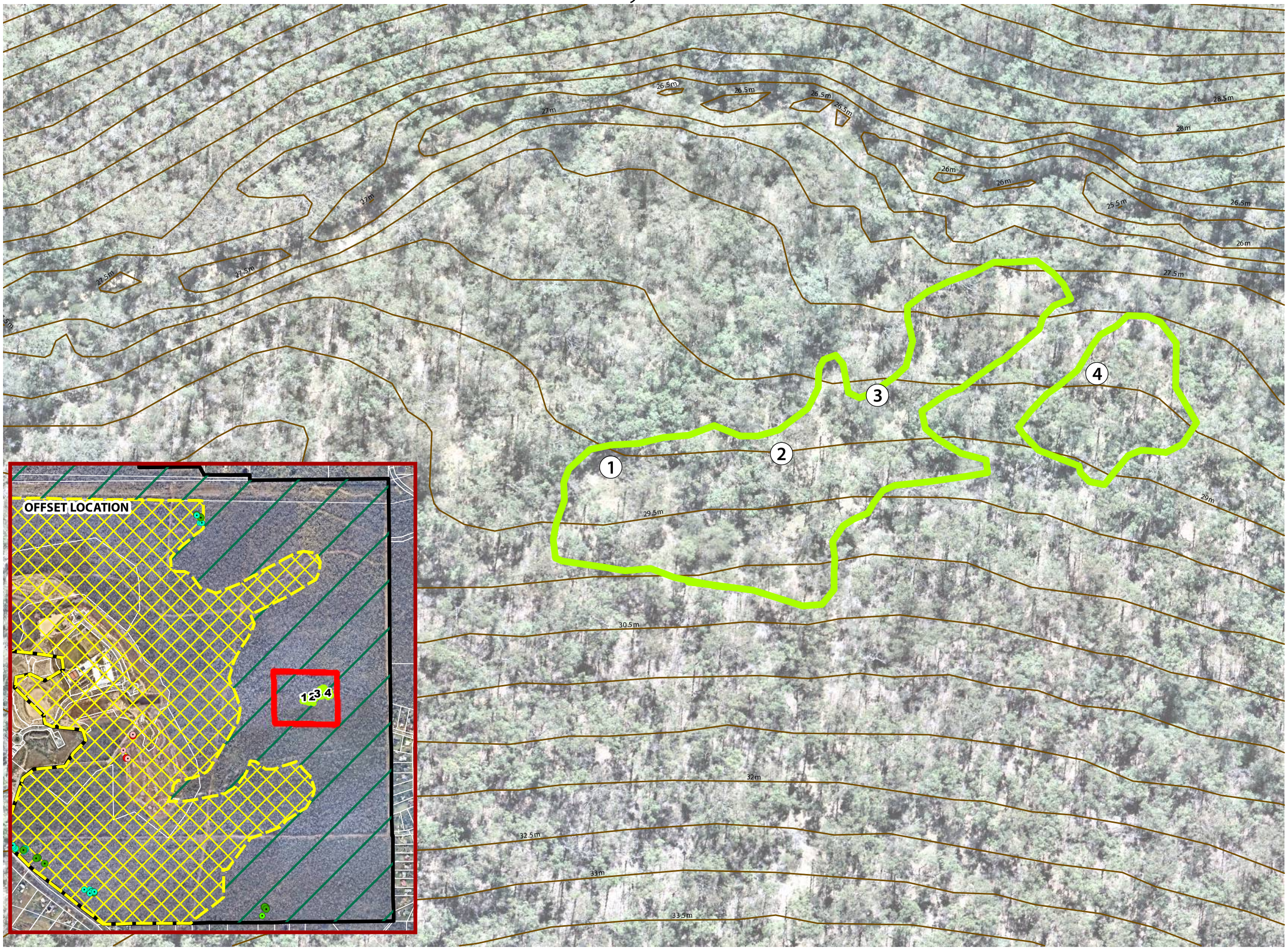
4. Rehabilitation Area - *Melaleuca irbyana*



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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2020), Aerial (Nearmap 2020)

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LEGEND

- Project DCDB
- Development footprint
- Conservation area
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)
- Mature *Melaleuca irbyana* specimens
- Semi-mature or juvenile *Melaleuca irbyana* specimens
- Mature *Melaleuca irbyana* specimen removed by clearing works
- Semi-mature or juvenile *Melaleuca irbyana* specimens removed by clearing works
- Contours (0.5m)
- (#) Evolve Environmental Solutions photo monitoring points

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
B	7/07/2022	2022 reporting	TC	LT

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

0 5 10 20 30 40 m

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4.1 Photo Point 1 - Rehabilitation Area - *Melaleuca irbyana*

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B	7/07/2022	2022 reporting	TC	LT

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4.2 Photo Point 2 - Rehabilitation Area - *Melaleuca irbyana*

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ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 7/07/2022 7598 E 04.2 Rehabilitation Area B

4.3 Photo Point 3 - Rehabilitation Area - *Melaleuca irbyana*

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ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 7/07/2022 7598 E 04.3 Rehabilitation Area B

4.4 Photo Point 4 - Rehabilitation Area - *Melaleuca irbyana*

NOTES
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B	7/07/2022	2022 reporting	TC	LT

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4. Summary and Conclusion

Saunders Havill Group has been engaged by Mirvac Queensland Pty Ltd to prepare an IMP for *Melaleuca irbyana* located within the extent of works for the master planned community referred to as Everleigh, located at 432-520 Greenbank Road, Greenbank. This IMP is intended to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0026119). The IMP has been prepared in accordance with the Flora Survey Guidelines.

A Protected Plants Clearing Permit (Permit No. WA0009354) was issued by the DES on 23 August 2020 which allows for clearing of *M. irbyana* over the entire Clearing Impact Area (i.e. 277 ha site). Conditions of the Permit (PPCM01) require all activities relating to the impact of threatened plant species under the permit to be carried out in accordance with the procedures and actions in the IMP. This included rehabilitation planting *of M. irbyana* within the on-site conservation area to ensure no significant residual impact on the species occurs as a result of the development.

Rehabilitation works in accordance with the IMP, including weed removal and tubestock planting commenced in March 2019, prior to the removal of any *M. irbyana* locations within the Clearing Impact Area. The 5,000m^2 *M. irbyana* rehabilitation area was secured as Declared Area on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658) under the VMA and is subject to legal monitoring and reporting benchmarks set by DOR. The *M. irbyana* rehabilitation area completed 3 years of management, achieved the minimum survival rate and is now considered to be self-sustaining. Rehabilitation works are no longer considered necessary, however monitoring of the on-site conservation area will continue until responsibility is transferred to Council.

To date, only one (1) Location of *M. irbyana* within the Clearing Impact Area (Location 5) has been removed. Three (3) Locations within the Clearing Impact Area remain. Therefore, this IMP seeks to support renewal of the Protected Plants Clearing Permit (Permit No. WA0026119) which expires on 22 August 2022 for the clearing of protected plants within the 277 ha Clearing Impact Area at the project site.

5. Appendices

Appendix A

Protected Plants Clearing Permit (WA0026119)

Appendix B

Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 10 July 2020

Appendix C

Declared Area Map

Appendix D

Wildlife Online Search

Nature Conservation Act 1992

Appendix E

Melaleuca irbyana Declared Area Rehabilitation Plan

Appendix A

Protected Plants Clearing Permit (WA0026119)

Permit

Section 15 of Nature Conservation (Administration) Regulation 2006

Protected Plant Clearing Permit

This wildlife authority is issued under the following legislation: Nature Conservation (Administration) Regulation 2017 Part 2 Division 1.

Permit number: WA0026119 **Valid from:** 23 August 2020 to 22 August 2022

Activity: Clearing endangered, vulnerable or near threatened plants

Role	Name	Registered address	
Principal Holder:	Saunders Havill Group Pty Ltd	9 Thompson St BOWEN HILLS QLD 4006 Australia	
Person In Charge:	Mark Clancy		
Business name:		**ABN/ACN**	144972949
Activity location/licensed premises	LOT 9001/SP300875 LOT 9002/SP317644 LOT 9003/SP317644		

Schedule

Family or Species or Schedule	Details	Category	Quantity	Unit
Species	bush house or weeping paperbark or swamp teatree, Melaleuca irbyana	Live	277	Hectares

Adam Northam
Department of Environment and Science
Delegate of the administering authority
Nature Conservation Act 1992

Date issued: 20 August 2020

Enquiries:
Wildlife Assessment Team
Email: wildlife@des.qld.gov.au
Postal Address: PO Box 102, Toowoomba, QLD, 4350

ABN 46 640 294 485

Queensland Government

Legislative Requirements and Conditions

Legislative Requirements

Legislative Requirements

PPCLR06 Where monitoring by the permit holder of impact management actions with respect to endangered, vulnerable or near threatened species in the clearing area identifies that those actions appear to be unsuccessful or failing, the permittee must notify DES immediately in order to discuss the significant residual impact of the clearing and furthermore discuss any potential implementation of an offset action in accordance with the Queensland Environmental Offset Policy.
This requirement may be found in Section 284(1) 0f the Nature Conservation (Wildlife Management) Regulation 2006

PPCLR01 This permit does not exempt the permit holder from obtaining other approvals relevant to the harvest of whole protected plants at the site.

PPCLR02 Activities carried out under this authority, unless otherwise authorised, apply to non-protected areas only.
This requirement may be found in section 15 of the Nature Conservation (Administration) Regulation 2017

PPCLR03 This permit includes the clearing of least concern protected plants within the clearing area.

Conditions

PPCM01 Activities relating to the impact of EVNT plant species under this permit must be in accordance with the procedures and actions outlined in the following documents, except where conditions below indicate otherwise:

- 'Impact Management Plan *Melaleuca irbyana* renewal for permit No. WA0009354 432-520 Greenback Road, Greenbank Prepared for Mirvac Queensland Pty Ltd 10 July 2020 Job No. 7598', associated appendices and any other supporting documentation submitted to the department in relation to application number APP0057006.

PPCM02 The permit holder is to notify DES in writing at least 48 hours in advance of clearing commencing, for example, via an email to wildlife@des.qld.gov.au

PPCM04 Should the project not proceed, in addition to the requirement to rehabilitate the area/s once cleared, the site/s must not be further disturbed and must be maintained to ensure erosion and weed control.

PPCM08 It is the permit holder's responsibility to ensure that the proposed rehabilitation area with EVNT species *Melaleuca irbyana* is and remains legally secured.

PPCM09 Rehabilitation and/or translocation reporting must be maintained from the commencement date of clearing and continue for a minimum period of 24 months.

The written report (including advice on each monitoring period) must be lodged with the department via an email to wildlife@des.qld.gov.au within 10 business days after each annual period.

Department of Environment and Science
www.des.qld.gov.au ABN 46 640 294 485

Appendix B

Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 10 July 2020

Impact Management Plan
Melaleuca irbyana
Renewal for Permit No. WA0009354

432-520 Greenbank Road, Greenbank
Prepared for Mirvac Queensland Pty Ltd
10 July 2020

Job No. 7598

Document Control

Document: Impact Management Plan for 432-520 Greenbank Road, prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd.

Document Issue

Issue	Date	Prepared By	Checked By
A	07.07.2020	KG	AD
B	10.07.2020	KG	AD

Prepared by

ABN 24 144 972 949
www.saundershavill.com

Reports and plans by others may be included in this document.

Table of Contents

Tables

Plans

Abbreviations and Acronyms

DAM	Declared Area Map
DES	Department of Environment and Science (Qld)
DNRME	Department of Natural Resources, Mines and Energy (Qld)
EDQ	Economic Development Queensland (Qld)
EVNT	Endangered, Vulnerable or Near Threatened (as defined by the NCA)
NCA	*Nature Conservation Act 1992* (Qld)
NCWR	Nature Conservation (Wildlife) Regulation 2006
PDA	Priority Development Area (herein referencing the Greater Flagstone Priority Development Area)
PMAV	Property Map of Assessable Vegetation
SHG	Sunders Havill Group

1. Introduction

Saunders Havill Group (SHG) was engaged by Mirvac Queensland Pty Ltd (Mirvac) to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* (Swamp Tee Tree) specimens located within the Greenbank project area located at 432-520 Greenbank Road, Greenbank.

As required under the *Protected Plants Assessment Guidelines* (the Guidelines) this IMP has been prepared to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0009354) for the clearing of *Melaleuca irbyana* specimens within the 277 hectare (ha) development area located at 432-520 Greenbank Road, Greenbank (Lot 1/SP297192). A copy the Protected Plants Clearing Permit is included at **Appendix A**.

1.1. Background

Protected Plants Flora Surveys undertaken over the site in 2018 recorded four isolated patches of *Melaleuca irbyana*; three of which are located within the Clearing Area (refer **Plan 1**). The species is listed as Endangered under the *Nature Conservation Act 1992*.

Subsequently, an Impact Management Plan *'Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018'* (IMP) was prepared to support a Protected Plants Clearing Permit application to the Department of Environment and Science (DES) in accordance with Section 3.2 of the *Nature Conservation (Wildlife Management) Regulation 2006 – Protected Plants Assessment Guidelines*. A copy of the IMP is included at **Appendix B**.

A Protected Plants Clearing Permit (Permit No. WA0009354) was issued by the DES on 24 August 2018 which allows for clearing of all *M. irbyana* over the entire Clearing Impact Area (i.e. 277 ha site). Conditions of the Permit (PPCM01) require all activities relating to the impact of EVNT plant species under the permit to be carried out in accordance with the procedures and actions in the IMP. This included rehabilitation planting of *M. irbyana* within future Conservation land in the eastern portion of the site to ensure no significant residual impact on the species occurs as a result of the development.

In March 2019, rehabilitation planting by land care consultant Evolve commenced at the rehabilitation area in accordance with the IMP. This included weed treatment and tube-stock planting of *M. irbyana* within a 5,000 m^2 area within the eastern Conservation land.

As the Conservation land (and *M. irbyana* rehabilitation area) will be ultimately handed over to Logan City Council, the proposed *M. irbyana* rehabilitation area was requested to be legally secured as a Declared Area (Category A) under the *Vegetation Management Act 1999* (VMA) to counterbalance the clearing of *M. irbyana*. on site and to ensure objectives of the exchange area are fully achieved. The Voluntary Declaration Management Plan was approved by DNRME and the Declared Area was secured on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658). A copy of the Declared Area Map is included at **Appendix C**.

The Protected Plants Clearing Permit (Permit No. WA0009354) expires on 23 August 2020. While clearing within the Permit area has been undertaken, clearing at the locations of the *M. irbyana* patches has not yet occurred. Importantly, rehabilitation works have commenced and subject to legal rehabilitation success, monitoring and reporting benchmarks under the Voluntary Declaration Management Plan. The purpose of this report is to support renewal of the Protected Plants Clearing Permit.

1.2. Site Details

Contextually, the site is located 30 kilometres (km) south of Brisbane and 10 km west of Logan Village, within the western suburb of Greenbank. The site is bound by Greenbank and Teviot Roads to the west and is predominately surrounded by rural residential development. Wearing Park immediately adjoins the site to the east and Greenbank Shopping Centre and Community Centre are located opposite the site, on the western side of Teviot Road. The site is located approximately 1.5 km southeast of Greenbank Military Training Camp and 500 metres east of the Brisbane – Sydney Railway Line. An infrastructure easement traverses the site parallel to the northern boundary. The site remains one of the last large rural properties in the immediate landscape predominately comprised of rural residential development.

The proposed clearing works will be undertaken over 277 ha of the 412 ha site to facilitate a master planned development and will be subject to future operational works approvals from Economic Development Queensland (EDQ) (DEV 2016/768).

Key site details are provided in **Table 1** below.

Table 1: Property Summary

Address	423-520 Greenbank Road, Greenbank
RPD	Lot 1 on SP297192
Local Government Area	Logan City
Administering Authority	Economic Development Queensland
Priority Development Area	Greater Flagstone PDA
Planning Scheme	Greater Flagstone PDA Development Scheme
Area Classification / Zone	Urban Living
Existing Land Use	Rural

1.3. Protected Plants Flora Survey

In accordance with the regulatory requirements, Protected Plant Flora surveys were conducted where clearing is proposed, including within areas mapped as 'High risk' under the Protect Plants Flora Survey Trigger Map High Risk and as per the Guidelines. The 2020 surveys were undertaken in accordance with the Guidelines (i.e. High Risk Areas), but also included survey at the four previously known locations of *M. irbyana* on site recorded by 2018 surveys.

Protected Plants Flora Surveys undertaken in June 2020 confirmed *M. irbyana* in the four previously recorded locations and well as one new location (location 5). Refer **Plan 1** for *M. irbyana* located during 2018 surveys and **Plan 2** for the location for *M. irbyana* located during 2020 surveys and **Table 2** for a summary. It is noted growth categories have changed since 2018 with the classification of "semi-mature" introduced. Growth categories are defined in **Section 2.2**.

A copy of the 2020 Protected Plans Flora Survey Report is provided under a separate cover.

Table 2: *M. irbyana* Locations

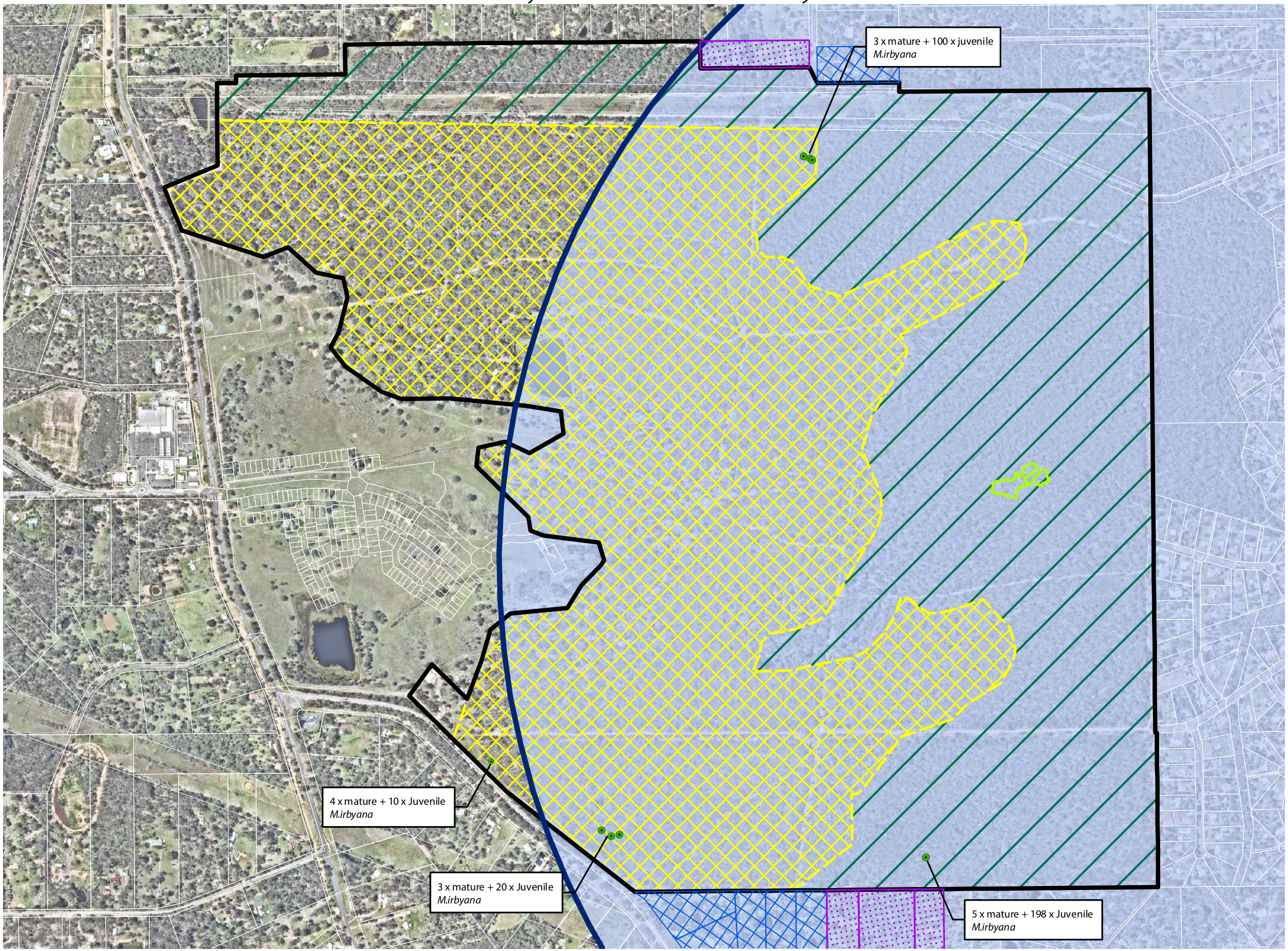
Location	2018 Survey Results	2020 Survey Results
1	3 x mature + 100 juveniles	3 x mature + 1 x semi mature + 100 juvenile
2	3 x mature + 20 x juveniles	3 x mature + 11 x semi mature + 10 juvenile
3a	4 x mature + 10 x juveniles	3 x mature
3b		1 x mature + 9 x juvenile
3c		2 x mature + 9 x semi mature + 3 x juvenile
3d		2 x semi mature + 2 x juvenile
4	5 x mature + 100 juveniles	5 x mature + 107 x semi mature + 8 x juvenile
5		x mature + 3 x semi mature + 24 x juvenile

1.4. IMP Intent

The IMP has been prepared in accordance with Section 3.2.1, as follows:

