Government of **Western Australia**
Department of **Water and Environmental Regulation**

Your ref: RVA292_80
Our ref: DWERT3701
Enquiries: Teresa Bryant 6364 6421

Ms Bernadette Van Der Wiele
Director
EndPlan Environmental
PO Box 138
NORTH FREMANTLE WA 6159

Via email: bernadette@endplanenvironmental.com.au

Dear Bernadette

PROPOSAL – MINISTERIAL STATEMENT 1094 – ENVIRONMENTAL MANAGEMENT PLAN – APPROVED

Thank you for your lettper of 30 May 2019 submitting the Environmental Management Plan, Armstrong Reserve, Dunsborough, Urban and Commercial Development (Ministerial Statement 1094, V1, dated 30 May 2019) to the Department of Water and Environmental Regulation (DWER) for review.

I note the plan has been prepared to satisfy condition 6-1 of Ministerial Statement 1094 which states:

6-1 To mitigate for significant residual impacts of the proposal on a priority ecological community Dunsborough Swamp Forest, threatened and significant fauna species *Pseudocheirus occidentalis* and Ctenotus ora, and declared rare flora *Caladenia viridescens*, the proponent shall, prior to the commencement of construction prepare and revise the Environmental Management Plan for the remaining portion of Armstrong Reserve outside the Development Envelope shown in Figure 1, to the satisfaction of the CEO, on the advice of the Department of Biodiversity, Conservation and Attractions (DBCA).

I am satisfied with the preparation of the Environmental Management Plan, Armstrong Reserve, Dunsborough, Urban and Commercial Development (Ministerial Statement 1094, V1, dated 30 May 2019 and consider the requirements of condition 6-1 of Ministerial Statement 1094 have been met.

Prime House, 8 Davidson Terrace Joondalup Western Australia 6027
Locked Bag 10 Joondalup DC WA 6919
Telephone: 08 6364 7000 Facsimile: 08 6364 7001
www.dwer.wa.gov.au

Please note any changes to the management actions or targets of the Environmental Management Plan, Armstrong Reserve, Dunsborough, Urban and Commercial Development (Ministerial Statement 1094, V1, dated 30 May 2019 would require the approval of DWER.

Yours sincerely

Anthony Sutton
Executive Director
EPA SERVICES
for the Chief Executive Officer under Notice of Delegation dated 3 July 2017

28 June 2019

ENVIRONMENTAL MANAGEMENT PLAN

ARMSTRONG RESERVE, DUNSBOROUGH, URBAN AND COMMERCIAL DEVELOPMENT (MINISTERIAL STATEMENT 1094)

RAY VILLAGE AGED SERVICES INCORPORATED trading as CAPECARE
20 RAY AVENUE, BUSSELTON W.A. 6280

ENDPLAN ENVIRONMENTAL

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Document: Environmental Management Plan
Armstrong Reserve, Dunsborough – Urban and Commercial Development
(Ministerial Statement 1094)
Document No: RVA292_78_V1

STATEMENT OF LIMITATIONS:

Scope of Services
This report has been prepared in accordance with the scope of work set out in the contract, or as otherwise agreed, between the Client and EndPlan Environmental (EndPlan).
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In preparing the report, EndPlan has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise stated in the report, EndPlan has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. EndPlan will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EndPlan.
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DOCUMENT CONTROL:

Document Title:	**ENVIRONMENTAL MANAGEMENT PLAN ARMSTRONG RESERVE, DUNSBOROUGH – URBAN AND COMMERCIAL DEVELOPMENT (MINISTERIAL STATEMENT 1094)**			
Document No.	**Version**	**Issue Date**	**Issued To**	**Authorisation**
RVA292_78	**DRAFT**	**6 May 2019**	**Client**	**BM van der Wiele**
RVA292_78	**V1**	**30 May 2019**	**DWER – EPA Services**	**BM van der Wiele**

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LIST OF ACRONYMS

CoB	City of Busselton
DBCA	Department of Biodiversity, Conservation and Attractions
DEC	Department of Environment and Conservation (former)
DFES	Department of Fire and Emergency Services
DoEE	Department of the Environment and Energy (Commonwealth)
DoP	Department of Planning
DoW	Department of Water (former)
DPaW	Department of Parks and Wildlife (former)
DWER	Department of Water and Environmental Regulation
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation (Act)
ESD	Environmental Scoping Document
FESA	Fire and Emergency Services (former)
Ha	Hectare
Km	Kilometre
M	Metre
MNES	Matters of National Environmental Significance
OEPA	Office of the Environmental Protection Authority
PER	Public Environmental Review
PMST	Protected Matters Search Tool
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (former)
TPS	Town Planning Scheme
WONS	Weeds of National Significance

SUMMARY

Proposal Title:	**Armstrong Reserve, Dunsborough, Urban and Commercial Development**
Proponent:	Ray Village Aged Services (Inc.) trading as Capecare
Ministerial Statement No.:	1094
EPA Objectives:	1. To protect flora and vegetation so that biological diversity and ecological integrity are maintained. 2. To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
Purpose:	To meet the legal requirements of **Conditions 6-1 to 6-3** of **Ministerial Statement 1094**.
Outcomes:	**Condition 6-1**: To mitigate for significant residual impacts of the proposal on a priority ecological community Dunsborough Swamp Forest, threatened and significant fauna species *Pseudocheirus occidentalis* and *Ctenotus ora*, and declared rare flora *Caladenia viridescens*, the proponent shall, prior to the commencement of construction shall prepare and revise the Environmental Management Plan for the remaining portion of Armstrong Reserve outside the Development Envelope shown in Figure 1, to the satisfaction of the CEO, on the advice of the Department of Biodiversity, Conservation and Attractions (DBCA). **Condition 6-2**: The Environmental Management Plan required by condition 6-1 shall be prepared in consultation with the City of Busselton and include: (1) dieback management measures prepared in consultation with the DBCA; (2) measures to ensure Banksia logs and other woody debris from the clearing in the development envelope are relocated to within the area shown as remaining portion of Armstrong Reserve in Figure 1 to enhance fauna habitat values; (3) weed control measures; (4) measures to control vehicle and pedestrian access; and (5) management measures to ensure impacts from the proposal are contained within the development envelope shown in Figure 1. **Condition 6-3**: After receiving notice in writing from the CEO that the Environmental Management Plan satisfies the requirements of

Proposal Title:	**Armstrong Reserve, Dunsborough, Urban and Commercial Development**
	condition 6-1, prior to the commencement of construction, unless otherwise agreed by the CEO, the proponent shall implement the revised Environmental Management Plan in consultation with the City of Busselton for a period of three (3) years from the commencement of construction.
Key Environmental Values:	Native flora and vegetation are protected under the Western Australian *Biodiversity Conservation Act 2016* and/or listed as Matters of National Environmental Significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* Within Armstrong Reserve, these include the Priority 1 Ecological Community' Dunsborough Swamp Forest' and the Threatened flora species *Caladenia viridescens* (Dunsborough Spider Orchid).
Key Provisions:	Flora and vegetation and terrestrial fauna.

1. CONTEXT, SCOPE AND RATIONALE

1.1 Proposal

Ray Village Aged Services (Inc.) trading as Capecare (Capecare), proposes to develop a 1.28 ha portion of Armstrong Reserve, Naturaliste Terrace, Dunsborough (the development envelope), for the purpose of an aged care facility. The aged care facility will consist of the following operational elements:

- An 80-bed residential care facility to cater for people with high physical needs in a dementia-enabling environment;
- Approximately 40 independent living apartments;
- Administration offices and community facilities (including meeting rooms for the Country Women's Association);
- Internal road network and road access between the proposed development envelope, Naturaliste Terrace and Armstrong Place.

The development envelope, situated within the municipal boundary of the City of Busselton, is located approximately 500 m north of the business centre of the town of Dunsborough and is bounded by Armstrong Place to the south, Gifford Road to the east, Naturaliste Terrace to the west and the remaining vegetated portion of Armstrong Reserve (refer to **Figure 1**).

Previously comprising Lots 111, 115, 116, 117 Naturaliste Terrace and a 9994 m^2 portion of Lot 257 Naturaliste Terrace (**Figure 2**), in accordance with the Western Australian *Town Planning and Development Act 2005*, rezoning of the development envelope has resulted in the amalgamation of the Lots into a single Certificate of Title (**Appendix 1**). Lot 600 is now the legal responsibility of Capecare and will be retained as one Title in perpetuity and is zoned 'Special Purpose – Aged Person Housing' under the City of Busselton's Local Planning Scheme No. 21. The remainder of Armstrong Reserve has been gazetted into three lots with the City of Busselton retaining vesting of Reserve 25339 (Lots 3000 and 601) for the purpose of 'Landscape Protection' and Water Corporation retaining vesting of Reserve 40445 (Lot 258) for the purpose of 'Drainage'.

This Environmental Management Plan (EMP) identifies management measures, monitoring actions, completion criteria and compliance reporting requirements that are to be implemented to ensure the long-term protection of the Priority 1 Ecological Community Dunsborough Swamp Forest, threatened and significant fauna species *Pseudocheirus occidentalis* and *Ctenotus ora*, and declared rare flora *Caladenia viridescens* from potential impacts resulting from the construction of the aged care facility within the development envelope.

Bushland outside of the development envelope will be retained and the rehabilitation will be guided by this EMP that has been prepared in consultation with the Department of Water and Environmental Regulation's EIA Planning Branch, the City of Busselton and the Department of Biodiversity Conservation and Attractions (DBCA).

1.2 Key Environmental Factors

The key environmental factors that may be affected by the development, the anticipated impacts, and the parameters integrated into the aged care facility design which has been designed to mitigate

significant environmental risks are summarised in **Table 1**. **Section 1.3** addresses the key environmental factors with respect to the baseline studies conducted while **Section 2** identifies the management actions and targets and the proposed monitoring and reporting requirements for each environmental factor.

