Notice of Application for a Planning Permit

Cardinia

The land affected by the application is located at:	L3 PS401903 2904 Gembrook-Launching Place Road, Gembrook VIC 3783
The application is for a permit to:	Buildings and Works for Extensions to a Building used for Outdoor Education Accommodation and Activities and Vegetation Removal

APPLICATION DETAILS	
The applicant for the permit is:	Clause 1 Planning
Application number:	T230441

You may look at the application and any documents that support the application at the office of the Responsible Authority:

Cardinia Shire Council, 20 Siding Avenue, Officer 3809.

This can be done during office hours and is free of charge.

Documents can also be viewed on Council's website: cardinia.vic.gov.au/advertisedplans or by scanning the QR code.

HOW CAN I MAKE A SUBMISSION?

This application has not been decided. You can still make a submission before a decision has been made. The Responsible Authority will not decide on the application before:	05 July 2024

WHAT ARE MY OPTIONS?

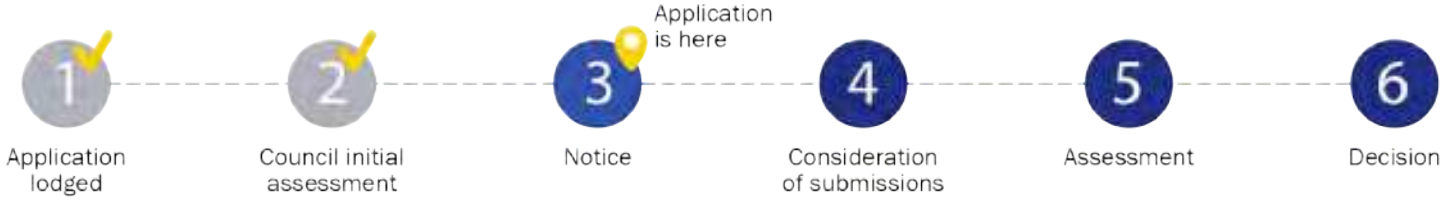
Any person who may be affected by the granting of the permit may object or make other submissions to the responsible authority.

An objection must:

- be made to the Responsible Authority in writing;
- include the reasons for the objection; and
- state how the objector would be affected.

If you object, the Responsible Authority will notify you of the decision when it is issued.

The Responsible Authority must make a copy of every objection available at its office for any person to inspect during office hours free of charge until the end of the period during which an application may be made for review of a decision on the application.



Application Summary

Portal Reference	A323824N

Basic Information

Proposed Use	Additions to an existing Outdoor Education, Accommodation & Activities Facility
Current Use	Outdoor Education, Accommodation & Activities Facility
Cost of Works	$400,000
Site Address	2904 Gembrook-Launching Place Road Gembrook 3783

Covenant Disclaimer

Does the proposal breach, in any way, an encumbrance on title such as restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope?	Not Applicable, no such encumbrances apply.

Contacts

Type	Name	Address	Contact Details
Applicant	[redacted] Clause 1 Planning	GPO Box 305, Flemington VIC 3031	W: +61-3-9370-9599 E: enquiries@clause1.com.au
Owner	[redacted]		
Preferred Contact	[redacted] Clause 1 Planning	GPO Box 305, Flemington VIC 3031	W: +61-3-9370-9599 E: enquiries@clause1.com.au

Fees

Regulation	Fee Condition	Amount	Modifier	Payable
9 - Class 12	More than $100,000 but not more than $1,000,000	$1,661.60	100%	$1,661.60
		Total		**$1,661.60**

Meetings

Meeting Type	Officer Name	Date of Meeting
Pre Application	[redacted]	09 Aug 2023

Documents Uploaded

Date	Type	Filename
06-09-2023	A Copy of Title	Att.B _ 2904-Gembrook-Launching-Place-Road - TITLE.pdf
06-09-2023	Alteration statement	1_Planning Report_HallsOutdoorEd_GembrookLauncingPlace.pdf
06-09-2023	Site plans	Att.A _ 2904_Gembrook_Launching_Place_Road_20-130TP_b - PLANS.pdf
06-09-2023	Additional Document	Att.D _ 2904_Gembrook_Launching_Place_Road Existing Use Rights - CERT of COMPLIANCE.pdf
06-09-2023	Additional Document	Att.E _ 5_2904_Gembrook_Launching_Place_Road - BMP.pdf
06-09-2023	Additional Document	Att.F _ 2904_Gembrook_Launching_Place_Road - ARBORIST REPORT.pdf
06-09-2023	Additional Document	Att.G _ 2904_Gembrook_Launching_Place_Road - SEPTIC_APPROVAL_EPA.pdf
06-09-2023	Additional Document	Att.C _ 2904-Gembrook-Launching-Place-Road-(ID42556)-Vicplan-Planning-Property-Report.pdf

☐ Remember it is against the law to provide false or misleading information, which could result in a heavy fine and cancellation of the permit

Lodged By

Site User	[redacted]
Submission Date	06 September 2023 - 04:14:PM

Declaration

☑ By ticking this checkbox, I, [redacted] declare that all the information in this application is true and correct; and the Applicant and/or Owner (if not myself) has been notified of the application.

REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958

VOLUME 10312 FOLIO 188

Security no : 124108608579A
Produced 25/08/2023 11:12 AM

LAND DESCRIPTION

Lot 3 on Plan of Subdivision 401903V.
PARENT TITLES :
Volume 07065 Folio 874 Volume 09371 Folio 825
Created by instrument PS401903V 09/01/1997

REGISTERED PROPRIETOR

[redacted]

ENCUMBRANCES, CAVEATS AND NOTICES

[redacted]

Any encumbrances created by Section 98 Transfer of Land Act 1958 or Section 24 Subdivision Act 1988 and any other encumbrances shown or entered on the plan set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE PS401903V FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

----------END OF REGISTER SEARCH STATEMENT----------

Additional information: (not part of the Register Search Statement)

Street Address: 2904 GEMBROOK-LAUNCHING PLACE ROAD GEMBROOK VIC 3783

ADMINISTRATIVE NOTICES

NIL

[redacted]

DOCUMENT END

Imaged Document Cover Sheet

The document following this cover sheet is an imaged document supplied by LANDATA®, Secure Electronic Registries Victoria.

Document Type	**Plan**
Document Identification	**PS401903V**
Number of Pages (excluding this cover sheet)	**2**
Document Assembled	**25/08/2023 11:15**

PLAN OF SUBDIVISION

STAGE NO. /

LTO use only
EDITION 1

Plan Number
PS 401903V

Location of Land

Parish: GEMBROOK

Township:

Section:

Crown Allotment: (PART) 10 & (PART) 90

Crown Portion:

LTO Base Record: GEMBROOK.

Title Reference: VOL 9371 FOL 825, VOL 7065 FOL 874

Last Plan Reference: —

Postal Address: BEENAK ROAD
(at time of subdivision) GEMBROOK

AMG Co-ordinates
(of approx. centre of land in plan) E 373 100 N 5800 500 Zone: 55

Vesting of Roads and/or Reserves

Identifier	Council/Body/Person
NIL	NIL

Council Certificate and Endorsement

Council Name: Cardinia Shire Council Ref: S96/018

1. This plan is certified under section 6 of the Subdivision Act 1988.
2. ~~This plan is certified under section 11(7) of the Subdivision Act 1988.~~
   ~~Date of original certification under section 6 / /~~
3. ~~This is a statement of compliance issued under section 21 of the Subdivision Act 1988.~~

OPEN SPACE

(i) A requirement for public open space under section 18 of the Subdivision Act 1988 ~~has~~/has not been made.

~~(ii) The requirement has been satisfied.~~

~~(iii) The requirement is to be satisfied in Stage.....~~

Council delegate
~~Council seal~~

Date 28 / 5 / 96

~~Re-certified under section 11(7) of the Subdivision Act 1988~~

~~Council Delegate~~
~~Council Seal~~

~~Date / /~~

Notations

Staging This ~~is~~/is not a staged subdivision
Planning Permit No. T 960117

Depth Limitation DOES NOT APPLY.

DIMENSIONS SHOWN THUS 46° 23' 211·23 ARE NOT THE RESULT OF THIS SURVEY.

AREA OF LOT 1 HAS BEEN OBTAINED BY DEDUCTION FROM TITLE.

Survey This plan is/~~is not~~ based on survey

This survey has been connected to permanent marks no(s) 63
In Proclaimed Survey Area No.

Easement Information

Legend: E - Encumbering Easement or Condition in Crown Grant in the Nature of an Easement
A - Appurtenant Easement R - Encumbering Easement (Road)

Easement Reference	Purpose	Width (Metres)	Origin	Land Benefited/In Favour Of
E-1	DRAINAGE	3	THIS PLAN	LOTS IN THIS PLAN.

LTO use only

Statement of Compliance/ Exemption Statement

Received ☑

Date 20 / 12 / 96

LTO use only

PLAN REGISTERED

TIME 1.55PM

[redacted]

Sheet 1 of 2 Sheets

M.J. REDDIE SURVEYS PTY
28 SHUTE AVE. BERWICK.
PHONE / FAX: 97074117.

[redacted]

SIGNATURE ..... DATE 10 / 12 / 1996

REF 96·1·16 VERSION 2

DATE 28 / 5 / 96

COUNCIL DELEGATE SIGNATURE

Original sheet size A3

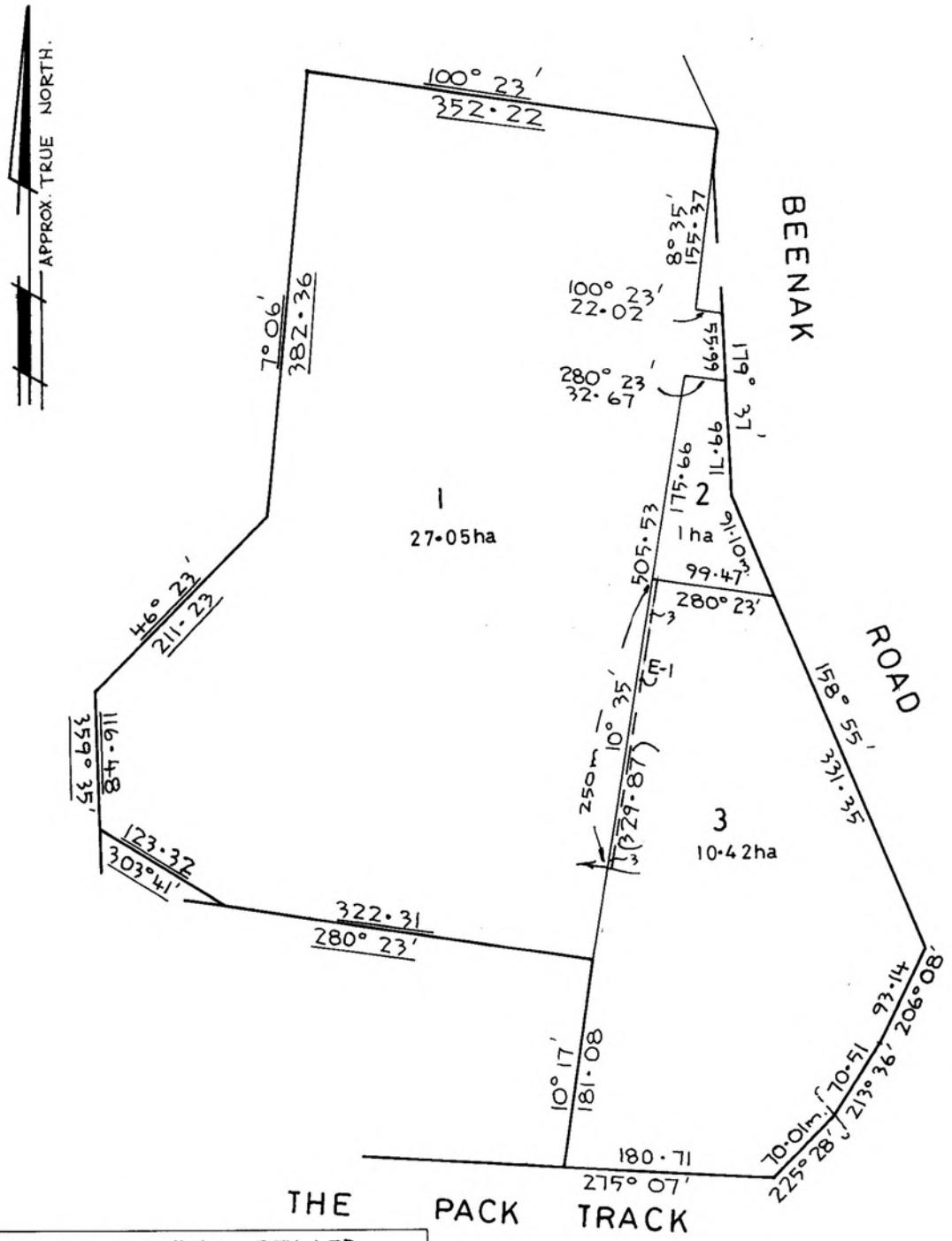
T.O.1

PLAN OF SUBDIVISION

Stage No.

Plan Number

PS 401903V



M.J. REDDIE SURVEYS PTY. LTD
28 SHUTE AVE BERWICK. VIC. 3806
PHONE / FAX : 97074117.

Sheet 2 of 2 Sheets

ORIGINAL

SCALE 1 : 4000 | SHEET SIZE A3

SCALE 40 0 80 160

LENGTHS ARE IN METRES

LICENSED

SIGNATURE

REF 96

96

SIGNATURE

Size A3

T.O.2

PLANNING PROPERTY REPORT

Environment, Land, Water and Planning

From www.planning.vic.gov.au at 25 August 2023 11:11 AM

PROPERTY DETAILS

Address:	**2904 GEMBROOK-LAUNCHING PLACE ROAD GEMBROOK 3783**
Lot and Plan Number:	**Lot 3 PS401903**
Standard Parcel Identifier (SPI):	**3\PS401903**
Local Government Area (Council):	**CARDINIA** www.cardinia.vic.gov.au
Council Property Number:	**2321301700**
Planning Scheme:	**Cardinia** Planning Scheme - Cardinia
Directory Reference:	**Melway 299 A4**

UTILITIES

Rural Water Corporation:	**Southern Rural Water**
Melbourne Water Retailer:	**Yarra Valley Water**
Melbourne Water:	**Inside drainage boundary**
Power Distributor:	**AUSNET**

STATE ELECTORATES

Legislative Council:	**EASTERN VICTORIA**
Legislative Assembly:	**MONBULK**

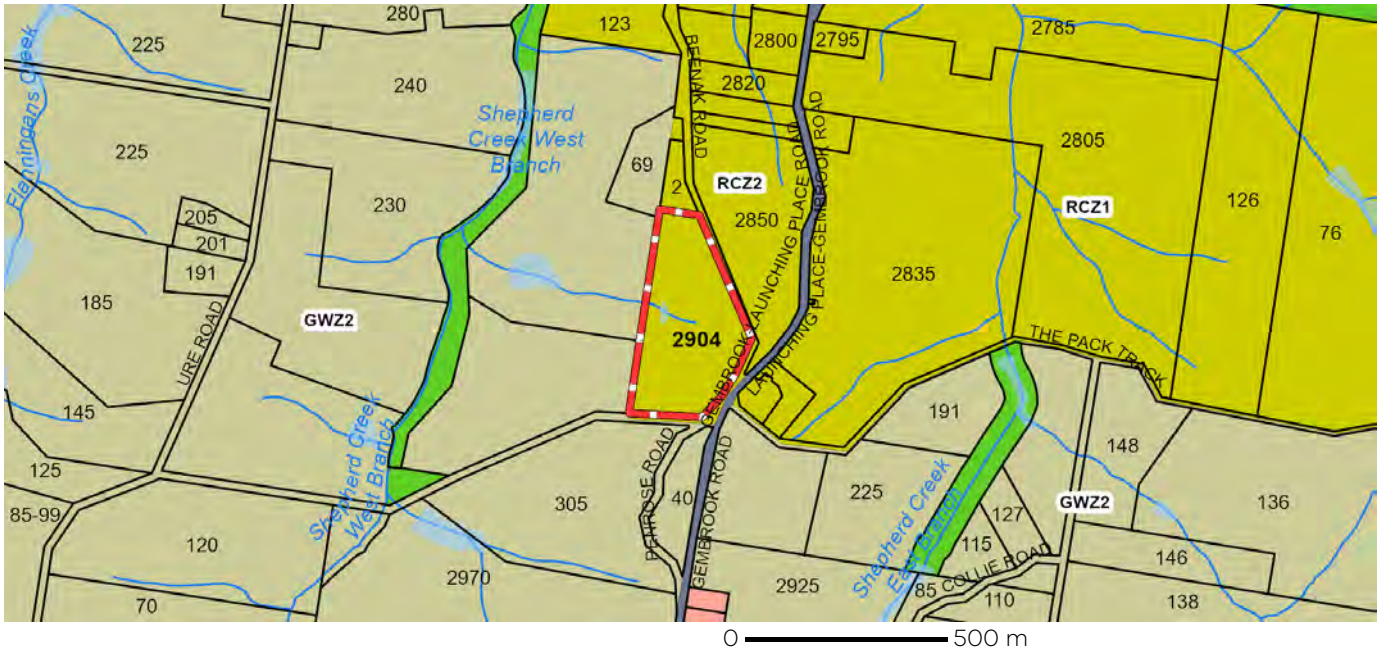
OTHER

Registered Aboriginal Party: **Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation**

View location in VicPlan

Planning Zones

RURAL CONSERVATION ZONE (RCZ)
RURAL CONSERVATION ZONE - SCHEDULE 2 (RCZ2)



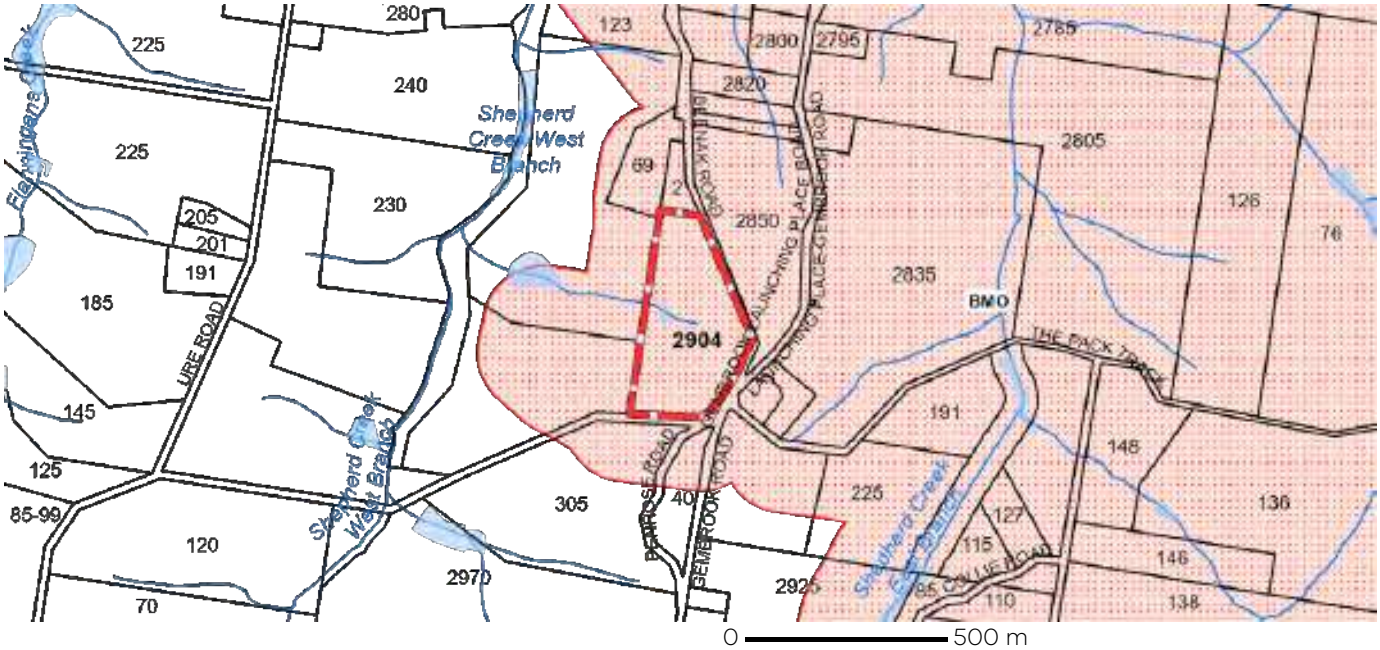
Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

PLANNING PROPERTY REPORT

Environment, Land, Water and Planning

Planning Overlays

BUSHFIRE MANAGEMENT OVERLAY (BMO)



BMO - Bushfire Management Overlay Water area Water course

Note: due to overlaps, some overlays may not be visible, and some colours may not match those in the legend

ENVIRONMENTAL SIGNIFICANCE OVERLAY (ESO)

ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1 (ESO1)

ESO - Environmental Significance Overlay Water area Water course

Note: due to overlaps, some overlays may not be visible, and some colours may not match those in the legend

PLANNING PROPERTY REPORT

Environment, Land, Water and Planning

Planning Overlays

OTHER OVERLAYS

Other overlays in the vicinity not directly affecting this land

DESIGN AND DEVELOPMENT OVERLAY (DDO)

HERITAGE OVERLAY (HO)

SIGNIFICANT LANDSCAPE OVERLAY (SLO)

Note: due to overlaps, some overlays may not be visible, and some colours may not match those in the legend

Further Planning Information

Planning scheme data last updated on 23 August 2023.

A **planning scheme** sets out policies and requirements for the use, development and protection of land.
This report provides information about the zone and overlay provisions that apply to the selected land.
Information about the State and local policy, particular, general and operational provisions of the local planning scheme that may affect the use of this land can be obtained by contacting the local council or by visiting https://www.planning.vic.gov.au

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the ***Planning and Environment Act 1987.***
It does not include information about exhibited planning scheme amendments, or zonings that may abut the land.
To obtain a Planning Certificate go to Titles and Property Certificates at Landata - https://www.landata.vic.gov.au

For details of surrounding properties, use this service to get the Reports for properties of interest.

To view planning zones, overlay and heritage information in an interactive format visit https://mapshare.maps.vic.gov.au/vicplan

For other information about planning in Victoria visit https://www.planning.vic.gov.au

PLANNING PROPERTY REPORT

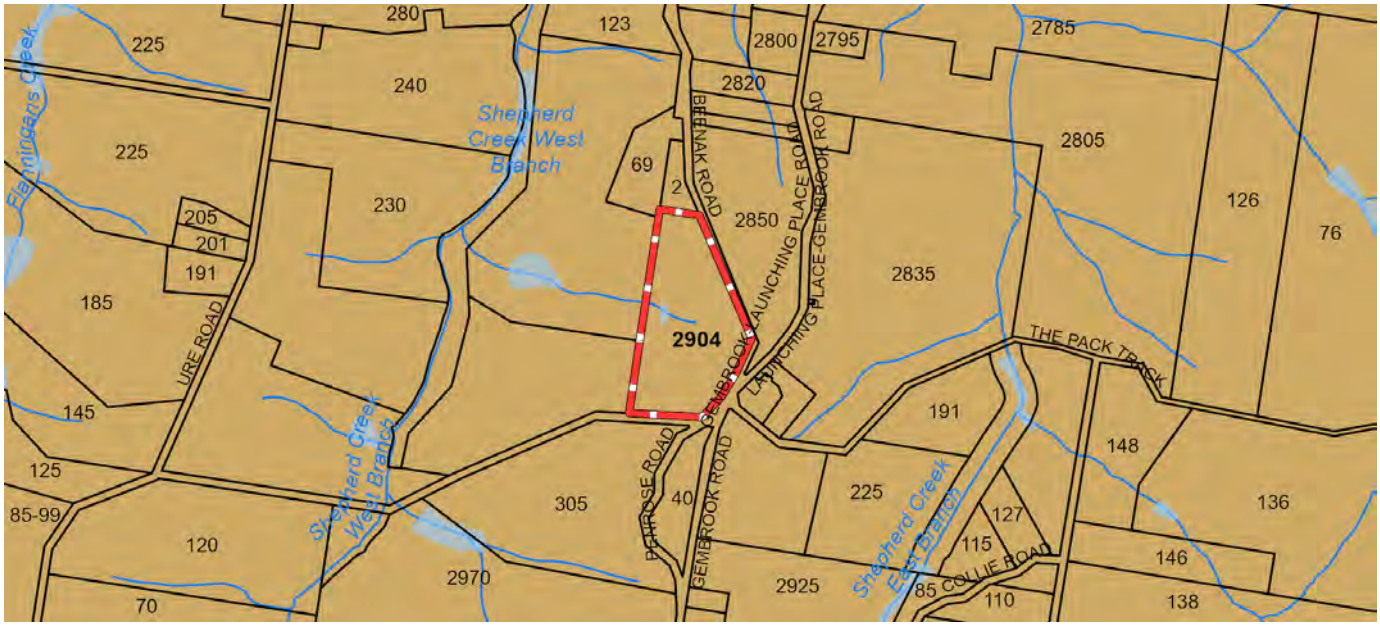
Environment, Land, Water and Planning

Designated Bushfire Prone Areas

This property is in a designated bushfire prone area. Special bushfire construction requirements apply to the part of the property mapped as a designated bushfire prone area (BPA). Planning provisions may apply.

Where part of the property is mapped as BPA, if no part of the building envelope or footprint falls within the BPA area, the BPA construction requirements do not apply.

Note: the relevant building surveyor determines the need for compliance with the bushfire construction requirements.



Designated BPA are determined by the Minister for Planning following a detailed review process. The Building Regulations 2018, through adoption of the Building Code of Australia, apply bushfire protection standards for building works in designated BPA.

Designated BPA maps can be viewed on VicPlan at https://mapshare.vic.gov.au/vicplan/ or at the relevant local council.

Create a BPA definition plan in VicPlan to measure the BPA.

Information for lot owners building in the BPA is available at https://www.planning.vic.gov.au.

Further information about the building control system and building in bushfire prone areas can be found on the Victorian Building Authority website https://www.vba.vic.gov.au. Copies of the Building Act and Building Regulations are available from http://www.legislation.vic.gov.au. For Planning Scheme Provisions in bushfire areas visit https://www.planning.vic.gov.au.

Native Vegetation

Native plants that are indigenous to the region and important for biodiversity might be present on this property. This could include trees, shrubs, herbs, grasses or aquatic plants. There are a range of regulations that may apply including need to obtain a planning permit under Clause 52.17 of the local planning scheme. For more information see Native Vegetation (Clause 52.17) with local variations in Native Vegetation (Clause 52.17) Schedule

To help identify native vegetation on this property and the application of Clause 52.17 please visit the Native Vegetation Information Management system https://nvim.delwp.vic.gov.au/ and Native vegetation (environment.vic.gov.au) or please contact your relevant council.

You can find out more about the natural values on your property through NatureKit NatureKit (environment.vic.gov.au)

clause 1 | TOWN PLANNING CONSULTANTS

Planning Permit Application

Subject Site:	**2904 Gembrook Launching Place Road Gembrook Lot 3 on PS 401903V**
Responsible Authority:	**Cardinia**
Proposal:	**Additions to an existing Outdoor Education, Accommodation & Activities Facility**
Permit Triggers:	**Clause 35.06-5 (RCZ) to construct a building or construct or carry out works** **Clause 42.01-2 (ESO1) to construct a building or construct or carry out works** **Clause 42.01-2 (ESO1) to remove destroy or lop vegetation** **Clause 44.06-2 (BMO) to construct a building or construct or carry out works** **Clause 52.17 (Native Vegetation) to remove destroy or lop vegetation**

Contents

List of Attachments

A: Plan Set
B: Land Title Details
C: Property Planning Report
D: Certificate of Compliance
E: Bushfire Assessment & Management Plan
F: Arborist Report
G: EPA Septic Approval
H: Ecological Assessment

Version Control

Date	Version	Auth.	Rev.
29.08.23	App	DB	AT
30.05.24	RFI Response	AT	AT

Clause 1 Town Planning Consultants
Phone: 9370 9599
Email: enquiries@clause1.com.au

Introduction

1. Planning permission is sought for the extension of the existing accommodation facility located at 2904 Gembrook Launching Place Road, Gembrook.

2. The proposed extension triggers a bushfire risk assessment and management plan, that will also result in some vegetation being removed from the site, to reduce risk from wildfire.

3. A permit is triggered by the following provisions:

    - Clause 35.06-5 (RCZ) to construct a building or construct or carry out works
    - Clause 42.01-2 (ESO) to construct a building or construct or carry out works
    - Clause 42.01-2 (ESO) to remove destroy or lop vegetation
    - Clause 44.06-2 (BMO) to construct a building or construct or carry out works
    - Clause 52.17 (Native Vegetation) to remove destroy or lop vegetation

4. The application also seeks retrospective approval for a small amount of buildings and works undertaken over the life of the use, that appear to not have previously approved under a planning permit.

5. This report provides overview of the proposal and an assessment against the relevant provisions of the Scheme.

Planning History

6. The following outlines the known planning history of the site:

- 2023: In May 2023 a certificate of compliance (GE230041) was issued for the subject site confirming that the following use of the land complies with the requirements of the planning scheme:

  Use of the land for Outdoor Education Accommodation and Activities

- 2022: An application for a certificate of compliance (GE220798) stating that the existing use of the land complies with the requirements of the Cardinia Planning Scheme was refused on 13 December 2022. The application was refused on the basis of insufficient evidence.

- 2022: Planning Permit Application T210786 for an extension to school camp facility and tree removal was refused on 9 March 2022. The refusal was based on the application breaching conditions of existing permit T2391 and/or representing a new prohibited use of the land.

- 2018: Planning Permit T180341 issued on 22 October 2018 for the development of the land for a building associated with group accommodation

- 2005: Planning Permit T040304 was issued for the use and development of the land for a managers dwelling on the 18/2/2005.

- 1996: Planning Permit T960117 was issued for the resubdivision, excision of a house lot and construction of a house on the excision on the 9/5/1996.

- 1996: Planning Permit T960118 was issued for the construction and use of a place of assembly on the 19/3/1996.

- 1986: Planning Permit P2391A. the use and development of part Crown Allotment 10, Parish of Gembrook, Gembrook/Launching Place Road, Gembrook, being the land more particularly described by Title Volume 9371, Folio 825, for the purposes of a Children's Guest House, generally in accordance with the information submitted with the application on the 20 January 1986.:

Subject Site & Context

7. The subject site is described on Title volume 10312 Folio 188 as Lot 3 on Plan of Subdivision 401903V and is more commonly known as 2904 Gembrook-Launching Place Road, Gembrook. The land is irregularly shaped and exhibits a total site area of approximately 10.4 hectares.

8. The site located on west side of Gembrook Launching Place Road, at the intersection of the Pack Track. The land falls from east to west across the site and includes:

    - A dwelling, sited towards the northern boundary
    - Buildings used for offices and storage, near the south eastern corner of the site
    - A main-building used for accommodation, roughly centralised on the site
    - Vehicle access from Beenak Road, via three separate crossovers. The northern most crossover provides access to the dwelling. The southern crossover leads to the existing office/storage buildings. Whilst the middle-crossover provides vehicle access (including coaches) to the accommodation building.
    - To the west of the accommodation building is a large cleared, grassed area and dam.
    - The site is bordered by heavy vegetation, dominated by large, native canopy trees.

9. The image below illustrates the site's configuration.

Figure 1: Aerial image of subject site (Nearmap 2022)

10. The following image shows the accommodation building, looking west from the cleared-glassed area.

Figure 2: View to existing building, looking north

11. The surrounding context and land uses can generally be summarised as follows:

12. To the immediate north is located a small lot, partially cleared, containing a single dwelling. Further north a variety of large cleared lots and smaller parcels include both single dwellings and agricultural uses.

13. To the immediate east, west and south of the site are located lots of varies sizes, most of which are cleared agricultural land, with the majority of lots hosting single dwellings. The image below provides more insight into the local context.