> **3.2.1 Impact management plan**
>
> An impact management plan must include the following sections:
>
> - attempts to avoid and minimise impact
> - nature of impact
> - management of impact
> - justification of impact management
> - survival of plant in the wild

1. 2018 Protected Plants Survey - *Melaleuca irbyana*



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LEGEND

- Project DCDB
- Qld DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- No Access under NCA Exemption (AP0007102)
- Surveyed under NCA Exemption (AP0007102)
- Mature *Melaleuca irbyana* specimen
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	13/07/2020	Preliminary	MP	KG

Transverse Mercator | GDA 1994 | Zone 56 | 1:10,000 @ A3

0 50 100 200 300 400 m

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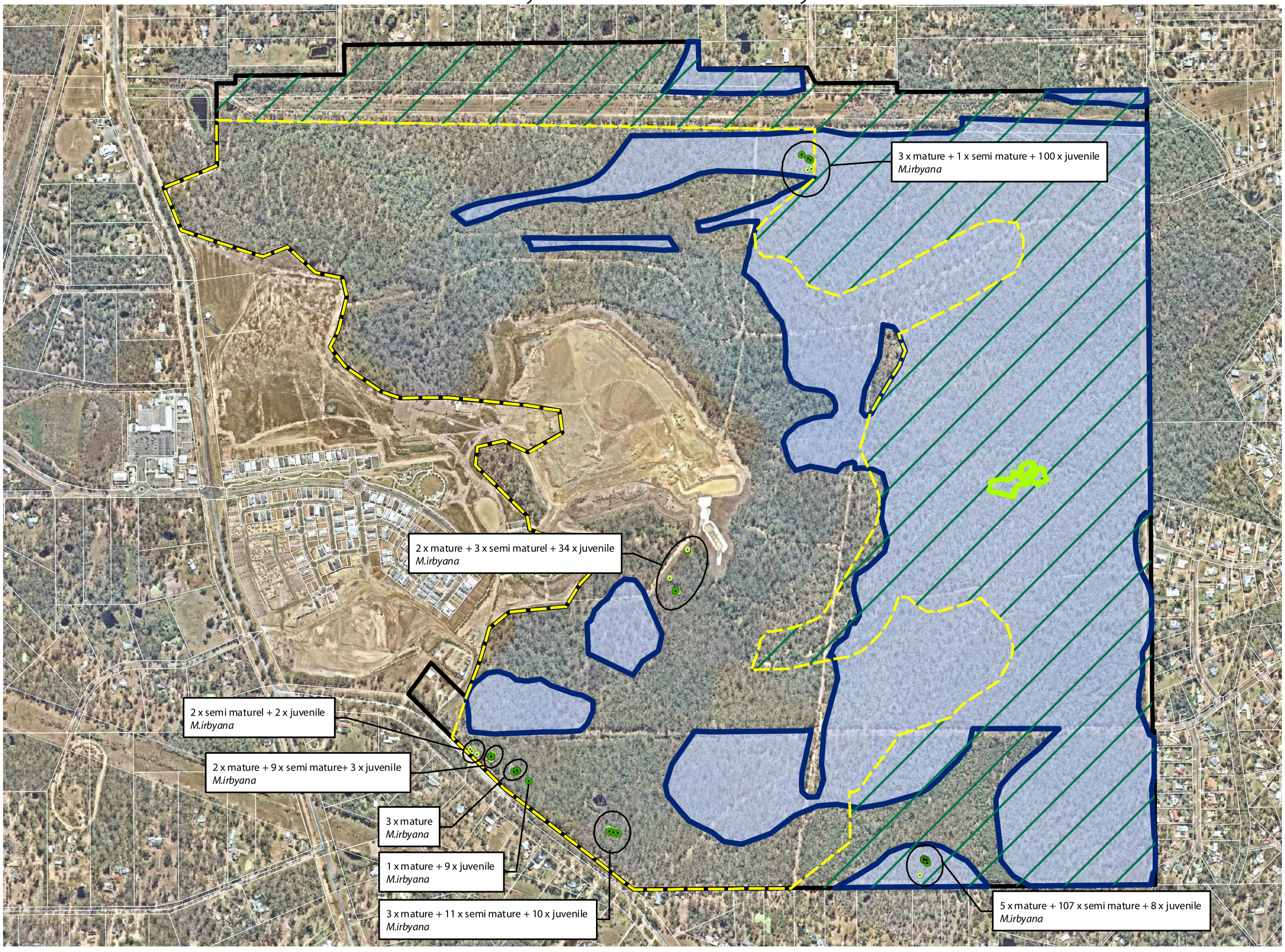
ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 13/07/2020 7598 E 01 NCA 2018 A

2. 2020 Protected Plants Survey - *Melaleuca irbyana*



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LEGEND

- Project DCDB
- QLD DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- Mature *Melaleuca irbyana* specimen
- Semi-mature or juvenile *Melaleuca irbyana* specimen
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	14/07/2020	Preliminary	MP	KG

Transverse Mercator | GDA 1994 | Zone 56 | 1:10,000 @ A3

0 50 100 200 300 400 m

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ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 14/07/2020 7598 E 02 NCA 2020 A

1.5. Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NCA) classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The Nature Conservation (Wildlife) Regulation 2006 (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 the Protected 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 **Plan 2**).

Prior to flora surveys, the schedules of the NCWR were considered in this report using a Wildlife Online Database Search with a 10 km radius from the site. Three (3) flora species listed under the NCWR were identified as having the potential to occur on site and are presented in **Table 3**. Refer to **Appendix D** for full search results.

Table 3: Wildlife Online Search Results–Flora

Scientific Name	Common Name	NCA Status
Marsdenia coronata	Slender Milkvine	Vulnerable
Coleus habrophyllus	-	Endangered
Melaleuca irbyana	Swamp Tea Tree	Endangered

2. Nature of the Impact

2.1. Background

The only EVNT species located within the Greenbank project area was *Melaleuca irbyana* (Swamp Tea Tree). This species was the only EVNT species recorded by 2018 surveys. Four (4) patches of *M. irbyana* preciously located in 2018 were confirmed on site during contemporary surveys in June 2020 to support renewal of the Protected Plants Clearing Permit (refer **Plan 1**). One additional patch of *M. irbyana* was recorded within the Clearing Area (location 5, refer **Plan 2**).

The existing Permit considered impacts for the entire Clearing Area (i.e. 277 ha). This IMP has been prepared for the same Clearing Area. It is anticipated the clearing of *M. irbyana* will occur within the next 2 years.

The profile of the species is detailed below in **Section 2.2**.

2.2. Protected Plant Profile

Melaleuca irbyana, a member of the Myrtaceae family, is listed as a threatened species under Schedule 2 of the *Nature Conservation (Wildlife) Regulation 2006* (NCWR) and is classified as "endangered". *Melaleuca irbyana* is also included as part of Endangered Regional Ecosystems (RE) 12.3.18, 12.3.19, 12.9-10.11 and 12.9-10.27 under the *Vegetation Management Act 1999* (VMA). This vegetation community is also listed as a Critically Endangered when present as a Threatened Ecological Community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

M. irbyana forms communities that occur in two (2) structural forms: the more common form consists of a dominant eucalypt canopy with an understorey containing *M. irbya*na thickets 8-12 metres in height; the less common form is an open forest or thicket of *M. irbyana* with emergent eucalypt trees. The understorey is sparse and can comprise of grasses, sedges, and herbs with a few shrubs, vines and possibly orchids present. There are fairly clear descriptions of *M. irbyana* communities, however, there are no clear indications of the point at which an individual tree or small number of trees are considered to be part of a community. An individual tree may still contribute reproductively to a community, or may have the potential to regenerate and in time create a community.

Growth categories for this assessment are definied as juvenile specimens less than two (2) meters in height, semi-mature specimens greater than two (2) meters in height but with a trunk less than 100mm DBH, and mature specimens retaining a trunk diameter of at least 100mm.

Logan City Council defines an *M. irbyana* community as, "*where Melaleuca irbyana occur in a patch size of 0.25 hectares or greater, or where a patch of Melaleuca irbyana less than 0.25 hectares adjoins a second patch and the sum of the patches is greater than 0.25 hectares*". This definition has been determined using methodology from the *Melaleuca irbyana* (Swamp Tea-tree) Community 1:25,000 Scale Mapping Project (Ryan, 2010).

2.3. *Melaleuca irbyana* On-site

The site was traversed as part of previous and contemporary NCA searches. *Melaleuca irbyana* were recorded the species in four (4) separate locations during both 2018 and confirmed again in 2020, with an additional patch also recorded (location 5). Refer to **Plan 1-2** for *Melaleuca irbyana* onsite locations. Four of these locations (locations 1, 2, 3, and 5) occur within the Clearing Area. One patch (location 4) is located outside the Clearing Area and will be retained by the development in Conservation. Refer **Table 4** for a description of the Regional Ecosystems.

2.3.1 Location 1

Location 1 is situated in the northern aspect of the site, adjacent to the power easement. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consists of three (3) established specimens, one (1) semi-mature specimen and one-hundred (100) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy, representing the Least Concern RE12.9-10.2.

Photo Plate 1: Location 1

2.3.2 Location 2

Location 2 is situated towards the south-western property boundary, adjacent to Greenbank Road. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This *Melaleuca irbyana* (Swamp Tea-tree) patch consists of three (3) established (mature) specimens, eleven (11) semi-mature specimens and ten (10) juvenile specimens. This patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Allocasuarina littoralis* (Black She-oak) and *Acacia spp.* regrowth.

Photo Plate 2: Location 2

2.3.3 Location 3

Location 3 is situated towards the south-western property boundary, adjacent to Greenbank Road and approximately 380 m west of Location 2. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consists of six (6) mature specimens, eleven (11) semi-mature specimens and fourteen (14) juvenile specimens. The overall patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Acacia leiocalyx* (Early Flowering Black Wattle), *Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth. The patch is separated into four separate patches.

Photo Plate 3: Location 3

2.3.4 Location 4

Location 4 is situated towards the southern property boundary, approximately 800 m east of Location 3. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch consists of five (5) mature specimens, one hundred and seven (107) semi-mature specimens and eight (8) juvenile specimens with a height less than two (2) meters. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy, typically representing the Least Concern RE12.9-10.2.

Photo Plate 4: Location 4

2.3.5 Location 5

Location 5 is situated towards the central portion of the development footprint. This patch is located within mapped non-remnant vegetation or Category X as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch consists of two (2) mature specimens retaining a trunk DBH greater than 100mm, three (3) semi-mature specimens with a trunk less than 100mm and a height greater than two (2) meters, and thirty-four (34) juvenile specimens with a height less than two (2) meters. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Allocasuarina littoralis* (Black She-oak) with scattered *Acacia leiocalyx* (Early Flowering Black Wattle), *Eucalyptus crebra* (Narrow Leaf Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum). These species are typical of the Of Concern Regional Ecosystem community 12.9-10.7.

Photo Plate 5: Location 5

Table 4: Regional Ecosystems Descriptions

Status	Code	Description
Endangered	12.9-10.12	Corymbia intermedia, Angophora leiocarpa, Eucalyptus seeana +/- E. siderophloia, E. tereticornis, E. racemosa subsp. racemosa, C. citriodora subsp. variegata woodland to open forest. Lophostemon suaveolens is often present as a sub-canopy or understorey tree. Occasional Melaleuca quinquenervia on lower slopes. Does not include areas dominated by Eucalyptus racemosa subsp. racemosa. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).
Of Concern	12.9-10.7:	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).
Of Concern	12.3.11	Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. E. seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)
Least Concern	12.3.6:	Melaleuca quinquenervia +/- Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia open forest to woodland with a grassy ground layer dominated by species such as Imperata cylindrica. Eucalyptus tereticornis may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a)
Least Concern	12.9-10.2:	Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, E. moluccana, E. acmenoides and E. siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

Based on the information provided in **Section 2.2**, the specimens located on site are not consistent with a *Melaleuca irbyana* community due to the patches predominately containing juvenile individuals with relatively few fully mature specimens. Importantly, these patches are not associated with Endangered Regional Ecosystems. Locations 1 and 4 were confirmed via a certified PMAV to be located within composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 while locations 2, 3 and 5 were located within non-remnant areas.

While Location 1 contains a substantial amount of juvenile species, overall, the significance of these patches is considered less than if they formed part of a broader existing community. The habitat value they currently provide is considered relatively limited, with no obvious noteworthy habitat for flora or fauna observed at the time of survey.

3. Management of the Impact

The proposed earthworks to facilitate the development footprint will require the removal of four (4) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens over the next two years as development progresses. A significant residual impact (SRI) assessment was undertaken in accordance with the *Queensland environmental Offsets Policy - Significant Residual Impact Guideline (DES 2014)* as part of the approved IMP (refer **Appendix B**). Prior to the SRI, an assessment survival in the wild and avoidance and mitigation was considered.

3.1. Avoidance and Minimisation of Impact

An assessment for the survival of the plant in the wild was previously made as part of the IMP (refer **Appendix B**) and has been updated as part of this assessment.

The proposed works are for the development of Greenbank master planned development in the Greater Flagstone PDA. Preliminary approval for the context plan and master plan has been issued by EDQ. These plans were informed by detailed analysis of the site by specialist consultants, including a detailed ecological analysis by SHG. Subsequently, areas for development shown are concentrated to areas of least constraint. Areas of highest ecological value have been identified for retention as conservation.

The proposed works will include the creation of residential allotments, a proposed school site, new roads, park and conservation areas and corridors. Minimisation of overall clearing impacts are evident through location of the proposed development, located outside Endangered remnant vegetation and waterway corridors. Rehabilitation of conservation areas and waterways is proposed as part of the development.

The proposed earthworks to facilitate the development footprint will require the removal of four (4) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens over the next two years, and ongoing property boundary maintenance within 100 m of the retained patch (Location 4). These specimens are located within Of Concern and non-remnant regrowth areas (refer **Plan 2**).

As per the EDQ endorsed Natural Environment Site Strategy, extensive conservation of greater than 89 hectares of proposed Conservation Parkland adjoining Norris Creek and Wearing Park is proposed as part of the development. In accordance with best practice management, restoration and rehabilitation works will seek to stabilise and reverse the negative effects of ongoing habitat fragmentation. The intent is for managed areas of rehabilitation and restoration to rectify canopy gaps and restore bare or denuded areas to provide additional habitat and refugia within the lower strata to maintain connectivity with external approval corridors and improve terrestrial corridor viability. Rehabilitation works within the conservation area and waterway corridors will include weed management and replanting with native species consistent with mapped Regional Ecosystems to augment ecological values and enhance connectivity.

Melaleuca irbyana grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and *Melaleuca* woodland with a sparse and grassy understorey. The species prefers poorly draining, heavy clay soils (Byrnes 1984; Barlow 1987). The approved conservation land rehabilitation works include an established *Melaleuca irbyana* thicket within remnant woodland forest to the north of the central waterway (Plans **2 & 3**). This land is relatively low lying and adjoins an ephemeral waterway that contains permanent billabongs. The approved *Melaleuca irbyana* planting site is therefore considered ideal for the species, which is dependent on specific groundwater and / or surface water hydrology. Impacts to *Melaleuca irbyana* have been minimised to the greatest practical extent and include establishing the *Melaleuca irbyana*

community, on the project site, within future conservation land and managing potential impacts from ongoing works that will occur within 100 m of a retained patch.

3.2. Survival of the Plant in the Wild

An assessment for the survival of the plant in the wild was previously made as part of the IMP (refer **Appendix B**) and has been updated as part of this assessment.

Based on the current disturbed nature of the site and the locations of the *Melaleuca irbyana* specimens mostly along property boundaries, it is not anticipated that the removal of four (4) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens will significantly hinder the future success of the species in the area. Importantly, the patch in location 4 is to be preserved within the conservation area and approved and established rehabilitation works provide a *Melaleuca irbyana* community on the site allowing the community to be protected in perpetuity.

3.3. Significant Residual Impact (Justification of the Impact)

A SRI assessment (refer Section 3 of the IMP at **Appendix B**) was made to support the Protected Plants Clearing Permit (Permit No. WA0009354) for the clearing of *Melaleuca irbyana* specimens within the 277 hectare clearing area. The SRI assessment concluded the clearing of three small patches of M. irbyana for the development would not result in a SRI due to extensive rehabilitation works proposed within the onsite Conservation land, including the establishment of a 5,000 m^2 *Melaleuca irbyana* thicket resulting in a net gain in *Melaleuca irbyana* across the site.

While rehabilitation for the 5,000 m^2 *Melaleuca irbyana* thicket has been undertaken, the permit for clearing within the 277 ha area is about to expire.

Renewal of the Protected Plant Clearing Permit for the same impact (i.e. clearing 277 ha) is requested. While an additional patch of *M. irbyana* has been identified, this falls within the same 277 ha impact area as previously assessed under the Permit No. WA0009354. The below SRI assessment for the clearing of the four patches of mostly juvenile *M. irbyana* proposed under this permit renewal concludes, with the established rehabilitation works, the impact would not result in a SRI.

To demonstrate this mitigation of impact, a response to the four (4) points of consideration within Section 1.2 of the *Significant Residual Impact Guideline* was provided below for ease of reference

- **The extent and duration of impact on the matter and its sensitivity to disturbance.**

  The impact on the matter is the removal of four (4) relatively small patches (locations 1, 2, 3 and 5) of predominately juvenile *Melaleuca irbyana* specimens from former paddock areas that have already been subject to high disturbance from cattle grazing and historical clearing. A patch (at location 4) will be retained with ongoing adjoining works within 100 m limited to the maintenance of the nearby property boundary. The sites are described in detail in **Section 2.3**, shown in **Plan 2** and summarised below:

  - Location 1: 3 x mature s + 1 x semi mature + 100 juvenile specimens, located within the north-east along a drainage feature
  - Location 2: 3 x mature + 11 x semi mature + 10 juvenile specimens, located along the southern boundary
  - Location 3: 5 mature + 20 semi mature + 14 juvenile specimens, located along the southern boundary
  - Location 4: 5 mature + 107 x semi mature + 8 x juvenile specimens, located along the southern boundary in the south-west

- Location 5: 2 x mature + 3 x semi mature + 34 x juvenile specimens, located within the central portion of the site

- **Timeframe for rehabilitation relative to the impact occurring and the ability of the matter to maintain its viability during this timeframe.**

  As required under Permit No. WA0009354 rehabilitation planting of six hundred and twenty-five (625) advanced tube stock specimens of *M. irbyana* occurred within a 5,000m^2 area within the central waterway corridor of the conservation zone (refer **Plan 2**). Although it is expected that these plantings will take approximately four (4) years to reach maturity they have been planted in a thicket to replicate as close to natural conditions for a *M. irbyana* ecological community as possible and will be maintained as part of the extensive rehabilitation works for the conservation zone. The area of planting of this thicket adjoins the central waterway corridor and is not within 100 m of future development areas. This location has been chosen to avoid human disturbance and as far away as possible from conflicting uses. Importantly, the rehabilitation area has been legally secured on title as a declared area (Category A) under the *Vegetation Management Act 1999* (refer **Appendix C**) and will be handed over to Logan City Council, along the with the waterway corridor, following the on-maintenance period. Further, the patch of *M. irbyana* at location 4 will be retained within the Conservation area and will be subject to regular compatible weed suppression and monitored for persistence as part of site maintenance before being handed over to Council.

- **Likely success of rehabilitation works to return the impacted matter to its original condition, and;**

  It is important to note that the Regional Ecosystems within and adjoining the creek corridor reflect those where the *M. irbyana* patches are currently located on-site. The rehabilitation area was chosen after detailed ecological survey of site attributes, including the prevailing low-lying topography, proximity to the creek, and canopy gaps with limited existing understorey. Thus, the planting of *M. irbyana* in the creek corridor has a high likelihood of success given the suitable landscape and habitat.

  Planting was undertaken by land care experts Evolve Environmental. Given that the impact is the removal predominately juvenile *M. irbyana*, the planting of six hundred and twenty-five (625) specimens of *M. irbyana* as a thicket within the conservation zone will result in rehabilitation outcomes and a consolidated *M. irbyana* thicket which will far exceed the impacted matter.

- **The time-lag effect—between impact and rehabilitation successfully delivering the original condition for the matter—on the matter's viability.**

  As mentioned previously, the removal of four relatively small patches of *M. irbyana* is not considered to significantly impact upon the viability of local populations nor remove significant habitat values. Although there will be a time-lag between the removal of the predominantly juvenile *M. irbyana* specimens and the maturity of the tube stock of *M. irbyana*, planting has already occurred to reduce the potential time lag-effect to the greatest practical extent. Overall, the rehabilitation proposed is considered a far superior ecological outcome for viability of local populations.

  The extent and number of *M. irbyana* planted is intended to establish a self-sustaining thicket of *M. irbyana* in a safe and secluded buffer environment that is capable of mitigating the proposed impacts. It is acknowledged that any future unavoidable loss of *M. irbyana* from the development area will be assessed by DES on a case by case basis, however, it is requested that DES consider the approval of Permit No. WA0009354 for the clearing of 277ha on the site consistent with the clearing being proposed.

3.4. Voluntary Declaration

As the Conservation land (and *M. irbyana* rehabilitation area) will be ultimately handed over to Logan City Council, the proposed *M. irbyana* rehabilitation area was requested to be legally secured as a Declared Area (Category A) under the *Vegetation Management Act 1999* (VMA) to counterbalance the clearing of *M. irbyana*. on site and to ensure objectives of the exchange area are fully achieved.