TABLE 1: Proposal Factors, Impacts and Design Inclusions to Minimise Environmental Risk

Environmental Factor	Proposal Activity which would affect the key environmental factor	Site-specific environmental value, existing and/or potential uses, ecosystem health condition or sensitive component of the key environmental factor which will be affected	Summary of key design inclusions and management activities to minimise environmental risk
Flora and Vegetation	• Clearing of existing vegetation. • Construction earthworks and temporary drainage infrastructure.	• Dunsborough Spider Orchid (*Caladenia viridescens*) • Priority Ecological Community (PEC) Dunsborough Swamp • Coastal Peppermint (*Agonis flexuosa*) trees	• Clearing of existing vegetation will be contained within the approved development envelope. • To ensure surrounding vegetation is not disturbed, the approved development envelope will be surveyed, pegged and temporary fencing erected to clearly demarcate of the limits of clearing during construction. • Permanent conservation fencing to be constructed between approved development envelope and remainder of Armstrong Reserve. • Dieback management measures will be implemented in accordance with the Dieback Management Plan. • To ensure Dieback is not spread, a Clean-On-Entry/Exit (COE) point will be constructed within the development envelope with educational signage for all construction personnel. • All construction drainage to be retained on-site.
Terrestrial Fauna	• Clearing of existing vegetation. • Noise and vibration associated with clearing and earthworks. • Construction earthworks and	• *Pseudocheirus occidentalis* (Western Ringtail Possum) • *Ctenotus ora* (Coastal Plains Skink)	• Clearing of existing vegetation will be contained within the approved development envelope. • To ensure surrounding vegetation is not

Environmental Factor	Proposal Activity which would affect the key environmental factor	Site-specific environmental value, existing and/or potential uses, ecosystem health condition or sensitive component of the key environmental factor which will be affected	Summary of key design inclusions and management activities to minimise environmental risk
	temporary drainage infrastructure.		disturbed, the approved development envelope will be surveyed, pegged and temporary fencing erected to clearly demarcate of the limits of clearing during construction. • *Banksia* logs and selected woody debris removed from within the development envelope will be relocated to the perimeter of the Reserve, in existing degraded areas of the Reserve or within the landscaped areas of the development envelope. • Permanent conservation fencing to be constructed between approved development envelope and remainder of Armstrong Reserve. • Prior to vegetation clearing commencing within the development envelope, a fauna trapping and relocation program will be implemented. • Prior to vegetation clearing commencing, the environmental consultant will carry out an induction for all clearing contractor personnel regarding the conservation significance of *P. occidentalis* and the importance of following the appropriate clearing procedures.

1.3 Condition Requirements

This Environmental Management Plan (EMP) has been prepared to fulfil the requirements of Conditions 6-1 to 6-3 of Ministerial Statement 1094 (**Appendix 2**).

Condition 6-1 states:

> *To mitigate for significant residual impacts of the proposal on a priority ecological community Dunsborough Swamp Forest, threatened and significant fauna species Pseudocheirus occidentalis and Ctenotus ora, and declared rare flora Caladenia viridescens, the proponent shall, prior to the commencement of construction shall prepare and revise the Environmental Management Plan for the remaining portion of Armstrong Reserve outside the Development Envelope shown in Figure 1, to the satisfaction of the CEO, on the advice of the Department of Biodiversity, Conservation and Attractions (DBCA).*

Condition 6-2 states:

> *The Environmental Management Plan required by condition 6-1 shall be prepared in consultation with the City of Busselton and include:*
> *(1) dieback management measures prepared in consultation with the DBCA;*
> *(2) measures to ensure Banksia logs and other woody debris from the clearing in the development envelope are relocated to within the area shown as remaining portion of Armstrong Reserve in Figure 1 to enhance fauna habitat values;*
> *(3) weed control measures;*
> *(4) measures to control vehicle and pedestrian access; and*
> *(5) management measures to ensure impacts from the proposal are contained within the development envelope shown in Figure 1.*

Condition 6-3 states:

> *After receiving notice in writing from the CEO that the Environmental Management Plan satisfies the requirements of condition 6-1, prior to the commencement of construction, unless otherwise agreed by the CEO, the proponent shall implement the revised Environmental Management Plan in consultation with the City of Busselton for a period of three (3) years from the commencement of construction.*

In addition, Condition 5-1 of Ministerial Statement 1094 relating to public availability of data, includes the requirement for management plans to be made publicly available for the remainder of the life of the proposal.

A copy of the approved EMP will be published on Capecare's website: http://capecare.com.au/independent-living/new-dunsborough-aged-care-village/

1.4 Rationale and Approach

This EMP uses a management-based approach to prioritise the provisions identified in Ministerial Statement 1094 (**Appendix 2**). Through the formal Environmental Impact Assessment (EIA) process to determine the environmental values of Armstrong Reserve[1], desktop assessments and field

[1] Public Environmental Review – Armstrong Reserve, Dunsborough, Aged Care Facility Development, EPA Assessment No. 1808 (EndPlan Environmental, September 2012)

surveys were conducted by consultants experienced in surveying the flora and fauna of the southern Swan Coastal Plain. To ensure that the biodiversity data collected was of an appropriate standard for use in EIA, each of the surveys was conducted in accordance with the technical guidance documents for biodiversity surveys issued by the Environmental Protection Authority (EPA)[2,3,4].

The field surveys and associated reports discussed in **Sections 1.4.1 – 1.4.4**, utilise scientific information (both published and unpublished) relating to the species, site and the region upon which their findings and conclusions have been based.

Based on the survey findings, the EPA recommended to the Minister for the Environment that this EMP should include measures to mitigate for significant residual impacts of the proposal on a priority ecological community Dunsborough Swamp Forest, threatened and significant fauna species *Pseudocheirus occidentalis* and *Ctenotus ora*, and declared rare flora *Caladenia viridescens*.

To reduce the impact of the proposal, Ministerial Statement 1094 identifies a clearly defined development envelope and the associated extent of native vegetation clearing. The majority of the remainder of Armstrong Reserve (Reserve 25339) has been protected through its rezoning to 'Landscape Protection' under the City of Busselton's Local Planning Scheme No. 21 and vested in the City for long-term management.

The clearing of the development envelope will be undertaken in one stage with civil construction works commencing shortly after. Construction of the aged-care facility is anticipated to take approximately two years.

1.4.1 Threatened Flora

Armstrong Reserve was surveyed for conservation significant flora, specifically orchid species on the 30 October 2009 for over seven hours. The survey was conducted within the flowering period of the majority of Threatened Flora (TF) species identified from the then Department of Environment and Conservation (DEC) database search results and marginally outside the normal flowering period for the TF *Caladenia caesarea* subsp. *maritima* and *C. excelsa* that finish flowering in September. No TF species were observed during the targeted survey. *Eucalyptus rudis* subsp. *cratyantha* (Priority 4) was the only conservation significant flora taxa that was definitively found on-site, with 23 individuals recorded from 20 locations.

In 2012, two targeted TF surveys were undertaken by officers from the former Department of Parks and Wildlife (DPaW), now the Department of Biodiversity, Conservation and Attractions (DBCA), and Dr Paul van der Moezel from PGV Environmental. The surveys identified that up to three individuals of the *C. viridescens* (Dunsborough Spider Orchid) occurred on Armstrong Reserve, one of which was likely to be impacted by the proposed development.

[2] Environmental Protection Authority 2004, *Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986) No 51 - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*, Environmental Protection Authority, Perth.

[3] Environmental Protection Authority 2004, *Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986) No 51 - Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*, Environmental Protection Authority, Perth.

[4] Environmental Protection Authority 2010, *Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*, Environmental Protection Authority, Perth, Western Australia.

In October 2013, Dr van der Moezel conducted a re-survey of Armstrong Reserve to confirm the number and accurately identify the location of any Dunsborough Spider Orchids present (**Appendix 3**). Four orchid plants were found in three locations, one of which was located just within the boundary of the development envelope (**Figure 3**).

1.4.2 Priority Ecological Community

In 2008, Dr Andrew Webb, an officer at the then Department of Environment and Conservation's (now DBCA) South West Regional Office, mapped a portion of the development envelope as a wetland describing the vegetation as consisting entirely of *Melaleuca rhaphiophylla – M. preissiana – Banksia littoralis* low forest on seasonally waterlogged soils of the Dunsborough-Eagle Bay area. which subsequently has been listed as a Priority 1 Ecological Community (Webb, 2008a). The area mapped by Dr Webb as representing the P1 PEC is shown on **Figure 3** (Webb, 2009a and 2009b). The total area of the P1 PEC occurring with Armstrong Reserve is approximately 3.21 ha while the area within the development envelope is approximately 4352 m^2.

In November 2009, a Level 2 Flora and Vegetation Survey was conducted at Armstrong Reserve by botanists from Ecoscape (Australia) Pty Ltd (2010). The survey found that Armstrong Reserve contains three distinct vegetation types correlating with landscape position: a low-lying dampland vegetation community *Melaleuca rhaphiophylla, Eucalyptus rudis*, and *Agonis flexuosa* Low Open forest or Woodland; a mid-slope vegetation community *A. flexuosa*, *Corymbia calophylla, E. rudis* and *Banksia littoralis* Low Open Forest to Open woodland; and an upland vegetation community *C. calophylla, A. flexuosa* and mixed species Open Forest to Low Woodland (**Figure 3**). All three vegetation types contain an *A. flexuosa* (Peppermint) component; known habitat for the *Pseudocheirus occidentalis* (Western Ringtail Possum).

The 2009 survey determined that the low-lying dampland and mid-slope vegetation belonged to the P1 PEC '*Corymbia calophylla, Melaleuca rhaphiophylla, Banksia littoralis, Eucalyptus rudis, Agonis flexuosa* low open forest with seasonal subsoil moisture of the Dunsborough area'.

