON refractus	Barbed Wire Grass	Ground	Tube	1	1/20m2	112	100
DIANELLA caerulea	Flax Lily	Ground	Tube	3	1/25m2	112	100
DIANELLA longifolia	Flax Lily	Ground	Tube	3	1/25m2	112	100
EUSTREPHUS latifolius	Wombat Berry	Ground	Tube	1.2	1/20m2	112	100
GAHNIA aspera	Red Fruited Sawsedge	Ground	Tube	1.2	1/20m2	112	100
GAHNIA sieberana	Sawsedge	Ground	Tube	0.4	1/20m2	112	100
HARDENBERGIA violacea	Native Sarsaparilla	Ground	Tube	0.4	1/10m2	112	100
IMPERATA cylindrica	Blady Gras	Ground	Tube	0.4	1/10m2	112	100
LOMANDRA longifolia	Matrush	Ground	Tube	0.4	1/25m2	112	100
THEMEDA triandra	Kangaroo Grass	Ground	Tube	0.4	1/25m2	112	100
					SUBTOTAL	1232	1100
					TOTAL	1232	1100
					OVERALL DENSITY	2.0 PER M2	2.0 PER M2

landscape architecture

LEGEND

NOTE:
All plans are compiled in accordance with engineering design prepared by Arcadis Australia Pacific Pty Limited

ARCADIS
Arcadis Australia Pacific Pty Limited
Level 7, 199 Grey Street
South Brisbane QLD 4101
ABN 76 104 485 289

Tel No: +61 7 3337 0000
Fax No: +61 7 3337 0055
www.arcadis.com

AMENDMENTS:

Issue	Date	Description	Checked
A	29/11/2016	Client Comments	MS
B	29/11/2016	Lodgement	MS
C	25/01/2017	Re-Lodgement	MS
D	03/03/2017	Re-Lodgement	MS

saunders havill group
Saunders Havill Group Pty Ltd ABN 24 144 972 949
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

40 YEARS 1975-2015

APPROVED COMPANY ISO9001 Quality Management Systems QMS Certification Services
APPROVED COMPANY ISO14001 Environmental Management Systems QMS Certification Services

CLIENT: Lendlease

PROJECT: Spring Mountain Culvert Crossings

DRAWING: Site Based Management Plan - Rehabilitation Species Schedules

SCALE: AS NOTED

DATE: March 17 | CHECKED: MS
PROJECT No: 7522 | DRAWN: TL
DRAWING No.: 7522 E 115 D

ATTACHMENT I –

Demarcation Flagging Inspection Notification

saunders havill group

Saunders Havill Group Pty Ltd ABN 24 144 972 949
address 9 Thompson St Bowen Hills Q 4006
phone (07) 3251 9444 email mail@saundershavill.com
web www.saundershavill.com fax (07) 3251 9455

surveying town planning urban design environmental management landscape architecture

Date: 03 March 2017
Site: Spring Mountain Precinct (Haul Road)
Client: Lend Lease
EPBC Ref: 2013/7057
SHG Ref: 7243
SHG Contact: Murray Saunders (07 3251 9444)

Attention: Ian Murray
Regional Development Manager, Communities
Level 4, Kings Gate,
King Street
Bowen Hills QLD 4006

Springfield Rise: Haul Road –Inspection of flagging for demarcation of clearing extents (Phase 1- early works bulk earthworks (Version 3)), 7002 Grande Avenue, Springfield (Lot 200 on SP283567)

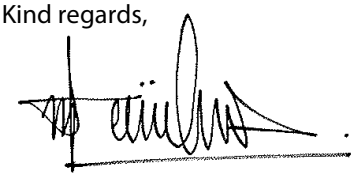
Dear Ian,

The *Environmental Management Division* of **Saunders Havill Group** was engaged by **Lendlease Communities** to carry out an inspection of flagging for demarcation fencing for the Phase 1- Early Works Bulk Earthworks clearing extent associated with the road known as the Haul Road at Springfield Rise.

Flagging of the Haul Road Phase 1 (version 3) clearing extent was undertaken by the appointed surveys, **Wolter Consulting,** on the 2nd March 2017. Ecologists from **Saunders Havill Group** checked and reflagged the clearing extent later that day on the 2nd March 2017 to confirm works will be undertaken in accordance with relevant Commonwealth and Council permit requirements.

The GPS track log of the inspection extent shown in the plan provided as **Attachment 1**. A post-inspection notification is provided as **Attachment 2** to be kept for your records.

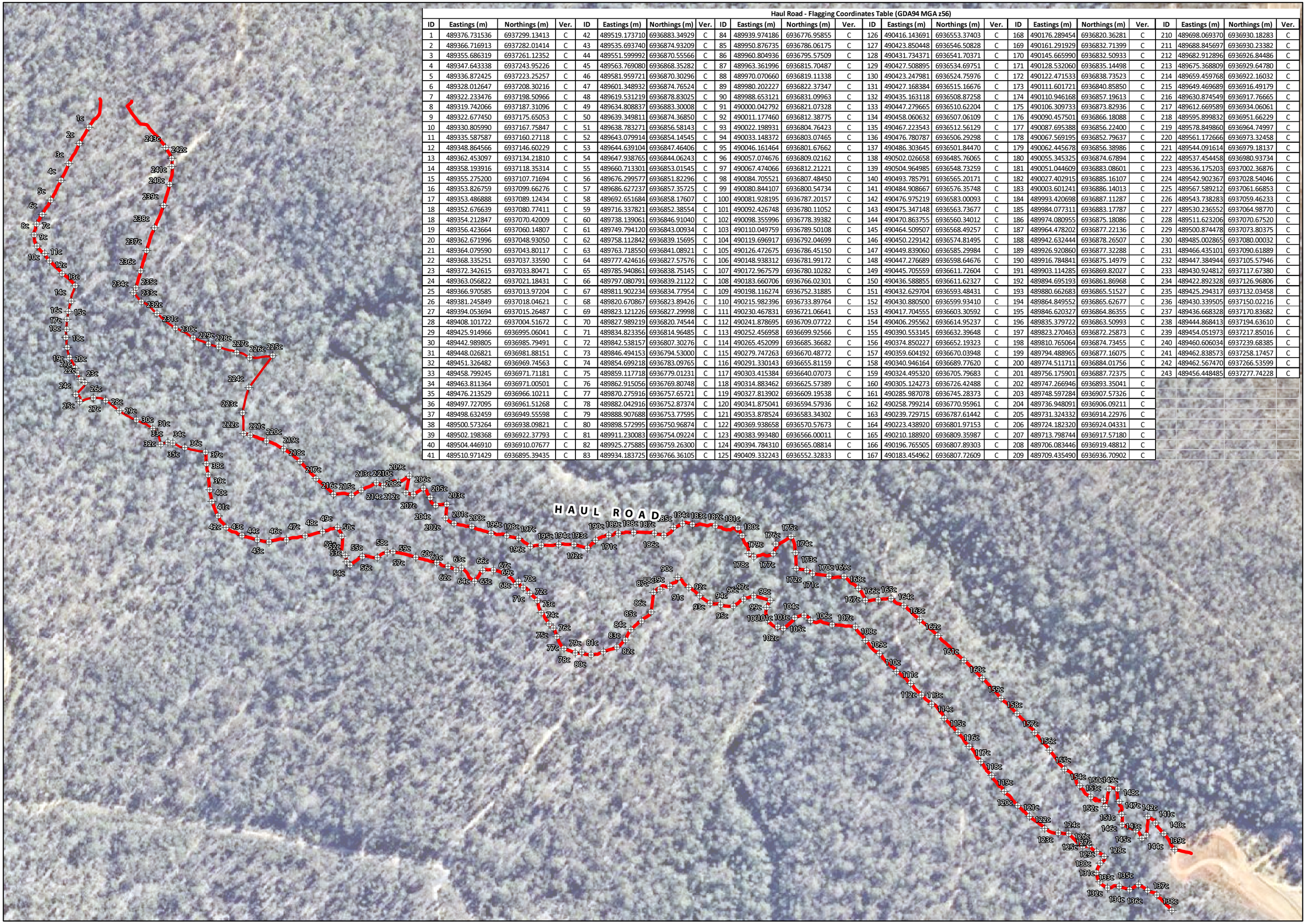
Kind regards,



Murray Saunders
Director – Saunders Havill Group

Attachment I –

Demarcation Fencing Inspection Track Log



Haul Road - Flagging Coordinates Table (GDA94 MGA z56)

ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.	ID	Eastings (m)	Northings (m)	Ver.
1	489376.731536	6937299.13413	C	42	489519.173710	6936883.34929	C	84	489939.974186	6936776.95855	C	126	490416.143691	6936553.37403	C	168	490176.289454	6936820.36281	C	210	489698.069370	6936930.18283	C
2	489366.716913	6937282.01414	C	43	489535.693740	6936874.93209	C	85	489950.876735	6936786.06175	C	127	490423.850448	6936546.50828	C	169	490161.291929	6936832.71399	C	211	489688.845697	6936930.23382	C
3	489355.686319	6937261.12352	C	44	489551.599992	6936870.55566	C	86	489960.804936	6936795.57509	C	128	490431.734371	6936541.70371	C	170	490145.665990	6936832.50933	C	212	489682.912896	6936926.84486	C
4	489347.643338	6937243.95226	C	45	489563.769080	6936868.35282	C	87	489963.361996	6936815.70487	C	129	490427.508895	6936534.69751	C	171	490128.532060	6936835.14498	C	213	489675.368809	6936929.64780	C
5	489336.872425	6937223.25257	C	46	489581.959721	6936870.30296	C	88	489970.070660	6936819.11338	C	130	490423.247981	6936524.75976	C	172	490122.471533	6936838.73523	C	214	489659.459768	6936922.16032	C
6	489328.012647	6937208.30216	C	47	489601.348932	6936874.76524	C	89	489980.202227	6936822.37347	C	131	490427.168384	6936515.16676	C	173	490111.601721	6936840.85850	C	215	489649.469689	6936916.49179	C
7	489322.233476	6937198.50966	C	48	489619.531219	6936878.83025	C	90	489988.653121	6936831.09963	C	132	490435.163118	6936508.87258	C	174	490110.946168	6936857.19613	C	216	489630.874549	6936917.76665	C
8	489319.742066	6937187.31096	C	49	489634.808837	6936883.30008	C	91	490000.042792	6936821.07328	C	133	490447.279665	6936510.62204	C	175	490106.309733	6936873.82936	C	217	489612.669589	6936934.06061	C
9	489322.677450	6937175.65053	C	50	489639.349811	6936874.36850	C	92	490011.177460	6936812.38775	C	134	490458.060632	6936507.06109	C	176	490090.457501	6936866.18088	C	218	489595.899832	6936951.66229	C
10	489330.805990	6937167.75847	C	51	489638.783271	6936856.58143	C	93	490022.198931	6936804.76423	C	135	490467.223543	6936512.56129	C	177	490087.695388	6936856.22400	C	219	489578.849860	6936964.74997	C
11	489335.587587	6937160.27118	C	52	489643.079914	6936854.14545	C	94	490033.148372	6936803.07465	C	136	490476.780787	6936506.29298	C	178	490067.569195	6936852.79637	C	220	489561.172666	6936973.32458	C
12	489348.864566	6937146.60229	C	53	489644.639104	6936847.46406	C	95	490046.161464	6936801.67662	C	137	490486.303645	6936501.84470	C	179	490062.445678	6936856.38986	C	221	489544.091614	6936979.18137	C
13	489362.453097	6937134.21810	C	54	489647.938765	6936844.06243	C	96	490057.074676	6936809.02162	C	138	490502.026658	6936485.76065	C	180	490055.345325	6936874.67894	C	222	489537.454458	6936980.93734	C
14	489358.193916	6937118.35314	C	55	489660.713301	6936853.01545	C	97	490067.474066	6936812.21221	C	139	490504.964985	6936548.73259	C	181	490051.044609	6936883.08601	C	223	489536.175203	6937002.36876	C
15	489355.275200	6937107.71694	C	56	489676.299577	6936851.82296	C	98	490084.705521	6936807.48450	C	140	490493.785791	6936565.20171	C	182	490027.402915	6936885.16107	C	224	489542.902367	6937028.54046	C
16	489353.826759	6937099.66276	C	57	489686.627237	6936857.35725	C	99	490080.844107	6936800.54734	C	141	490484.908667	6936576.35748	C	183	490003.601241	6936886.14013	C	225	489567.589212	6937061.66853	C
17	489353.486888	6937089.12434	C	58	489692.651684	6936858.17607	C	100	490081.928195	6936787.20157	C	142	490476.975219	6936583.00093	C	184	489993.420698	6936887.11287	C	226	489543.738283	6937059.46233	C
18	489352.676639	6937080.77411	C	59	489716.337821	6936852.38554	C	101	490092.426748	6936780.11052	C	143	490475.347148	6936563.73677	C	185	489984.077311	6936883.17787	C	227	489530.236552	6937064.98770	C
18	489354.212847	6937070.42009	C	60	489738.139061	6936846.91040	C	102	490098.355996	6936778.39382	C	144	490470.863755	6936560.34012	C	186	489974.080955	6936875.18086	C	228	489511.623206	6937070.67520	C
19	489356.423664	6937060.14807	C	61	489749.794120	6936843.00934	C	103	490110.049759	6936789.50108	C	145	490464.509507	6936568.49257	C	187	489964.478202	6936877.22136	C	229	489500.874478	6937073.80375	C
20	489362.671996	6937048.93050	C	62	489758.112842	6936839.15695	C	104	490119.696917	6936792.04699	C	146	490450.229142	6936574.81495	C	188	489942.632444	6936878.26507	C	230	489485.002865	6937080.00032	C
21	489364.079590	6937043.80117	C	63	489763.718550	6936841.08921	C	105	490126.472675	6936786.45150	C	147	490449.839060	6936585.29984	C	189	489926.920860	6936877.32288	C	231	489466.435101	6937090.61889	C
22	489368.335251	6937037.33590	C	64	489777.424616	6936827.57576	C	106	490148.938312	6936781.99172	C	148	490447.276689	6936598.64676	C	190	489916.784841	6936875.14979	C	232	489447.384944	6937105.57946	C
23	489372.342615	6937033.80471	C	65	489785.940861	6936838.75145	C	107	490172.967579	6936780.10282	C	149	490445.705559	6936611.72604	C	191	489903.114285	6936869.82027	C	233	489430.924812	6937117.67380	C
24	489363.056822	6937021.18431	C	66	489797.080791	6936839.21122	C	108	490183.660706	6936766.02301	C	150	490436.588855	6936611.62327	C	192	489894.695193	6936861.86968	C	234	489422.892328	6937126.96806	C
25	489366.970585	6937013.97204	C	67	489811.902234	6936834.77954	C	109	490198.116274	6936752.31885	C	151	490432.629704	6936593.48431	C	193	489880.662683	6936865.51527	C	235	489425.294317	6937132.03458	C
26	489381.245849	6937018.04621	C	68	489820.670867	6936823.89426	C	110	490215.982396	6936733.89764	C	152	490430.880500	6936599.93410	C	194	489864.849552	6936865.62677	C	236	489430.339505	6937150.02216	C
27	489394.053694	6937015.26487	C	69	489823.121226	6936827.29998	C	111	490230.467831	6936721.06641	C	153	490417.704555	6936603.30592	C	195	489846.620327	6936864.86355	C	237	489436.668328	6937170.83682	C
28	489408.101722	6937004.51672	C	70	489827.989219	6936820.74544	C	112	490241.878695	6936709.07722	C	154	490406.295562	6936614.95237	C	196	489835.379722	6936863.50993	C	238	489444.868413	6937194.63610	C
29	489425.914966	6936995.06041	C	71	489834.823356	6936814.96485	C	113	490252.456958	6936699.92566	C	155	490390.553145	6936632.39648	C	197	489823.270463	6936872.25873	C	239	489454.051973	6937217.85016	C
30	489442.989805	6936985.79491	C	72	489842.538157	6936807.30276	C	114	490265.452099	6936685.36682	C	156	490374.850227	6936652.19323	C	198	489810.765064	6936874.73455	C	240	489460.606034	6937239.68385	C
31	489448.026821	6936981.88151	C	73	489846.494153	6936794.53000	C	115	490279.747263	6936670.48772	C	157	490359.604192	6936670.03948	C	199	489794.488965	6936877.16075	C	241	489462.838573	6937258.17457	C
32	489451.326482	6936969.74563	C	74	489854.699218	6936783.09765	C	116	490291.330143	6936655.81159	C	158	490340.946164	6936689.77620	C	200	489774.511711	6936884.01756	C	242	489462.567470	6937266.53599	C
33	489458.799245	6936971.71181	C	75	489859.117718	6936779.01231	C	117	490303.415384	6936640.07073	C	159	490324.495320	6936705.79683	C	201	489756.175901	6936887.72375	C	243	489456.448485	6937277.74228	C
34	489463.811364	6936971.00501	C	76	489862.915056	6936769.80748	C	118	490314.883462	6936625.57389	C	160	490305.124273	6936726.42488	C	202	489747.266946	6936893.35041	C				
35	489476.213529	6936966.10211	C	77	489870.275916	6936757.65721	C	119	490327.813902	6936609.19538	C	161	490285.987078	6936745.28373	C	203	489748.597284	6936907.57326	C				
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37	489498.632459	6936949.55598	C	79	489888.907688	6936753.77595	C	121	490353.878524	6936583.34302	C	163	490239.729715	6936787.61442	C	205	489731.324332	6936914.22976	C				
38	489500.573264	6936938.09821	C	80	489898.572995	6936750.96874	C	122	490369.938658	6936570.57673	C	164	490223.438920	6936801.97153	C	206	489724.182320	6936924.04331	C				
39	489502.198368	6936922.37793	C	81	489911.230083	6936754.09224	C	123	490383.993480	6936566.00011	C	165	490210.188920	6936809.35987	C	207	489713.798744	6936917.57180	C				
40	489504.446910	6936910.07677	C	82	489925.275885	6936759.26300	C	124	490394.784310	6936565.08814	C	166	490196.765505	6936807.89303	C	208	489706.083446	6936919.48812	C				
41	489510.971429	6936895.39435	C	83	489934.183725	6936766.36105	C	125	490409.332243	6936552.32833	C	167	490183.454962	6936807.72609	C	209	489709.435490	6936936.70902	C				

ATTACHMENT 2 –

NCA Flora Survey Report and Exemption Notification

Keira Grundy

Subject: FW: 7522: FW: AR082999 Exempt Clearing Email Lot 33 on SP269190

From: PALM [mailto:palm@ehp.qld.gov.au]
Sent: Friday, 22 January 2016 3:27 PM
To: Keira Grundy <keiragrundy@saundershavill.com>
Subject: RE: AR082999 Exempt Clearing Email Lot 33 on SP269190

Dear Mr Ian Murray

Applicant: Lend Lease Communities (Springfield) Pty Ltd
Exempt clearing notification (protected plants)
Where clearing is to be conducted –
Street Address: Sinnathamby Boulevard, Springfield
Lot/Plan: Lot 22 on SP234042 and Lot 33 on SP269190
EHP Reference: AR082999

Thank you for your email. Please retain this email as acknowledgement of receipt of a protected plant exemption notification submitted under section 261ZA of the Nature Conservation (Wildlife Management) Regulation 2006. Clearing of a protected plant under this section must be conducted within two years after the flora survey report was submitted to the Department of Environment and Heritage Protection.

It is strongly recommended for audit purposes that you keep this email together with the relevant flora survey trigger map, flora survey report and any other documentation relating to the clearing in question.

Please visit www.ehp.qld.gov.au for information about available online services.

Kind regards
Katrina

Queensland Government

Katrina Theilemann
Administration Officer
Customer Service Team I Regulatory Capability and Customer Service
Department of Environment and Heritage Protection

P 1300 130 372 (option 4) **F** (07) 3330 5875 **E** Palm@ehp.qld.gov.au
400 George Street BRISBANE QLD 4000
GPO Box 2454, BRISBANE QLD 4001

environmental management

saunders havill group

Spring Mountain
Villages 6, 8, 13 & Haul Road
Protected Plants Flora Survey Report

Lendlease
15th December 2015
7522

Document Control

Title	Spring Mountain – Villages 6, 8, 13 & Haul Road –Protected Plants Flora Survey Report
Job Number	**7522**
Client	Lendlease

Document Issue

Issue	Date	Prepared By	Checked By
Draft	15.12.2015	David Havill	Keira Grundy
Final			

Disclaimer

This report has been prepared for **Lendlease. 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 report to support the document.

Table of Contents

Figures

Plans

Tables

I. Introduction

The *Environmental Management Division* of the **Saunders Havill Group** was engaged by **Lendlease** to prepare this Protected Plants Flora Survey Report to enable clearing within areas mapped as 'High Risk' under the *Nature Conservation Act 1992* (NCA). Clearing works are associated with early works stages at Spring Mountain, specifically Villages 6, 8 and 13 and a primary road connection known as the Haul Road. The Spring Mountain development site is located Sinnathamby Boulevard, Springfield Central (Lot 22 on SP234042 and Lot 33 on SP269190) and is within the jurisdiction of **Ipswich City Council** (ICC).

The **Queensland Government** has adopted a risk-based approach to the regulation of protected plants under the NCA. The regulatory framework captures activities that pose a high risk to plant biodiversity. Regulatory, educational and compliance effort are consequently focused on high risk activities. Under the framework, when a non-exempt clearing activity is proposed within a 'High Risk' area, the proponent of that activity is required to complete a flora survey prior to commencement of clearing.

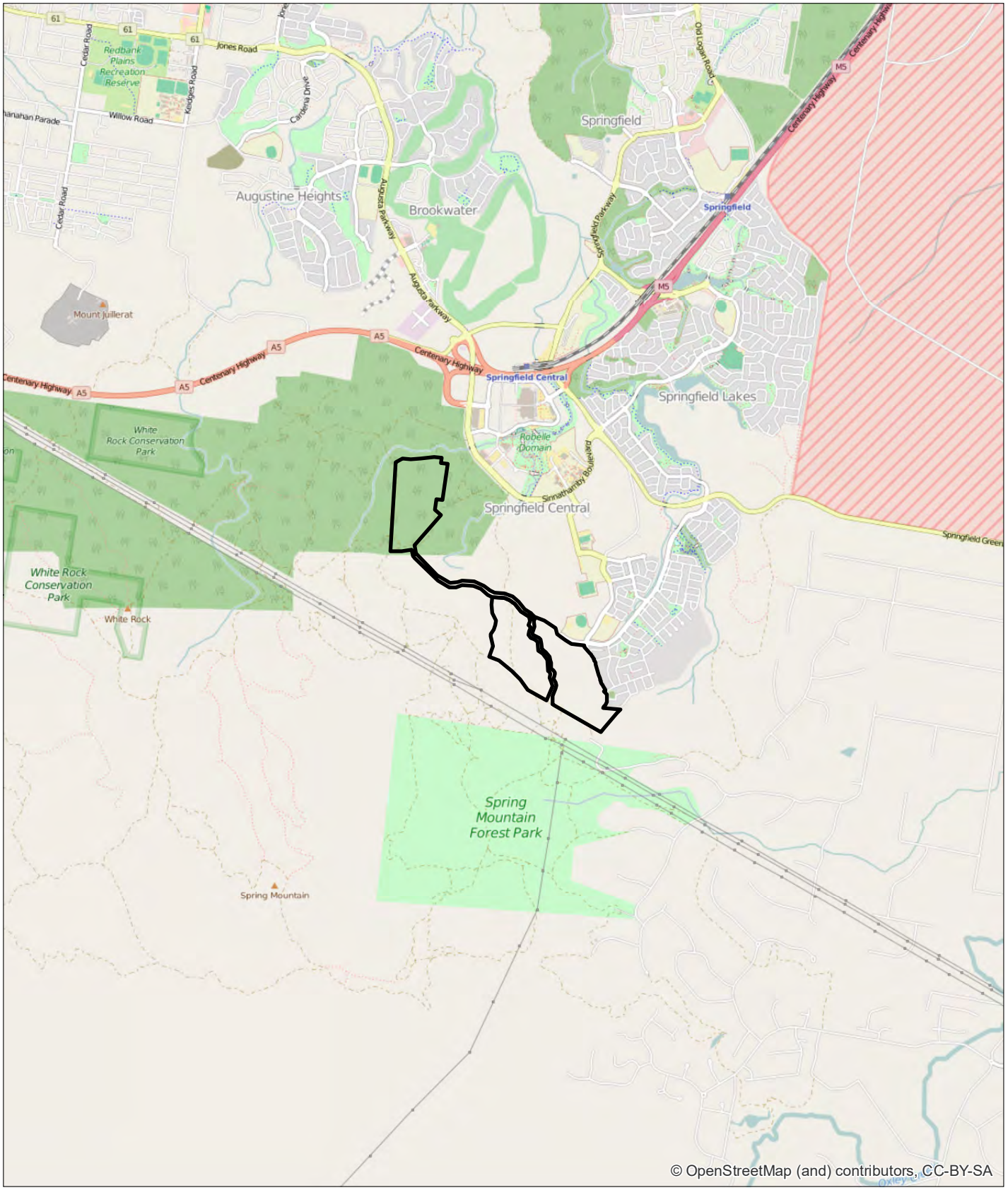
The main objective of the flora survey is to locate any Endangered, Vulnerable or Near Threatened (EVNT) plants that may be present within the clearing impact area. This is especially important for determining the degree of assessment required for a particular clearing activity. For example, if the survey establishes that EVNT plant species are not present within the clearing impact area, the proposed clearing will be exempt and, following notification to the department, a clearing permit will not be required. Alternatively, if EVNT plant species are identified, and clearing is considered to impact on the EVNT plant (i.e. clearing comes within 100m of the EVNT plant) then an application for a Protected Plant Clearing Permit is required.