Figure 3: Aerial Image, Site Context (Nearmap 2022)

The Proposal

New Buildings & Works

14. The proposed works include the construction of:

    - Four additional rooms at the north-west corner of the existing building
    - The addition of ensuites to Rooms 1-5, located on the northern elevation of the building and
    - An extension to the existing west-facing deck
    - The above works will also require the following associated activities:
        - Removal of a small shed from between the building and pool
        - Removal of vegetation and other associated bushfire management requirements

15. The image highlights the proposed building extension in yellow:

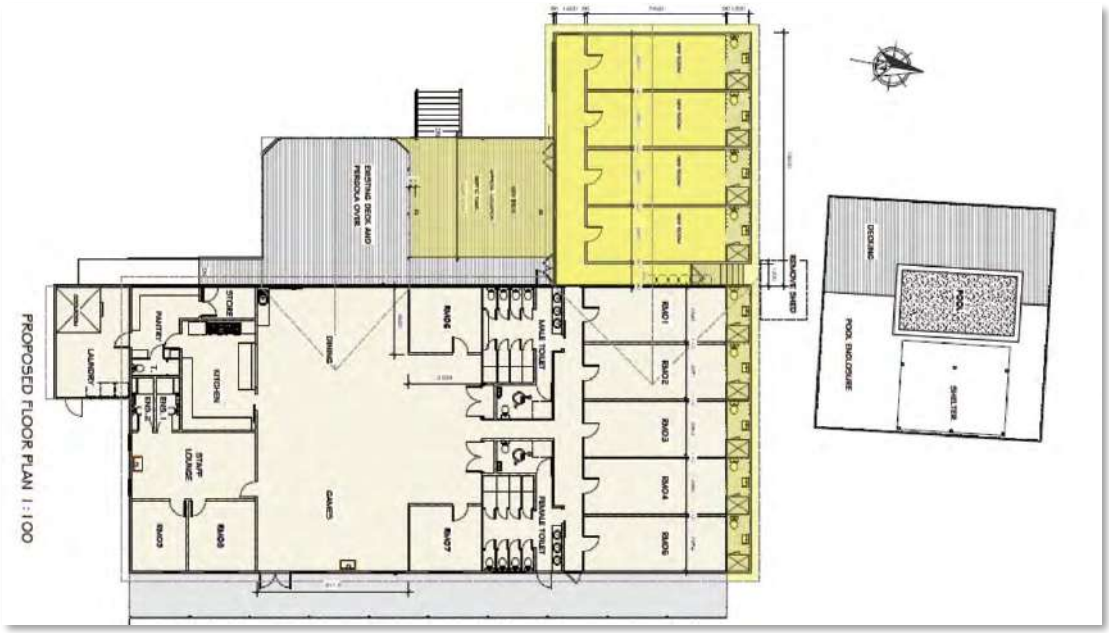


Figure 4: Extract Proposed Ground Floor Plan

16. The proposed extension is designed to match and extend the existing roof-lines and building form. The external finishes are proposed to match the existing building and include:

    - Cream cement-sheet based weatherboards and
    - Cottage green colorbond roofing

17. The elevations below illustrate the extent of form proposed (clouded):

Figure 5: Extract from Proposed Plans

Retrospective Approval

18. Council has also identified that some 'other works' to the building may have occurred without a planning permit over the years. The applicant has identified the following other works that may be of interest to Council:

    - Construction of the small laundry addition at the south-west corner of the building
    - Construction of a roofed-deck extension on the north elevation

19. The extent of these works is highlighted yellow on the plan below and shown on the following images.

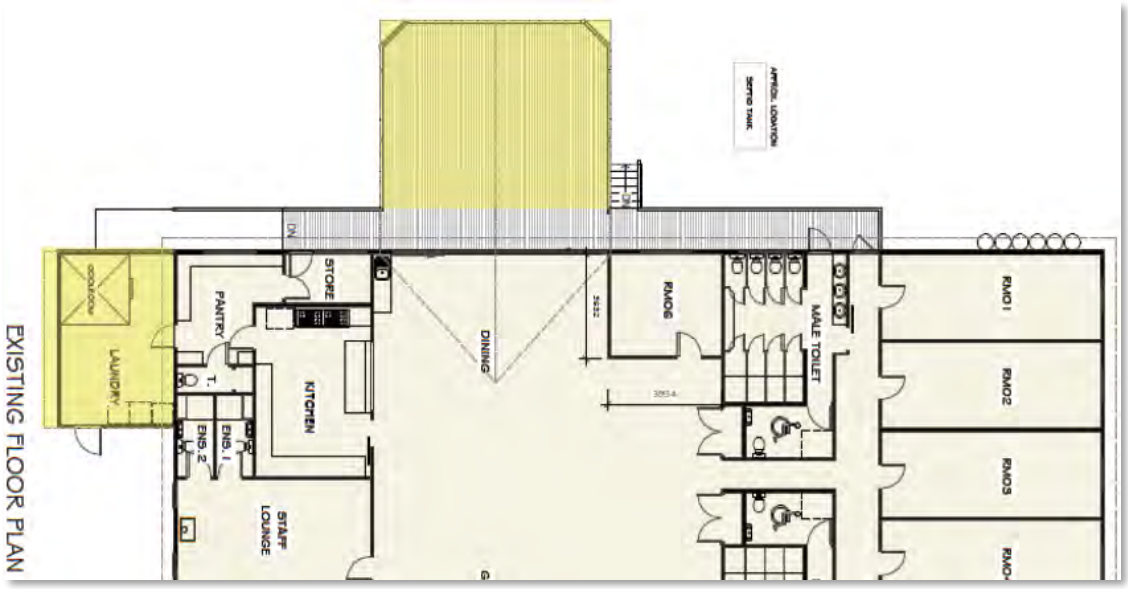


Figure 6: Extract of existing floor plan with 'other works' highlighted

Figure 7: Images depicting roofed-deck and laundry

20. We seek approval of the plans as submitted including any retrospective approval required to legitimise the small list of 'other works' that may have been undertaken over the years.

Vegetation Removal

21. As a result of the bushfire risk reduction measures recommended and approved by the CFA a number of trees are required to be removed and pruned. A detailed discussion regarding tree removal is provided later in this report.

Other Notable Considerations relating to the Proposal

22. The proposed extension of the building is required to provide for the more efficient use of the facility. The inclusion of ensuites to rooms will assist in overcoming existing concerns relating to 'gender based' toilets.

23. We note that the existing use rights are not restricted to a maximum number of guests. The operator has indicated that the extension may cater for up to 120 guests – however, we submit that it is not open to Council to restrict the number of guests, when consideration is given to the relevant permit triggers.

Relevant Planning Controls and Policies

24. The follow provisions are considered directly relevant to the application:

Clause 12.01 Biodiversity	Clause 42.01 Environmental Significance Overlay (ESO1)
Clause 12.05 Significant Environments & Landscapes	Clause 44.06 Bushfire Management Overlay
Clause 13.02 Bushfire	Clause 52.06 Car Parking
Clause 17.04 Tourism	Clause 52.12 Bushfire Protection Exemptions
Clause 21.01-3 Key Issues	Clause 52.17 Native Vegetation
Clause 21.02 Environment	Clause 53.02 Bushfire Planning
Clause 21.04 Economic Development	Clause 63 Existing Uses
Clause 21.07-1 Gembrook	Clause 65.01 Approval of an Application or Plan
Clause 35.06 Rural Conservation Zone	Clause 66 Referral & Notice Provisions

Relevant Planning Considerations

25. The following includes discussions and assessments relating to the most relevant policy considerations.

Over Arching Policy

26. Policy at Clauses 12.01, 12.05, 21.02, 21.07-1, 42.01 and 52.17 seeks, primarily, to protect the natural beauty, bio-diversity, vegetation cover and other environmental values of the area. Policy at Clauses 13.02, 44.06, 52.12 and 53.02 provides guidance on bushfire risk mitigation and related exemptions. Whilst clauses 17.04 and 21.04 seeks to support tourism and economic development in the region.

27. The current proposal is considered to hit the right balance between the above, competing objectives.

28. The existing use provides an important tourism and economic driver to the region. The well-established business has been operating from the site for decades without any off site amenity issues. This is not an application that includes consideration of a 'new' use.

29. The fact that the existing use will continue to operate from the site lends weight to the argument that, regardless of the proposed buildings and works, it would be prudent to bring the site's bushfire risk mitigation up to the standards expected by Clauses 13.02, 44.06, 52.12 and 53.02.

30. As a result of the modern requirements contained within the bushfire provisions, some native vegetation is required to be removed from the site, to reduce fuel loads and risk. The impact of the removal of native vegetation from the site is not considered unreasonable or significant, as discussed later in this report.

31. On balance, it is considered that the proposal gives affect to the overarching policy considerations and will result in net community benefit by; enhancing the offering of this popular and much-loved existing educational and recreational facility as well as permitting important bushfire-risk-reduction works (vegetation removal) to protect life and property.

Existing Use Rights

32. As mentioned previously, a certificate of compliance has recently been issued over the land. The certificate confirms that the use of the land for *Outdoor Education Accommodation and Activities* enjoys existing use rights.

33. Although the work proposed in this application will increase the accommodation capacity of the site, no permission is required for the small change to the existing 'use' of the land.

34. The Tribunal has held on numerous occasions that, under existing use rights, the operator has the ability to reasonably expand that use without the need for further planning approval. Relevant caselaw can be reviewed at:

    - Stonnington CC v Abgol Pty Ltd & Ors [2005] VCAT 2346
    - Wellington v Surf Coast Shire Council & Ors
    - Mansfield Shire Council v Pamela Buchholz & Ors [P3413/2012]

35. Based principles established in the above cases, it is considered that no planning permission is required for any element of the land's use, even if this proposal results in an intensification of that use.

36. In addition to the above caselaw, we provide the following brief assessment of Clause 62.05.

Clause 63.05 Tests	**Response**
No building or works are constructed or carried out without a permit. A permit must not be granted unless the building or works complies with any other building or works requirement in this scheme.	This application seeks planning approval for all relevant works. All proposed works are considered to comply with the requirements of the scheme.
Any condition or restriction to which the use was subject continues to be met. This includes any implied restriction on the extent of the land subject to the existing use right or the extent of activities within the use.	The certificate of compliance, issued by Council 12 May 2023, confirms that the site enjoys existing use rights for *Outdoor Education Accommodation and Activities*. The certificate includes no restrictions on use's operations including no restriction to the hours/days of operation or patron/guest numbers.

The amenity of the area is not damaged or further damaged by a change in the activities beyond the limited purpose of the use preserved by the existing use right	The operations on site will continue to accommodate school and similar groups on site in the manner that it has for decades. No notable change to the amenity of the area will result from the proposal.

37. We submit that the use meets the above tests and that the well-established 'existing use rights' allow the use to continue and expand on site without consideration by Council.

Zoning Considerations

38. The Rural Conservation Zone seeks:

To implement the Municipal Planning Strategy and the Planning Policy Framework.

To conserve the values specified in a schedule to this zone.

To protect and enhance the natural environment and natural processes for their historic, archaeological and scientific interest, landscape, faunal habitat and cultural values.

To protect and enhance natural resources and the biodiversity of the area

To encourage development and use of land which is consistent with sustainable land management and land capability practices, and which takes into account the conservation values and environmental sensitivity of the locality

To provide for agricultural use consistent with the conservation of environmental and landscape values of the area.

39. The proposal is considered to give affect to the purpose of the zone by virtue of:

- The works providing for enhanced function of the existing use on site - a use that relies on ensuring that the natural environment, biodiversity, fauna habitat and landscape values of the area are maintained and well managed, for the benefit of their guests
- The proposed works area considered a small, non-intrusive addition to the existing building & environs
- The required vegetation removal is considered a normal part of the land's management and critical to ensuring the safety of not just life and property, but also reducing the risk of catastrophic wildfires and their impact the landscape values of the area.

40. With specific reference to the relevant decision guidelines, we note:

General Issues

41. The proposal is associated with a well-established existing use that relies on the environmental beauty of the area as a draw-card. The small additional built-form and vegetation removal is not considered to impact the natural environment or landscape qualities of the area. In contrast, we submit that the works will result in modern best practice management of fire risk that will decrease the risk of bushfire impact to the surrounding environment.

42. The site is of a size that can easily accommodate the proposal and the small increase is built form. The extension is located more than 100m form the nearest neighbour, hidden from public view and will not impact neighbouring uses.

Rural Issues

43. The proposal includes no significant additional infrastructure requirements and will be easily serviced onsite. The use is long standing and the site's capacity to sustain the enterprise is well established.

Environmental Issues

44. At the time of preparing this application an offset assessment has not been completed. We request that Council garnish referral advice and approval from FRV prior to requiring a detailed assessment of the vegetation removal values and offset requirements.

45. The minor nature of the works, and long-established use. is not considered to warrant an integrated land management plan for the site.

46. All effluent disposal can be treated on site, via the existing EPA approved system.

Accommodation Issues

47. The proposed works will not result in the fragmentation of agricultural land nor impact, in anyway, the agricultural land uses nearby.

Impact from Building(s)

48. We note that both the ESO and RCZ require consideration of issues relating to a buildings' design, siting and potential impact on environmental values. With consideration given to the most relevant decision guidelines we provide the following:

49. As is evidenced in the above images, the existing accommodation-building is sited part-way down a slope, more than 100m to the nearest neighbour and the subject site is bordered by significant native

vegetation. These attributes ensure that the existing building and the proposed extension remain hidden from off-site vantage points.

50. The existing building and proposed extension enjoy a 360^0 backdrop of native canopy. The building will remain nestled into this backdrop and will not impact prominent ridgelines or significant view lines.

51. The extension is designed to match the existing building. The overall height, to top of roof ridge, is 6.21metres. This is significantly lower than the surrounding, towering tree canopy. The materials have been selected to match the existing building (cement-sheet weatherboards and colorbond roofing) and will remain muted in the colours of cream and green.

52. The applicant considers that the proposal is ideally sited to ensure limited impact to the valuable landscape and environmental character of the area and that the proposed form and materials selection ensures the building maintains its inconspicuous profile within this setting.

Bushfire Risk

53. A detailed Bushfire Hazard Assessment, Bushfire Management Assessment and Bushfire Management Plan (BMP), prepared by John Burke of BAL Assessments, accompanies this application.

54. The report concludes that a BAL-29 be designated for the new buildings and works and identifies inner and outer Fuel Management Zones:

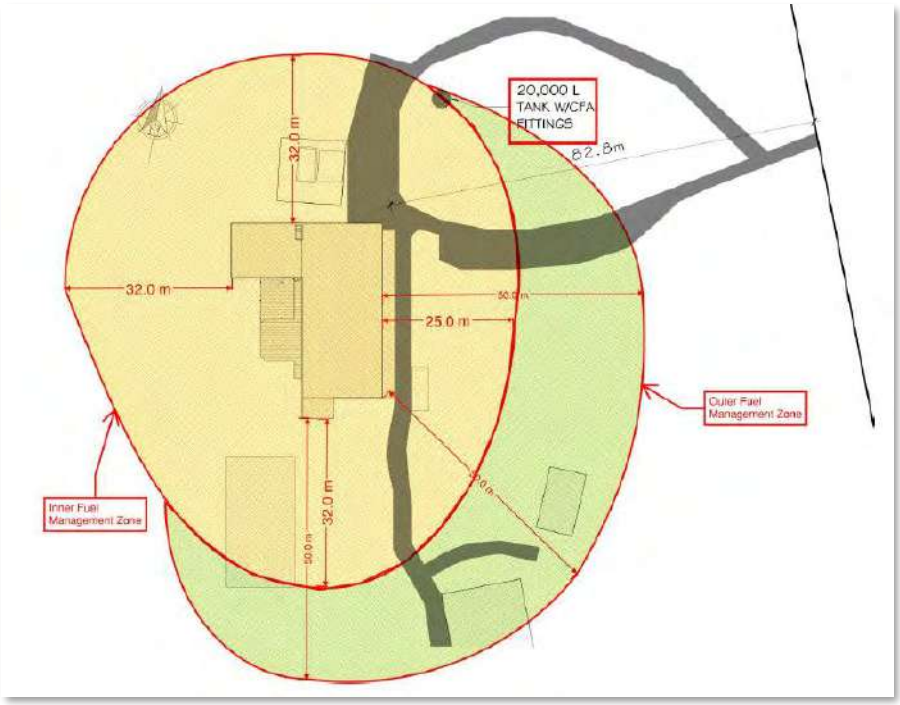


Figure 8: Extract from BMP (John Burke, pg1), showing inner and outer fuel zones

55. The BMP utilises a 'clumping' strategy to reduce the extent of vegetation that is to be removed. Referral advice from the CFA confirms that the proposal meets their satisfaction.

Vegetation Removal

56. The Bushfire Management Plan, discussed above identifies areas in which 'fuel' is to be managed. This 'management' includes the removal of numerous trees.

57. We note that trees within 10m of the building and other vegetation within 50m of the building are exempt from the need for a planning permit, or Council's consideration, under Cl 52.12-1 *Exemptions to create defendable space around buildings used for accommodation.*

58. An Arborist Report (prepared by Matt Weatherhead, Tree Designs) identifies the impact on vegetation on site under the requirements of the above BMP. In summary, the Arborst Report finds of the 81 located in the survey area:

    - 16 trees are required to be removed and
    - 23 additional trees require some pruning.

59. The sixteen trees to be removed are listed below:

Tree No,	DBH in cm	Botanical Name	Common Name	Works Required
8	40	Eucalyptus muelleriana	Yellow Stingubark	Remove tree
9	20	Ecalyptus radiata	Narrow leaved Peppermint	Remove tree
32	45	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
34	25	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
43	45	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
45	50	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
46	35	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
47	70	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
60	65	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
69	30	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
70	20	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
71	55	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
76	55	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
77	75	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
79	20	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
80	35	Eucalyptus muelleriana	Yellow Stringybark	Remove tree

60. In addition to the Aborists Report, a detailed Ecological Assessment, accompanies this application. The assessment provides additional details on the vegetation impacted by the proposal and calculates the required offsets.

In support of the proposed vegetation removal and with consideration of the decision guidelines contained within ESO1 we provide the following:

- The existing accommodation facilities does not comply with modern expectations regarding 'defendable space' within a bushfire prone area
- The proposal will ensure that the fuel loads surrounding the building(s) (with existing use rights) are reduced to the levels considered acceptable, under today's controls
- It is considered that this vegetation removal, for the maintenance of defendable space, should be undertaken, regardless of the small building extension proposed – to ensure the safety of existing facility and guests. We note that the existing building is located closer to the vegetation being removed, than the newly proposed buildings.
- Given the existing use will perpetuate on site, it is considered important to ensure the defendable space requirements are met, for the safety of existing and future guests
- The extent of vegetation removal has been prescribed by the bushfire consultant, approved by the CFA and is considered the minimum amount possible to ensure the safety life and property
- The proposed vegetation removal is not expected to notably impact the remnant vegetation or habitat in the immediate area.

61. It is considered that significant weight should be given to the need to remove vegetation in order to reduce the risk from fire to the existing building used for accommodation onsite (and the small extension proposed). The removal of 16 trees is not considered to have a noticeable impact on the tree cover or biodiversity across the site. The retention of hundreds of trees on site is considered to ensure the proposal gives effect to the statement of environment significance and objectives contained in ESO1, whilst balancing the need to mitigate bushfire risk.

Vehicle Access & Parking

62. We submit that no permit is triggered by Clause 52.06. Pursuant to clause 52.06-6 under the heading "Number of car parking spaces required for other uses", the scheme states:

> *Where a use of land is not specified in Table 1 or where a car parking requirement is not specified for the use in another provision of the planning scheme or in a schedule to the Parking Overlay, before a new use commences or the floor area or site area of an existing use is increased, car parking spaces must be provided to the satisfaction of the responsible authority.*

63. In this instance the use is not listed in *Table 1* and the 'parking spaces must be provided to' Council's satisfaction. In support of our assertion that the proposal is wholly appropriate we note:

64. No change is proposed to the existing vehicle parking and access arrangements on site. The existing access and parking arrangements have served the existing use well for many years.

65. Guests to the facility arrive via chartered-coaches. Between two and three large coaches generally drop off and pick up guests at the commencement and completion of their stay. The coaches do not stay on site and no long-term parking is required for them. The existing one-way looped-driveway allows the coaches to conveniently park on the site whilst loading and unloading guests.

66. A minimum of eleven car parking spaces are also provided along the driveway at the base of the loop for individual cars to park, if required. Site's use model generally relies on buses to drop off and pick up guests. So the provision of additional 'car' parking is provided for incidental use buy guests and the occasional use of staff.

67. The access way is considered to currently meet the requirements for emergency vehicle access and we note that the CFA has reviewed the proposal and provided their consent for the issue of a permit.

68. The following images illustrate the existing looped driveway, parking and drop-off areas.

Figure 9: Aerial image with looped-driveway and parking highlighted

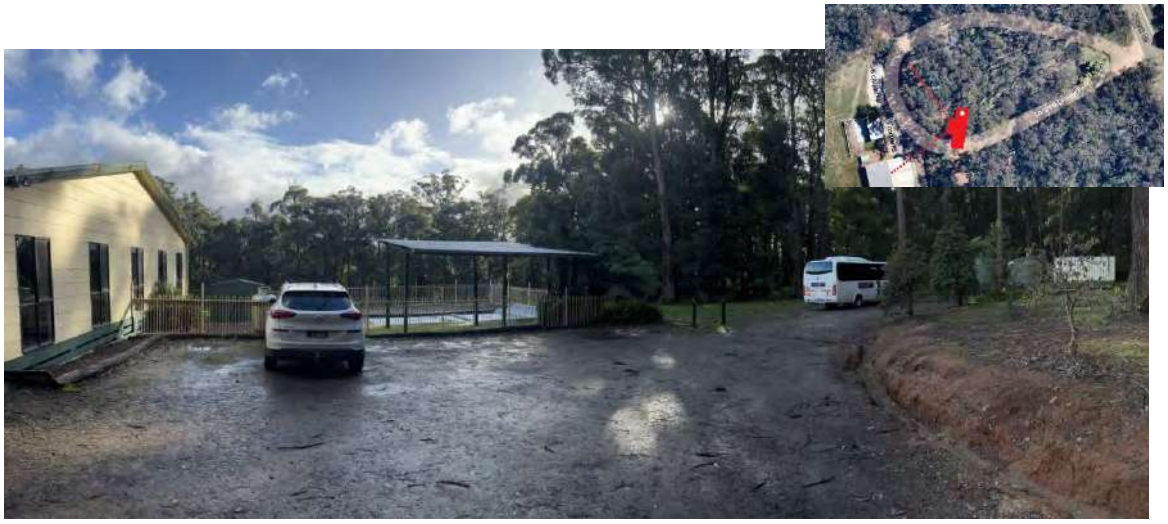


Figure 10: Image looking west from bottom of accessway towards pool

Figure 11: Image looking north from part way down accessway-loop

Figure 12: Image looking west from Beenak Road to site entrance

Figure 13: Image looking south along Beenak Road at site entrance

Figure 14: Image looking east from next to pool towards parking area and entrance loop

69. The following indicatively illustrates the location of parking and vehicle sweep paths onsite.

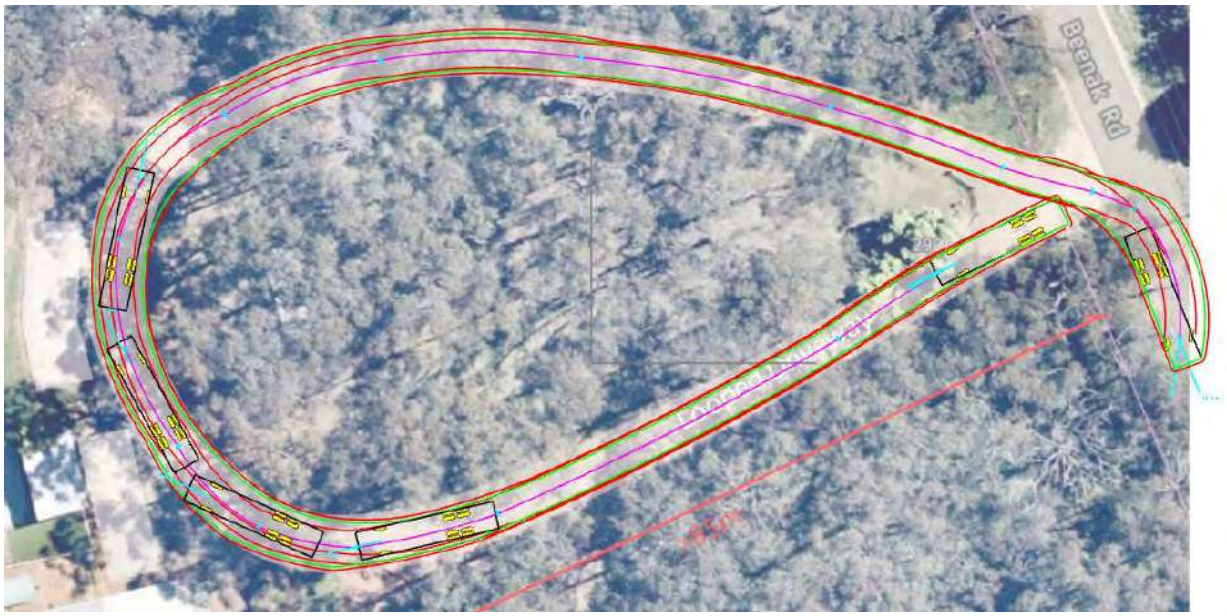


Figure 15: Indicative sweep paths and propping areas for passenger buses (RTR 2014 AU)

70. The following illustrates car parking access for passenger vehicles.

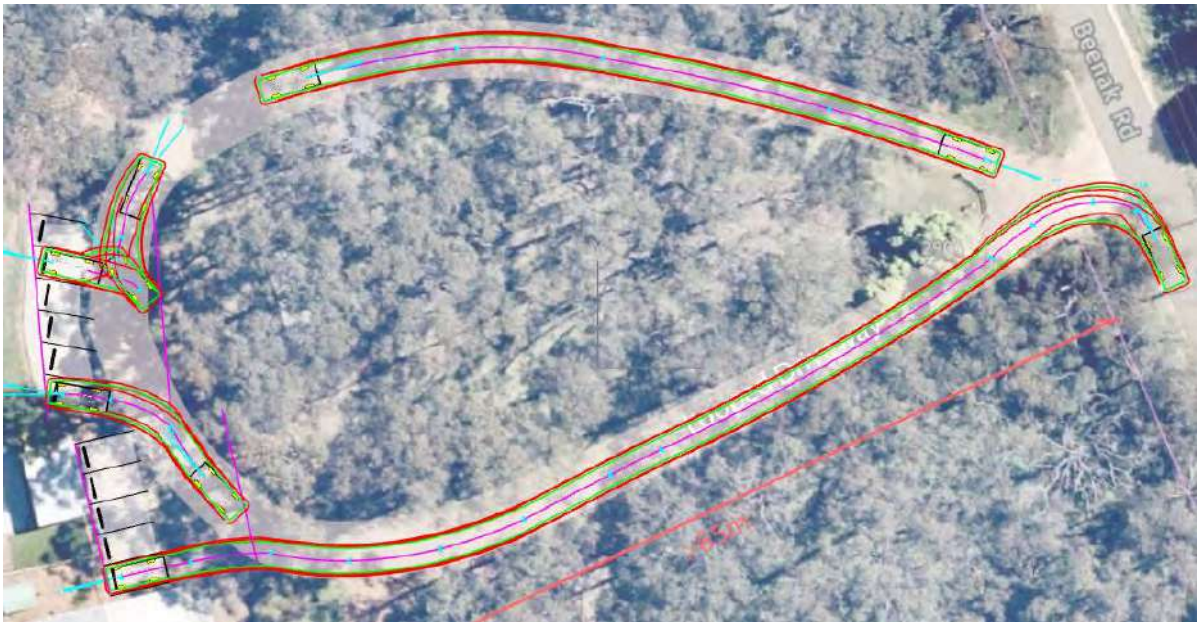


Figure 16: Indicative sweep paths and parking for B99 vehicles

71. As evidenced above and viewed during Council's site inspection, ample parking and vehicle access is provided under the existing conditions on site.

72. Clause 52.06-7 that an application under Cl52.06-5 must be accompanied by a Car Parking Demand Assessment. In this instance the application does not seek a permit under Cl52.06-5 and therefor no Car Parking Demand Assessment is required. However, we provide the following to assist Council:

Matters to be addressed under a Car Parking Demand Assessment

Matter to be addressed	Response
The likelihood of multi-purpose trips within the locality which are likely to be combined with a trip to the land in connection with the proposed use.	There is no likelihood of mutli-purpose trips.
The variation of car parking demand likely to be generated by the proposed use over time.	The well established use model relies upon guests arriving via coach. Only limited car parking spaces are ever required for staff and guests that accompany buses via private vehicles.
The short-stay and long-stay car parking demand likely to be generated by the proposed use.	Staff do not generally park in the spaces associated with the accommodation, but may require parking for up to 8hrs at a time onsite when undertaking maintenance and other duties. The incidental use by guests is likely to be for the duration of their stay (up to 5days).
The availability of public transport in the locality of the land.	Guests are not expected to utilise public transport to access the site
The convenience of pedestrian and cyclist access to the land.	Guests are not expected to utilise pushbikes to access the site
The provision of bicycle parking and end of trip facilities for cyclists in the locality of the land.	See above. Although it is noted that ample space exists for the parking of bicycles onsite
The anticipated car ownership rates of likely or proposed visitors to or occupants (residents or employees) of the land.	As noted previously, the use model employees coaches to transport guest to and form the site. School groups and other guests generally have less than 3 cars accompany their stay.
Any empirical assessment or case study.	The use has been operating on the land for decades. The above submissions are based on the uses empirical history.

Waste Treatment

73. The applicant has recently obtained approval from the EPA (Attachment G) for upgrades to the sewerage and wastewater treatment facilities on site. The applicant submits that any requirements of the responsible authority can easily be obtained via a standard permit condition, should Council deem to grant the permit.

Notice & Review Requirements

74. Section 52.1. requires that responsible authority to give notice of an application in the prescribed for (inter alia):

    (a) to the owners (except persons entitled to be registered under the Transfer of Land Act 1958 as proprietor of an estate in fee simple) and occupiers of allotments or lots adjoining the land to which the application applies unless the responsible authority is satisfied that the grant of the permit would not cause material detriment to any person

    …

    (d) to any other persons, if the responsible authority considers that the grant of the permit may cause material detriment to them. (underline-emphasis added)

75. The following table details the relevant exemptions from the notice requirements of section 52(1)(a), (b) and (d), the decision requirements of section 64(1), (2) and (3) and the review rights of section 82(1) of the Act, contained within the scheme:

Trigger	Notes	Exempt
RCZ	Cl 35.06-5: to construct a building or construct or carry out works	No
ESO	Cl 42.01-2: to construct a building or construct or carry out works	No
ESO	Cl 42.01-2: to remove destroy or lop vegetation	No
BMO	Cl 44.06-2: to construct a building or construct or carry out works	Yes
NV	Cl 52.17: to remove destroy or lop vegetation	No

76. The proposed small addition to the accommodation facility is completely hidden from public view and cannot be said to result in material detriment to neighbours of nearby lots.

77. Similarly, the extent and location of vegetation removal, is located away from public vantage points. The fall of the land ensures that the trees to be removed will not be noticed from the nearby roads or adjoining properties. Moreover, the significant extent of vegetation that is to remain on site ensures that the trees being removed will not noticeably impact the treed canopy backdrop that currently exists on site.

78. It is the applicant's submission that although 4 of the 5 triggers are not expressly exempt under the scheme, the relatively small scale of the proposal and it's siting away from public view will ensure that the extent of change it not noticed by nearby residents or passersby. It is submitted that no material detriment of any kind can be said to result from the proposal, and we are hopeful that Council will see fit to determine the application without the need for public notification.

Conclusion

79. As a result of the above considerations, it is submitted that the proposal to undertake a small extension to the existing building on the subject site will results in minimal impact to the surrounding environment and enhance the applicant's ability to ensure the school children and other groups can continue to enjoy this institution. It is considered that he proposal responds appropriately to the Municipal Planning Strategy and the Planning Policy Framework and all relevant provisions contained in the Scheme.

If you have any questions relating to this application please do not hesitate to contact us.
Thank you for your consideration.
Clause 1 Planning

strata
geoscience and environmental

Land Capability Assessment and Wastewater Management Plan for

Stringybark Lodge Camp
2904 Gembrook-Launching Place Road
Gembrook

September 2020

Report Details

Table 1: Site, Client, Author and Report Details	
Address	2904 Gembrook-Launching Place Road Gembrook
Nature of Proposed Development	Expansion of Outdoor Education Camp
Client	Aubin Environmental
Author	[redacted] MEngSc CPSS
Report Number	SR03594v3
Report Date	14 September 2020

Table 2: Copies Recipient	
1 PDF	[redacted] OutTask Environmental
1 PDF	[redacted] Aubin Environmental
1 PDF	Strata Geoscience and Environmental Project File

Table of Contents

Executive Summary

Aubin Environmental contracted Strata Geoscience and Environmental Pty Ltd to conduct a Land Capability Assessment (LCA) and Wastewater Management Plan at the Stringybark Lodge Camp, Gembrook, Victoria. The proposal is to upgrade the existing system in two stages, namely:

1. Stage 1: Upgrade existing system for current 84 bed capacity
2. Stage 2: Upgrade existing system for proposed 120 bed capacity

The investigation consisted of desktop, field reconnaissance, risk analysis, modelling, design and reporting.

Desktop and field investigation, combined with risk modelling found that the site has constraints associated with:

- Proximal surface waters
- Soil Drainage
- Climate
- Soil Texture

Given these findings, the following design recommendations were made:

- Treatment of all effluent generated onsite to a minimum of Class C levels with reference to EPA 2003 (20/30/1000) with minimum 20m setbacks to any downslope waterway.
- Land application via sub surface irrigation scaled via water and nutrient balancing into existing grassland
- Balancing of peak flows generated from weekday activities over a full 7-day period via buffer tanks.

Further to the above, the following specifications have been modelled:

Table 1: Key Recommendations and System Specifications	
Maximum Modelled Daily Effluent Flows	**11.184 (7.989 kL balanced over 7 days)**
Minimum Recommended Treatment Level	**Class C (20/30/1000)**
Land Application Concept Design	**4480 m^2** of sub surface irrigation based upon water balance modelling with buffer storage
Buffer Storage (KL)	**60 KL**
Buffer Storage (days at peak flow)	**5.4 Days**

It is noteworthy that the system proposal has the following additional risk mitigation strategies:

- **Modelling accounts for zero wet winter storage.**
- **Occupancy during high risk periods of the year (wet months) is always low – records show waste water being less than 1000 L/d during these months.**
- **Minimum setback distances from all waterways and surface waters is maintained from both treatment infrastructure and effluent envelopes.**
- **The downslope dam is further protected from downslope movement of effluent and runoff with downslope diversion berms.**
- **The proposed irrigation envelopes are further protected from overland run on with upslope diversion berms.**
- **60 KL buffer storage allows for peak flows to be disposed of over 7 days and with daily flow rate monitoring will allow for accurate system tailoring over the system design life.**

1. Introduction, Guidelines and Standards Referenced

Strata Geoscience and Environmental Pty Ltd was commissioned to perform a limited scope Land Capability Assessment for:

Table 2: Site and Client Details	
Client/Agent	Aubin Environmental
Site Address	2904 Gembrook-Launching Place Road Gembrook (see Site Plan)
Nature of Development	Existing Outdoor Education Camp

The investigation was conducted based upon specific development plans supplied by the client (Figures 2&3) and with reference to the following documents:

1. EPA Victoria (1997) Code of Practice for Small Wastewater Treatment Plants
2. EPA Victoria (2016) Code of Practice for Onsite Wastewater Management
3. EPA Victoria (2003) Guidelines for Environmental Management – Use of Reclaimed Water
4. Australian Standard AS1547-2012 Onsite Wastewater Management

The investigation also follows the principles outlined in:

1. 2006 MAV & DSE Model LCA Report
2. EPA Publication 746.4 Guidelines for Land Capability Assessment
3. MAV DEPI & EPA 2014 Land Capability Assessment Framework
4. AS1726-1993 Geotechnical Site Investigations.