1.4.3 *Pseudocheirus occidentalis* (Western Ringtail Possum)

In order to determine the potential impact of the proposed development on the fauna inhabiting Armstrong Reserve, a Level 2 fauna survey (including a targeted survey for *Pseudocheirus occidentalis* and habitat tree survey) was conducted on-site in September 2011 by zoologists from Ecoscape (Australia) Pty Ltd (**Appendix 4**).

The fauna survey identified:

- A total of 31 species were recorded through sightings, captures and calls.
- The only species of conservation significance identified was the *Pseudocheirus occidentalis* with a total of ten sightings.
- A total of 14 dreys were identified and were most commonly observed in *Melaleuca* sp., followed by *A. flexuosa* and *Casuarina* sp. trees.

An analysis of the *P. occidentalis* data was conducted with DISTANCE 4.0 (Thomas *et al*., 2010). The analysis used the factors of transect length, perpendicular distance to sighting from line, and number of individuals observed at that point on the line. The Effective Strip Width was estimated to be 7.94 m, within which there was a 91.6% probability of observing a *P. occidentalis*. The density of *P. occidentalis* was estimated to be 8.398 per hectare, with 95% confidence interval 3.43 to 20.55.

At the time of the survey, the central estimate for the number of *P. occidentalis* in the 3.51 ha Armstrong Reserve was estimated to be 29.5, with 95% probability.

In February 2012, a *P. occidentalis* habitat tree survey conducted within the development envelope identified that approximately 1155 m^2 of *P. occidentalis* habitat would be impacted by the development (i.e. 67.5% of the development envelope).

1.4.4 *Ctenotus ora* (Coastal Plains Skink)

In November 2012, a zoologist from Ecoscape (Australia) Pty Ltd conducted a targeted habitat survey for the *Ctenotus ora* (Coastal Plains Skink). Considered to be of high conservation significance (in 2012 the species was listed as Priority 1 species by the then Department of Environment and Conservation[5]), the species is thought to be dependent on sandy substrates, appears to have low population density where it occurs, and populations are fragmented both by the discontinuous distribution of sandy soils, and remnant vegetation providing suitable habitat. Any clearing of suitable habitat within the range of this species could have at least temporary and potentially significant impacts on local populations, because of the low population density and prior fragmentation of habitat by urban and agricultural development (**Appendix 5**).

On the 11 November 2012, a *C. ora* specimen was trapped in the southern part of Armstrong Reserve adjacent to the fence of the Shire works depot in a Marri, Peppermint, and mixed species low woodland or open forest. A skink consistent with *C. ora* was seen fleeing to cover (sticks and leaf litter around the base of a small Peppermint tree) and a funnel trap was then set at the site, with short fences along the edge of the litter pile. When checked, the trap contained an adult *C. ora*. The specimen was accessioned to the Western Australian Museum collection and sampled for DNA comparison which confirmed that the specimen was a *C. ora*.

1.5 Index of Biodiversity Surveys for Assessments (IBSA)

The following Index of Biodiversity Surveys for Assessments (IBSA) data packages have been prepared by the consultancies who conducted the field surveys associated with the information contained in **Section 2**:

- Armstrong Reserve, Dunsborough – *Caladenia viridescens* Survey Report (Source: PGV Environmental, 2013)
- Armstrong Reserve, Dunsborough – Flora and Vegetation Assessment (Source: Ecoscape (Australia) Pty Ltd., 2010)
- Armstrong Reserve, Dunsborough – Level 2 Fauna Survey (Source: Ecoscape (Australia) Pty Ltd., 2012)
- Armstrong Reserve, Dunsborough – *Ctenotus ora* Potential Impact Assessment (Source: Ecoscape (Australia) Pty Ltd., 2012)

[5] *Ctenotus ora* is currently listed as a **P3** species defined as poorly known species known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. (https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals September 2018 listing)

Given that all the surveys were conducted prior to the 30 April 2018, they fall under the transition period. As stated in the document *Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessment* (Environmental Protection Authority, 2018):

> *The IBSA data package must contain a Metadata and Licensing Statement in .pdf format, a survey report in .pdf format and a plain-text survey report in .txt format. The provision of electronic data files is optional; if provided, they may be in any file format and it is not necessary for the files to possess all attributes specified by the IBSA data standards.*

Each of the IBSA data packages has been prepared in accordance with the Department of Water and Environmental Regulation (DWER) document *Instructions for Preparing Data Packages for the Index of Biodiversity Surveys for Assessments (IBSA)*[6]. The biodiversity survey information collected has been captured in electronic data format and will be made publicly available through the DWER website[7].

Appendix 6 contains a copy of each of the related *Form: IBSA Data Package* prepared by the environmental consultancies: Ecoscape (Australia) Pty Ltd (2019) and PGV Environmental (2019).

[6] Instructions and Form: IBSA Data Packages online at: http://epa.wa.gov.au/forms-templates/instructions-preparing-data-packages-index-biodiversity-surveys-assessments-ibsa

[7] DWER IBSA Portal: https://biocollect.ala.org.au/ibsa#max%3D20%26sort%3DdateCreatedSort

2. EMP PROVISIONS

This section presents survey information gathered in relation to the key environmental factors:

- Flora and Vegetation; and
- Terrestrial Fauna

with referral to baseline studies undertaken with respect to the relevant provision, the approach to be applied to managing the environmental risks associated with the proposed development and any other relevant information including assumptions and uncertainties.

2.1 Flora and Vegetation

Level 2 flora and vegetation type and condition survey conducted on Armstrong Reserve in Spring 2009 (Ecoscape (Australia) Pty Ltd, 2010) and targeted TF surveys conducted in October 2012 form the baseline for future comparison and assessment.

The EPA objective for Flora and Vegetation, the purpose and outcomes for this EMP and the key environmental values, impacts and risks are identified in **Table 2** (over the page).

Management actions and targets, monitoring and reporting requirements for this environmental factor are identified in **Table 3**.

TABLE 2: Flora and Vegetation Provisions

EPA FACTOR	FLORA AND VEGETATION
EPA Objective:	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Purpose:	To meet the legal requirements of **Conditions 6-1 to 6-3** of **Ministerial Statement 1094**.
Outcomes:	**Condition 6-1**: To mitigate for significant residual impacts of the proposal on a priority ecological community Dunsborough Swamp Forest, threatened and significant fauna species *Pseudocheirus occidentalis* and *Ctenotus ora*, and **declared rare flora *Caladenia viridescens*,** the proponent shall, prior to the commencement of construction shall prepare and revise the Environmental Management Plan for the remaining portion of Armstrong Reserve outside the Development Envelope shown in Figure 1, to the satisfaction of the CEO, on the advice of the Department of Biodiversity, Conservation and Attractions (DBCA). **Condition 6-2**: The Environmental Management Plan required by condition 6-1 shall be prepared in consultation with the City of Busselton and include: (1) dieback management measures prepared in consultation with the DBCA; (2) measures to ensure Banksia logs and other woody debris from the clearing in the development envelope are relocated to within the area shown as remaining portion of Armstrong Reserve in Figure 1 to enhance fauna habitat values; (3) weed control measures; (4) measures to control vehicle and pedestrian access; and (5) management measures to ensure impacts from the proposal are contained within the development envelope shown in Figure 1. **Condition 6-3**: After receiving notice in writing from the CEO that the Environmental Management Plan satisfies the requirements of condition 6-1, prior to the commencement of construction, unless otherwise agreed by the CEO, the proponent shall implement the revised Environmental Management Plan in consultation with the City of Busselton for a period of three (3) years from the commencement of construction.
Key Environmental Values:	Native flora and vegetation are protected under the Western Australian *Biodiversity Conservation Act 2016* and/or listed as Matters of National Environmental Significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* Within Armstrong Reserve, these include the Priority 1 Ecological Community' Dunsborough Swamp Forest' and the Threatened flora species *Caladenia viridescens* (Dunsborough Spider Orchid).
Key Impacts and Risks:	Urban development, weeds and recreation impacts, fire and changes in hydrology.

TABLE 3: Flora and Vegetation Management Actions, Targets, Monitoring and Reporting Requirements

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
1. Implement the recommended *Phytophthora cinnamomi* Dieback management measures identified in the Dieback Management Plan (DMP) (**Appendix 7**). 2. Source materials (including clean fill, landscaping soils and mulch) and machinery brought into the development envelope and/or the Reserve from *Phytophthora* Dieback free suppliers. 3. Plants used in revegetation areas within the Reserve are to be sourced from NIASA accredited nurseries and must be certified by the supplier as being *Phytophthora* Dieback and weed-free.	To minimise the spread of existing Dieback infected areas and to reduce the risk of new infestations occurring within Armstrong Reserve.	1. Monitor the implementation and compliance of each management measure identified in the DMP. 2. Re-validate the *Phytophthora* mapping annually to ensure no evidence of further dieback infestation.	1. Revalidation mapping results to be provided to the DBCA Blackwood Office and the City of Busselton. 2. Management measures identified in the DMP to be addressed in the annual Compliance Assessment Report (CAR) to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.
4. Translocate the *Caladenia viridescens* individual located within the development envelope to Armstrong Reserve. 5. Conduct a re-survey of the translocated individual each flowering period (mid-September to late-October) in the first two years following transplanting.	To conserve and protect the Threatened Flora species *Caladenia viridescens*.	1. Conduct annual re-survey of translocated individual each flowering period for 2 years post-translocation. **Note:** this work has been completed – refer to **Appendix 3**.	1. Ensure TF Licence Permit reporting requirements are fulfilled. 2. To be addressed in the annual CAR to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.
6. Prior to clearing commencing:	Clear no more than 9020 m^2 of native	1. Clearing contractors clearing	To be addressed in the annual