Contextually, the Spring Mountain project site is located to the west of Springfield Central, approximately 13km southeast of Ipswich City and approximately 26 km southwest of Brisbane City. The site is bordered by commercial development and educational facilities associated with Springfield Central to the northeast, residential development to the southeast and large vegetated rural properties adjoining White Rock-Spring Mountain Conservation Estate and more broadly the Flinders-Karawatha Bioregional Corridor. The site is bound by Centenary Highway to the north and Sinnathamby Boulevard to the east. The surrounding suburbs of Redbank Plains, Springfield Lakes and Swanbank are highly urbanised and contain a mixture of residential housing, commercial properties and industrial land uses. Refer to **Figures 1 and 2** for site context and aerial. Clearing works proposed within Village 6, 8, 13 and the Haul Road form part of early works for the commencement of the Spring Mountain project which forms part of the Greater Springfield urban development area (refer **Plan 1**). It is noted that the Spring Mountain project (refer **Plan 2**) has been approved by the Commonwealth **Department of the Environment** (DoE) (EPBC 2013/7057).

The flora surveys outlined in this report were conducted where proposed clearing is mapped within 'High Risk' areas under Protected Plants Flora Survey Trigger Mapping (refer **Figure 3**) as per the *Flora Survey Guidelines – Protected Plants Nature Conservation Act 1992*.

I.I. Key Site Details

Address	Sinnathamby Boulevard
RPD	Lot 22 on SP234042, Lot 33 on SP269190
Local Government Area	Ipswich City Council
Planning Scheme	Springfield Structure Plan, which forms part of the Ipswich City Council Planning Scheme 2003
Area Classification/Zone	Community Residential
Existing Land Use	Vacant
Proposed Land Use	Residential / Road



Legend

Project impact area

Figure 1 *Site Context*

File ref. 7522 E 01 Site Context A
Date *5/01/2016*
Project *Springfield Villages 6 & 8*

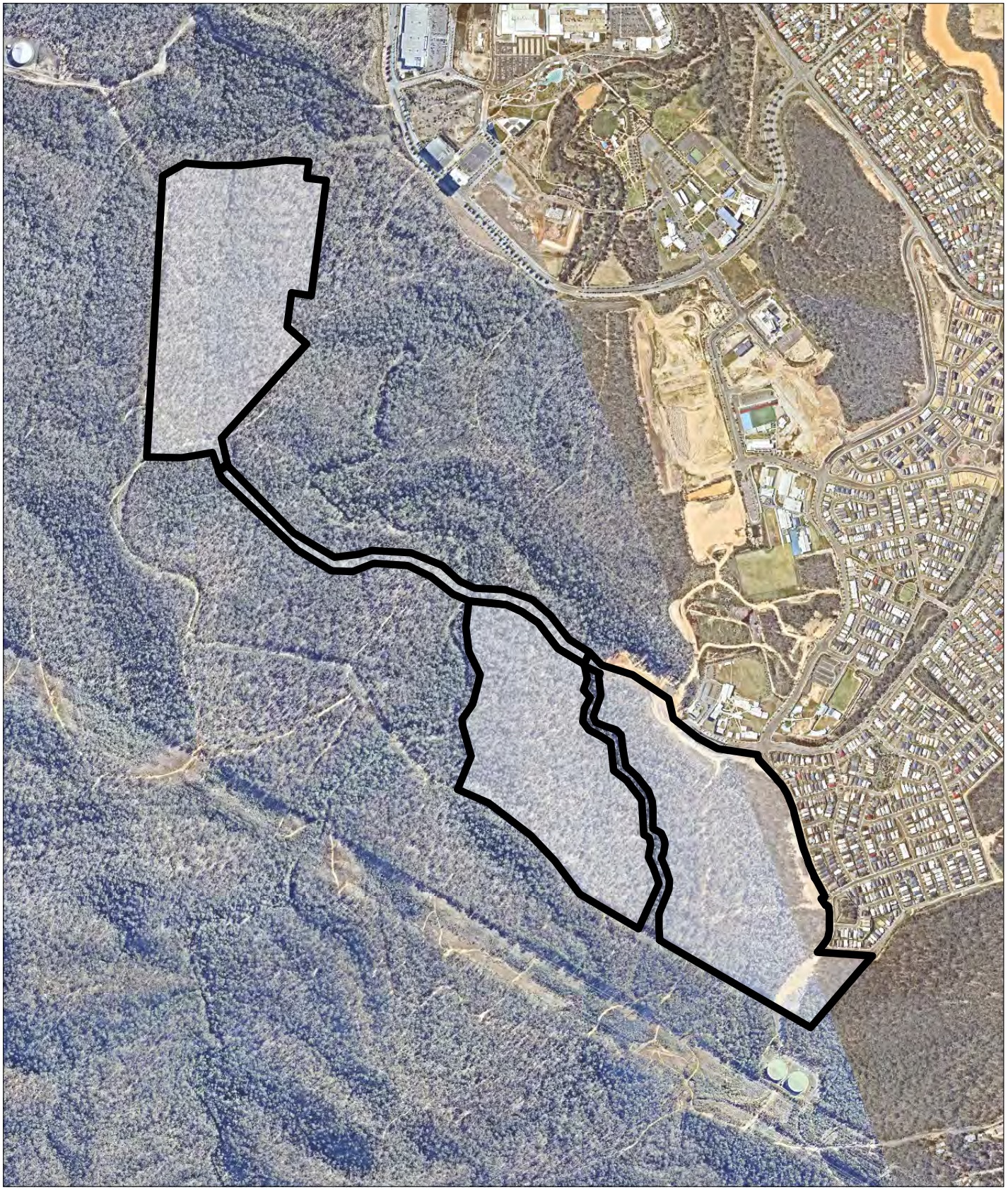
0 250 500 1,000 1,500 *m*

Scale (A4): 1:50,000 [GDA 1994 MGA Z56]

N

saunders havill group

Layer Sources QLD GIS Layers (QLD Gov. Information Service 2014), Aerial (Nearmap 2014)



Legend

Project impact area

Figure 2 *Site Aerial*

File ref. 7522 E 02 Site Aerial A
Date *5/01/2016*
Project *Springfield Villages 6 & 8*

0 100 200 400 600 *m*

N

Scale (A4): 1:15,837 [GDA 1994 MGA Z56]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2014), Aerial (Nearmap 2014)

Legend

Project impact area

High Risk

Figure 3 *NCA Flora Survey Trigger Map*

File ref. 7522 E 03 NCA A
Date *5/01/2016*
Project *Springfield Villages 6 & 8*

0 100 200 400 600 *m*

N

Scale (A4): 1:15,837 [GDA 1994 MGA Z56]

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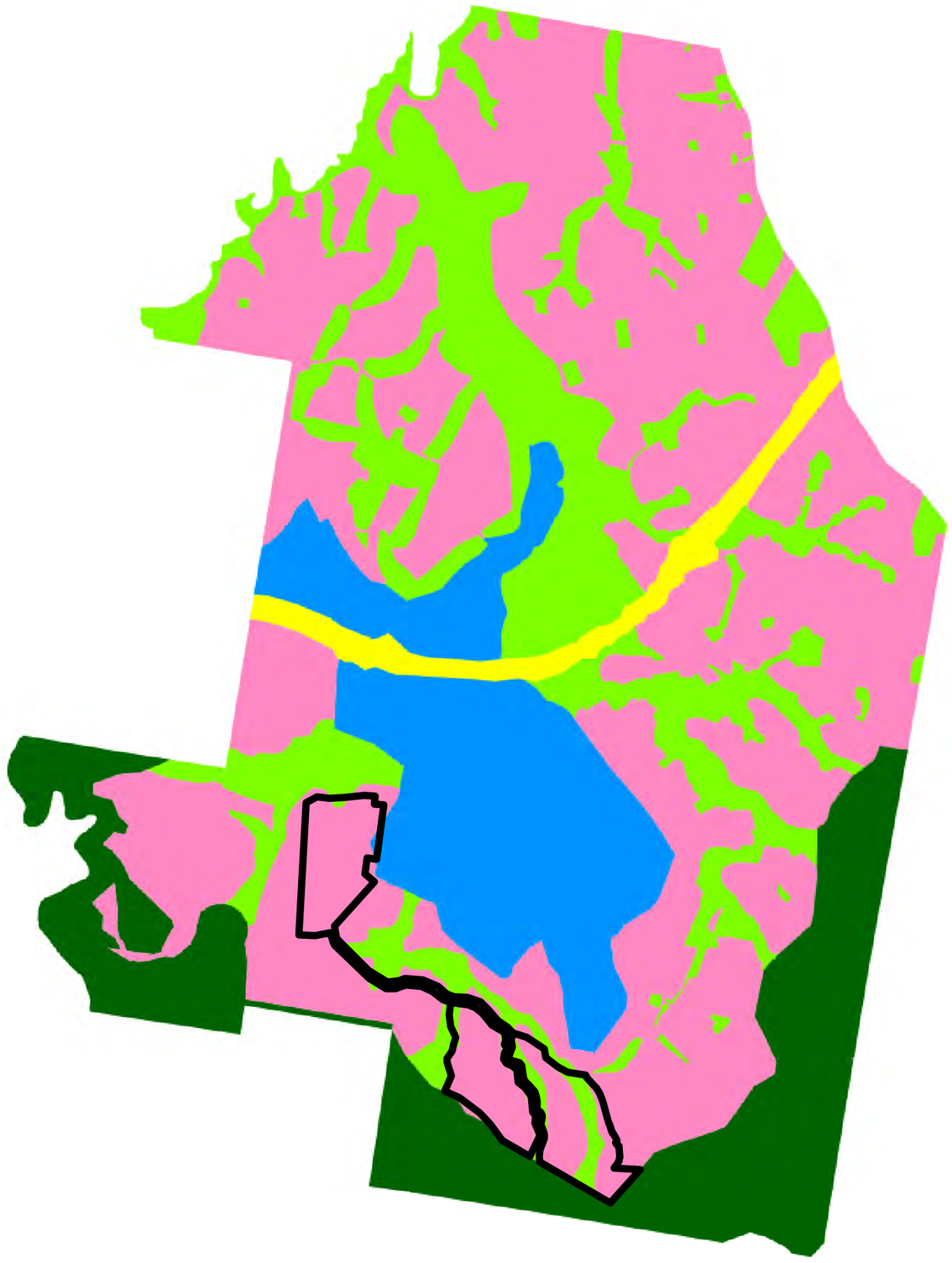
Layer Sources QLD GIS Layers (QLD Gov. Information Service 2014), Aerial (Nearmap 2014)

0 500 1,000 2,000 m

N

Legend

- Project impact area
- Community residential
- Town centre
- Regional transport corridor
- Open space
- Conservation



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ISSUES:

Issue	Date	Description	Drawn	Checked
A	5/01/2016	Prelim Draft	AL	MS

APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

Spring Mountain- Villages 6 , 8 &13 & Haul Road

Greater Springfield Structure Plan

Date | 5/01/2016
Scale | 1:32,500 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | **Lend Lease**
Project | **NCA**
Address/RPD | **Springfield**
Source | **DCBD (DNRM, 2013), Aerial (QLD Globe, 2013) Layout (LandPartners 2014)**

Plan 1

SHG File
7522 E 02 Structure Plan A

0 100 200 400 600 800 1,000 m

Legend

Project impact area

RESIDENTIAL DEVELOPMENT AREA

OPTIONAL USE AREA B

EXISTING SCHOOL

PROPOSED SCHOOL

PROPOSED NEIGHBOURHOOD CENTRE

ACTIVITY CENTRE

INFRASTRUCTURE (EXISTING)

DISTRICT 2 PARK (D2P1)

MAJOR DISTRICT PARK NORTH (FP1)

FORMAL PARK WEST (FP2)

LINEAR CREEKLINE OPEN SPACE

LOCAL RECREATION PARK

CENTENARY HIGHWAY

SINNATHAMBY BOULEVARD

TOWN CENTER ROAD TYPE 2A MODIFIED

MAJOR COLLECTOR DUAL LANE STREET
(NO ACCESS)
(Area shown is where road has been defined)

MAJOR COLLECTOR STREET (ACCESS)
(Area shown is where road has been defined)

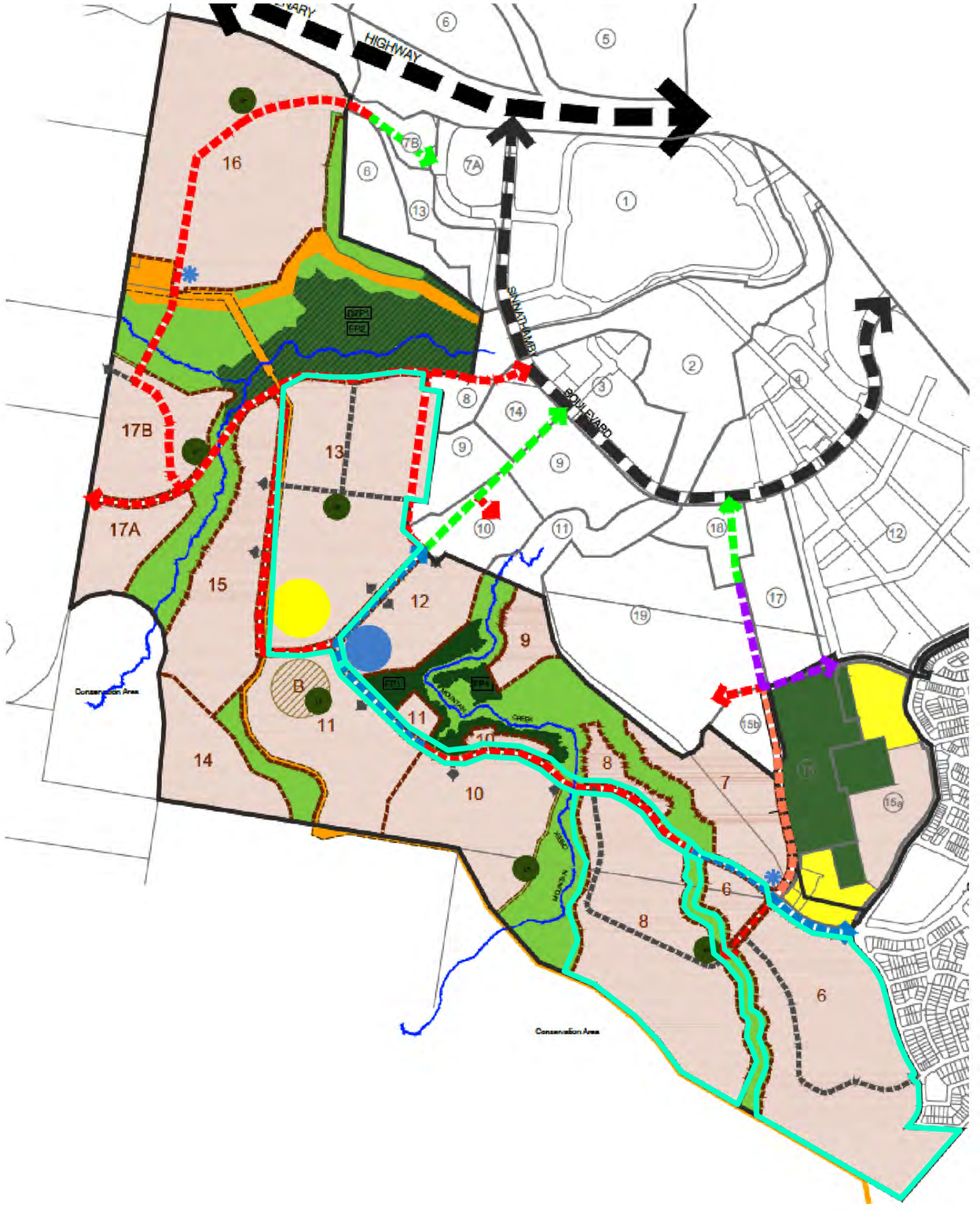
COLLECTOR STREET

VILLAGE BOUNDARY

SPRING MOUNTAIN PRECINCT BOUNDARY 352 ha

INDICATIVE TOWN CENTRE DEVELOPMENT AREAS (SUBJECT TO TOWN CENTRE CONCEPT PLAN)

NOTE:
LOCATIONS AND AREAS OF VARIOUS LAND USE ELEMENTS AS SHOWN ARE CONCEPTUAL ONLY AND SUBJECT TO DETAILED DESIGN



N

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ISSUES:

Issue	Date	Description	Drawn	Checked
A	5/01/2016	Prelim Draft	AL	MS

APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

Spring Mountain - Villages 6, 8 13 & Haul Road

Spring Mountain Development Proposal

Date | 5/01/2016
Scale | 1:15,000 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Lend Lease
Project | NCA
Address/RPD | Springfield
Source | Development Layout (LandPartners 2015)

Plan 2

SHG File
7522 E 01 Draft Layout A

2. Desktop Assessment

2.1. Nature Conservation Act

The NCA classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The *Nature Conservation (Wildlife) Regulation 1994* (NCWR) lists plant and animal species presumed extinct, endangered, vulnerable, near threatened, least concern, international or prohibited.

The **Queensland Government** has adopted a regulatory framework that captures activities that pose a high risk to plant biodiversity. Under the framework, when a non-exempt clearing activity is proposed within a 'High Risk' area, the proponent of that activity is required to complete a flora survey prior to commencement of clearing. The Protected Plants Flora Survey Trigger Map shows 'High Risk' areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location.

A search of Projected Plants Flora Survey Trigger Mapping indicated proposed clearing areas within the subject site are overlayed as 'High Risk' and so are subject to flora survey requirements (refer **Figure 3**)..

Prior to flora surveys, the schedules of the NCWR were considered in this report using a Wildlife Online Database Search with a 10 kilometre radius from the site. Six (6) flora species listed under the NCWR were identified as having the potential to occur on site and are presented in **Table 1**. Refer to **Appendix A** for full search results.

Table 1: Wildlife Online Search Results - Flora

Scientific Name	Common Name	Status
Marsdenia coronata	Slender Milk Vine	Vulnerable
Plectranthus habrophyllus	-	Endangered
Eucalyptus curtisii	Plunkett Mallee	Near Threatened
Melaleuca irbyana	Swamp Tea Tree	Endangered
Notelaea ipsviciensis	-	Endangered
Notelaea lloydii	Lloyd's Native Olive	Vulnerable

2.2. Additional legislative instruments

In order to maximise the scope of the flora survey, a search of protected matters listed as potentially present within 10 km of the sites under the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was conducted using the Protected Matters Search Tool. Potential flora EVNT species listed under the EPBC Act are presented in **Table 2**. Refer to **Appendix B** for full search results.

Table 2: EPBC Act Protected Matters Search Results - Flora

Scientific Name	Common Name	Status
Arthraxon hispidus	Hairy Joint Grass	Vulnerable
Bosistoa transversa	Three-leaved Bosistoa	Vulnerable
Cupaniopsis tomentella	Boonah Tuckeroo	Vulnerable
Notelaea ipsviciensis	Cooneana Olive	Critically Endangered
Notelaea lloydii	Lloyd's Olive	Vulnerable
Phaius australis	Lesser Swamp-orchid	Endangered
Phebalium distans	My Berryman Phebalium	Critically Endangered
Planchonella eerwah	Shiny-leaved Condoo	Endangered
Plectranthus habrophyllus	-	Endangered
Sophora fraseri	-	Vulnerable
Thesium australe	Austral Toadflax	Vulnerable

Regional Ecosystem mapping under the *Vegetation Management Act, 1999* (VMA) was utilised to inform flora survey targets and techniques. The broader area where the survey sites occur is mapped under the VMA as Least Concern 12.9-10.19a, 12.9-10.17a, 12.9-10.2, and 12.9-10.7 as described below and highlighted in **Plan 3**.

Least Concern RE 12.9-10.19a

Description	*Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments.*

Least Concern RE 12.12.17a

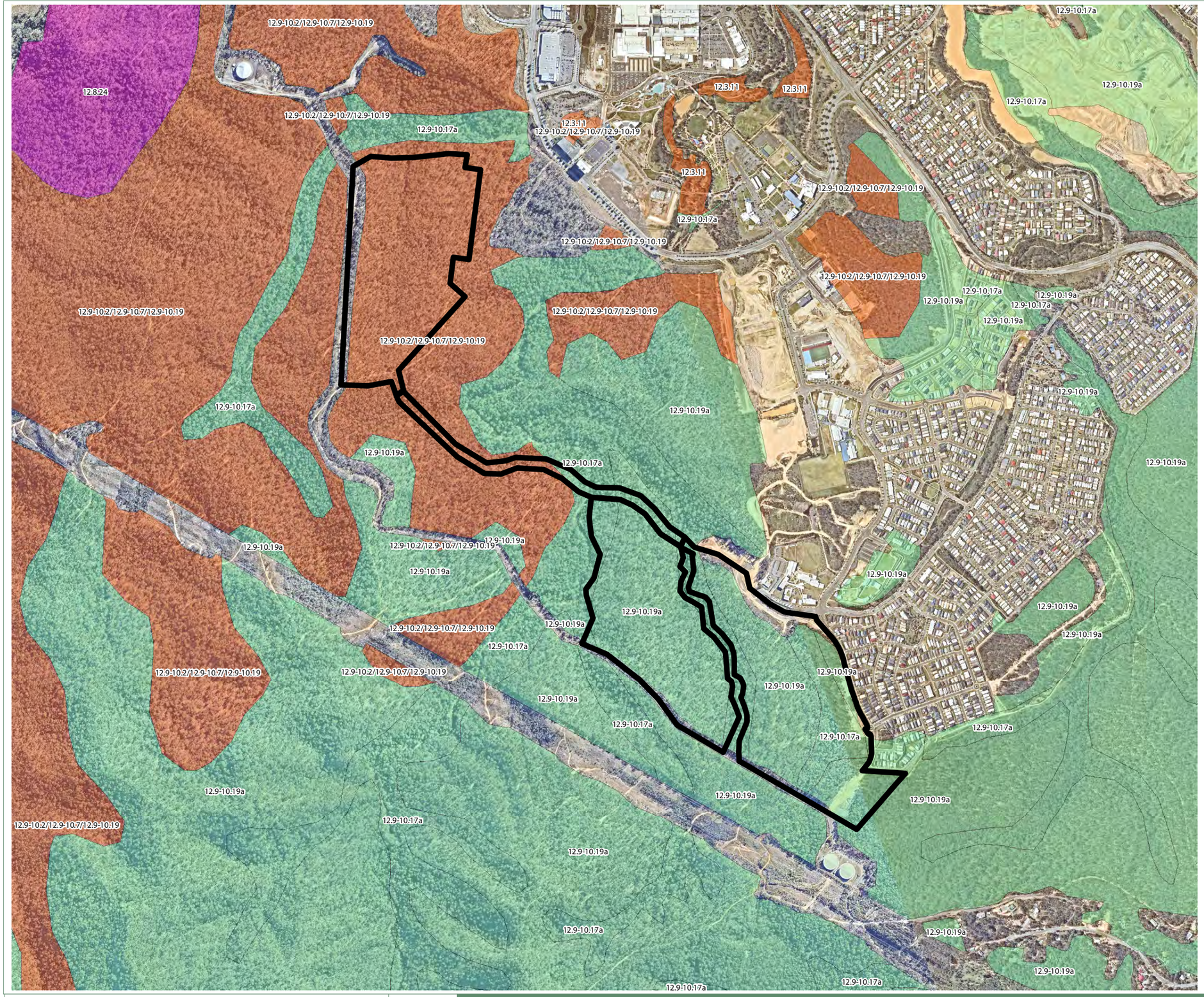
Description	*Lophostemon confertus or Lophostemon suaveolens dominated open forest usually with emergent Eucalyptus and/or Corymbia species. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments.*

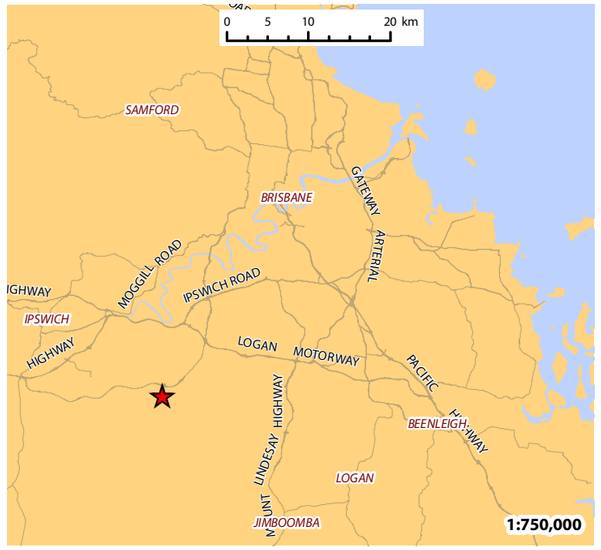
Least Concern RE 12.9-10.2

Description	*Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

Of Concern RE 12.9-10.7

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





Legend

- Project impact area

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

0 200 400 600 800 1,000 m

N

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ISSUES:

Issue	Date	Description	Drawn	Checked
A	5/01/2016	Prelim Draft	AL	MS

APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

Spring Mountain- Villages 6, 8 & 13 & Haul Road

Regional Ecosystems v8

Date | 5/01/2016
Scale | 1:14,962 @ A3
Data Information:
Universal Transverse Mercator
GDA 1994 MGA Zone 56
Client | Lend Lease
Project | NCA
Address/RPD | Springfield
Source | DCBD (DNRM, 2013), Aerial (QLD Globe, 2013)

Plan 3

SHG File
7522 E 03 REs A

3. Flora Survey Methodology

3.1. Clearing Impact Areas

The proposed clearing sites (i.e. Villages 6, 8, 13 and the Haul Road) are mostly mapped as 'High Risk' areas under Protected Plants Flora Survey Trigger (refer **Figure 3**). The Clearing Impact Areas, which are identified the areas to be cleared inclusive of a 100m buffer, are shown in **Plan 4**.