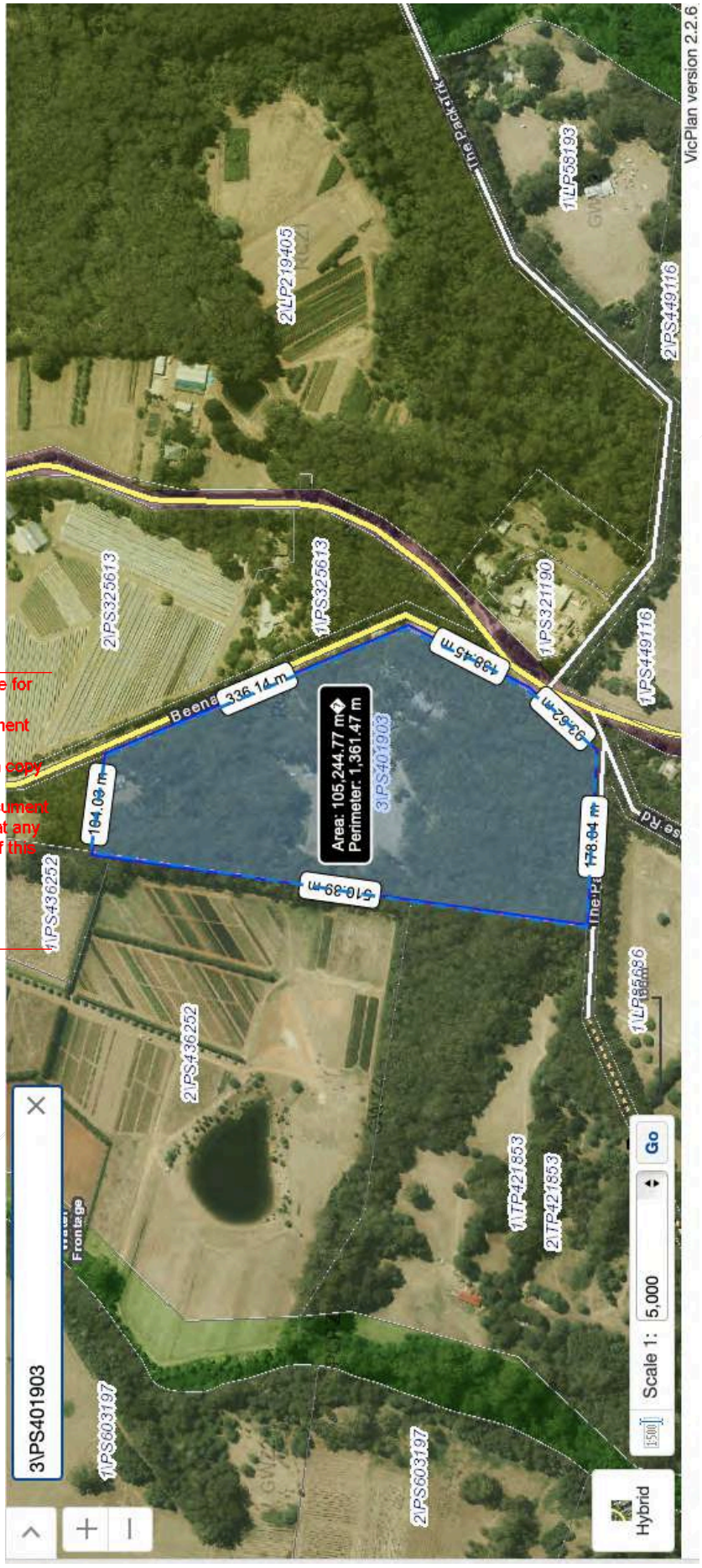
2. Description of Development

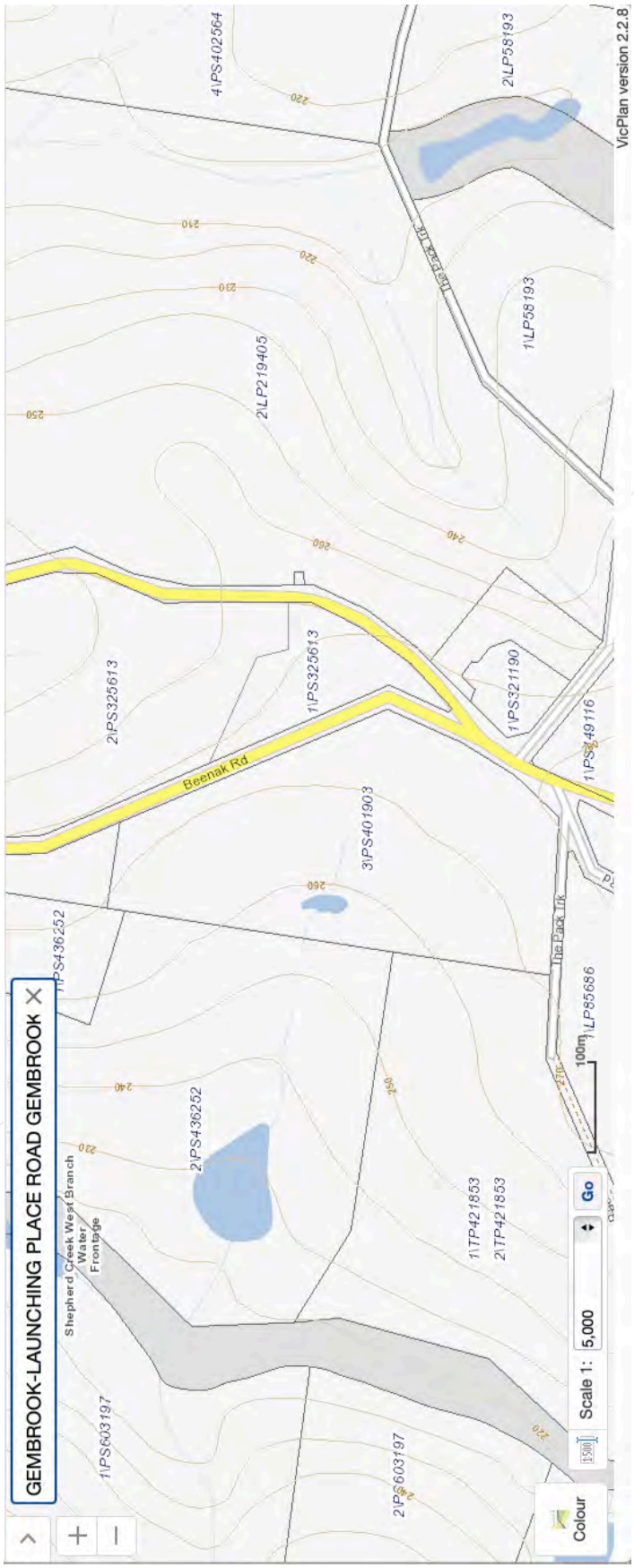
Table 3: Site Description	
Site Address	2904 Gembrook-Launching Place Road Gembrook
Owner/Developer/Agent	Aubin Environmental
Address	As above
Council Area	Cardinia Shire Council
Zoning	RCZ2
Allotment Size	10.4Ha approx.
Anticipated Wastewater Load	Stage1 & 2: Up to 7.989 kL/D (See Section 6- averaged over 7 days)
Availability of Sewer	Unsewered and likely to be unsewered in mid term

3. Site Plans and Key Site Features

A range of soil and landscape features were assessed for their potential to impact upon land application area siting and level of wastewater treatment required over the site. Figures 1-2 give locality and proposed site plans respectively whilst Table 3 summarises key features as in relation to effluent management over the site.

Figure 1 Locality Plan, Site Dimension Plan, Site Survey Plan (if available), VVG Portal Search Plan





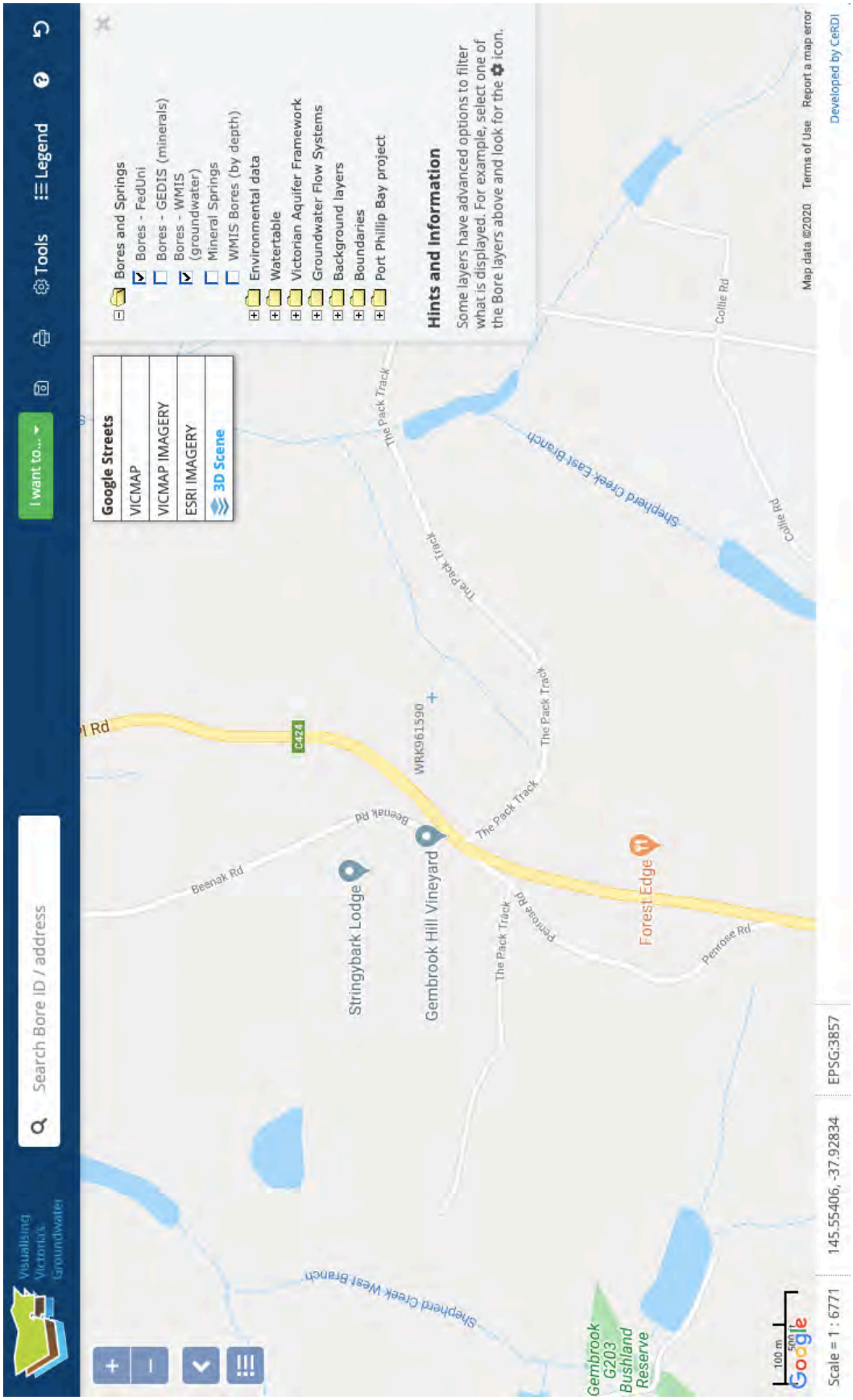


Table 5 Site Features	
Climate	The nearest weather station with **long term** data is the Beaconsfield Upper Station with a 90th % annual rainfall of 1226 mm (BOM 2020). Climate Data from BOM presented in Appendix 2.
Exposure	The site is relatively shielded with exposure to winds which predominate from the NW/SW directions
Vegetation	Pasture/native woodland
Landform	Slopes measured up to 5% with handheld inclinometer
Slope, Slope Stability and Aspect	Minor slope, no identified stability issues, westerly aspect
Fill	No fill evident in proposed land application areas
Rocks and Rock Outcrops	None observed
Erosion Potential	No evidence of erosion, erosion potential considered low
Nearest Surface Water	Dam and ephemeral drainage line onsite – maintain 20m setback
Flood Potential	Unknown
Stormwater Run-on and Upslope Seepage	Neglible stormwater run on.
Groundwater	Closest Groundwater bore >100m away. Risk to groundwater from subsurface irrigation into topsoils of secondary effluent considered low. Based on the Department of Natural Resources and Environment Groundwater Resources Victoria Map groundwater is likely to be >10m below ground surface and have a salinity range of 501-1000 mg/L TDS. The following beneficial uses are indicated SEPP (Waters): • Maintenance of ecosystems • Stock watering • Industrial water use • Primary contact recreation • Buildings and structures
Site Surface Drainage and Subsurface Drainage	The site receives minimal run on and does not show signs of springs or other areas of ephemeral subsurface water retention. Given clay subsoils perched watertable may exist in some areas of the site
Recommended Buffer Distances	Given the significant land area, all buffer distances as stipulated in EPA (1997/2016) are achievable.
Available Land Application Area	There is surplus space to land application area requirements

4. Soil Assessment and Constraints

Soils have been assessed for their suitability for onsite wastewater management through both desktop review and intrusive field investigation.

4.1 Site Geology

Referring to Geoscience Australia 1:250000 geological mapping series and GeoVic online portal, the site is underlain by a contact Tertiary aged Volcanic deposits.

4.2 Field Investigation

Field investigation consisted of drilling three soil bores using a 38mm soil probe to 1.5m or refusal on rock with retrieval of undisturbed soil cores for logging, sampling and testing for pH, EC, CEC, Emmerson Class.

Bore logs and soil permeability data/soil test results (where relevant) are presented in Appendix 1. As a general comment soil appeared to be relatively uniform across the site and geotechnical drilling revealed Clayey SILTS (ML) (grading to Clayey SILTS (MH) / Silty CLAYS (CL).

With reference to the classification system of Isbell (2002) soils are classified as Reddish Brown **Ferrosols** being structured clays soils with a free iron content >5%. Subsoils clays will exhibit a moderate structure and will show the existence of vertical macropores throughout drier periods, significantly increasing their unsaturated hydraulic conductivities. Subsoils will show moderate to high cation exchange complex for the absorption of nutrients, are likely to have dispersive phases and a slightly acidic pH trend.

Table 4 Typical Soil Characteristics	
Soil Depth (m)	2.0m+ (variable)
Depth to Water Table (m)	2.5m+
Coarse Fragments (%)	0-5%
Soil Permeability and Concept Design Loading Rates	Approximately 0.63m/d DIR of 3.0mm/d appropriate

	Topsoils	Subsoils
Description	Clayey SILT (ML)	Clayey SILT (ML)/ Silty CLAY (CL)
Soil Category (AS1547-2011)	3b	4
DIR (mm/d)/DLR (L/D)	4.5	3.5
pH	5.8	5.5
EC	0.9	4.1
EMMERSON	8	7

4.3 Soil Permeability

Soil permeability was measured using the constant head Talsma-Hallam method in accordance with AS 1547:2012 (see Appendix 6) and are presented in Table 5 below:

Location	*K_{unsat}*
BH1 (500)	0.63
BH2 (500)	1.2

The result indicates DIR/LTAR values based upon **CLAY LOAM (Class 4)** soils under AS1547-2012/EPA 2016 have been modelled.

5. Land Capability Assessment Matrix

5.1 Assessment Matrix

Referring to MAV & DSE (2006), EPA Victoria Publication 746.1 Land Capability Assessment for Onsite Domestic Wastewater Management and MAV DEPI & EPA 2014 Land Capability Assessment Framework, a qualitative LCA assessment table has been produced for the site.

Table 6: Risk Assessment of Site Characteristics (MAV, DEPI, EPA 2014)				
Characteristic	**Level of Constraint**			**Assessed Level of Constraint for Site and Mitigation if required**
	Nil or Minor	**Moderate**	**Major**	
Aspect (affects solar radiation received)	North / North-East / North-West	East / West / South-East / South-West	South	Moderate
Climate (difference between annual rainfall and pan evaporation)	Excess of evaporation over rainfall in the wettest months	Rainfall approximates to evaporation	Excess of rainfall over evaporation in the wettest months	Moderate
Erosion [1] (or potential for erosion)	Nil or minor	Moderate	Severe	Minor
Exposure to sun and wind	Full sun and/or high wind or minimal shading	Dappled light	Limited patches of light and little wind to heavily shaded all day	Moderate
Fill [2] (imported)	No fill or minimal fill, or fill is good quality topsoil	Moderate coverage and fill is good quality	Extensive poor quality fill and variable quality fill	Minor
Flood frequency (ARI) [3]	Less than 1 in 100 years	Between 100 and 20 years	More than 1 in 20 years	Minor
Groundwater bores [4]	No bores onsite or on neighbouring properties	Setback distance from bore complies with requirements in EPA Code of Practice 891.4 (as amended)	Setback distance from bore does not comply with requirements in EPA Code of Practice 891.4 (as amended)	Minor

Characteristic	Level of Constraint			Assessed Level of Constraint for Site and Mitigation if required
	Nil or Minor	**Moderate**	**Major**	
Land area available for LAA	Exceeds LAA and duplicate LAA and buffer distance requirements	Meets LAA and duplicate LAA and buffer distance requirements	Insufficient area for LAA	Minor
Landslip (or landslip potential) [5]	Nil	Minor to moderate	High or Severe	Minor
Rock outcrops (% of surface)	<10%	10-20%	>20%	Minor
Slope Form (affects water shedding ability)	Convex or divergent side-slopes	Straight side-slopes	Concave or convergent side-slopes	Minor
Slope gradient [6] **(%)**				
(a) for absorption trenches and beds	<6%	6-15%	>15%	Minor
(b) for surface irrigation	<6%	6-10%	>10%	Minor
(c) for subsurface irrigation	<10%	10-30%	>30%	Minor –lateral flow negligible
Soil Drainage [7] **(qualitative)**	No visible signs or likelihood of dampness, even in wet season	Some signs or likelihood of dampness	Wet soil, moisture-loving plants, standing water in pit; water ponding on surface, soil pit fills	Minor

Characteristic	Level of Constraint			Assessed Level of Constraint for Site and Mitigation if required
	Nil or Minor	**Moderate**	**Major**	
Stormwater run-on	Low likelihood of stormwater run-on		High likelihood of inundation by stormwater run-on	Minor
Surface waters - setback distance (m) [9]	Setback distance complies with requirements in EPA Code of Practice 891.4 (as amended)		Setback distance does not comply with requirements in EPA Code of Practice 891.4 (as amended)	Minor – 20m setback for secondary treatment
Vegetation coverage over the site	Plentiful vegetation with healthy growth and good potential for nutrient uptake	Limited variety of vegetation	Sparse vegetation or no vegetation	Minor

Characteristic	Level of Constraint					Assessed Level of Constraint for Site and Mitigation if required
	Nil or Minor		**Moderate**	**Major**		
Soil Drainage [8] **(Field Handbook definitions)**	Rapidly drained. Water removed from soil rapidly in relation to supply, excess water flows downward rapidly. No horizon remains wet for more than a few hours after addition	Well drained. Water removed from the soil readily, excess flows downward. Some horizons may remain wet for several days after addition	Moderately well drained. Water removed somewhat slowly in relation to supply, some horizons may remain wet for a week or more after addition	Imperfectly drained. Water removed very slowly in relation to supply, seasonal ponding, all horizons wet for periods of several months, some mottling	Poorly/Very poorly drained. Water remains at or near the surface for most of the year, strong gleying. All horizons wet for several months	Moderate

Table 7: Risk Assessment of Soil Characteristics

Characteristic	Level of Constraint			Assessed Level of Constraint for Site and Mitigation if required
	Nil or Minor	Moderate	Major	
Electrical Conductivity (ECe) (dS/m) as a measure of soil salinity [1]	<0.8	0.8 – 2	>2	Minor
Emerson Aggregate Class (consider in context of sodicity)	4, 5, 6, 8	7	1, 2, 3	Minor
Gleying [2] **(see Munsell Soil Colour Chart)**	Nil	Some evidence of greenish grey / black or bluish grey / black soil colours	Predominant greenish grey / black, bluish grey / black colours	Minor
Mottling (see Munsell Soil Colour Chart)	Very well to well-drained soils generally have uniform brownish or reddish colour	Moderately well to imperfectly drained soils have grey and/or yellow brown mottles and in the mottled areas occur higher in the profile the less well-drained the soil	Poorly drained soils have predominant grey colours with yellow brown or reddish brown mottles located along root channels, large pores and cracks	Minor
pH [3] **(favoured range for plants)**	5.5 - 8 is the optimum range for a wide range of plants; 4.5 - 5.5 suitable for many acid-loving plants		<4.5, >8	Minor

Characteristic	Level of Constraint			Assessed Level of Constraint for Site and Mitigation if required
	Nil or Minor	**Moderate**	**Major**	
Rock Fragments (size & volume %)	0 – 10%	10 – 20 %	>20%	Minor
Sodicity [4] (ESP %)	<6%	6 – 8%	>8%	Minor
Soil Depth to Rock or other impermeable layer (m) [5]	>1.5 m	1.5 – 1 m	<1 m	Minor
Soil Structure (pedality)	Highly or Moderately structured	Weakly-structured	Structureless, Massive or hardpan	Minor
Soil Texture, [6] Indicative Permeability	Cat. 2b, 3a, 3b, 4a	Cat. 4b, 4c, 5a	Cat. 1, 2a, 5b, 5c, 6	Moderate
Watertable Depth (m) below the base of the LAA	>2 m	2 – 1.5 m	<1.5 m	Minor

Legend:

Nil or Minor: If all constraints are minor, conventional/standard designs are generally satisfactory.
Moderate: For each moderate constraint an appropriate design modification over and above that of a standard design, should be outlined.
Major: Any major constraint might prove an impediment to successful on-site wastewater management, or alternatively will require in-depth investigation and incorporation of sophisticated mitigation measures in the design to permit compliant onsite wastewater management.

5.2 LCA Conclusions

Qualitative LCA modelling has identified the following site constraints/risks:

- Proximal dam– maintain min 20m upslope setback
- Proximal ephemeral drainage line - maintain min 10m upslope setback
- Soil Drainage
- Climate – use water balance model
- Soil Texture

5.3 Risk Mitigation and Design Implications

The identified constraints may be risk mitigated by:

- Treat to minimum Class C levels
- Install surface irrigation
- Confirm minimum setback distances to all sensitive environmental receivers

Please refer to See Section 6 and Appendices for further specific system recommendations.

6. Proposed Onsite Wastewater System Design

6.1 General System Recommendations

Given the results of the LCA, the following recommendations are made for a suitable wastewater treatment system:

- Minimum Class C treatment of effluent with subsurface disposal via irrigation is a suitable method for onsite wastewater effluent disposal.

6.2 Onsite Wastewater Flow and Land Application Area Modelling

For modelling purposes EPA has advised that a design flow of 93.2 l/p/d should be adopted based on the 16 October to 16 November 2018 YVW meter monitoring period. See calculation below:

EPA Approved Design Flows			
Metering Period	Total Visitors	Total Usage (L)	Design Flow per Person (L/d)
16/10/19-16/11/19	769	71680	93.2

Stage 1 – 84 Bed Capacity (Staff and Students)

- A design loading of 93.2L/person/day has been applied given measured volumes calculated by the applicant.
- Therefore, daily loading for Stage 1 at full capacity is **7828.8 L/d.**
- Given that peak flows will be received throughout weekdays only (ie the site is closed over the weekends) and in consideration of the addition of a 60kL balancing tank, daily peak loading is 7828.8L/day x5/7) = **5592 L/day**

Stage 2 – 120 Bed Capacity

- Increase in bed numbers to 1**20.**
- Therefore, daily loading for Stage 2 at full capacity is **11184 L/d.**
- Given that peak flows will be received throughout weekdays only (ie the site is closed over the weekends) and in consideration of the addition of

a 60kLl balancing tank, daily peak loading is 11184L/day x5/7) = **7989 L/day**

- **Additional Loading for Stage 2 = 2397 L/day**

THE TOTAL DAILING LOADING AT PEAK CAPACITY FOR BOTH STAGES = 7.989 kL/day

Therefore, the calculated effluent flows and required disposal area for is as follows:

6.2.1 Water Balance and Land Application Area Modelling

Please refer to Appendix 2 for the water balance modelling based upon MAV 2014 water balancing. "The VLCAF/MAV guidance does not require the use of 90th percentile wet year rainfall in the design of sub-soil irrigation disposal areas. However, Halls Outdoor has agreed to adopt 90th percentile wet year in the VLCAF/MAV water balance calculations as a **further** conservative measure ensuring low risk of offsite export from the sub-soil irrigation system.

The VLCAF/MAV water balance calculates a sub-soil irrigation area of **4480 m^2** is required to cater for the 90th percentile wet year (~21% higher across the year compared with average rainfall year) and adopting the agreed 93.2 l/p/d design flows, 120 beds, and a maximum 7,989 l/d flow from the 60kL balance tanks.

6.2.2 Nutrient Balance and Land Application Area Modelling

Please refer to Appendix 2 for the nutrient balance modelling (Nitrogen) based upon MAV 2014 nutrient balancing. The methodology aims to ensure that the LAA is of sufficient size to ensure all nutrients from the applied effluent are assimilated by soils and vegetation. As a result of these calculations, at least **2651 m^2** of area is required to achieve sustainable assimilation of N over the nominated system design life.

BASED UPON THE ABOVE MODELLING THE MINIMUM MODELLED LAND APPLICATION AREA REQUIREMENT IS 4480 m^2 FOR CLASS C TREATED EFFLUENT BASED UPON THE WATER BALANCE MODEL.

6.2.3 Effluent Storage Volume Modelling

The above water and nutrient balancing proposes no winter storage. However, **60 KL** of onsite storage in 20 KL tanks is proposed to allow for peak flow balancing over 7 days given the site usage occurs on weekdays only. Given the peak daily effluent production 11184 L/day, this equates to **5.4 days** effluent storage at peak flow rates.

6.3 System Concept Design

6.3.1 Treatment System

Given the above modelling the following treatment system would be appropriate:

- The Aubin Treatment Plant has 20kL/D treatment capacity, which provides more than 8kL/D excess treatment capacity for this site
- Flow rate meter with daily readout and digital logger/telemetry
- Min 60 kL buffer storage capacity.

6.3.2 Land Application Areas

The land application areas could consist of:

- Minimum 4480 m^2 of sub surface irrigation with appropriate buffer zones. Two irrigation field are proposed (see Appendix 3) with 400m^2 zones within each field
- Zoned pressure dosed sequencing valves – to dose each zone alternately

6.3.3 Provision of Adequate Setback Distances

Given the minimum land application areas modelled above combined with the current development plan, setback distances complying with the minimum requirements of EPA Vic (2016) are achievable (see Figure 2 and Appendix 3).

6.4 System Risk Management

Risk identification and reduction measures compliant with AS1547 – 2012 Clause A3.2 is presented below:

Table 8 System Risk Management		
Risk	**Factors that Increase Risk Likelihood**	**Design Risk Reduction Measures**
Hydraulic Overloading of System	• Under scaled system • Prolonged overuse • Leaking taps • Shock Loading • Excessive solid disposal	• Scale to peak potential loading • Use Conservative DLR/DIR • Use water conservation practices eg water reduction fixtures • Not rated for spa installation
Biological Failure	• Overuse of household chemicals • Shock loading	• Limit detergents and bleach use where practical • System not fit for spa or sinkerator installation
Marginal Soil Conditions	• Low soil hydraulic conductivity • Dispersive soils • Poor aspect/drainage	• Use appropriate DLR/DIR after permeability testing • Treat with gypsum, manage sodium inputs
Site Constraints	• See section 5	

Risk	Factors that Increase Risk Likelihood	Design Risk Reduction Measures
High Rainfall/Torrential Rainfall	• Inappropriate LAA Scaling • Stormwater impacts	• Use suitable hydraulic scaling • Stormwater Diversion around LAA if required
Clogged Outlet Filter	• Overloading • Infrequent cleaning	• Clean monthly • Regular servicing inline with manufacturers recommendations
Pipe Blockages	• Overloading • Infrequent de-sludging	• Reduce solids inflows • De-sludge septic max 3 year intervals • Check IO's regularly
Sludge transport to LAA	• Infrequent de-sludging • Clogged outlet filter • High organic loading	• Regular servicing inline with manufacturers recommendations • De-sludge septic max 3 year intervals • Clean outlet filter monthly • No sinkerator installation
Broken pipes in LAA	• Stock/vehicles	• Exclude stock/vehicles

6.5 System Management and Maintenance

The proposed system is designed to allow for system automation and as such there are negligible management requirements from owners/site managers. A detailed operations manual and maintenance log must be provided to the owners/site managers upon installation of the system. This will remain onsite

and will provide details on troubleshooting, emergency service technical support, service scheduling, flow rate and effluent quality monitoring.

Emergency contacts for on call service agents will be listed next to alarm modules and in operations manual to provide support in the event of technical difficulties/breakdown

6.5.1 Servicing

The following servicing program is recommended:

- Servicing of WTP and associated infrastructure is proposed in line with minimum manufacturer's recommendations.
- Desludging of anaerobic/sedimentation chambers and septic tanks at a maximum frequency of three years.

6.5.2 Monitoring

Annual effluent sampling and analysis at a NATA accredited laboratory is recommended but not mandatory over the first two years of operation. Sampling should be conducted by suitable qualified personnel and involve chain of custody documentation.

The following parameters should be included in any analysis

- BOD
- TSS
- Thermotolerant Coliforms
- Oil and Grease
- Total Nitrogen
- Ammonia
- Total Phosphorous
- pH

6.5.3 Effluent Quality Objectives

The proposed upgraded treatment system process will perform to a minimum Class C treatment standard as prescribed by EPA (2003). Namely:

- BOD <20mg/L
- TSS<30mg/L
- CFU<1000cfu/100ml

6.5.4 Contingency Planning

Specific contingencies for installed systems will be included in the operations manual and include:

Table 9 Contingency Planning

Problem	Contingency
Overflow of effluent from treatment plant	• Call service agent immediately • Reduce/cease effluent loading into system (ie ensure all taps, fixtures etc are off) • Minimise building use until problem fixed • Attempt to contain pooling effluent (only if safe to do so)
Critical components of treatments Plants not working	• Structure duty standby of all critical components with auto changeover.
Treatment plant pump not working (Alarm ringing/flashing)	• Check power supply to pump • Call service agent immediately • Reduce/cease effluent loading into system (ie ensure all taps, fixtures etc are off) • Minimise building use until problem fixed
Structural failure of treatment plant tank	• Call service agent immediately • Reduce/cease effluent loading into system (ie ensure all taps, fixtures etc are off)

	• Minimize building use until problem fixed
Effluent overflowing in land application area	• Call service agent immediately • Reduce/cease effluent loading into system (ie ensure all taps, fixtures etc are off) • Minimise building use until problem fixed • If problem persists seek advice from designer
Water run on to land application area	• Ensure upslope diversion of run on • Check existing diversion system and clear if required
Land application area emitting odours	• Call service agent immediately – check treatment quality of effluent at outlet to land application area • Check for physical damage to land application area • If problem persists seek advice from designer
Excessive growth of vegetation in land application area	• Check for physical damage to land application area. • Mow/slash land application area at more regular intervals. • Remove aggressive inva68sive weed species. • If problem persists seek advice form designer

7. Conclusions and Further Recommendations

In conclusion, the following comments and recommendations are made:

- Given the identified site and soil limitations, **Class C treatment** with subsurface disposal is required.
- The maximum wastewater flow rate modelling shows that the generated flows from the proposed development is likely to be no more than **11.184 kL/day**. Flows above this figure are not warranted by this design.
- Modelled flows will likely require a land application area comprising:
    - Min **4480 m^2** of subsurface irrigation with appropriate buffer zones
- It is likely that peak flows associated with the modelled development should be within the buffering capacity of proposed system both in terms of the system sizing as well as for effluent acceptance into the disposal area.
- Given the lot size and current development plan adequate setback distances and reserve provisions can be met.
- It is likely that earthworks and drainage installation associated with development proposal will alter conditions of the site and as a result the recommendations of this report MUST be reconfirmed after these works have occurred. Failure to ensure this will void the design recommendations. Stormwater diversion or interceptor drain installation may be appropriate at this time.