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
(a) Re-survey the authorised extent of clearing using the authorized extent GPS coordinates with locations identified using star pickets/high visibility flagging tape. (b) Erect temporary fencing (using star pickets, flagging and sight wire) around the authorised extents. 7. Following completion of construction of the aged care facility, construct a permanent fence along the development envelope/Reserve interface (**Appendix 8**) to prevent unauthorised access into this area of vegetation.	vegetation within the development envelope to protect threatened and priority flora and fauna and vegetation communities. Temporary fencing to remain *in situ* (for the duration of the clearing and earthworks phases) so that the area of PEC that is to be retained is clearly visible to all civil works and construction contractors.	register. 2. Inspect initial clearing to ensure boundary lines meet requirements and check quarterly during construction. 3. Fly with UAV (drone) following clearing to obtain aerial imagery of cleared development envelope. 4. Monitor integrity of temporary fencing quarterly during construction. 5. Photographic evidence of permanent fence.	Compliance Assessment Report to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.
8. Conduct a weed survey and map degraded areas within the Reserve. 9. Prior to a Weed Management Plan being prepared and any associated ground disturbance works commencing, consult the DBCA's South West Regional office to ensure that areas containing TF and/or the PEC are adequately protected.	To maintain the diversity of the Reserve's flora, ensure that no new Environmental Weeds or Weeds of National Significance (WONS) are introduced.	1. Establish permanent quadrats in each revegetation area to monitor the success rate of weed control measures and revegetation. GPS coordinates will be taken of each of the quadrats to ensure that the same locations are monitored at every monitoring event. 2. Conduct pre-clearing baseline data gathering of each quadrat.	1. The results of the weed survey will be provided to the City of Busselton and appropriate completion criteria agreed on. 2. Following completion of initial planting, the plant species and the numbers of each species planted in the revegetation areas will be provided to the City of Busselton by the rehabilitation contractor.

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
10. Prepare a Weed Management Plan (WMP) for the Reserve. The WMP will include conducting a weed survey to identify and map the weed species present, to prioritise the species' threat to the native vegetation of the Reserve and to determine the appropriate management measures to be implemented. 11. Implement the Weed Management Plan targeting the eradication of weeds species identified on the Weeds of National Significance (WONS) or Declared weeds and weeds identified as high priority (i.e. rhizomatous grasses, bulbous, woody and noxious weeds). 12. Implement revegetation **only** in degraded areas of vegetation identified through the weed mapping survey. 13. Where practicable, use local provenance seed stock for revegetation activities undertaken within the Reserve to maintain the genetic integrity and diversity of the Reserve's flora. 14. Implement a Revegetation		3. Conduct quarterly weed monitoring. 4. Conduct six-monthly quadrat monitoring (endemic and introduced flora species) for 3-years following vegetation clearing. 5. During each monitoring event, collect photographic evidence of the quadrat with the date and quadrat identification number clearly shown.	3. Six monthly monitoring reports will be prepared by the rehabilitation contractor and submitted to the City of Busselton. 4. The six-monthly monitoring reports will be included in the annual CAR to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
Monitoring Program using permanent sampling quadrats to monitor the progress of revegetation within the Reserve. 15. Conduct infill planting in revegetation areas to ensure the completion criteria are met during the 3-year management period.			
16. Implement all management actions identified in Tables 5.1 and 5.2 of the City and DFES-approved Bushfire Management Plan (**Appendix 9**). 17. No construction work to be undertaken within the development envelope when there is a Total Fire Ban in place in the City of Busselton.	To minimise the risk of bushfire within and around the Reserve.	Monitor landowner compliance with the Bushfire Management Plan recommendations and the annual City of Busselton Firebreak Order.	To be addressed in the annual CAR to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.
18. Construct permanent Bushland Reserve Fencing Type B in keeping with the construction standards shown in **Appendix 8** along the boundary of the development/Reserve interface as identified on **Figure 4**. 19. Maintain the integrity of the permanent fencing.	To reduce unnecessary impacts to Armstrong Reserve by controlling access. To inform the community of the environmental value of conservation significant species and communities and the threats posed to them and the role that stakeholders play in protecting the ecological values of the Reserve.	1. Monitor (and photographic evidence) of permanent fencing following construction. 2. Quarterly monitoring of fencing for any necessary maintenance. 3. Quarterly monitoring (and photographic evidence) of permanent signage.	To be addressed in the annual CAR to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
20. Provide emergency and revegetation maintenance vehicle access at the two existing locked gates located along the existing firebreak: one at the Naturaliste Terrace entry and the other at the Gifford Road entry as identified in **Figure 4**.			
21. Install interpretative and educational signage at strategic locations identified on **Figure 4**.			

2.2 Terrestrial Fauna

A Level 2 terrestrial fauna survey including a targeted survey for the *Pseudocheirus occidentalis* (Western Ringtail Possum) conducted on Armstrong Reserve in September 2011 and a targeted survey for *Ctenotus ora* (Coastal Plains Skink) conducted in November 2012, (Ecoscape (Australia) Pty Ltd, 2012a, 2012b). The survey data gathered will form the baseline for future comparative assessments.

The EPA objective for Terrestrial Fauna, the purpose and outcomes for this EMP and the key environmental values, impacts and risks are identified in **Table 4** (over the page).

Management actions and targets, monitoring and reporting requirements for Terrestrial Fauna are identified in **Table 5**.

TABLE 4: Terrestrial Fauna Provisions

EPA FACTOR	TERRESTRIAL FAUNA
EPA Objectives:	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.
Purpose:	To meet the legal requirements of **Conditions 6-1 to 6-3** of **Ministerial Statement 1094**.
Outcomes:	**Condition 6-1**: To mitigate for significant residual impacts of the proposal on a priority ecological community Dunsborough Swamp Forest, threatened and significant fauna species ***Pseudocheirus occidentalis*** **and** ***Ctenotus ora*****,** and declared rare flora *Caladenia viridescens*, the proponent shall, prior to the commencement of construction shall prepare and revise the Environmental Management Plan for the remaining portion of Armstrong Reserve outside the Development Envelope shown in Figure 1, to the satisfaction of the CEO, on the advice of the Department of Biodiversity, Conservation and Attractions (DBCA). **Condition 6-2**: The Environmental Management Plan required by condition 6-1 shall be prepared in consultation with the City of Busselton and include: (1) dieback management measures prepared in consultation with the DBCA; (2) measures to ensure Banksia logs and other woody debris from the clearing in the development envelope are relocated to within the area shown as remaining portion of Armstrong Reserve in Figure 1 to enhance fauna habitat values; (3) weed control measures; (4) measures to control vehicle and pedestrian access; and (5) management measures to ensure impacts from the proposal are contained within the development envelope shown in Figure 1. **Condition 6-3**: After receiving notice in writing from the CEO that the Environmental Management Plan satisfies the requirements of condition 6-1, prior to the commencement of construction, unless otherwise agreed by the CEO, the proponent shall implement the revised Environmental Management Plan in consultation with the City of Busselton for a period of three (3) years from the commencement of construction.
Key Environmental Values:	Native terrestrial fauna are protected under the Western Australian *Biodiversity Conservation Act 2016* and/or listed as Matters of National Environmental Significance under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999.* Within Armstrong Reserve, these fauna include the Critically Endangered species *Pseudocheirus occidentalis* (Western Ringtail Possum) and the Priority 3 species *Ctenotus ora* (Coastal Plains Skink).
Key Impacts and Risks:	Habitat loss, degradation and fragmentation, invasive species, inappropriate fire regimes.

TABLE 5: Terrestrial Fauna Management Actions, Targets, Monitoring and Reporting Requirements

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
1. Prior to vegetation clearing commencing within the development envelope, the following management measures designed to protect the existing PEC1 vegetation and associated fauna habitat that is to be retained will be undertaken: (a) The surveyor will GPS and record the coordinates of any Peppermint trees identified to be retained within the development envelope. (b) The environmental consultant will accompany the clearing contractor on a walkover of the development envelope to identify areas of vegetation marked for retention and to agree upon a process and timetable for clearing. 2. Prior to vegetation clearing commencing within the development envelope, the fauna specialist will: (a) Obtain a *Regulation 15 Licence to Take/Capture Fauna for*	To protect and conserve the Critically Endangered *Pseudocheirus occidentalis* (Western Ringtail Possum).	1. On **two consecutive nights** during the week prior to vegetation clearing of the development envelope commencing: (a) Conduct a distance sampling survey of the *P. occidentalis* population within the Reserve using the transect lines identified in **Figure 5**. (b) Conduct a count of the drey and *P. occidentalis* population within the authorised development envelope as defined in **Appendix 2**) 2. Conduct distance sampling surveys of *P. occidentalis* within Armstrong Reserve **twice annually** for **three** years following commencement of vegetation clearing. The surveys will use the series of semi-permanent transects as shown as **Figure 5**. 3. Certify that the clearing contractor's induction has been conducted through induction register. 4. Photographic evidence taken of the vegetation clearing process.	1. The *P. occidentalis* monitoring reports will be included in the annual CAR to be prepared by Capecare, submitted to the DEWR and published on the Capecare website. 2. Within one month of the expiration of the *Regulation 15 Licence to Take/Capture Fauna for Educational or Public Purposes* Capecare's fauna specialist will provide the Director General of the DBCA a 'return' report. A copy of the 'return' report will also be provided to the proponent for issuing to the City of Busselton.

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
Educational or Public Purposes issued by the DBCA. (b) On **two consecutive nights** during the week prior to vegetation clearing of the development envelope commencing, (i) Conduct a distance sampling survey of the *P. occidentalis* population within the Reserve using the transect lines identified in **Figure 5**. The survey will establish a new baseline of the *P. occidentalis* population against which subsequent post-clearing survey data will be measured. (j) Conduct a count of the drey and *P. occidentalis* population within the authorised development envelope as defined in **Appendix 2**) and if practicable, remove all dreys and *P. occidentalis* located. 3. Immediately prior to vegetation clearing works commencing,		5. Check surveyors mapped location of any Peppermint tree to be retained within the development envelope.	