3.2. Survey extent

Table 3 and **Plan 4** summarise the Clearing Impact Areas and Transect extents. General observations for EVNT flora species were conducted at all times while on-site, including while traversing roads and vegetated area both inside and outside designated Clearing Impact Areas. The 100m buffer areas was assessed where access was possible.

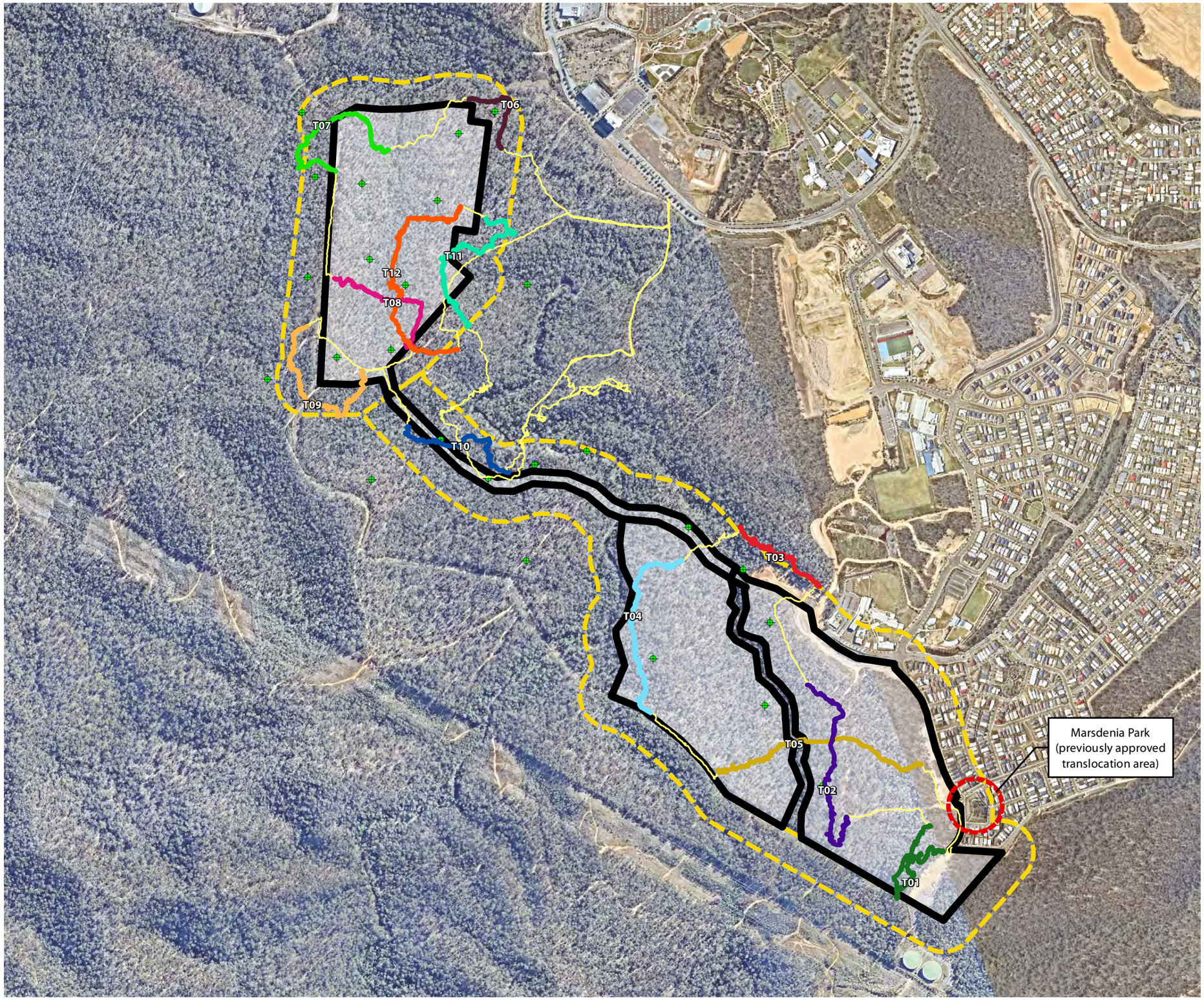
Table 3: Transect Coordinates

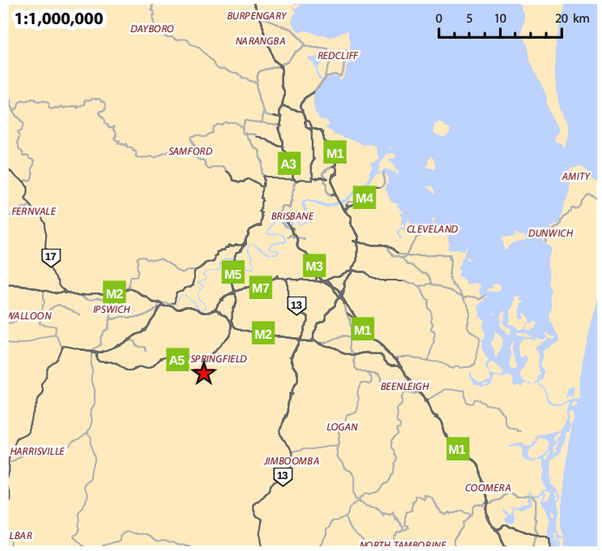
Transect	Start	Finish
1	-27.703174° / 152.909798°	-27.702452° / 152.909382°
2	-27.702202° / 152.906698°	-27.698432° / 152.905453°
3	-27.695617° / 152.905829°	-27.693931° / 152.903303°
4	-27.694879° / 152.901439°	-27.699177° / 152.900416°
5	-27.700895° / 152.902626°	-27.700693° / 152.909101°
6	-27.683117° / 152.895659°	-27.681752° / 152.894641°
7	-27.683179° / 152.892057°	-27.683791° / 152.890378°
8	-27.686838° / 152.890317°	-27.688842° / 152.892838°
9	-27.689488° / 152.891223°	-27.688196° / 152.889467°
10	-27.691064° / 152.892680°	-27.692380° / 152.895896°
11	-27.688213° / 152.894579°	-27.685155° / 152.895197°
12	-27.684803° / 152.894378°	-27.688865° / 152.894291°

3.3. Flora Survey Methodology

The clearing sites were surveyed using the preferred timed meander survey technique as per *Flora Survey Guidelines – Protected Plants Nature Conservation Act 1992* by three (3) suitably qualified professionals including (1) Senior Ecologists and two (2) Ecologists (refer to **Appendix C** for curricula vitae). Surveys were carried out as follows:

1) The Clearing Impact Areas were traversed on foot by project Ecologists (refer to **Plan 4**).
2) The start and finish time of each meander was recorded.
3) The track log of project Ecologist's transects was recorded using a handheld GPS unit accurate to < 1m.
4) The identity of all plant species encountered during each meander was recorded.
5) The site and surrounds were photographed.





Legend

- Impact area
- 100m impact area buffer
- GPS tracklog
- Observational surveys

Meander transect centreline

- T01
- T02
- T03
- T04
- T05
- T06
- T07
- T08
- T09
- T10
- T11
- T12

0 50 100 200 300 400 500 m

N

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ISSUES:

Issue	Date	Description	Drawn	Checked
A	5/01/2016	Prelim Draft	TC	MS

APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

Spring Moutain - Villages 6, 8 & 13 & Haul Road

Flora Meandering Survey Transects

Date | 5/01/2016
Scale | 1:12,500 @ A3
Coordinate System | GDA 1994 MGA Zone 56
Projection | Transverse Mercator
Client | Lend Lease
Project | Springfield
Address/RPD | Springfield Villages 6 to 8
Sources | QLD GIS Layers (QLD Gov. Info Services 2015), Aerial (Nearmap, 2015)

Plan 4

SHG File
7522 E 01 Flora Meandering Survey B

4. Flora Survey Results

The Clearing Impact Areas were assessed on 8 and 9 July 2015. **No EVNT species were encountered in any of the proposed clearing areas** however a population of translocated *Marsdenia coronate* (Slender Milk Vine) was recorded within the 100m buffer. Given the extent of survey it can be stated with a high level of confidence that no EVNT species will be cleared by the proposed development.

A total of one hundred and thirty seven (137) species were identified throughout the survey period. This included fourteen (14) herbs, thirteen (13) vines, three (3) orchids and epiphyte species, forty six (46) ground layer species, twenty five (25) shrubs, twenty (20) sub-canopy species and sixteen (16) canopy species. The transect length varied however a total of 11.813 kilometres were searched for threatened species by three ecologists using the meander methods. Each transect was located in areas which represented each mapped vegetation community verified through extensive site surveys.

It is noted however that *Marsdenia coronate* (Slender Milk Vine) has been recorded within the buffer area adjacent to Transect 1 (refer **Plan 1**). These specimens form part of a previously approved translocation program and are located within a Council Park known as Marsdenia Park, within the existing residential development to the east. The proposed works will not impact on these specimens which are separated from the project area by an existing bitumen road.

Table 4 summarises the details of each of the timed meander transects. Meander transect descriptions with photographs are presented in the following pages. A general description for each transect area is provided in this section and respective species lists in **Appendix D**.

Table 4: Meander survey summary

Site	Date	Start Time	Finish Time	Duration	Distance	Flora Species
1	1.12.2015	11.05am	12.45pm	100 minutes	1.161km	55
2	1.12.2015	12.25pm	13.45	80 minutes	1.117km	39
3	1.12.2015	13.46	15.08	92 minutes	888m	52
4	1.12.2015	14.55	16.18	83 minutes	1.149km	46
5	1.12.2015	16.00	17.15	75 minutes	1.189km	42
6	2.12.2015	9.31am	10.40am	69 minutes	480m	79
7	2.12.2015	10.23am	11.47am	85 minutes	982m	45
8	2.12.2015	11.25am	12.27pm	62 minutes	756m	47
9	2.12.2015	12.31	13.55	86 minutes	1.019km	58
10	2.12.2015	13.42	14.42	60 minutes	696m	44
11	14.12.2015	13.36	15.08	92 minutes	1.019m	51
12	14.12.2015	14.55	16.27	92 minutes	1.357km	64

4.1. Meander Transect 1

Transect 1 is located within mapped remnant vegetation dominated by Least Concern Regional Ecosystem community 12.9-10.19a. This community is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*. Transect searches extended along 1.1.61 kilometres. Canopy species recorded are consistent with current regional ecosystem mapping. *Corymbia henryi* (Large Leaf Spotted Gum) and *Eucalyptus fibrosa* (Broad Leaf Ironbark) were the dominant species recorded.

The Transect 1 Area is located towards the edge of the existing residential development, on North West facing slopes. The canopy and sub-canopy tree layers are largely intact with disturbances confined to some minimal historic tree removal including evidence of logging practices. The shrub and ground layer are dominated by native species with the majority of introduced species confined to the occasion small clump of *Lantana camara* (Lantana) and patches of introduced grasses and weeds along the edge of the vegetated patch and within the cleared easement track which runs to an existing water tower directly south of the transect. The shrub layer is very sparse with the ground layer patchy in areas amongst areas of exposed earth and leaf litter.

Only a small area of exposed rock surface was observed along a portion of the ridge line adjacent to the cleared track throughout the transect area. This area was thoroughly searched specifically for both *Marsdenia coronate* (Slender Milk Vine) and *Plectranthus habrophyllus* (Plectranthus) both of which have habitat niches suited to this terrain. The remaining area retained an open understorey and ground layer.

Photo: Transect 1 dominated by Corymbia henryi and Eucalyptus fibrosa.

Photo: Exposed rocky terrain observed along the ridge line.

Fifty five (55) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. Flora diversity consisted of two (2) herbs, four (4) vines, twenty six (26) ground layer, twelve (12) shrub, seven sub-canopy and four (4) canopy species.

4.2. Meander Transect 2

Transect 2 is located within mapped remnant vegetation dominated by Least Concern Regional Ecosystem community 12.9-10.19a. This community is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*. Transect searches extended along 1.117 kilometres.

Species recorded within the canopy are dominated by *Eucalyptus fibrosa* (Broad Leaf Ironbark). This dominant species is scattered amongst *Corymbia henryi* (Large Leaf Spotted Gum) and the occasional *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus acmenoides* (White Mahogany). This transect is consistent with the current remnant regional ecosystem mapping. A patchy shrub layer was recorded throughout the transect area however overall is considered relatively sparse. The ground layer also varied from relatively sparse amongst the areas with exposed rock along the ridge lines with greater densities recorded on slopes and towards the lower portion of the transect.

Disturbances within this transect are restricted to some introduced species within the ground layer which are mainly concentrated along the edges of vehicle access tracks. Some evidence of logging and fire is also noted throughout the survey.

Some exposed rocky outcrops, limited to along the ridgeline, were recorded by field survey. The remaining area is typical of Landzone 9-10, containing fine to coarse grained sedimentary rocks.

Photo: Transect 2 dominated by Eucalyptus fibrosa and Corymbia henryi

Photo: Minimal exposed rock outcrops.

Thirty nine (39) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included one (1) herb, four (4) vines, twelve (12) ground layer, ten (10) shrub, five (5) sub-canopy and seven (7) canopy species.

4.3. Meander Transect 3

Transect 3 is located within mapped remnant vegetation dominated by least concern regional ecosystem 12.9-10.17. This community is described as *Lophostemon confertus or Lophostemon suaveolens dominated open forest usually with emergent Eucalyptus and/or Corymbia species. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments.* The transect survey included investigations along 888m.

This transect is located within vegetation that is typical of lower gully lines with increase densities of *Lophostemon suaveolens* (Swamp Box). There is a greater density of weed species recorded throughout this transect which occurred along the edges of the cleared adjacent development area directly south as well as throughout the mapped waterway. It is noted that thick patches of Lant*ana camara* (Lantana) was recorded along the edges of this mapped waterway. The ground layer was relatively dense with leaf litter and bare earth confined to isolated small patches.

Photo: Eucalyptus and Corymbia species dominated the hill side with Lophostemon suaveolens dominated the lower embankment area.

Photo: Steep south west facing slope

Although canopy species recorded are consistent with current regional ecosystem mapping, the age structure appeared to be reduced with the number of large trees remaining previously removed through historical logging practices. The height of this vegetation community however remains at remnant status.

Fifty two (52) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity consisted of five (5) herb, three (3) vines, nineteen (19) ground layer, eleven (11) shrub, six (6) sub-canopy and eight (8) canopy species.

4.4. Meander Transect 4

Transect 4 is located within mapped remnant vegetation dominated by Least Concern Regional Ecosystem community 12.9-10.19a. This community is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*. The transect included investigations along 1.149 kilometres.

Although elements of Least Concern Regional Ecosystem 12.9-10.19 were recorded throughout this transect, some species representing Least Concern Regional Ecosystem 12.9-10.2 and Of Concern Regional Ecosystem 12.9-10.7 were also observed however were too small to separate through mapping amendments. The shrub layer is dominated by Acacia species including *Acacia leiocalyx* (Early Flowering Black Wattle), *Acacia disparrima* (Hickory Wattle) and *Acacia concurrens* (Black Wattle). This appeared to be a result of fire activity which was evident towards the canopy of some of the established canopy trees. The ground layer is recorded as being dense and is dominated by *Themeda triandra* (Kangaroo Grass) and *Imperata cylindrica* (Blady Grass).

The majority of this transect is located on a western facing slope with weeds confined to the lower portion of the hill and is dominated by *Lantana camara* (Lantana). The site also retained evidence of fire and some past logging activities.

Photo: Fire evidence throughout the transect area typical with Acacia regrowth within the shrub layer.

Photo: Species recorded typical of the current regional ecosystem mapping.

The vegetation community retains a canopy height and structure which retains its remnant status. Also observed were a number of well-established specimens which appeared to be less favourable for past logging practices.

Forty six (46) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included two (2) herb, four (4) vines, nineteen (19) ground layer, eight (8) shrub, seven (7) sub-canopy and six (6) canopy species.

4.5. Meander Transect 5

Transect 5 is located within two (2) regional ecosystem communities both of which are categorised as Least Concern regional ecosystems. The areas outside of the mapped waterway is described as RE12.9-10.19a whereas the vegetation associated with the drainage line is described as RE12.9-10.17a. The transect survey included investigations along 1.189 kilometres.

The majority of Transect 5 is located within mapped remnant vegetation dominated by Least Concern Regional Ecosystem community 12.9-10.19a. This community is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*. Transect 5 is also traverses across a mapped drainage line and is located within mapped remnant vegetation dominated by least concern regional ecosystem 12.9-10.17. This community is described as *Lophostemon confertus or Lophostemon suaveolens dominated open forest usually with emergent Eucalyptus and/or Corymbia species. Occurs in gullies and southern slopes on Cainozoic and Mesozoic sediments.*

The changes between the two regional ecosystem communities appeared evident with the increase in density of *Lophostemon suaveolens* (Swamp Box) associated with the drainage line or lower lying areas. The Landzone between these two communities is mapped the same, however it is noted that a very small portion of this drainage feature contains some deposited material and contains characteristics of Landzone 3. This portion of the Least Concern RE12.9-10.17 area is too small to map within the regional ecosystem framework. Apart from the occasional small patch of *Juncus sp*, there were limited changes in flora species recorded.

Photo: Majority of transect located within RE12.9-10.19a.

Photo: Transect intersected mapped drainage feature mapped as RE12.9-10.17.

The majority of this transect contained very little shrub layer coverage with the density of the ground layer relatively high. Patches of bare earth and leaf litter were confined to some isolated small patches.

Forty three (43) species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included two (2) herb, four (4) vines, twelve (12) ground layer, twelve (12) shrub, seven (7) sub-canopy and five (5) canopy species.

4.6. Meander Transect 6

Transect 6 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey included investigations along 480 metres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Transect located within a composite Regional Ecosystem community.

Photo: Greater density of weed invasion towards the lower slopes of the transect area.

The majority of Transect 6 Is located on a north facing slope and on the southern side of a mapped waterway. Disturbances were confined to selective canopy thinning through logging practices, cleared vehicle tracks as well as weed infestations. The whole of transect area contained evidence of fire with patches of *Imperata cylindrica* (Blady Grass) dominating the ground layer as well as a shrub layer dominated by *Acacia* species.

The diversity of species recorded within this transect is a result of the mapped composite regional ecosystem community. Patches of vegetation were dominated by species representing each of the regional ecosystem communities however the understorey, including the shrub and ground layer remained relatively consistent throughout the entire transect area. Small changes in species were recorded within areas containing exposed rocky outcrops and within the low lying areas associated with overland flow paths.

Seventy nine (79) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included five (5) herb, six (6) vines, three (3) orchids/epiphytes, thirty two (32) ground layer, twelve (12) shrub, thirteen (13) sub-canopy and eight (8) canopy species.

4.7. Meander Transect 7

Transect 7 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey included investigations along 982 metres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

The dominant regional ecosystem observed throughout the transect area is recorded as the Least Concern RE12.9-10.2 however elements of RE12.9-10.19 and Of Concern RE12.9-10.7 were observed within small patches within and adjacent to this transect. Small habitat variations were recorded within areas containing exposed rock however these patches were confined to isolated areas towards the ridgeline. Limited diversity was recorded within the shrub layer limited to three native species amongst patches of *Lantana camara* (Lantana).

Greater disturbances were recorded within the canopy layer within this portion of the site resulting in greater weed invasion and higher density of ground layer species dominated by *Imperata cylindrica* (Blady Grass).

Photo: Transect located within a mapped composite regional ecosystem community.

Photo: Transect located within a mapped composite regional ecosystem community.

Forty five (45) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included five (5) herb, five (5) vines, eighteen (18) ground layer, four (4) shrub, six (6) sub-canopy and seven (7) canopy species.

4.8. Meander Transect 8

Transect 8 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey included investigations along 786 metres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Some exposed rocky outcrops thoroughly searched for threatened plants

Transect 8 contained some exposed rock outcrop areas however the majority of the investigation area contained a thick dense a grass layer with a scattered or sparse shrub layer amongst a woodland community. Although some introduced species were observed within the ground layer, these specimens were generally associated with old vehicle access tracks most likely as a result of logging activities.

Species recorded within the canopy are dominated by *Corymbia citriodora* (Spotted Gum), and *Eucalyptus siderophloia* (Grey Ironbark). This dominant species is recorded amongst scattered *Corymbia henryi* (Large Leaf Spotted Gum) and the occasional *Eucalyptus seeana* (Narrow Leaf Red Gum) and *Angophora leiocarpa* (Smooth Bark Apple). This transect is consistent with the current remnant regional ecosystem mapping. A patchy shrub layer was recorded throughout the transect area however overall was relatively sparse. The ground layer also varied from relatively sparse amongst the areas with exposed rock along the ridge lines with greater densities recorded on slopes and towards the lower portion of the transect.

Photo: Very few introduced species recorded throughout the transect

Forty seven (47) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included five (5) herb, five (5) vines, twenty (20) ground layer, three (3) shrub, six (6) sub-canopy and eight (8) canopy species.

4.9. Meander Transect 9

Transect 9 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey included investigations along 1.019 kilometres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Transect dominated by Corymbia citriodora

The dominant regional ecosystem community recorded within the transect area is Least Concern RE12.9-10.2 with *Corymbia citriodora* (Spotted Gum) being the dominant species recorded within the canopy layer. Other canopy species included *Angophora leiocarpa* (Smooth Bark Apple), *Corymbia intermedia* (Pink Bloodwood), *Corymbia trachyphloia* (Brown Bloodwood), *Eucalyptus acmenoides* (White Mahagany), *Eucalyptus seeana* (Narrow Leaf Red Gum) and *Eucalyptus siderophloia* (Grey Ironbark). Disturbances within this transect were restricted to some introduced species within the ground layer which were mainly concentrated along the vehicle access tracks. Some evidence of logging and fire were also recorded throughout the survey.

Fifty eight (58) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included six (6) herb, six (6) vines, twenty two (22) ground layer, nine (9) shrub, eight (8) sub-canopy and seven (7) canopy species.

4.10. Meander Transect 10

Transect 10 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey included investigations along 696 metres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Evidence of fire with greater densities of Acacia regrowth.

Canopy species recorded throughout transect 10 are include scattered occurrences of *Angophora leiocarpa* (Smooth Bark Apple), *Corymbia intermedia* (Pink Bloodwood), *Corymbia trachyphloia* (Brown Bloodwood), *Eucalyptus microcorys* (Tallowwood), *Eucalyptus seeana* (Narrow Leaf Red Gum), and *Eucalyptus siderophloia* (Grey Ironbark).

Disturbances within this transect were restricted to some introduced species within the ground layer which were mainly concentrated along the vehicle access tracks. Some evidence of logging and fire were also recorded throughout the survey. Species recorded within the shrub layer were dominated by Acacia species including *Acacia leiocalyx* (Early Flowering Black Wattle), *Acacia concurrens* (Black Wattle) and *Acacia disparrima* (Hickory Wattle).

The ground layer was relatively dense with the occasional rocky outcrop and small patches of leaf litter and bare earth.

Forty four (44) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included three (3) herb, four (4) vines, seventeen (17) ground layer, eight (8) shrub, six (6) sub-canopy and six (6) canopy species.

4.II. Meander Transect II

Transect 11 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey length included investigations along 1.019 kilometres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Site dominated by Corymbia citriodora

Photo: Minimal exposed rock.

The canopy layer is dominated by *Corymbia citriodora* (Spotted Gum), with occasional occurrences of *Angophora leiocarpa* (Smooth Bark Apple), *Corymbia henryi* (Large Leaf Spotted Gum), *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus acmenoides* (White Mahogany), *Eucalyptus seeana* (Narrow Leaf Red Gum), *Eucalyptus siderophloia* (Grey Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum).

Disturbances within this transect were restricted to some introduced species within the ground layer which were mainly concentrated along the vehicle access tracks. Some evidence of logging and fire were also recorded throughout the survey.

Fifty one (51) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included five (5) herb, six (6) vines, sixteen (16) ground layer, nine (9) shrub, seven (7) sub-canopy and eight (8) canopy species.

4.12. Meander Transect 12

Transect 12 is located within mapped remnant vegetation dominated by a composite regional ecosystem community including 65% Least Concern RE12.9-10.2, 20% Of Concern RE12.9-10.7 and 15% Least Concern RE12.9-10.19. The transect survey length included investigations along 1.357 kilometres.

- Least Concern Regional Ecosystem community 12.9-10.19a is described as *Corymbia henryi +/- Eucalyptus fibrosa subsp. Fibrosa, Corymbia citriodora subsp. Variegate, Eucalyptus siderophloia, Eucalyptus crebra open forest. Occurs in coastal areas on Cainozoic and Mesozoic sediments*.