- **If the prescriptions of this report are followed the likely human and environmental health risks associated with effluent disposal over the site is low.**

[redacted]

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W: www.strataconsulting.com.au

8. References

- AS1726-1993- Geotechnical Site Investigations
- AS 1547-2012 Onsite Wastewater Disposal
- Bureau of Meteorology Website- Monthly Climate Statistics
- EPA (2016) Vic Code of Practice for Onsite Wastewater Management
- EPA (1997) Code of Practise for Small Wastewater Treatment Plants
- EPA Victoria (2003) Guidelines for Environmental Management – Use of Reclaimed Water
- MAV & DSE 2006 (as amended) Model LCA Report
- VLCAF (2016) Victorian Land Capability Assessment Framework – Calculation of Water and Nutrient Balances
- Isbell (2002) Australian Soil Classification (Revised Edn) CSIRO Publishing

Appendix 1 Site Photos, Indicative Borelogs and Soil Permeability Data

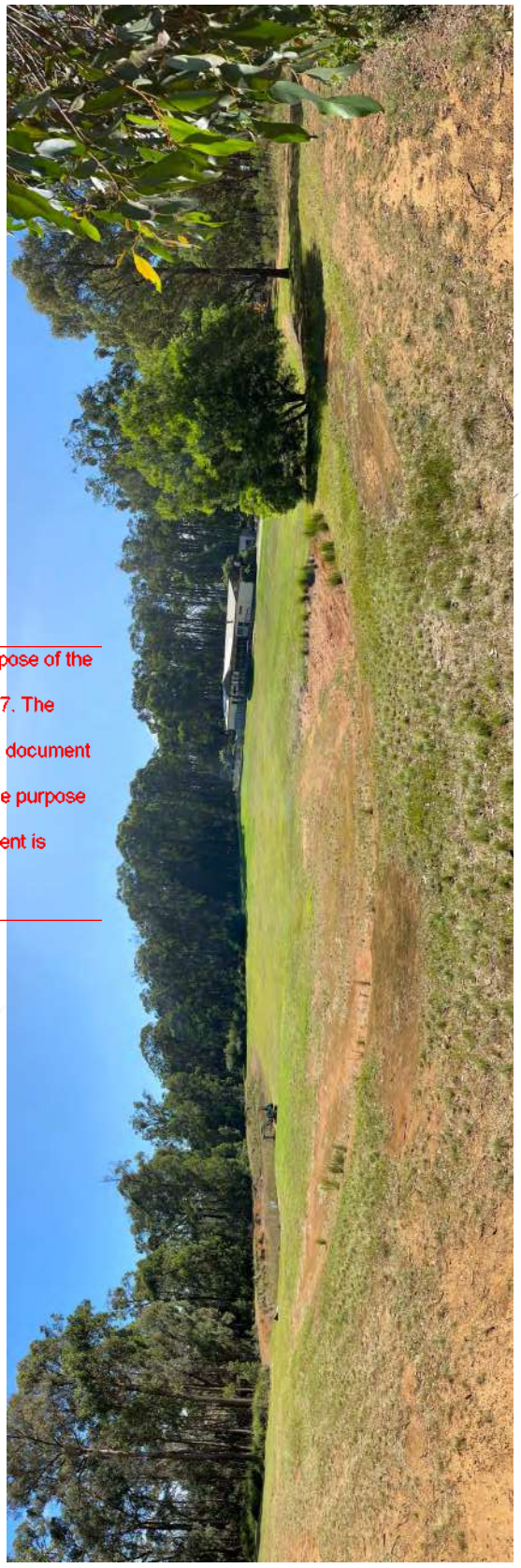


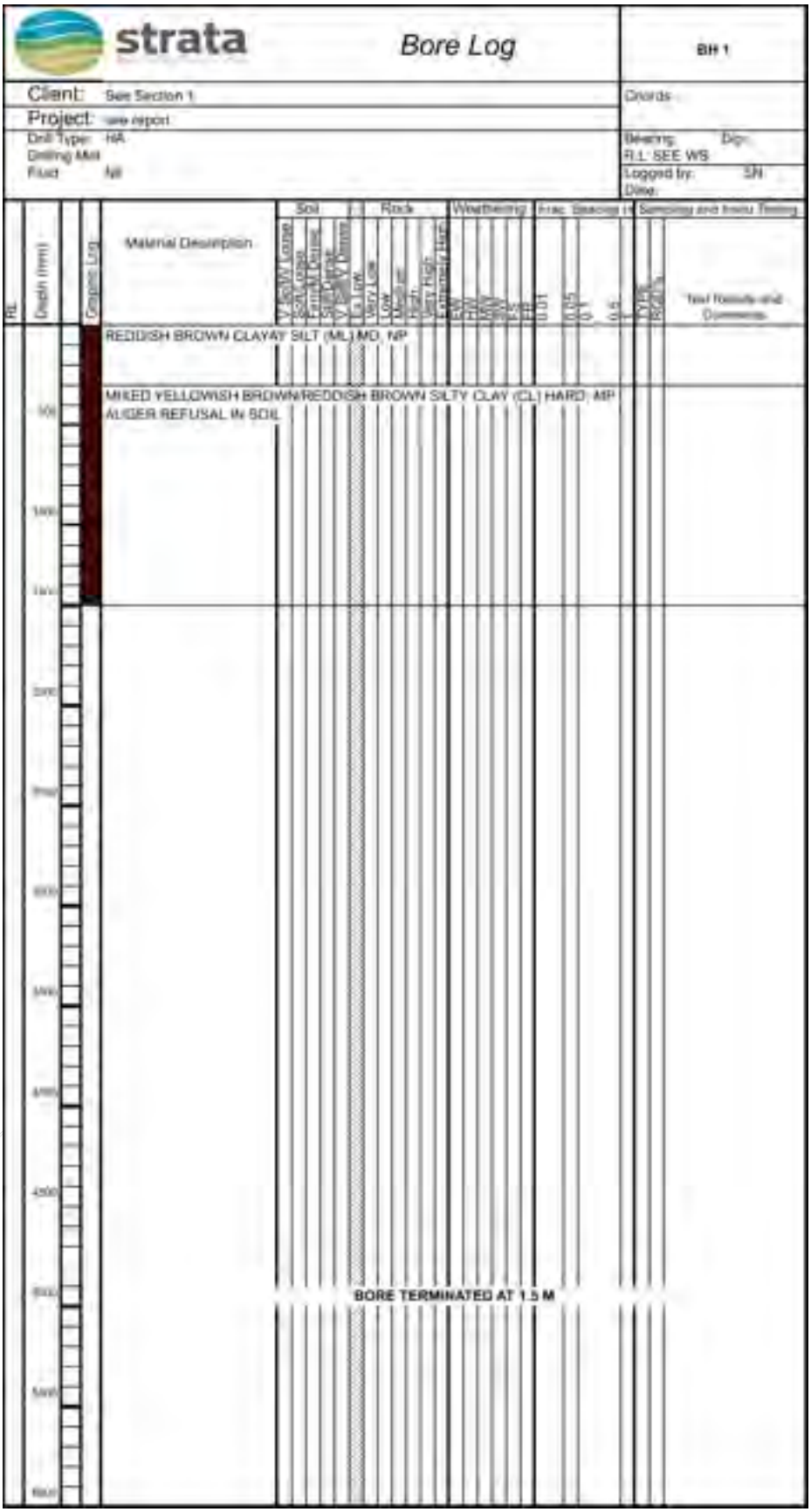
Plate 1 Taken from dam wall overlooking proposed irrigation area 1 and drainage line

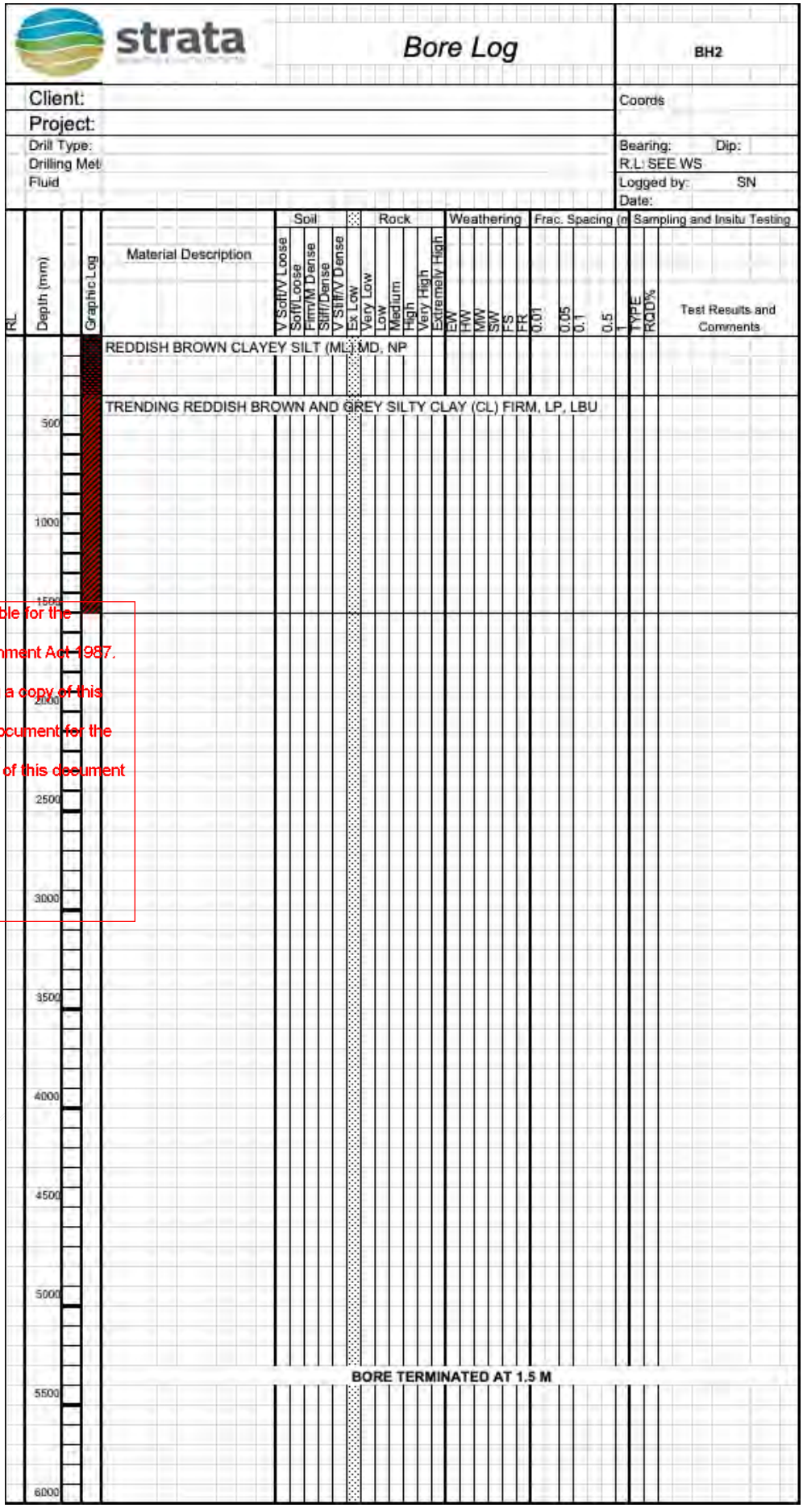
Plate 2 (Above) Proposed irrigation area 1

Plate 2 (Below) Looking Toward dam across drainage line

Plate 4 (above) Looking across dam to Proposed irrigation area 2

Plate 5 (below) Typical leading edge of vegetation abutting proposed irrigation areas (upslope of proposed irrigation)





strata

Bore Log

BH2

Client:

Project:

Drill Type:
Drilling Met
Fluid

Coords

Bearing: Dip:
R.L: SEE WS
Logged by: SN
Date:

RL	Depth (mm)	Graphic Log	Material Description	Soil: V Soft/V Loose	Soft/Loose	Firm/M Dense	Stiff/Dense	V Stiff/V Dense	Rock: Ex Low	Very Low	Low	Medium	High	Very High	Extremely High	Weathering: EW	HW	MW	SW	FS	FR	Frac. Spacing (m): 0.01	0.05	0.1	0.5	1	Sampling and Insitu Testing: TYPE	RQD%	Test Results and Comments
			REDDISH BROWN CLAYEY SILT (ML) MD, NP																										
	500		TRENDING REDDISH BROWN AND GREY SILTY CLAY (CL) FIRM, LP, LBU																										
	1000																												
	1500																												
	2000																												
	2500																												
	3000																												
	3500																												
	4000																												
	4500																												
	5000																												
	5500		BORE TERMINATED AT 1.5 M																										
	6000																												

Permeability Results

To see the instructions on the right hand side of this page, make sure that 75% is entered in the Zoom box in the right hand corner of the Standard toolbar. (This rule will not be printed)

Constant head permeameter

Project **Location**

Site description

Tested by SN **Date**

Test hole geometry

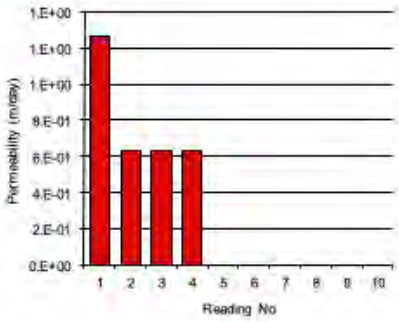
	Test 1	Test 2
Hole depth (m)	0.5	0.5
Depth (m) of water in hole	0.3	0.2
Hole diameter (mm)	38	38
Depth (m) to imperm. layer	2	2

TEST 1

Depth interval (m) tested 0.2 to 0.5 Soil type tested

Test duration (mins)

Reading No.	Water infiltrated (L)	Time to infiltrate (min)	Infiltrat. rate (L/min)	Perme-ability (m/day)
1	0.6	5	1.2E-01	1.3E+00
2	0.3	5	6.0E-02	6.3E-01
3	0.3	5	6.0E-02	6.3E-01
4	0.3	5	6.0E-02	6.3E-01

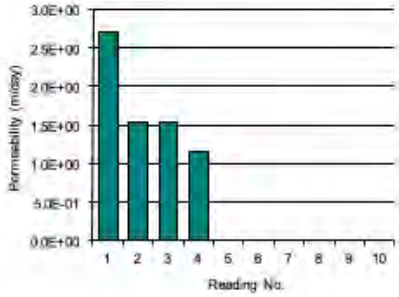


TEST 2

Depth interval (m) tested 0.3 to 0.5 Soil type tested

Test duration (mins)

Reading No.	Water infiltrated (L)	Time to infiltrate (min)	Infiltrat. rate (L/min)	Perme-ability (m/day)
1	0.7	5	1.4E-01	2.7E+00
2	0.4	5	8.0E-02	1.5E+00
3	0.4	5	8.0E-02	1.5E+00
4	0.3	5	6.0E-02	1.2E+00



Note: Permeability $K = 4.4Q\{\sinh^{-1}(H/2r)-[(r/H)^2+0.25]^{0.5}+(r/H)\}/2\pi H^2$ where Q = infiltration rate, H = depth of water in test hole, r = hole radius and pi = 3.1416. H should be in the range 5r to 10r. See Australian/New Zealand Standard 1547: 2000 *On-site domestic-wastewater management*. Appendix 4.1F. The Standard's equation has a typographical error, which has been corrected here. If an impermeable layer is at depth S no more than 2H below the base of the test hole, use $K = 3Q\ln[H/r]/\pi H(2H+3S)$.

See Talsma, T. and Hallam, P. (1980): Hydraulic Conductivity Measurement of Forest Catchments. *Australian Journal of Soil Research* 30, pp 139-148.

Scientific Notation

Enter any number **0.63**

This is the same number in scientific notation **6.3E-01**

(The number has been rounded to one decimal place)

Appendix 2 Climate Data, Water and Nutrient Balancing (MAV, 2014)

Please read the attached notes before using this spreadsheet

Irrigation area sizing using Nominated Area Water Balance for Zero Storage

Site Address:	Stringybark Camp		
Date:	14/9/2020	**Assessor:**	S NIELSEN

INPUT DATA

Design Wastewater Flow	Q	7,989	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)
Design Irrigation Rate	DIR	3.5	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2013)
Nominated Land Application Area	L	4480	m^2	See Note 1
Crop Factor	C	0.6-0.8	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type. See note 2
Rainfall Runoff Factor	RF	0.7	unitless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff
90% Wet Year Profile Rainfall	Upper Beaconsfield			BoM Station and number
Mean Monthly Pan Evaporation Data	Scoresby Research Inst			BoM Station and number

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D		days	31	28	31	30	31	30	31	31	30	31	30	31	365
Rainfall	R		mm/month	80	75	86	98	108	107	108	116	119	120	112	96	1226
Evaporation	E		mm/month	174	154	124	81	53	39	43	59	78	105	132	155	1197
Crop Factor	C		unitless	0.80	0.80	0.70	0.70	0.60	0.60	0.60	0.60	0.70	0.80	0.80	0.80	
OUTPUTS																
Evapotranspiration	ET	ExC	mm/month	139	123	87	57	32	23	26	35	55	84	108	124	890.5
Percolation	B	DiRxD	mm/month	108.5	98	108.5	105.0	108.5	105.0	108.5	108.5	105.0	108.5	105.0	108.5	1277.5
Outputs		ET+B	mm/month	247.7	221.2	195.3	161.7	140.3	128.4	134.3	143.9	159.6	192.5	210.6	232.5	2168.0
INPUTS																
Retained Rainfall	RR	RxRF	mm/month	56	52.5	59.5	68.6	75.6	74.9	75.6	81.2	83.3	84	78.4	68.6	858.2
Applied Effluent	W	(QxD)/L	mm/month	55.3	49.8	55.3	53.5	55.3	53.5	55.3	55.3	53.5	55.3	53.5	55.3	650.9
Inputs		RR+W	mm/month	111.3	102.4	114.8	122.1	130.9	128.4	130.9	136.5	136.8	139.3	131.9	123.9	1509.1
STORAGE CALCULATION																
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for the month	S	(RR+W)-(ET+B)	mm/month	-136.4	-118.8	-80.5	-39.6	-9.4	0.0	-3.4	-7.4	-22.8	-53.2	-78.7	-108.6	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	N		mm	0.00												
	V	NxL	L	0												
LAND AREA REQUIRED FOR ZERO STORAGE			m^2	1292	1326	1824	2574	3828	4480	4219	3950	3141	2283	1913	1511	

MINIMUM AREA REQUIRED FOR ZERO STORAGE: 4480.0 m^2

CELLS

	Please enter data in blue cells
XX	Red cells are automatically populated by the spreadsheet
XX	Data in yellow cells is calculated by the spreadsheet; DO NOT ALTER THESE CELLS

NOTES

[1] This value should be the largest of the following; land application area required based on the most limiting nutrient balance or minimum area required for zero storage

[2] Values selected are suitable for pasture grass in Victoria

Nutrient Balance

Site Address:

SUMMARY - LAND APPLICATION AREA REQUIRED BASED ON MOST LIMITING NUTRIENT BALANCE 2651 m^2

INPUT DATA[1]

Wastewater Loading			Nutrient Crop Uptake					
Hydraulic Load	7989	L/day	Crop N Uptake	220	kg/ha/yr	which equals	60.27	$mg/m^2/day$
Effluent N Concentration	25	mg/L	Crop P Uptake	50	kg/ha/yr	which equals	13.70	$mg/m^2/day$
% N Lost to Soil Processes (Geary & Gardner 1996)	0.2	Decimal	**Phosphorus Sorption**					
Total N Loss to Soil	39945	mg/day	P-sorption result	240	mg/kg	which equals	3360	kg/ha
Remaining N Load after soil loss	159780	mg/day	Soil Bulk Density	1400	kg/m^3			
Effluent P Concentration	8	mg/L	Depth of Soil	1	m			
Design Life of System	25	yrs	% of Predicted P-sorp.[2]	0.5	Decimal			

NUTRIENT BALANCE BASED ON ANNUAL CROP UPTAKE RATES

Minimum Area required with zero buffer			Determination of Buffer Zone Size for a Nominated Land Application Area (LAA)		
Nitrogen	2651	m^2	Nominated LAA Size	3250	m^2
Phosphorus	1990	m^2	Predicted N Export from LAA	-13.18	kg/year
			Predicted P Export from LAA	-14.76	kg/year
			Phosphorus Longevity for LAA	77	years
			Minimum Buffer Required for excess nutrient	0	m^2

PHOSPHORUS BALANCE
Using the nominated LAA Size

Nominated LAA Size	3250	m^2			
Daily P Load	0.064	kg/day	→ Phosphorus generated over life of system	583.197	kg
Daily P Uptake	0.045	kg/day	→ Phosphorus vegetative uptake for life of system	0.125	kg/m^2
Measured P-sorption capacity	0.338	kg/m^2			
Assumed P-sorption capacity	0.168	kg/m^2	→ Phosphorus adsorbed over 50 years	0.168	kg/m^2
Site P-sorption capacity	546.000	kg	→ Desired Annual P Application Rate	36.090	kg/year
			which equals	0.104	kg/day
P-load to be sorbed	7.078	kg/year			

Monthly Rainfall (millimetres)

BEACONSFIELD UPPER

Station Number: 086261 · State: VIC · Opened: 1968 · Status: Open · Latitude: 37.98°S · Longitude: 145.42°E · Elevation: 196 m

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1968						105.1	74.5	81.5	47.3	115.7	121.4	89.0	
1969	47.3	87.2	97.5	68.0	181.6	31.5	75.8	68.9	140.5	55.8	75.9	68.2	998.2
1970	130.9	10.1	234.4	100.6	178.0	74.2	76.4	139.1	86.3	82.2	92.1	119.6	1323.9
1971	60.4	72.1	41.6	101.8	147.7	90.6	44.4	47.6	88.1	147.3	201.1	95.3	1138.0
1972	56.1	179.4	25.2	89.9	66.8	17.4	88.5	80.5	64.6	66.5	66.2	1.5	802.6
1973	65.5	204.0	125.9	47.4	99.6	100.5	56.6	120.3	78.8	110.5	93.5	85.5	1188.1
1974	66.3	43.2	50.0	191.6	160.2	29.6	144.0	128.2	118.8	118.8	84.4	119.1	1254.2
1975	44.6	7.6	67.8	72.8	90.6	58.4	71.2	161.9	131.4	185.0	102.8	64.0	1058.1
1976	37.0	15.4	44.2	29.1	37.2	72.4	37.2	120.6	122.0	105.8	114.2	105.4	840.5
1977	49.9	50.8	82.2	106.6	94.0	179.8	84.8	50.8	58.0	39.0	58.4	38.6	892.9
1978	69.8	81.2	100.0	64.8	118.6	55.4	113.8	150.0	125.0	76.6	123.8	126.4	1205.4
1979	25.9	41.1	38.8	77.0	104.2	39.5	27.3	92.4	61.0	148.4	42.4	22.4	720.4
1980	45.7	4.6	14.6	70.0	63.4	159.4	68.6	96.4	70.2	111.8	0.0	0.0	704.7
1981	56.3	27.5	97.4	66.2	148.8	76.1	127.6	148.6	51.8	92.6	96.2	43.4	1032.5
1982	96.9	18.8	111.4	115.0	108.1	71.8	40.0	34.8	104.0	49.6	25.8	62.8	839.0
1983	45.6	10.6	110.8	63.0	117.9	115.0	52.6	91.4	113.6	111.0	110.4	33.8	975.7
1984	80.4	50.4	87.6	89.8	15.8	62.0	100.6	106.8	208.0	70.4	64.2	65.1	1001.1
1985	22.2	7.8	56.4	123.0	97.3	74.6	107.5	109.0	58.0	102.0	106.6	171.4	1035.8
1986	70.0	40.2	13.7	94.8	120.5	98.4	131.0	56.9	60.5	160.4	42.2	128.0	1016.6
1987	30.0	57.5	92.6	46.5	106.1	97.0	111.4	70.5	82.3	59.6	92.5	80.8	926.8
1988	67.1	46.0	54.7	34.8	85.7	92.7	93.3	83.5	75.7	68.7	131.0	115.0	948.2
1989	86.4	15.0	106.6	101.1	88.7	127.5	102.4	95.4	94.8	213.9	29.4	5.0	1066.2
1990	2.5	173.0	43.3	63.5	21.6	101.9	106.1	118.4	110.3	150.4	58.2	81.0	1030.2
1991	151.7	0.0	64.6	40.7	36.4	170.1	151.5	128.0	156.8	47.2	51.5	122.4	1120.9
1992	65.6	37.2	57.6	83.0	91.9	73.9	77.0	96.3	208.6	144.3	164.5	109.2	1209.1
1993	120.8	81.6	49.2	30.3	41.4	111.2	47.9	103.5	202.2	123.3	135.2	205.6	1252.2
1994	73.5	155.8	30.4	74.0	67.9	68.0	30.5	58.4	113.6	46.0	94.7	5.4	818.2
1995	88.8	27.6	59.8	176.6	90.6	121.6	144.8	88.0	48.0	118.6	112.8	59.0	1136.2
1996	96.1	101.4	51.4	150.4	24.8	120.0	200.0	103.9	161.3	86.5	86.9	43.4	1226.1
1997	37.4	8.0	18.6	33.2	92.2	63.8	46.2	70.7	69.8	53.2	77.8	18.2	589.1
1998	96.0	68.4	33.2	68.4	68.8	117.9	74.6	35.0	82.0	112.2	96.9	124.8	978.2
1999	34.6	98.0		58.0				133.9	68.0				
2000	85.8			56.9	190.5	67.6	76.8	70.5	142.8	161.2	47.2	80.0	
2001	46.6	20.2	84.8	156.1	33.0	88.4	34.0		48.0		82.8	58.4	
2002	70.0	64.0					63.8		81.6			45.5	
2003					60.0		134.6		98.6		56.8	111.7	
2004	87.2	31.6				158.4	90.4	114.2			160.5	70.6	
2005	62.0			41.1	29.8	46.0	65.4	131.1	94.1	53.0	98.2	93.2	
2006	65.7		69.0	133.7	100.4		96.7	62.8	52.4	33.2	66.0	62.8	
2007	66.8	22.6	69.7	20.1		101.0	138.9	66.0	68.6	52.2	94.0	190.8	
2008		71.4	28.8	50.0	49.6	68.8		115.0	44.0	53.0	140.1	98.4	
2009	12.0		67.8	88.2	30.0	49.8	111.8		192.8	121.5			
2010	58.0	44.5	144.5	58.4	64.1	115.8	70.6	144.5	82.9	162.8	118.9	102.0	1167.0
2011	105.7	237.4	85.0	103.3	90.2	80.0	72.0	37.6	102.5	91.4			
2018				26.0	98.2	61.0	114.0	83.9	*52.0*	*37.8*	135.2	*69.0*	
2019	11.4	*25.2*	*36.6*	54.7	139.5	*100.4*	*143.0*	*148.8*					
2020	*126.8*	*137.0*	*64.3*	*173.9*									

Quality control: 12.3 Done & acceptable, *12.3* Not completed or unknown

Monthly Rainfall (millimetres)

BEACONSFIELD UPPER

Station Number: 086261 · State: VIC · Opened: 1968 · Status: Open · Latitude: 37.98°S · Longitude: 145.42°E · Elevation: 196 m

Statistics for this station calculated over all years of data

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	65.6	61.9	69.5	81.3	89.1	88.4	89.1	96.3	98.2	98.5	91.5	80.8	1016.0
Lowest	2.5	0.0	13.7	20.1	15.8	17.4	27.3	34.8	44.0	33.2	0.0	0.0	589.1
5th percentile	13.0	7.4	18.2	29.2	24.8	31.9	34.5	38.1	48.0	38.9	29.4	5.0	712.6
10th percentile	26.7	8.0	28.1	33.5	30.0	46.4	41.3	51.4	51.9	47.1	42.4	18.6	802.6
Median	65.6	43.8	64.3	70.0	90.6	84.2	80.9	95.8	84.6	97.3	93.5	80.4	1030.2
90th percentile	103.9	157.5	110.9	147.1	148.8	126.9	141.8	144.0	159.9	160.5	135.2	126.2	1226.1
95th percentile	126.2	180.6	127.8	172.1	178.0	159.4	144.7	148.8	200.8	163.9	160.5	169.2	1253.2
Highest	151.7	237.4	234.4	191.6	190.5	179.8	200.0	161.9	208.6	213.9	201.1	205.6	1323.9

Statistics calculated over the period 1961-1990

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	57.1	56.5	77.1	82.6	102.4	83.9	84.2	98.0	93.5	106.2	84.0	74.8	1000.0
Lowest	2.5	4.6	13.7	29.1	15.8	17.4	27.3	34.8	47.3	39.0	0.0	0.0	704.7
5th Percentile	22.4	7.6	15.1	35.4	22.4	29.8	37.5	47.9	52.4	50.2	26.2	1.9	724.5
10th percentile	26.3	8.0	26.6	46.6	39.8	33.1	40.9	52.0	58.0	56.6	32.0	8.5	806.2
Median	56.2	42.2	75.0	74.9	101.9	76.1	84.8	95.4	86.3	105.8	92.1	80.8	1008.9
90th percentile	85.8	164.4	111.3	114.2	159.1	125.0	124.8	146.7	130.1	158.4	123.3	125.0	1203.7
95th percentile	96.4	179.1	125.2	122.6	177.1	156.2	130.7	149.9	139.6	182.5	130.3	127.8	1251.8
Highest	130.9	204.0	234.4	191.6	181.6	179.8	144.0	161.9	208.0	213.9	201.1	171.4	1323.9

1) Calculation of statistics

Summary statistics, other than the Highest and Lowest values, are only calculated if there are at least 20 years of data available.

2) Gaps and missing data

Gaps may be caused by a damaged instrument, a temporary change to the site operation, or due to the absence or illness of an observer.

3) Further information

http://www.bom.gov.au/climate/cdo/about/about-rain-data.shtml.

Product code: IDCJAC0001 reference: 61871595 Created on Tue 26 May 2020 11:47:02 AM AEST

BOM Scoresby Research Institute Data

- Climate change
- Extremes of climate
- About Australian climate

Site details

Site name: SCORESBY RESEARCH INSTITUTE **Site number:** 086104 **Commenced:** 1948
Latitude: 37.87° S **Longitude:** 145.26° E **Elevation:** 80 m **Operational status:** Open
Map

View: Main statistics / All available Period: Use all years of data Text size: Normal / Large

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	Plot	Map
Temperature																
Maximum temperature																
Mean maximum temperature (°C)	26.4	26.5	24.2	20.1	16.4	13.6	13.1	14.2	16.6	19.2	21.6	24.2	19.7	62	1948 2020	
Highest temperature (°C)	43.8	46.1	39.8	33.4	26.6	22.2	22.2	24.3	30.8	35.0	39.4	41.8	46.1	53	1965 2020	
Date	29 Jan 2009	07 Feb 2009	08 Mar 2016	01 Apr 2014	07 May 2002	08 Jun 2005	18 Jul 2013	27 Aug 2007	23 Sep 2017	06 Oct 2015	21 Nov 2019	20 Dec 2019	07 Feb 2009			
Lowest maximum temperature (°C)	14.6	14.0	13.0	10.3	7.2	5.7	4.2	6.1	7.6	9.6	11.6	13.9	4.2	53	1965 2020	
Date	11 Jan 1965	02 Feb 2005	31 Mar 1978	28 Apr 2008	31 May 1977	19 Jun 1975	08 Jul 1973	16 Aug 1970	11 Sep 1969	01 Oct 1968	02 Nov 1966	07 Dec 1969	08 Jul 1973			
Decile 1 maximum temperature (°C)	19.4	19.8	18.2	15.3	13.1	11.2	10.6	11.4	12.7	14.3	15.8	17.7		52	1965 2020	
Decile 9 maximum temperature(°C)	35.0	34.5	31.5	25.9	20.9	16.5	15.8	17.8	21.3	25.5	29.2	32.2		52	1965 2020	
Mean number of days ≥ 30 °C	8.5	8.5	5.1	0.3	0.0	0.0	0.0	0.0	0.0	0.7	2.4	5.2	30.7	53	1965 2020	
Mean number of days ≥ 35 °C	3.2	2.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.4	8.2	53	1965 2020	
Mean number of days ≥ 40 °C	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.0	53	1965 2020	
Minimum temperature																
Mean minimum temperature (°C)	13.4	13.9	12.5	10.1	8.3	6.3	5.9	6.3	7.6	8.8	10.4	11.9	9.6	62	1948 2020	
Lowest temperature (°C)	3.6	4.8	2.2	0.3	-0.3	-2.7	-3.6	-2.3	-0.9	0.1	1.5	2.8	-3.6	53	1965 2020	
Date	03 Jan 2009	10 Feb 1980	06 Mar 1969	30 Apr 2009	24 May 2008	16 Jun 1969	23 Jul 1994	29 Aug 2018	08 Sep 2003	22 Oct 2006	02 Nov 1998	06 Dec 1967	23 Jul 1994			
Highest minimum temperature (°C)	29.2	27.2	26.1	23.1	17.6	15.7	14.0	15.9	20.3	24.2	25.6	27.6	29.2	53	1965 2020	
Date	29 Jan 2009	25 Feb 1968	13 Mar 2013	10 Apr 2005	18 May 2014	07 Jun 2001	19 Jul 2013	26 Aug 2004	21 Sep 2019	13 Oct 1977	20 Nov 2007	20 Dec 2015	29 Jan 2009			
Decile 1 minimum temperature (°C)	9.2	9.6	8.3	5.6	4.1	2.1	1.9	2.7	3.5	4.3	6.0	8.0		52	1965 2020	
Decile 9 minimum temperature (°C)	18.4	19.1	17.5	14.9	12.6	10.2	9.3	10.0	12.0	13.7	15.3	16.8		52	1965 2020	
Mean number of days ≤ 2 °C	0.0	0.0	0.0	0.1	0.6	2.9	3.3	2.1	0.9	0.4	0.0	0.0	10.3	53	1965 2020	
Mean number of days ≤ 0 °C	0.0	0.0	0.0	0.0	0.1	0.7	0.7	0.5	0.1	0.0	0.0	0.0	2.1	53	1965 2020	
Ground surface temperature																
Mean daily ground minimum temperature (°C)	9.9	10.3	9.1	6.9	5.4	3.2	2.5	3.2	4.1	5.8	7.4	8.9	6.4	31	1951 1990	
Lowest ground temperature (°C)	0.4	-0.7	-1.9	-2.3	-5.2	-7.9	-8.0	-4.9	-7.5	-3.6	-2.2	-0.1	-8.0	25	1965 1990	
Date	26 Jan 1965	10 Feb 1980	29 Mar 1965	13 Apr 1965	20 May 1981	16 Jun 1969	21 Jul 1982	05 Aug 1967	27 Sep 1989	07 Oct 1966	17 Nov 1967	19 Dec 1971	21 Jul 1982			
Mean number of days ground min.	0.0	0.0	0.1	0.5	1.3	4.1	4.8	2.8	2.1	0.7	0.2	0.0	16.6	25	1965	

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	Plot	Map
Rainfall																
Mean rainfall (mm)	53.2	53.2	53.2	68.5	87.2	69.4	73.0	79.9	82.6	82.4	81.1	75.4	851.8	62	1948 2020	
Highest rainfall (mm)	192.5	212.4	184.8	201.2	168.3	171.6	180.5	168.0	186.6	171.2	178.3	186.6	1237.1	69	1948 2020	
Date	1963	2011	1970	2020	1962	1977	1952	1975	1992	2001	1992	1993	1952			
Lowest rainfall (mm)	2.2	0.3	4.0	18.4	12.4	13.7	25.5	28.2	28.8	13.4	19.1	3.7	512.8	69	1948 2020	
Date	2009	1956	1951	2018	2009	1972	1976	1982	2006	2006	1959	1972	1997			
Decile 1 rainfall (mm)	19.5	5.9	18.9	28.2	45.5	31.0	40.6	40.3	40.8	37.1	28.5	28.2	645.4	69	1948 2020	
Decile 5 (median) rainfall (mm)	51.6	41.7	46.8	62.6	83.2	64.6	71.2	82.4	78.6	77.2	73.8	73.0	843.2	69	1948 2020	
Decile 9 rainfall (mm)	95.7	108.0	85.0	113.8	138.3	107.8	106.6	115.3	127.4	142.6	138.0	144.0	1043.1	69	1948 2020	
Highest daily rainfall (mm)	69.6	145.4	89.4	78.2	57.6	74.2	58.9	41.0	67.1	63.6	55.9	68.0	145.4	69	1948 2020	
Date	29 Jan 1963	03 Feb 2005	22 Mar 1970	08 Apr 1977	16 May 1974	01 Jun 2013	14 Jul 1952	17 Aug 1983	20 Sep 1958	31 Oct 2010	09 Nov 1954	03 Dec 2003	03 Feb 2005			
Mean number of days of rain	8.9	7.8	10.2	12.4	16.4	16.8	18.6	18.1	16.0	15.2	13.7	11.5	165.6	69	1948 2020	
Mean number of days of rain ≥ 1 mm	6.2	5.4	6.8	8.3	11.7	11.0	12.3	13.2	11.6	11.1	9.9	8.0	115.5	69	1948 2020	
Mean number of days of rain ≥ 10 mm	1.7	1.5	1.6	2.0	2.8	1.9	1.8	2.2	2.5	2.6	2.9	2.4	25.9	69	1948 2020	
Mean number of days of rain ≥ 25 mm	0.4	0.6	0.3	0.4	0.3	0.2	0.2	0.2	0.4	0.3	0.5	0.7	4.5	69	1948 2020	

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years	Plot	Map
Other daily elements																
Mean daily wind run (km)	226	212	201	193	192	198	233	244	243	232	229	225	219	45	1965 2020	
Maximum wind gust speed (km/h)	80	74	68	78	70	76	74	83	76	85	89	70	89	17	2001 2020	
Date	26 Jan 2006	14 Feb 2018	21 Mar 2013	02 Apr 2008	26 May 2010	14 Jun 2018	01 Jul 2008	21 Aug 2009	19 Sep 2003	28 Oct 2007	30 Nov 2015	28 Dec 2016	30 Nov 2015			
Mean daily sunshine (hours)	8.8	8.6	7.2	5.5	4.4	3.9	4.1	4.6	5.4	6.3	7.2	8.0	6.2	15	1965 1979	
Mean daily solar exposure (MJ/m^2)	23.9	20.7	16.0	10.9	7.3	6.0	6.6	9.4	12.8	17.3	20.9	23.5	14.6	30	1990 2020	
Mean number of clear days														0	1988 1988	
Mean number of cloudy days														0	1988 1988	
Mean daily evaporation (mm)	5.6	5.5	4.0	2.7	1.7	1.3	1.4	1.9	2.6	3.4	4.4	5.0	3.3	23	1965 1994	