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
Capecare's fauna specialist will inspect all trees and undergrowth contained within the authorised development envelope for the presence of any *P. occidentalis* and herd to suitable habitat located within the Reserve. 4. The fauna specialist will be present throughout the clearing process to rescue any *P. occidentalis* that may be encountered by the clearing contractor. 5. The environmental consultant will carry out an induction for all clearing contractor personnel regarding the conservation significance of *P. occidentalis* and the importance of following the approved clearing procedures. 6. Initial clearing of the development envelope will commence with an experienced arborist removing branches of mature Peppermint trees to breast plate height using a chainsaw. Heavy machinery will then be used to remove tree stumps and undergrowth. 7. Clearing will be conducted such that it achieves a progression of			

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
clearing in the direction toward the areas of remnant vegetation that is to be retained (e.g. working from Armstrong Place towards the Reserve to allow the *P. occidentalis* to move into the adjoining Reserve. 8. All cleared vegetative debris from the development envelope will be removed from site on the same day as clearing takes place to prevent *P. occidentalis* from using the stockpiles as refuges. 9. During construction should injured fauna be found, contact the DBCA immediately to arrange for its care (DBCA Blackwood District Office: 9752 5555).			
10. Plantings in revegetation areas to be 100%, development envelope and street trees are to be planted with 80% tree and shrub species that are known to be primary habitat plant species for *P. occidentalis*.	Establish a self-sustaining vegetation community with flora species known to be primary foraging plants for *P. occidentalis*.	Planting lists and invoices indicate the proportion of *P. occidentalis* foraging plants versus other species is: (a) 100% in Armstrong Reserve revegetation areas; and (b) 80% in the development envelope and street trees.	1. Lists of species type and number will be reported to the City of Busselton following planting. 2. To be addressed in the annual Compliance Assessment Report to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.
11. If practicable, relocate selected *Banksia* logs and woody debris	To protect and conserve the Priority species *Ctenotus ora* (Coastal Plains	1. Pre- and post-clearing photographic evidence of	1. *Ctenotus ora* survey report to be provided to the DBCA.

MANAGEMENT ACTION	MANAGEMENT TARGET	MONITORING	REPORTING
removed from within the development envelope to existing degraded areas on the perimeter of the Reserve. 12. Conduct a *Ctenotus ora* survey once only during Capecare's 3-year management period to determine the population of the species. .	Skink).	relocated logs and woody debris. 2. Conduct a single monitoring survey of *Ctenotus ora.*	2. To be addressed in the annual Compliance Assessment Report to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.
13. If required, install tree guards around tubestock used in the revegetation areas to prevent rabbits from eating seedlings. 14. Should signs of feral animals be observed during weed/revegetation inspections, engage a qualified pest controller to manage feral species. 15. Provide surrounding residents with a brochure containing information on the impacts of domestic pets on native fauna.	To control and minimise the impact of feral and domestic pets on the native flora and fauna of Armstrong Reserve and to raise community awareness of the impacts of domestic pets on the Reserve.	1. Quarterly weed monitoring to check for evidence of herbivoring and signs (scats, markings) of feral animals. 2. Copy of brochure to be sighted.	1. Signs of herbivoring or feral animals to be reported to Environmental Consultant for actioning. 2. To be addressed in the annual Compliance Assessment Report to be prepared by Capecare, submitted to the DEWR and published on the Capecare website.

3. ADAPTIVE MANAGEMENT AND REVIEW

3.1 Flora and Vegetation

Sections 3.1.1 – 3.1.3 following discuss the key issues that may impact upon the floral diversity and PEC condition of Armstrong Reserve if they are not adequately managed. In the event that quarterly site inspections and six-monthly quadrat monitoring indicate rehabilitation is not developing in line with expected trends for the plant biodiversity parameters being monitored, contingency actions identified in **Table 6** will be implemented.

3.1.1 *Phytophthora cinnamomi* Dieback

Phytophthora cinnamomi 'Dieback' is the most significant species in the South West of Western Australia and is one of the most common diseases impacting the quality of bushland within many urban and peri-urban areas (Dieback Working Group, 2008). Dieback infestation currently affects a substantial proportion of Armstrong Reserve and has the potential to adversely impact the Reserve's biodiversity conservation values.

Human activity can cause the most significant, rapid and widespread distribution of both of the Dieback pathogen, and bushland restoration projects can inadvertently spread the pathogen through the inadvertent use of infected plant stock and importation of infested soil.

The Dieback Management Plan (**Appendix 7**) identifies the level of infestation occurring within Armstrong Reserve (**Figure 6**) and contains a series of management measures recommended to be implemented to prevent the spread of the infestation. Annual monitoring and mapping of the infestation will determine whether the existing infestation is spreading or if new infestation 'hot spots' have occurred. Should either of these occur, the initial response will be to liaise with the DBCA's Dieback specialist's to use Best Management Practice measures (e.g. the application of Phosphite through stem injection and foliar spray) to prevent the spread of infestation.

3.1.2 Floral Diversity

In May 2015, Dr Andrew Webb (DBCA South West Region Botanist) conducted an inspection of Armstrong Reserve and concluded that remnant native vegetation of Excellent to Pristine condition is located outside of the development envelope and that the drainage reserve (**Figure 3**) contains excellent condition vegetation and is dominated by *Baumea* and *Cyathochaeta* sedge species. Dr Webb determined that the existing native vegetation was assisting in minimising potential impacts from erosion, weed invasion and nutrient impacts occurring within the drainage reserve.

To ensure that this vegetation is protected from potential impacts from the development, Capecare will construct a temporary fence along the development envelope/Reserve interface (identified in **Figure 4)** during the clearing and initial earthworking phases to prevent overclearing and damage to the PEC. The temporary fencing will be required to be removed at the time that the retaining wall is constructed along the Reserve/development area interface boundary. Following construction of the retaining wall, a permanent conservation fence will then be constructed to prevent unauthorised access into this area.

Although the majority of the Reserve vegetation is in a very good condition, there are a few areas that have become degraded since the 2009 survey. As part of the weed survey that will be conducted within the Reserve, As part of the weed survey that will be conducted within the Reserve,

areas of vegetation identified as 'degraded' will be revegetated to improve the floral diversity of the Reserve.

Six-monthly quadrat monitoring will be undertaken to target the following issues:

- Prior to initial planting – to determine baseline data.
- First spring - to determine if there are any immediate losses as a result of transplant shock, weed competition, predation or weather-related impacts.
- First autumn - to determine mortality and survival rates over the first summer period.
- Second spring – to assess the long-term success of the revegetation operation and determine the need for further remedial works to be implemented.
- Second autumn – to assess the long-term success of the revegetation operation and determine the need for further remedial works to be implemented.

Revegetation maintenance work (e.g. infill planting) will be carried out in response to monitoring identified above to ensure completion targets are met during Capecare's three-year management period.

3.1.3 Weed Management

Weeds represent a major issue contributing to degradation of native bushland areas and require control to maintain natural areas to preserve their ecological integrity. During the 2009 botanical survey, 19 introduced species were observed in Armstrong Reserve (Ecoscape (Australia) Pty Ltd, 2010). None of the weeds observed were listed on the WONS (Weeds Australia, 2008) and Environmental Weeds. The Environmental Weed Census and Prioritisation (Department of Environment and Conservation, 2008) has identified *Sonchus oleraceus* as having a very high priority for control in order to protect biodiversity values. Due to the time delay between the initial survey and now, a weed mapping survey of Armstrong Reserve will be conducted to identify and map the weed species present, to prioritise the species' threat to the native vegetation of the Reserve and to determine the appropriate management measures to be implemented.

A Weed Management Plan will then be implemented within the Reserve focussing on those areas that are subject to revegetation. Weed control will target the eradication of weed species identified on the Weeds of National Significance (WONS) or Declared weeds and weeds identified as high priority (i.e. rhizomatous grasses, bulbous, woody and noxious weeds) with the expectation that weed removal will enable native plant species to thrive and spread.

TABLE 6: Triggers and Corrective Actions for Rehabilitation

ITEM	TRIGGER	CORRECTIVE ACTION
1.	Revegetation completion criteria are not met at Years 2 and 3.	1. Identify the cause/survival rate. 2. Implement one or more corrective actions, such as: - Undertaking additional infill planting; - Implementing supplementary watering, fertilising, wetting agents if required; 3. Monitor the success of the corrective action.
2.	Weed coverage is impacting on development of the native species cover.	1. Identify the cause/weed species. 2. Implement one or more corrective actions, such as: - Using a different chemical for eradicating the species identified; - Utilising hand weeding/digging; - Conducting additional weed controls. 3. Monitor the success of the corrective action.
3.	Insect attack is reducing plant productivity within the native revegetation cover.	1. Identify the insect/s. 2. Implement one or more corrective actions, such as: - Apply an appropriate insecticide aimed at eradicating the species identified; - Increasing nutritional status of soil to improve plant health and increase plant resistance. 3. Monitor the success of the corrective action.
4.	Revegetation areas appear to be suffering dieback/revegetation is not thriving as expected.	1. Identify the cause, including whether dieback is caused by *Phytophthora*. 2. Engage a *Phytophthora* dieback consultant to confirm the presence of the disease. 3. Implement management measures prescribed by the dieback consultant. 4. Monitor the success of the corrective action.
5.	Unauthorised access (humans, feral or pest species) into revegetation area.	1. Identify the nature and extent of pest/unauthorised human access. 2. Undertake fence maintenance. 3. Implement eradication of feral species (baiting, trapping) on an 'as-needs-basis' in consultation with the DBCA.

3.2 Terrestrial Fauna

3.2.1 *Pseudocheirus occidentalis* (Western Ringtail Possum)

In 2011, following consultation with staff from the then DEC Science Division and the University of Western Australia, a *P. occidentalis* monitoring program was prepared to:

(i) Derive a quantitative estimate of the *P. occidentalis* population size within the development envelope; and
(ii) Assess the immediate and long-term effects, from the proposed development, on the *P. occidentalis* population within the development envelope.