- Least Concern Regional Ecosystem 12.9-10.2 is described as *Corymbia citriodora subsp. Variegate open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, Eucalyptus moluccana, Eucalyptus acmenoides and Eucalyptus 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.*

- Of Concern Regional Ecosystem 12.9-10.7 is described as *Eucalyptus crebra +/- Eucalyptus tereticornis, Corymbia tessellaris, Angophora leiocarpa, Eucalyptus melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments.*

Photo: Site vegetation consistent with current regional ecosystem mapping.

Photo: Sparse understorey typical of the regional ecosystem communities searches.

Disturbances within this transect were restricted to some introduced species within the ground layer which were mainly concentrated along the vehicle access tracks. Some evidence of logging and fire were also recorded throughout the survey.

Sixty four (64) flora species were recorded throughout the transect area, all of which are listed as common under state and federal legislation. This diversity included five (5) herb, six (6) vines, twenty seven (27) ground layer, seven (7) shrub, eleven (11) sub-canopy and eight (8) canopy species.

4.13. Summary

Field surveys were carried out within the clearing impact area and buffer of early works precincts (Village 6, 8, 13 and the Haul Road) of the Spring Mountain project site which is mapped as 'High Risk' by Protected Plants Flora Survey Trigger Mapping. The surveys utilised the preferred random meander technique as outlined in the *Flora Survey Guidelines – Protected Plants Nature Conservation Act 1992* to identify the presence of EVNT species. Coverage included the clearing extents as well as a 100 m buffer with each Clearing Impact Area almost entirely traversed during the timed meander transects. Twelve (12) meander transects as well as continual observations were completed throughout the investigation area.

The following points provide a summary of the investigation area:

- The vegetation communities observed have been extensively searched and analysed against current regional ecosystem mapping with overall consistence's in the location of reach regional ecosystem community. Some minor variations were observed however in the majority of areas these variations are too small to provide for changes to this mapping.
- The majority of the clearing site's canopy is relatively in-tact representing an open forest to woodland community. Although evidence of forestry practices were recorded in all transects and throughout observational survey points, the site remains as remnant due to the vegetation community's height and density.
- The sub-canopy layer is relatively sparse throughout the majority of the site and is typical of the mapped vegetation communities represented on site.
- The shrub layer is relatively sparse and in some areas is almost completely absent, which is typical of the mapped regional ecosystem communities. However evidence of fire and some vegetation clearing was recorded throughout the majority of all transects.
- Weed invasion in most areas was largely confined to areas that have been cleared including vehicle access tracks and easements as well as greater densities recorded within overland flow paths and mapped waterways and drainage lines.
- Exposed rocky habitat was recorded in isolated patches along ridge lines as well as along major creek lines. Although these areas have been extensively searched, no threatened species were recorded at the time of the assessment within the investigation area.
- *Marsdenia coronate* (Slender Milk Vine) has been recorded within the buffer area adjacent to Transect 1. These specimens form part of a previously approved translocation program and are located within a Council Park known as Marsdenia Park, within the existing residential development to the east. The proposed works will not impact on these specimens which are separated from the project area by a 20m wide existing bitumen road.

Surveys **did not identify any EVNT species within the proposed clearing areas** however a population of translocated *Marsdenia coronate* (Slender Milk Vine) was located within the 100m buffer. While this protected species is located with the 'Clearing Impact Area' as defined by the *Flora Survey Guidelines*, as no impacts to EVNT species will occur as a result of the proposed clearing, an *'Exempt Clearing Notification'* form should be lodged with the *Department of Environment and Heritage Protection* prior to any clearing taking place.

5. Appendices

Appendix A

Wildlife Online Search Results

Appendix B

Protected Matters Search Results

Appendix C

Curricula Vitae

Appendix D

Species Lists

Appendix A

Wildlife Online 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: -27.6906
Longitude: 152.8996
Distance: 10
Email: davidhavill@saundershavill.com
Date submitted: Monday 30 Nov 2015 15:16:35
Date extracted: Monday 30 Nov 2015 15:20:08

The number of records retrieved = 19

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		10
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V		10
animals	birds	Falconidae	*Falco hypoleucos*	grey falcon		V		1
animals	birds	Maluridae	*Stipiturus malachurus*	southern emu-wren		V		1
animals	birds	Psittacidae	*Lathamus discolor*	swift parrot		E	E	3
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted snipe		V	E	8
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		13
animals	birds	Turnicidae	*Turnix melanogaster*	black-breasted button-quail		V	V	1
animals	mammals	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)		V	E	3
animals	mammals	Macropodidae	*Petrogale penicillata*	brush-tailed rock-wallaby		V	V	8
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	541
animals	mammals	Vombatidae	*Vombatus ursinus*	common wombat		NT		1
animals	reptiles	Elapidae	*Acanthophis antarcticus*	common death adder		V		1
plants	higher dicots	Apocynaceae	*Marsdenia coronata*	slender milkvine		V		19/19
plants	higher dicots	Lamiaceae	*Plectranthus habrophyllus*			E	E	11/11
plants	higher dicots	Myrtaceae	*Eucalyptus curtisii*	Plunkett mallee		NT		13/13
plants	higher dicots	Myrtaceae	*Melaleuca irbyana*			E		1/1
plants	higher dicots	Oleaceae	*Notelaea ipsviciensis*			E	CE	12/12
plants	higher dicots	Oleaceae	*Notelaea lloydii*	Lloyd's native olive		V	V	6/6

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 B

Protected Matters Search Results

Australian Government

Department of the Environment

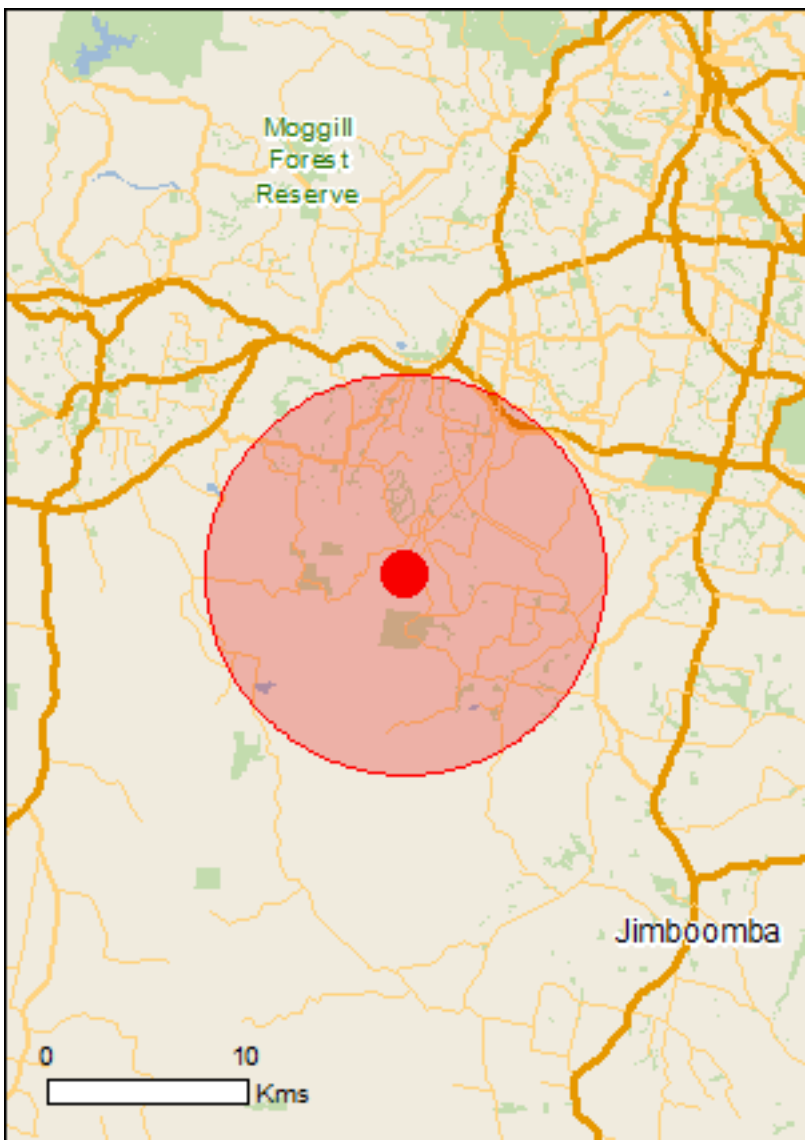
EPBC Act Protected Matters Report

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

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

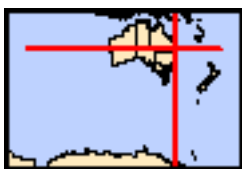
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 30/11/15 16:16:24



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:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	54
Listed Migratory Species:	34

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:	1
Commonwealth Heritage Places:	1
Listed Marine Species:	36
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:	3
Regional Forest Agreements:	None
Invasive Species:	35
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Moreton bay	20 - 30km upstream

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
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	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
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

Name	Status	Type of Presence
		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 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 daemelii 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

Name	Status	Type of Presence
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 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
Cupaniopsis tomentella		
Boonah Tuckeroo [3322]	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 likely to occur within area
Phebalium distans		
Mt Berryman Phebalium [81869]	Critically Endangered	Species or species habitat may occur within area
Planchonella eerwah		
Shiny-leaved Condoo, Black Plum, Wild Apple [17340]	Endangered	Species or species habitat likely to 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

Name	Status	Type of Presence
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
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 likely 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 dunmalli 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

Name	Threatened	Type of Presence
		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
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 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

Name	Threatened	Type of Presence
		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
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]		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 known 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

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]		Species or species habitat may occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species

Name	Threatened	Type of Presence
		habitat may 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
[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

Name	Threatened	Type of Presence within area
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
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
Mount Perry 1	QLD
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 Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
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

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
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
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
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

Name	Status	Type of Presence 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

-27.6906 152.89956

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.

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Appendix C

Curricula Vitae – Pen Port

David Havill: Senior Ecologist

David Havill has significant practical experience in the areas of ecological site assessments (flora and fauna), weed management programs, large scale revegetation projects, wetland rehabilitation and waterway restoration. He has a strong understanding of the intricate workings of the Vegetation Management Act 1999 and the complex codes and policies which influence site vegetation constraints.

David's expertise relates to the on-site identification and spatial mapping of fauna and flora species including endangered, rare and vulnerable plants and animals. He has an accurate understanding of site survey processes and standards developed by the State and Commonwealth Governments. This provides the ability to challenge the various inaccuracies that occur within broad scale vegetation mapping developed by these Government agencies.

David works closely with our in house team of GIS, environmental planning, and landscape rehabilitation specialists to document findings of ecological survey and prepare targeted restoration and rehabilitation strategies. He has a strong understanding of construction techniques associated with development projects and has the ability to prepare practical flora and fauna management plans to assist in guiding the construction process within sensitive areas.

Qualifications
Bachelor of Applied Science (Natural Systems and Wildlife Management), University of Queensland (1998)

Angela Little: Ecologist

Angela is a member of our Environmental Management team, with an academic background in the fields of marine and environmental science, and significant experience within the university and government research setting. Angela's environmental management experience is widespread, ranging from GIS support, ecological assessment in aquatic and terrestrial environments, compliance assessments for state departments, and reporting to meet regulatory requirements for resource sector, infrastructure and land development projects.

Angela has substantial technical expertise in water quality monitoring and baseline assessments, which includes equipment calibration, field sampling, and data management. Her recent completion of a qualification in Environment and Sustainability has enabled Angela to develop skills in community engagement.

Qualifications
Graduate Certificate in Environment, Griffith University (2013)
Bachelor of Science with Honours (Marine Science) Class I, James Cook University (2004)

Maree Clancy: Ecologist

Maree has extensive ecological field and desktop research experience gained while working in the forestry industry and with the Australian Koala Foundation. In previous roles she assisted with quarterly and annual reporting of rehabilitation/revegetation works at residential development reserves, habitat translocation sites and the Bruce Highway upgrade project, and also with annual fauna surveying and reporting on various projects. She has a wealth of experience with preliminary desktop assessments of potential species at survey sites and the identification of flora and fauna species present during surveys.

At the Australian Koala Foundation, Maree was involved in the Koala habitat mapping project which included the use of GIS and determining habitat values for regional ecosystems and mosaics based on canopy species rankings and percentage composition.

Maree has additional skills in native seed propagation and growing of seedlings for large scale revegetation and farm forestry projects, ongoing monitoring of propagation methods and plant health status and adaptive approaches to improving methods.

Qualifications
Bachelor of Environmental Science, University of the Sunshine Coast (2014)

Appendix D

Species Lists

Site Flora - Transect Meander Results													
Species	**Common Name**	**Transect 1**	**Transect 2**	**Transect 3**	**Transect 4**	**Transect 5**	**Transect 6**	**Transect 7**	**Transect 8**	**Transect 9**	**Transect 10**	**Transect 11**	**Transect 12**
HERB													
Brunoniella australis	Blue Trumpet							"	"	"	"		
Chrysocephalum apiculatum	Yellow Buttons	"		"	"		"	"	"	"	"	"	"
Commelina diffusa	Wandering Jew			"		"	"		"	"	"	"	"
Crassula sieberiana	Australian Crassula						"						
Einadia nutans	Einadia						"						
Glossocardia bidens	Native Cobbler's Pegs											"	"
Lobelia purpurascens	White Root	"				"	"	"	"	"		"	"
Oxalis corniculata	Yellow Wood-sorrel			"			"	"	"	"	"	"	"
Murdannia graminea	Slug Herb								"	"			
Phyllanthus virgatus	Phyllanthus		"		"			"	"	"		"	"
Plectranthus parviflorus	Plectranthus			"						"			
Poranthera microphylla	Poranthera						"						
Hybanthus stellarioides	Spade Flower							"			"		
Wahlenbergia gracilis	Small-flowered Bluebell			"		"		"	"	"	"	"	"
Total Number of Herbs Recorded		**2**	**1**	**5**	**2**	**2**	**5**	**5**	**5**	**6**	**3**	**5**	**5**
VINES													
Asparagus africanus	Climbing Asparagus Fern						"						
Cassytha glabella	Dodder Laurel							"	"	"		"	"
Eustrephus latifolius	Wombat Berry	"	"	"	"				"	"		"	"
Geitonoplesium cymosum	Scrambling Lily							"			"		
Glycine microphylla	Glycine			"	"	"		"	"			"	
Hardenbergia violacea	Native Sarsaparilla		"							"		"	"
Ipomoea cairica	Mile-a-minute						"						
Neonotonia wightii	Glycine	"			"		"			"			"
Parsonsia straminea	Monkey Rope Vine					"							
Passiflora suberosa	Corky Passion Vine	"	"	"	"	"	"	"	"	"	"	"	"
Smilax australis	Barbed Wire Vine					"					"		

Thunbergia alata	Black-eyed Susan						"						
Vigna vexillata	Wild Cowpea	"	"				"	"	"	"	"	"	"
Total Number of Vines Recorded		**4**	**4**	**3**	**4**	**4**	**6**	**5**	**5**	**6**	**4**	**6**	**6**
ORCHIDS / EPIPHYTES													
Dockrillia linguiformis	Tongue Orchid						"						
Platycerium bifurcatum	Elkhorn						"						
Platycerium suberbum	Staghorn						"						
Total Number of Orchids / Epiphytes Recorded		**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**
GROUND													
Adiantum aethiopicum	Maidenhair Fern						"						
Ageratum houstonianum	Blue Billygoat Weed	"							"		"		"
Ambrosia artemisiifolia	Annual Ragweed	"					"						
Andropogon virginicus	Whicky Grass												"
Aristida sp.	Many Head Wire Grass	"		"	"	"	"	"	"	"		"	"
Asclepias curassavica	Red-head Cotton Bush						"						
Bidens pilosa	Cobbler's Pegs	"			"		"		"	"	"		
Cassytha pubescens	Dodder Laurel						"						
Cayratia clematidea	Slender Grape						"						
Centella asiatica	Pennywort						"						
Cheilanthes distans	Bristle Cloak Fern	"	"	"	"	"	"	"	"	"	"		"
Chloris gayana	Rhodes Grass	"			"			"		"			
Chloris virgata	Feathertop Rhodes Grass	"								"			
Conyza bonariensis	Flaxleaf Fleabane	"					"		"				
Cymbopogon refractus	Barbed Wire Grass	"		"	"			"	"	"		"	"
Cyperus polystachyos	Bunchy Sedge	"	"	"	"		"	"	"		"		
Dianella caerulea	Blueberry Lilly	"	"	"	"	"	"	"	"	"	"	"	"
Dianella longifolia	Blueberry Lilly	"	"	"	"	"	"	"		"	"	"	"
Drynaria rigidula	Basket Fern						"						
Entolasia stricta	Wiry Panic	"	"	"	"	"	"	"	"	"	"	"	"
Gahnia aspera	Saw Sedge	"		"	"	"	"	"	"		"	"	"
Goodenia rotundifolia	Goodenia	"		"	"	"				"	"	"	"
Heliotropium amplexicaule	Blue Heliotrope						"		"				"
Heteropogon contortus	Black Spear Grass		"	"	"		"	"			"	"	"
Eremophila debilis	Winter Apple			"	"								
Imperata cylindrica	Blady Grass	"	"	"	"			"	"	"	"	"	"

Juncus usitatus	Common Rush						"						"
Lantana montevidensis	Creeping Lantana			"			"		"	"	"	"	"
Lepidosperma laterale	Variable Sword Sedge	"		"		"		"	"	"			"
Lomandra longifolia	Mat Rush			"			"	"		"	"	"	"
Lomandra multiflora	Many-flowering Mat Rush	"			"	"	"	"	"	"			"
Megathyrsus maximus	Guinea Grass		"				"				"		"
Melinis repens	Red Natal Grass			"	"		"		"	"	"	"	"
Panicum sp.	Panicum	"	"	"	"			"		"	"	"	"
Paspalum conjugatum	Sourgrass	"					"	"	"			"	"
Poa labillardieri	Tussock Grass	"	"			"	"	"	"	"			"
Pomax umbellata	Pomax	"	"		"					"			
Pteridium esculentum	Bracken											"	"
Senecio madagascariensis	Fireweed	"				"	"						
Sida cordifolia	Flannel Weed			"						"			
Solanum nigrum	Blackberry Nightshade	"					"						
Solanum seaforthianum	Brazilian Nightshade	"					"						
Sporobolus pyramidalis	Giant Rat's Tail Grass						"			"			"
Themeda triandra	Kangaroo Grass	"	"	"	"	"	"	"	"	"	"	"	"
Urochloa mutica	Para Grass						"						
Xyris complanata	Hat Pins								"				"
Total Number of Ground Layer Species Recorded		**26**	**12**	**19**	**19**	**12**	**32**	**18**	**20**	**22**	**17**	**16**	**27**
SHRUB													
Acacia complanata	Flat Stem Wattle				"					"			
Acacia fimbriata	Fringed Wattle	"	"	"	"	"	"	"		"	"	"	"
Baccharis halimifolia	Groundsel Bush						"						
Breynia oblongifolia	Coffee Bush						"	"			"	"	"
Bursaria spinosa	Black Thorn		"	"		"						"	
Daviesia villifera	Daviesia	"	"			"							
Dodonaea lanceolata	Hop Bush	"	"	"	"	"			"	"	"		
Dodonaea triangularis	Small-leaved Hop	"											
Gomphocarpus physocarpus	Balloon Cotton Bush	"					"				"		
Grewia latifolia	Dog's Balls		"		"	"							
Jacksonia scoparia	Dogwood	"	"				"	"	"	"		"	"
Lantana camara	Lantana	"		"	"	"	"	"			"	"	"
Leucaena leucocephala	Leucaena						"						

Leucopogon juniperinus	Prickly Heath	"	"	"	"	"			"	"	"	"	"
Ochna serrulata	Ochna			"									
Opuntia stricta	Prickly Pear	"		"		"				"			"
Persoonia sericea	Persoonia	"	"	"		"				"	"	"	"
Pultenaea euchila	Orange Pultenaea	"	"	"	"	"				"		"	
Schinus terebinthifolius	Broadleaved Pepper Tree						"						
Senna pendula	Easter Cassia						"						
Solanum mauritianum	Wild Tobacco Tree						"						
Solanum torvum	Devil's Fig						"						
Tithonia diversifolia	Japanese Sunflower						"						
Trema tomentosa	Poison Peach			"		"							
Xanthorrhoes johnsonii	Forest Grass Tree	"	"	"	"	"				"	"	"	
Total Number of Shrub Species Recorded		**12**	**10**	**11**	**8**	**12**	**12**	**4**	**3**	**9**	**8**	**9**	**7**
SUB-CANOPY													
Acacia concurrens	Black Wattle		"	"	"		"		"	"	"	"	"
Acacia disparrima	Hickory Wattle												
Acacia leiocalyx	Early Flowering Black Wattle	"		"	"	"	"	"	"	"		"	"
Acacia salicina	Sally Wattle	"	"	"		"							"
Allocasuarina littoralis	Black She-oak	"	"	"	"	"		"	"	"	"	"	"
Allocasuarina torulosa	Forest Oak							"					"
Alphitonia excelsa	Soap Tree	"	"	"	"	"	"	"	"	"	"	"	"
Celtis sinensis	Chinese Elm						"						
Cinnamomum camphora	Camphor Laurel						"						
Cupaniopsis anacardioides	Tuckeroo	"			"	"	"			"			"
Glochidion ferdinandi	Cheese Tree												"
Jagera pseudorhus	Foambark Tree						"					"	
Lophostemon confertus	Brush Box			"		"				"	"	"	"
Lophostemon suaveolens	Swamp Box				"		"	"	"	"	"		"
Melaleuca quinquenervia	Broad Leaf Paperbark						"						
Melaleuca saligna	Willow Bottlebrush					"	"						
Melia azedarach	White Cedar						"						
Petalostigma pubscens	Quinine Bush	"	"		"			"	"	"	"	"	"
Schefflera actinophylla	Umbrella Tree	"					"						
Tecoma stans	Yellow Bells						"						
Total Number of Sub-canopy Species Recorded		**7**	**5**	**6**	**7**	**7**	**13**	**6**	**6**	**8**	**6**	**7**	**11**

CANOPY												
Angophora leiocarpa	Smooth Bark Apple	"	"		"		"	"	"	"	"	"	"
Angophora woodsiana	Rough Bark Apple						"						
Corymbia citriodora	Spotted Gum		"	"	"	"	"	"	"	"		"	"
Corymbia henryi	Large Leaf Spotted Gum	"	"	"		"	"	"	"			"	
Corymbia intermedia	Pink Bloodwood			"		"	"	"	"	"	"	"	"
Corymbia tessellaris	Moreton Bay Ash						"						"
Corymbia trachyphloia	Brown Bloodwood	"	"		"			"		"	"		
Eucalyptus acmenoides	White Mahogany		"	"	"			"		"		"	"
Eucalyptus crebra	Narrow Leaf Ironbark												
Eucalyptus fibrosa	Broad Leaf Ironbark	"	"	"									
Eucalyptus major	Grey Gum						"		"				
Eucalyptus micorcorys	Tallowood										"		
Eucalyptus moluccana	Gum Topped Box			"									
Eucalyptus seeana	Narrow Leaf Red Gum			"	"	"			"	"	"	"	"
Eucalyptus siderophloia	Grey Ironbark		"	"		"	"	"	"	"	"	"	"
Eucalyptus tereticonris	Forest Red Gum				"				"			"	"
Total Number of Canopy Species Recorded		**4**	**7**	**8**	**6**	**5**	**8**	**7**	**8**	**7**	**6**	**8**	**8**
Total Species Recorded		**55**	**39**	**52**	**46**	**42**	**79**	**45**	**47**	**58**	**44**	**51**	**64**

ATTACHMENT 3 –

Plectanthus habrophyllus Pre-clearance Survey Notification

saunders havill group

Saunders Havill Group Pty Ltd ABN 24 144 972 949
address 9 Thompson St Bowen Hills Q 4006
phone (07) 3251 9444 email mail@saundershavill.com
web www.saundershavill.com fax (07) 3251 9455

surveying town planning urban design environmental management landscape architecture

Date: 21 September 2016
Site: Spring Mountain Precinct
Client: Lend Lease
EPBC Ref: 2013/7057
SHG Ref: 7243
SHG Contact: Murray Saunders (07 3251 9444)

Attention: Ian Murray
Regional Development Manager, Communities
Level 4, Kings Gate,
King Street
Bowen Hills QLD 4006

Springfield Rise: Haul Road –*Plectanthus habrophyllus* pre-clearance survey, 7002 Grande Avenue, Springfield (Lot 33 on SP269190 & Lot 22 on SP234042)

Dear Ian,

This letter provides confirmation that the *Environmental Management Division* of **Saunders Havill Group** was engaged by **Lendlease Communities** to undertake a pre-clearance survey for *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) threatened flora species *Plectanthus habrophyllus* within the proposed clearing extent for the Haul Road – Phase 1 preliminary bulk earthworks area to meet Condition 6 of the EPBC Act approval (Ref: 2013/7057).

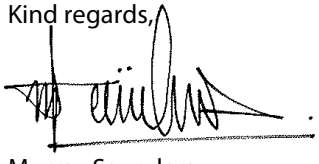
No *Plectanthus habrophyllus* specimens were recorded within the Haul Road clearing extent (refer to **Attachment 1** for a copy of the clearing extent). It is noted that no *Plectanthus habrophyllus* populations were previously recorded as part of the Spring Mountain EPBC survey by **Yurrah** (refer to **Attachment 2**).