The "*Voluntary Declaration Management Plan (Melaleuca irbyana Declared Area), 432-520 Greenbank Road, Greenbank, prepared by Saunders Havill Group for Mirvac (Queensland) Pty Ltd, dated March 2019*" was submitted to the Department of Natural Resources, Mines and Energy (DNRME) as part of the Voluntary Declaration and included the following attachments:

- Appendix A – Protected Plants Clearing Permit (Permit No. WA0009354)
- Appendix B - *Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018'*
- Appendix C – Declared Area Plan (proposed)
- Appendix D - *Melaleuca irbyana* Declared Area Rehabilitation Plan, prepared for Mirvac QLD Pty Ltd, by SHG dated March 2019.

Importantly, the Rehabilitation Plan in Appendix D of the Voluntary Declaration application, provides detailed rehabilitation, monitoring and reporting procedures in format suitable for tender and expands on the single page plan in Section 3 of the IMP (previously assessed and approved by DES in 2018 (Permit No. WA0009354).

The Voluntary Declaration Management Plan was approved by DNRME and the Declared Area was secured on title on 3 March 2020 and is shown as Category A (PMAV 2019/002658).

A copy of the Rehabilitation Plan has been extracted and included hereafter for ease of reference.

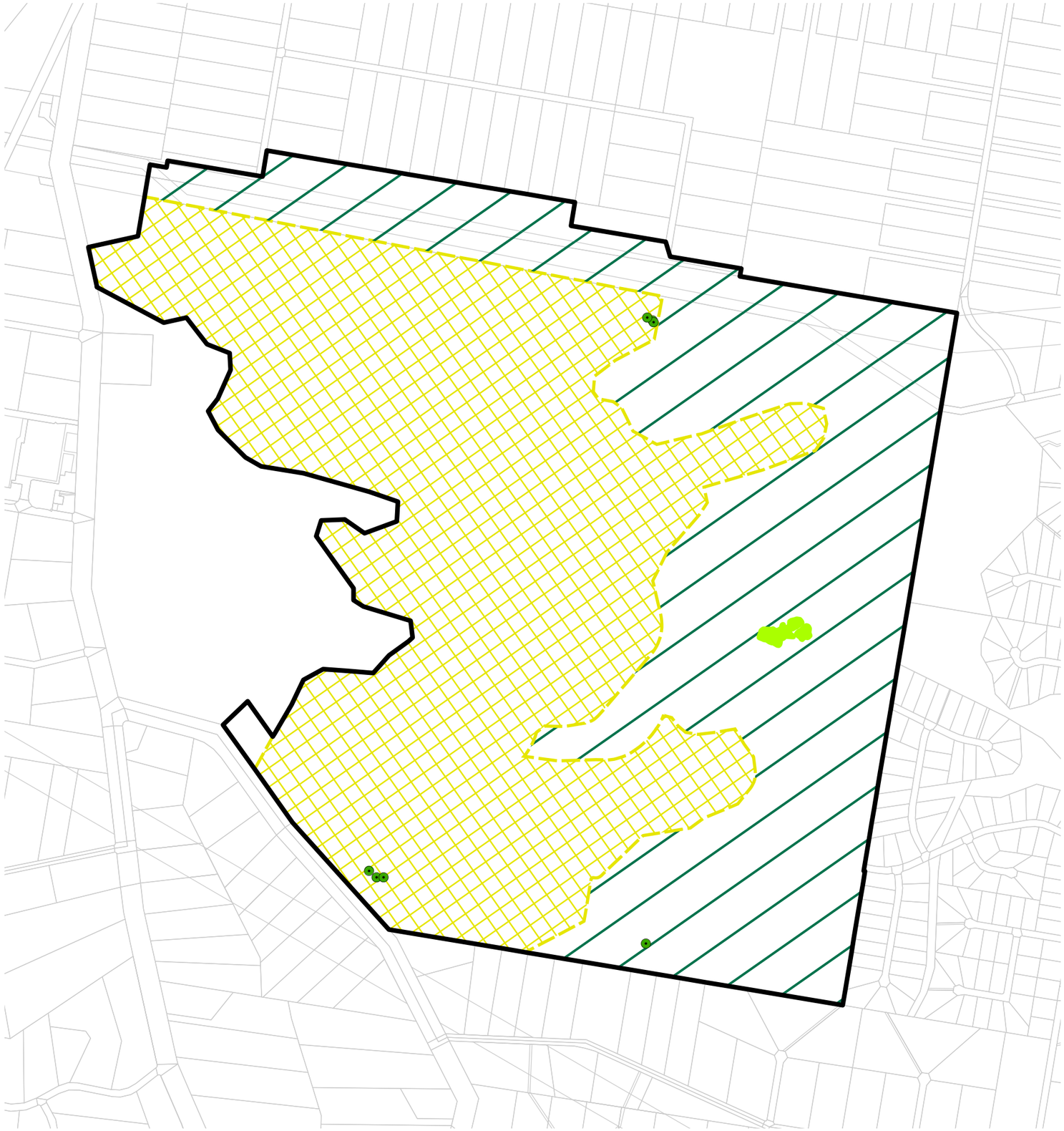
3.5. Rehabilitation

Land care Consultants Evolve were engaged by Mirvac to undertake installation and establishment of the *M. irbyana* rehabilitation area. Rehabilitation works area ongoing in accordance with the Rehabilitation Plan (refer Photos below). It is understood that the *M. irbyana* offset area planting was completed in January 2020 and Evolve are continuing maintenance practices as specified in the approved Rehabilitation Plan. Refer to **Plan 3** for a plan of the rehabilitation area extracted from the VDec.

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

PLAN SET				
SHEET NO.	TITLE	DESCRIPTION	ISSUE	DATE
1	7598 E 01 VDEC RMP B	Cover sheet	B	23/05/2019
2	7598 E 02 VDEC RMP A	Details sheet	A	15/04/2019
3	7598 E 03 VDEC RMP B	Introduction / Weed management	B	23/05/2019
4	7598 E 04 VDEC RMP A	Planting, fauna, responsibilities	A	15/04/2019
5	7598 E 05 VDEC RMP B	Maintenance and monitoring	B	23/05/2019
6	7598 E 06 VDEC RMP A	Monitoring photo plan - Pre-works/Maintenance	A	15/04/2019
7-9	7598 E A01-A03 V-DEC RMP A	Appendix A - Weed treatment & Removal	A	15/04/2019



Legend

- *Melaleuca irbyana* patch
- Declared Area
- Conservation area
- Urban Area
- Project site
- QLD DCDB

Saunders Havill Group

CLIENT: Everleigh

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PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDER-GROUND SERVICES AND DETAILD LOCATIONS OF ALL SERVICES.

AMENDMENTS:

Issue	Date	Description	Checked
B	24/05/2019	Client Amendments	AD

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PROJECT:

423 - 520 Greenbank Road, Greenbank (1/SP297192)

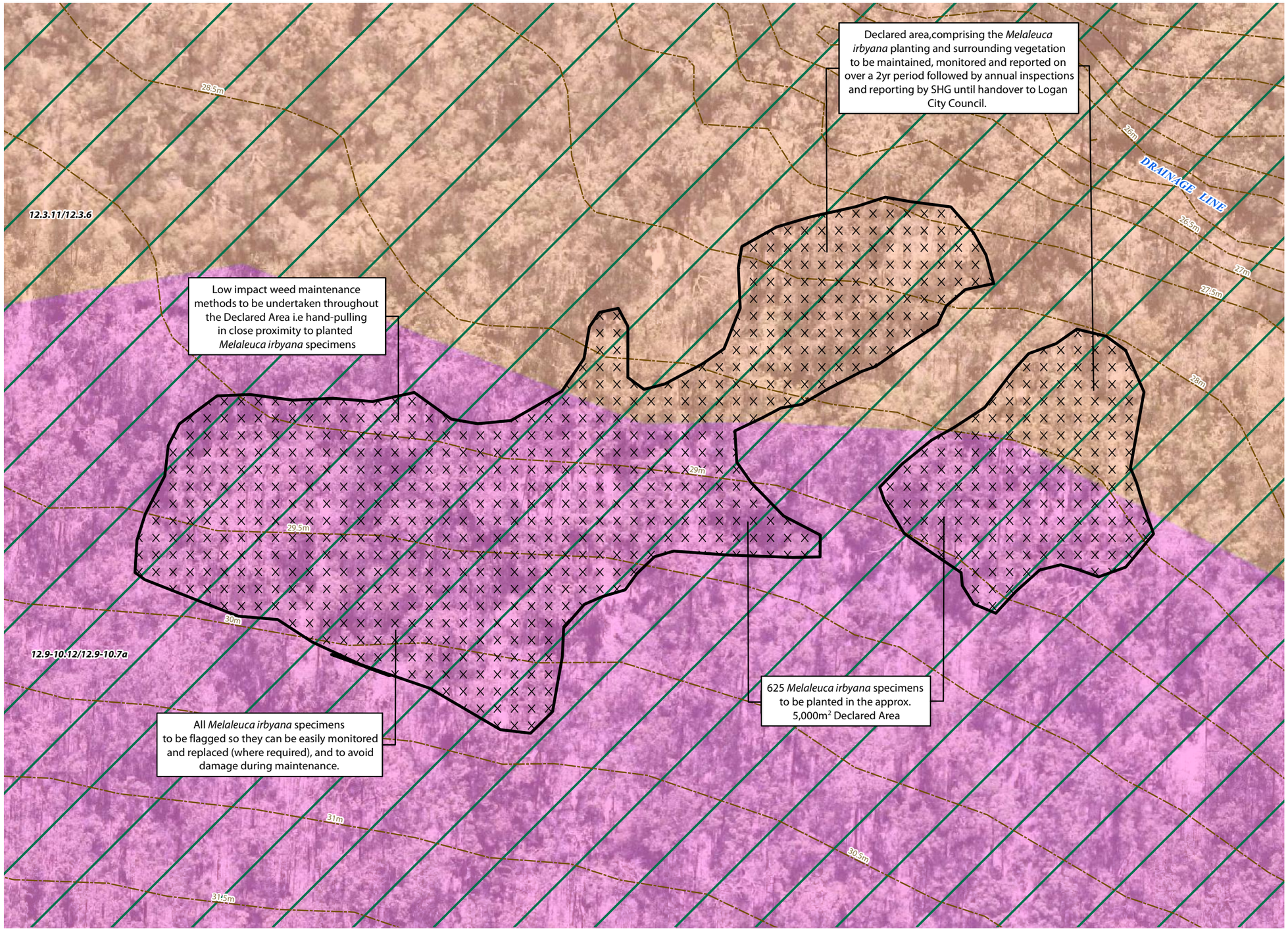
environmental management

PLAN OF: Rehabilitation Plan Cover Sheet

DATE:	24/05/2019	CHECKED:	AD
CLIENT REF.:	JOB NO.	DRAWN:	MC
DRAWING No.:	7598 E 01 VDEC RMP B		

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN - DETAIL SHEET



LEGEND

- Management Zone 1: Melaleuca Irbyana planting and rehabilitation site (Approx. 5,000m²)
- Conservation area
- Contours (0.5m)

VM regional ecosystem map - v11

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems

CLIENT: Everleigh

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REFERENCES:

AMENDMENTS:

Issue	Date	Description	Checked
A	15/04/2019	Client Draft	AD

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PROJECT: 423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF: Detail Sheet

DATE:	15/04/2019	CHECKED:	AD
CLIENT REF:	7598	DRAWN:	MC
DRAWING No.:	7598 E 02 VDEC RMP A		

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

INTRODUCTION

Saunders Havill Group (SHG) was engaged by MIRVAC to prepare a Voluntary Declaration Rehabilitation Plan (VDRP) for the clearing of 140 *Melaleuca irbyana* (Swamp Tree Tree) specimens. The replacement plants will be located in a Declared Area within the approved conservation area of the Everleigh project. The clearing works, current and future will facilitate the creation of residential lots, a school, and internal roads for the site's ultimate development layout.

The rehabilitation proposal for the clearing of 140 *Melaleuca Irbyana* is the planting of more than four (4) advanced tube stock specimens of *Melaleuca Irbyana* per tree cleared. A total of 625 (560+65 additional) *Melaleuca Irbyana* will be planted as a result. The Declared planting area is proposed within the site's conservation zone (refer Plan 2) and will cover 5,000 m^2. The specific location of the planting area was determined onsite by Ecologists from SHG. The percentage of existing canopy cover and the land zone features were taken into consideration when determining the optimal location for planting. Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *Melaleuca Irbyana* ecological community as possible and maintained as part of the rehabilitation works for the conservation zones. The area of planting of this thicket is centralised within the conservation zone and adjacent the waterway corridor, as stipulated by the EDQ approved NESS, and not within 100m of future development areas.

This Rehabilitation Plan is drafted to identify and manage the site disturbances for the planting of the 625 *Melaleuca Irbyana* specimens within a 5,000m^2. The planting will involve low impact weed removal and the retention of any existing native vegetation in the immediate area. The planting will be succeeded by a two (2) year period of maintenance, monitoring and reporting, then annual inspections and reporting by SHG until handover to Logan City Council.

REHABILITATION - APPROACHES

Ecologists from SHG have assessed the site's vegetation. Broadly, it was determined that a hybrid of infill planting and minor reconstruction approaches will be used on site. This approach is described below:

ECOLOGICAL RESTORATION APPROACH	
INFILL PLANTING / MINOR RECONSTRUCTION	
Applies:	To natural areas where the native plant community is largely healthy and functioning. Where area retains canopy trees, few T2 layer trees but with largely bare shrub and ground cover layers. 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 the main management issue is weed infestation and/or historical land use practices is causing ground and shrub layers to be absent from the area.
Role of planting:	Infill planting is to assist the existing natural area reach the intended composition through planting specific species.
Goal vegetation community:	The re-establishing plant community will be substantially similar in structure, composition and diversity to the original vegetation.

Note: Table adapted from Gold Coast City Council's 'Guideline for the preparation of a Rehabilitation Plan'

WEED MANAGEMENT

Rehabilitation treatment is to generally include the following points:

- A number of weeds are recorded for removal within shrub & ground layer
- Weed removal and management will utilise low impact methods to minimise impacts on planted *Melaleuca Irbyana* specimens

Weed management typically comprises a major part of rehabilitation site works. Weed management provides the basis of aiding natural regeneration and assisted natural regeneration. It also forms part of the preliminary work required for reconstruction and fabrication scopes. Weed Management to be undertaken in accordance with SEQERF Primary, Follow-up and Maintenance works notes (adjacent).

Critical skills for Weed Management include:

- Knowledge of relevant legislation
- Plant Identification skills
- Knowledge of different weed management techniques

Knowledge of Relevant Legislation:

It is expected contractors have a depth of knowledge of relevant legislation to complete site rehabilitation works.

This may include occupational Health and Safety laws as well as environmental and heritage protection legislation. Bush regenerators must comply with the requirements of the Workplace Health and Safety Act 2011 or, when working on Commonwealth lands, the Commonwealth's Occupational Health and Safety (Commonwealth Employment) Act 1991. Contractors should also obtain all relevant permits required under State and Commonwealth legislation (e.g.Nature Conservation Act 1992, Fisheries Act 1994, Vegetation Management Act 1999, Biosecurity Act 2014). Contractors must also be aware of and adhere to cultural heritage protection obligations under the Aboriginal Cultural Heritage Act 2003 and where chemicals are in use, the Agricultural Chemicals Distribution Control Act 1966.

In addition to the above, contractors should also be familiar with local government body requirements (e.g. Pest Management Plans, Local Codes, Policies and Guidelines) and Classifications of weeds. Refer to adjacent schedules for classification of weeds under the Biosecurity Act 2014).

RESTRICTED MATTERS (*BIOSECURITY ACT 2014*)	
Category	Description
1	must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. Includes red imported fire ants, electric ants, Asian honey bees, and certain animal diseases, aquatic diseases and pathogens.
2	must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. includes certain noxious fish, weeds and pest animals
3	You must not distribute this restricted matter. It must not be given as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit. Deliberate human distribution or disposal contrary to the legislation is a key source of spread into other areas. includes weeds, pest animals and noxious fish
4	You must not move this restricted matter to ensure that it does not spread into other areas of the state. includes specific weeds, pest animals and noxious fish
5	You must not possess or keep this restricted matter under your control. These pests have a high risk of negatively impacting on the environment. You may only keep this restricted matter under a permit of the *Biosecurity Act 2014* or another Act. includes weeds, pest animals and noxious fish
6	You must not feed this category of restricted matter. Feeding this restricted matter may cause their numbers to increase and negatively impact the economy or the environment. Feeding for the purpose of preparing for or undertaking a control program is exempted. Includes invasive animals such as feral deer, foxes, rabbits and wild dogs and noxious fish such as carp, gambusia and tilapia.
7	If you have these noxious fish in your possession you must kill the restricted matter and dispose of the carcass by burying the whole carcass in the ground above the high tide water mark or placing it in a waste disposal receptacle. Includes noxious fish such as carp, weather loach, climbing perch and gambusia

Plant Identification Skills:

Both native and weed species should be identified prior to primary weed removal works and ongoing throughout the follow-up and maintenance periods. This is to maximise natural regeneration and reducing likelihood of accidental weed spraying to native vegetation. Regenerating species to be treated and maintained in a similar manner to newly planted revegetation tubestock. If contractor is unsure of species, advise should be sought by botanist, specialist contractor or confirmed with Queensland Herbarium. Refer to indicative Weed Treatment schedules derived from Queensland Herbarium for an indication of weed species and treatments.

Knowledge of Different Weed Management Techniques:

A range of weed management techniques are available to combat varying weed species and scenarios. Refer to adjacent schedules and Appendix A for an indication of weed management techniques.

WEED MANAGEMENT TECHNIQUES	
METHOD	DESCRIPTION
Herbicide	The herbicide weed control techniques described below provide a range of proven methods that can be used on a restoration site.
Cut - Scrape-Paint	Cut the stem of the plant close to the ground (approximately 1-2cm) ensuring that soil does not come in contact with the cut surface. The cut can be made at a slight angle in order to increase the surface area that is exposed to the chemical. Apply herbicide immediately to the cut stump using poison pot and brush or dripper bottle. Using a knife, scrape the sides of the stump thoroughly to expose the green tissue. Apply herbicide to the scraped stump. The chemical must be applied within 10 seconds of the cut or scrape being made in order for it to be fully effective.
Cut - Paint	Cut the stem of the plant close to ground level. Apply herbicide to the cut stump using poison pot and brush or dripper bottle. This method is best suited to easy-to-treat weeds such as small-leaved privet (Ligustrum sinense), provided that the diameter of the stem at ground level is less than approximately three centimetres. If a glyphosate-/ metsulfuron methyl herbicide mix is being used in the poison pot, a greater range of weeds can be controlled using this method e.g. Easter cassia.
Scrape - Paint	Scrape as much of the stem as possible (one side of the stem) using a knife and apply herbicide to the scrape. Leave a small section of the vine unscraped, and then twist the vine so that the next scrape is made on the opposite side of the stem to the preceding scrape. Continue along the length of the vine, scraping and painting as much of the stem as possible, with scraping to be concentrated along the thicker stems close to the root of the plant. This is the best method to use for madeira vine, as it allows the chemical to translocate to the underground storage organs and aerial tubers which may be hanging in large clusters above head height. This avoids the potential problem of tubers from cut stems left hanging in the trees from dropping to the ground and sprouting. When scraping madeira vine stems a deep scrape is advisable – scrape right through to the fibrous, stringy section of the stem, taking care not to sever the vine. This method is also suitable for treatment of ochna.
Over-spraying	Over-spraying involves the use of knapsacks or power sprayers to treat large expanses of weed such as lantana thickets. The foliage must be covered with herbicide but not to the point of running off the plant. The dead plants remain in place and can be cut down at a later stage. Prior to over-spraying, any weeds that are growing closely around established native plants must be hand removed or treated by cut-scrape-paint.
oll-hang	Vines such as mile-a-minute (*Ipomoea cairica*) which produce long stolons extending many metres along the surface of the ground, are suited to the roll-hang method. Locate the base of the plant and carefully pull up the runners and roll them up. The resulting roll of vine is then hung in the fork of a tree to dry out as if it is left on the ground it is likely to re-shoot. Where runners are climbing up into a tree they are cut off at head height prior to the runner being rolled up – there is no need to pull cut vines down from trees as this action is likely to damage the tree. The base of the vine is treated using the cutscrape-paint method.
Gouge-paint	This method applies to plant species that have a fleshy underground storage organ, such as the large tuber that is often found at the base of madeira vine. It is also particularly appropriate for the treatment of climbing asparagus (*Protasparagus plumosus*). If using this technique on climbing asparagus, first cut the stems that are growing into the canopy at head height and also at the base. The fleshy rhizome can then be gouged, or alternatively in the case of climbing asparagus, it may be struck several times firmly with the head of a pair of loppers, allowing the brown outer covering of the crown to peel away exposing the white fleshy inner section of the rhizome for application of herbicide. Gouge out sections of the fleshy base with a knife and apply herbicide using a paint pot and brush or dripper bottle within 10 seconds.