The monitoring program acknowledges that some *P. occidentalis* are likely be displaced by the development. Where these displaced possums have been left *in situ* at other development envelopes within the south-west of Western Australia, the fate of the displaced possums is unknown. Where possums have previously been translocated from other developments, the translocation outcomes have been varied. Self-sustaining *P. occidentalis* populations appear to have become established at some translocation sites, at others there has been a high level of mortality attributed to predation by cats (*Felis catus*) and south-west carpet pythons (*Morelia spilota imbricata*) (Dr Paul de Tores, pers. comm.).

During the Level 2 fauna survey undertaken at Armstrong Reserve (Ecoscape (Australia) Pty Ltd, 2012a) the population size (abundance) and density of *P. occidentalis* was estimated using Distance Sampling methodology (Buckland *et al*., 2004) to provide a quantitative assessment of population size and reliable estimates with all assumptions clearly stated, assessment of whether these assumptions are met and the derived estimates provided with confidence intervals and estimates of variance. The methodology acknowledges imperfect detection (i.e. the estimates are derived in the knowledge that not all animals will be detected during the survey) and incorporates a model selection approach to enable competing models to be compared to determine which model (or set of variables with the potential to influence detection and/or abundance) best describe the data (**Appendix 4**).

A series of semi-permanent transects were established within the habitat to be retained within Armstrong Reserve and temporary transects were established within habitat contained within the development envelope that will be cleared (**Figure 5**). The program DISTANCE was used to analyse the data and provide estimates of density of *P. occidentalis* on-development envelope. Density estimates were derived using DISTANCE Sampling protocols and the Line Transect option of the software DISTANCE 4.0 (Thomas *et al.,* 2002).

Given the time lapse between the 2011 survey and the anticipated commencement of vegetation clearing within the development envelope (2019), a distance sampling survey of the *P. occidentalis* population utilising the development envelope and the Reserve using the utilising the transect lines identified in **Figure 5** will be conducted. The survey will be undertaken on two consecutive nights during the week prior to vegetation clearing of the development envelope. The results from the survey will establish a new **baseline** of the *P. occidentalis* population against which subsequent post-clearing survey data will be measured.

All vegetation clearing will be undertaken in keeping with the clearing protocols recommended in the document *Procedures to Minimise Risk to Western Ringtail Possums during Vegetation Clearing and Building Demolition* (Department of Conservation and Environment, 2009) (**Appendix 10**). And for the duration of the clearing process, a fauna specialist will be present to assist in the salvage and relocation of any stranded fauna. Relocation will be undertaken in accordance with the *Regulation 15 Licence to Take/Capture Fauna for Educational or Public Purposes* issued by the DBCA.

In order to assess the immediate and long-term effects of development on the *P. occidentalis* population within the Reserve, distance sampling surveys will be repeated twice annually for **three** years following commencement of vegetation clearing.

Should the survey data indicate that the resident population of *P. occidentalis* is decreasing over time, Capecare will liaise with the DBCA's Bunbury Regional Office Senior Wildlife Officer to review the monitoring methodology and data collected and discuss the implementation of recommended management and mitigation measures proposed.

3.2.2 *Ctenotus ora* (Coastal Plains Skink)

The species *C. ora* is considered to be of high conservation significance (listed as a Priority 1 species the DBCA). It is thought to be dependent on sandy substrates, appears to have low population density where it occurs, and populations are fragmented both by the discontinuous distribution of sandy soils, and of remnant vegetation providing suitable habitat. Any clearing of suitable habitat within the range of this species could have at least temporary and potentially significant impacts on local populations, because of the low population density and prior fragmentation of habitat by urban and agricultural development (Ecoscape (Australia) Pty Ltd, 2012b).

Species mapping indicates that the Dunsborough population is likely to extend to several contiguous blocks of bushland as well as Armstrong Reserve, but may be effectively isolated from larger areas of occupied habitat to the east and west. It is considered that the proposed development envelope does not break any existing linkages that might be important to an existing population of *Ctenotus ora* (**Appendix 5**).

A *C. ora* survey of Armstrong Reserve will be conducted **once only** during Capecare's **3-year** management period to determine the resident population of the species.

Should the survey data indicate that the resident population *C. ora* population is decreasing over time, Capecare will liaise with the DBCA's Bunbury Regional Office Senior Wildlife Officer to review the monitoring methodology and data collected and discuss the implementation of recommended management and mitigation measures proposed.

4. STAKEHOLDER CONSULTATION

4.1 Department of Regional Development and Lands

With respect to rezoning of the remainder of Armstrong Reserve outside of the development envelope, Capecare liaised with officers from the Bunbury Office of the (then) Department of Regional Development and Lands (DRDL) and planning officers from the City of Busselton.

The DRDL advised Capecare (Kevin Harrison, pers. comm. 27 February 2014) that with respect to the rezoning that the following actions were required:

- In relation to the surrender of the Reserves that make up the development envelope, the DRDL requested a formal response from the City of Busselton requesting the surrender of the Portion of Reserve 25229 and the cancellation of Reserves 36468 and 34732. While the City supported this proposal, a formal response from the City was required before the DRDL could seek the final approval from the Minister for Land.
- Reserve 25229 is for the purpose of "Recreation". The City will need to supply a Council resolution to surrender a portion of this reserve and change the purpose to 'Landscape Protection'.
- Reserve 36468 is for the purpose of "Depot Site". The City will need to supply a Council resolution to surrender and cancel this reserve.
- Reserve 34732 is for the purpose of "Bush Fire Brigade". This reserve will also need to be cancelled.

On the 15 October 2014, the Department of Lands advised Capecare that the Minister of Lands had approved the transfer of the land from the State of Western Australia to the Capecare subject to the conditions that the land was used for "Seniors Accommodation, Community and Day Care Centre" and held as a section 75 Title by Ray Village Aged Services (Inc.) trading as Capecare.

4.2 City of Busselton

4.2.1 Rezoning

The development envelope previously comprised Lots 111, 115, 116, 117 Naturaliste Terrace and a 9994 m^2 portion of Lot 257 Naturaliste Terrace (**Figure 2**). The City of Busselton advised Capecare that Lot 600 Naturaliste Terrace was in the process of being rezoned to 'Special Purpose – Aged Persons Housing' as part of Amendment 1 to the Local Planning Strategy 21 (LPS21), and that the remainder of Armstrong Reserve was consolidated into Lot 601 (now part of Reserve 25229) with the purpose of 'Landscape Protection' under the management of the City of Busselton.

In accordance with the Western Australian *Town Planning and Development Act 2005*, rezoning of the development envelope has been undertaken resulting in the amalgamation of the previous Lots into a single Certificate of Title: Lot 600 on Deposited Plan 403383 Armstrong Place, Dunsborough issued to Capecare on the 25 February 2015 (**Appendix 1**).

Lot 600 is now the legal responsibility of Capecare and will be retained as one Title in perpetuity and is zoned 'Special Purpose – Aged Person Housing' under the City of Busselton's Local Planning Scheme No. 21. The remainder of Armstrong Reserve has subsequently been gazetted into three separate lots with the City of Busselton retaining the vesting of Reserve 25339 (Lots 3000 and 601)

for the purpose of 'Landscape Protection' and the Water Corporation retaining vesting of Reserve 40445 (Lot 258) for the purpose of 'Drainage'.

4.2.2 EMP Development

Condition 6-2 states that "*the Environmental Management Plan required by condition 6-1 shall be prepared in consultation with the City of Busselton."*

Condition 6-3 states that "*the proponent shall implement the revised Environmental Management Plan in consultation with the City of Busselton for a period of three (3) years from the commencement of construction."*

Throughout the preparation of this EMP, Capecare has liaised with the City of Busselton's environmental planning officers to ensure that the environmental objectives, management measures and completion criteria meet the City's environmental requirements for the management of their Reserve.

4.3 Department of Biodiversity, Conservation and Attractions

4.3.1 Threatened Flora

In October 2013, a re-survey of the location of the *Caladenia viridescens* population within Armstrong Reserve was undertaken by Dr Paul van der Moezel. A survey report based on the survey findings was issued to the then Mr Peter Hanly and Dr Andrew Webb from the then DPaW Bunbury Office, and following further discussions in February 2014, a decision was made to translocate the individuals identified as being within the development envelope.

In February 2014, an *Application for a Permit to Take Rare Flora* was submitted to the then DPaW and DRF Permit 156-1314 was issued to Dr van der Moezel. On the 6 June 2014, translocation of the plant was undertaken by Dr van der Moezel in association with Mr Ben Lullfitz (then DPaW Local Flora Conservation Officer). DRF Permit 156-1314 required that a re-survey of the translocated orchid be undertaken each flowering period (mid-September to late-October) in the first two years following transplanting. The initial re-survey was undertaken by Dr Paul van der Moezel in October 2014. In accordance with Condition 8.11 of DRF Permit 156-1314, the final re-survey of the translocated *C. viridescens* within was undertaken on the 6 October 2015. The translocated plant was observed to be in full flower and in good health (**Appendix 3**).

4.3.2 Dieback Management

Condition M6.2 states that the EMP should include Dieback management measures prepared in consultation with the DBCA. In November 2014, the proponent commissioned Mr Bruno Rikli (BARK Environmental) to conduct a Dieback assessment of Armstrong Reserve (including the development envelope) and to liaise with the Blackwood District Office of the then DPaW with respect to his findings and to discuss preferred management measures as they apply to both the development envelope and the remainder of Armstrong Reserve.

The City of Busselton's Senior NRM Environment Officer, Mr Will Oldfield and then DPaW Officer Mr Jeremy Chick (Blackwood District Office) were consulted when undertaking the Dieback

management work and determining appropriate *Phytophthora* hygiene management measures specifically for Armstrong Reserve.