The following provides relevant details of the survey:

Applicant: Lend Lease Communities (Springfield) Pty Ltd
Site Details: 7002 Grande Avenue, Springfield (Lot 22 on SP234042 & Lot 33 on SP269190)
Development Area: Springfield Rise Haul Road

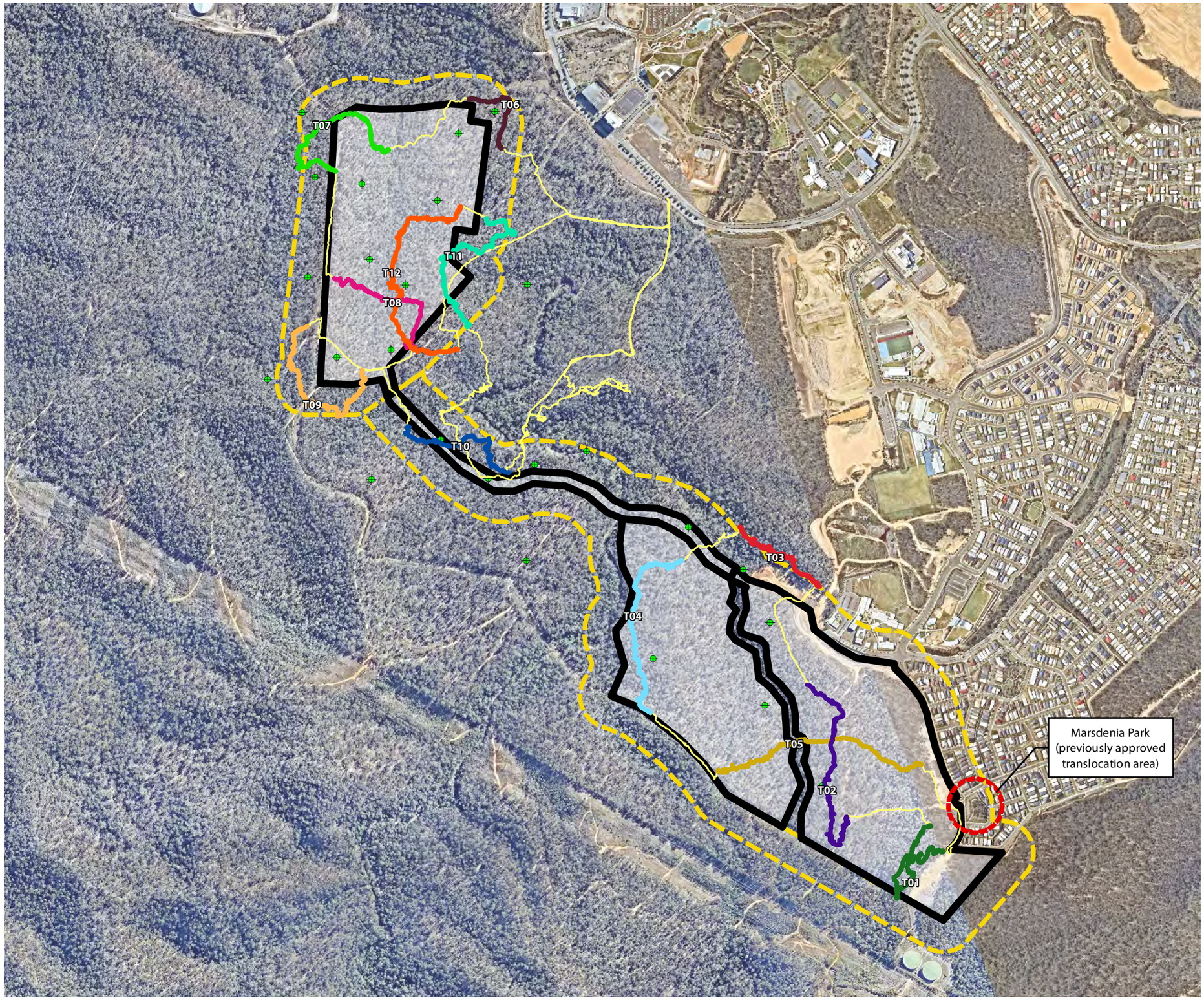
***Plectanthus habrophyllus* Pre-Clearance Survey Results:**
Survey Completed by: Andrew Craig (Senior Ecologist) & Lincoln Smith (Ecologist)
Survey Completion Date: 8 July 2015 and 20 September 2016
Was the survey undertaken in accordance with EPBC Act survey guidelines? Yes
Were any *Plectanthus habrophyllus* specimens identified within the clearing area? No

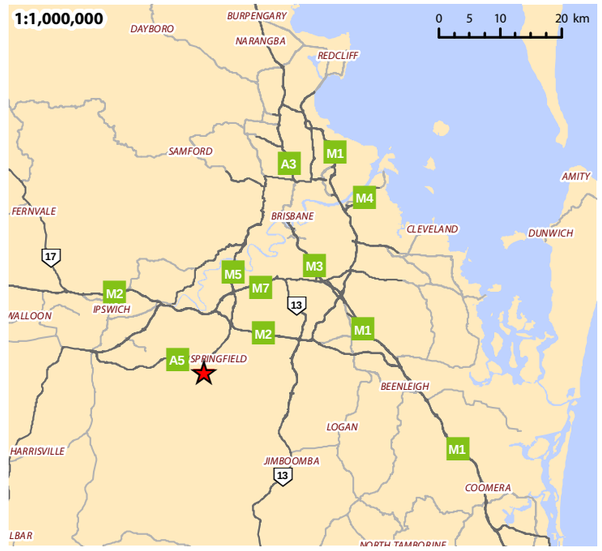
Kind regards,



Murray Saunders
Director – Saunders Havill Group

Attachment I –
Plectranthus habrophyllus Pre-clearance Survey Extent





Legend

- Impact area
- 100m impact area buffer
- GPS tracklog
- Observational surveys

Meander transect centreline

- T01
- T02
- T03
- T04
- T05
- T06
- T07
- T08
- T09
- T10
- T11
- T12

0 50 100 200 300 400 500 m

N

saunders havill group

ISSUES:

Issue	Date	Description	Drawn	Checked
A	5/01/2016	Prelim Draft	TC	MS

APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

Springfield - Villages 6 & 8

Flora Meandering Survey Transects

Date | 5/01/2016
Scale | 1:12,500 @ A3
Coordinate System | GDA 1994 MGA Zone 56
Projection | Transverse Mercator
Client | Lend Lease
Project | Springfield
Address/RPD | Springfield Villages 6 to 8
Sources | QLD GIS Layers (QLD Gov. Info Services 2015), Aerial (Nearmap, 2015)

Plan 1

SHG File
7522 E 01 Flora Meandering Survey B

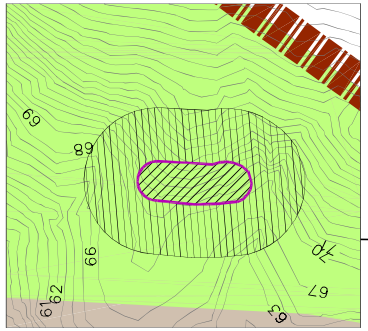
Attachment 2 –
Plectranthus habrophyllus Surevy by Yurrah

CONCEPT MANAGEMENT PLAN

GPS Locations of *Plectranthus habrophyllus* populations UTM Zone 56 J		
ID	Latitude	Longitude
Plec 1	489651	6937126
Plec 2	489534	6937058
Plec 3	490045	6937140
Plec 4	488935	6937742
Plec 5	489700	6938233
Plec 6	489823	6937058

INSERT A

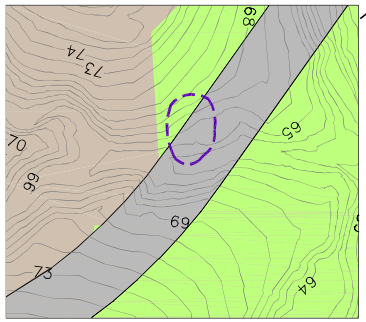
Scale 1:2000 @ A3



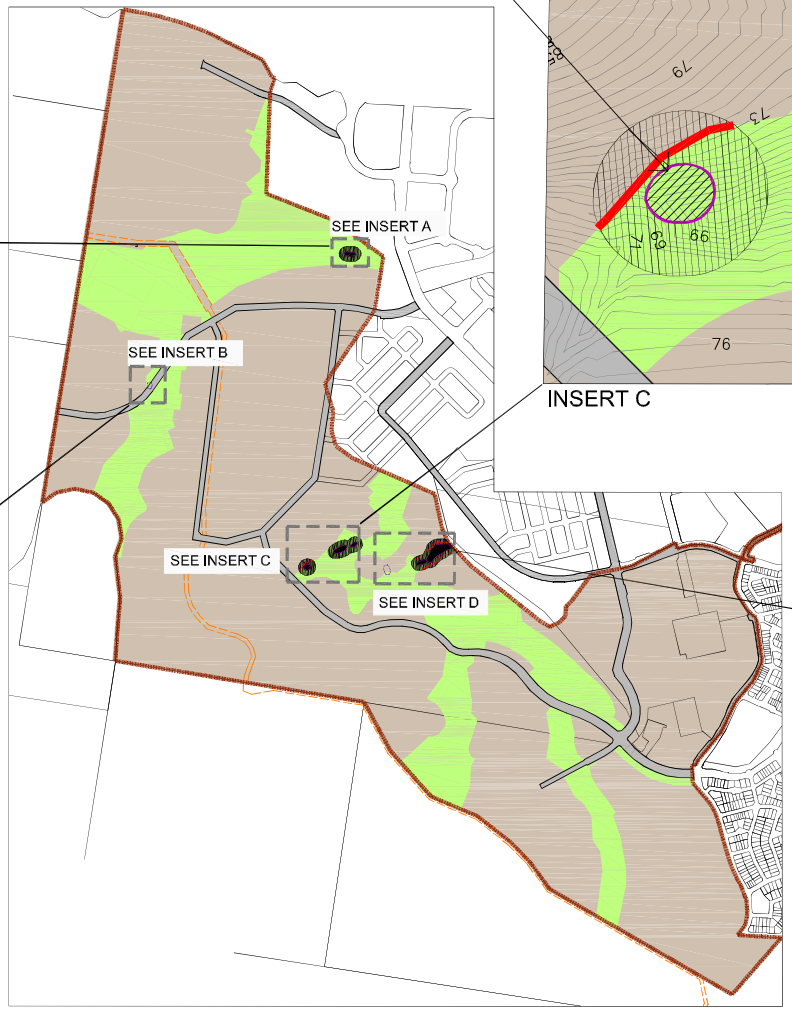
Approximate extent of *Plectranthus habrophyllus* sub-population (ID - Plec 5). Approximately 5 mature individuals within approximately 500m². 127m from development footprint to the south.

INSERT B

Scale 1:2000 @ A3



Approximate extent of *Plectranthus habrophyllus* ID - Plec 4. Approximately 5 mature individuals within approximately 400m². Population will require translocation into Linear Open Space. See Insert C. The road is located in this allignment to minimise earthworks within the linear open space and development areas.The southeast regional pipeline is located along the ridge to the west and controls the level of the road as it crosses this linear open space area.

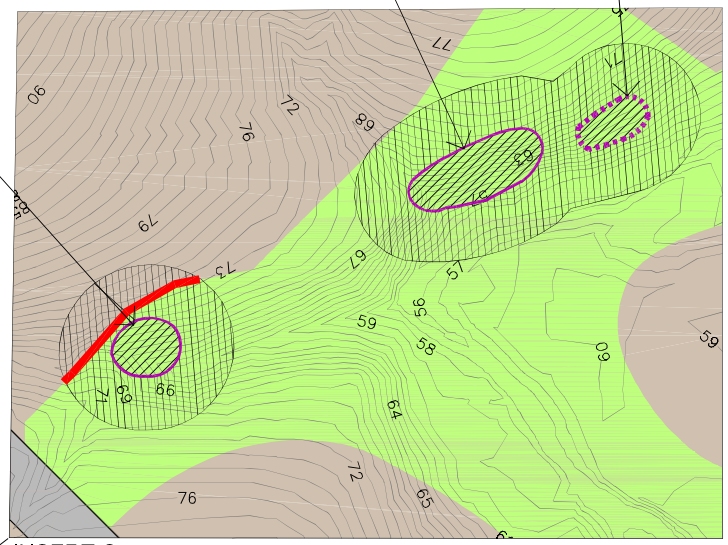


Scale - 1:20 000 @ A3

Approximate extent of Plectranthus habrophyllus ID - Plec 2. Approximately 5 mature individuals within approximately 200m². Development footprint, proposed residential, 5m to northwest.

Approximate extent of Plectranthus habrophyllus ID - Plec 1. Approximately 10 mature individuals within approximately 500m². Development footprint, proposed residential, 20m to northwest.

Receive area for Plec 4.



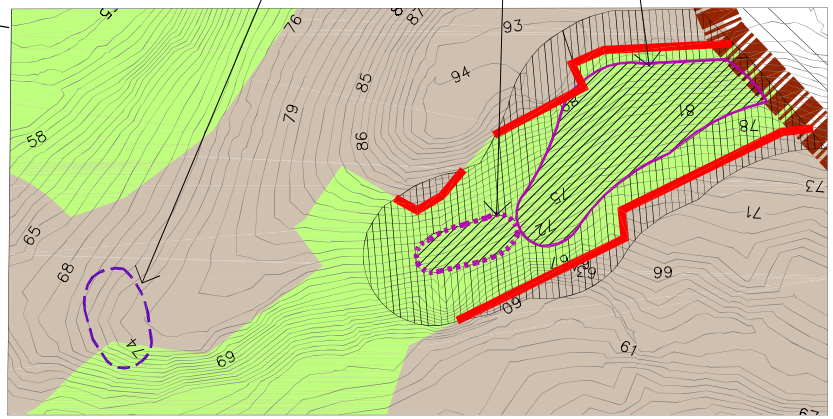
INSERT C

Scale 1:2000 @ A3

Approximate extent of *Plectranthus habrophyllus* ID - Plec 6. Approximately 20 mature individuals within approximately 500m². Population will require translocation into Linear Open Space to the east.

Receive area for Plec 6.

Approximate extent of *Plectranthus habrophyllus* ID - Plec 3. Approximately 50 mature individuals within approximately 3000m². Adjacent to residential development.



INSERT D

Scale 1:2000 @ A3

LEGEND

E2 Precinct Boundary

Proposed Development Layout

Development footprint - use other than for conservation purposes

Linear Open Space - managed for conservation purposes

Management Plan Core Conservation Areas - *Plectranthus habrophyllus* population location

Where adjacent to an area identified for 'Interface Management' additional management actions required during clearing and construction. Refer Threatened Flora Management Plan Section 3.2.2. Refer Section 3.3 for ongoing habitat management.

In-situ population.

Receive area - translocated population.

Management Plan Buffer Area

Buffer Area overlapping development area. Considered detailed design required. Refer Threatened Flora Management Plan Section 3.2.1 for more information.

Buffer Area within Linear Open Space. Any Buffer Area adjacent an area identified for 'Interface Management' will require targeted management actions for protection of threatened flora during clearing and construction. Refer Threatened Flora Management Plan Section 3.2.2 for more information.

Management Plan Additional Management Actions

Approximate population extent of *P. habrophyllus* to be translocated. Refer Threatened Flora Management Plan Section 3.1 for actions.

Threatened flora interface management required. Refer Threatened Flora Management Plan Section 3.3.1 for actions.

ATTACHMENT 4 –

Fauna Spotter Catcher Pre-clearance

WHIMP and WPMP

March 2017

Fauna Spotter Catcher Wildlife and Habitat Impact Mitigation Plan

Springfield Rise – Haul Road Amendment
Spring Mountain, Queensland

Report prepared for Shadforths Civil Contractors

Report prepared by

QLD Fauna Consultancy Pty Ltd

Phone: (07) 3376 9780

Fax: (07) 3376 9740

Email: fauna@qfc.com.au

Date:	08/03/17
Title:	Fauna Spotter Catcher Wildlife and Habitat Impact Mitigation Plan Springfield Rise – Haul Road Amendment, Spring Mountain, Queensland
Author/s:	Bryan Robinson, Camille Palmer, Ramona Rohwedder
Reviewed by:	Bryan Robinson
Status:	Final Report
Filed as:	QFC WHIMP Shadforths Springfield Rise Haul Road March 2017.doc

Contents

1. Introduction

1.1 Project Background

Queensland Fauna Consultancy Pty Ltd has been engaged by Shadforths Civil Contractors to prepare a Fauna Spotter Catcher Wildlife and Habitat Impact Mitigation Plan for changed clearing extent for the Haul Road as part of the Springfield Rise Project, Spring Mountain, Queensland.

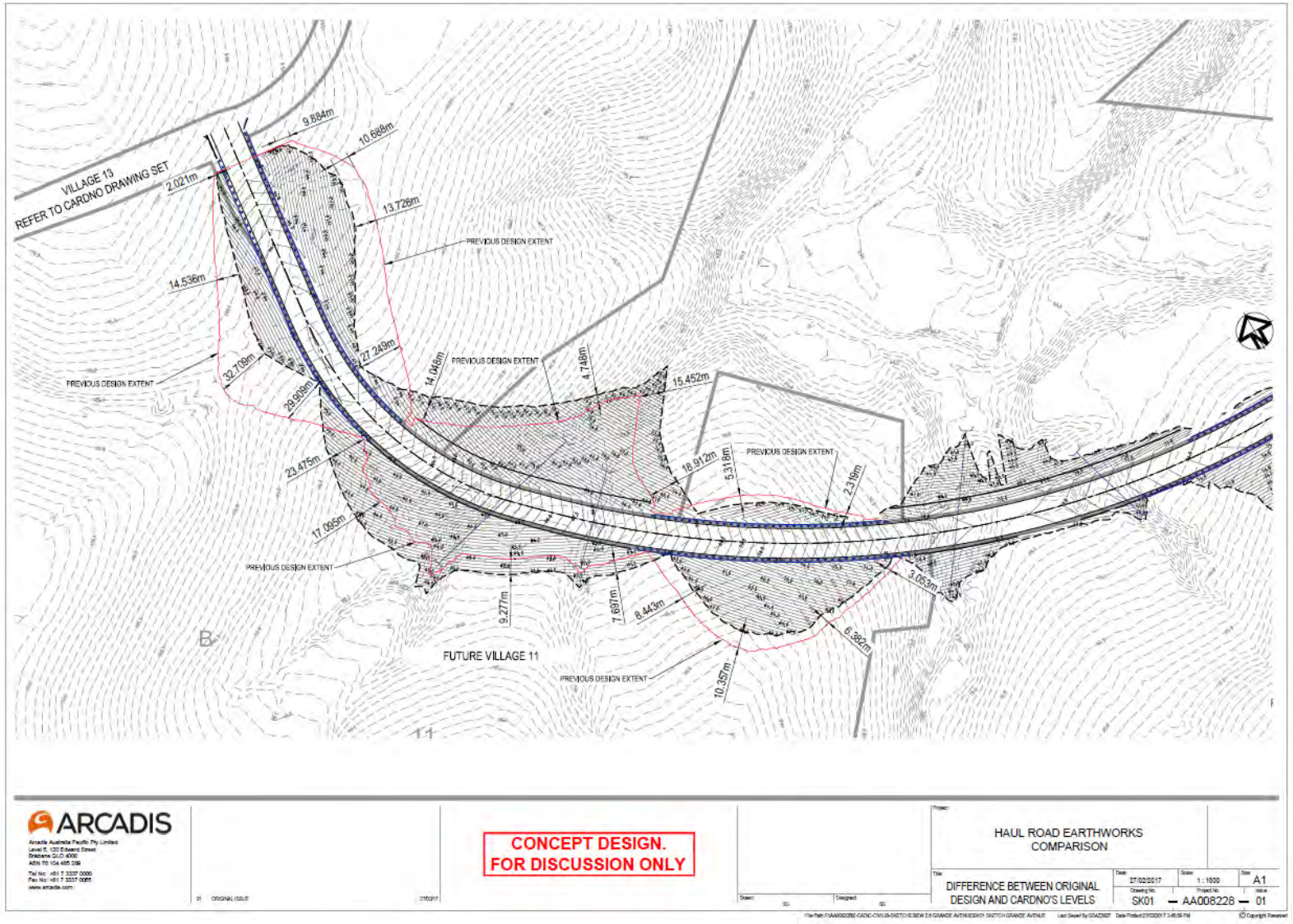
The objective of this report is to summarise the existing fauna values presented in the Fauna Spotter Catcher Pre-clearance Survey and Wildlife Protection and Management Plan (WPMP) and assign mitigatory strategies applicable to probable species likely to be encountered during the clearing of identified habitats throughout or within specific localities of the site. Fauna species both common and of elevated conservation value have been considered within the parameters of onsite investigations and, where provided to QFC, include review of current fauna and floristic reports that may influence the assemblages expected to utilise the microhabitats evident within the site.

This review encompasses species identified under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Queensland *Nature Conservation Act 1992*. Further consideration is given, where applicable, to species of iconic, cultural and/or regional significance identified under commonwealth, state or local planning instruments aimed at the persistence of biodiversity values within the area.

1.2 Project Location and Site Description

The Haul Road is centrally located within the Springfield Rise precinct and will connect Village 6, 8, 10, 11, 12 and 13. The Haul Road is accommodated within a 20-metre road reserve (Saunders Havill Group, 2016). The site extent has changed since the previous survey and the amended site plan is presented in Map 1.

Site formation consists of a woodland vegetative complex with an undulating topography, gullies and scattered rocky ridges. Dominant trees species across a number of vegetation types include *Corymbia citriodora, C. henryi, Eucalyptus siderophloia, E. moluccana, Lophostemon suaveolens* and *Angophora leicarpa*.



Map 1: Project area (Image supplied by Shadforths Civil Contractors, 2017)

1.3 Current Permits and Authorities

All activities conducted during the site investigations were implemented under the provisions of a number of permits issued to Queensland Fauna Consultancy Pty Ltd by the Department of Environment and Heritage Protection (DEHP) formerly the Department of Environment and Resource Management and the Department of Employment, Economic Development and Innovation (DEEDI). These permits and additional authorities are listed in *Table 1*.

Table 1: Current Permits and authorities issued to QFC

Permit/Authorisation	Permit Number	Expiry Date
Damage Mitigation Permit	WIMP17840916	22nd December 2017
Rehabilitation Permit	WIRP15052614	10th September 2017
Scientific User Registration	Registration Number 589	27th February 2019
Animal Ethics	CA 2016/01/939	27th February 2019

These permits and approvals enable QFC to conduct the investigation, observation and relocation of protected animals exposed to disturbance due to infrastructure expansion resulting in the destruction of natural and artificial habitats.

2. Mitigation Strategies

2.1 Fauna Spotter

It is advised that all identified fauna habitats onsite be inspected by a licensed Fauna Spotter prior to vegetation clearing, and all vegetation removal activities be supervised during the clearing process.

2.2 Clearing Methodologies

In accordance to the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016* the following sequential clearing conditions are required to be adhered to:

- Clearing of trees is carried out in a way that ensures koalas living in or near the area being cleared (the clearing site) have enough time to move out of the clearing site without human intervention, including in particular, for a clearing site with an area of more than 6ha, by:
    - Carrying out the clearing in stages; and
    - Ensuring not more than the following is cleared in any one stage:
        - for a clearing site with an area of 6 ha or less—50 percent of the site's area;
        - for a clearing site with an area of more than 6ha—3ha or 3 percent of the site's area, whichever is the greater; and
    - Ensuring that between each stage there is at least one period of 12 hours that starts at 6 p.m. on a day and ends at 6 a.m. on the following day, during which no trees are cleared on the site.

In addition to these measures it is recommended that clearing activities be undertaken in a directional manner specified by the fauna spotter/catcher. This is done so as to reduce the likelihood of negative interactions between fauna and potential hazards e.g. roads and traffic, prevent isolation of fauna through habitat fragmentation, and to ensure that natural dispersal of wildlife away from clearing activities is not impeded. Given the linear clearing area and undulating terrain it's likely clearing direction will vary however a map of the proposed general clearing direction can be found in Appendix A.

2.3 Fauna Fencing

Temporary fencing has been installed along Sinnathamby Boulevard, restricting the movement of large fauna species such as macropods and koalas onto roadways. As the Haul Road is situated centrally within the Springfield Rise precinct and away from busy roadways, fauna fencing around the immediate proposed clearing area is not required.

2.4 Felling Procedures

Trees identified as having potential fauna values (such as hollows, arboreal termitaria and exfoliating bark) will be clearly identified and subsequently marked for supervision during felling and inspected once felled. Efforts will be made to determine potentially occupant species by way of investigations for indicative signs (scats, scratchings and tracks) on the day(s) of clearing. Where no signs are found or potentially occupant species are undeterminable, machinery operators will be instructed to fell trees in a manner directed at minimising the potential risk of injury to fauna.

All identified microhabitats will be inspected via ground based observation and the direction of felling will be determined considering the safety of personnel, machinery and potentially occupant fauna. Felling procedures will see implementation of a soft felling technique specifically constructed by QFC to achieve minimal deceleration and impact upon felling. This will be achieved under direction of the Fauna Spotter present directly communicating with the plant operator(s).

2.5 Macropods

Though no direct observations were made during the inspection, other signs including macropod tracks were located in areas adjacent to site.

Eastern Grey Kangaroos *Macropus giganteus* and Red-necked Wallaby have required intensive management on other sites within the Springfield area. The area of proposed clearing activities exhibits direct connectivity to other areas of notable habitat values along the western, northern and southern boundaries. Therefore all clearing should proceed as proposed to ensure a higher probability of successful natural progression off site. Any variation from this proposal must be discussed with the senior fauna spotter and a representative from Shadforths Civil Contractors.