WEED MANAGEMENT TECHNIQUES	
METHOD	DESCRIPTION
Basal Barking	This method involves mixing an oil-soluble herbicide in diesel/kerosene and painting or spraying the full circumference of the trunk or stem of the plant from ground level to a height of approximately 45cm. Basal bark application is suitable for thin-barked woody weeds including saplings, regrowth and multi-stemmed shrubs. The method will usually result in the mortality of difficult-to-control woody weeds at any time of the year, provided the bark is not wet or too thick to enable the herbicide to penetrate. The method should not be used in wet weather, adjacent to waterways or in areas where native trees and shrubs are located. The use should be restricted to situations where a weed is particularly difficult to control e.g. cherry guava and where other methods have been unsuccessful.
Splatter Gun	This small gas-powered injector kit is fitted into a knapsack for easy carrying and delivers large droplets in a stream over the weed. The gun is used to deliver a concentrated herbicide (glyphosate or metsulfuron methyl) across large dense expanses of weed. The method is used for species such as lantana (ratio of 1:9 of glyphosate:water). Splatter gun involves spraying strips at one to two metre intervals over the thicket. The herbicide is then translocated throughout the entire plant. The method does not require the whole plant to be covered as in over-spray.
Spot-spraying	A knapsack filled with an appropriate herbicide mix is used by the operator to selectively control environmental weeds. A keen eye and an ability to distinguish between the native and weed species likely to be present, especially at seedling stage, is essential. Marker dye is added to the chemical mix to allow the operator to see what has already been sprayed, thus covering the ground weeds comprehensively and thoroughly Glyphosate and metsulfuron methyl are the main herbicides used for spot-spraying in ecological restoration, together with the addition of a penetrant and/or surfactant and marker dye.
Stem Injection	Large woody weeds such as camphor laurel, coral trees (Erythrina spp, Privet Ligustrum spp) and umbrella trees are generally treated by stem-injection. Holes are drilled at regular intervals around the base of the tree and exposed roots using a drill. A tree injection syringe attached to a small capacity knapsack is used to fill the holes with the herbicide. Stem-injection of trees can also be undertaken using a hatchet to create cuts in a 'brickwork pattern' in trunks of trees for the application of herbicide (known as tree frilling). Frilling is more labour intensive than drilling. The greatest benefit of steminjection is that the trees can be left standing in situ as they die, provided there is no risk to humans or infrastructure from falling limbs. This creates convenient roosts for birds and other animals, and prevents the formation of large amounts of debris on the ground and damage to understorey plants which would result if the trees were to be cut down using a chainsaw.
Wick Wiping	Wick wipers can be manually used with a sponge or wick applicator, attached to a container filled with herbicide or as an attachment towed by a tractor. The manual method can be used to selectively apply herbicide to the leaves of weeds growing in sensitive situations. The hand-held container can leak and generally spot spraying would be recommended. The use of a tractor drawn wick wiper is used to control taller growing species such as introduced grasses and to encourage the growth of lower growing species. This method could be used in preparation for planting.
Mechanical	Mechanical weed control involves the use of powered and non-powered equipment such as brushcutters, chainsaws, slashers, shovels, pruners, saws, etc. These methods are best used in situations where there is a large, uninterrupted stand of weeds.
Dig and Bag	Dig and remove tuberous/ rhizomatous root systems. Remove roots or whole plant in hard/ compacted soils. Place in suitable container and remove from site, dispose of by deep burial, burn or burial at a land fill, must not place declared weed species in recycling (mulch).
Hand-Pull	Remove totally from ground by hand (human). Perform when soil is moist. Applicable to small infestations or areas of environmental sensitivity (including sensitive watercourses, when frogs are breeding, or presence of threatened species).
General Mechanical	May involve use of machinery (e.g. brushcutter, chainsaw, slasher, dozer, excavator). Suitable for large infestations and weed trees. Initially cost-effective, but requires immediate revegetation of site or matting/ mulch application and extensive maintenance periods. Generates excessive soil and vegetation disturbance.

Note: Table adapted from a table in SEQERF

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Surveying | Civil Engineering | Urban design | Environmental

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REFERENCES:

South East Queensland Ecological Restoration Framework (2012)

Guideline for the preparation of a Rehabilitation Plan (GCC)

AMENDMENTS:

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A	15/04/2019	Client Draft	AD
B	24/05/2019	Client Amendments	AD

PROJECT:

423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF: Rehabilitation Plan Notes

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Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

PLANTING

Prior to undertaking planting installation, the following general items should be considered:

- Sourcing plant material
- Timing of planting
- Site preparation
- Planting density
- Planting installation

Sourcing Plant Material:

There are a number of options for sourcing plant material for revegetation purposes. Propagation from site seed is a good outcome however is often limited by required timing of works. Sourcing planting from local nurseries is the commonly chosen option and has the following benefits:

- Awareness of genetic considerations when collecting seed.
- Experience with breaking dormancy mechanisms in hard to germinate seeds.
- Highly successful propagation techniques.
- Ability to provide high quality stock to order
- Draw on industry resources.

For threatened species, it is recommended to source seed from stock of local provenance, as close to the receiving site as possible—to maintain the genetic signature of the local population. Furthermore, seed should be sourced randomly from as many individuals as possible across the population—to ensure a representative range of genetic material is collected and to minimise potential for inbreeding.

Timing of Planting:

The timing of planting should ideally be aligned with the wet season in SEQ (summer and autumn). This minimises the need for intensive watering to establishment planting. Planting between February to May is the most beneficial as it also seeks to avoid intense heat periods of summer. Despite this, it is understood planting may occur at various times within the rehabilitation areas due to development timing needs.

Site Preparation:

Site or planting preparation includes:

- Fencing to exclude grazing animals and people (if required)
- Pre-spraying of exotic grasses and other weeds to planting areas
- Consideration of source of water for new planting (access tracks, temporary irrigation)
- Arranging delivery of mulch, jute netting and treeguards (if required)
- Treatment of heavily compacted soils by ripping and or application of gypsum
- Soil amelioration as required

Planting Density:

The planting will provide a net benefit of greater than 4 to 1 in an area protected under the NESS. Planting of the 625 specimens will be planted at approximately 1 per 8m2 to form a *Melaleuca Irbyana* thicket.

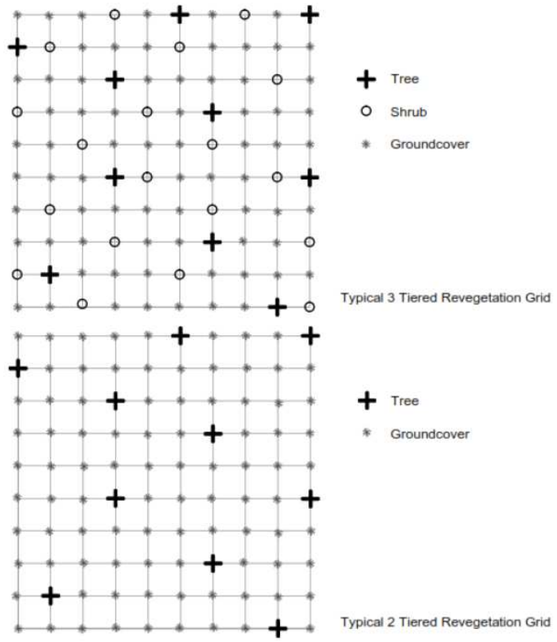
PLANTING INSTALLATION

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 sheet, 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.
- 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.
- Planting is to be undertaken in accordance with the planting grid contained within this drawing sheet.
- 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:
    - 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 200mm
    - 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.

PLANTING SET OUT

Revegetation planting locations shall be generally set out in accordance with a typical random grid pattern as shown below.



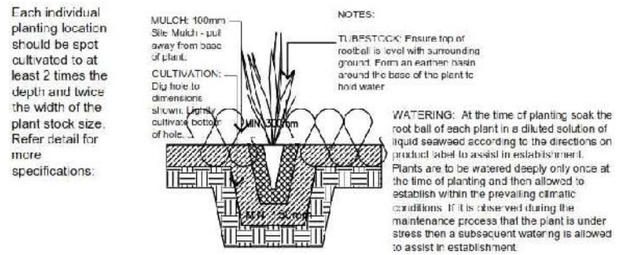
Typical 3 Tiered Revegetation Grid

Typical 2 Tiered Revegetation Grid

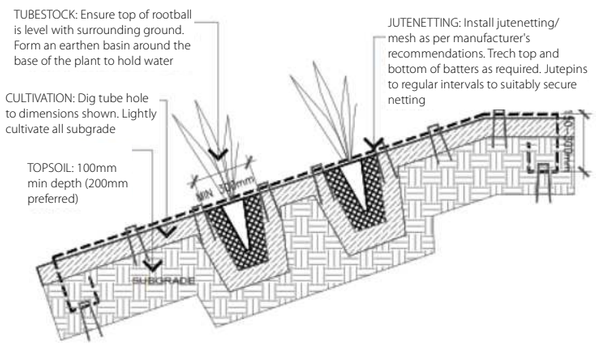
MULCH / JUTE MATTING

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 Jute mat and or suitably anchored natural fibre weed mat installed to manufactures specifications have been specified.

Typical planting details as below for standard medium mulch installation and jute netting. Refer to manufacturer's recommendations for detailed jute netting installation including pinning, etc.



Where evidence of plant damage is occurring i.e. Kangaroo or wallaby grazing, tree guards grow tubes to be installed as required.



Jute netting mesh to be installed as per manufacturer's recommendations. Indicative detail shown only.

FAUNA CONSIDERATIONS

Consideration for fauna habitat and values should be given during rehabilitation site works and should seek to enhance and restore the existing native vegetation areas and promote safe fauna movement throughout the site and into the larger greenspace corridors where possible. It is assumed properties adjacent to the rehabilitation scope of works will undertake individual site analysis, fauna investigations, and implement future measures as required. As part of these rehabilitation works, basic fauna works will be undertaken. These treatments will primarily involve:

- Fauna Habitat Value and Protection
- Increased fauna habitat value within the rehabilitation areas.

Rehabilitation Areas to include reuse of site fallen hollow logs and site rock to create fauna safe havens and cover from predators for small fauna. This approach coupled with additional revegetation works allows greater fauna security and movement within the rehabilitation areas. Consideration for bushfire requirements should be reviewed to confirm no conflict in both the fauna and rehabilitation approaches. Refer indicative images below.

RESPONSIBILITIES

It is also critical for all parties to understand their responsibilities as part of the overall rehabilitation 'team'.

REHABILITATION TEAM RESPONSIBILITIES	
PARTY	DESCRIPTION
Proponent	Ensure all consultants, contractors, sub-contractors or others utilizing the area are aware of the Rehabilitation Plan.
	Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings and conditioned by the Assessment Manager.
	Provide security via an uncompleted works bond and maintenance bond for the cost of works if required.
	Cover the costs of all necessary resources to ensure works are completed as per the approved documents.
Consultants	Brief proponent on their requirements in implementing and maintaining works as per the Rehabilitation Plan.
	Attend pre-start and compliance (on and off maintenance) inspections.
	Undertake monitoring and reporting to the Assessment Manager as set up by this document.
	Be available to respond to technical queries to the approved documentation when on-site conditions require changes.
	Liaise with the Assessment Manager throughout all stages of approval, initial works and maintenance of works.
Assessment Manager	Provide technical expertise via commentary on the approval of documentation.
	Attend pre-start and compliance (on and off maintenance) inspections.
	Reduce and release securities held against works at the completion of successful milestone inspections.
	Be available to respond to technical queries to the approved documentation when on-site conditions require changes.
	Accept and review maintenance reports as dictated (if required) in this document.
Contractor	Complete works in strict accordance with the documentation.
	Attend pre-start and compliance (on and off maintenance) inspections.
	Hold relevant licenses in applicable weed management/ revegetation/ fauna management, any required insurances for scope of works and an understanding of required Laws, Act, Policies and Guidelines.
	Recommend changes to the documentation when specific experience or on-site conditions require so.

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Surveying Planning Urban design Engineering

CLIENT:
Mirvac
Everleigh

REFERENCES:
South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS:

Issue	Date	Description	Checked
A	15/04/2019	Client Draft	AD

PROJECT:
423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF:
Planting, fauna, responsibilites

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Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN

MAINTENANCE

The planting will be followed up by a two (2) year period of maintenance, monitoring and reporting to ensure benchmarks for plant survival and weed management are obtained. Further annual inspections and reporting will be undertaken by SHG until handover to Logan City Council.

Maintenance, as with all ecological restoration work, is fundamental in ensuring project success. Maintenance of the planting includes tasks such as:

- Herbicide spraying to control competing weeds.
- Watering while plants are establishing. This is often highly variable and depends on the suite of species planted, weather conditions and time of year when planted. A watering schedule may consist of watering every day for week 1, twice per week for weeks 2-6 and then weekly from weeks 6-12.
- Repair of tree guards if they become damaged.
- Replenishment of mulch.
- Maintaining exclusion fencing; and
- Additional planting may be required to replace plants that do not survive (e.g.to meet survival rate requirements, or to fill gaps).

Maintenance is required following installation of the plants, although if maintenance is regular and thorough during the first year, maintenance requirements are likely to taper off significantly in the following years. The utilisation of benchmark criteria helps to determine rehabilitation success during the maintenance period and assists in prompting when additional maintenance activities are required. Typically accepted benchmarks or performance indicators for dedicated or open space rehabilitation works include:

- Compliance 'On Maintenance' requirements:
  - All required planting completed.
  - 98% plant survival.
  - 98% kill rate of declared environmental weeds.

- Ongoing 'Off Maintenance' requirements:
  - 98% plant survival.
  - Tree guards, stakes and general rubbish removed.
  - No remaining eroded or degraded areas.
  - 98% kill rate of declared environmental weeds.

The desired end-product is a fully-functioning system that can support itself in perpetuity, with minimal maintenance and input required.

MONITORING

Informal monitoring will occur through ongoing site inspections, note taking and photo-monitoring for the duration of the maintenance / monitoring period (2 years) (Refer to tables below for frequency).

Informal monitoring notes and photos (to address accepted benchmarks above) are to be submitted to SHG and DNRME under the Voluntary Declaration. Notes should also be distributed to the rehabilitation team and rectification works completed against notes.

Monitoring of rehabilitation works is a method of determining ecological restoration success in conjunction with the adjacent benchmarks. Monitoring of the weed management and revegetation works allows for:

- Review of the pre-established performance indicators for measuring the success of the weed removal and control.
- Ensure level of protection for existing identified native vegetation inclusive of that which has naturally regenerated
- Review the rate of spread or contraction of weed infestation within the control program.
- Monitor the rate of assisted regeneration and revegetation of desirable native species promoted in areas where weeds have been removed.
- Identification of new weed threats or other factors that may be effecting areas designated for rehabilitation.

Monitoring timeframes may involve a series of key milestones:

- Prestart Inspection - On site meeting prior to the initial commencement of work. Typically involves Consultant, Contractor and Assessment Manager to work through rehabilitation areas and clarify any adjustments to scope against approved works.
- Compliance Inspections - At the completion of the Primary Site Works, a compliance inspection meeting will be held with the Consultant, Contractor and Assessment Manager to inspect the works on-site in relation to the approved plans and previously agreed benchmarks performance indicators. Should the rehabilitation be a dedicated asset (open space) to the assessment manager, this inspection is commonly referred to as 'on maintenance'. For dedicated assets, a secondary compliance inspection will be required (off maintenance).
- Ongoing Monitoring Inspections- Monitoring to occur on a regular basis as highlighted above. These inspections will generally occur throughout the process, specifically before, during and after relevant compliance inspections.

Photo-monitoring is required for submission over the duration of the monitoring period. Approximate photo-monitoring locations were determined by SHG during the preliminary approval process (refer *Sheet 6*) and are to be utilised for the remainder of the monitoring period.

A permanent photo point can be set up using a star picket marked with fluorescent yellow safety cap or painted timber stakes, so that a photograph may be taken of the site at regular intervals as it is being restored. A time series of photographs from a degraded state prior to the commencement of restoration, through the transition stages and into the maintenance stage will assist in assessing the success of the ecological restoration process. Collected site data and photos should be compiled in a 'master' monitoring report for proper record keeping.

INDICATIVE SCHEDULE OF WORK ITEMS AND MAINTENANCE SEQUENCING FOR THE TWO (2) YEAR MAINTENANCE PERIOD

TIMING	SPRING			MILESTONE: COMPLIANCE / "ON MAINTENANCE"	SUMMER			AUTUMN			WINTER			SPRING			SUMMER			AUTUMN			WINTER			SPRING			MILESTONE: COMPLIANCE / "OFF MAINTENANCE"
	PRIMARY WORKS				FOLLOW-UP WORKS			FOLLOW-UP / MAINTENANCE WORKS			MAINTENANCE WORKS			MAINTENANCE WORKS			MAINTENANCE WORKS			MAINTENANCE WORKS			MAINTENANCE WORKS			MAINTENANCE WORKS			
	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	
WEEK 1	Pre-start meeting Council, Contractor and Superintendent	Weed management - "knockdown spray"	Mulch spreading and Jute-mat installation		Watering and Monitoring and reporting (throughout establishment)	Watering and Monitoring and reporting (throughout establishment)	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). Photomonitoring as required		Informal monitoring and reporting	Informal monitoring and reporting. Photomonitoring as required.		Informal monitoring and reporting	Monitoring (watering to replacement plants only). Photomonitoring as required		Informal monitoring and reporting	Informal monitoring and reporting. Photomonitoring as required.		Monitoring and reporting	Informal monitoring and reporting. Photomonitoring as required.		Informal monitoring and reporting	Mulch - top up depths to 100mm and replace / repair Jutematting as required	Informal monitoring and reporting. Photomonitoring as required.	Monitoring (watering to replacement plants only)	
WEEK 2	Initial weed management works - wood weed removal /"knockdown" spray	Soil Preparation and cultivation	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	
WEEK 3	Weed management works - removal by hand	Soil Preparation and modification	Planting and Watering		Natural regeneration plants - weed management	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	Weed Management - slashing of maintenance access paths	Mulch - stockpiled on site	Planting and Watering		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	

INDICATIVE SCHEDULE OF MAINTENANCE AND MONITORING SEQUENCING UNTIL HANDOVER TO COUNCIL

ACTIVITY	INDICATIVE OCCURANCE - YEAR 0-2	INDICATIVE OCCURANCE - YEAR 2 UNTIL HANDOVER TO COUNCIL
Cleaning Operations		
Litter Collection (general landscape)	"As above"	Annually*
Horticultural Environment		
Planting of shrubs and trees (infill planting post initial works)	"As above"	Annually*
Care of existing trees and shrubs (inc. formative pruning)	"As above"	Annually*
Native bushland maintenance (inc. maintaining access paths, mulch, matting, etc.)	"As above"	Annually*
Pest control	"As above"	Annually*
Weed treatment	"As above"	Annually*
Watering	"As above"	Monitor*
Monitoring / Photo location	Quarterly	Annually
* Reactionary maintenance as required		

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CLIENT:

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AMENDMENTS:

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PROJECT:

423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF:

Maintenance & Monitoring

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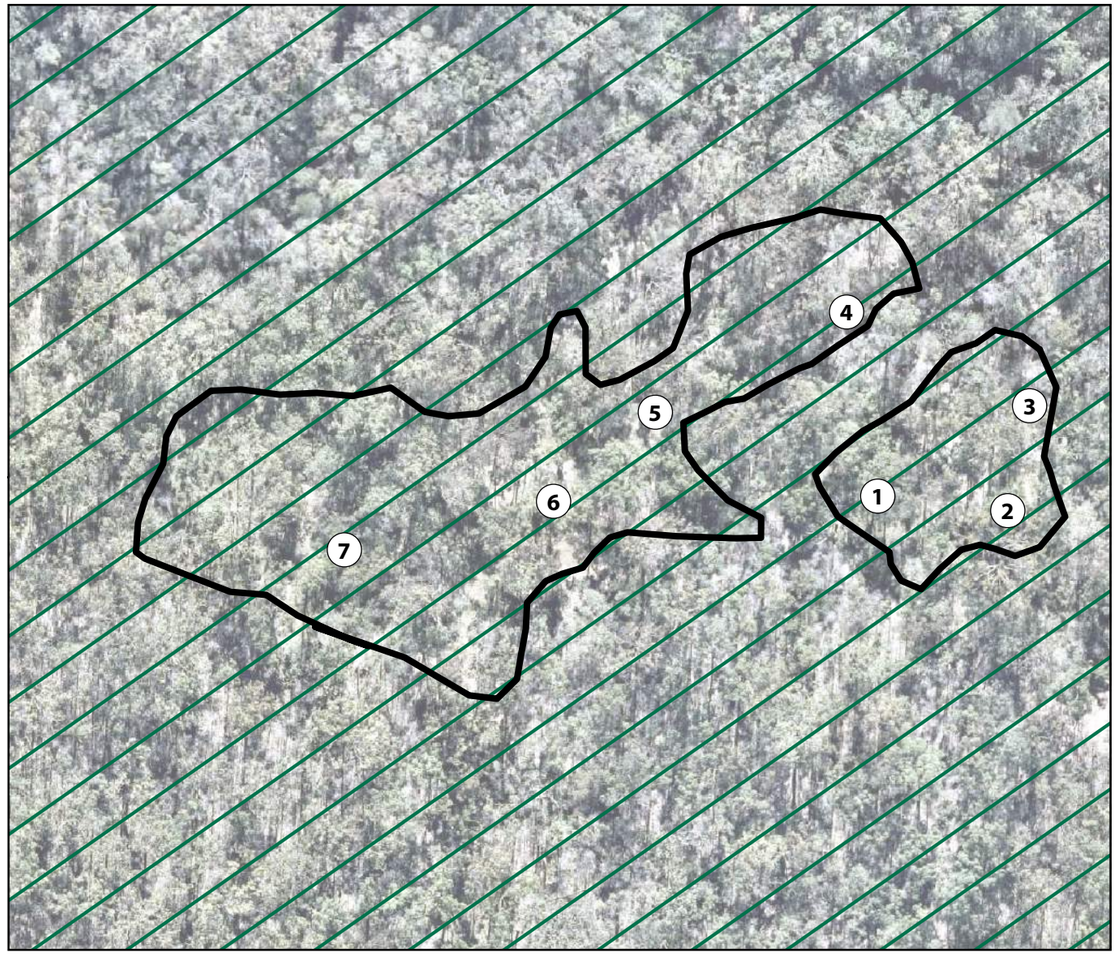
DRAWING No.:	7598 E 05 VDEC RMP B		

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN - APPROXIMATE PHOTO MONITORING LOCATIONS

LEGEND

- Photo monitoring location (approximate)
- Conservation area
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)



saunders havill group

CLIENT:

mirvac

Everleigh

DISCLAIMER:

THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT. SAUNDERS HAVILL GROUP CANNOT ACCEPT REPONSIBILITY FOR ANY USE OF OR RELIANCE UPON THE CONTENTS OF THESE DRAWING BY ANY THIRD PARTY.