The assessment was completed in January 2015 by Mr Bruno Rikli who is registered by the DBCA in the detection, diagnosis and mapping of *P. cinnamomi*. The report describes the results from mapping the occurrence (presence and distribution) of *P. cinnamomi* within Armstrong Reserve. Best practice dieback hygiene management measures relevant to the site are recommended and a management map prepared to guide operational management planning (**Appendix 7**).

Following further consultation with the Blackwood District Office, the *Phytophthora* Dieback Assessment Report was submitted to the then DPaW and the City of Busselton in January 2015 for their review and approval.

4.3.3 Offset Site

Approval 2006/2834 issued under the Commonwealth's *Environment Protection Conservation and Biodiversity Act 1999* requires Capecare to provide an environmental offset in lieu of the clearing of approximately 9,020 m^2 of *P. occidentalis* habitat within the development envelope. The designated offset site comprises a portion of Lots 217 - 219 (on Deposited Plan 4918 / Volume 1918 / Folio 406) Busselton Bypass, Vasse and forms part of the Broadwater Nature Reserve. The offset site is vested in the Conservation and Parks Commission and the DBCA.

Since Approval 2006/2834 was issued, Capecare has liaised with Mr Kim Williams, Mr Peter Hanly and Dr Andrew Webb (DBCA Bunbury Regional Office) with respect to fulfilling the requirements of EPBC Approval 2006/2834 condition 5.

4.4 Community Consultation

On the 24 January 2018, a Stakeholder Engagement Workshop was held to assist in information the Architectural Design Masterplan of the Residential Care Facility and Independent Living Units. The forum was attended by approximately 130 community members who were provided with information relating to the environmental and planning processes already undertaken followed by a Q&A session where members of the community could be provided with detailed information.

A further community information forum was held on the 5 July 2018 to update the community on the status of the planning and environmental approvals process.

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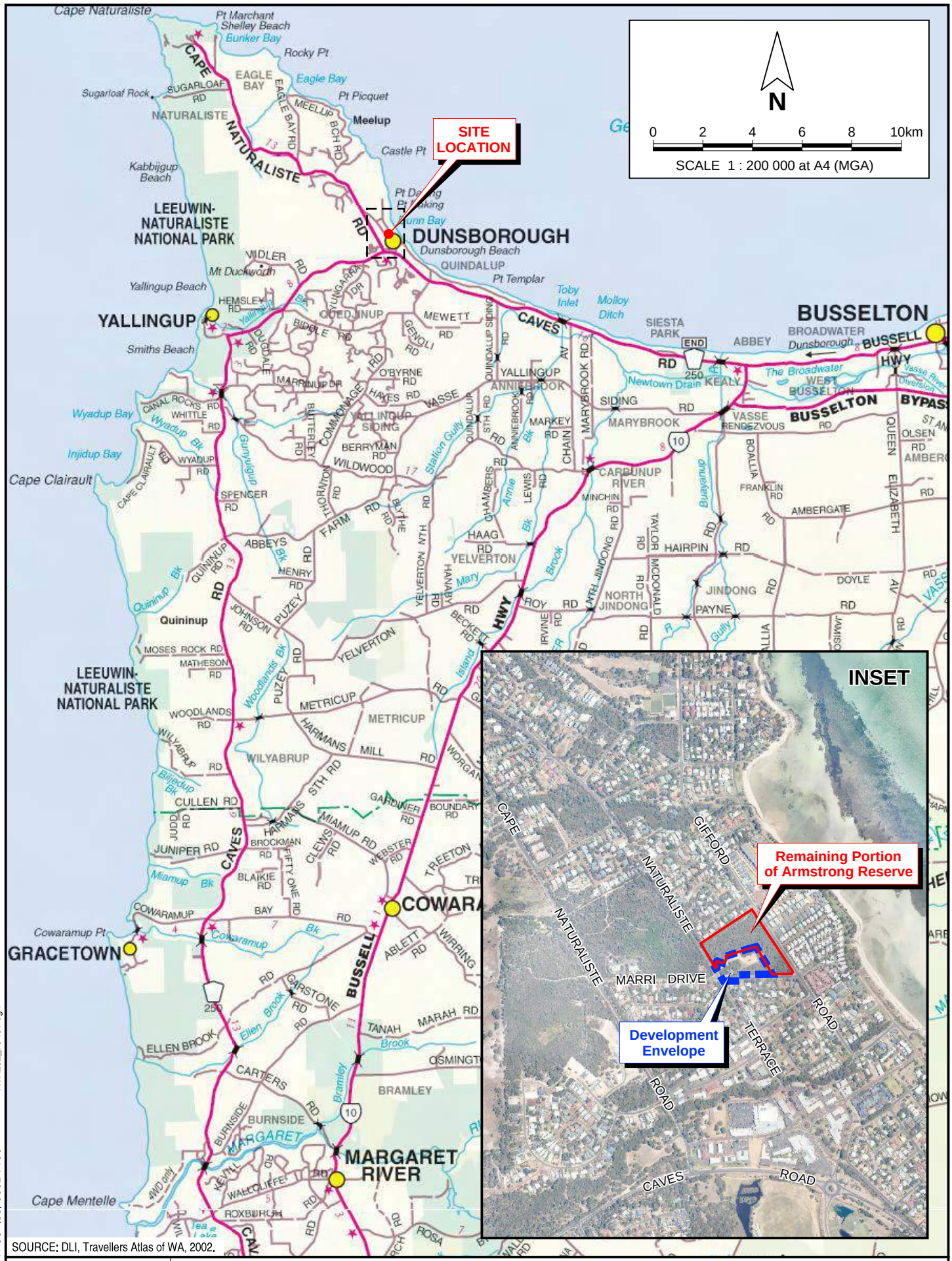
FIGURES

ENVIRONMENTAL MANAGEMENT PLAN

ARMSTRONG RESERVE, DUNSBOROUGH, URBAN AND COMMERCIAL DEVELOPMENT (MINISTERIAL STATEMENT 1094)



PINPOINT CARTOGRAPHICS (08) 9562 7136 RVA292_78-f01.dgn

EndPlan Environmental

Ray Village Aged Care Services Inc t/a Capecare
ENVIRONMENTAL MANAGEMENT PLAN
ARMSTRONG RESERVE, DUNSBOROUGH - URBAN AND COMMERCIAL DEVELOPMENT

Date: 17 May 2019
Drawn: B. Van der Wiele

REGIONAL LOCATION

Figure 1

Report No. RVA292_78

AERIAL PHOTOGRAPH SOURCE: NearMap, flown February 2010.

PINPOINT CARTOGRAPHICS (08) 9562 7136 RVA292_78-f02.dgn

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ARMSTRONG RESERVE, DUNSBOROUGH - URBAN AND COMMERCIAL DEVELOPMENT

Date: 17 May 2019
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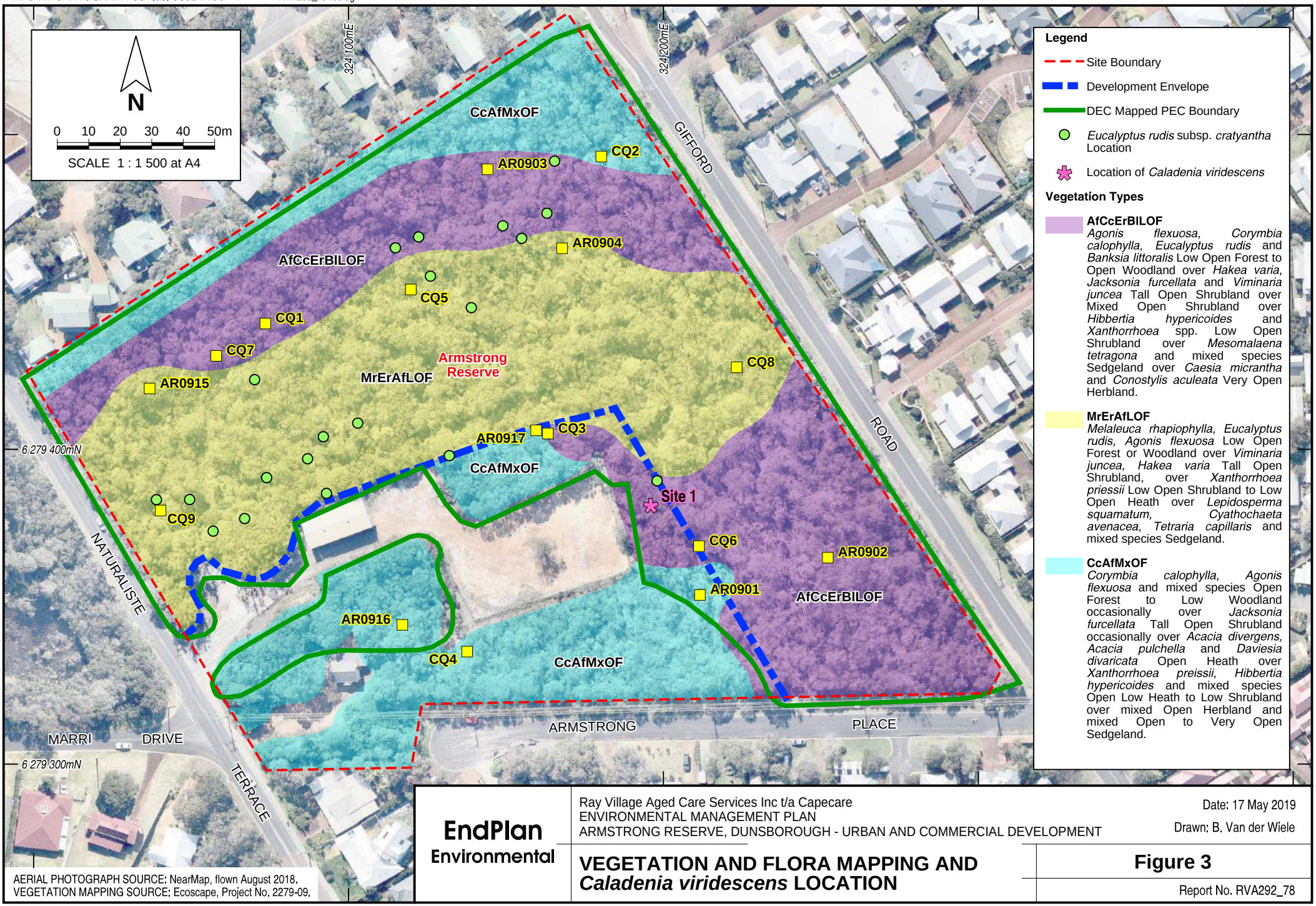
EXISTING ENVIRONMENT WITH CADASTRE (2015)

Figure 2

Report No. RVA292_78

PINPOINT CARTOGRAPHICS (08) 9562 7136 RVA292_78-f03.dgn



AERIAL PHOTOGRAPH SOURCE: NearMap, flown August 2018.
VEGETATION MAPPING SOURCE: Ecoscape, Project No. 2279-09.