If the macropods then do not disperse of their own accord in response to incremental habitat reductions, or the macropods welfare is deemed to be unduly jeopardized by clearance activities, alternative strategies are to be recommended by the fauna spotter and subsequently implemented.

2.6 Aquatic Fauna

It is not envisaged that aquatic dewatering activities will be required within the proposed clearing area.

2.7 General Terrestrial and Arboreal Fauna

Overall the site contains medium value refugial opportunities for arboreal and terrestrial fauna species. The species expected within the site are likely to primarily reflect common fauna assemblages for the region however provisions are proposed directly for common fauna and species of conservation significance.

It is advised that all identified fauna habitats onsite be inspected by a DEHP approved Fauna Spotter prior to vegetation clearing and all vegetation removal activities be supervised during the clearing process. Terrestrial load reduction activities will be conducted ahead of the clearing front where possible. Fauna captured will be relocated to adjacent habitat consistent with the life history requirements of the species requiring translocation.

2.8 EVNT Fauna

It is not envisaged that any species, listed under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* or the *Nature Conservation Act 1992*, other than those listed in the WPMP, will require specific management during vegetation clearing activities.

However, specific management for those identified EVNT species will include targeted investigations immediately prior to vegetation removal activities on each day of clearing and subsequently whilst clearing takes place. Preliminary investigations will be supported by additional monitoring applied during clearing activities with a designated fauna spotter operating with each machine actively involved in vegetation or identified habitat disturbance. These should include the following:

Koala:
As favoured Koala food trees on site exceed a diameter of 100mm at 1.3 metres from the ground, requirements under the Koala Plan's 'Koala Habitat Area' provisions trigger the need for inspection and monitoring during vegetation clearing by a qualified Fauna Spotter.

Historically known to occur within the area the Koala will feature highly in daily search efforts with a dedicated and detailed methodology employed as follows:

- Pre clearing (preliminary) investigations to be conducted specifically for Koala detection by one experienced fauna spotter a minimum half hour prior to works each day. The investigation will embrace all designated clearing zones identified for that day inclusive of a 25 metre buffer around that zone;
- Once clearing commences a fauna spotter will accompany each machine providing continuous verification of habitat values and potential identification of undetected koalas ahead of operating plant. This will also account for potentially transient Koalas that may enter the site after preliminary investigations are complete.

Direct observational methodology will include the following components

- Use of binoculars to inspect the crown, forks and trunk of trees for individuals currently occupying the site;
- 'Drip zone' searches at the base of known food trees for the presence of scats to a radius equal to that of the crown of individual trees;
- Inspection of trunks for scratchings indicative of use by Koalas;
- Repeat observations made of single trees from numerous angles at repeated times throughout the clearing activities by the assigned fauna spotter.

In the event a Koala is detected, the Fauna Spotter will determine the appropriate course of action with exclusion zones implemented and alterations to the clearing plan discussed with the Site

Supervisor. Once defined, these directions will be communicated to the plant operators and clearing will proceed in accordance with the recommendations made.

Changes to Koala management strategies highlighted in the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016* have resulted in particular conditions placed on vegetation clearance involving the removal of Koala food trees. These provisions entail an increased responsibility by developers and land clearance operators alike to ensure the welfare of potentially present Koalas in areas identified as having significance for the persistence of this species.

Where significance under planning instruments is assigned provisions may include the restriction of all clearance that directly interferes with any tree a Koala is residing in or surrounding trees that, when felled, may impact on the crown of the host tree. Koalas are to leave via their own volition through a corridor designated by the Fauna Spotter to the closest remaining suitable habitat.

Throughout this time the Koala may not be interfered with by any means unless special dispensation has been sought through the appropriate government body or where the Koala is evidently in a state of compromised health. Only when Koalas have vacated a tree can clearance operations include the identified host tree and surrounding vegetation which composes the established exclusion zone. Recommendations made by the Fauna Spotter on site will embrace these provisions.

Grey-headed Flying Fox:
Although no Flying Fox camps or roosts were noted during the site survey, the transient nature of this species and the abundance of available feeding resources would see probability for the species to intermittently utilise the site.
The following recommendations are made for management of potentially occurring Grey-headed Flying Fox:

- Daily Inspection of trees assigned for removal be conducted to detect potential roosting Flying Foxes;
- Trees found to contain roosting Flying Foxes to be left standing and re assessed at the end of each days clearing. Being a transient species, the disturbance associated by the surrounding clearing is likely to see individuals fly off via its own volition come nightfall and not return the following morning, thus negating the need for direct disturbance.

Powerful Owl:
The site contains hollowing bearing trees with the potential to support nesting localities for the Powerful Owl. Diurnal roosting opportunities are afforded however these are considered only moderately favourable. Feeding resources would be available as highly targeted species such as glider and possum species are common throughout the region.
The following recommendations are made for management of potentially occurring Powerful Owl;

- Inspection daily of trees assigned for removal in areas of likely occurrence to detect potentially roosting birds;
- Identification of hollows exhibiting suitable dimensions for use as a nesting resource;
- Ground searches for casts and faecal accumulates indicative of the presence of Powerful Owl roosting and nesting sites;

- Implementation of a soft felling technique where trees are determined to have potential for occupancy.

Spotted-tail Quoll:
Although no dens or further evidence of Spotted-tail Quoll activity was detected during the survey, the species is known to occur in low densities in proximity to the site. Geomorphic structure and topography are considered favourable resulting in the following recommendations for further mitigation during the clearing activity:

- Inspection daily of identified geomorphic structure such as large boulders and rock accumulates, large hollow ground logs and log stock piles;
- Monitored dismantling of identified microhabitats by fauna spotters with machinery assistance.

Greater Glider:
The site contains hollow-bearing trees with the potential to support den localities for the Greater Glider. Suitable feeding resources are highly available given the availability of *Eucalyptus* leaves; on which the Greater Glider almost exclusively feeds on. The following recommendations are made for management of potentially occurring Greater Glider;

- Basal and drip zone searches for scats indicative of the presence of Greater Glider;
- Inspection daily of trees assigned for removal in areas of likely occurrence to detect Great Glider;
- Implementation of a soft felling technique where trees are determined to have potential for occupancy.

Tusked Frog:
Ephemeral aquatic habitats conducive to the presence of the Tusked Frog are noted at a number of localities throughout the site.

Subsequently, it is recommended that daily Inspection of ephemeral aquatic microhabitats be conducted to detect potentially occupant Tusked Frog.

Collared Delma:
The presence of rocky habitats combined with *Eucalyptus* dominated woodlands presents known favorable habitat for the Collared Delma. The following recommendations are made for mitigation during clearing activity:

- Inspection daily of identified geomorphic structures including rocky outcrops, surface rock, leaf litter and bark exfoliates;
- Monitored dismantling of identified microhabitats by fauna spotters with machinery assistance.

3. Wildlife Capture & Removal Plan

Relocation of native fauna is a strategy that may be required during the course of developmental works to up-hold the project's required nature conservation, animal welfare and human safety objectives.

In all circumstance where native fauna are required to be relocated it must be done so, or under the direct supervision of, a suitably licensed fauna spotter/catcher. A summary of the fauna capture, handling and relocations strategies to be implemented by the fauna spotter/catcher for fauna groups deemed likely, or possible, to occur on site are presented in *Table 2*.

Table 2: Fauna capture, handling and relocation strategy table

Animal Group	Capture and handling	Relocation
Lizards Geckoes Dragons Monitors	• Place one hand behind the head at the base of the quadrates and the other at the base of the tail behind the hind limbs; • Be cautious when handling smaller skinks and legless lizards as they may discard their tail; • Lizards and geckoes can be placed inside suitably sized calico bags • In the case of large monitor lizards keep the animal's ventral surface directly away from the body with the tail between the upper arm and torso. • Dragons and small monitors can be placed in suitably sized calico bags. Larger monitors to be placed in suitably sized crate	• Place the lizard head first into a suitable holding crate for later release. o Dragons & monitors– release up trees or into heavy vegetation; o Water dragons – in the vicinity of riparian areas; o Skinks, Geckoes, Legless lizards – around creek margins.
Snakes	• Due to their mobile nature, large snakes generally do not require to be handled or relocated, with the exception of slow moving species (i.e. pythons) or smaller species; • Snakes should be identified and only moved if competent and safe to do so (see SOP006 Handling Venomous Snakes Procedure); • Do not attempt to catch a snake if you're not competent; • Injured snakes should be handled with suitable equipment.	• Release in suitable habitat e.g. along creek lines for python and tree snakes • If feasible take them well away from clearance site to a suitable release location • Release discreetly away from high density suburban areas
Small Mammals	• Place a gloved hand around the whole animal in the case of small mammals (melomys or rats), • Do not handle rodents by the tail as this will cause damage to the tail sheath • Place the animal in calico bag in a cool place for later relocation. • Minimise holding time to avoid animal gnawing through bags and escaping	• Release animal into area suitable to its habitat requirements. Ensure plenty of cover is available.

Animal Group	Capture and handling	Relocation
Glider Family	• Place gloved hands around the animal at initial capture; • Place the glider(s) into a calico bag or suitable animal crate ensuring family groups are kept together for all inclusive release; • Place in a cool dry area during the day. • When using calico bags ensure the bag is hung and well ventilated • Where possible contain gliders within hollow by plugging openings with a towel or calico bag	• Release glider into habitat with natural hollows and canopy cover; • When releasing a family group with more than one furred young (being carried on the back) either: o Divide young between parents as a mother is unlikely to carry more than one young, o Place young in elevated hollow with parents and allow them to move away in their own time. • Place animal in bag at the base of the selected tree, opening the bag wide and allowing the animal to leave the bag when it is ready. • Relocate hollow (with gliders inside) to suitable habitat and cover lightly with foliage so that the gliders can move away of their own accord and are protected from predators.
Amphibians	• Amphibians should be handled only when necessary and handling times should be kept to a minimum to help prevent: o Removal of the protective mucous layer covering the skin of amphibians; o To prevent handling stress induced by changes in their body temperature; o Risk of spreading pathogens and parasites. • Amphibians from different sites need to be kept isolated from each other, and need to be kept in different containers or bags; • Any dead or sick amphibians need to be quarantined from other amphibians. Amphibians can be handled utilising one of the following methodologies: • **Bare handed** – ensure hands are sterilized before handling and free from lotions, sunscreen etc • **Gloves** – disposable gloves desirable or disinfect gloves between handling different animals; • **Plastic bags** – Single use lightweight plastic bags can be used to pick up and handle frogs; again plastic bags should be disposed of before handling amphibians form a different site. • All staff should be knowledgeable and familiar with the ***Interim Hygiene Protocol for Handling Amphibians – Technical Manual (DEHP)***	• Always ensure that amphibians are kept moist until release. This can include storing in a designated container with moist soil or toweling or in a wet calico bag; • Release into suitable adjacent vegetation that is typical of the species requirements; • Suitable release locations include riparian vegetation, low-lying wetlands, alongside creek lines, hollow logs, dams and ponds; • Amphibians from different sites need to released in separate locations; • Disinfection procedures in relation to amphibians need to be followed.

Animal Group	Capture and handling	Relocation
Macropods	• 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. • Capture and restraint of healthy macropods (other than pouch young) must be performed using sedation or anaesthesia due to the high risk of developmental myopathy, and other capture and restraint-associated conditions. Sedative and anaesthetic drugs may only be used under direct supervision of a registered veterinarian, or by appropriately licensed persons (Hanger & Nottidge, 2009).	• Release animal into suitable to its habitat requirements. Ensure plenty of cover is available. • Macropods are to be released within the range of normal movement from their place of origin. E.g. a Kangaroo can be released within 100 km of its origin, based on its capacity to travel long distances. • Monitor animals to ensure adequate recovery if sedated.
Microbats	• Only vaccinated persons are to handle bats • If possible plug the hollow opening with a bag or towel and ask the operator to cut the hollow from the tree; • Always wear gloves when handling bats. • If not contained within a hollow, place bats inside a calico bag and hang upright in a cool place	• Relocate hollow (with bats inside) to suitable habitat and cover lightly with foliage so that the bats can move away of their own accord and are protected from predators. • Bats not contained within a hollow should be released as late as possible at the end of the day.
Possums	• Use thick elbow length gloves when handling possums; • Try to grip the animal behind the head near the shoulder blades and around the tail so that you have control of the animal; • Keep fingers away from the mouth of the animal; • Keep the animal's body facing away at all times; • Transfer into a thick calico bag and then into a kitty crate. Place in a safe and shady place until you can relocate the animal.	• Release the possum into habitat with adequate hollows and cover; • Place animal in bag at the base of a select tree, opening the bag and allow the animal to leave the bag when it is ready; • When releasing a Ringtail Possum mother with more than one furred young (being carried on her back) it is unlikely that she will carry both young if highly stressed; o Choose a smaller shrubby tree with vines or heavy foliage (so the adult can construct a drey easily) o Watch the adult ascend the tree, it is possible she will only carry one young and so any additional young may be pushed from her back o It may be necessary to take one or more of the young to a wildlife carer o If possible place mother and young in a suspended hollow, cover lightly with foliage and allow the animals to move on their own accord. This way the mother can ferry young one at a time to a more suitable location.

Animal Group	Capture and handling	Relocation
Birds	• Use gloves when handling larger birds • Use a towel to cover the bird and simultaneously restrain the bird and transfer into calico bag • With larger parrots and raptors, restrain head and legs and transfer into a kitty crate • Wrap chicks loosely in a towel and transfer to kitty crate, keep in a warm location.	• Relocate adult birds in suitable habitat • Chicks should be referred to wildlife carer
Koalas	Movement of Koalas is heavily legislated in South East Queensland. Koalas are not to be captured or relocated without the prior consent of Department Environment and Natural Resource Management (DERM). Koalas should be left to move away of their own volition and trees are not to be felled while a Koala remains in occupancy. See SOP003 Koala Management Procedure for further information.	

4. Wildlife Contingency Plan

In the event sick, injured or orphaned protected animals are encountered during the course of the project they shall be administered to in accordance with the *Code of Practice Care of Sick, Injured or Orphaned Protected Animals in Queensland* under the *Nature Conservation Act 1992*.

The stages in which injuries or illness are described under the code are as follows:

Critical: Injuries or illnesses that are life-threatening; for example, an animal that has been struck by a car and has serious head injuries.

Serious: Injuries or illnesses that might reasonably be expected to cause moderate pain (but are not immediately life-threatening), and the animal is not showing obvious signs of distress or pain, or significantly reduced mental activity; for example an animal with a closed fracture but no other apparent injuries and that is alert and responsive.

Mild: The injuries or illness of an animal appear to cause little discomfort, pain or function loss and are not life-threatening (even without immediate vet treatment); for example superficial cuts, superficial bruising or orphaned animals suffering from mild dehydration.

4.1 Basic Wildlife Care

If wildlife requiring care are encountered by the fauna spotter/catcher they will be attended to in the manner set out by the guidelines provided in *Table 4*. Supplementary advice will be sought from a wildlife carer and/or veterinarian where required. QFC have previously utilised experienced local carer groups and vets. These are listed in Table 3.

Table 3: List of Local Vets & Wildlife Carer Groups

Vets			
Name	**Location**	**Contact Number**	**Comments**
RSPCA Wildlife Hospital	139 Wacol Station Road, Wacol	07 3426 9999	24 Hours/7days
Carers			
Name	**Location**	**Contact Number**	**Comments**
RSPCA Wildlife Hospital	139 Wacol Station Road, Wacol	07 3426 9999	24 Hours/7days
Ipswich Koala Protection Society	Ipswich	Ruth: 07 5464 6274 / 0419 760 127 Helen: 07 3282 5035 / 0417 604 761	Specialize in koalas however rescue all wildlife

Table 4: Basic Wildlife Care

Birds	Reptiles & Amphibians	Mammals
Egg Viable eggs must be kept warm until transferred to a suitable wildlife carer. It is necessary that the orientation of the eggs be maintained as fixed embryos may be lost. Keep wrapped in a pouch and on a heat source (where available). An ideal temperature is between 25-27° (DEHP 2013); where possible attempt to identify the species so the carer can be informed as the management of eggs can vary in accordance with species and stage of development.	**Egg** Viable eggs must be kept warm and stable until transferred to a wildlife carer. It is necessary that the orientation of the eggs be maintained as fixed embryos may be lost. Keep wrapped in pouch or towel and place into an animal crate in a safe location.	**Neonate** Unfurred animals need to be kept warm until transferred to a carer. Place into a pouch and onto a heat pad. Ideal temperature is between 31-34°. 25-27° is appropriate in most other cases (DEHP 2013). Regularly check the animal to ensure it is not overheating by observing for obvious signs of distress (i.e. panting, very warm to the touch, red blotched skin). Adjust the temperature where required. Seek further advice from the carer if you are unsure.
Chick Make sure the animal is correctly identified as different species often have very different requirements. Place chicks into a pouch/towel onto a heat source maintained around 31-34° (only if they have not fledged) and keep in an animal crate until transferred to a carer.	**Juvenile** Place animals in a suitable lined crate and keep covered in a dark quiet place. Refer to the wildlife contact list in your QFC Folder for a carer who specialises in reptiles.	**Juvenile** Place into a lined crate and keep covered in a dark and quiet location.
Adult Keep adult birds in a lined animal crate or cage and covered in a quiet area.	**Adult** Place animals in a suitable lined crate and keep covered in a dark quiet place. Refer to the wildlife contact list in your QFC Folder for a carer who specialises in reptiles.	**Adult** Place into a lined crate and keep covered in a dark and quiet location.
Feeding Providing food and water is generally not required during short periods (2-3 hrs) though this should be reconsidered if animals need to held longer. Consult the vet and/or carer for further advice on how to proceed.	**Feeding** Newly hatched reptiles may require feeding if kept overnight. Consult with QFC for further advice. Snakes and turtles will not require feeding but water should be made available.	**Feeding** Providing food and water is generally not required during short periods (2-3 hrs) though this should be reconsidered if animals need to be held longer. Consult the carer for further advice on how to proceed.

4.2 First Aid

Animals suffering from serious injuries or illness encountered on the project should be passed on to veterinary care as soon as possible. In the interim a licensed fauna spotter/catcher can provide first aid for the animal and organise suitable transportation.

If a seriously sick or injured animal is encountered the fauna spotter/catcher should:

1. Keep the animal calm by placing into an animal crate and keeping it covered in a dark and quiet location. Isolate any nearby threats such as domestic animals or predators.
2. Quickly and thoroughly inspect the animal for trauma. If the injuries are not serious enough to require euthanasia administer the basic first aid as a minimum (but only if capable to do so)

Representative first aid that may be administered by a fauna spotter/catcher is provided in *Table 5*.

Table 5: **Wildlife First Aid**

Ailment	First Aid
Bleeding	Using material that is clean and sanitary, apply direct pressure to the affected area. Bandages can be used to hold material in place until vet treatment can be sought. Veterinarian treatment should be sought for further assistance as soon as possible.
Broken limbs	House the animal in a suitably sized animal crate with towels under the animal for comfort. Keep the crate covered and in a quiet location. Proceed to a veterinarian for further assistance as soon as possible.
Injured tails	House the animal in a suitably sized animal crate with towels under the animal for comfort. Keep the crate covered and in a quiet location. Proceed to a veterinarian for further assistance as soon as possible.
Concussions	House the animal in a suitably sized animal crate with towels under the animal for comfort. Keep the crate covered and in a quiet location. Proceed to a veterinarian for further assistance as soon as possible.

4.3 Euthanasia

Section 12 of the code details how to determine when euthanasia is required and how to euthanise animals ethically. The following standards as listed under the code are to be followed when assessing whether euthanasia is required:

- The euthanasia of wildlife where required is to be provided for by all wildlife rehabilitators;
- Euthanasia without exception is to be carried out when:

    - Significant pain or suffering is to be alleviated where it is not able to be managed by a vet;
    - Further treatment is **not** practical or recovery is **not** expected in a way in which the animal can be successfully rehabilitated back to the wild;
    - Resources are not available to provide appropriate care or an acceptable quality of life throughout the likely rehabilitation period.

- Animals that are suffering and have a poor prognosis for survival must be euthanised rather than left to die from the injury or illness. Failure to undertake appropriate action is a breach of the Animal *Care and Protection Act 2001*.
- Unless permission has been granted by the Department of Environment and Heritage Protection for the animal to enter the Queensland Species Management Plan (QSMP) or otherwise advised by the DEHP Wildlife Management Director, animals must be euthanised when:

    - An orphaned animal is not viable or likely to be rehabilitated;
    - No suitable release locations are available;
    - The ability for an animal to reproduce is lost due to an injury, disease or surgical procedure;
    - The ability to move freely or normally (i.e. run, climb, crawl, hop, fly or swim) is permanently impaired. Examples are: a missing or impaired limb, wing, foot or tail that would significantly impair the animal's ability to survive in the wild;
    - The ability to sense environment (i.e. see, smell, fell, taste or hear) is permanently impaired. For example: missing or injured organ such as an eye, ear or nose that would significantly impair the animal's ability to survive in the wild;
    - The ability to catch, find or handle food is permanently impaired;
    - Its advanced age renders it unlikely to survive in the wild.

5. Wildlife Storage & Housing Plan

For wildlife requiring storage, temporary housing and transportation to release sites and/or to a wildlife carer or veterinarian, guidelines set out in the Code of Practice and QFC's Animal Ethics Permit will be followed.

Dependent on the species of animal and condition of the animal, temporary storage and housing of animals will be as follows:

Calico bags: Calico bags will be used to temporarily house fauna such as snakes, lizards and small mammals (including microbats), Bags will range in size from 200mm x 200mm to 600mm x 1800mm. Bag selection will vary according to the size of animals to be placed in them. In the case of snakes a "hoop bag" may be used to facilitate capture. The hoop is approximately 500mm in diameter attached to a handle. The bag is placed around the hoop ensuring a greater area in which to pass the snake through into the bag.

Plastic holding tubs/containers/animal crate: Plastic holding tubs/containers/crates will be used to temporarily house fauna such as snakes, lizards, frogs, small mammals and birds (Plastic holding tubs/containers/crates will range in size from 150mm x 150mm x 120mm to 500mmx 400mm x

400mm. Plastic holding tubs/containers/crates selection will vary according to the size and number of animals to be placed in them.

In addition to this, material is used to line the tub/crate to ensure the animals won't lose its footing. This may include folded towels on the bottom of the crate or a fitted pad. These items are washed between each use to reduce the spread of disease/parasites.

Section 9 of the Code relates to how transportation of wildlife should be undertaken. The following will be adhered to when transporting wildlife to the vet and/or carer:

- Additional pain or distress of the animal is to be avoided;
- Wildlife should only be transported when necessary;
- Transport containers must be appropriate for the species (size, strength and behaviour of species being moved;
- Transport containers must be designed and maintained in a way as to:
    - Prevent injury;
    - Prevent escape;
    - Prevent rolling/tipping during transit;
    - Prevent damage to plumage (feathers);
    - Be hygienic;
    - Minimise stress and
    - Be suitably ventilated.

- Non-compatible species must not be transported in a manner which allows for visual or physical contact;
- Containers must be secured to prevent movement and provide protection from direct sunlight, wind and rain;

Venomous, dangerous or potentially disease transmitting animals must be clearly marked with warning labels (i.e. Caution –'venomous snake' or 'live bat') and be locked and secured.

6. Wildlife Release & Disposal Plan

Future development area and parkland areas border the Haul Road to the west, north and east, with residential areas to the south. White Rock Conservation Park lies to the south-west of the precinct and presents a highly favorable translocation site for fauna encountered during clearing activities. With the exception of highly mobile species such as birds and macropods where natural relocation may occur, it will be necessary for the fauna spotter/catcher to translocate the majority of fauna found into suitable habitat within these areas.

The selection of the release area aids in minimising the fauna load within the proposed parkland areas to the north and west, and isolating animals within the fragmented habitat of the development area to the east. A map of the intended release site can be viewed in Appendix B.

In regard to all fauna capture and disposal activities conducted on the project the following records will be made:

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.

7. Post Works Impact Minimisation

As the project area will be cleared of all vegetation, post works impact monitoring and/or impact minimisation is deemed not necessary. It is unlikely the vast majority of wildlife will return to the area as all habitat and foraging resources will be removed and habitat connectivity is also not present.

In the event that fauna is found on site post-works, it is recommended personnel contact QFC and a licensed and experienced wildlife consultant can be dispatched to remove and relocate the animal should it be necessary. QFC wildlife consultants are available 24/7 for fauna related call-outs in relation to this project.

It is recommended that if any fauna, such as Kangaroos and Wallabies, are noted in the wider area and appear distressed post-works that QFC be contacted to further assess the situation.

8. Assessment, Conclusion and Fauna Management Recommendations

A number of conclusions and recommendations are presented, with the specific intention of providing a comprehensive management structure to facilitate minimal impact to fauna during the clearing of vegetation and subsequent disturbance of habitats. The directives given by Fauna Spotter Catchers should embrace a “best practice” approach which includes implementation of proven specific management techniques for identified habitat types and compliance with legislation relevant to the activity.

Fauna management is presented here specific to EVNT fauna, general terrestrial and arboreal fauna and aquatic fauna. Although each is treated separately, overlap does occur within target techniques providing a comprehensive approach for target species of all conservation significance.