CONFIRM ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION AND DO NOT SCALE FROM THE DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETRES. ANY DISCREPANCIES SHOULD BE CLARIFIED IN WRITING WITH SAUNDERS HAVILL GROUP PRIOR TO THE COMMENCEMENT OF WORK.

PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDER-GROUND SERVICES AND DETAILD LOCATIONS OF ALL SERVICES.

REFERENCES:

AMENDMENTS:

Issue	Date	Description	Checked
A	15/04/2019	Client Draft	AD

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1:1,000 @ A3

PROJECT:

423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF:

Photo monitoring locations

DATE:	15/04/2019	CHECKED:	AD
CLIENT REF.:	7598	DRAWN:	MC
DRAWING No.:	7598 E 06 VDEC RMP A		

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN - WEED TREATMENT & REMOVAL (1)

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND

Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
1	Verbenaceae	Lantana camara var. camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
2	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	5	S/O	Seedlings: Hand pull	
3	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	38	5	H/O	Hand pull and dispose	
4	Bignoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	5	V/O	Tubers: crown or dig up, bag and remove.	
	Basellaceae	Anredera cordifolia (madeira vine)	8	16	5	V/O	Small Vines & Tubers: Hand pull. Bag and dispose.	
6	Asparagaceae	Asparagus africanus (ornamental asparagus, asparagus fern)	7	26	5	V/O	dig out roots and dispose of at local council landfill site. remove entire crown and underground stem to prevent regrowth	
7	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	5	T/O	remove when small .hand pull or dig out small seedlings. combine dozing, burning and controlled grazing for large infestations	
8	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	5	T/O	Seedlings: Hand pull	
9	Anacardiaceae	Schinus terebinthifolius (broad-leaf pepper tree)	6	49	5	T/O	Seedlings: Hand pull	
	Salviniaceae	Salvinia molesta (salvinia)	8	57	5	Ha/F	Mechanical removal of small infestations; Salvinia weevil (Biological control)	
11	Cabombaceae	Cabomba caroliniana (cabomba, fanwort)	4	12	5	Ha/F	Mechanical removal of small infestations	
12	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	5	S/OA	N/A	
13	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	5	Ha/OF	Mechanical removal of small infestations	
14	Acanthaceae	Hygrophila costata (Glush weed)	3	7	5	Ha/F	Hand pull smal infestations. Can be controlled by planting competitive native species.	
	Oleaceae	Ligustrum lucidum (tree privet)	5	9	5	T/O	Seedlings: Hand pull	
16	Asteraceae	Sphagneticola trilobata (Singapore daisy)	6	34	5	H/O	Hand pull	
17	Asteraceae	Ageratina adenophora (crofton weed)	6	38	5	H/O	Hand pull and hang to dry.	
18	Verbenaceae	Lantana montevidensis (creeping lantana)	8	62	5	S/O	Fire and/or mechanical control	
19	Fabaceae	Neonotonia wightii (glycine)	5	16	5	H/A	N/A	
	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	5	H/A	Hand or mechanical removal of small infestations	
21	Oleaceae	Ligustrum sinense (Chinese privet)	4	11	5	T/O	Seedlings: Hand pull	
22	Ochnaceae	Ochna serrulata (ochna)	7	33	5	S/O	N/A	
23	Asparagaceae	Asparagus aethiopicus cv. Sprengeri (asparagus ground fern)	5	35	5	H/O	dig out unwanted plants and dispose of at the appropriate council landfill. remove the entire crown of underground stem of plant to prevent regrowth	
24	Poaceae	Sporobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	5	H/U?	Hand or mechanical removal of small infestations	
25	Asteraceae	Ageratina riparia (mistflower)	5	38	5	H/O	Hand pull and hang to dry.	
26	Asclepiadaceae	Araujia sericifera (mothvine)	9	38	4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit.	
27	Crassulaceae	Bryophyllum daigremontianum x B. delagoense (hybrid mother-of millions)	6	15	5	H/O	Hand pull and dispose	
28	Convolvulaceae	Ipomoea cairica (mile-a-minute)	7	56	4	V/O	Vines & Runners: hand pull, roll up and hand up to dry.	
29	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4	V/O	Seedlings & Small Vines: Hand Pull	
30	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4	V/O	Scattereded or medium-density infestations: Where possible, repeated slashing close to ground level is recommended.	
31	Phytolaccaceae	Rivina humilis (baby pepper)	8	61	4	H/O	Hand pull and hang to dry.	
32	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	5	H/U	Hand or mechanical removal of small infestations	
33	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	5	H/U	Hand or mechanical removal of small infestations	
34	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first.	
35	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	5	Ha/F	place plant material in a sealed plastic bag, leave in sunlight to rot then burn or dispose of at a council-approved land fill tip	
36	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	1?	3	5	Ha/U	physical removal of plant should not be attempted	
37	Passifloraceae	Passiflora suberosa (cork passionflower)	8	166	4	V/O	N/A	
38	Poaceae	Melinis minutiflora (molasses grass)	5	17	5	H/A	Grazing or mowing	
39	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4	V/O	Stems: Hand pull; Fruit: Bag and remove.	
40	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4	V/O	Vines and Runners: hand pull, roll up and hang to dry.	
41	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4	ST/A	Small plants: Hand pull or mechanical removal	
42	Poaceae	Brachiaria mutica (para grass)	6	18	4	Ha/A	Grazing	
43	Hydrocharitacea e	Egeria densa (egeria waterweed)	2	7	4	Ha/F	hand pulling, cutting and digging with machines effective	
44	Pinaceae	Pinus elliottii (slash pine)	4	22	4	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	
41	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4	ST/A	Small plants: Hand pull or mechanical removal	
42	Poaceae	Brachiaria mutica (para grass)	6	18	4	Ha/A	Grazing	
43	Hydrocharitacea e	Egeria densa (egeria waterweed)	2	7	4	Ha/F	hand pulling, cutting and digging with machines effective	
44	Pinaceae	Pinus elliottii (slash pine)	4	22	4	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	
45	Caesalpiniaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4	ST/O	Seedlings: Hand pull	
46	Poaceae	Chloris gayana (Rhodes grass)	9	55	4	H/A	Hand pulling and removal and digging of larger clumps	
47	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4	H/O	Hand pull and dispose	
48	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4	H/U	hand pulling of small areas is not recommended	
49	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4	V/O	Vines and Runners: hand pull, roll up and hang to dry.	
50	Acanthaceae	Thunbergia alata (black eyed susan)	5	22	4	H/O	N/A	
51	Fabaceae	Macroptilium atropurpureum (siratro)	8	39	4	V/A	N/A	
52	Rosaceae	Rubus ellipticus (yellowberry)	4	26	4	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	
53	Colchicaceae	Gloriosa superba (glory lily)	3	26	4	V/O	N/A	
54	Verbenaceae	Phyla canescens (lippia, Condamine couch)	3	4	4	Ha/O	a combined approach of different control methods including chemical and mechanical with land management practices is most effective	
55	Solanaceae	Solanum seaforthianum (Brazilian nightshade)	8	78	4	V/O	Hand pull	
56	Araceae	Pistia stratiotes (water lettuce)	3	8	4	Ha/OF	Mechanical removal of small infestations	
57	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4	V/O	Rhizomes: crown and hang to dry.	
58	Commelinaceae	Tradescantia fluminensis (Qld use T. albiflora) (wandering jew)	5	9	4	H/O	N/A	
59	Solanaceae	Cestrum parqui (green cestrum)	6	36	4	S/O	Seedlings: Hand pull	
60	Caesalpiniaceae	Senna septemtrionalis (arsenic bush, was S. floribunda)	6	25	4	S/O	Seedlings: Hand pull	
61	Solanaceae	Solanum mauritianum (wild tobacco tree)	8	30	4	S/O	Seedlings: Hand pull	
62	Apocynaceae	Catharanthus roseus (pink periwinkle)	5	22	4	S/O	Hand pull	
63	Passifloraceae	Passiflora subpeltata (white passion flower)	10	60	4	V/O	Stems: Hand pull	
64	Fabaceae	Desmodium uncinatum (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	
65	Poaceae	Melinis repens (red Natal grass)	10	134	4	H/A	Grazing or mowing	
66	Nymphaeaceae	Nymphaea caerulea subsp. zanzibarensis (blue lotus)	4	17	4	Ha/OF	Hand pull small infestations.	
67	Onagraceae	Oenothera drummondii subsp. drummondii (beach evening primrose)	3	17	4	H/O	Hand pull	
68	Tiliaceae	Triumfetta rhomboidea (Chinese burr)	7	44	4	H/U	Hand pull	
69	Haloragaceae	Myriophyllum aquaticum (parrot's feather)	3	15	4	Ha/F	N/A	
70	Passifloraceae	Passiflora foetida (stinking passion flower)	7	50	4	V/O	Hand Pull	
71	Asteraceae	Verbesina encelioides (crownbeard)	7	34	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
72	Poaceae	Paspalum mandiocanum (broad leaf paspalum)	3	6	4	H/A	N/A	
73	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	4	H/A	Hand pull or dig up	

Saunders Havill Group
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CLIENT:

Everleigh

DISCLAIMER:

REFERENCES:

Queensland Herbarium Invasive Naturalised Plants in South East Queensland

AMENDMENTS:

Issue	Date	Description	Checked
A	15/04/2019	Client Draft	AD

PROJECT:

423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF:

Weed Treatment & Removal

DATE:	15/04/2019	CHECKED:	AD
CLIENT REF.:	7598	DRAWN:	MC
DRAWING No.:	7598 E A07 VDEC RMP A		

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN - WEED TREATMENT & REMOVAL (2)

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND

Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
73	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	4	H/A	Hand pull or dig up	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
74	Ruppiaceae	Ruppia maritima (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	
75	Arecaceae	Syagrus romanzoffiana (queen palm)	4?	10	4	T/O	Seedlings: Hand pull or crown; Trees: cut below growing point	
76	Poaceae	Hymenachne amplexicaulis cv. Olive (hymenachne)	1?	1	4	Ha/A	a combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	
77	Asteraceae	Senecio tamoides (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
78	Poaceae	Cenchrus ciliaris (buffel grass)	4	15	4	H/A	Hand or mechanical removal of young plants	
79	Acanthaceae	Thunbergia grandiflora (thunbergia, blue thunbergia)	2	3	5?	V/O	N/A	
80	Cactaceae	Opuntia tomentosa (velvet tree pear)	8	46	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
81	Euphorbiaceae	Ricinus communis (castor oil plant)	7	20	4	S/O	Seedlings: Hand pull	
82	Asteraceae	Senecio madagascariensis (fire weed)	6	28	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
83	Cyperaceae	Cyperus involucratus (African sedge)	6	15	4	Ha/OF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	
84	Asteraceae	Tithonia diversifolia (Mexican sunflower)	5	11	4	H/O	N/A	
85	Poaceae	Setaria sphacelata (South African pigeon grass)	9	41	4	H/A	Hand pull or dig up	
86	Asclepiadaceae	Gomphocarpus physocarpus (balloon cotton bush)	10	132	4	S/OU	Slash in winter and burn cuttings. Wanderer Butterfly can also be used as biological control.	
87	Poaceae	Digitaria didactyla (Queensland blue couch)	9	70	4	H/A	Hand pull or cultivation	
88	Caesalpiniaceae	Gleditsia triacanthos (honey locust)	7	12	4	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method.	
89	Poaceae	Paspalum notatum (bahia grass)	4	10	4	H/A	Hand pull or dig up	
90	Cactaceae	Opuntia monacantha (drooping tree pear, syn. O. vulgaris)	2	3	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
91	Poaceae	Paspalum conjugatum (paspalum grass)	7	38	4	H/A	Cut below crown.	
92	Malpighiaceae	Hiptage benghalensis (hiptage)	3	5	4	S,V/O	Hand pull small infestations.	
93	Solanaceae	Solanum torvum (devil's fig)	6	39	4	S/O	Seedlings: Hand pull	
94	Caesalpiniaceae	Caesalpinia decapetala (thorny poinciana)	4	20	4	S,V/O	Seed-heads: Bag and remove.	
95	Poaceae	Pennisetum alopecuroides (swamp foxtail)	7	29	4	H/O	Hand Pull	
96	Verbenaceae	Duranta erecta (duranta)	6	14	4	ST/O	Shrubs: CS&P (1:1.5)	
97	Brassicaceae	Nasturtium officinale (Qld use Rorippa nasturtium-aquaticum) (watercress)	7	19	4	Ha/FU	Manually grub and destroy.	
98	Polygonaceae	Acetosa sagittata (rambling dock)	4	18	4	V/U	Tubers: Dig up, bag and remove.	
99	Poaceae	Cynodon dactylon (couch, Bahama grass introduced cultivars)	10	45	4	H/OA	Hand pull small infestations, removing all roots or smother with mulch.	
100	Bignoniaceae	Tecoma stans (yellow bells)	4	16	4	ST/O	N/A	
101	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	4	ST/O	Seedlings: Hand pull	
102	Mimosaceae	Mimosa pudica (common sensitive plant)	4	12	4	S/A	N/A	
103	Commelinaceae	Callisia fragrans (purple succulent)	3	9	4	H/O	N/A	
104	Scrophulariaceae	Paulownia tomentosa (paulownia)	3	5	4	T/AO	Seedlings: Hand pull	
105	Commelinaceae	Tradescantia zebrina (zebrina)	3	12	4	H/O	N/A	
106	Acanthaceae	Ruellia malacosperma (ruellia)	5	16	4	H/O	N/A	
107	Poaceae	Pennisetum clandestinum (kikuyu grass)	4	12	4	H/A	Hand Pull	
108	Liliaceae	Lilium formosanum (Taiwan lily)	5	10	4	H/O	Hand pull or crown and dispose	
109	Asteraceae	Sigesbeckia orientalis (Indian weed)	10	148	4	H/U	Hand pull or cultivation.	
110	Asteraceae	Bidens pilosa (cobbler's pegs)	10	110	4	H/U	Hand pull or cultivation.	
111	Cactaceae	Opuntia stricta (common prickly pear)	7	67	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
112	Poaceae	Eleusine indica (crowsfoot grass)	8	55	4	H/A	Pull and chip. Replant with native couch.	
113	Poaceae	Axonopus compressus (broad leaved carpet grass)	5	23	4	H/AO	Cut stems from roos.	
114	Lamiaceae	Salvia coccinea (red salvia)	9	46	4	H/O	remove small areas by hand or machine	
115	Asteraceae	Ageratum houstonianum (blue billygoat weed)	8	81	4	H/UO	N/A	
116	Myrtaceae	Psidium guajava and P. guineense (yellow guava and West Indes guava)	4	7	4	ST/AO	N/A	
117	Rosaceae	Rubus bellobatus (kittatinny blackberry)	5	22	4	S/O	slashing hinders growth, giving some control if plants are slashed before they seed	
118	Myrtaceae	Eugenia uniflora (Brazilian cherry)	4	19	4	ST/O	N/A	
119	Oleaceae	Olea europaea (olive)	2	6	4?	T/A	Seedlings: Hand pull	
120	Poaceae	Brachiaria decumbens (signal grass)	4	14	4	H/A	Grazing	
121	Fabaceae	Stylosanthes scabra (shrubby stylo)	4	4	4.3?	H/A	N/A	
122	Commelinaceae	Commelina benghalensis (hairy wandering jew)	4	7	4	H/O	Collect and Bag	
123	Poaceae	Pennisetum purpureum (elephant grass)	2	9	4	H/O	Grazing or mechanical removal	
124	Zingiberaceae	Hedychium coronarium (wild ginger)	2	2	4	H/O	Small Plants: Hand pull and dispose	
125	Phytolaccaceae	Phytolacca octandra (inkweed)	10	50	3	H/O	Hand pull or crown	
126	Asclepiadaceae	Asclepias curassavica (red cotton bush)	9	43	3	S/O	Hand pull; Slash	
127	Solanaceae	Lycium ferocissimum (African boxthorn)	1?	5	4.4?	S/O	N/A	
128	Mimosaceae	Prosopis pallida (algaroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re-shooting can occur.	
129	Juncaceae	Juncus articulatus (jointed rush)	1	2	4	Ha/FO	Hand pull.	
130	Cactaceae	Opuntia aurantiaca (tiger pear)	1	2	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
131	Poaceae	Arundo donax (giant reed)	1	4	4	H/O	Physical removal of small infestations.	
132	Cactaceae	Opuntia imbricata (rope pear)	1	1	4	H/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
133	Bignoniaceae	Pyrostegia venusta (flame vine)	1	1	4	V/O	N/A	
134	Poaceae	Cortaderia selloana (pampas grass)	2	1	4	H/O	Small Plants: dig out by hand or machine	
135	Solanaceae	Solanum hispidum (giant devil's fig)	5	23	4	S/O	Hand pull	
136	Agavaceae	Furcraea foetida (Cuban hemp)	3	4	4.3?	S/OA	Dig out by hand or machine	
137	Agavaceae	Furcraea selloa (hemp)	1	2	4?	S/OA	Dig out by hand or machine	
138	Agavaceae	Agave americana (century plant)	4	9	4	S/OA	Dig out by hand or machine	
139	Rutaceae	Murraya paniculata cv. Exotica (murraya)	6	26	4	S/O	Seedlings: Hand pull	
140	Rosaceae	Rubus discolor (R. fruticosus complex, a blakberry)	4	10	4	S/OA	slashing hinders growth, giving some control if plants are slashed before they seed	
141	Brassicaceae	Cakile edentula (American sea rocket)	4	24	4	H/U	Manually grub and destroy.	
142	Balsaminaceae	Impatiens walleriana (balsam)	2	6	4	H/O	N/A	
143	Agavaceae	Agave sisalana (sisal)	2	4	4	S/OA	Dig out by hand or machine	
144	Agavaceae	Agave vivipara var. vivipara (sisal)	2	3	4	S/OA	Dig out by hand or machine	
145	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	4	ST/A	Seedlings: Hand pull	
146	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	4	H/A	Hand pull or dig out small infestations.	

saunders havill group
Surveying · Civil Engineering · Urban design · Environmental · Project management

CLIENT:

Everleigh

DISCLAIMER:

REFERENCES:

Queensland Herbarium Invasive Naturalised Plants in South East Queensland

AMENDMENTS:

Issue	Date	Description	Checked
A	15/04/2019	Client Draft	AD

PROJECT:

423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF:

Weed Treatment & Removal

DATE:	15/04/2019	CHECKED:	AD
CLIENT REF.:	7598	DRAWN:	MC
DRAWING No.:	7598 E A08 VDEC RMP A		

Everleigh, Greenbank

VOLUNTARY DECLARATION REHABILITATION PLAN - WEED TREATMENT & REMOVAL (3)