Statistics 9 am conditions	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years		Plot	Map
Mean 9am temperature (°C)	18.8	18.9	17.3	14.5	11.5	9.1	8.5	9.7	11.9	14.1	15.4	17.3	13.9	52	1948 2010		
Mean 9am wet-bulb temperature (°C)	15.1	15.4	14.3	12.1	10.0	7.9	7.1	8.0	9.5	11.2	12.3	13.8	11.4	49	1948 2010		
Mean 9am dew-point temperature (°C)	11.7	12.5	11.6	9.9	8.4	6.6	5.6	5.9	6.9	8.2	9.4	10.6	8.9	36	1971 2010		
Mean 9am relative humidity (%)	67	70	73	76	82	85	82	78	73	70	69	67	74	45	1948 2010		
Mean 9am cloud cover (oktas)	4.7	4.3	4.6	5.0	5.3	5.4	5.3	5.2	5.3	5.2	5.3	5.0	5.0	38	1948 1994		
Mean 9am wind speed (km/h)	11.1	10.1	10.0	9.4	8.7	9.4	10.7	11.7	12.6	12.7	11.6	11.4	10.8	42	1965 2010		
9am wind speed vs direction plot																	

top

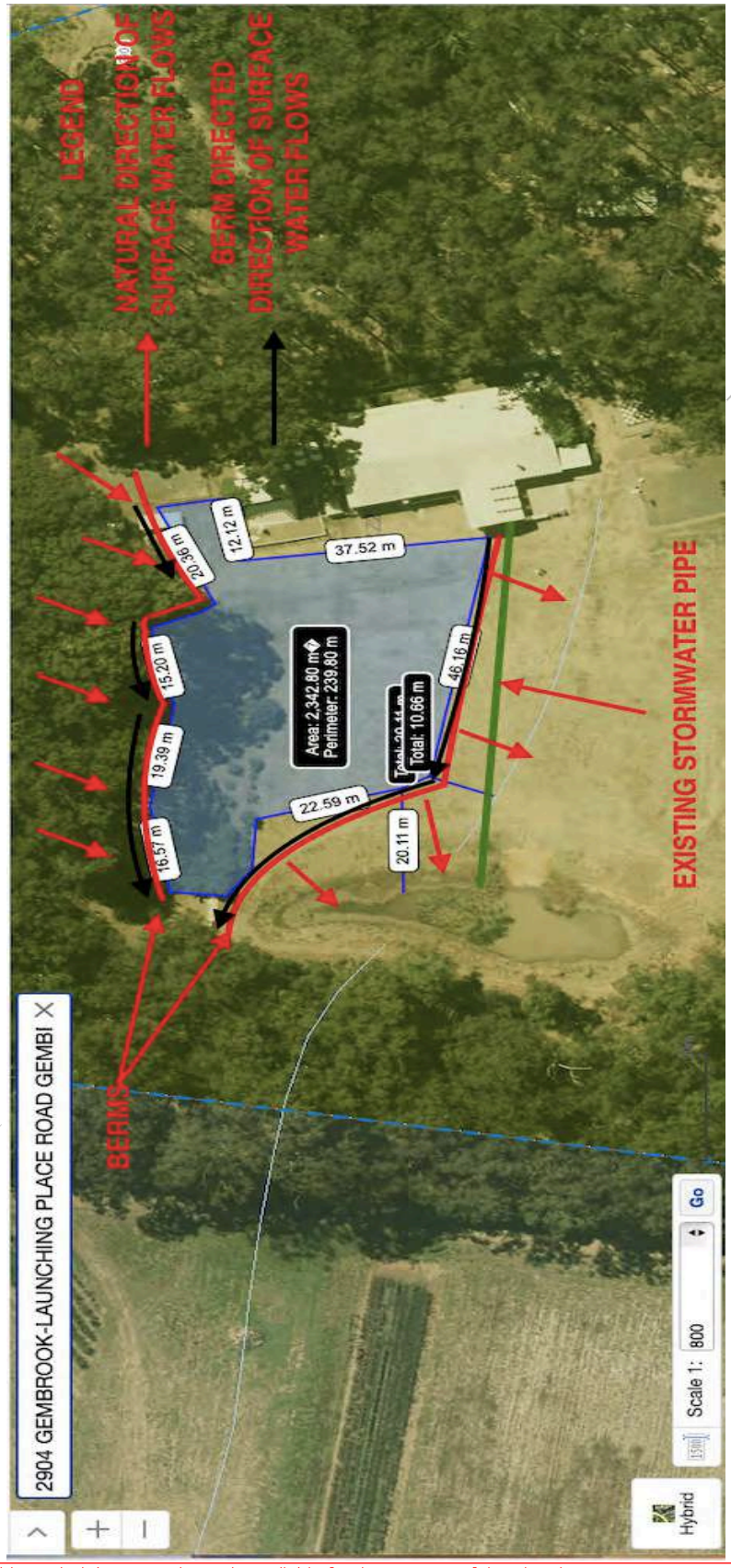
Statistics 3 pm conditions	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years		Plot	Map
Mean 3pm temperature (°C)	25.5	25.3	23.0	19.1	15.7	13.2	12.5	13.6	15.7	17.8	20.7	22.7	18.7	14	1988 2010		
Mean 3pm wet-bulb temperature (°C)	17.8	17.9	16.0	13.9	12.0	10.4	9.5	10.3	11.4	12.6	15.3	16.0	13.6	11	1988 2010		
Mean 3pm dew-point temperature (°C)	11.8	11.9	10.5	9.3	8.4	7.1	6.1	5.9	6.7	7.5	9.5	10.0	8.7	14	1988 2010		
Mean 3pm relative humidity (%)	46	47	48	56	64	68	66	61	57	54	52	48	56	14	1988 2010		
Mean 3pm cloud cover (oktas)														0	1988 1993		
Mean 3pm wind speed (km/h)	16.6	15.4	15.0	13.7	12.9	13.8	14.4	15.8	17.2	17.1	16.2	16.7	15.4	14	1988 2010		
3pm wind speed vs direction plot																	

red = highest value blue = lowest value

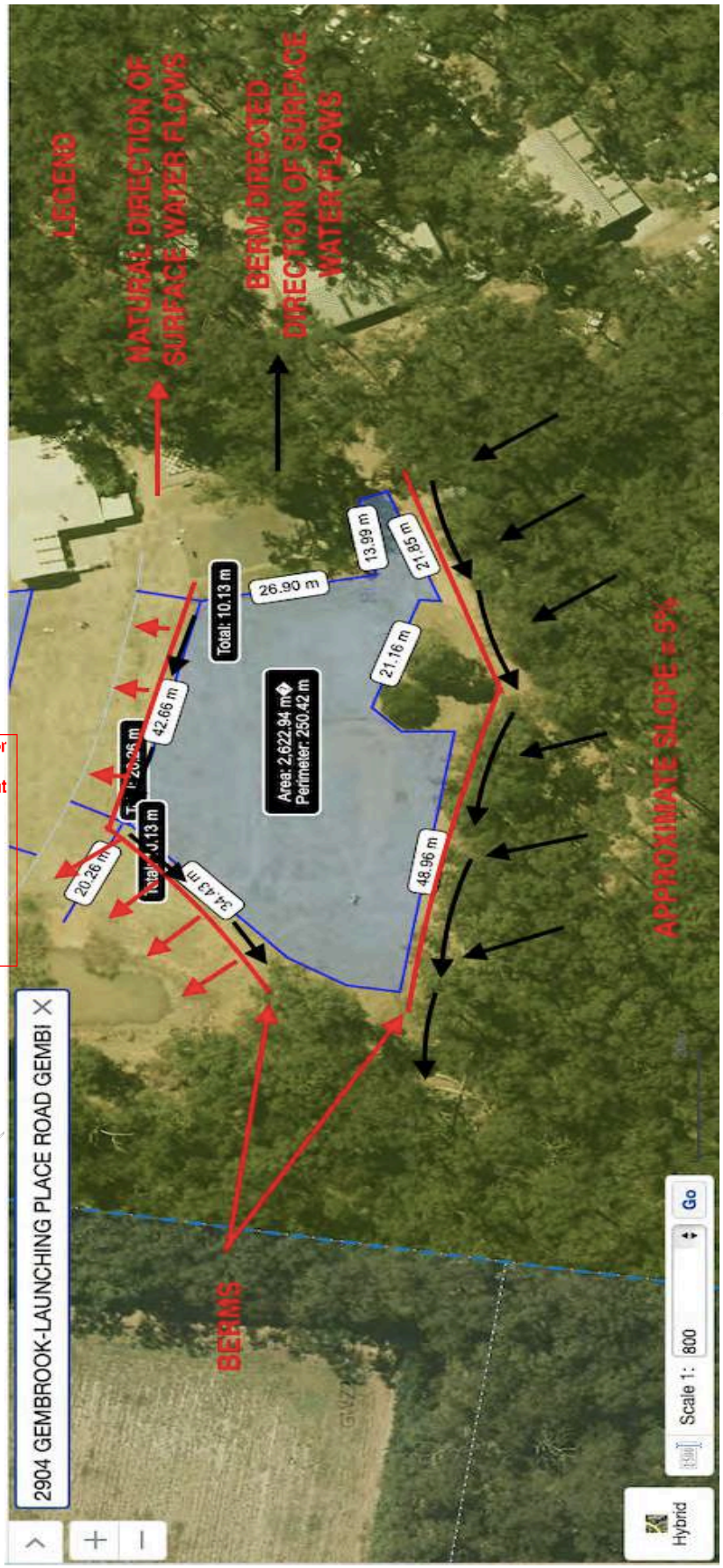
Product IDCJCM0035 Prepared at Thu 11 Jun 2020 00:39:02 AM EST

Appendix 3 Irrigation Concept Design and WTP Schematic

Proposed Irrigation Area 1 – Dimensions and Setbacks



Proposed Irrigation Area 2 – Dimensions and Setbacks



Proposed Irrigation Area Plan and Cross Section Views
Irrigation Design

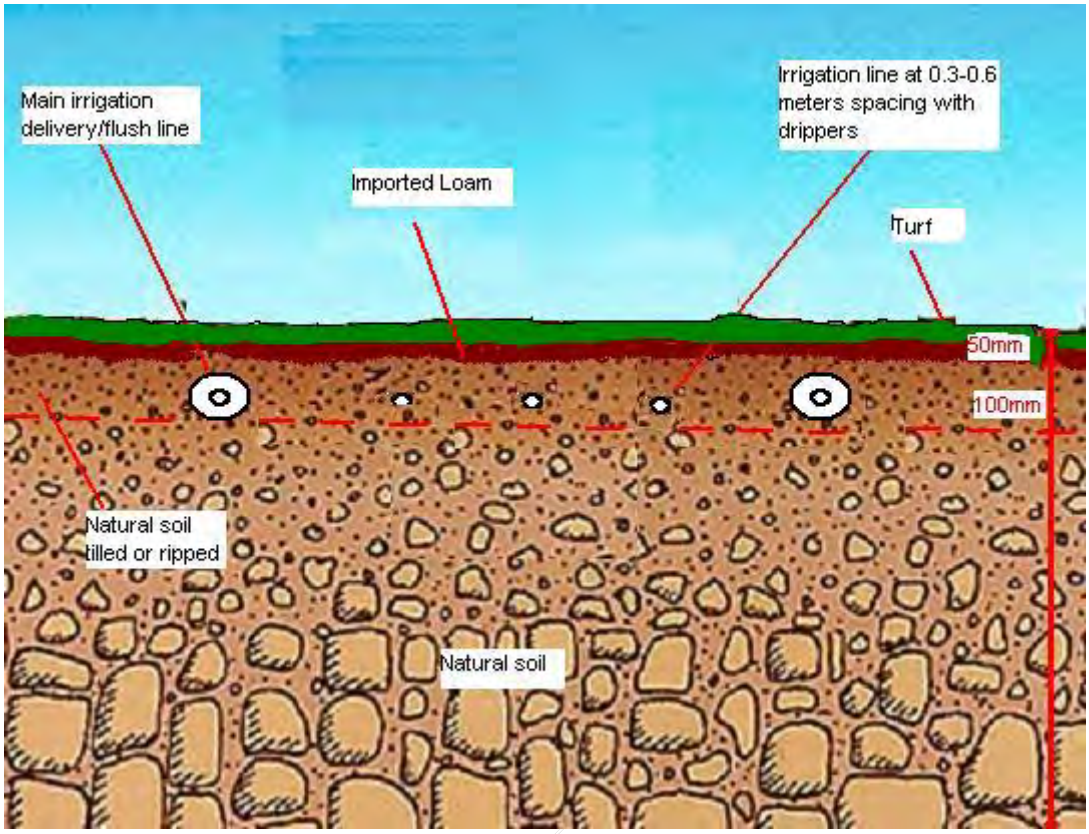


Figure 1 Irrigation cross section showing major delivery/flush lines and irrigation lines.

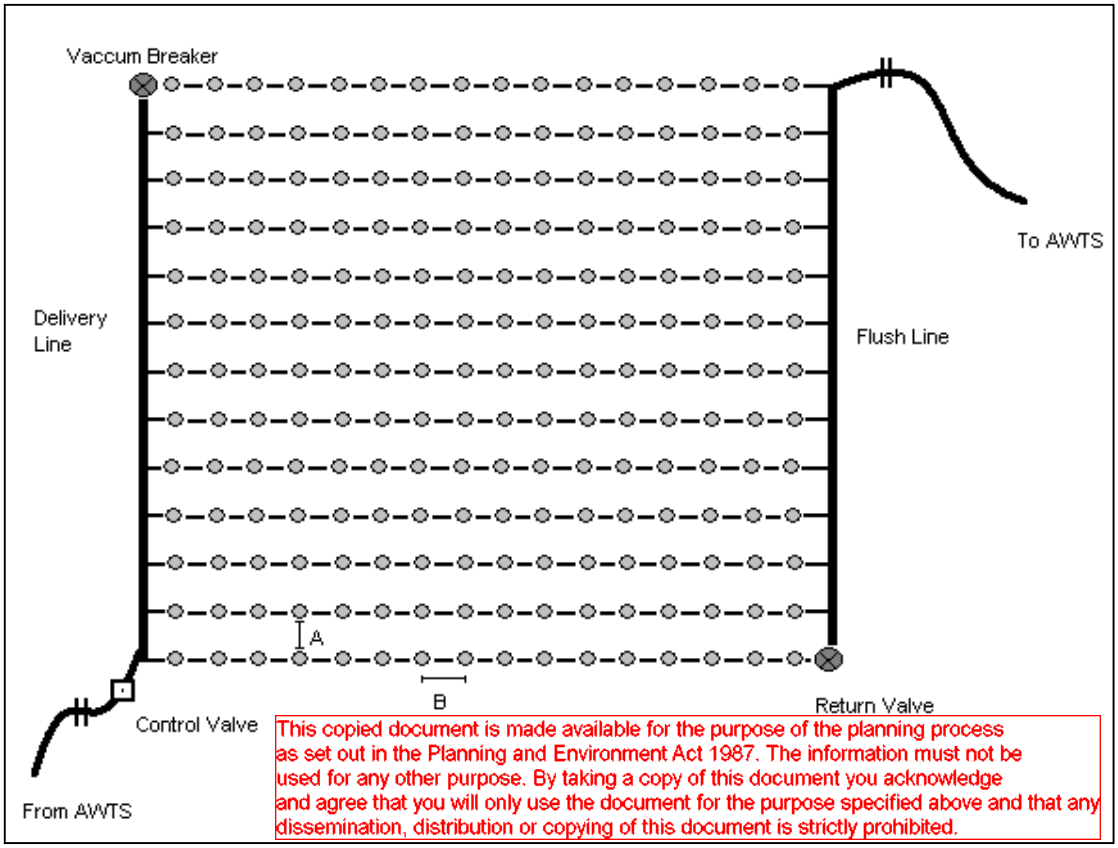


Figure 2 Irrigation Plan View

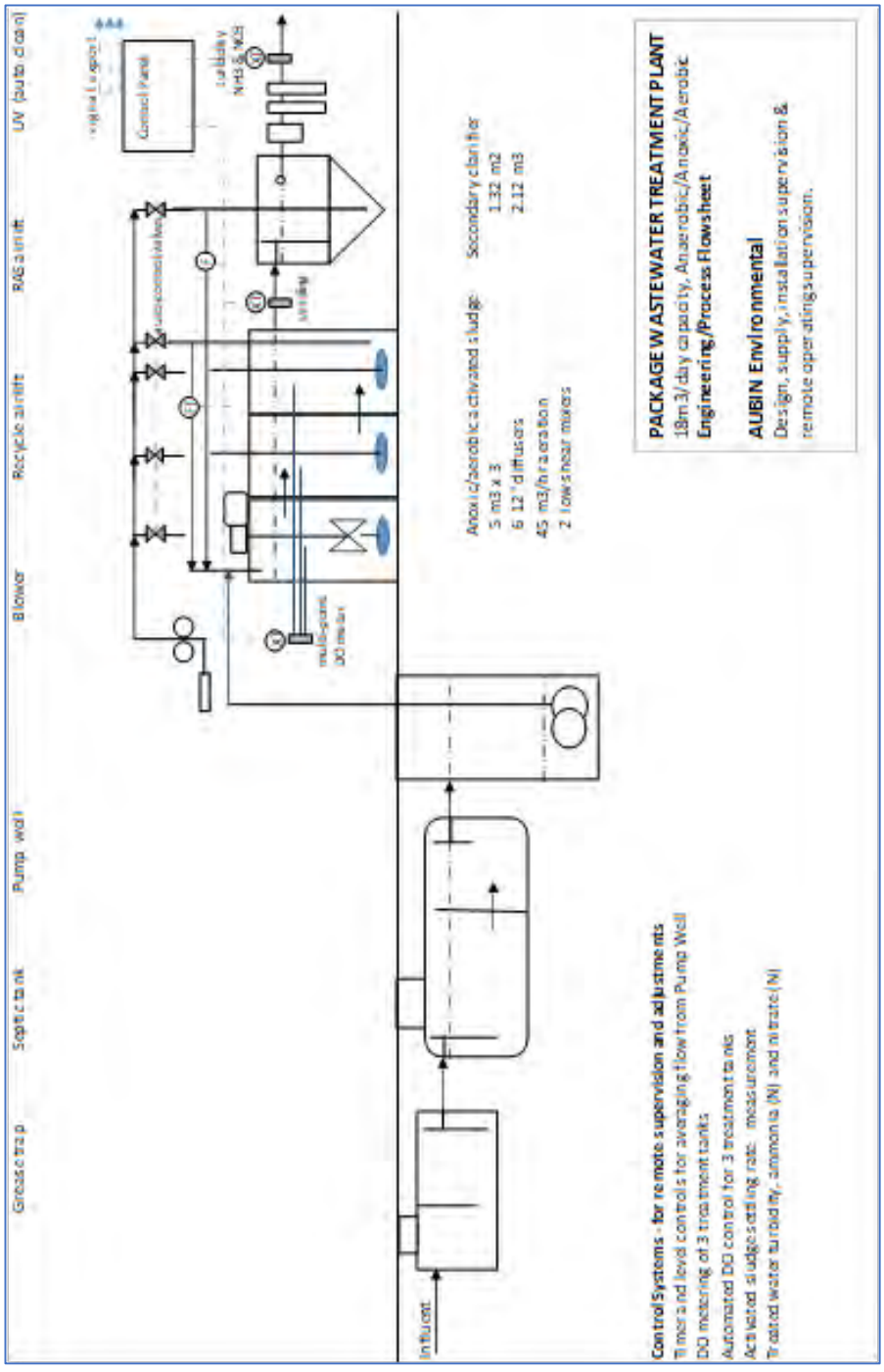
Site De-vegetation and Soil Renovation Processes (only applicable for recently de-vegetated sites) (Pre irrigation installation)

1. The land application area is located in the area contained within the bushfire buffer zone and hence will have all vegetation removed. This will alleviate the effects of the forest canopy reducing evapotranspiration rates.
2. Soils will be disturbed by site de-vegetation and removal of large trees. After de-vegetation the following steps should be taken to renovate the soil profile before irrigation is installed:
    a. Harrow and level the residual soil surface. Ensure that the ground surface is levelled along natural slope contours and that all major rocks and large roots are removed.
    b. Gypsum should be incorporated at the rate of 1kg/5m^2
    c. Imported topsoil (not clay) should be applied as shown in Fig 1 above. Do not compact this layer, and avoid travelling over with large machinery.
    d. Irrigation should be laid as per the specifications below (point 3-14) and covered with further topsoil as per Fig 1 above.
    e. Selected vegetation should be planted at a density of approx. 1 plant per 4m^2.
    f. Mulch should be placed over the site as shown in Figure 1 above.

Land Application Area Design and Construction Notes

3. Delivery/flush line diameter = 25 -30 mm
4. Irrigation line diameter = 12-16mm
5. Irrigation line spacing (A) =300 mm for Sands, Sandy Loams and Loams to 600mm for Clay Loams, Light Clays and Heavy Clays (see the wastewater flow modelling section of this report for soil classification).
6. Dripper/Sprinkler spacing (B) as per manufacturers specifications.
7. A vacuum breaker should be installed at the highest point of the irrigation area (or in the case of multiple irrigation lots at each lot). This breaker should be protected and marked).
8. A flush line should be installed at the lowest point of the irrigation area incorporating a return valve for back flushing of the system back into the treatment chamber.
9. **All lateral lines MUST be installed parallel to the contours of the land. All minimum setbacks MUST be adhered to.**
10. An inline filter must be inserted into the delivery line.
11. The first 100mm of the natural soil below the ground surface should be mechanically tilled to aid line installation and soil permeability
12. Gypsum should be incorporated at the rate of 1kg/5m^2 in dispersive soils.
13. Imported topsoil (not clay) should be applied as shown above only in areas of soil disturbance or where surface rock is evident.
14. Selected vegetation should be planted at a density of approx. 1 plant per 4m^2. Recommendation regarding suitable species is made in this report.
15. Irrigation areas greater than 400 m^2 should be split into 100 m^2 cells with effluent flows switched between irrigation lots with an automatic valve system.
16. Where practical a 50% reserve area should be identified on the site to allow movement of the irrigation area if required.
17. In areas of moderate to steep slopes (>10%) then upslope cut off drainage should be installed to minimise shallow ground water recharge of the irrigation area from upslope.
18. All livestock and Vehicles MUST be excluded from irrigation area.

WTP Schematic



Appendix 4 Extract from EPAV 2016

Code of practice – onsite wastewater management

Table 5: Setback distances for primary and secondary treatment plants and effluent disposal/irrigation areas in sewered and unsewered areas (where applicable) [1, 2, 6, 10]

Landscape feature or structure	Setback distances (m)		
	Primary sewage and greywater systems	Secondary sewage and greywater systems	Advanced secondary greywater systems [3]
Building			
Wastewater field up-slope of building [7]	6	3	3
Wastewater field down-slope of building	3	1.5	1.5
Wastewater up-slope of cutting/escarpment [12]	15	15	15
Allotment boundary			
Wastewater field up-slope of adjacent lot	6	3	1
Wastewater field down-slope of adjacent lot	3	1.5	0.5
Services			
Water supply pipe	3	1.5	1.5
Wastewater up-slope of potable supply channel	300	150	150
Wastewater field down-slope of potable supply channel	20	10	10
Gas supply pipe	3	1.5	1.5
In-ground water tank [14]	15	7.5	3
Stormwater drain	6	3	2
Recreational areas			
Children's grassed playground [15]	6	3 [16]	2 [16]
In-ground swimming pool	6	3 [16]	2 [16]
Surface waters (up-slope of:)			
Dam, lake or reservoir (potable water supply) [8, 13]	300	300 [4]	150
Waterways (potable water supply) [9, 13]	100	100 [4, 5, 17]	50
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high-tide mark; dams, reservoirs or lakes (stock and domestic, non-potable) [8, 9]	60	30	30
Groundwater bores			
Category 1 and 2a soils	NA [11]	50 [19]	20
Category 2b to 6 soils	20	20	20
Watertable			
Vertical depth from base of trench to the highest seasonal water table [18]	1.5	1.5	1.5
Vertical depth from irrigation pipes to the highest seasonal water table [18]	NA	1.5	1.5

1. Distances must be measured horizontally from the external wall of the treatment system and the boundary of the disposal/irrigation area, except for the 'Watertable' category which is measured vertically through the soil profile. For surface waters, the measuring point shall be from the 'bank-full level'.
2. Primary water-based sewerage systems must only be installed in unsewered areas; secondary sewerage systems must only be installed and managed in sewered areas by Water Corporations; secondary greywater systems can be installed in sewered and unsewered areas (see Section 3.12.3).
3. Advanced secondary greywater systems treating effluent to ≤10/10/10 standard.
4. The setback distance in a Special Water Supply Catchment area may be reduced by up to a maximum of 50% conditional on the following requirements (otherwise the setback distances for primary treatment systems apply):
   - effluent is secondary treated to 20/30 standard as a minimum
   - a maintenance and service contract, with a service technician accredited by the manufacturer, is in place to ensure the system is regularly serviced in accordance with Council Septic Tank Permit conditions and
   - Council is satisfied the reduction in set-back distance is necessary to permit the appropriate development of the site and that risks to public health and the environment are minimised.

41

Code of practice - onsite wastewater management

Appendix A:

Table 9: Soil Categories and Recommended Maximum Design Loading/Irrigation Rates (DLR/DIR) for Land Application Systems [1, 2, 3]

Soil texture	Soil structure	Soil category	Indicative permeability (Ksat) (m/d)	Design Loading Rates and Design Irrigation Rates (DLR / DIR) (mm/day)					
				Absorption trenches/beds and Wick Trench & Bed Systems 6 for primary effluent (see Table L1 in AS/NZS 1547: 2012)	(ETA) Evapo-transpiration absorption beds and trenches (see Table L1 in AS/NZS 1547: 2012)	Secondary treated effluent applied to Wick Trench & Bed System [4]	Sub-surface and surface irrigation (see Table M1 in AS/NZS 1547: 2012)	LPED (see Table M1 in AS/NZS 1547: 2012)	Mounds (basal area) (see Table M1 in AS/NZS 1547: 2012)
Gravels and sands	Structureless (massive)	1	>3.0	NA [5]	NA [5]	25	5 [5] (see Note 2 in Table M1)	NA [5]	24
Sandy loams	Weakly structured	2a	>3.0						24
	Massive	2b	1.4 - 3.0	13	15	30		4	24
Loams	High / moderate structured	3a	1.5 - 3.0	15	15	30	4 (see Note 1 in Table M1)	3.5	24
	Weakly structured or massive	3b	0.5 - 1.5	10	10	30			16
Clay loams	High / moderate structured	4a	0.5 - 1.5	10	12	30	3.5 (see Note 1 in Table M1)	3	16
	Weakly structured	4b	0.12 - 0.5	5	8	20			8
	Massive	4c	0.06 - 0.12	4	5	10			5 (see Note to Table N1)
Light clays	Strongly structured	5a	0.12 - 0.5	3	8	12	3 (see Note 1 in Table M1)	2.5 (see Note 4 in Table M1)	8
	Moderately structured	5b	0.06 - 0.12	(see Notes 2 and 3 in Table L1)	5 (see Notes 2, 3 & 5 in Table L1)	10			5 (see Note to Table N1)
	Weakly structured or massive	5c	<0.06			8			
Medium to heavy clays	Strongly structured	6a	0.06 - 0.5			6 (see Notes 2 and 3 in Table L1)	2 (see Note 2 in Table M1)	NA	
	Moderately structured	6b	<0.06						
	Weakly structured or massive	6c	<0.06						

1. Adapted from Australian Standard AS/NZS 1547: 2012 – On-site domestic wastewater management.
2. The DIR and DLR are recommended maximum application rates for treated effluent. A water balance may indicate that a reduced application rate is required for a specific site.
3. The exception is where the soil does not have a high perched or high seasonal (winter) watertable (see AS/NZS 1547).
4. See Appendix E for design, installation and maintenance details.
5. Lower application rates may be required for reduced soil permeability in sodic and dispersive soils, soils with a perched or seasonally high watertable or soils with a limiting layer.
6. The application rate may be increased in sandy soils with a high watertable where an advanced secondary treatment system with disinfection replaces a primary treatment system on an existing lot that is too small to accommodate the maximum DIR for category 1 to 2b soils.

51

Appendix 5 Permeability Test Methodology (AS1547-2012)

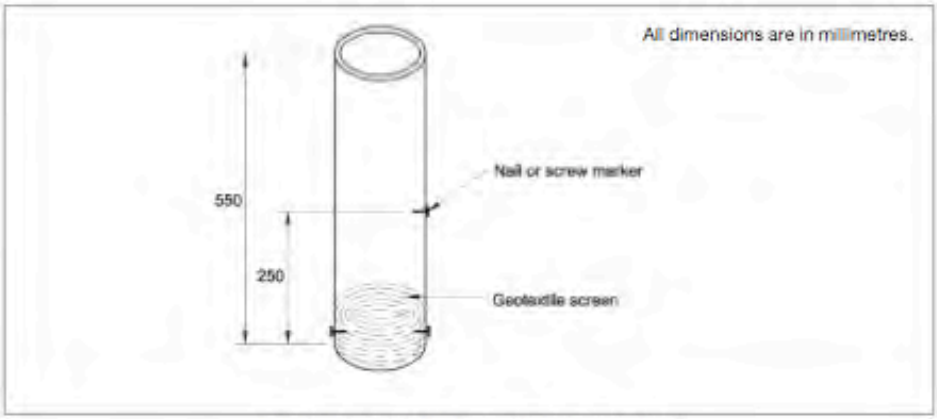


FIGURE G2 ANTI-SCOURING DEVICE

G4 TEST PROCEDURE

G4.1 Single test holes

The test method for single test holes is as follows:

(a) Excavate a cylindrical hole to the soil absorption zone using an auger;

(b) Measure the final depth of the hole. Erect the permeameter by adjusting the tripod so that the air inlet will be approximately 250 mm above the bottom of the test hole. Remove permeameter from the hole;

(c) Insert the anti-scouring device. Fill the hole to approximately 250 mm deep with water, sufficient to cover the soil absorption zone or to a level that matches the height of the invert of the delivery pipe. This is the level of water to be maintained in the test hole during testing. Remove anti-scouring device;

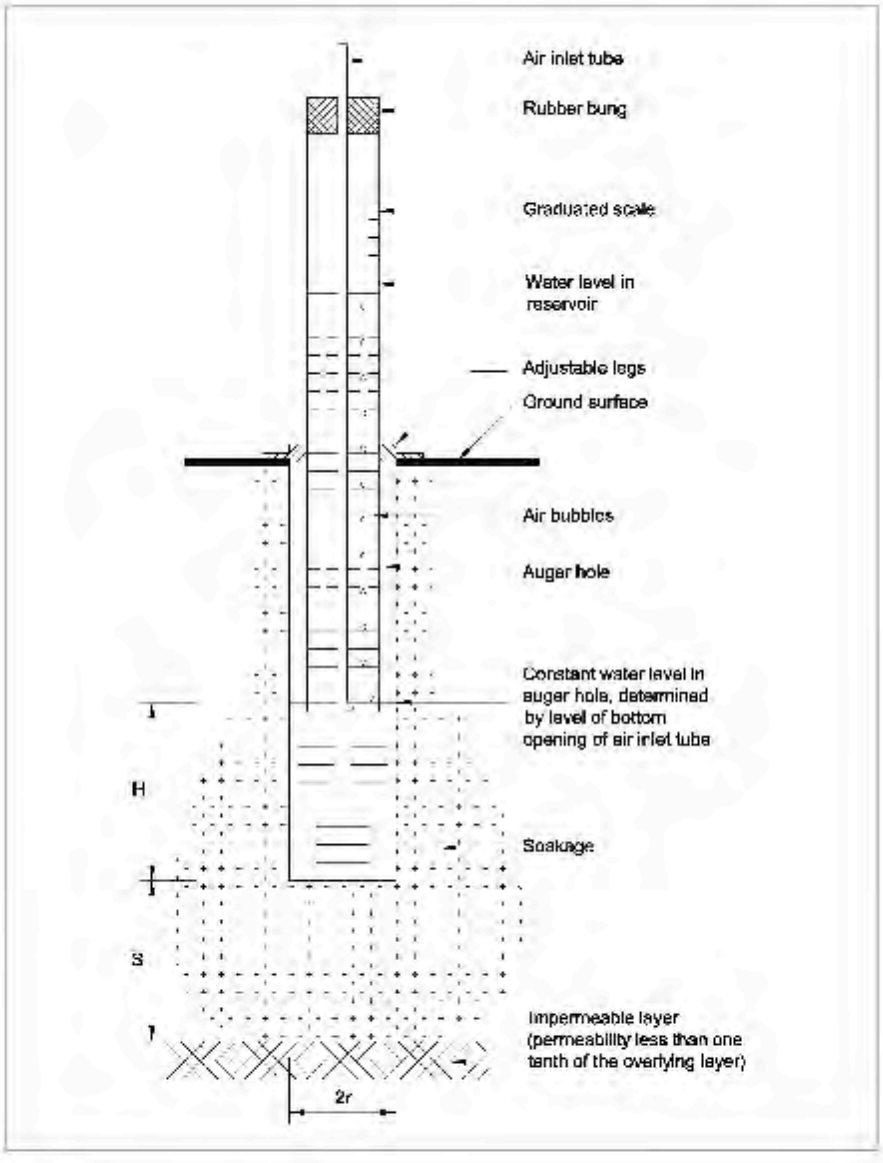
(d) Invert the permeameter and fill it with water. Temporarily close/cover the bottom end of the reservoir and turn it upright. Place the bottom of the reservoir directly over the test hole, while keeping the outlet closed. Quickly remove temporary cover and immediately lower the reservoir to rest on its stand (see (c) above) and fix in place;

(e) The suction flask is used to remove excess water from the test hole;

(f) When the water level in the hole drops sufficiently, air will enter the reservoir from the air inlet tube. Once the first air-bubble rises in the reservoir the test measurements commence;

(g) Read the level of water in the reservoir at predetermined fixed-time intervals;

(h) The drop in water level in the reservoir is recorded until it becomes 'constant' over three successive readings, that is, until the last drop of level differs by less than 10% from the preceding drop.



where:

H = depth of water in test hole

S = the depth to an underlying impermeable layer

r = radius of the test hole

FIGURE G1 PERMEAMETER ASSEMBLY

Appendix 5 Professional Indemnity Insurance Certificate of Currency

Certificate of Currency

Aon Risk Services Australia Limited
ABN 17 000 434 720 AFSL 241141

[redacted]

Dear [redacted]

In our capacity as Insurance Brokers to [redacted], we hereby certify that the under mentioned insurance policy is current.