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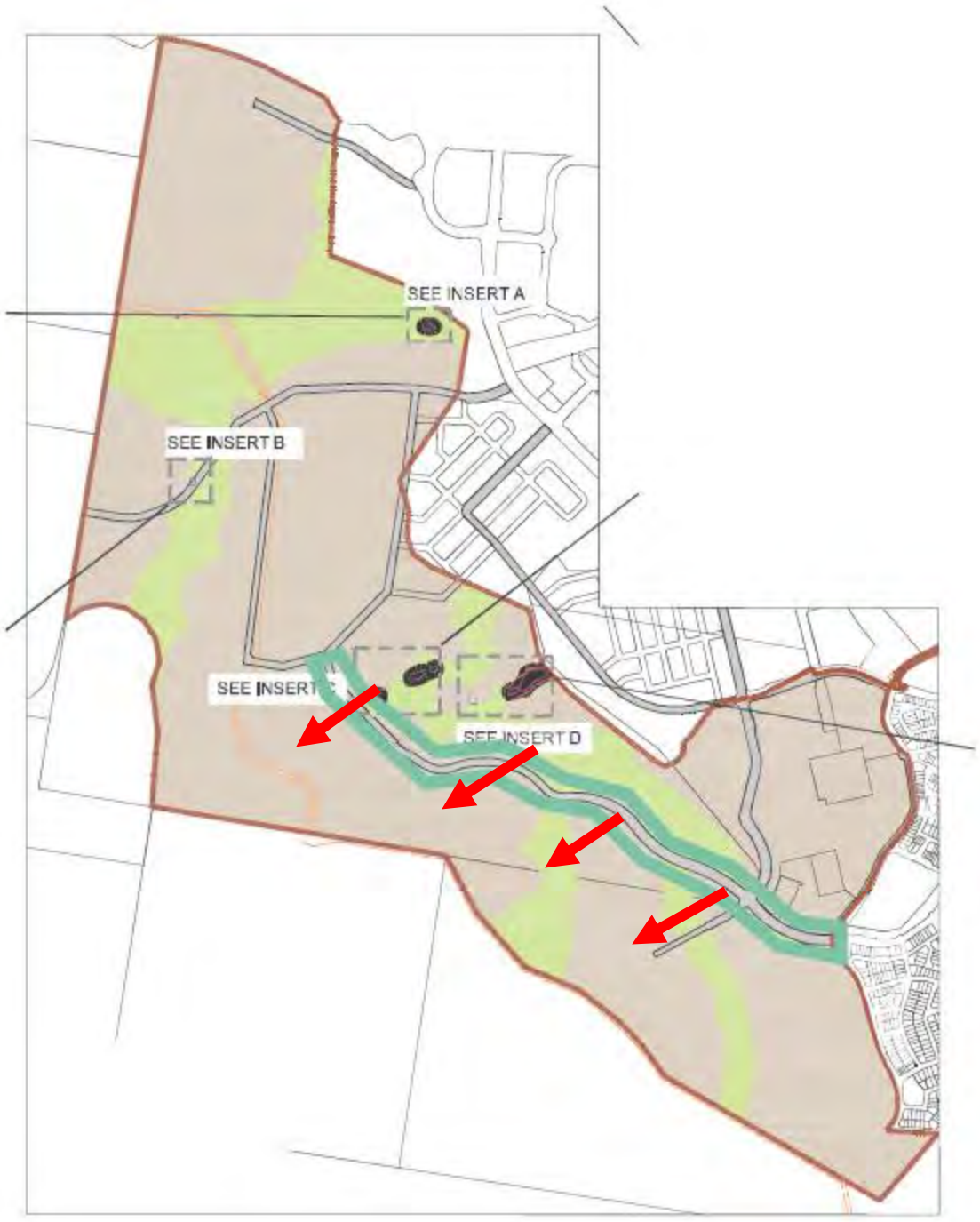
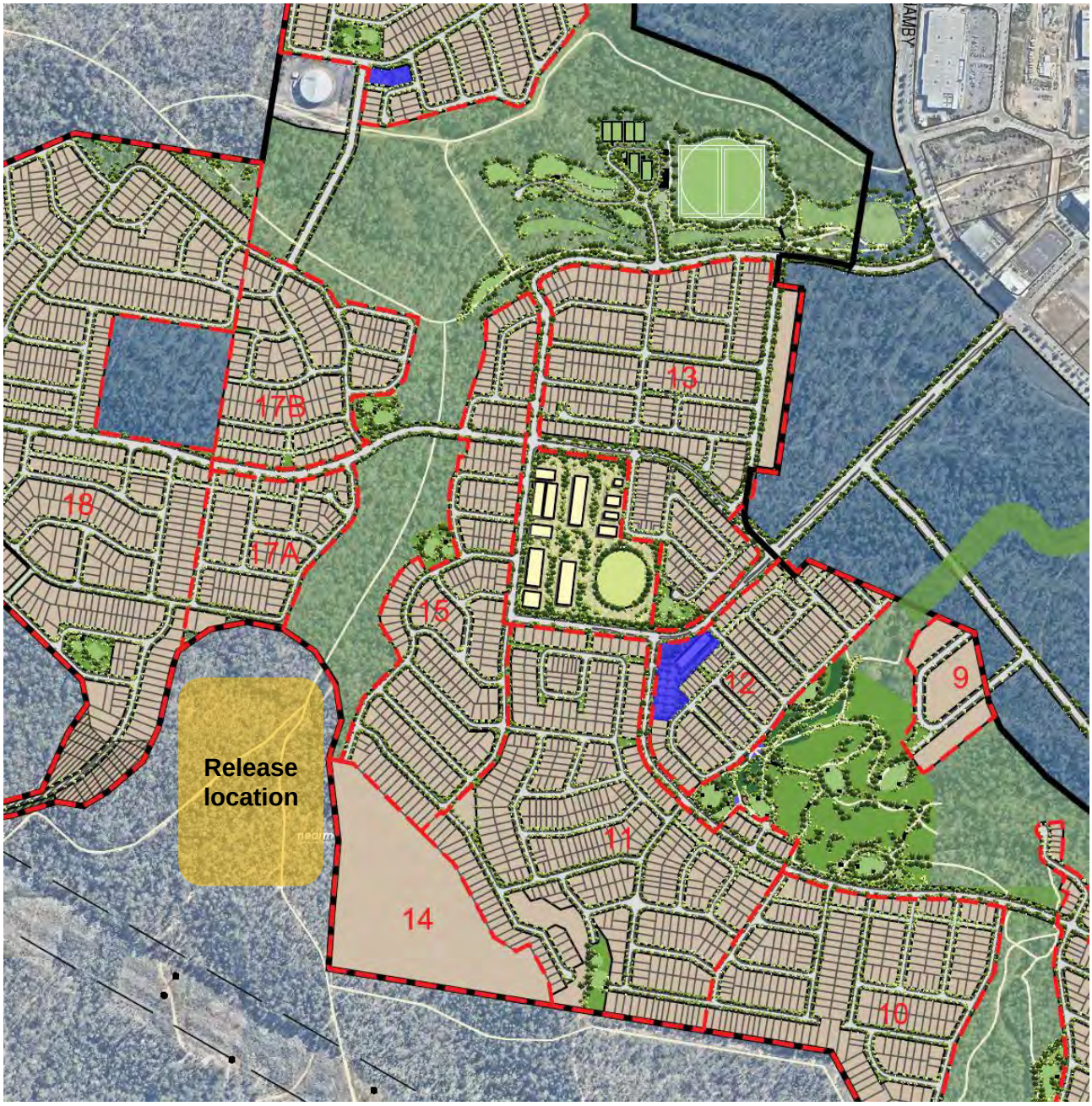
10. Appendix A: Intended Direction of Clearing



11. Appendix B: Intended Release Site for Wildlife



March 2017

Fauna Spotter Catcher Pre-clearance Survey and Wildlife Protection & Management Plan

Springfield Rise – Haul Road Amendment
Spring Mountain, Queensland

Report prepared for Shadforths Civil Contractors

Report prepared by

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Date:	08/03/17
Title:	Fauna Spotter Catcher Pre-clearance and Habitat Values Survey Springfield Rise – Haul Road Amendment, Spring Mountain, Queensland
Author/s:	Bryan Robinson, Camille Palmer, Ramona Rohwedder
Reviewed by:	Bryan Robinson
Field personnel:	Jason Raguse
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Contents

1. Introduction

1.1 Project Background

Queensland Fauna Consultancy Pty Ltd has been engaged by Shadforths Civil Contractors to conduct a Fauna Spotter Catcher Pre-clearance and Habitat Values Survey and present a subsequent report for a changed clearing extent for the Haul Road of the Springfield Rise development, Spring Mountain, Queensland. The site location is presented in Map 1 with the clearing extent presented in Appendix D.

The objective of this report is to summarise the existing fauna values present and assign mitigatory strategies applicable to probable species likely to be encountered during the clearing of identified habitats throughout or within specific localities of the site. Fauna species both common and of elevated conservation value have been considered within the parameters of onsite investigations and, where provided to QFC, include review of current fauna and floristic reports that may influence the assemblages expected to utilise the micro habitats evident within the site.

This review encompasses species identified under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Queensland *Nature Conservation Act 1992*. Further consideration is given, where applicable, to species of iconic, cultural and/or regional significance identified under commonwealth, state or local planning instruments aimed at the persistence of biodiversity values within the area.

1.2 Project Location and Site Description

The Haul Road is centrally located within the Springfield Rise precinct and will connect Village 6, 8, 10, 11, 12 and 13. The Haul Road is accommodated within a 20-metre road reserve (Saunders Havill Group, 2016). The site extent has changed since the previous survey (refer to Appendix D).

Site formation consists of a woodland vegetative complex with an undulating topography, central gully and scattered rocky ridges. Dominant trees species across a number of vegetation types include *Corymbia citriodora, C. henryi, Eucalyptus siderophloia, E. moluccana, Lophostemon suaveolens* and *Angophora leicarpa*.

Map 1: Project Location (Image supplied by Saunders Havill Group, 2016)

1.3 Current Permits and Authorities

All activities conducted during the site investigations were implemented under the provisions of a number of permits issued to Queensland Fauna Consultancy Pty Ltd by the Department of Environment and Heritage Protection (DEHP) formerly the Department of Environment and Resource Management and the Department of Employment, Economic Development and Innovation (DEEDI). These permits and additional authorities are listed in Table 1.

Table 1: **Current Permits and authorities issued to QFC**

Permit/Authorisation	Permit Number	Expiry Date
Damage Mitigation Permit	WIMP17840916	22nd December 2017
Rehabilitation Permit	WIRP15052614	10th September 2017
Scientific Purposes Permit	WISP16935816	14th February 2021
Scientific User Registration	Registration Number 589	27th February 2019
Animal Ethics	CA 2016/01/939	27th February 2019

These permits and approvals enable QFC to conduct the investigation, observation and relocation of protected animals exposed to disturbance due to infrastructure expansion resulting in the destruction of natural and artificial habitats.

2. Methodology

A site inspection was carried out on 4th March 2017 by Qld Fauna Consultancy. A standard set of observational techniques aimed at maximising the detection of fauna and the probable habitats they may occupy were employed to ascertain and identify the current fauna values throughout the project area. Where species of elevated conservation significance where foreseen as potentially present targeted searches were instigated to further evaluate individual species habitat.

Due to the habitat variability expressed across the development site the composition of investigations may include a range of features that entail specific components indicative of the presence of particular species or faunal groups. This may include where evident, observation of activity or signs of both historical and current use.

These may include but are not limited to the following:

- Identification of terrestrial microhabitats such as ground hollows, rock, burrows, leaf litter, stands of heavy vegetation, fallen branches and bark exfoliations;
- Identification of arboreal micro habitats including basal, trunk and limb hollows, tree fissures, bark exfoliates and arboreal termitaria;
- Identification of constructed arboreal micro habitats including bird nests and Ringtail Possum dreys;
- Artificial habitats including but not limited to ornamental gardens, discarded rubbish, human dwellings and other infrastructure;
- Observation and investigation of aquatic habitats including dams, soaks, creeks, rivers and seasonally inundated vegetation communities. Artificial aquatic habitats may include constructed drains and culverts. Further components of interest include bank profiles and undercuts, submerged and/or exposed timber and rock, immediate aquatic and riparian vegetation, surfacing animals, nesting and/or feeding birds;
- Direct observation of active or exposed fauna within terrestrial, aquatic and arboreal habitats;
- Identification of scats, tracks and scratchings to determine fauna potentially present or to have historically utilised the site for either transient or longer term life history purposes.

2.1 Specific methodology for Koalas *Phascolarctos cinereus*

Due to specific requirements and the cryptic nature of the Koala the following techniques were employed to assist in ascertaining the current and historical presence/absence status of the species at the site:

- Use of binoculars to inspect the crown, forks and trunk of trees for individuals currently occupying the site;
- 'Drip zone' searches at the base of known food trees for the presence of scats to a radius equal to that of the crown of individual trees;
- Inspection of trunks for scratchings indicative of use by Koalas.

3. Findings

The findings endeavor to demarcate the existing habitat profiles and the features present into three distinct groups: terrestrial, arboreal and aquatic. All habitat features present onsite are noted, however it is probable additional features will be present with these being accounted for during the Fauna Spotter Catcher process to be applied to all vegetation clearing across the site.

3.1 Terrestrial Habitat Features

The terrestrial fauna values of the site consist of a variety of different components and microhabitat features. The understorey vegetation is predominantly grassy ranging in density from sparse to moderate (Figure 1).

Leaf litter (Figure 2) is also a feature on site, being at variable depths, providing refugial opportunities and microhabitat connectivity that can be exploited by several fauna species. The site is also exhibitive of scattered woody debris and minimal ground timber (Figure 3 and Figure 4). Rocky ground and rocky outcrops were observed at the site further adding habitat value for transient and resident fauna (Figure 5).

Mammal assemblages may comprise both native and introduced species. Evidence of Bandicoot foraging activity was observed in the form of diggings (Figure 6).

Localities for identified terrestrial habitat features are presented in Map 2. GPS coordinates for indicative terrestrial habitat features are shown in Table 2.

A comprehensive list of fauna species recorded in the region can be viewed in Appendix C.

Table 2: **Localities for identified terrestrial habitat features**

Number	Habitat Feature	GPS Coordinates	
		Easting	Northing
1	Hollow log	0489536	6937029

Figure 1: Grassy understorey

Figure 2: Leaf litter

Figure 3: Leaf litter and woody debris

Figure 4: Hollow log

Figure 5: Boulders and rocky ground

Figure 6: Bandicoot digging

3.2 Arboreal Habitat Features

Much of the clearance area consists predominately of Eucalypt woodland (Figure 7) consisting of trees of varying height, species and density suitable for feeding and nesting resources. The intermittent contiguous canopy structure within the vegetation represented may be facilitative of arboreal progression for species such as Brushtail Possum *Trichosurus vulpecula* and Common Ringtail Possum *Pseudocheirus peregrinus.*

Hollow-bearing stags (Figure 8 and Figure 9) feature at the site providing habitat opportunities for a number of arboreal mammal and reptile species. No avian nests were observed during the survey however further inspections are recommended immediately prior to clearing commencement. No Possum dreys were sighting at the time of the inspection.

Localities for identified (arboreal habitat features are presented in Map 2. GPS coordinates for all indicative arboreal habitat features are shown in Table 3.

Primary and secondary Koala food trees located in the clearance area include *Angophora leiocarpa Eucalyptus siderophloia, E. tereticornis, E. propinqua, Corymbia intermedia, C. citriodora variegata Lophostemon confertus* and *L. suaveolens.* However, no evidence was observed to indicate recent use of these trees by koalas. No koala scats were found during 'drip zone' searches and characteristic scratchings were not found during trunk investigations. A Koala habitat values map for the clearance area is presented in Appendix A.

Table 3: **Localities for identified arboreal habitat features**

Number	Habitat Feature	GPS Coordinates	
		Easting	Northing
1	Hollow-bearing stag	0489562	6937042
2	Hollow-bearing stag	0489542	6937037

Figure 7: Woodland on rocky slope

Figure 8: Hollow bearing stag

Figure 9: Hollow bearing stag

Map 2: **Localities for identified terrestrial and arboreal habitat features**

Key for habitat feature type:

Hollow log	Hollow-bearing stag

3.4 Endangered, Vulnerable and Near Threatened (EVNT) Species

It is not envisaged that any EVNT fauna species will be detrimentally impacted by the proposed works. However, seven species identified within the Online EPBC Protected Matters Report and the Queensland Government Wildlife Online Search Tool were considered likely or possible to occur within the site and will require further mitigation during clearing activities.

Although no evidence was found during the site inspection of very recent Koala use the species has previously been recorded in the area. Some areas within the site are identified as High Value Bushland features under Koala Habitat in South East Queensland mapping sourced from the DEHP online search tool (see Appendix A). It is advised that dedicated methodologies be employed by a qualified Fauna Spotter specific to the detection of these species prior to vegetation clearing activities.

Table 4: **Significant species deemed likely or possible to occur within the clearance survey area**

Common Name **Scientific Name**	**Species Information**	**Likelihood of Occurrence within the Clearance Survey area**
Mammals		
Koala *Phascolarctos cinereus* **EPBC:** Vulnerable **NCA:** Vulnerable	Inhabits a range of open forest and woodland communities which may include any of the following noted food trees: *Eucalyptus*, *Corymbia*, *Melaleuca*, *Angophora* and *Lophostemon*.	***Likely*** Known food trees for the transient Koala (*Phascolarctos cinereus)* occur on the clearance site and the species is well documented within the area.
Grey-headed Flying-fox *Pteropus poliocephalus* **EPBC:** Vulnerable **NCA:** Least Concern	The Grey-headed Flying-Fox roosts in aggregations of various sizes on exposed branches, commonly of emergent trees. Roost sites are typically located near water, such as lakes, rivers or the coast. Habitat includes open forests, woodlands, urban parks and gardens.	***Possible*** Suitable vegetation communities containing both feeding and roosting resources occur on and adjacent to the clearance site.
Spotted-tail Quoll (SE Mainland Population) *Dasyurus maculates maculatus* **EPBC:** Endangered **NCA:** Vulnerable	Currently known from the Granit Belt and Border Ranges though small numbers may occur from Gympie to the QLD border (Curtis *et al*. 2012). Inhabits vine-forest, wet and dry sclerophyll forests and woodlands containing boulder piles, fallen logs and hollow trees utilised as shelter sites (Curtis *et al.* 2012).	***Possible*** Preferred habitat type and habitat features present and the species is documented within the area.
Greater Glider *Petauroides volans* **EPBC:** Vulnerable **NCA:** Least Concern	Largest of the gliders, the Great Glider is found along eastern Australia within a variety of eucalypt dominated forests and tall open woodlands (Lindenmayer 2002)	***Possible*** Preferred habitat type and habitat features present and the species is documented within the area.

3.3 Aquatic Habitat Features

An ephemeral drainage feature is located within the amended Haul Road location (Figure 10). No pooling of water was present at the time of inspection however the sandy soil associated with the drainage feature is ideal for a range of amphibian species including Tusked Frog *Adelotus brevis.* Intermittent ponded features after rain may provide breeding opportunities for amphibian species.

Figure 10: Gully

Amphibians		
Tusked Frog *Adelotus brevis* **EPBC:** Not Listed **NCA:** Vulnerable	Inhabits permanent ponds and streams within rainforests, wet to dry forests and farmland areas (Anstis 2013). Nests are constructed under leaf litter, vegetation or logs at the edge of ponds or stream pools in concealed locations (Anstis 2013).	***Possible*** Preferred habitat types present and the species is documented within the area.
Birds		
Powerful Owl *Ninox strenua* **EPBC:** Not Listed **NCA:** Vulnerable	Inhabits forests and woodlands of eastern and south-eastern Australia (Beruldsen 2003). Breeds once per year in May to July or August. Nests in hollow trunks or limbs of large trees, usually at considerable height (Beruldsen 2003).	***Possible*** Preferred habitat types present and the species is documented within the area.
Reptiles		
Collared Delma *Delma torquata* **EPBC:** Vulnerable **NCA:** Vulnerable	Weathered loose rocks, flattish bedrock outcroppings, logs or mats of leaf litter, or in cracks and crevices among tussock grasses. Lays two eggs around December with hatching in February or March (Curtis et al. 2012)	***Possible*** Preferred habitat type and habitat features present.

4. Fauna Impacts

It is important to consider the proposed development surrounding the site and potential for fragmenting habitat and isolating species when investigating potential fauna impacts.

Impacts to fauna as a result of vegetation clearance will include the following:

- Loss of trees for foraging, roosting and nesting;
- Loss of hollow-bearing trees for nesting and refuge;
- Loss of habitat and foraging areas for terrestrial species;
- Loss of overall habitat;
- Potential loss of abundance of some local species.

Other impacts may include:

- Injury or death during felling of trees;
- Injury or death from machinery;
- Alteration of nesting, foraging and general activities due to disturbance.

5. Assessment and Conclusion

Overall the site contains medium value refugial opportunities for arboreal and terrestrial fauna species (see Section 3.1 and 3.2). The species expected within the site are likely to primarily reflect common fauna assemblages for the region; however, provisions will be proposed directly for common fauna and species of conservation significance.

The connectivity to adjacent habitat in conjunction with sequential clearing methodologies will aid in the movement of medium to large size fauna such as Koala and Kangaroos. Specific methodologies for these species will be detailed within the Wildlife and Habitat Impact Mitigation Plan (WHIMP).

A number of conclusions and recommendations will be presented in the WHIMP, with the specific intention of providing a comprehensive management structure to facilitate minimal impact to fauna during the clearing of vegetation and subsequent disturbance of habitats.

It is advised that all identified fauna habitats onsite be inspected by a DEHP approved Fauna Spotter prior to vegetation clearing and all vegetation removal activities be supervised during the clearing process (as per the SBMP Haul Road (Feb) – 07: Pre-Clearance – Fauna Management). Terrestrial load reduction activities will be conducted ahead of the clearing front where possible. Fauna captured will be relocated to adjacent habitat consistent with the life history requirements of the species requiring translocation. The directives given by Fauna Spotter Catchers should embrace a “best practice” approach which includes implementation of proven specific management techniques for identified habitat types and compliance with legislation relevant to the activity.