QUEENSLAND HERBARIUM INVASIVE NATURALISED PLANTS IN SOUTH EAST QUEENSLAND

Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
147	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	4?	H/O	Hand pull and hang to dry.	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
148	Fabaceae	Pueraria lobata (kudzu)	3	4	4	V,S/O	Slash; Diminish by shading site	
149	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	3	7	4	Ha/FO	Physical removal of small infestations.	
150	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	4	Ha/OF	Hand pull small infestations.	
151	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	4	S/O	N/A	
152	Euphorbiaceae	Jatropha gossypiifolia (cotton-leaf physic nut, bellyache bush)	1	1	4	S/O	Hand pull	
153	Malvaceae	Sida rhombifolia (Paddy`s lucerne)	9	69	4	S/U	Hand pull or dig out.	
154	Poaceae	Themeda quadrivalvis (grader grass)	8	25	4	H/A	Hand pull or dig out small infestations.	
155	Poaceae	Andropogon virginicus (whisky grass)	6	14	4	H/A	Hand pull or dig out small infestations.	
156	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3	T/O	Seedlings: Hand pull	
157	Acanthaceae	Justicia betonica (squirreltail)	2	4	4	S/O	Hand pull smal infestations. Can be controlled by planting competitive native species.	
158	Mimosaceae	Acacia boliviana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	
159	Simaroubaceae	Ailanthus altissima (tree of heaven)	1?	3	4	T/O	Seedlings: Hand pull	
160	Poaceae	Echinochloa colona (awnless barnyard grass)	9	44	3	H/A	Hand or mechanical removal of small infestations	
161	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	8	53	3	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	
162	Moraceae	Morus alba (white mulberry)	3	10	3	T/O	N/A	
163	Arecaceae	Colocasia esculenta (taro)	3	4	3	H/AO	Hand pull.	
164	Cannaceae	Canna indica (canna lily)	3	9	3	H/O	Dig out entire plant	
165	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3	S,V/O	N/A	
166	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	ST/O	N/A	
167	Cactaceae	Harrisia martinii (harrisia cactus)	2?	4	4	S/O	The use of the biological mealy-bug agent is recommended	
168	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
169	Fabaceae	Erythrina crista-galli (cockspur coral tree)	2?	4	4	T/O	N/A	
170	Sapindaceae	Koelreuteria elegans (Chinese rain tree)	1?	1	3.6?	T/O	Seedlings: Hand pull	
171	Zingiberaceae	Hedychium gardnerianum (ginger lily)	1?	3	4	H/O	Small Plants: Hand pull and dispose	
172	Acanthaceae	Hypoestes phyllostachya (polka-dot plant	3	5	4	H/O	Hand pull or crown and dispose	
173	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3	ST/O	Vines and Runners: hand pull, roll up and hang to dry.	
174	Asteraceae	Conyza sumatrensis (tall fleabane)	9	45	3	H/U	Hand or mechanical removal of small infestations	
175	Fabaceae	Tipuana tipu (tipuana)	2	5	3	T/O	Seedlings: Hand pull	
176	Asteraceae	Tagetes minuta (stinking roger)	8	32	3	H/U	Hand pull and hang to dry.	
177	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	6	14	3	ST/A	Seedlings: Hand pull	
178	Poaceae	Cenchrus echinatus (Mossman river grass)	8	43	3	H/A	Hand or mechanical removal of young plants	
179	Asteraceae	Conyza canadensis (Canadian fleabane)	10	55	3	H/U	Hand or mechanical removal of small infestations	
180	Euphorbiaceae	Euphorbia cyathophora (painted spuge)	8	20	3	H/O	Hand pull	
181	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3	H/O	Hand pull or dig up	
182	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3	H/O?	Hand pull	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
183	Fabaceae	Desmodium intortum (greenleaf desmodium)	4	11	3	H/A	Hand pull or crown and dispose	
184	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3	H/O	Hand Pull	
185	Asteraceae	Conyza bonariensis (flax-leaf fleabane)	7	38	3	H/U	Hand or mechanical removal of small infestations	
186	Solanaceae	Solanum erianthum (a tobacco bush)	7	19	3	S/O	Hand pull	
187	Poaceae	Stenotaphrum secundatum (buffalo grass)	3	23	3	H/AO	Hand or mechanical removal of small infestations	
188	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3	ST/O	Hand pull small infesttions. Slashing can be used but should be followed up by herbicide application.	
189	Rubiaceae	Coffea arabica (coffee)	3	7	3	ST/A	Saplings: Hand pull	
190	Bignoniaceae	Spathodea campanulata (African tulip tree)	1?	1	3	T/O	N/A	
191	Fabaceae	Macrotyloma axillare (perennial horse gram)	4	12	3	V,H/A	N/A	
192	Iridaceae	Watsonia meriana var. bulbillifera (bulbil watsonia)	2	3	3	H/O	Dig up, bag and remove	
193	Passifloraceae	Passiflora edulis (passion fruit)	6	12	3	V/AO	Hand Pull	
194	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3	H/O	Seedlings: Hand pull	
195	Dracaenaceae	Sansevieria trifasciata (sansevieria)	2?	7	3	H/O	Hand pull or dig up	
196	Poaceae	Digitaria eriantha (pangola grass)	5	20	3	H/A	Hand pull or cultivation	
197	Rosaceae	Eriobotrya japonica (loquat)	3	5	3	T/O	Seedlings: Hand pull	
198	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
199	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.4?	T/A	Mechanical or chain removal.	
200	Mimosaceae	Acacia farnesiana (mimosa bush)	6	15	3	T/A	Mechanical removal of small plants.	

Explanatory notes.

Sub-region (Sr): Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded (Queensland Herbarium data).
Rec no. (R): Total number of records for species within study area, Queensland Herbarium CORVEG and HERBRECS data.
Scores (S): Based on panel data of invasiveness, 5 (highest) to 3 (moderate). ? indicate doubtful scores.

Life forms (LFS): T-tree (woody plant >5m), ST-small tree (2-5m), S-shrub (woody <2m), H-herb (grasses & forbes), Ha-aquatic herbs.
Source: A-agriculture, O-ornamental and landscaping, F-fish aquarium, U-unintentional introduction and/or contaminant.

Abbreviations: Control Methods

CS&P = cut scrape and paint

S&P = scrape and paint

C&P = cut and paint

F/I = frill or inject stem

Abbreviations: Herbicides

G = Glyphosate, eg. Roundup Biactive, Weedmaster Duo

MM = Metsulfuron methyl, eg, Brushoff

F = Fluroxypyr, eg. Starane

Abbreviations: Herbicide Dilution Rates for High Concentration Applications

GU = Glyphosate undiluted

G1 = 1 part water to 1 part glyhphosate

G1.5 = 1.5 parts water to 1 part glyphosate

G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations

G100 = 100mL glyphosate per 10L of water + surfuctant, eg 20mL LI 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfuctant, eg 50mL LI 700 per 10L

G100 + MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
G200 + MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water

MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg. 2mL Agral per 10L water

F100 = 100mL fluroxypyr per 10L water

F150 = 150mL fluroxypyr per 10L water

Other Abbreviations

= Locally non-indigenous native species

Ref. 1. Big Scrub Rainforest Landcare Group (2008), 'Common Weeds of Subtropical Rainforests of Eastern Australia: A practical manual on their identification and control'

Ref. 2. Department of Primary Industries and Fisheries (QLD), 'Weeds and pest animals and ants'.

Ref. 3. Holland et al. (1996), 'Suburban Weeds', DPI QLD.

Ref 4. Port Stephens Council (NSW), 'Weed Busters'.
Ref 5. Depertment of Primary Industries (NSW), 'Noxious and Environmental Weed Handbook, 3rd Edition'.

Ref 6. Department of Environment and Conservation, 'Florabase', (DEC- WA)

Ref 7. Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2009) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

Saunders Havill Group
Surveying Town planning Urban design Environmental Project management

CLIENT: Everleigh

DISCLAIMER:

THESE PLANS HAVE BEEN PREPARED FOR THE EXCLUSIVE USE OF THE CLIENT. SAUNDERS HAVILL GROUP CANNOT ACCEPT RESPONSIBILITY FOR ANY USE OF OR RELIANCE UPON THE CONTENTS OF THESE DRAWING BY ANY THIRD PARTY.

CONFIRM ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION AND DO NOT SCALE FROM THE DRAWINGS. ALL DIMENSIONS ARE IN MILLIMETRES. ANY DISCREPANCIES SHOULD BE CLARIFIED IN WRITING WITH SAUNDERS HAVILL GROUP PRIOR TO THE COMMENCEMENT OF WORK.

PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR FURTHER UNDER-GROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

REFERENCES:

Queensland Herbarium Invasive Naturalised Plants in South East Queensland

AMENDMENTS:

Issue	Date	Description	Checked
A	15/04/2019	Client Draft	AD

@ A3

PROJECT:

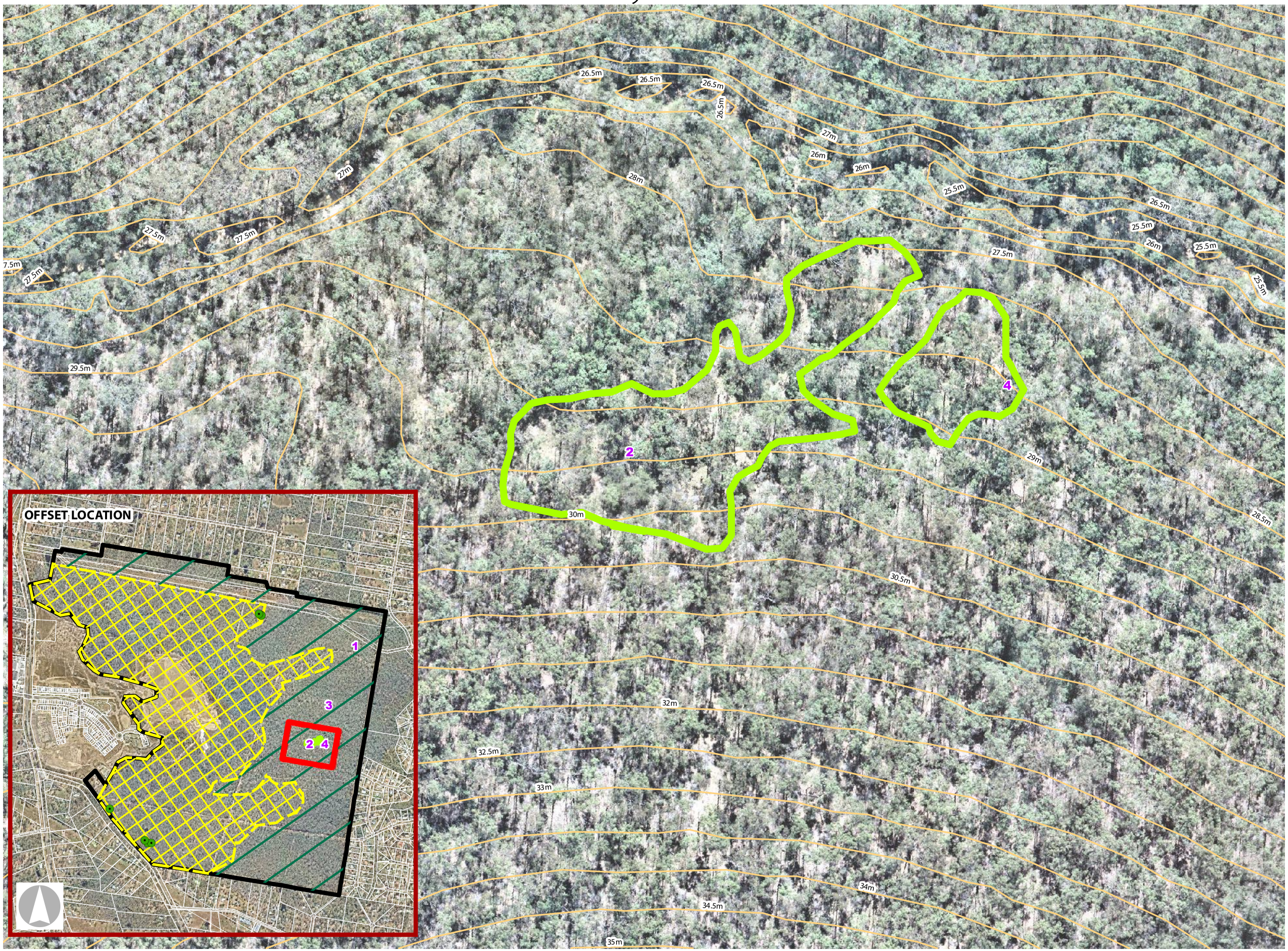
423 - 520 Greenbank Road, Greenbank (1/SP297192)

environmental management

PLAN OF: Weed Treatment & Removal

DATE:	15/04/2019	CHECKED:	AD
CLIENT REF:	7598	DRAWN:	MC
DRAWING No.:	7598 E A09 VDEC RMP A		

3. Rehabilitation Area - *Melaleuca irbyana*



NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2020), Aerial (Nearmap 2020)

*This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Project DCDB
- Development footprint
- Conservation area
- Mature *Melaleuca irbyana* specimen to be impacted by clearing works
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)
- Contours (0.5m)
- 1 Evolve Environmental Solutions photo monitoring points

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	13/07/2020	Preliminary	MP	KG

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,095 @A3

0 5 10 20 30 40 m

saunders havill group

mirvac

Everleigh

ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 13/07/2020 7598 E 03 Rehabilitation Area A

4. Summary and Conclusion

Saunders Havill Group has been engaged by Mirvac Queensland Pty Ltd to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* located within the extent of works for the Everleigh Greenbank project. This IMP is intended to support the renewal of the Protected Plants Clearing Permit (Permit No. WA0009354) from Department of Environment and Science (DES). The IMP has been prepared in accordance with the *Nature Conservation (Wildlife Management) Regulation 2006 - Protected Plants Assessment Guidelines*.

A Protected Plants Clearing Permit (Permit No. WA0009354) was issued by the DES on 24 August 2018 which allows for clearing of M. irbyana over the entire Clearing Impact Area (i.e. 277 ha site). Conditions of the Permit (PPCM01) require all activities relating to the impact of EVNT plant species under the permit to be carried out in accordance with the procedures and actions in the IMP. This included rehabilitation planting of M. irbyana within future Conservation land in the eastern portion of the site to ensure no significant residual impact on the species occurs as a result of the development. Rehabilitation works in accordance with the IMP, including weed removal and advanced tubestock planting commenced in March 2019. Further, a 5,000m^2 *M. irbyana* rehabilitation area was made a declared area (Category A) under the *Vegetation Management Act* 1999 and is subject to legal monitoring and reporting benchmarks set by DNRME.

While clearing within the Permit area has been undertaken, clearing at the locations of the *M. irbyana* patches has not yet occurred. Therefore, this IMP seeks to support renewal of the Protected Plants Clearing Permit (Permit No. WA0009354) which expires on 23 August 2020 for the clearing of protected plants within the 277 ha impact area at the project site.

5. Appendices

Appendix A

Protected Plants Clearing Permit (WA0009354)

Appendix B

Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018

Appendix C

Declared Area Map

Appendix D

Wildlife Online Search

Nature Conservation Act 1992

Appendix A

Protected Plants Clearing Permit (WA0009354)

Permit

Protected Plant Clearing Permit

This wildlife authority is issued under the following legislation: Nature Conservation (Administration) Regulation 2017 Part 2 Division 1.

Permit number: WA0009354 **Valid from:** 24 August 2018 to 23 August 2020

Activity: Clearing endangered, vulnerable or near threatened plants

Role	Name	Registered address	
Principal Holder:	Saunders Havill Group Pty Ltd	9 Thompson St BOWEN HILLS QLD 4006 Australia	
Person In Charge:	Mark Clancy	Mark Clancy	
Business name:	144972949	**ABN/ACN**	Nature Conservation (Wildlife) Regulation 2006 /
Activity location/licensed premises	LOT 1/sp297192		

Schedule

Family or Species or Schedule	Details	Category	Quantity	Unit
Species	bush house or weeping paperbark or swamp teatree, Melaleuca irbyana	Live	277	Hectares

Jenny Keys
Department of Environment and Science
Delegate of the administering authority
Nature Conservation Act 1992

Date issued: 24 August 2018

Enquiries:
Wildlife Assessment Team
Email: wildlife@des.qld.gov.au
WA0009354
Postal Address: PO Box 102, Toowoomba, QLD, 4350

ABN 46 640 294 485

Queensland Government

Legislative Requirements and Conditions of Wildlife Authority

Legislative Requirements

PPCLR06 Where monitoring by the permit holder of impact management actions with respect to endangered, vulnerable or near threatened species in the clearing area identifies that those actions appear to be unsuccessful or failing, the permittee must notify DES immediately in order to discuss the significant residual impact of the clearing and furthermore discuss any potential implementation of an offset action in accordance with the Queensland Environmental Offset Policy.
This requirement may be found in Section 284(1) 0f the Nature Conservation (Wildlife Management) Regulation 2006

Nature Conservation

PPCLR01 This permit does not exempt the permit holder from obtaining other approvals relevant to the harvest of whole protected plants at the site.

PPCLR02 Activities carried out under this authority, unless otherwise authorised, apply to non-protected areas only.
This requirement may be found in section 15 of the Nature Conservation (Administration) Regulation 2017

PPCLR03 This permit includes the clearing of least concern protected plants within the clearing area.

Conditions

PPCM01 Activities relating to the impact of EVNT plant species under this permit must be in accordance with the procedures and actions outlined in the following documents, except where conditions below indicate otherwise:

'Impact Management Plan Melaleuca irbyana 432-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd 3 July 2018', and associated appendices and supporting documentation.

PPCM02 The permit holder is to notify DES in writing at least 48 hours in advance of clearing commencing, for example, via an email to wildlife.management@ehp.qld.gov.au

PPCM04 Should the project not proceed, in addition to the requirement to rehabilitate the area/s once cleared, the site/s must not be further disturbed and must be maintained to ensure erosion and weed control.

PPCM08 It is the permit holder's responsibility to ensure that the proposed rehabilitation area with EVNT species *Melaleuca irbyana* is legally secured.

Department of Environment and Science
www.des.qld.gov.au ABN 46 640 294 485

Queensland Government

PPCM09 Rehabilitation and/or translocation reporting must be maintained from the commencement date of clearing and continue for a minimum period of 24 months.
The written report (including advice on each monitoring period) must be lodged with the Wildlife Assessment Team, Department of Environment and Heritage Protection, via an email to wildlife@des.qld.gov.au within 10 business days after each annual period.

Department of Environment and Science
www.des.qld.gov.au ABN 46 640 294 485

Queensland Government

Appendix B

Impact Management Plan Melaleuca irbyana 43-520 Greenbank Road, Greenbank prepared for Mirvac QLD Pty Ltd, dated 3 July 2018

Impact Management Plan
Melaleuca irbyana

432-520 Greenbank Road, Greenbank
Prepared for Mirvac Queensland Pty Ltd
3 July 2018

Job No. 7598

Document Control

Document: Impact Management Plan for 432-520 Greenbank Road, prepared by Saunders Havill Group for Mirvac Queensland Pty Ltd.

Document Issue

Issue	Date	Prepared By	Checked By
A	14.02.2018	KG / JG	AD
B	03.07.2018	JG	AD

Prepared by

ABN 24 144 972 949
www.saundershavill.com

Reports and plans by others may be included in this document.

Table of Contents

Figures

Tables

Plans

Abbreviations and Acronyms

DES Department of Environment and Science (Qld) (formally EHP)
EDQ Economic Development Queensland (Qld)
EHP Former Department of Environment and Heritage Protection (Qld) (now DES)
EVNT Endangered, Vulnerable or Near Threatened (as defined by the NCA)
NCA *Nature Conservation Act 1992* (Qld)
NCWR Nature Conservation (Wildlife) Regulation 2006
PDA Priority Development Area (herein referencing the Greater Flagstone Priority Development Area)
SHG Sunders Havill Group

1. Introduction

Saunders Havill Group (SHG) was engaged by Mirvac Queensland Pty Ltd (Mirvac) to prepare an Impact Management Plan (IMP) for *Melaleuca irbyana* (Swamp Tee Tree) specimens located within the Greenbank project area located at 432-520 Greenbank Road, Greenbank.

The Greenbank project was referred to the Commonwealth Department of the Environment and Energy (DEE) on behalf of Mirvac by SHG and deemed a Controlled Action for potential impacts on the Koala and Grey-headed Flying-fox under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to be assessed on Preliminary Documentation. Of note, Area 1 was approved by the DEE to be excised from the referral area. The Preliminary Documentation for the assessment of the project is nearing completion.

The Greenbank project has received preliminary approval under the Greater Flagstone Urban Development Area Development Scheme 2011 (PDA Development Scheme) by Economic Development Queensland (EDQ) who are the administering authority for development in the Greater Flagstone Priority Development Area (PDA).

As part of a protected plants flora trigger survey in accordance with the Protected Plants Guidelines, specimens of *M. irbyana*, listed as Endangered under the *Nature Conservation Act 1992* (NCA), were recorded within the Greenbank project area. This IMP has been prepared to support a clearing permit (protected plants) application to the Department of Environment and Science (DES) in accordance with Section 3.2 of the *Nature Conservation (Wildlife Management) Regulation 2006 – Protected Plants Assessment Guidelines*.

The IMP has been prepared in accordance with Section 3.2.1 of the *Protected Plants Assessment Guidelines,* as follows:

> **3.2.1 Impact management plan**
>
> An impact management plan must include the following sections:
>
> - attempts to avoid and minimise impact
> - nature of impact
> - management of impact
> - justification of impact management
> - survival of plant in the wild

Contextually, the site is located 30 kilometres (km) south of Brisbane and 10 km west of Logan Village, within the western suburb of Greenbank. The site is bound by Greenbank and Teviot Roads to the west and is predominately surrounded by rural residential development. Wearing Park immediately adjoins the site to the east and Greenbank Shopping Centre and Community Centre are located opposite the site, on the western side of Teviot Road. The site is located approximately 1.5 km southeast of Greenbank Military Training Camp and 500 metres east of the Brisbane – Sydney Railway Line. An infrastructure easement traverses the site parallel to the northern boundary. The site remains one of the last large rural properties in the immediate landscape predominately comprised of rural residential development. Refer to Figure 1 for the site context and Figure 2 for the site aerial.

The proposed clearing works will be undertaken over parts of the 412 hectare (ha) site to facilitate a master planned development and will be subject to future operational works approvals from EDQ. It is noted that a NCA Protected Plants Flora Survey has been undertaken and exemption obtained from the DES, formally the Department of Environment and Heritage Protection (EHP), for clearing over Area 1 to the west (Lot 2 & Lot 3 on SP297192 and along the boundary fence

line to support existing operational works approvals (Ref: APP0007102, APP0007278, respectively). No EVNT species were recorded within these clearing areas.