As at Date
23 May 2019

Policy Information

Class of Insurance
Professional Indemnity

Insurer (Lead)
TASMAN UNDERWRITING PTY LTD
ABN: 76 006 090 464

Policy Number(s)
TU/PI/20130490

Expiry Date
26/05/2020

Insured
Nielsen Family Trust T/As Strata Geoscience &
Environmental Pty Ltd
[redacted]T/As Strata Geoscience and Environmental

Professional Indemnity Limits
$2,000,000 any one claim
$2,000,000 in the aggregate

Situation of Risk
Anywhere in the world except USA & Canada

Retroactive date
5th May 2010, excluding known claims and/or circumstances

Important notes

- This certificate is a summary of cover only. Please refer to the Policy Wording and Schedule for its full terms and conditions.
- Aon does not guarantee that the insurance outlined in this Certificate will continue to remain in force for the period referred to as the Policy may be cancelled or altered by either party to the contract, at any time, in accordance with the terms of the Policy and the *Insurance Contracts Act 1984 (Cth)*.
- Aon accepts no responsibility or liability to advise any party who may be relying on this Certificate of such alteration to or cancellation of the Policy.
- This Certificate does not:
  - represent an insurance contract or confer rights to the recipient; or
  - amend, extend or alter the Policy.

Contact Us

CRM	Telephone	Email	Branch
[redacted]	[redacted]		

Aon Risk Services Australia Limited | ABN 17 000 434 720 | AFSL 241141

Appendix 7 Terms and Conditions

Scope of Work
These Terms and Conditions apply to any services provided to you ("the Client") by Strata Geoscience and Environmental Pty Ltd ("Strata"). By continuing to instruct Strata to act after receiving the Terms and Conditions or by using this report and its findings for design and/or permit application processes and not objecting to any of the Terms and Conditions the Client agrees to be bound by these Terms and Conditions, and any other terms and conditions supplied by Strata from time to time at Strata's sole and absolute discretion. The scope of the services provided to the Client by Strata is limited to the services and specified purpose agreed between Strata and the Client and set out in the correspondence to which this document is enclosed or annexed ("the Services"). Strata does not purport to advise beyond the Services.

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The Services are supplied to the Client for the sole benefit of the Client and must not be relied upon by any person or entity other than the Client. Strata is not responsible or liable to any third party. All parties other than the Client are advised to seek their own advice before proceeding with any course of action.

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The Client is responsible for the provision of all legal, survey and other particulars concerning the site on which Strata is providing the Services, including particulars of existing structures and services and features for the site and for adjoining sites and structures. The Client is also responsible for the provision of specialised services not provided by Strata. If Strata obtains these particulars or specialised services on the instruction of the Client, Strata does so as agent of the Client and at the Client's expense. Strata is not obliged to confirm the accuracy and completeness of information supplied by the Client or any third party service provider. The Client is responsible for the accuracy and completeness of all particulars or services provided by the Client or obtained on the Client's behalf. Strata is not liable, and accepts no responsibility, for any claim, demand, charge, loss, damage, injury or expense whatsoever suffered by the Client or any other person or entity resulting from the failure of the Client or third party to provide accurate and complete information. In the event additional information becomes available to the Client, the Client must inform Strata in writing of that information as soon as possible. Further advice will be provided at the Client's cost. Any report is prepared on the assumption that the instructions and information supplied to Strata has been provided in good faith and is all of the information relevant to the provision of the Services by Strata. Strata is not liable, and accepts no responsibility, for any claim, demand, charge, loss, damage, injury or expense whatsoever if Strata has been supplied with insufficient, incorrect, incomplete, false or misleading information.

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While all reasonable care is taken in reporting to the Client, Strata does not warrant that the information contained in any report is free from errors or omissions. Strata is not liable, and accepts no responsibility, for any claim, demand, charge, loss, damage, injury or expense whatsoever resulting from errors in a report. Any report should be read in its entirety, inclusive of any summary and annexures.. Strata does not accept any responsibility where part of any report is relied upon without reference to the full report. Latter versions of any report invalidate any recommendations, assumptions, or designs contained in former reports. Strata is not liable, and accepts no responsibility, for any claim, demand, charge, loss, damage, injury or expense whatsoever based upon the use of older versions of any report.

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Any report provided by Strata will be prepared on the basis of unique project development plans which apply only to the site that is being investigated. Reports provided by Strata do not apply to any project other than that originally specified by the Client to Strata. The Report must not be used or relied upon if any changes to the project are made. The Client should engage Strata to further advise on the effect of any change to the project. Further advice will be provided at the Client's cost. Strata is not liable, and accepts no responsibility, for any claim, demand, charge, loss, damage, injury or expense whatsoever where any change to the project is made without obtaining a further written report from Strata. Changes to the project may include, but are not limited to, changes to the investigated site or neighbouring sites, for instance, variation of the location of proposed building envelopes/footprints, changes to building design which may impact upon sewage treatment plant system design, specification and performance.

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Strata is not responsible for the interpretation of site data or report findings by other parties, including parties involved in the design and construction process. The Client must seek advice from Strata about the interpretation of the site data or report.

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Where sewage treatment plant and/or application system designs are provided by Strata, reasonable effort will be made to minimise environmental, public health and commercial risks associated with the disposal of effluent within site boundaries with respect to relevant Australian guidelines and industry best practise at the time of investigation. Strata is not liable, and accepts no responsibility, for any claim, demand, charge, loss, damage, injury or expense whatsoever resulting from:

(i) changes to either the project or site conditions that affect the onsite wastewater land application system's ability to safely dispose of modelled wastewater flows; or
(ii) changes to original use of site infrastructure or changes from original modelled loadings as a result of change of use or incorrect loading information supplied by the client: or
(iii) seepage, pollution or contamination or the cost of removing, nullifying or clearing up seepage, polluting or contaminating substances; or
(iv) poor system performance where septic tanks have not been de-sludged at maximum intervals of 3 years or sewage treatment plants have not been serviced in compliance with the manufacturers recommendations; or
(v) system /component failure of any recommended system/component; or

(vi) poor contractor construction/installation practice; or
(vii) Inferior product/component selection by installing contractor ; or
(viii) any treatment plant , treatment plant component or land application area breakdown of any kind; or
(ix) failure of the client to commission both interim and final inspections by the designer throughout the system construction; or
(x) the selection of inappropriate plants for irrigation areas or any increased cost associated with upkeep of recommended plants or their replacement; or
(xi) damage to any infrastructure by seepage/effluent including but not limited to foundations, walls, driveways and pavements; or
(xii) land instability, soil erosion or dispersion caused by seepage/effluent or the installation of sewage plant infrastructure; or
(xiii) Excavation difficulties given hard rock, watertables, collapsing soils or other difficult conditions; or
(xiv) Dammages to underground services via excavation or system installation; or
(xv) design changes requested by the Permit Authority;or
(xvi) time delays associated with any of the above, or to strata or any of its representatives being able to mobilise to site for any reason.

Furthermore Strata does not guarantee septic trench, bed or mound design life beyond 2 years from installation,. Strata does not warrant EPA sand filter designs.

Strata does not consider site contamination, unless the Client specifically instructs Strata to consider the site contamination in writing. If a request is made by the Client to consider site contamination, Strata will provide additional terms and conditions that will apply to the engagement.

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ALL DETAILS IN THIS DOCUMENT ARE COMEMRCIAL IN CONFIDENCE
AND ARE NOT INTENDED FOR PUBLIC DISEMINATION.

ACTIVATED SLUDGE SEWAGE TREATMENT PLANT

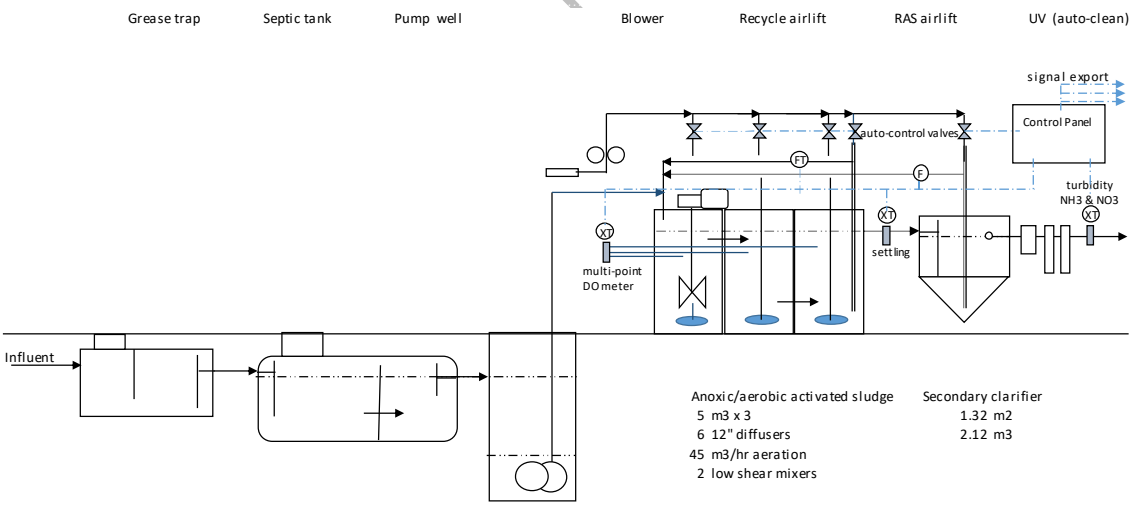
This package plant is designed and manufactured in Melbourne, Australia by AUBIN Environmental.

The overall process schematic is shown in Figure 1 and the detail drawing of the active treatment phases that are built into a shipping container along with all mechanics and controls (secondary treatment, denitrification, clarification and disinfection) are shown in Figure 2.

The process is based on classic activated sludge sewage treatment and is augmented with dynamically controlled recirculation loops, computerised process controls and continuous monitoring of key performance indicators.

The unit proposed has nominal maximum capacity limits shown in Table 1. Minimum retention times through the various treatment phases are shown in Table 2 for this particular site, based on peak predicted daily loading. The 99th%ile and average demand on site will be significantly lower than this and so it's expected that the extended aeration retention times will also achieve digestion of excess sludge, reducing sludge removal volumes.

The design includes anoxic denitrification.



Control Systems - for remote supervision and adjustments
Timer and level controls for averaging flow from Pump Well
DO metering of 3 treatment tanks
Automated DO control for 3 treatment tanks
Activated sludge settling rate - measurement
Treated water turbidity, ammonia (N) and nitrate (N)

PACKAGE WASTEWATER TREATMENT PLANT
18m3/day capacity, Anaerobic/Anoxic/Aerobic
Engineering/Process Flowsheet

AUBIN Environmental
Design, supply, installation supervision & remote operating supervision.

FIGURE 1: Process schematic

AUBIN Environmental
(Combined Separation Systems Pty Ltd)
4 / 32 Onslow Avenue, Campbellfield, VIC
ABN: 55 154 344 260

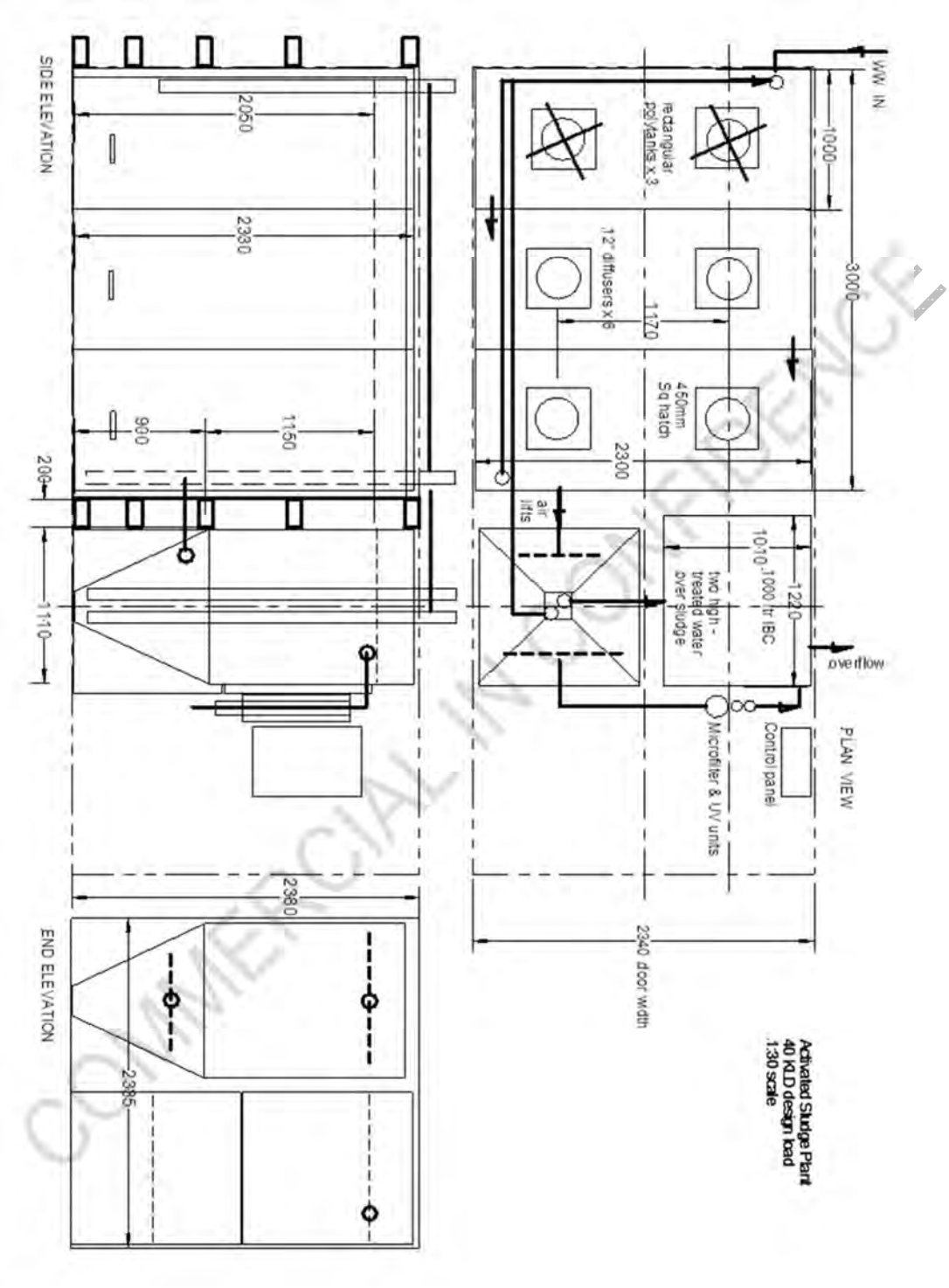


FIGURE 2: Containerised multi-stage secondary treatment module

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TABLE 1: Capacity of 20 foot treatment package

System Capacity		
Hydraulic	20	kL/day
BOD	18.9	kg/day
Ammonia	30	kg/day (as N)

TABLE 2: Secondary treatment phases and *site-specific* retention times

DESIGN BASIS				
Peak daily loading	20	kL/day		
Peak loading, average hourly	0.83	kL/hour		
	Overall dimensions	**Denitrification**	**Aerobic**	**Calrifier**
Length (m)	4	1	2	1
Width (m)	2.3	2.1	2.1	2.1
Depth (m)	2	2.1	2.1	2
Volume (m3)	18	4.4	8.82	4.2
Hours retention		**5**	**11**	**5**

TABLE 2: TARGET EFFLUENT QUALITY

Class C (based on Table 1, EPA Publication 464.2)

Parameter	Upper limit
E.coli	1000 org/100ml
pH	6 – 9
BOD	20 mg/L
Suspended solids	30 mg/L

Note that this system also includes high efficiency de-nitrification and dosing can be added for phosphorous removal as required.

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ABN: 55 154 344 260

DISINFECTION

Disinfection is achieved using ultra violet irradiation. Ultra violet radiation is proven to be highly effective at deactivating sewage bacteria.

The UV system is generously sized to provide excess UV intensity, and the continuous online monitoring systems enable us to ensure that the treated effluent is sufficiently treated and clarified to be effectively susceptible to UV penetration.

UV system includes nightly chemical clean (CIP) and periodic manual clean.

ONLINE MONITORING SYSTEM

The process plant is operated by PLC that is connected to the internet using mobile broadband.

The built in monitoring system includes

- Sludge settling (visual analysis of mixed liquor using automatic HD video camera) – daily
- Dissolved oxygen – continuous, multiple locations within the anoxic / aerobic phases
- Ammonia – automated daily snapshot
- Nitrates – automated daily snapshot
- Pump operation – inlet pump and filtrate transfer pump (flow rate sensors)

These parameters have been selected to facilitate remote access to all data required by engineers to assess and optimise performance, particularly in response to daily, weekly and seasonal fluctuations in demand and loadings.

The online monitoring system is for technical support and to facilitate our engineers to optimise plant performance and efficiency. This monitoring is not intended to replace water quality monitoring conducted by a 3rd party laboratory to demonstrate compliance.

12 MONTH OPTIMISATION PROGRAM

Every commercial site has a unique demand profile that fluctuates on a daily, weekly and seasonal basis, and setting a treatment plant up to match and accommodate these fluctuations is as important and influential on the effluent quality as the technology selection and design.

It is for this reason that AUBIN Environmental include 12 months of observation and optimisation with every treatment plant, and continue to provide support beyond this setup period.

The built in monitoring and remote controls provide our engineers with all information and access required to understand and adjust operational protocols to optimise performance, and avoid breakdown of biological performance.

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GREENHOSE GAS ASSESSMENT

The aerated stage of treatment is driven by electrically powered air blower (roots blower). The blower is fitted with both variable speed drive and timer controls, and so consumption will be a proportion of motor capacity.

On this site we expect that the VSD will nominally be adjusted to 50% during aeration phase and 10% during non-aeration phase, during which the only air demand is to drive the small air lifts for the various recirculation loops within the plant.

Actual blower operation will be adjusted according to results from the continuous monitoring hydraulic throughput and dissolved oxygen demand, which will eliminate consumption of excess electricity during off-peak demand.

Recirculation of mixed liquor (RAS) is driven by and air lift drive by the primary roots blower. At times when only the air lifts are in operation (no water aeration) power draw will be minimal.

Sundry items include PLC with micro-computer (5V) and internet access, and auto-sampling system that includes 24V water diaphragm pumps for sample and clean operations. These are very small and infrequent power consumers and their contribution is negligible.

The below consumption is representative of the worst case scenario – the busiest day of the year. All other days will be lower than shown in this table.

TABLE 3: Greenhouse Gas assessment

BASED ON THE SINGLE BIGGEST HYDRAULIC LOAD OF THE YEAR ACTUAL CONSUMPTION WILL BE LOWER

GREEN HOUSE ASESSMENT	kW	Hrs/day	kWh / year	kg CO2/kWh	kg CO2/year
Balance tank metering pump	0.37	0.007	0.9	1.09	0.98
Airlift Blower (continuous)	0.19	20	1387	1.09	1512
Blower during aeration (intermittent, on demand)	0.38	12	1664.4	1.09	1814
UV	0.08	24	700.8	1.09	764
				TOTAL	**4091**

Tree Designs Australia Pty Ltd
Phone: 0400 645 606
Email: matt@treedesigns.com.au
Web: www.treedesigns.com.au
A.B.N. 53 6419 72 885

31 January, 2022

Arborist Report

Preliminary Site Survey

Lot 3 Beenak Rd, Gembrook

Prepared For

Halls Outdoor Education
03 5968 1739
anthonyh@hallsoutdoored.com.au

Version – 1.0

Prepared By – Tree Designs Australia Pty Ltd

[redacted]

Qualified Arborist - Cert IV/Diploma Horticulture/ Arboriculture (Melbourne University)

Summary of Conclusions/Recommendations:

Below is a dot point summery of the findings of this report. All data used to come to these conclusions is shown in the report below.

- BAL Assessments report shows conditions to be met in order to build the proposed extension. These include 2m canopy separation of all trees within 25m to the east and 32m in all other directions. This is the Inner Fuel Management Zone.
- Trees have been assessed and grouped into 10 groups. Each group will be separated from the others by either pruning or removal to achieve the 2m canopy separation.
- All ground cover will be removed up to 50m as per the Outer Fuel Management Zone conditions.
- All low branches will be uplifted to 2m and no branches will overhang or touch any buildings as per both the Inner and Outer Fuel Management Zone requirements.
- A fire break will be established across the NE side of the forest at the edge of the Outer Fuel Management Zone.

Contents

1. Introduction

Tree Designs Australia Pty Ltd was briefed to inspect and report on a large number of trees located at Lot 3 Beenak Rd, Gembrook for Halls Outdoor Education. This report is in response to the conditions outlined in the report written by John Burke, BAL Assessments, dated 1 September 2021. The report is titled "Bushfire Management Overlay Assessment: Gembrook-Launching Place Rd 2904, Gembrook"
The Bushfire Management Overlay Assessment (BMOA) report asks for the following summarised conditions, in relation only to defendable space and tree management, to be meet: (All conditions for defendable space are shown in section 6.1. of this report)

INNER FUEL MANAGAMENT ZONE – Defendable space to a distance of 25m to the east and 32m in all other directions around the building.

- Separation of tree canopies by 2m.
- Trees are not to overhang or touch any elements of the buildings.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

OUTER FUEL MANAGEMENT ZONE – Defendable space to a distance of 50m to the east and south around the building.

- There must be clearance of at least 2m between the lowest branches and ground level.

This report aims to provide a basic survey of the trees located on site within the Inner fuel management zone and the outer fuel management zone of the proposed new building.
The report will focus on how to achieve the conditions relating to tree management set by BAL Assessments in terms of bushfire management and canopy separation for the planning and construction of additional bunkhouse rooms for the camp.

This report will provide the following key objectives:

- Identify and record some basic dimensions of the various trees situated within the inner and outer fuel management zone areas surrounding the new building.
- Number and label each tree and identify the species and list the DBH of each tree.
- Provide recommendations for managing the trees, including removal or pruning, to achieve the canopy separations outlined within the BMOA report.

2. Methodology

An inspection of the trees on the property took place on 8/12/2021 from the ground only. An aerial inspection did not take place. Photos were also taken of the site.

Data collected for each tree includes the following:

- Botanical Name
- Common Name
- Diameter at Breast Height (DBH)
- Notes/Works Required

The descriptions of each of these can be seen in Appendix 1 of this report.

Each tree has also been tagged with metal tags showing its corresponding number on the western side of the tree at approximately 2m from ground level.

3. Data Collected

The following table shows all the data collected on the trees.

Tree Number	DBH in cm	Botanical Name	Common Name	Comments/Works Required
1	35	Eucalyptus obliqua	Messmate	
2	90	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 2 by 2m
3	35	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 1 by 2m
4	40	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 3 by 2m
5	65	Eucalyptus muelleriana	Yellow Stringybark	
6	35	Eucalyptus muelleriana	Yellow Stringybark	
7	40	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 4 by 2m
8	40	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
9	20	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
10	35	Eucalyptus muelleriana	Yellow Stringybark	
11	60	Eucalyptus muelleriana	Yellow Stringybark	
12	60	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 2 by 2m
13	35	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 2 by 2m
14	35	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 2 by 2m
15	40	Eucalyptus muelleriana	Yellow Stringybark	
16	40	Eucalyptus muelleriana	Yellow Stringybark	
17	40	Eucalyptus muelleriana	Yellow Stringybark	
18	45	Eucalyptus muelleriana	Yellow Stringybark	
19	25	Eucalyptus muelleriana	Yellow Stringybark	
20	50	Eucalyptus muelleriana	Yellow Stringybark	
21	50	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 3 by 2m
22	20	Eucalyptus radiata	Narrow leaved Peppermint	
23	35	Eucalyptus muelleriana	Yellow Stringybark	
24	20	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 3 by 2m
25	50	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 3 by 2m
26	60	Eucalyptus muelleriana	Yellow Stringybark	
27	40	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 5 by 2m

Tree Number	DBH in cm	Botanical Name	Common Name	Comments/Works Required
28	35	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 5 by 2m
29	30	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 5 by 2m
30	25	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 4 by 2m
31	45	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 4 by 2m
32	45	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
33	35	Eucalyptus radiata	Narrow leaved Peppermint	
34	25	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
35	75	Eucalyptus muelleriana	Yellow Stringybark	
36	65	Eucalyptus muelleriana	Yellow Stringybark	
37	45	Eucalyptus muelleriana	Yellow Stringybark	
38	40	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 6 by 2m
39	60	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 6 by 2m
40	35	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 6 by 2m
41	50	Eucalyptus muelleriana	Yellow Stringybark	
42	60	Eucalyptus muelleriana	Yellow Stringybark	
43	45	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
44	60	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 5 by 2m
45	50	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
46	35	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
47	70	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
48	55	Eucalyptus muelleriana	Yellow Stringybark	
49	70	Eucalyptus muelleriana	Yellow Stringybark	
50	60	Eucalyptus muelleriana	Yellow Stringybark	
51	70	Eucalyptus muelleriana	Yellow Stringybark	
52	30	Eucalyptus radiata	Narrow leaved Peppermint	
53	65	Eucalyptus muelleriana	Yellow Stringybark	Bifurcated trunk
54	65	Eucalyptus muelleriana	Yellow Stringybark	
55	45	Eucalyptus muelleriana	Yellow Stringybark	
56	35	Eucalyptus muelleriana	Yellow Stringybark	

Tree Number	DBH in cm	Botanical Name	Common Name	Comments/Works Required
57	95	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 6 by 2m. Bifurcated trunk
58	75	Eucalyptus muelleriana	Yellow Stringybark	Prune to separate canopy from tree group 7 by 2m
59	65	Eucalyptus radiata	Narrow leaved Peppermint	Prune to separate canopy from tree group 9 by 2m
60	65	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
61	60	Eucalyptus muelleriana	Yellow Stringybark	
62	80	Eucalyptus muelleriana	Yellow Stringybark	Separate canopy from tree group 8
63	20	Eucalyptus radiata	Narrow leaved Peppermint	
64	35	Eucalyptus radiata	Narrow leaved Peppermint	
65	45	Eucalyptus muelleriana	Yellow Stringybark	
66	45	Eucalyptus muelleriana	Yellow Stringybark	
67	40	Eucalyptus muelleriana	Yellow Stringybark	
68	55	Eucalyptus muelleriana	Yellow Stringybark	
69	30	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
70	20	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
71	55	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
72	60	Eucalyptus muelleriana	Yellow Stringybark	
73	60	Eucalyptus muelleriana	Yellow Stringybark	
74	25	Eucalyptus muelleriana	Yellow Stringybark	
75	45	Eucalyptus muelleriana	Yellow Stringybark	
76	55	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
77	75	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
78	40	Eucalyptus muelleriana	Yellow Stringybark	
79	20	Eucalyptus radiata	Narrow leaved Peppermint	Remove tree
80	35	Eucalyptus muelleriana	Yellow Stringybark	Remove tree
81	45	Eucalyptus muelleriana	Yellow Stringybark	

Table 3.1. All data collected.

4. Observations/Discussion

4.1. Defendable Space Requirements

The Bushfire Management Overlay Assessment conducted by BAL Assessments included the all the following conditions that must be met relating to defendable space management taken directly from page 30 of the report.

1. Defendable Space

1.1 Inner Fuel Management Zone

Defendable space *to a distance of 25m to the east and 32m in all other directions around the building* is provided and is managed in accordance with the following requirements:

• Grass must be short cropped and maintained during the declared fire danger period.

• All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.

• Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.

• Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.

• Shrubs must not be located under the canopy of trees.

• Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.

• Trees must not overhang or touch any elements of the building.

• The canopy of trees must be separated by at least 5 2 metres.

• There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

1.2 Outer Fuel Management Zone

Defendable space *to a distance of 50m to the east and south around the building* is provided and is managed in accordance with the following requirements:

• Grass must be short cropped and maintained during the declared fire danger period.

• All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.

• Shrubs must not be located under the canopy of trees.

• Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.

• There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Figure 4.1. Text taken from BMOA report showing conditions to be meet for defendable space tree management.

In terms of tree management, the following information from above is applicable:

INNER FUEL MANAGAMENT ZONE – Defendable space to a distance of 25m to the east and 32m in all other directions around the building.

- Separation of tree canopies by 2m.
- Trees are not to overhang or touch any elements of the buildings.

- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

OUTER FUEL MANAGEMENT ZONE – Defendable space to a distance of 50m to the east and south around the building.

- There must be clearance of at least 2m between the lowest branches and ground level.

This report will only cover the requirement to separate canopies of trees and how this can be achieved.

4.2. Defendable Space Requirements in Relation to Buildings

The following image, also taken from BAL Assessments report shows the areas that will need to be managed according to the conditions outlined in figure 4.1.

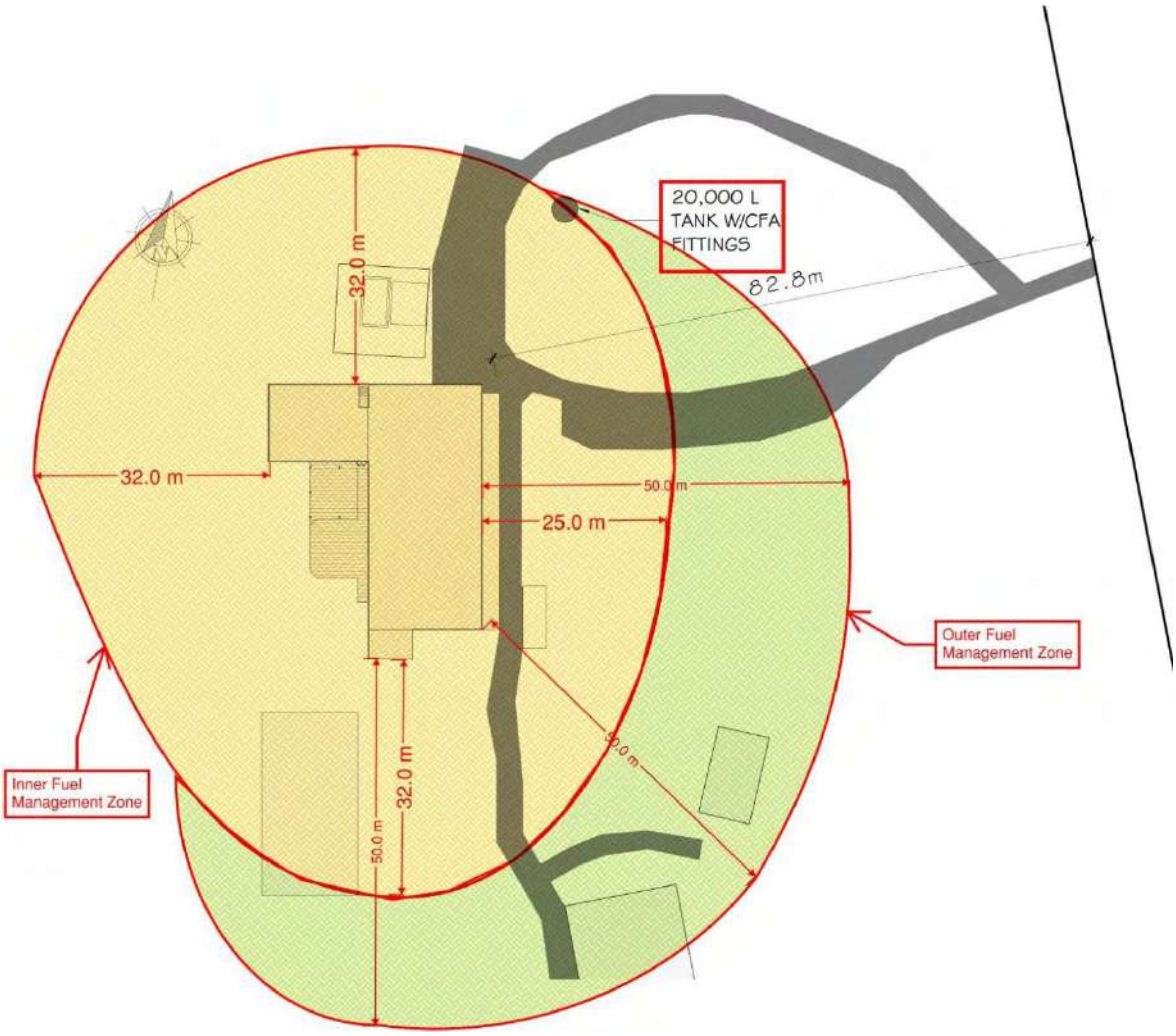


Figure 4.2. Both Inner Fuel Management Zone and Outer Fuel Management Zone.

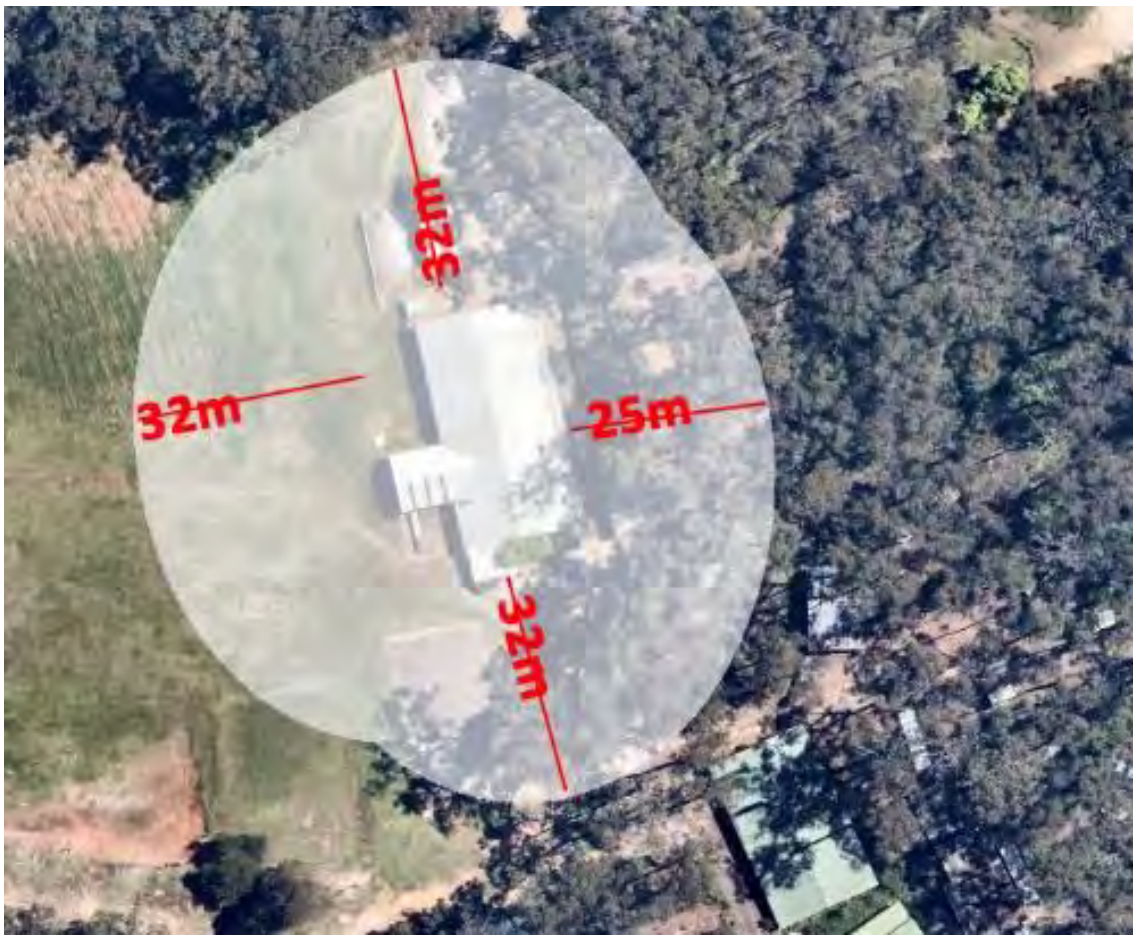


Figure 4.3. Arial image showing the just the Inner Fuel Management Zone measured and plotted using near maps.