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ARMSTRONG RESERVE, DUNSBOROUGH - URBAN AND COMMERCIAL DEVELOPMENT

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VEGETATION AND FLORA MAPPING AND *Caladenia viridescens* LOCATION

Figure 3

Report No. RVA292_78

PINPOINT CARTOGRAPHICS (08) 9562 7136 RVA292_78-f04.dgn

CADASTRAL SOURCE: Landgate, February 2019.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown August 2018.

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ARMSTRONG RESERVE, DUNSBOROUGH - URBAN AND COMMERCIAL DEVELOPMENT

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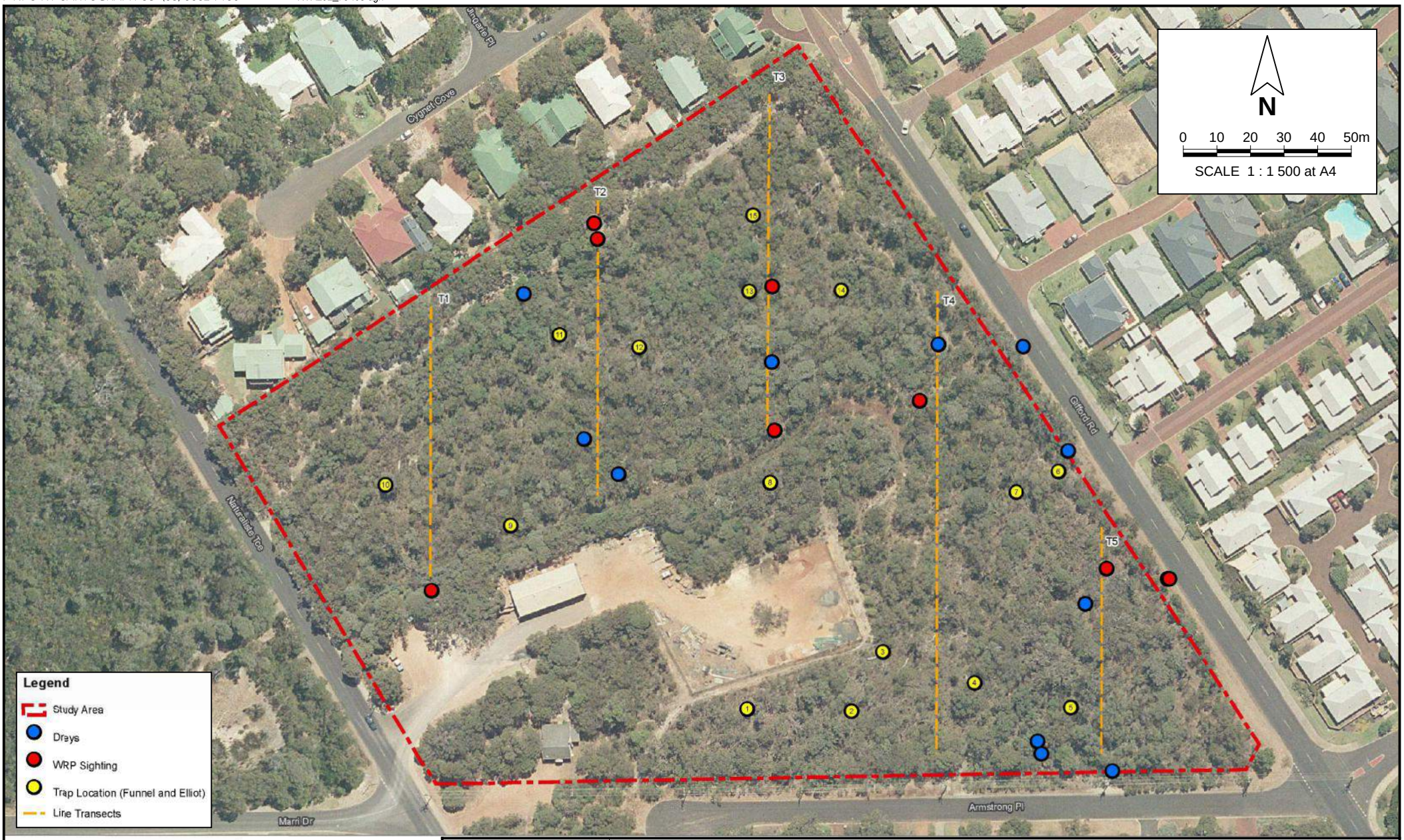
GATES, FENCING AND SIGNAGE LOCATIONS

Figure 4

Report No. RVA292_78

PINPOINT CARTOGRAPHICS (08) 9562 7136 RVA292_78-f05.dgn



SOURCE: Ecoscape, Project No. 2582-10 Rev 0.

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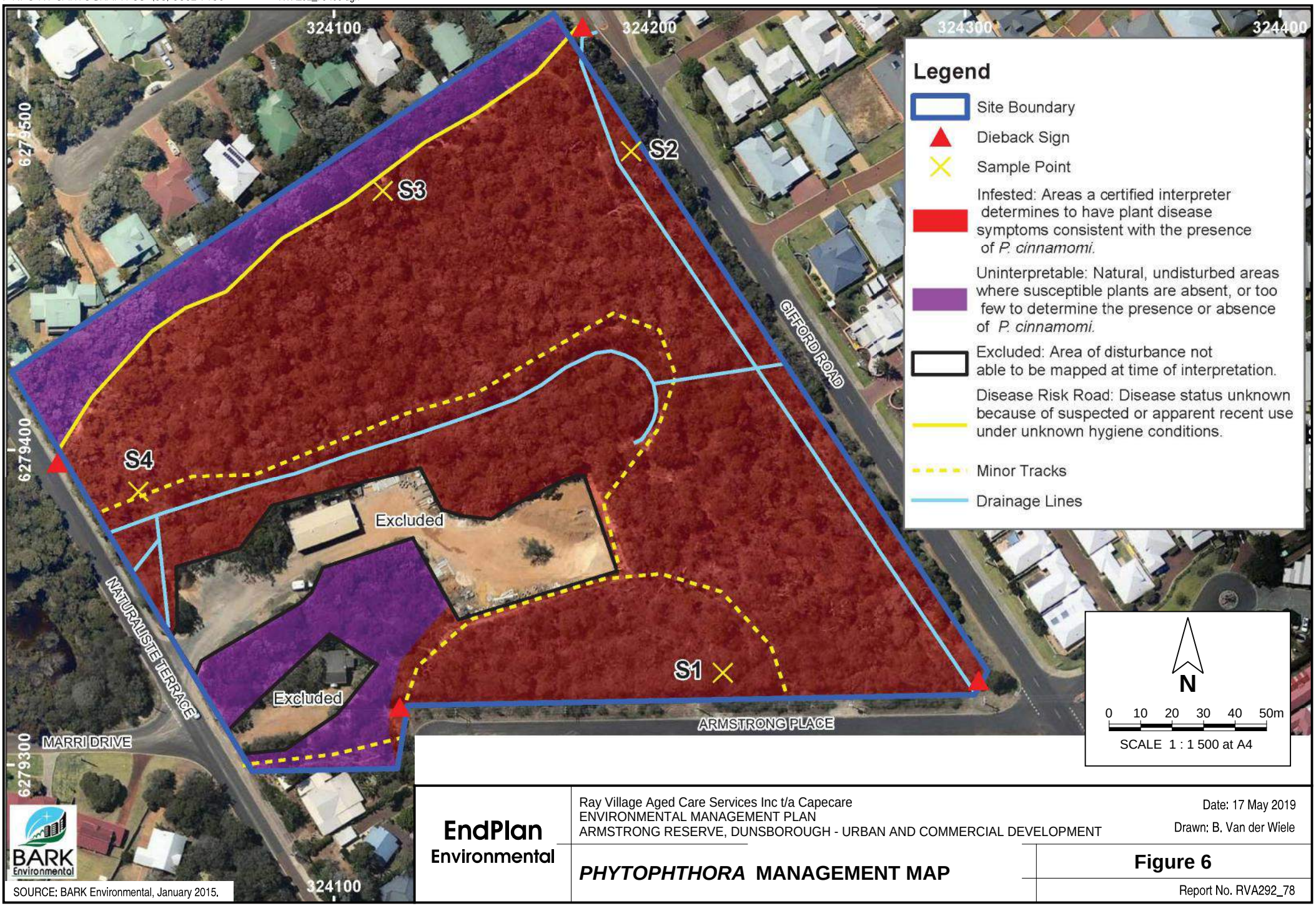
WRP SURVEY TRANSECT LINES

Figure 5

Report No. RVA292_78



SOURCE: BARK Environmental, January 2015.

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***PHYTOPHTHORA* MANAGEMENT MAP**

Figure 6

Report No. RVA292_78