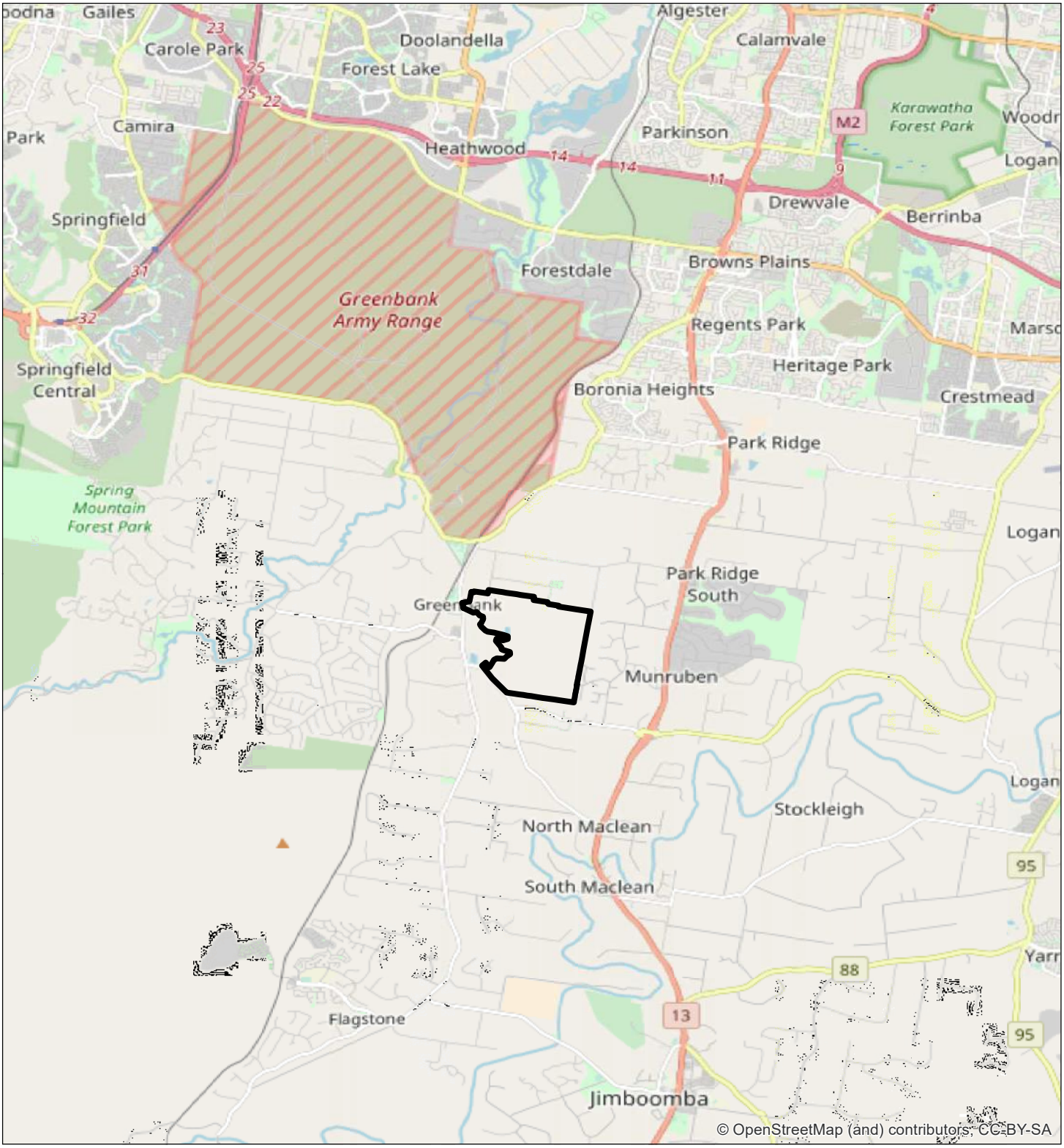
Flora surveys were conducted where clearing is proposed, including within areas mapped as 'High risk' under the Protect Plants Flora Survey Trigger Map High Risk (refer Figure 3) and as per the Flora Survey Guidelines – Protected Plants.

1.1. Property Summary

Key site details are provided in Table 1 below.

Table 1: Property Summary

Address	423-520 Greenbank Road, Greenbank
RPD	Lot 1 on SP297192
Local Government Area	Logan City
Administering Authority	Economic Development Queensland
Priority Development Area	Greater Flagstone PDA
Planning Scheme	Greater Flagstone PDA Development Scheme
Area Classification / Zone	Urban Living
Existing Land Use	Rural



Legend

Site DCDB

Figure 1

Site Context

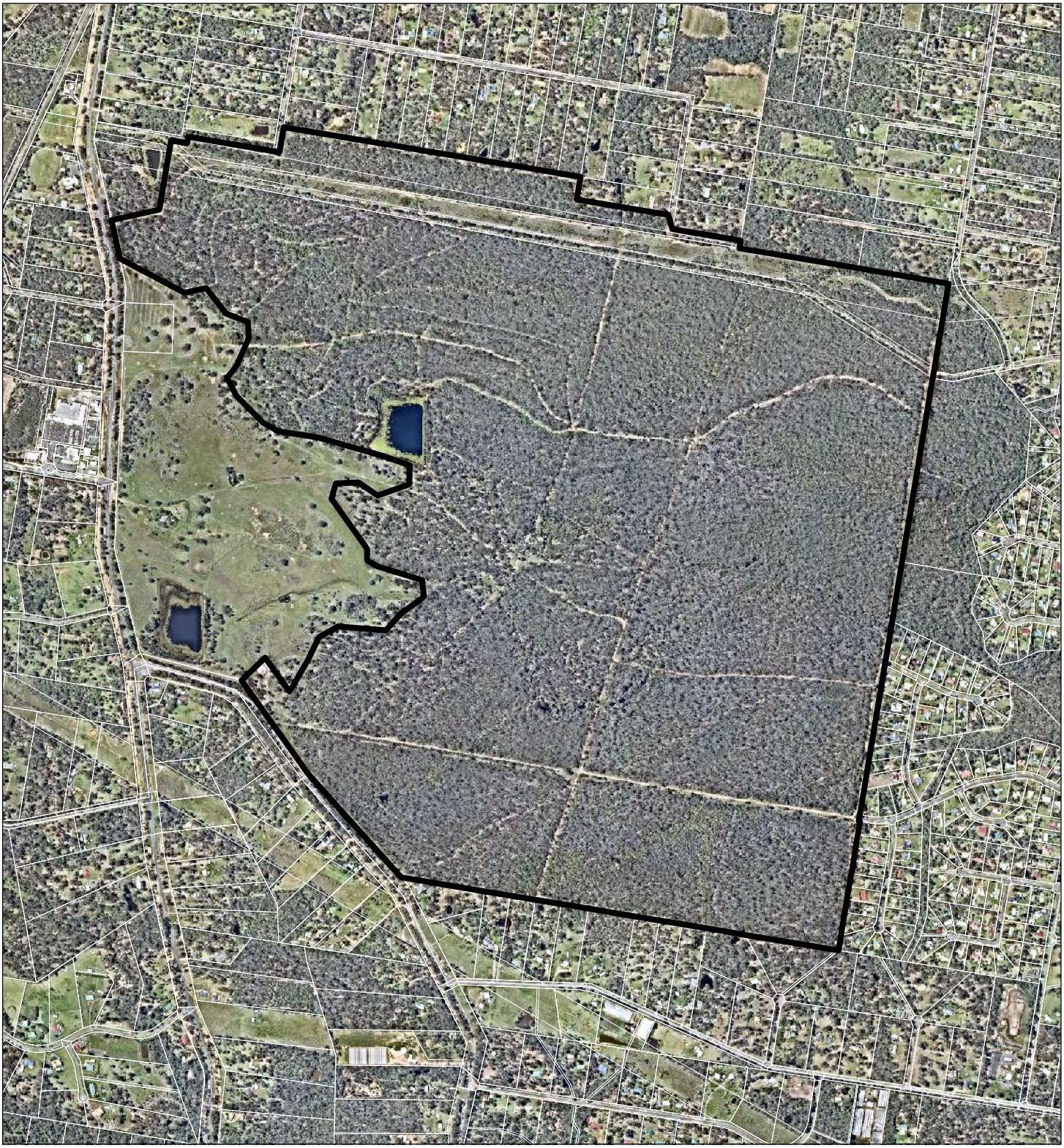
File ref. 7598 E Figure 1 NCA 2 Site Context B
Date *19/02/2018*
Project *Greater Flagstone Project, Greenbank (1/SP297192)*

0 1,000 2,000 3,000 4,000 *m*

Scale (A4): 1:125,000 [GDA 1994 MGA Z56]

N

Layer Sources QLD GIS Layers (QLD Gov. Information Service 2017)



Legend

Project Site DCDB

Qld DCDB

Figure 2

Site Aerial

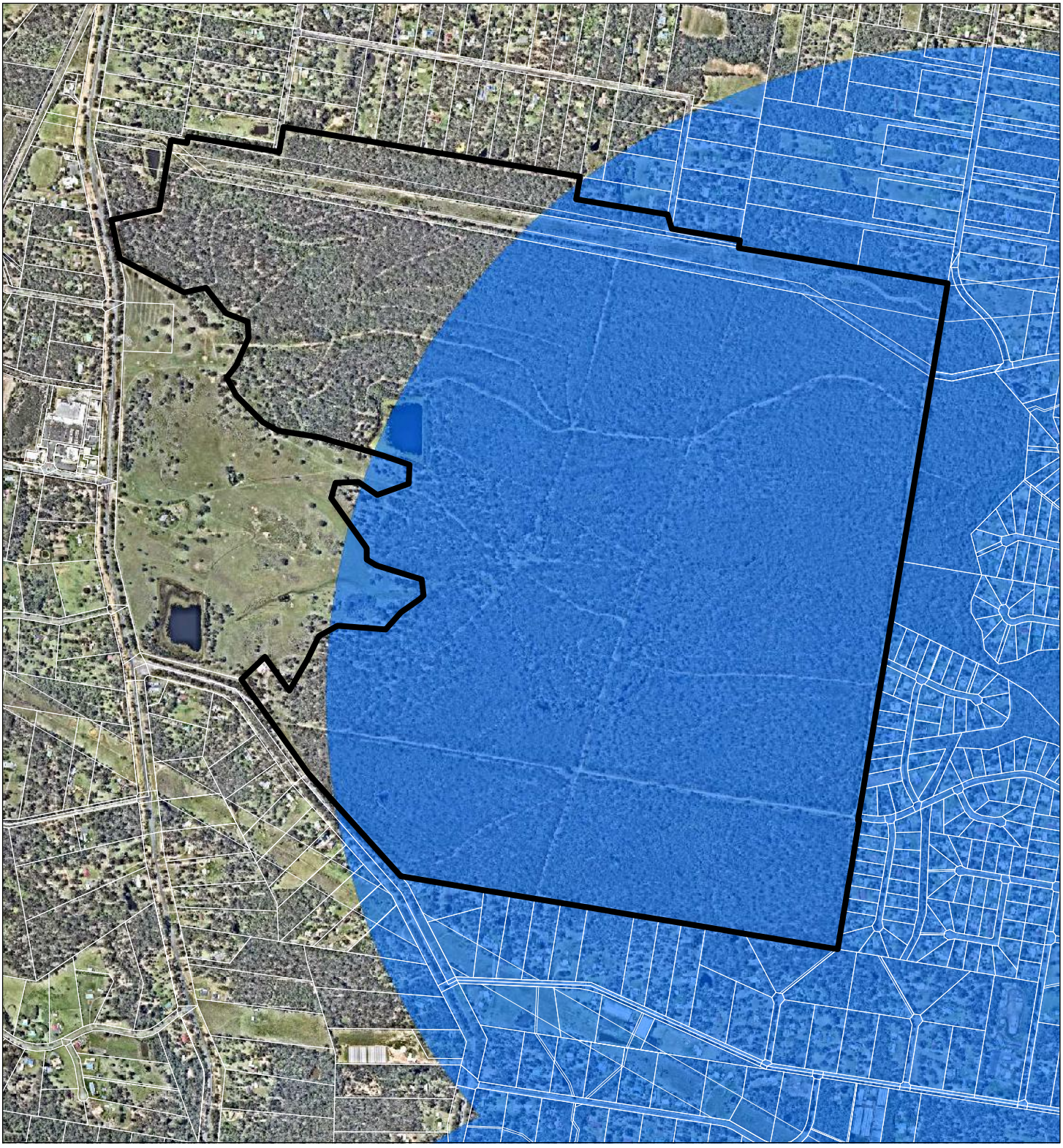
File ref. 7598 E Figure 2 NCA 2 Site Aerial B
Date *19/02/2018*
Project *Greater Flagstone Project, Greenbank (1/SP297192)*

0 100 200 400 600 800 *m*

N

Scale (A4): 1:17,000 [GDA 1994 MGA Z56]

Layer Sources QLD GIS Layers (QLD Gov. Information Service 2017), Aerial (Nearmap 2017)



Legend

- Project Site DCDB
- Qld DCDB
- Flora survey trigger area

Figure 3

NCA - Protected Plants Flora Survey Trigger Mapping

File ref. 7598 E Figure 3 NCA 2 Protected Plants B
Date *19/02/2018*
Project *Greater Flagstone Project, Greenbank (1/SP297192)*

0 100 200 400 600 800 *m*

N

Scale (A4): 1:17,000 [GDA 1994 MGA Z56]

Layer Sources QLD GIS Layers (QLD Gov. Information Service 2017), aerial (Nearmap 2017)

1.2. Nature Conservation Act 1992

The *Nature Conservation Act 1992* (NCA) classifies and protects significant areas (Protected Areas) and protects threatened plant and animal species. The Nature Conservation (Wildlife) Regulation 2006 (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 the Protected 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 km radius from the site. Three (3) 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 2: Wildlife Online Search Results–Flora

Scientific Name	Common Name	NCA Status
Marsdenia coronata	Slender Milkvine	Vulnerable
Plectranthus habrophyllus	-	Endangered
Melaleuca irbyana	-	Endangered

2. Nature of the Impact

2.1. Background

The only EVNT species located within the Greenbank project area was *Melaleuca irbyana* (Swamp Tea Tree). The profile of this species is detailed below in Section 2.2.

2.2. Protected Plant Profile

Melaleuca irbyana, a member of the Myrtaceae family, is listed as a threatened species under Schedule 2 of the *Nature Conservation (Wildlife) Regulation 2006* (NCWR) and is classified as "endangered". *Melaleuca irbyana* is also included as part of Endangered Regional Ecosystems (RE) 12.3.18, 12.3.19, 12.9-10.11 and 12.9-10.27 under the *Vegetation Management Act 1999* (VMA). This vegetation community is also listed as a Critically Endangered when present as a Threatened Ecological Community under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC).

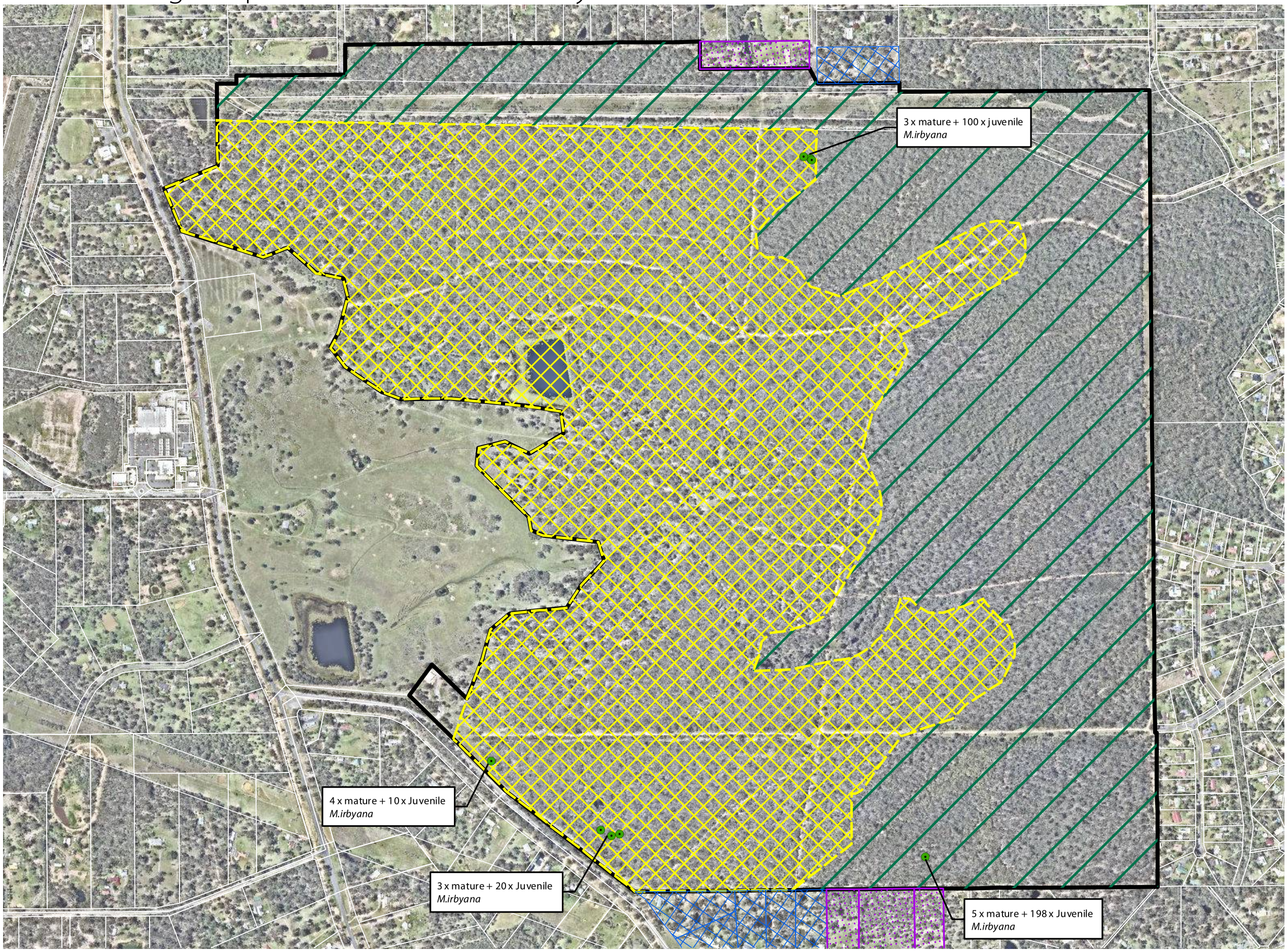
M. irbyana forms communities that occur in two (2) structural forms: the more common form consists of a dominant eucalypt canopy with an understorey containing *M. irbya*na thickets 8-12 metres in height; the less common form is an open forest or thicket of *M. irbyana* with emergent eucalypt trees. The understorey is sparse and can comprise of grasses, sedges, and herbs with a few shrubs, vines and possibly orchids present. There are fairly clear descriptions of *M. irbyana* communities, however, there are no clear indications of the point at which an individual tree or small number of trees are considered to be part of a community. An individual tree may still contribute reproductively to a community, or may have the potential to regenerate and in time create a community.

Logan City Council defines an *M. irbyana* community as, "*where Melaleuca irbyana occur in a patch size of 0.25 hectares or greater, or where a patch of Melaleuca irbyana less than 0.25 hectares adjoins a second patch and the sum of the patches is greater than 0.25 hectares*". This definition has been determined using methodology from the *Melaleuca irbyana* (Swamp Tea-tree) Community 1:25,000 Scale Mapping Project (Ryan, 2010).

2.3. *Melaleuca irbyana* On-site

The entire site was traversed as part of previous and contemporary NCA searches. While *Melaleuca irbyana* were not previously recorded in the Clearing Impact Area associated with Area 1 and the Perimeter Clearing works extents, surveys conducted as part of this reporting, over the balance of the site, recorded the species in four (4) separate locations. Refer to Plan 1 for *Melaleuca irbyana* onsite locations.

1. Clearing Impact - *Melaleuca irbyana*



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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Qld Gov. and Google 2016)

LEGEND

- Project DCDB
- Development footprint
- Conservation area
- NCA flora survey trigger area
- No Access under NCA Exemption (AP0007102)
- Surveyed under NCA Exemption (AP0007102)
- Mature *Melaleuca irbyana* specimen

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	5/03/2018	Preliminary	TC	AD
B	11/06/2018	Updated impact area	TC	AD

Transverse Mercator | GDA 1994 | Zone 56 | 1:10,000 @A3

0 50 100 200 300 400 m

saunders havill group

mirvac

Everleigh

ADDRESS/RPD: Teviot Road, Greenbank (1/SP297192) 11/06/2018 7598 E 01 NCA 2 Impact Plan B

Location 1:

Location 1 is situated in the northern aspect of the site, adjacent to the power easement. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. Refer to Plan 1 for *Melaleuca irbyana* on site locations and Table 3 for a description of the Regional Ecosystems). This patch of *Melaleuca irbyana* (Swamp Tea-tree) consisted of three (3) established specimens and one-hundred (100) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy.

Photo Plate 1: Location 1

Location 2:

Location 2 is situated towards the south-western property boundary, adjacent to Greenbank Road. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This *Melaleuca irbyana* (Swamp Tea-tree) patch consisted of three (3) established specimens and twenty (20) juveniles. This patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Allocasuarina littoralis* (Black She-oak) and *Acacia spp*. regrowth.

Photo Plate 2: Location 2

Location 3:

Location 3 is situated towards the south-western property boundary, adjacent to Greenbank Road and approximately 380 m west of Location 2. This patch is located within mapped non-remnant vegetation as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. This patch of *Melaleuca irbyana* (Swamp Tea-tree) consisted of four (4) established specimens and ten (10) juveniles. The patch of *Melaleuca irbyana* was found within a regrowth vegetation community, with surrounding vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth.

Photo Plate 3: Location 3

Location 4:

Location 4 is situated towards the southern property boundary, approximately 800 m east of Location 2. This patch is located within mapped composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 as confirmed via PMAV 2016/002969 certified on the 11th of May 2017. These Regional Ecosystems are described in Table 3 below. This patch consists of five (5) established specimens and one hundred and ninety-eight (198) juveniles. This patch of *Melaleuca irbyana* was surrounded by vegetation dominated by *Acacia spp., Allocasuarina littoralis* (Black She-oak) and *Alphitonia excelsa* (Soap Tree) regrowth with *Corymbia citriodora* (Spotted Gum) dominated canopy.