6. References

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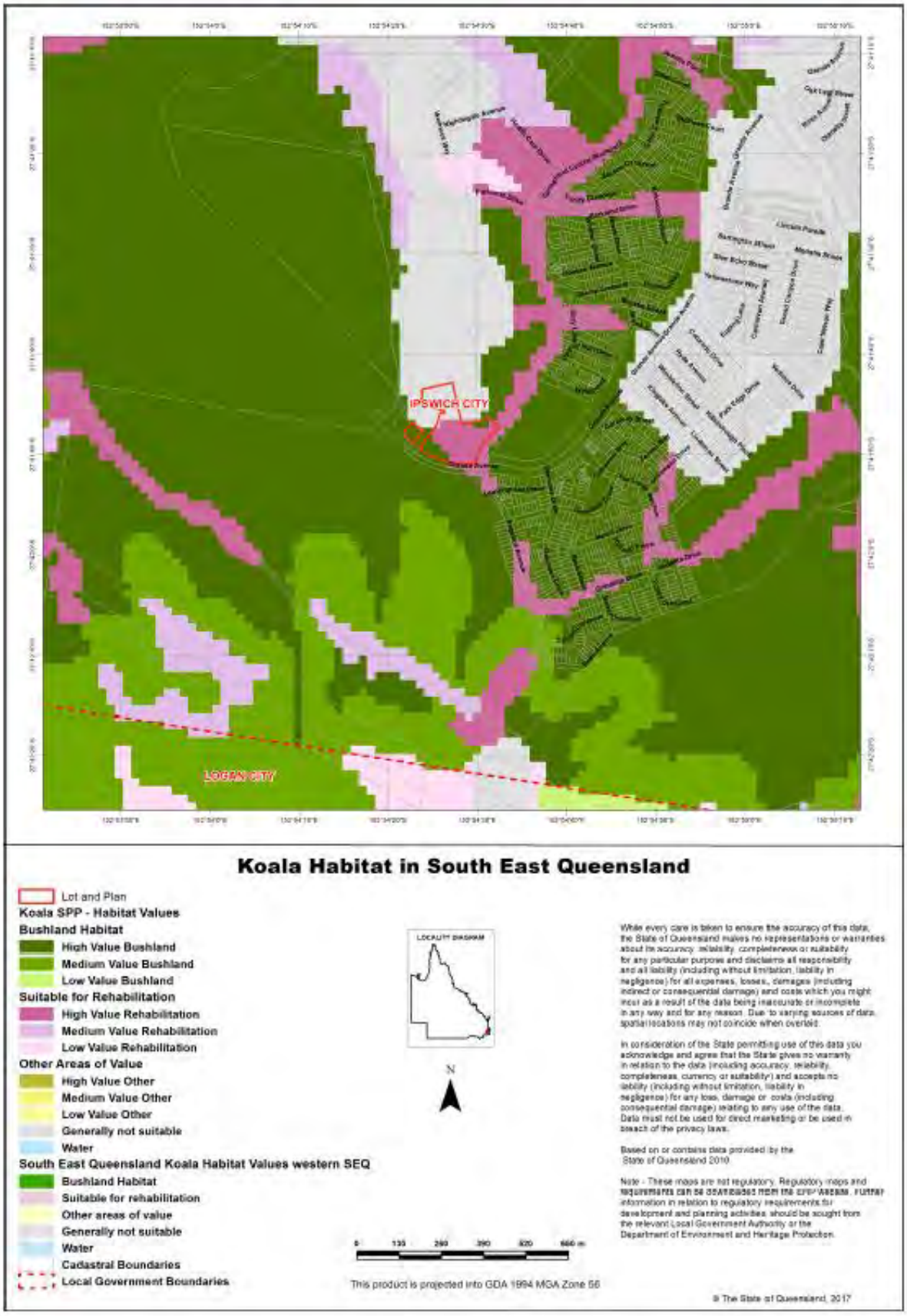
7. Appendix A: Koala Habitat Values



8. Appendix B: EPBC Act Protected Matters Report

Australian Government
Department of the Environment

EPBC Act Protected Matters Report

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

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

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

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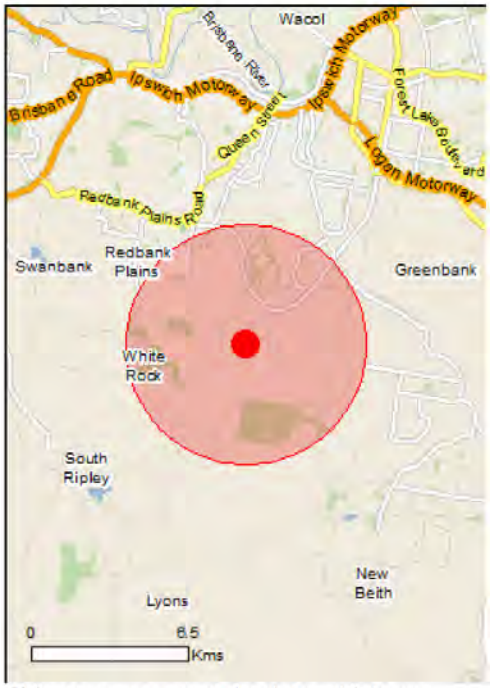

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

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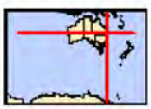

Summary

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:	35
Listed Migratory Species:	13

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:	1
Commonwealth Heritage Places:	1
Listed Marine Species:	20
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:	1
Regional Forest Agreements:	None
Invasive Species:	32
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	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma_coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to 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
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Poephila cincta cincta		
Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix melanogaster		
Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
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, Digul [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
Petauroides volans		
Greater Glider [254]	Vulnerable	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
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

Reptiles		
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
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
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		
Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

9. Appendix C: Wildlife Online Extract

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: Animals
Type: Native
Status: All
Records: All
Date: Since 1980
Latitude: -27.6863
Longitude: 152.8916
Distance: 5
Email: camillejpalmer@gmail.com
Date submitted: Monday 26 Sep 2016 16:36:34
Date extracted: Monday 26 Sep 2016 16:40:02

The number of records retrieved = 285

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	Hylidae	*Litoria fallax*	eastern sedgefrog		C		14
animals	amphibians	Hylidae	*Litoria nasuta*	striped rocketfrog		C		5
animals	amphibians	Hylidae	*Litoria dentata*	bleating treefrog		C		1
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		8
animals	amphibians	Hylidae	*Cyclorana alboguttata*	greenstripe frog		C		1
animals	amphibians	Hylidae	*Litoria wilcoxii*	eastern stony creek frog		C		5
animals	amphibians	Hylidae	*Litoria gracilenta*	graceful treefrog		C		11
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		6
animals	amphibians	Hylidae	*Litoria brevipalmata*	green thighed frog		C		1
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		5
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		2
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		9
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		22
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		7
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		1
animals	amphibians	Myobatrachidae	*Pseudophryne coriacea*	red backed broodfrog		C		1
animals	amphibians	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog		C		8
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		4
animals	amphibians	Myobatrachidae	*Pseudophryne raveni*	copper backed broodfrog		C		10
animals	amphibians	Myobatrachidae	*Pseudophryne major*	great brown broodfrog		C		1
animals	amphibians	Myobatrachidae	*Uperoleia rugosa*	chubby gungan		C		2
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		46
animals	birds	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill		C		24
animals	birds	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren		C		34
animals	birds	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill		C		2
animals	birds	Acanthizidae	*Gerygone mouki*	brown gerygone		C		1
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		43
animals	birds	Acanthizidae	*Acanthiza nana*	yellow thornbill		C		8
animals	birds	Acanthizidae	*Acanthiza lineata*	striated thornbill		C		9
animals	birds	Acanthizidae	*Acanthiza pusilla*	brown thornbill		C		18
animals	birds	Acanthizidae	*Chthonicola sagittata*	speckled warbler		C		17
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		9
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		14
animals	birds	Accipitridae	*Aviceda subcristata*	Pacific baza		C		8
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		3
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		1
animals	birds	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk		C		2
animals	birds	Accipitridae	*Accipiter novaehollandiae*	grey goshawk		C		2
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		29
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		12
animals	birds	Alcedinidae	*Ceyx pusilla*	little kingfisher		C		1
animals	birds	Alcedinidae	*Ceyx azureus*	azure kingfisher		C		3
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		19
animals	birds	Anatidae	*Cygnus atratus*	black swan		C		2
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		15
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		SL		8

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Ardeidae	*Ardea ibis*	cattle egret		SL		12
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		3
animals	birds	Ardeidae	*Ardea intermedia*	intermediate egret		C		2
animals	birds	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron		C		1
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		16
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		68
animals	birds	Artamidae	*Artamus superciliosus*	white-browed woodswallow		C		1
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		2
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		49
animals	birds	Artamidae	*Artamus cyanopterus*	dusky woodswallow		C		9
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		61
animals	birds	Artamidae	*Cracticus tibicen*	Australian magpie		C		64
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		1
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		35
animals	birds	Cacatuidae	*Cacatua sanguinea*	little corella		C		2
animals	birds	Cacatuidae	*Eolophus roseicapillus*	galah		C		26
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V		2
animals	birds	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo		C		5
animals	birds	Campephagidae	*Lalage leucomela*	varied triller		C		11
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		63
animals	birds	Campephagidae	*Coracina tenuirostris*	cicadabird		C		30
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		9
animals	birds	Campephagidae	*Lalage tricolor*	white-winged triller		C		1
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		18
animals	birds	Charadriidae	*Vanellus miles*	masked lapwing		C		2
animals	birds	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork		C		1
animals	birds	Cisticolidae	*Cisticola exilis*	golden-headed cisticola		C		21
animals	birds	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper		C		6
animals	birds	Climacteridae	*Climacteris affinis*	white-browed treecreeper		C		1
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		47
animals	birds	Columbidae	*Geopelia striata*	peaceful dove		C		35
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		26
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		21
animals	birds	Columbidae	*Chalcophaps indica*	emerald dove		C		6
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		33
animals	birds	Columbidae	*Macropygia amboinensis*	brown cuckoo-dove		C		18
animals	birds	Columbidae	*Leucosarcia melanoleuca*	wonga pigeon		C		1
animals	birds	Columbidae	*Lopholaimus antarcticus*	topknot pigeon		C		7
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		34
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		120
animals	birds	Corvidae	*Corvus coronoides*	Australian raven		C		1
animals	birds	Cuculidae	*Cuculus optatus*	oriental cuckoo		SL		5
animals	birds	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo		C		9
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		11
animals	birds	Cuculidae	*Eudynamys orientalis*	eastern koel		C		21
animals	birds	Cuculidae	*Chalcites minutillus barnardi*	little bronze-cuckoo		C		1

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animals	birds	Cuculidae	*Centropus phasianinus*	pheasant coucal		C		21
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		29
animals	birds	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo		C		22
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		15
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		39
animals	birds	Dicruridae	*Dicrurus bracteatus bracteatus*	spangled drongo (eastern Australia)		C		1
animals	birds	Estrildidae	*Neochmia temporalis*	red-browed finch		C		49
animals	birds	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		8
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		26
animals	birds	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar		C		14
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		12
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		3
animals	birds	Falconidae	*Falco peregrinus*	peregrine falcon		C		13
animals	birds	Falconidae	*Falco hypoleucos*	grey falcon		V		1
animals	birds	Halcyonidae	*Dacelo novaeguineae*	laughing kookaburra		C		81
animals	birds	Halcyonidae	*Todiramphus macleayii*	forest kingfisher		C		14
animals	birds	Halcyonidae	*Todiramphus sanctus*	sacred kingfisher		C		26
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		13
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		21
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		8
animals	birds	Hirundinidae	*Cheramoeca leucosterna*	white-backed swallow		C		8
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		50
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		28
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		63
animals	birds	Megaluridae	*Megalurus timoriensis*	tawny grassbird		C		8
animals	birds	Megapodiidae	*Alectura lathami*	Australian brush-turkey		C		9
animals	birds	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater		C		5
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		87
animals	birds	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater		C		11
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		67
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		83
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		17
animals	birds	Meliphagidae	*Anthochaera chrysoptera*	little wattlebird		C		8
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		68
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		13
animals	birds	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill		C		19
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		C		6
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		48
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		18
animals	birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater		C		86
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		45
animals	birds	Meliphagidae	*Ptilotula fusca*	fuscous honeyeater		C		13
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		SL		58
animals	birds	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch		SL		8
animals	birds	Monarchidae	*Myiagra inquieta*	restless flycatcher		C		5
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		38

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animals	birds	Monarchidae	*Myiagra cyanoleuca*	satin flycatcher		SL		1
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		38
animals	birds	Monarchidae	*Monarcha melanopsis*	black-faced monarch		SL		15
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		3
animals	birds	Nectariniidae	*Dicaeum hirundinaceum*	mistletoebird		C		41
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		35
animals	birds	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird		C		16
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		32
animals	birds	Pachycephalidae	*Pachycephala pectoralis*	golden whistler		C		41
animals	birds	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush		C		12
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		65
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		62
animals	birds	Pachycephalidae	*Falcunculus frontatus*	crested shrike-tit		C		1
animals	birds	Pardalotidae	*Pardalotus punctatus*	spotted pardalote		C		38
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		94
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		1
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		22
animals	birds	Petroicidae	*Petroica rosea*	rose robin		C		25
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		58
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		2
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		5
animals	birds	Phasianidae	*Coturnix ypsilophora*	brown quail		C		17
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		22
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		2
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		12
animals	birds	Psittacidae	*Alisterus scapularis*	Australian king-parrot		C		17
animals	birds	Psittacidae	*Trichoglossus haematodus moluccanus*	rainbow lorikeet		C		67
animals	birds	Psittacidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)		C		2
animals	birds	Psittacidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		56
animals	birds	Psittacidae	*Parvipsitta pusilla*	little lorikeet		C		43
animals	birds	Psittacidae	*Platycercus eximius*	eastern rosella		C		13
animals	birds	Psittacidae	*Platycercus adscitus*	pale-headed rosella		C		39
animals	birds	Psophodidae	*Psophodes olivaceus*	eastern whipbird		C		49
animals	birds	Psophodidae	*Cinclosoma punctatum*	spotted quail-thrush		C		11
animals	birds	Ptilonorhynchidae	*Ptilonorhynchus maculatus*	spotted bowerbird		C		1
animals	birds	Ptilonorhynchidae	*Sericulus chrysocephalus*	regent bowerbird		C		1
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		1
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		8
animals	birds	Recurvirostridae	*Himantopus himantopus*	black-winged stilt		C		1
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		45
animals	birds	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail		SL		25
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		70
animals	birds	Rhipiduridae	*Rhipidura leucophrys leucophrys*	willie wagtail (southern)		C		1
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		6
animals	birds	Strigidae	*Ninox boobook*	southern boobook		C		28
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		3

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animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		6
animals	birds	Timaliidae	*Zosterops lateralis*	silvereye		C		65
animals	birds	Timaliidae	*Zosterops lateralis cornwalli*	silvereye (eastern)		C		1
animals	birds	Turnicidae	*Turnix varius*	painted button-quail		C		14
animals	birds	Tytonidae	*Tyto novaehollandiae novaehollandiae*	masked owl (southern subspecies)		C		1
animals	insects	Hesperiidae	*Neohesperilla xanthomera*	yellow grass-skipper				1
animals	insects	Lycaenidae	*Acrodipsas brisbanensis brisbanensis*	bronze ant-blue				2
animals	insects	Lycaenidae	*Candalides cyprotus pallescens*	copper pencilled-blue				1
animals	insects	Lycaenidae	*Ogyris oroetes oroetes*	silky azure				1
animals	insects	Lycaenidae	*Ogyris zosine zosine*	northern purple azure (southern subspecies)				1
animals	insects	Nymphalidae	*Polyura sempronius sempronius*	tailed emperor				1
animals	insects	Nymphalidae	*Acraea andromacha andromacha*	glasswing				7
animals	insects	Nymphalidae	*Danaus plexippus plexippus*	monarch				7
animals	insects	Nymphalidae	*Tirumala hamata hamata*	blue tiger				1
animals	insects	Nymphalidae	*Junonia villida calybe*	meadow argus				1
animals	insects	Nymphalidae	*Melanitis leda bankia*	common evening-brown				3
animals	insects	Nymphalidae	*Euploea core corinna*	common crow				3
animals	insects	Nymphalidae	*Danaus petilia*	lesser wanderer				4
animals	insects	Nymphalidae	*Vanessa kershawi*	Australian painted lady				2
animals	insects	Papilionidae	*Graphium sarpedon choredon*	blue triangle				3
animals	insects	Pieridae	*Eurema hecabe*	large grass-yellow				4
animals	insects	Pieridae	*Eurema smilax*	small grass-yellow				1
animals	insects	Pieridae	*Delias nigrina*	black jezebel				2
animals	insects	Pieridae	*Belenois java teutonia*	caper white				1
animals	insects	Pieridae	*Catopsilia pomona pomona*	lemon migrant				1
animals	insects	Pieridae	*Eurema brigitta australis*	no-brand grass-yellow				1
animals	mammals	Acrobatidae	*Acrobates pygmaeus*	feathertail glider		C		1
animals	mammals	Canidae	*Canis lupus dingo*	dingo				6
animals	mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)		C		5
animals	mammals	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)		V	E	1
animals	mammals	Dasyuridae	*Antechinus stuartii*	brown antechinus		C		1
animals	mammals	Dasyuridae	*Sminthopsis murina*	common dunnart		C		2
animals	mammals	Dasyuridae	*Planigale maculata*	common planigale		C		1
animals	mammals	Macropodidae	*Macropus rufogriseus*	red-necked wallaby		C		18
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		20
animals	mammals	Macropodidae	*Macropus robustus*	common wallaroo		C		1
animals	mammals	Macropodidae	*Macropus dorsalis*	black-striped wallaby		C		2
animals	mammals	Macropodidae	*Macropus parryi*	whiptail wallaby		C		4
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		10/1
animals	mammals	Miniopteridae	*Miniopterus schreibersii oceanensis*	eastern bent-wing bat		C		1
animals	mammals	Molossidae	*Tadarida australis*	white-striped freetail bat		C		10
animals	mammals	Molossidae	*Mormopterus sp.*					1
animals	mammals	Molossidae	*Mormopterus lumsdenae*	northern free-tailed bat		C		1

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animals	mammals	Muridae	*Rattus fuscipes*	bush rat		C		1
animals	mammals	Muridae	*Rattus tunneyi*	pale field-rat		C		2
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		5
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		C		1
animals	mammals	Petauridae	*Petaurus norfolcensis*	squirrel glider		C		21
animals	mammals	Petauridae	*Petaurus breviceps*	sugar glider		C		3
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		19
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	56
animals	mammals	Potoroidae	*Aepyprymnus rufescens*	rufous bettong		C		1
animals	mammals	Pseudocheiridae	*Petauroides volans*	greater glider		C	V	15
animals	mammals	Pseudocheiridae	*Pseudocheirus peregrinus*	common ringtail possum		C		5
animals	mammals	Pteropodidae	*Pteropus sp.*					2
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		9
animals	mammals	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox		C	V	8
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		3
animals	mammals	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat		C		2
animals	mammals	Vespertilionidae	*Scotorepens sp.*					2
animals	mammals	Vespertilionidae	*Scotorepens orion*	south-eastern broad-nosed bat		C		3
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		1
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		8
animals	reptiles	Agamidae	*Diporiphora australis*	tommy roundhead		C		5
animals	reptiles	Agamidae	*Intellagama lesueurii*	eastern water dragon		C		6
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		2
animals	reptiles	Colubridae	*Dendrelaphis punctulatus*	green tree snake		C		6
animals	reptiles	Colubridae	*Tropidonophis mairii*	freshwater snake		C		1
animals	reptiles	Colubridae	*Boiga irregularis*	brown tree snake		C		1
animals	reptiles	Diplodactylidae	*Nebulifera robusta*	robust velvet gecko		C		1
animals	reptiles	Diplodactylidae	*Diplodactylus vittatus*	wood gecko		C		2
animals	reptiles	Diplodactylidae	*Oedura tryoni*	southern spotted velvet gecko		C		5
animals	reptiles	Elapidae	*Brachyurophis australis*	coral snake		C		2
animals	reptiles	Elapidae	*Pseudonaja textilis*	eastern brown snake		C		2
animals	reptiles	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake		C		3
animals	reptiles	Elapidae	*Vermicella annulata*	bandy-bandy		C		1
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		5
animals	reptiles	Elapidae	*Furina diadema*	red-naped snake		C		1
animals	reptiles	Elapidae	*Demansia psammophis*	yellow-faced whipsnake		C		10
animals	reptiles	Elapidae	*Pseudechis guttatus*	spotted black snake		C		2
animals	reptiles	Gekkonidae	*Gehyra dubia*	dubious dtella		C		3
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		4
animals	reptiles	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink		C		7
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		2
animals	reptiles	Scincidae	*Lampropholis amicula*	friendly sunskink		C		2
animals	reptiles	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink		C		2
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		8
animals	reptiles	Scincidae	*Morethia taeniopleura*	fire-tailed skink		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	reptiles	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis		C		5
animals	reptiles	Scincidae	*Ophioscincus ophioscincus*	yolk-bellied snake-skink		C		1
animals	reptiles	Scincidae	*Carlia pectoralis sensu lato*			C		3
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		26
animals	reptiles	Scincidae	*Carlia munda*	shaded-litter rainbow-skink		C		1
animals	reptiles	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus		C		3
animals	reptiles	Scincidae	*Tiliqua scincoides*	eastern blue-tongued lizard		C		1
animals	reptiles	Scincidae	*Concinnia martini*	dark bar-sided skink		C		1
animals	reptiles	Scincidae	*Carlia schmeltzii*	robust rainbow-skink		C		3
animals	reptiles	Scincidae	*Ctenotus arcanus*	arcane ctenotus		C		1
animals	reptiles	Scincidae	*Concinnia tenuis*	bar-sided skink		C		1
animals	reptiles	Scincidae	*Carlia vivax*	tussock rainbow-skink		C		18
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		8

CODES

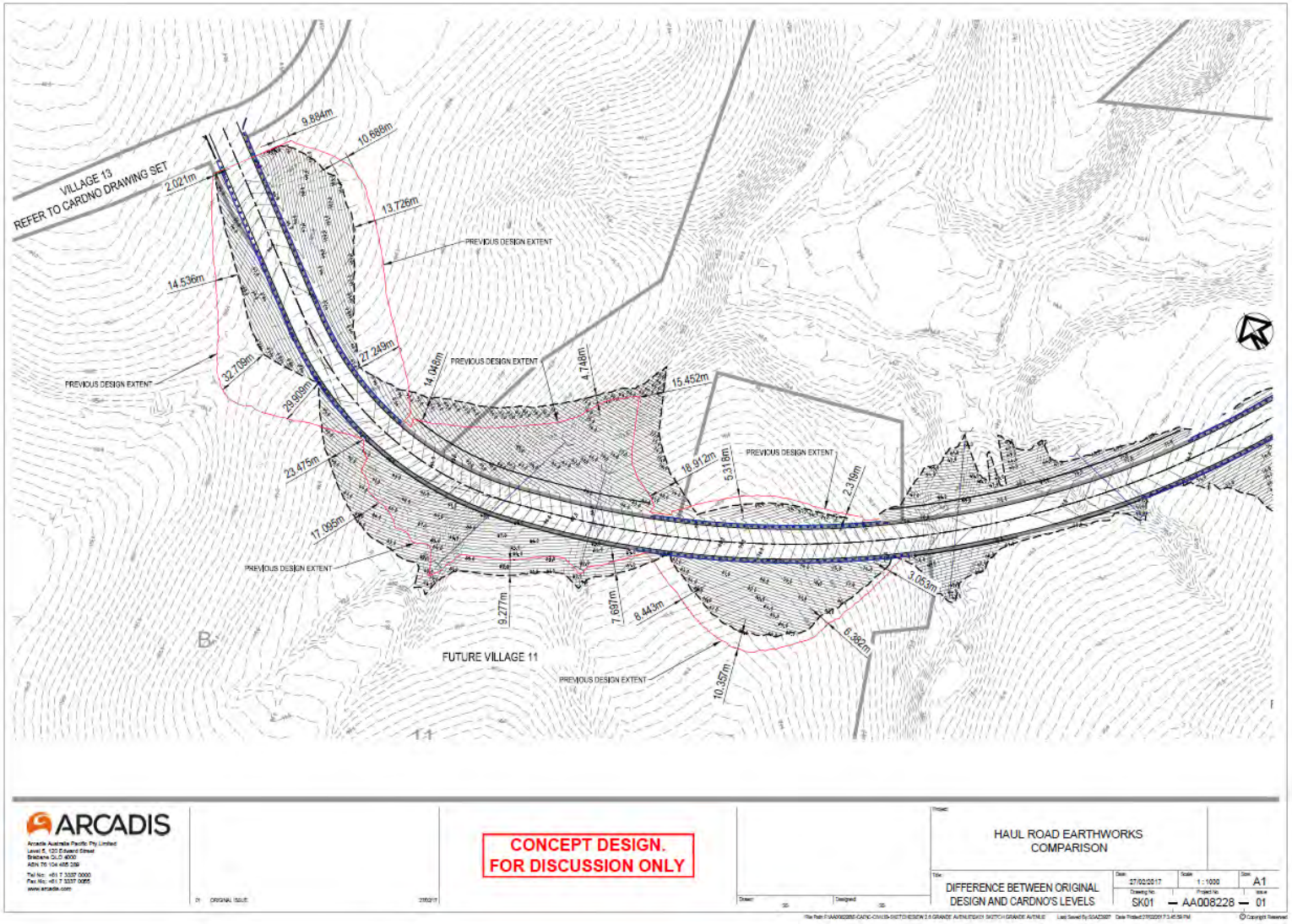
I - Y indicates that the taxon is introduced to Queensland and has naturalised.

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.

10. Appendix D: Haul Road Clearing Areas



ATTACHMENT 5–

Contactor Environmental Awareness Acknowledgement

ENVIRONMETAL AWARENESS

CONTRACTOR ACKNOWLEDGEMENT

I , Tony Hooper, the Contractor (or the Contractor Representative), appointed by Lendlease Communities, acknowledge receipt and acceptance of the Lendlease Communities rules and policies in the **Springfield Rise Site Based Management Plan**. By signing below, I acknowledge that there are mechanisms in place to ensure all material provided within this SBMP will be read and understood by all site contractors and sub-contractors prior to commencing works on site.

Shadforths Civil Engineering Contractors
Company Name (Please print)

_____
Signature (Contractor / Contractor Representative)

_Tony Hooper_____
Name (Please print)

_Project Manager_____
Title / Position

__9/3/2017_____
Date

10 FLORA & FAUNA CHECKLIST

Pre-Clearance Checklist:

This Site Based Management Plan (V6) contains only a small portion of information included within existing assessment management plans for Spring Mountain. Subsequently, the volume of requirements remains complex and overlapping. To ensure compliance with approval requirements and provide a record trail for reporting to the Commonwealth Department of the Environment the following pre-clearance checklist is to be completed with each phase of works.

The checklist is to be completed by the principal contractor and requires sign off by the Environmental Coordinator and Fauna Spotter. To complete the checklist a number of items need to be issued from various parties to the principal contractor (eg confirmation of pre-clearance surveys).

The pre-clearance checklist is established in a format which enables direct annual reporting to the Department of the Environment and will include a number of attachments.

Springfield RISE

Springfield Rise - Environmental Pre-Start Checklist

Project Area: Village 6	Date:			
Contractor: Shadforths	Construction Stage/ Activity: Early works bulk earthworks			
Date work is to start:				
Date work is to cease:	Compliance			

#	Control Measure	Yes	No	N/A	Comments
1	Are clearing extents marked out and fenced? (N.B. Fencing is required as per ICC permits unless instructed otherwise by Council, Fauna Spotter or Environmental Coordinator).	✓			Completed by Wolter Consulting on DATE
2	Has the fencing of clearing extents demarcation been inspected by the Environmental Coordinator?	✓			Completed by SHG on DATE
3	Has sign off been provided by the Environmental Coordinator for demarcation areas?	✓			See Attachment 1
4	Has certification for pre-clearance flora been provided? (N.B. Exemptions/permits for protected plants under the NCA must be obtained by EHP where works occur in a High Risk Area). Please provide date and reference.	✓			See Attachment 2. **EHP Reference: AR082999 22 January 2016**
5	Have pre-clearance checks surveys for *Plectranthus habrophyllus* been completed over the clearing area?	✓			Completed by SHG on 8 July 2015. See Attachment 3.
6	Are there 'no-go' zones identified within the clearing area?		✓		
7	If yes, have 'no-go' zones been demarcated, fenced, signed and inspected by the Environmental Coordinator and Contractor?			✓	
8	Has the appointed Fauna Spotter completed pre-clearance surveys and reports?				
9	Has the appointed Fauna Spotter identified any