4.3. Site Map with Tree Numbers

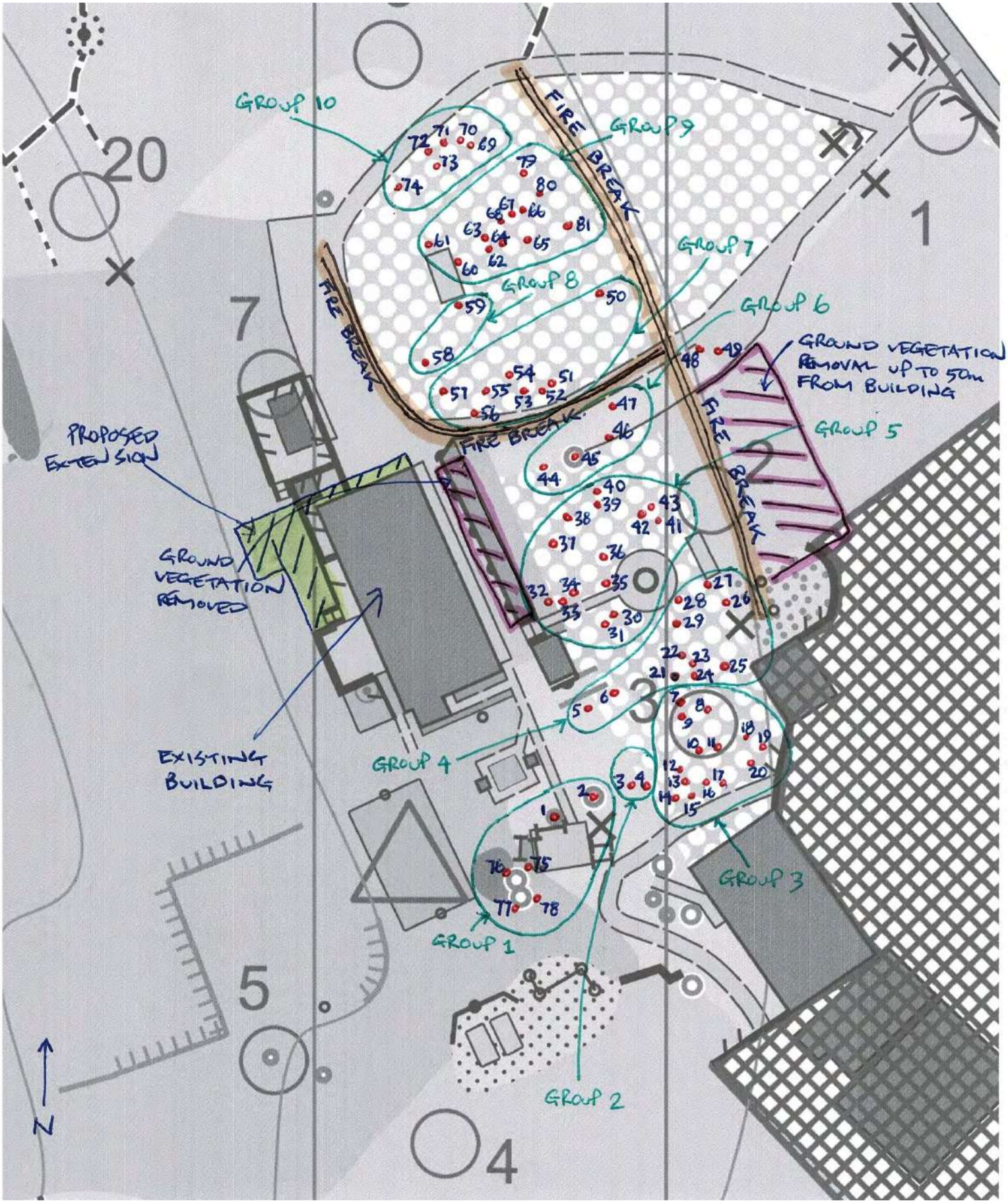


Figure 4.4. Site map with tree numbers, tree groups, location of proposed extension & existing building, and fire breaks. This map is taken from a scaled map created for the camp for a rogaine activity. It is scaled to 1:1500 when printed on A3.

4.4. Photos of the Site

Figure 4.5. Front (NE) side of existing building. All ground cover to be removed.

Figure 4.6. Location of fire break to the east at the edge of the 50m zone.

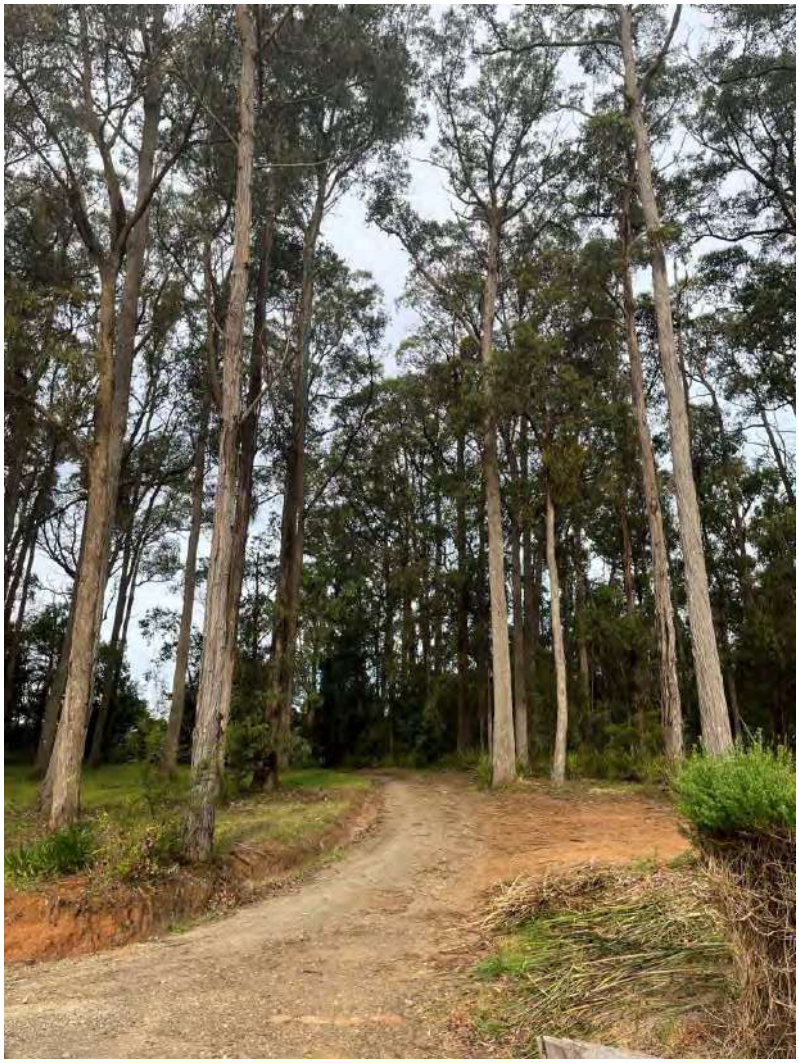


Figure 4.7. Road that will act as a fire break once removals and pruning is undertaken.

Figure 4.8. Looking over the area of trees towards north from group 2

Figure 4.9. The existing building north corner.

4.4. Separation of Canopies within the Inner Fuel Management Zone

With the conditions outlined there will need to be separation of tree canopies within the Inner Fuel Management Zone by 2m. To achieve this without removing the majority of the trees we have created small groups of trees with canopy separation or fire breaks in between. This will result in some tree removal and some canopy separation pruning. In order to achieve the conditions set we have surveyed all the trees within the area shown in figure 4.2, both inner and outer fuel zones. Expanding the area of canopy separation required from only inner to both inner and outer fuel management zones, allows us to achieve the conditions set with less tree removal. This is achieved by taking advantage of natural already present fire breaks and also creating our own fire breaks. See figures 4.6 and 4.7. From the assessment we have chosen trees with poor health and/or structure to be removed and taken advantage of already clear areas. For example the internal property roads. The fire breaks are clearly shown in figure 4.4.

4.5. Tree Groups and Fire Breaks

To achieve the conditions set, the trees have been placed in groups as can be seen in figure 4.4. The trees were grouped while assessing trees for removal and pruning. From the assessments clear fire breaks were made between each group, often with larger canopy separation then the 2m required. To completely separate the forest from the buildings a further measure was taken by creating one long fire break across the north east side as can be seen in figure 4.4. The ground cover up to 50m from the building will also be removed right across this area as is required. See figure 4.5.
Each tree group will need to be isolated from adjoining groups by a minimum of 2m canopy separation. Trees have been marked for removal and others to have the canopy pruned as can be seen in table 3.1. Each tree has been numbered and tagged to avoid confusion.

4.6. Further requirements for Defendable Space

As outlined in figure 4.1., along with 2m canopy separation between trees there are also further requirements. These include shrub removal below the canopy of the trees. The camp has committed to slashing the grass and shrubs below to achieve this.
The trees must not overhang or touch any of the buildings. This condition has already been met with maintenance pruning as part of their schedule.
There must be a clearance of at least 2 metres between the lowest tree branches and ground level. This condition has also been met by consistent maintenance pruning and the natural growth habit of the trees on site. The trees average a height of 35m with majority of the trees only having branches in the up most canopy.

5. Conclusions and Recommendations

In order to achieve the conditions set by BAL Assessments, there will need to be pruning for separation of the canopies to 2m as requested. The areas to be pruned and the trees to be removed are all out lined in table 3.1.
All work required to achieve the objectives of this report, should be completed by a qualified arborist as to Australian standards AS4373-1996 - Pruning of Amenity Trees. This is important to maintain the health of the trees in the natural forest environment. Not only for the camp to continue being able to educate the kids on good forest management but also to preserve a rare patch of relatively untouched forest area that surrounds the camp.
With the strategies of grouping trees described in this report there will be successful fire breaks formed, resulting in less tree removal preserving the natural forest that surrounds the camp and makes it unique.

It is also recommended that any future development works are supervised by a qualified arborist and follow Australian standards, AS4970-2009 - Protection of Trees on Development Sites.

6. Arboriculture Terminology

The following arboriculture terminology may have been used in the descriptions:

Adventitious roots – roots that have developed in locations that do not usually produce roots e.g. growing in the union between trunks.
Bifurcation – the forking of a trunk into two roughly equal sized stems. The union between the two stems is often relatively weak.
Bracket Fungi – the fruiting body of a wood decay fungus usually seen as a semi-circular 'bracket' on a trunk or branch. The presence of a bracket fungi often indicates extensive decay in the underlying wood.
Branch Collar - A swelling at the base of a branch where it joins the trunk or another branch. Wood that has formed around a branch attachment.
Callus – wood tissue growth in the response to pruning or damage to the cambium layer
Cambium – The cellular layer beneath the bark that gives rise to tree nutrients.
Co-dominant trunks – two roughly equal sized trunks arising from a single trunk when it bifurcates. The union between co-dominant trunks is often weak.
Coppice - *Regrowth* from a cut tree *stump* or the base of a damaged stem
Crown – The leaves and branches of the tree measured from the lowest branches to the uppermost section of the tree.
Critical Root Zone (CRZ) – is the minimum radial distance from the trunk where extensive root severance can occur without the tree becoming potentially unstable and prone to uprooting.
Decay – The degradation of woody tissue.
Delamination – longitudinal splitting of branches. Branches that delaminate often fail over a period of time.
Dieback – The loss of foliage and life of a limb generally spreading from the tip to the base of the branch.
Epicormic branch/shoot – a branch that has arisen from a dormant (i.e. epicormic) bud in response to severe pruning (lopping), branch failure, tree decline or fire. Epicormic branches can often be poorly attached.
Flange development – the flange-like swelling on either side of a branch or trunk union. It indicates the presence of included bark within the union and hence a relatively weak union.
Fungal fruiting body/ bracket fungi – the fruiting body of a wood decay fungus usually seen as a semi-circular 'bracket' on a trunk or branch. The presence of a fungal fruiting body often indicates extensive decay in the underlying wood.
Included bark – bark that is included within the branch or trunk union. Unions with included bark are weaker than those without included bark.
Kino – a dark reddish exudate produced by many corymbias and eucalypts, often in response to injury.
Lopping – indiscriminate pruning of large branches with no regard for the physiological or aesthetic wellbeing of the tree.
Leader – The topmost portion of the tree trunk that is able to grow more than the laterals below. (Matheny and Clark, 1994)
Picus – A measuring tool that detects and electronically measures the amount of decay in it's various stages. The Sonic Tomograph obtains data in a non-invasive or destructive manner, and produces detailed information in a computerised form.

Pollard heads – the distorted, 'club-like' branches resulting from the heavy pruning of framework branches followed by regular removal of new shoots back to the original pruning point.
Sap wood – The outer layers of woody tissue that are functional in terms of translocation.
Stub – A branch that has been indiscriminately cut back near the base leaving no foliage present.
Translocation – The conduction of soluble materials from one part of the plant to another.
Tree Protection Zone (TPZ) – the radial distance from the trunk outside which any construction related activity should have no impact on the tree's health and vigour. Construction is excluded from this zone or carefully controlled to minimize damage to the root system.
ULE (Useful Life Expectancy) – an estimate of the time that a tree can be retained as a useful specimen without it becoming unsafe or dying. The ULE is determined from the assessment of the health and vigour and structure of the tree.
Weight reduction – pruning technique used to reduce the length and weight of a branch. It is commonly used to reduce the likelihood of the failure of long extended branches.
Wound-wood formation – wood that has grown around a trunk or branch wound after the wounding has taken place. In some cases wound-wood can completely cover a wound. Structurally it is typically stronger than normal wood.

7. Reference Material

AS 4373, 2007, Australian Standard, Pruning Amenity Trees, 2nd Edition Standards Australia

AS 4970, 2009, Australian Standard, Protection of Trees on Development Sites, Standards Australia

Near Maps 2021

Costermons, L. 1983, Native Trees and Shrubs of South-Eastern Australia, Reed New Holand, 2003

Nicolle, D 2006, Eucalypts of Victoria and Tasmania, Bloomings Books, 2006

Appendix 1 – Data Collection Definitions

The following data was collected for each tree, based on the collectors experience and opinion of each of the trees.

1.1. Identification

The tree is identified in the most current Latin botanical name and common name.

1.2. Diameter at Breast Height (DBH)

Diameter at Breast Height – measured at 1.3 metres above ground level. Stated in cm.
Appendix A of AS4970 is used as a standard for determining odd trunk shapes and multiple trunks.

1.3. Comments/Works Required

Any comments on the trees health or structure, key attributes, location etc are mentioned.
Any works required for either canopy separation, uplifting or removal.

2904 Gembrook-Launching Place Rd
Gembrook
Lot 3 PS401903
Cardinia
Council Property Numbers:
2321301700
Melway 299 A4

CUMBRE

ECOLOGICAL ASSESSMENT

2 April 2024

[redacted]
Principal
Cumbre Consulting P/L

cumbre.com.au

CONTENTS

1 INTRODUCTION

1.1 Project Background

Cumbre Consulting was commissioned by Halls Outdoor Education to assess the environmental value of vegetation at 2904 Gembrook-Launching Place Rd Gembrook (Lot 3 PS401903) for management of vegetation in regard to defendable space around a proposed extension to the current development. See Figure 1 Location of Study Area, and Figure 2A Proposed development design and Figure 2B Tree designs- trees numbered for management.

Figure 1: Location of Study Area.

Figure 2A: Proposed development design

4.3. Site Map with Tree Numbers

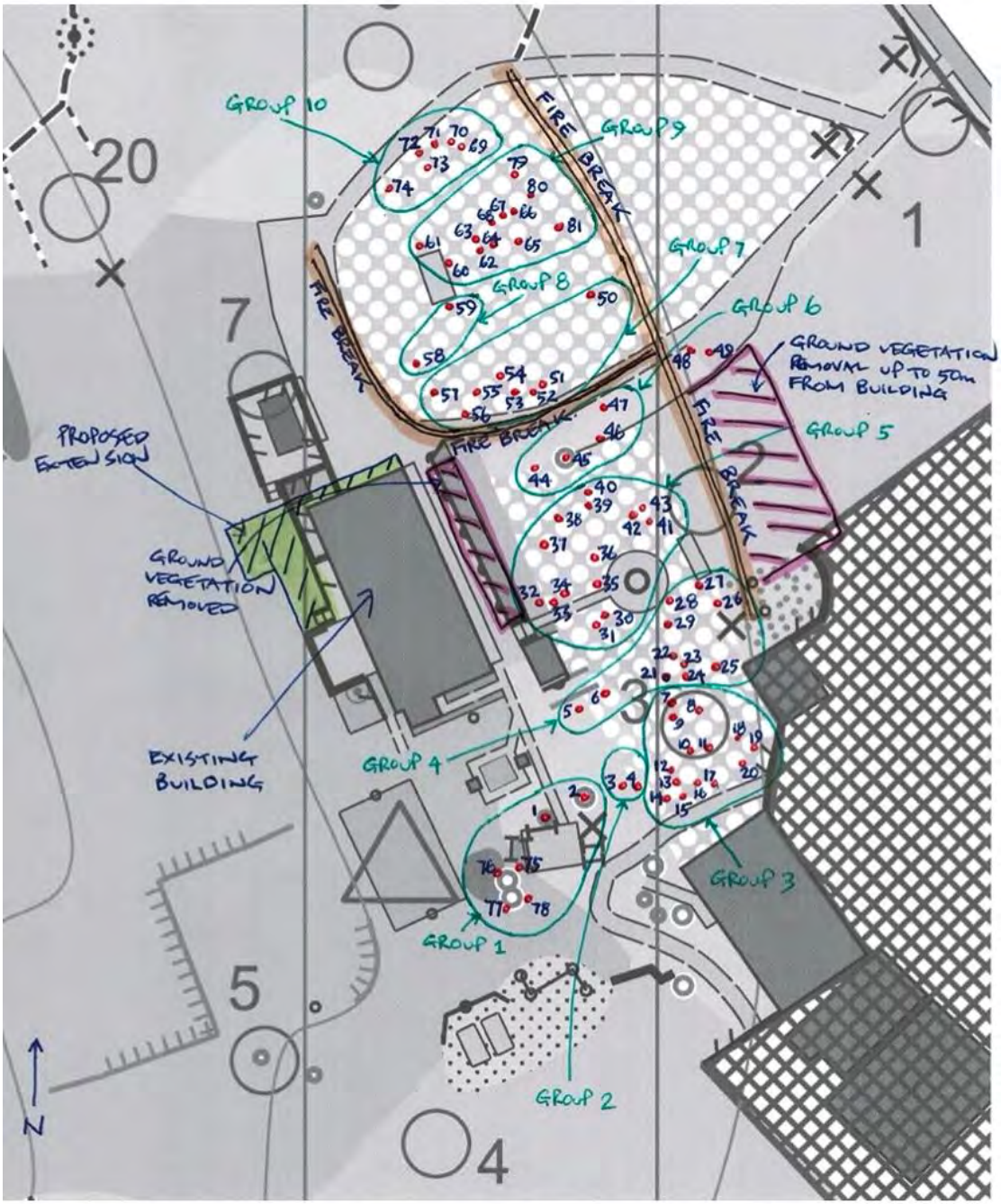


Figure 4.4. Site map with tree numbers, tree groups, location of proposed extension & existing building, and fire breaks. This map is taken from a scaled map created for the camp for a rogaine activity. It is scaled to 1:1500 when printed on A3.

Figure 2B: Tree Designs Site map – trees numbered for management[1].

[1] Tree Designs Australia Pty Ltd 2022. Arborist Report. Preliminary Site Survey. Lot 3 Beenak Rd Gembrook.

1.2 Objectives

The objectives of this assessment are:

- Assess the conservation significance of the habitat
- Map the extent, type, and condition of the native vegetation
- Assess potential impacts of the proposed development on ecological values
- Consider measures that could avoid or reduce any impacts
- Assess and quantify measures to offset impacts and achieve a Net Gain

1.3 Study Area

The property is located at 2904 Gembrook-Launching Place Rd Gembrook within the municipality of the Cardinia Shire Council. The land is zoned Rural Conservation Zone (RCZ) Schedule 2 (RCZ2).The following Planning Scheme Overlays pertain to this project:

Table 1 Planning Scheme Overlays

Clause Number	Name	Associated Schedules
42.01	Environmental Significance Overlay (ESO)	Schedule 1 (ESO1)
44.06	Bushfire Management Overlay (BMO)	

The property falls into the Highlands – Southern Fall Bioregion and Port Phillip and Westernport Catchment Management Authority (CMA). The Department of Energy, Environment, and Climate Action (DEECA) and Planning (DEECA) Native Vegetation Regulation Map (NVR map)[2] list the 1750 Ecological Vegetation Classes (EVC's) as: 45 Shrubby Foothill Forest. See Figure 3 Ecological Vegetation Class Map.

2 DESCRIPTION OF METHODS

2.1 Field Survey

The EVC was identified using state-wide EVC mapping and then ground truthed on 13 March 2024. The study area was traversed by foot. Records were taken of all indigenous vascular plant species. Native vegetation areas were recorded and mapped.

2.2 Defining and Assessing Vegetation

Native vegetation in Victoria has been defined by DELWP as belonging to two categories. These are:

REMNANT PATCH

A remnant patch of native vegetation is either:

- any area of vegetation where at least 25 per cent of the total perennial understorey plant cover is native
- any area with three or more native canopy trees where the dripline of at least one other tree, forming a continuous canopy, or

[2] DEECA 2023. Native vegetation Regulation Map (NVR Map) sourced at https://www.environment.vic.gov.au/native-vegetation/NVRMap

- any mapped wetland included in the Current wetlands map, available in DELWP systems and tools.

SCATTERED TREE

A scattered tree is:

- a native canopy tree that does not form part of a remnant patch. [3]

HABITAT HECTARE

Habitat hectare (Vegetation Quality Assessment) is a site-based measure that combines extent and condition of native vegetation. The current condition of native vegetation is assessed against a benchmark for its Ecological Vegetation Class (EVC). EVCs are classifications of native vegetation types. The benchmark for an EVC describes the attributes of the vegetation type in its mature natural state, which reflects the pre- settlement circumstances. The condition score of native vegetation at a site can be determined through undertaking a habitat hectare assessment.
The habitat hectare assessment takes the following features into account: large trees; tree canopy cover; under-storey; cover of weeds; regeneration; organic litter; logs (condition score); patch size; neighbourhood; distance to core area (viability score)
The habitat hectares of native vegetation are calculated by multiplying the current condition of the vegetation (condition score) by the extent of native vegetation.

2.3 Special Considerations

The survey was done in March 2024 after a very December & January. This site is not limited by rainfall. The site is very modified around the current developments. There is not considered to be any significant limitations to this study.

3 FLORA

The following Ecological Vegetation Classes (EVC) from the Highlands-Southern Fall bioregion were identified in this study using the DEECA Native Vegetation Regulation Map and field assessment (See Figure 3):

3.1 Pre-European Settlement – 1750 Map of Highlands-Southern Fall EVCs Present in Study Area

3.1.1 Ecological Vegetation Class: 16 Lowland Forest

Eucalypt forest to 25m on relatively fertile, moderately well-drained soils in areas of relatively high rainfall. Characterised by the diversity of life forms and species in the understorey including a range of shrubs, grasses and herbs.

3.1.2 Ecological Vegetation Class: 29 Damp Forest

Grows on a wide range of geologies on well-developed generally colluvial soils on a variety of aspects, from sea level to montane elevations. Dominated by tall eucalypt tree layer to 30m tall over a medium to tall dense shrub layer of broad-leaved species typical of wet forest mixed with elements from dry forest types. The ground layer includes herbs

[3] DELWP 2017. Guidelines for the removal, destruction or lopping of native vegetation
https://www.environment.vic.gov.au/native-vegetation/native-vegetation

and grasses as well as a variety of moisture-dependent ferns including occasional tree ferns.

3.1.3 Ecological Vegetation Class: 45 Shrubby Foothill Forest

Occurs on ridges and mainly on southern and eastern slopes in association with Damp Forest or Wet Forest on moderately fertile soils and at a range of elevations. The overstorey is medium eucalypt forest to 25m tall over an understorey characterised by a distinctive middle strata dominated by a diversity of narrow-leaved shrubs and a paucity of ferns, graminoids and herbs in the ground stratum.

Figure 4: Pre-1750 Ecological Vegetation Class(es) modelled for the study area.

LEGEND

Colour Key	EVC No.	Name	Bioregion	Status
	16	Lowland Forest	Highlands-Southern Fall	Least Concern
	29	Damp Forest	Highlands-Southern Fall	Least Concern
	45	Shrubby Foothill Forest	Highlands-Southern Fall	Least Concern

4 FAUNA

No threatened fauna surveys were conducted, and none threated fauna were recorded through field work as part of this study.

5 RESULTS

5.1 Habitat Hectare Calculations and Quantification of Losses in Patches of Native Vegetation

Three patches (P) of vegetation were assessed as part of this proposal. See Figure 4 for the assessed zones and results Appendix 1, Native vegetation removal (NVR) report. The following table depicts; Habitat Hectare Calculations, size in hectares and distribution of large trees (if present) for quantification of losses of the patches identified. See Table 2 below.

Table 2 Habitat Hectare Calculations

Habitat Site (Patch)			1	2	3
Site & Habitat Zone			1A	2A	3A
EVC Name (initials)			SFF	SFF	SFF
EVC Number			45	45	45
		Max Score	Score	Score	Score
Site Condition	Large Old Trees	10	10	0	0
	Tree Canopy Cover	5	5	0	5
	Lack of Weeds	25	13	6	9
	Understory	15	5	5	5
	Recruitment	10	1	0	0
	Organic Litter	5	5	5	5
	Logs	5	0	0	0
Landscape value	Patch Size	10	8	8	8
	Neighbourhood	10	4	4	4
	Distance to Core	5	4	4	4
Habitat points out of 100		100	55	32	40
Habitat Score (hab points/100)		0.##	0.55	0.32	0.4
Site size Ha			0.0208	0.0131	0.0096
Large Trees			1	0	0
Percentage of loss (%)			100	100	100

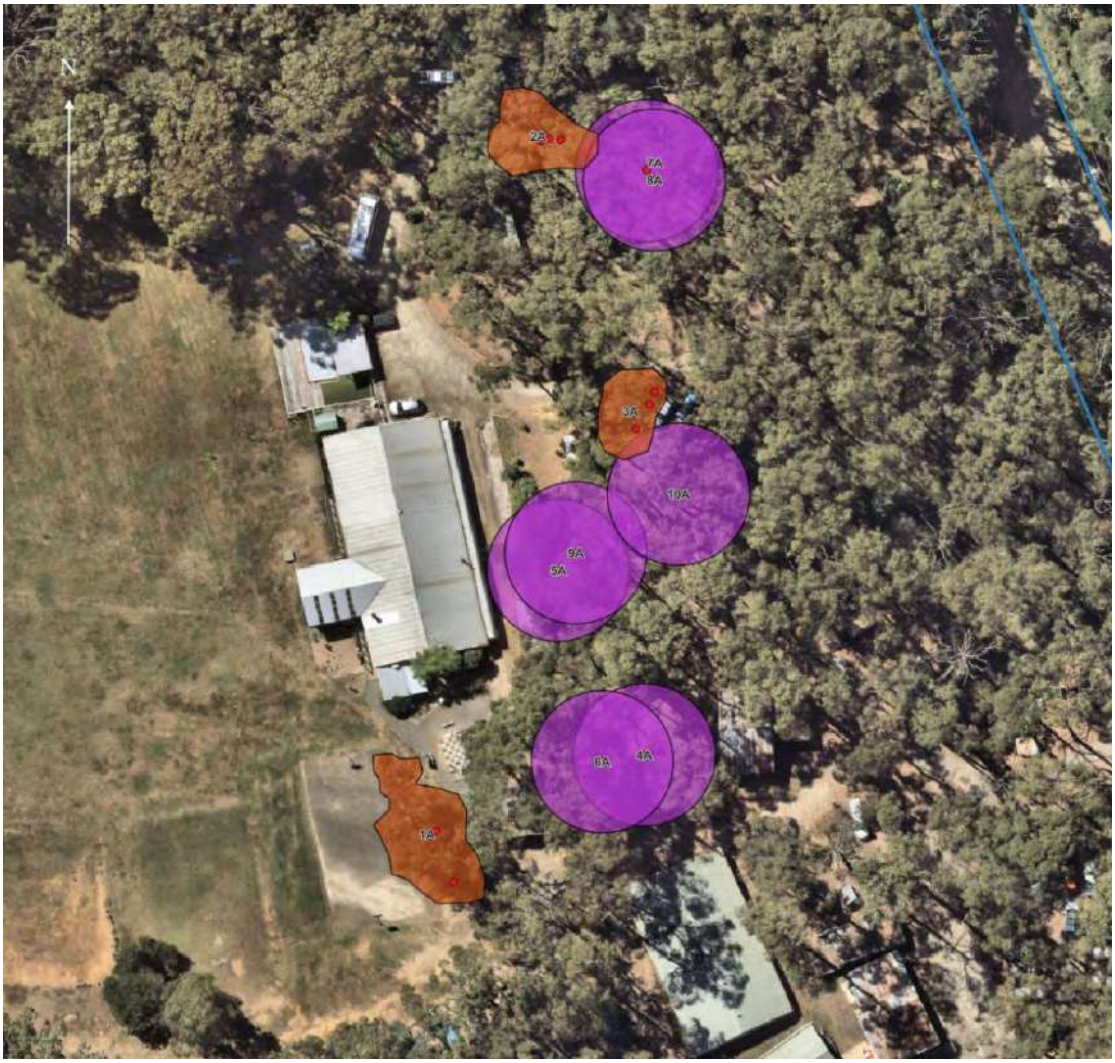


Figure 4: Assessed area (Orange marks the patches impacted, Purple marks the scattered/canopy trees impacted, red dots mark the location of trees in patches and as scattered trees located by GPS).

See full size at this link
https://www.dropbox.com/scl/fo/oa709m1iuwv3xoo4xwdrp/h?rlkey=uutpogp32nkwlmr740kct1gla&dl=0

5.2 Description of the native vegetation to be removed

The indigenous overstorey species on site consists of:

- *Eucalyptus muelleriana*, Yellow Stringybark
- *Eucalyptus obliqua*, Messmate
- *Eucalyptus radiata*, Narrow-leaf Peppermint

The large tree benchmark for EVC 45 Shrubby Foothill Forest is ≥70cm Diameter at Breast Height (DBH).
There are 8 large trees located in the defendable space see Tree Designs 2023 report[4]. One large tree is impacted within this assessment to manage vegetation in the defendable space. See Table 4 for a description of each tree considered impacted for defendable space management.
See Appendix 2 for photos of the vegetation impacted.

[4] Tree Designs Australia Pty Ltd 2022. Arborist Report. Preliminary Site Survey. Lot 3 Beenak Rd Gembrook.

Table 4 Trees assessed for removal as per Tree Designs 2022 report.

Tree No.	Arborist Tree No.	Common name	Species	DBH (CM)	TPZ (M)	Impacted zone	Hollows	Photo
1	8	Yellow Stringybark	*Eucalyptus muelleriana*	40	4.8	ST 4A	No	1
2	9	Narrow Leaved Peppermint	*Eucalyptus radiata*	20	2.4	ST 6A	No	1
3	32	Yellow Stringybark	*Eucalyptus muelleriana*	45	5.4	ST 5A	No	2
4	34	Yellow Stringybark	*Eucalyptus muelleriana*	25	3.0	ST 9A	No	2
5	43	Yellow Stringybark	*Eucalyptus muelleriana*	45	5.4	ST 10A	No	3
6	45	Yellow Stringybark	*Eucalyptus muelleriana*	50	6.0	Patch 3A	No	4
7	46	Narrow Leaved Peppermint	*Eucalyptus radiata*	35	4.2	Patch 3A	No	4
8	47	Yellow Stringybark	*Eucalyptus muelleriana*	68	8.16	Patch 3A	No	4
9	60	Yellow Stringybark	*Eucalyptus muelleriana*	65	-	Storm damage not present	No	5
10	69	Yellow Stringybark	*Eucalyptus muelleriana*	30	3.6	Patch 2A	No	6
11	70	Narrow Leaved Peppermint	*Eucalyptus radiata*	20	2.4	Patch 2A	No	6
12	71	Yellow Stringybark	*Eucalyptus muelleriana*	55	6.6	Patch 2A	No	6
13	76	Yellow Stringybark	*Eucalyptus muelleriana*	55	6.6	Patch 1A	No	7
14	77	Yellow Stringybark	*Eucalyptus muelleriana*	77	9.24	Patch 1A	No	7
15	79	Yellow Stringybark	*Eucalyptus muelleriana*	20	2.4	ST 7A	No	8
16	80	Narrow Leaved Peppermint	*Eucalyptus radiata*	35	4.2	ST 8A	No	8

5.3 Quantification of Losses for Scattered/Canopy Trees

There are seven scattered trees in this assessment, none are large: See Table 4 for a description of each tree and Figure 4 for their location.