Photo Plate 4: Location 4

Table 3: Regional Ecosystems Descriptions

Status	Code	Description
Endangered	12.9-10.12	Corymbia intermedia, Angophora leiocarpa, Eucalyptus seeana +/- E. siderophloia, E. tereticornis, E. racemosa subsp. racemosa, C. citriodora subsp. variegata woodland to open forest. Lophostemon suaveolens is often present as a sub-canopy or understorey tree. Occasional Melaleuca quinquenervia on lower slopes. Does not include areas dominated by Eucalyptus racemosa subsp. racemosa. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).
Of Concern	12.9-10.7:	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).
Of Concern	12.3.11	Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. E. seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)
Least Concern	12.3.6:	Melaleuca quinquenervia +/- Eucalyptus tereticornis, Lophostemon suaveolens, Corymbia intermedia open forest to woodland with a grassy ground layer dominated by species such as Imperata cylindrica. Eucalyptus tereticornis may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a)
Least Concern	12.9-10.2:	Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, E. moluccana, E. acmenoides and E. siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).

Based on the information provided in **Section 2.2**, the specimens located on site are not consistent with a *Melaleuca irbyana* community due to the patches predominately containing juvenile individuals with very few mature specimens. Importantly, these patches are not associated with Endangered Regional Ecosystems. Locations 1 and 4 were confirmed via a certified PMAV to be located within composite 'Of Concern' Regional Ecosystem RE12.9-10.2/12.9-10.7 while locations 2 and 3 were located within non-remnant areas.

While Location 1 contains a substantial amount of juvenile species, overall, the significance of these patches is considered less than if they formed part of a broader existing community. The habitat value they currently provide is considered relatively limited, with no obvious noteworthy habitat for flora or fauna observed at the time of survey.

2.4. Avoidance and Minimisation of Impact

The proposed works are for the development of Greenbank master planned development in the Greater Flagstone PDA. Preliminary approval for the context plan and master plan has been issued by EDQ. These plans were informed by detailed analysis of the site by specialist consultants, including a detailed ecological analysis by SHG. Subsequently, areas for development shown are concentrated to areas of least constraint. Areas of highest ecological value have been identified for retention as conservation.

The proposed works will include the creation of residential allotments, a proposed school site, new roads, park and conservation areas and corridors. Minimisation of overall clearing impacts are evident through location of the proposed development, located outside Endangered remnant vegetation and waterway corridors. Rehabilitation of conservation areas and waterways is proposed as part of the development.

The proposed earthworks to facilitate the development footprint will require the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens, and ongoing property boundary maintenance within 100 m of a fourth patch. These specimens are located within Of Concern and non-remnant regrowth areas (refer Plan 1).

As per the EDQ endorsed Natural Environment Site Strategy, extensive conservation of greater than 89 hectares of proposed Conservation Parkland adjoining Norris Creek and Wearing Park is proposed as part of the development. In accordance with best practice management, restoration and rehabilitation works will seek to stabilise and reverse the negative effects of ongoing habitat fragmentation. The intent is for managed areas of rehabilitation and restoration to rectify canopy gaps and restore bare or denuded areas to provide additional habitat and refugia within the lower strata to maintain connectivity with external approval corridors and improve terrestrial corridor viability. Rehabilitation works within the conservation area and waterway corridors will include weed management and replanting with native species consistent with mapped Regional Ecosystems to augment ecological values and enhance connectivity.

Melaleuca irbyana grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and *Melaleuca* woodland with a sparse and grassy understorey. The species prefers poorly draining, heavy clay soils (Byrnes 1984; Barlow 1987). The proposed conservation land rehabilitation works will include establishing a *Melaleuca irbyana* thicket within remnant woodland forest to the north of the central waterway. This land is relatively low lying and adjoins an ephemeral waterway that contains permanent billabongs. The proposal *Melaleuca irbyana* planting site is therefore considered ideal for the species, which is dependent on specific groundwater and / or surface water hydrology. Impacts to *Melaleuca irbyana* have been minimised to the greatest practical extent and include establishing a *Melaleuca irbyana* community, on the project site, within future conservation land and managing potential impacts from ongoing works that will occur within 100 m of a retained patch.

2.5. Survival of the Plant in the Wild

Based on the current disturbed nature of the site and the locations of the *Melaleuca irbyana* specimens along property boundaries, it is not anticipated that the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens will significantly hinder the future success of the species in the area. Importantly, the fourth patch is to be preserved within the conservation area and proposed rehabilitation works seek to establish a *Melaleuca irbyana* community on the site allowing the community to be protected in perpetuity.

3. Offset Assessment

The *Protected Plants Assessment Guideline* states that an offset compensates for residual impacts after impact management requirements of the guideline have been met. The specimens located are not considered to constitute ecological communities (as described in Section 2.2.), and therefore the viability of *Melaleuca irbyana* local populations are not considered to be impacted by this proposal.

The proposed earthworks to facilitate the development footprint will require the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens. In consideration of the extensive rehabilitation works proposed within the onsite conservation land, including the establishment of an *Melaleuca irbyana* thicket, the proposed rehabilitation works will ensure a net gain in *Melaleuca irbyana* across the site. IN light of rehabilitation efforts, the removal of small patches of *Melaleuca irbyana* specimens is not considered to impose a Significant Residual Impact, as defined under the DES policy, and therefore offsets are not considered applicable in this case.

3.1. Rehabilitation works

It is considered that the proposed rehabilitation works will mitigate the impact to the extent that the impact on the Matter of State Environmental Significance (MSES) would not be considered significant.

To demonstrate this mitigation of impact, a response to the four (4) points of consideration within Section 1.2 of the *Significant Residual Impact Guideline* is provided below.

- **The extent and duration of impact on the matter and its sensitivity to disturbance.**

  The impact on the matter is the removal of three (3) relatively small patches of predominately juvenile *Melaleuca irbyana* specimens from former paddock areas that have already been subject to high disturbance from cattle grazing and historical clearing. A fourth patch will be retained with ongoing adjoining works within 100 m limited to the maintenance of the nearby property boundary. The sites are described in detail in Section 2.3, shown in Plan 1 and summarised below:

  - Location 1: 3 x mature s + 100 juvenile specimens, located within the north-east along a drainage feature
  - Location 2: 4 x mature + 10 juvenile specimens, located along the southern boundary
  - Location 3: 3 mature +20 juvenile specimens, located along the southern boundary
  - Location 4: 5 mature + 198 juvenile specimens, located along the southern boundary in the south-west

- **Timeframe for rehabilitation relative to the impact occurring and the ability of the matter to maintain its viability during this timeframe.**

  The rehabilitation proposed is the planting of six hundred and twenty-five (625, equates to 140 cleared specimens at 4:1 plus an additional 65 specimens over 5,000 m^2 at 1 per 8 m^2) advanced tube stock specimens of *M. irbyana* within a relatively isolated portion of the central waterway corridor of the conservation zone (refer Plans 2 to 4). Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *M. irbyana* ecological community as possible and maintained as part of the extensive rehabilitation works for the conservation zone. The area of planting of this thicket adjoins the central waterway corridor and is not within 100 m of future development areas. This location has been chosen to avoid human disturbance and as far away as possible from conflicting uses.

It is noted that the rehabilitated creek corridor will be handed over to Logan City Council following the on-maintenance period. Further, the fourth patch of *M. irbyana* that is to be retained within the conservation area will be subject to regular compatible weed suppression and monitored for persistence as part of site maintenance due to its proximity to ongoing property boundary maintenance works within 100 m.

- **Likely success of rehabilitation works to return the impacted matter to its original condition, and;**

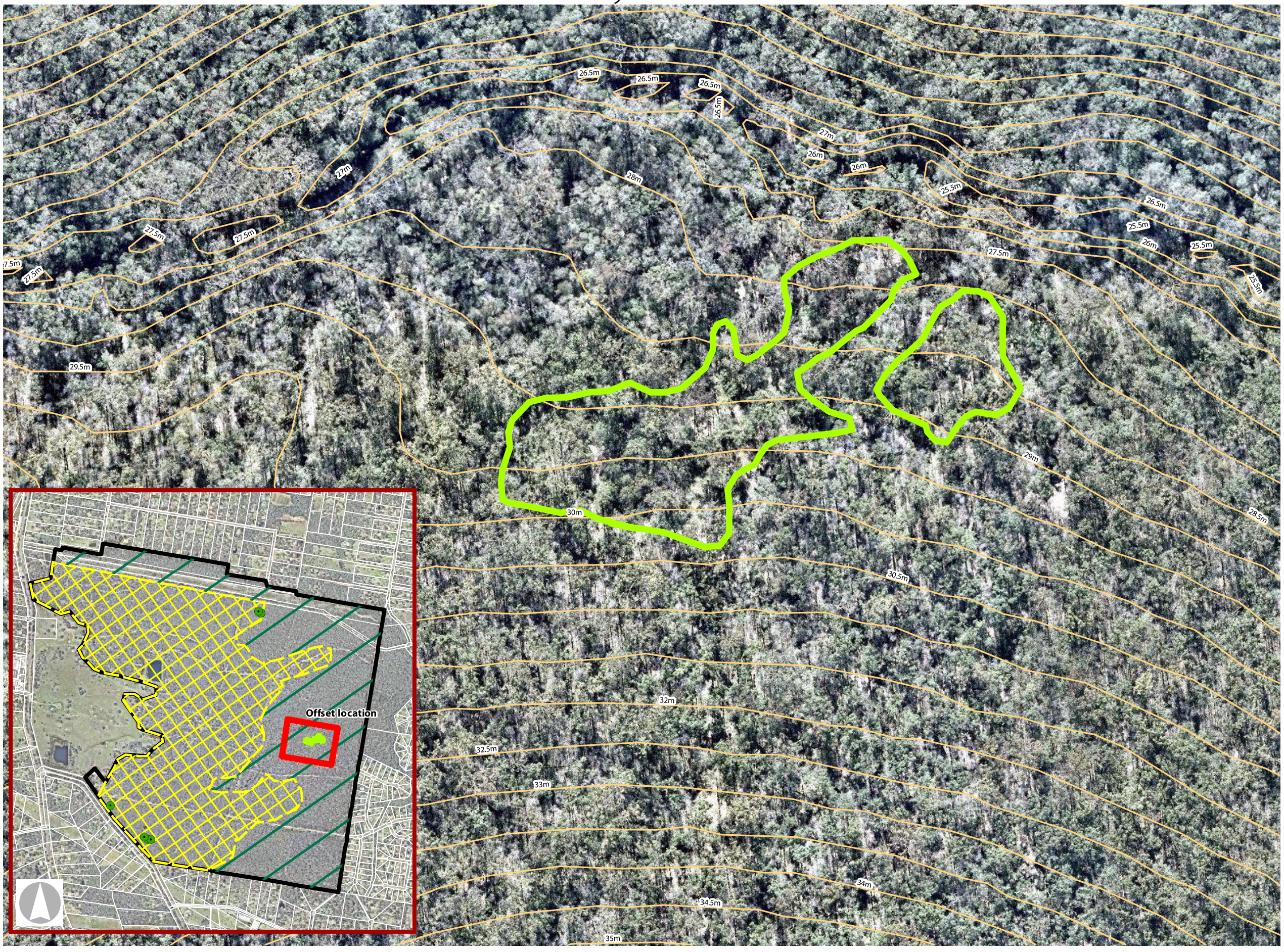
  It is important to note that the Regional Ecosystems within and adjoining the creek corridor reflect those where the *M. irbyana* patches are currently located on-site. The proposed rehabilitation area was chosen after detailed ecological survey of site attributes, including the prevailing low-lying topography, proximity to the creek, and canopy gaps with limited existing understorey (refer Plans 2 & 4). Thus, the planting of *M. irbyana* in the creek corridor has a high likelihood of success given the suitable landscape and habitat. Given that the impact is the removal of a 140 single individual specimens of *M. irbyana* which are almost entirely juveniles, the planting of six hundred and twenty-five (625) specimens of *M. irbyana* as a thicket within the conservation zone to be rehabilitated will far exceed the original condition of the impacted matter at an offset ratio of greater than 4:1.

- **The time-lag effect—between impact and rehabilitation successfully delivering the original condition for the matter—on the matter's viability.**

  As mentioned previously, the removal of three small patches of *M. irbyana* is not considered to significantly impact upon the viability of local populations nor remove significant habitat values. Although there will be a time-lag between the removal of the predominantly juvenile *M. irbyana* specimens and the maturity of the tube stock of *M. irbyana* to be planted. Overall, the rehabilitation proposed is considered a far superior ecological outcome for viability of local populations.

  The extent and number of *M. irbyana* to be planted is intended to establish a self-sustaining thicket of *M. irbyana* in a safe and secluded buffer environment that is capable of mitigating the proposed impacts. It is acknowledged that any future unavoidable loss of *M. irbyana* from the development area will be assessed by DES on a case by case basis.

2. Offset Assessment - *Melaleuca irbyana*



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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Nearmap 2018)

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Project DCDB
- Development footprint
- Conservation area
- Mature *Melaleuca irbyana* specimen to be impacted by clearing works
- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)
- Contours (0.5m)

Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

Issue	Date	Description	Drawn	Checked
A	11/06/2018	Preliminary	TC	AD

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,095 @A3

0 5 10 20 30 40 m

saunders havill group

mirvac

Everleigh

3. Melaleuca Irbyana - Rehabilitation/Planting Site Notes

INTRODUCTION

Saunders Havill Group (SHG) was engaged by MIRVAC to prepare an Impact Management Plan (IMP) for the clearing of 140 *Melaleuca irbyana* (Swamp Tree Tree) specimens. The replacement plants will be located within the approved conservation area of the Everleigh project (herein referred to as 'the site'). The clearing works, current and future will facilitate the creation of residential lots, a school and internal roads for the site's ultimate development layout.

The rehabilitation proposal for the clearing of 140 *Melaleuca Irbyana* is the planting of four (4) advanced tube stock specimens of *Melaleuca Irbyana* per tree cleared. A total of 625 (560+65 additional) *Melaleuca Irbyana* will be planted as a result. The planting area is proposed within the site's conservation zone (refer Plan 2) and will cover 5,000 m^2. The specific location of the planting area was determined onsite by Ecologists from SHG. The percentage of exiting canopy cover and the land zone features were taken into consideration when determining the optimal location for planting. Although it is expected that these plantings will take approximately four (4) years to reach the size of the impacted matter, they will be planted in a thicket to replicate as close to natural conditions for a *Melaleuca Irbyana* ecological community as possible and maintained as part of the rehabilitation works for the conservation zones. The area of planting of this thicket is centralised within the conservation zone and adjacent the waterway corridor, as stipulated by the EDQ approved NESS, and not within 100m of future development areas.

This Rehabilitation Plan is drafted to identify and manage the site disturbances for the planting of the 625 *Melaleuca Irbyana* specimens within a 5,000m^2. The planting will involve low impact weed removal and the retention of any existing native vegetation in the immediate area.

SITE PREPARATION

Once the planting locations have been determined not to impact existing native vegetation, the location is to be spot sprayed prior to soil cultivation. Herbicides must be applied by appropriately qualified/supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.

The planting will provide a net benefit of greater than 4 to 1 in an area protected under the NESS.
Rehabilitation treatment is to generally include the following points:

- A number of weeds are recorded for removal within shrub & ground layer
- Weed removal and management will utilise low impact methods
- Planting of the 625 specimens will be planted at approximately 1 per 8m^2 to form a *Melaleuca Irbyana* thicket.

Ecologists from SHG have assessed the site's vegetation. Broadly, it was determined that the assisted natural regenerate approach will be used on site. This approach is described below:

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 control, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration
- When the main management issue is weed infestation and/or current land use practices

Role of planting:

- Planting in such areas should be limited to where species cannot return to site without direct intervention.

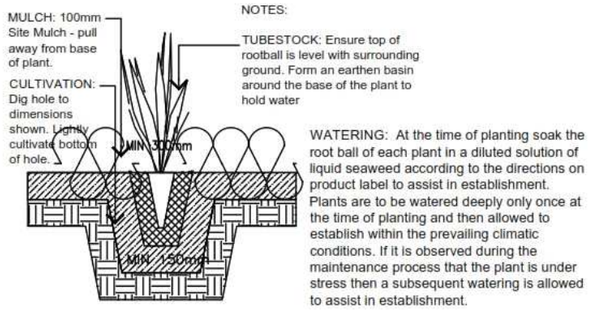
Goal vegetation community:

- The re-establishing plant community will be substantially similar in structure, composition and diversity to the original vegetation

MULCH

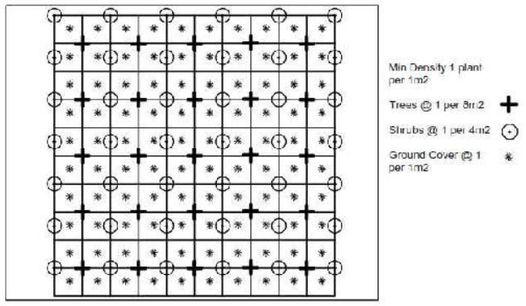
Areas to be blanket mulched to a minimum depth of 100mm leaving a 50mm gap surrounding the trunk of planted stock. Areas which are too steep or where overland flows may occur, a combination of mulch and Jute mat and or suitably anchored natural fibre weed mat installed to manufactures specifications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

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:



PLANTING

Planting locations shall be generally set out in accordance with a typical random grid pattern as shown on this drawing sheet below with the *Melaleuca Irbyana* to be planted at 1 per 8m^2.



All stock shall be advanced tube stock specimens of *Melaleuca Irbyana*, well formed, and 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 environmental coordinator has the right to inspect and reject stock prior to planting.

INSTALLATION

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 sheet, 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.
- 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.
- Planting is to be undertaken in accordance with the planting grid contained within this drawing sheet.
- 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:
    - 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 200mm
    - 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 & MONITORING

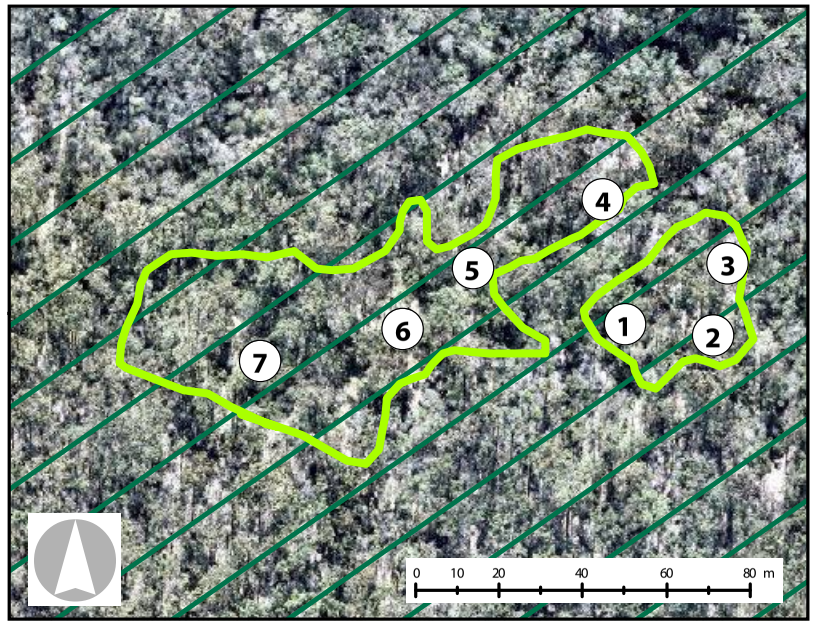
MAINTENANCE SCHEDULE

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.

Issue	Date	Description	Drawn	Checked
A	3/07/2018	Preliminary	TC	MS

4. Melaleuca Irbyana - Rehabilitation/Planting Site Photos



LEGEND

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- Melaleuca Irbyana planting/rehab site (Approx. 5,000m²)
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Note: Juvenile *Melaleuca irbyana* are specimens less than 2 metres tall

NOTES
This plan was prepared as a desktop assessment tool.
The information on this plan is not suitable for any other purpose.
Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2016), Aerial (Nearmap 2018)

* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

Issue	Date	Description	Drawn	Checked
A	11/06/2018	Preliminary	TC	AD

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,095 @A3

saunders havill group

mirvac

Everleigh

4. Summary and Conclusion

Saunders Havill Group has been engaged by Mirvac Queensland Pty Ltd to complete an Impact Management Plan (IMP) for *Melaleuca irbyana* located within the extent of works for the Everleigh Greenbank project. This IMP is intended to support a clearing permit (protected plants) application to the Department of Environment and Science (DES) in accordance with the *Nature Conservation (Wildlife Management) Regulation 2006 - Protected Plants Assessment Guidelines*.

Earthworks associated with the development will necessitate the removal of three (3) relatively small patches of predominantly juvenile *M. irbyana* and the retention of a fourth within the conservation area but within 100 m of ongoing property boundary maintenance. The Protected Plants Assessment Guideline states that an offset compensates for residual impacts after impact management requirements of the guideline have been met. Activities are not anticipated to adversely impact on the viability of any localised *M. irbyana* ecological communities, and the removal of three small *M. irbyana* patches is not considered to impose a Significant Residual Impact as defined under the DES policy in consideration of proposed rehabilitation works within the central creek corridor of the conservation zone. Therefore, offsets are not considered applicable in this case. It is important to note that investment in the conservation zone rehabilitation works proposed, i.e. revegetation and weed removal and the establishment of 625 tube stock *M. irbyana* plantings, is considered to provide a superior ecological outcome relative to the removal of a single specimen at an offset ratio greater than 4:1.