5.4 Vegetation not included in the assessment

- *Planted natives and exotic trees were not included in this assessment.* There are some planted natives and exotics located around the existing buildings.
- *Areas with < 25 % native vegetation.* The understorey is modified with in most of the defendable space around the buildings.
- *Regrowth: Native vegetation that is to be removed, destroyed, or lopped that has naturally established or regenerated on land lawfully cleared of native vegetation and is less than 10 years old.* There was no overstorey considered less than 5 years of age. There is no vegetation considered exempt from this category.

- *Dead Tree < 40cm Diameter at Breast Height (DBH) - at 1.3m above ground level*. There were no trees in this category.

5.5 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) applies to sites where proposed developments of projects may have a significant impact on matters of National Environmental Significance (NES). There are currently four categories/ matters of National Environmental Significance pertaining to this proposal:

- Wetlands of International Importance (Ramsar): 1 - Western port
- Listed Threatened Ecological Communities: 1
- Listed Threatened Species: 44
- Listed Migratory Species: 11

5. 5.1 Ecological Communities:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The vegetation within the study area dis not of this community and does not meet the thresholds to be considered a listed ecological community.

5.5.2 Threatened Species (Flora & Fauna)

A desktop assessment identified 10 threatened flora, 34 threatened fauna species and 11 listed migratory species listed under the EPBC Act that may occur within the study area.
The site assessment, however, confirmed that it is unlikely that any EPBC Act listed flora or fauna species regularly occur within the study area or have significant habitat within the study area that is impacted in this assessment.

The study area is very modified. The impact is small (1.86ha) See Appendix 1 Native vegetation removal report where it states, "Removal of less than 0.5ha in this location will not have a significant impact on any habitat for a rare or threatened species and is not applicable in the Intermediate pathway". Map 1 to Schedule 1 to Clause 42.01 (ESO1) Appendix 4, shows that this study area is not located in a zone of botanical or zoological significance.

Based on the above, the proposed development and removal of vegetation does not trigger a permit requirement under the relevant requirements of the EPBC Act.

5.6 Flora and Fauna Guarantee Act 1988 (Victoria)

5.6.1 Threatened flora

A search of the Victorian Biodiversity Atlas (VBA) shows Nineteen species of flora listed as threatened under the FFG Act 1988 are recorded within a 5km radius of the study area. Nine of these species are considered present or (less than or equal) $\leq 20\ years\ old$.

However, the FFG Act does not apply to listed threatened flora species occurring on private land, unless the land is listed as critical habitat, which this site is not.

5.6.2 Threatened fauna

A search of the Victorian Biodiversity Atlas (VBA) shows twenty-eight species of fauna listed as threatened under the FFG Act 1988 are recorded within a 5km radius of the study area. Thirteen of these species is $\leq 20\ years\ old$.

However, the FFG Act does not apply to listed threatened flora species occurring on private land, unless the land is listed as critical habitat, which this site is not.

Most of these species are unlikely to occur due to the modification/absence of suitable habitats.

5.6.3 Protected Flora

In addition, the FFG Act also lists 'Protected Flora'. Protected flora includes whole families or genera, not just plant species, such as daisies, heaths, orchids, and most acacias. These species and genera are not necessarily regarded as threatened but require an approved 'protected flora licence/permit' from DELWP prior to their removal from public land.

There is no impact to crown land in this assessment.

6 IMPLICATION FOR DEVELOPMENT

6.1 Avoiding Impacts on Native Vegetation and Defendable Space

The minimal amount of native vegetation is to be removed in this proposal by the CFA allowing the Bushfire management Plan to group trees within the eastern zone of the defendable space for management.

Achieving defendable space is the reason for this application.

6.2 Minimising Impacts on Native Vegetation

The arborist has assessed all the trees in the inner and outer zones of the bushfire management plan and determined the better trees to be retained, which trees are to be pruned to meet the management requirements and which trees require removal. Grouping the trees for management has minimised the amount of impact.

No feasible opportunities exist to further avoid removal or minimise impacts without compromising the proposed development.

6.3 Offset Statement

The client will purchase a third party offset from the credit register. Indications of the availability of offset; the type and amount of offset have been found on the native vegetation credit register. See Appendix 3 for evidence of availability.

6.4 Offsets required as per DELWP Native Vegetation Removal (NVR) report.

- Offset required is 0.070 general habitat units.
- Offset vicinity is within the Port Phillip and Western Port (CMA) or the Cardinia Shire Council.
- Minimum strategic biodiversity score 0.753
- 1Large tree(s)

See Appendix 1- DELWP Native vegetation removal report.

7 SUMMARY OF APPLICANT REQUIREMENTS/DECISION GUIDELINES

Table 4 Requirements

Number	Decision guideline to be considered	Response
1	Information about the native vegetation to be removed, including: The assessment pathway and reason for the assessment pathway^. This includes the location category of the native vegetation to be removed. A description of the native vegetation to be removed. Maps showing the native vegetation and property in context. The offset requirement that will apply if the native vegetation is approved to be removed^.	See Section 5 This project is mapped as Location 1. The total area of removal is 0.186ha which is an intermediate pathway. See Section 5 See Figure 1 Location of the study area, Figure 2A Proposed development design, Figure 2B Tree Designs Site Map, Figure 3 EVC Map, Figure 4 Assessed zone(s), & Appendix 1- Native vegetation removal report. See Appendix 1-Native vegetation removal report, 6.3 Offset statement & Appendix 3 showing the offset is available.
2	Topographic and land information relating to the native vegetation to be removed, showing ridges, crests and hilltops, wetlands and waterways, slopes of more than 20 percent, drainage lines, low lying areas, saline discharge areas, and areas of existing erosion, as appropriate.	The property slopes from the east towards the west. There are no distinguishing ecological features. See Contours and Watercourses aerial photo in Appendix 5. There is no erosion or evidence of salinisation on site.
3	Recent, dated photographs of the native vegetation to be removed	See Appendix 2, Photos 1 – 10.
4	Details of any other native vegetation approved to be removed, or that was removed without the required approvals, on the same property or on contiguous land in the same ownership as the applicant, in the five-year period before the application for a permit is lodged	N/A

5	An avoid and minimise statement. The statement describes any efforts to avoid the removal of and minimise the impacts on the biodiversity and other values of native vegetation, and how these efforts focussed on areas of native vegetation that have the most value.	See 6.1 & 6.2
6	Property Vegetation Plan applies.	No
7	Where the removal of native vegetation is to create defendable space, a written statement explaining why the removal of native vegetation is necessary.	Defendable space is part of this proposal. See BMP and arborist report.
8	Clause 52.16 applications- Native Vegetation Precinct Plan (NVPP)	N/A
9	An offset statement providing evidence that an offset that meets the offset requirements for the native vegetation to be removed has been identified and can be secured.	See Section 6.3
10	A site assessment report of the native vegetation to be removed, completed by an accredited native vegetation assessor.	This ecological report compiled by Heather Beever accredited native vegetation assessor.
11	Information about impacts on rare or threatened species habitat.	See Appendix 1 Native vegetation removal report where it states -Page 1 “Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species”. Page 5 “Not applicable in the Intermediate Pathway”..

8 RECOMMENDATIONS/ CONCLUSIONS

The proposal is designated Location 1, the Ecological Vegetation Class (EVC) is categorised Least Concern. The proposal is for an extension to the current development with little impact to native vegetation to achieve the appropriate defendable space management. The proposal has been thoroughly considered. Provided the offset is met and other council considerations are met the proposal seems sound.

9 REFERENCES

DEECA 2024. Biodiversity EVC Benchmarks Victorian Goldfields Bioregion. Sourced at https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks

DEECA 2024. Native vegetation Regulation Map (NVR Map) sourced at https://www.environment.vic.gov.au/native-vegetation/NVRMap

DEECA 2024. Search the Native Vegetation Credit Register. https://nvcr.delwp.vic.gov.au/

Department of Transport & Planning 2024. VicPlan Sourced at https://mapshare.vic.gov.au/vicplan/

Royal Botanic Gardens Victoria 2024. VICFLOR Flora of Victoria. Sourced at https://vicflora.rbg.vic.gov.au/

Tree Designs Australia Pty Ltd 2022. Arborist Report. Preliminary Site Survey. Lot 3 Beenak Rd Gembrook.

DELWP 2017. Applicant's guide – Applications to remove, destroy or lop native vegetation sourced, https://www.environment.vic.gov.au/__data/assets/pdf_file/0024/90762/Applicants-guide-applications-to-remove,-destroy-or-lop-native-vegetation.pdf

DEWLP 2017. Guidelines for the removal, destruction or lopping of native vegetation sourced, https://www.environment.vic.gov.au/__data/assets/pdf_file/0021/91146/Guidelines-for-the-removal,-destruction-or-lopping-of-native-vegetation,-2017.pdf

DEWLP 2017. Assessor's handbook – Applications to remove, destroy or lop native vegetation, sourced, https://www.environment.vic.gov.au/__data/assets/pdf_file/0022/91255/Assessors-handbook-Applications-to-remove,-lop-or-destroy-native-vegetation-V1.0.pdf

DSE 2004. Native Vegetation: sustaining a living landscape. Vegetation Quality Assessment Manual-Guidelines for applying habitat hectares scoring method Version

APPENDIX 1 - DELWP Native vegetation removal (NVR) report

Native vegetation removal report

This report provides information to support an application to remove, destroy or lop native vegetation in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation*. The report **is not an assessment by DELWP** of the proposed native vegetation removal. Native vegetation information and offset requirements have been determined using spatial data provided by the applicant or their consultant.

Date of issue: 27/03/2024
Time of issue: 12:56 pm

Report ID: CUM_2024_014

Project ID	Job168_2904GembrookLaunchingPlaceRd_VG94_v1

Assessment pathway

Assessment pathway	**Intermediate Assessment Pathway**
Extent including past and proposed	0.186 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.186 ha
No. Large trees proposed to be removed	1
Location category of proposed removal	Location 1 The native vegetation is not in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map), sensitive wetland or coastal area. Removal of less than 0.5 hectares in this location will not have a significant impact on any habitat for a rare or threatened species

1. Location map

OFFICIAL

Native vegetation removal report

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

General offset amount[1]	0.070 general habitat units
Vicinity	Port Phillip and Westernport Catchment Management Authority (CMA) or Cardinia Shire Council
Minimum strategic biodiversity value score[2]	0.753
Large trees	1 large tree

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix 2 includes information about the rare or threatened species mapped at the site.

Appendix 3 includes maps showing native vegetation to be removed and extracts of relevant species habitat importance maps

1 The general offset amount required is the sum of all general habitat units in Appendix 1

2 Minimum strategic biodiversity score is 90 per cent of the weighted average score across habitat zones where a general offset is required

Native vegetation removal report

Next steps

Any proposal to remove native vegetation must meet the application requirements of the Intermediate Assessment Pathway and it will be assessed under the Intermediate Assessment Pathway.

If you wish to remove the mapped native vegetation you are required to apply for a permit from your local council. Council will refer your application to DELWP for assessment, as required. **This report is not a referral assessment by DELWP.**

This *Native vegetation removal report* must be submitted with your application for a permit to remove, destroy or lop native vegetation.

Refer to the *Guidelines for the removal, destruction or lopping of native* vegetation (the Guidelines) for a full list of application requirements This report provides information that meets the following application requirements:

- The assessment pathway and reason for the assessment pathway
- A description of the native vegetation to be removed (met unless you wish to include a site assessment)
- Maps showing the native vegetation and property
- The offset requirements determined in accordance with section 5 of the Guidelines that apply if approval is granted to remove native vegetation.

Additional application requirements must be met including:

- Topographical and land information
- Recent dated photographs
- Details of past native vegetation removal
- An avoid and minimise statement
- A copy of any Property Vegetation Plan that applies
- A defendable space statement as applicable
- A statement about the Native Vegetation Precinct Plan as applicable
- An offset statement that explains that an offset has been identified and how it will be secured.

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

All zones require a general offset, the general habitat units each zone is calculated by the following equation in accordance with the Guidelines:

General habitat units = extent x condition x general landscape factor x 1.5, where the general landscape factor = 0.5 + (strategic biodiversity value score/2)

The general offset amount required is the sum of all general habitat units per zone.

Native vegetation to be removed

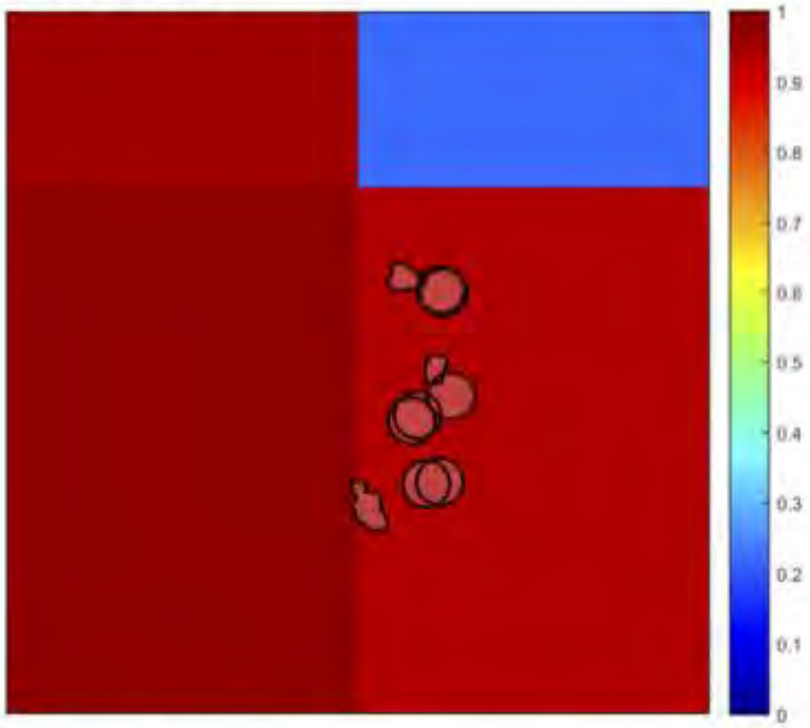
Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	Type	BioEVC	BioEVC conservation status	Large tree(s)	Partial removal	Condition score	Polygon Extent	Extent without overlap	SBV score	HI score	Habitat units	Offset type
1-A	Patch	hsf_0045	Least Concern	1	no	0.550	0.021	0.021	0.946		0.017	General
4-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.022	0.940		0.006	General
5-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.019	0.940		0.006	General
6-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.022	0.940		0.006	General
7-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.016	0.940		0.005	General
8-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.017	0.940		0.005	General
9-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.018	0.940		0.005	General
10-A	Scattered Tree	hsf_0045	Least Concern	0	no	0.200	0.031	0.029	0.940		0.008	General
2-A	Patch	hsf_0045	Least Concern	0	no	0.320	0.013	0.013	0.940		0.006	General
3-A	Patch	hsf_0045	Least Concern	0	no	0.400	0.010	0.010	0.940		0.006	General

Appendix 2: Information about impacts to rare or threatened species' habitats on site

This is not applicable in the Intermediate Assessment Pathway.

Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map



3. Aerial photograph showing mapped native vegetation

4. Map of the property in context

Yellow boundaries denote areas of proposed native vegetation removal.

APPENDIX 2 – Photos of Study Area

Photo 1: Arborist Trees 7, 8 & 9.

Looking southeast at Trees 7, 8 & 9 to be managed in the defendable space.

Trees 8 & 9 to be removed. Tree 7 to be pruned.

Photo taken: 13/3/24.

Photo 2: Arborist Trees 32, 33 & 34.

Looking southeast at Trees 32, 33 & 34. Trees 32 and 34 to be removed. Tree 33 is to be retained.

Photo taken: 13/3/24

Photo 3: Arborist Tree 41, 42 & 43.

Looking south at Tree 43 to be removed for defendable space management. Tree 41 & 42 to be retained.

Photo taken: 13/3/24

Photo 4: Arborist trees 45, 46 & 47-Patch 3.

Looking east at three trees that require removal to manage defendable space.

Photo taken: 13/3/24

Photo 5: Arborist Tree 60 (missing).

Looking north across location where Tree 60 had been located but had been lost as a result of storm damage.

Photo taken: 13/3/24

Photo 6: Arborist Trees 69, 70 & 71 – Patch 2A.

Looking north at Trees 69, 70 & 71 to be removed for defendable space management.

Photo taken: 13/3/24

Photo 7: Arborist Trees 76, & 77- Patch 1.

Looking east at Trees 76 & 77 to be removed as per bushfire management of defendable space. Understorey also requires partial removal to manage defendable space.

Photo taken: 13/3/24

Photo 8: Arborist Trees 79 & 80.

Looking east at Trees 79 & 80 that require removal to manage defendable space.

Photo taken: 13/3/24

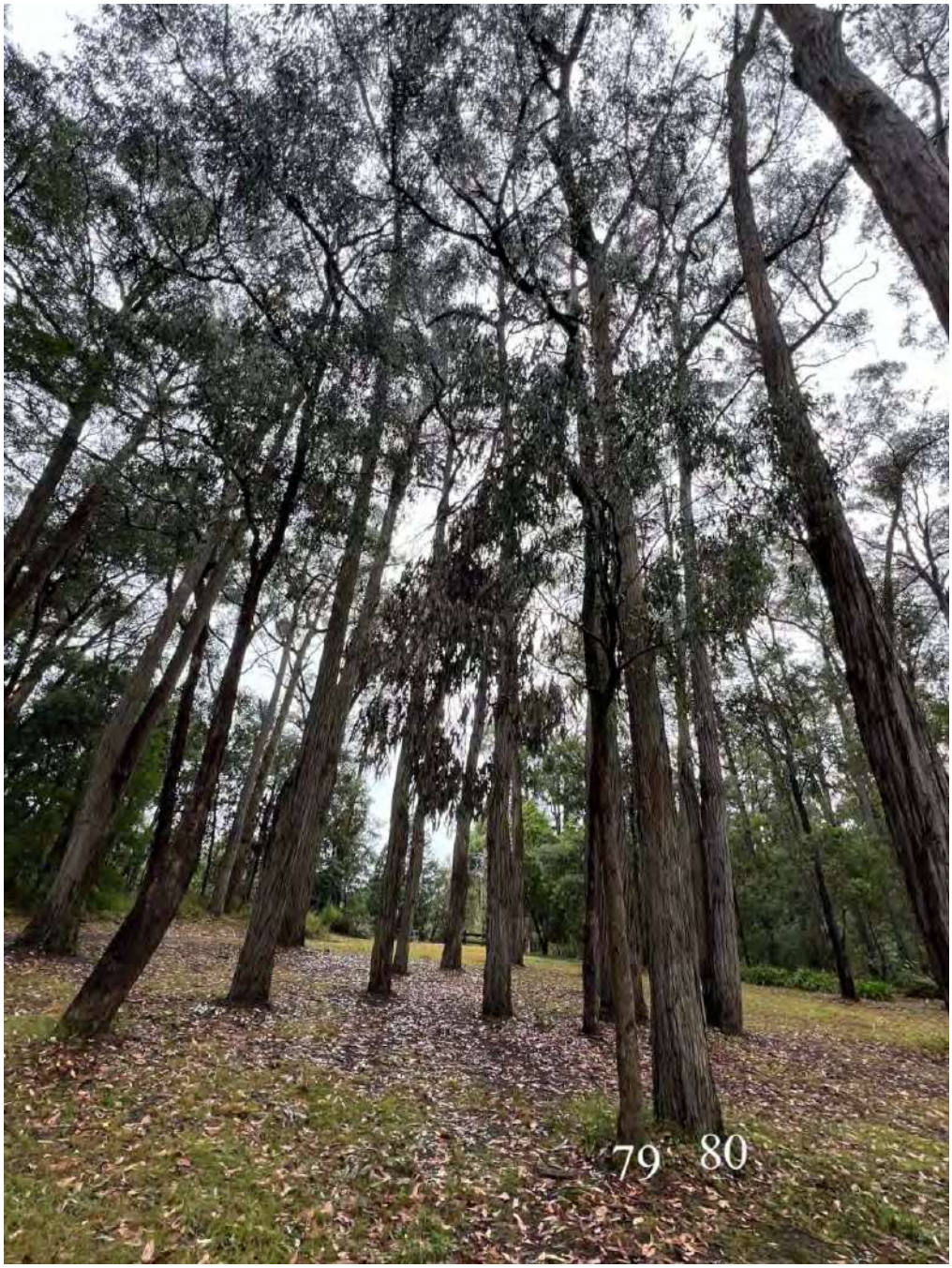


Photo 9: Treed area east of the existing building.

Looking northwest at treed zones east of the existing building.

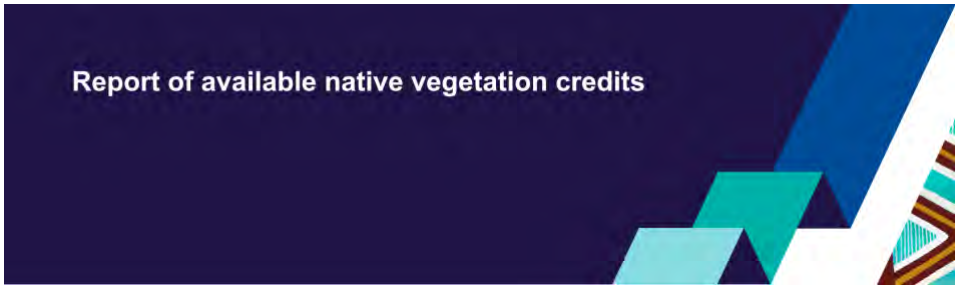
Photo taken: 13/3/24

Photo 10: Access loop northeast of existing building.

Looking northeast at access track and location of two patches of trees to be removed for defendable space management.

Photo taken: 13/3/24

APPENDIX 3 – Search of Native Vegetation Credit Register



This report lists native vegetation credits available to purchase through the Native Vegetation Credit Register.

This report is **not evidence** that an offset has been secured. An offset is only secured when the units have been purchased and allocated to a permit or other approval and an allocated credit extract is provided by the Native Vegetation Credit Register.

Date and time: 03/04/2024 12:03 **Report ID: 23531**

What was searched for?

General offset

General habitat units	Strategic biodiversity value	Large trees	Vicinity (Catchment Management Authority or Municipal district)	
0.07	0.753	1	CMA	Melbourne Water
			or LGA	Cardinia Shire

Details of available native vegetation credits on 03 April 2024 12:03

These sites meet your requirements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
BBA-0277	2.514	430	Melbourne Water	Mornington Peninsula Shire	No	Yes	No	Abezco, Ethos, VegLink
BBA-0670	16.274	100	Melbourne Water	Cardinia Shire	No	Yes	No	Abezco, VegLink
BBA-0677	6.768	960	Melbourne Water	Whittlesea City	No	Yes	No	Abezco, VegLink
BBA-0678	7.269	312	Melbourne Water	Nillumbik Shire	No	Yes	No	VegLink
BBA-0678_02	0.363	35	Melbourne Water	Nillumbik Shire	Yes	Yes	No	Abezco, VegLink
BBA-2870	0.537	83	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
BBA-2871	1.460	115	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3687_01	0.219	27	Melbourne Water	Baw Baw Shire	Yes	Yes	No	Baw Baw SC
VC_CFL-3710_01	6.249	270	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3740_01	0.085	16	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	Bio Offsets

These sites meet your requirements using alternative arrangements for general offsets.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_CFL-3708_01	0.198	507	Melbourne Water	Yarra Ranges Shire	Yes	Yes	No	VegLink
VC_CFL-3744_01	0.470	28	Melbourne Water	Macedon Ranges Shire	Yes	Yes	No	VegLink

These potential sites are not yet available, land owners may finalise them once a buyer is confirmed.

Credit Site ID	GHU	LT	CMA	LGA	Land owner	Trader	Fixed price	Broker(s)
VC_CFL-3746_01	3.242	315	Melbourne Water	Macedon Ranges Shire	Yes	Yes	No	VegLink

LT - Large Trees *CMA - Catchment Management Authority* *LGA - Municipal District or Local Government Authority*

Next steps

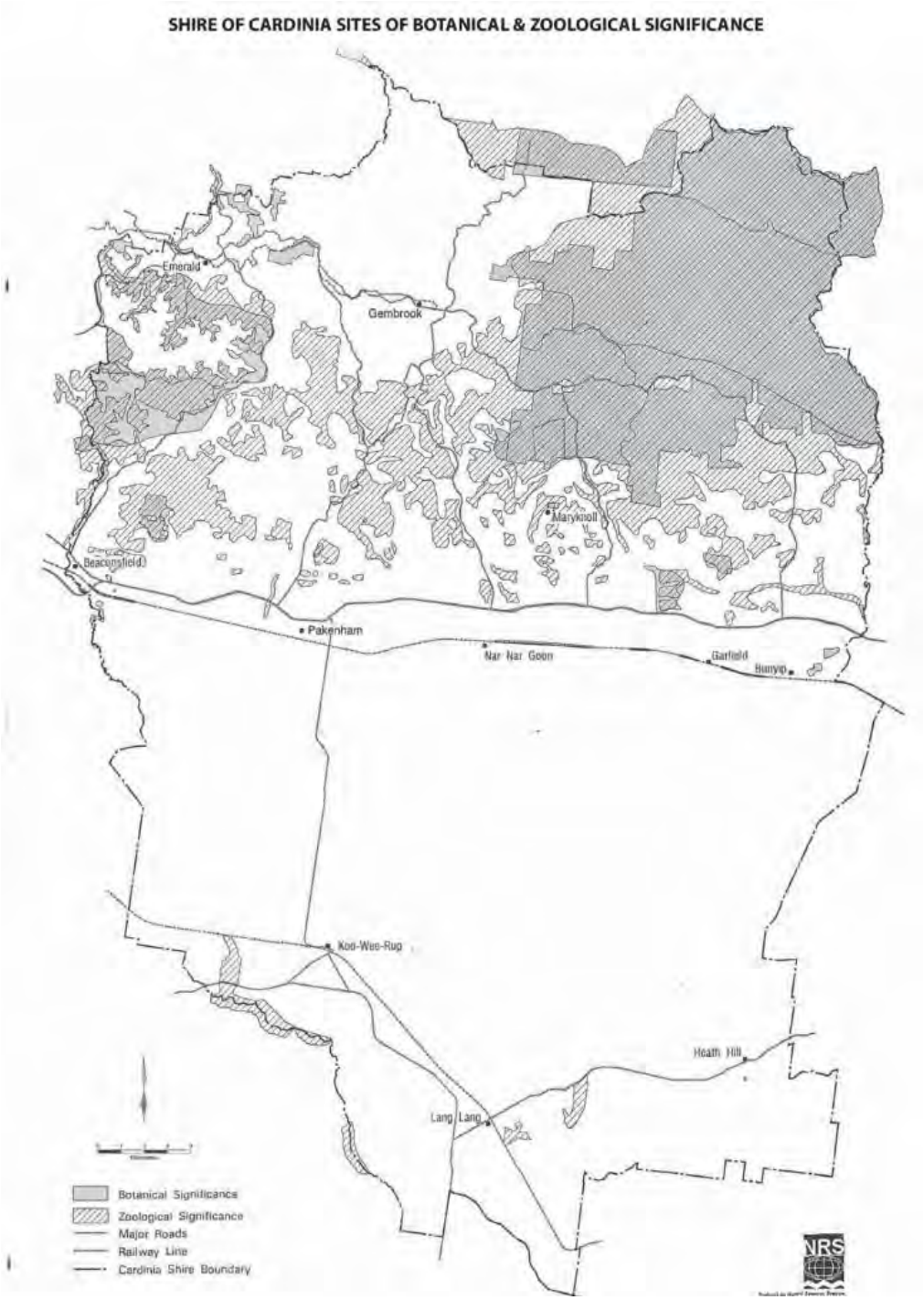
If applying for approval to remove native vegetation
Attach this report to an application to remove native vegetation as evidence that your offset requirement is currently available.

If you have approval to remove native vegetation
Below are the contact details for all brokers. Contact the broker(s) listed for the credit site(s) that meet your offset requirements. These are shown in the above tables. If more than one broker or site is listed, you should get more than one quote before deciding which offset to secure.

Broker contact details

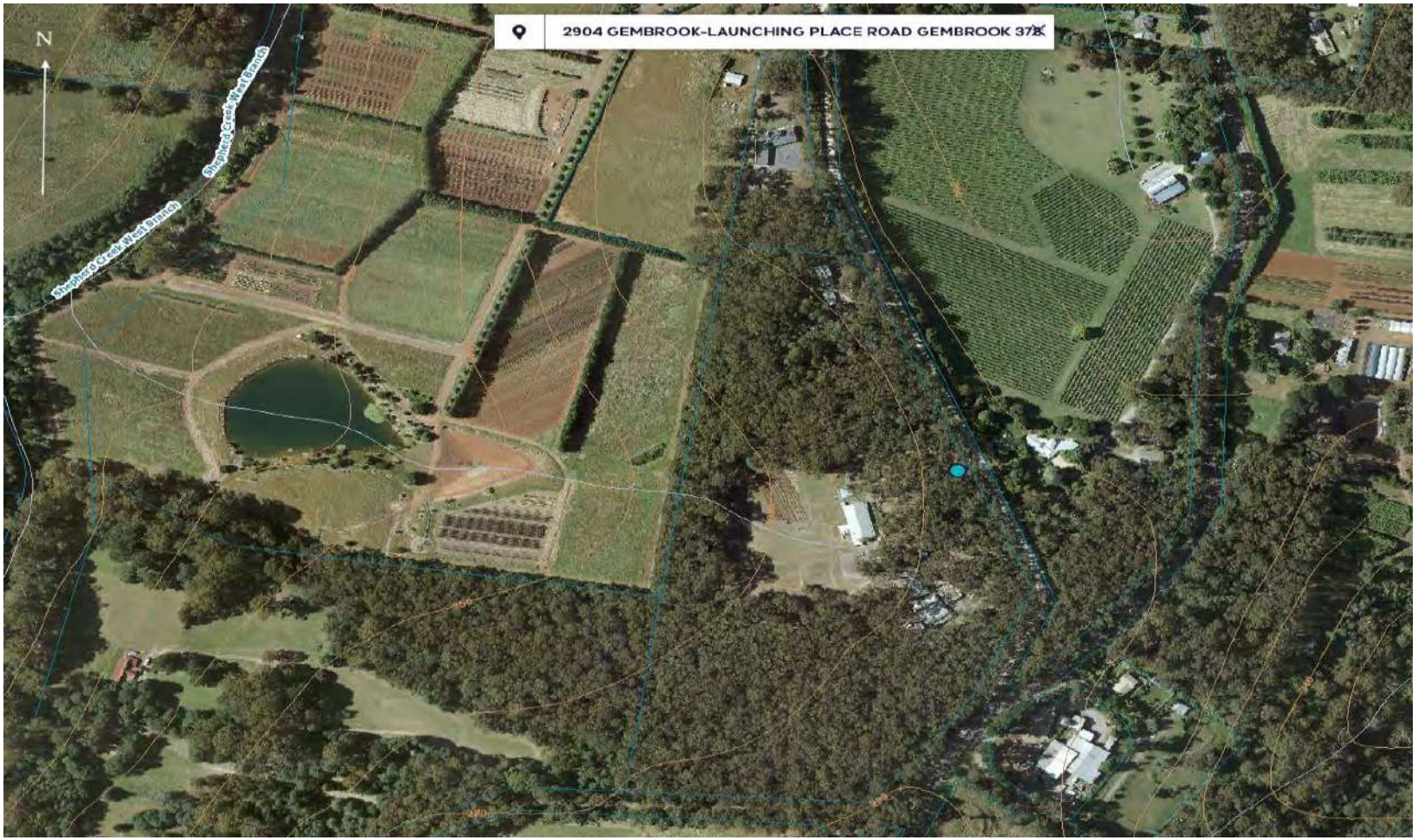
Broker Abbreviation	Broker Name	Phone	Email	Website
Abezco	Abzeco Pty. Ltd.	(03) 9431 5444	offsets@abzeco.com.au	www.abzeco.com.au
Baw Baw SC	Baw Baw Shire Council	(03) 5624 2411	bawbaw@bawbawshire.vic.gov.au	www.bawbawshire.vic.gov.au
Bio Offsets	Biodiversity Offsets Victoria	0452 161 013	info@offsetsvictoria.com.au	www.offsetsvictoria.com.au
Contact NVOR	Native Vegetation Offset Register	136 186	nativevegetation.offsetregister@delwp.vic.gov.au	www.environment.vic.gov.au/native-vegetation
Ecocentric	Ecocentric Environmental Consulting	0410 564 139	ecocentric@me.com	Not avaliable
Ethos	Ethos NRM Pty Ltd	(03) 5153 0037	offsets@ethosnrm.com.au	www.ethosnrm.com.au
Nillumbik SC	Nillumbik Shire Council	(03) 9433 3316	offsets@nillumbik.vic.gov.au	www.nillumbik.vic.gov.au
TFN	Trust for Nature	8631 5888	offsets@tfn.org.au	www.trustfornature.org.au
VegLink	Vegetation Link Pty Ltd	(03) 8578 4250 or 1300 834 546	offsets@vegetationlink.com.au	www.vegetationlink.com.au
Yarra Ranges SC	Yarra Ranges Shire Council	1300 368 333	biodiversityoffsets@yarraranges.vic.gov.au	www.yarraranges.vic.gov.au

APPENDIX 4 – Shire of Cardinia Site of Botanical & Zoological Significance.



CUMBRE

APPENDIX 5 – Contour map of study area



BAL Assessments
3/1021 Toorak Road
Camberwell VIC 3124
John@BAL.net.au
0417 885 747

Hall's Outdoor Education
Gembrook-Launching Place Rd 2904,
Gembrook
[redacted]

1 September 2021

Dear [redacted]

This report has been prepared as a Bushfire Management Statement to meet the objectives, requirements, measures and standards of clauses 44.06 and 53.02 of the local government authority's planning scheme for a proposed alteration and addition to an existing Camp accommodation building.

Anyone wishing to visit the site is asked to contact Anthony on 0417 373 462

This report successfully addresses all three Application Requirements of cl. 44.06 being:

1 *A Bushfire Hazard Site Assessment*
2 *A Bushfire Hazard Landscape Assessment*
3 *A Bushfire Management Statement (BMS)*

and also includes:

4 *A Bushfire Management Plan (BMP)*

The camp is surrounded by Forest at varying distances and some aspects on minor downslopes. In an effort to minimise tree removal other enhanced measures are being proposed:

- Upgrade basic construction safety to the existing units, things like enclose the subfloor and install vents with ember mesh, caulking of gaps around windows, replacing timber fascia's, install non-combustible gutter-guard etc
- Increase distance of Understory management to offset 2m gaps between canopies in lieu of 5m gaps within the defendable space to the East and South.
- Installation of a new 20,000 litre Colorbond firefighting water tank

The camp has an emergency management plan that sees them removing students from the site on code red days only. To be out by 8am and return by 7pm (after the high-risk hours of the day have passed). They have sufficient bus transport on site to remove students should a nearby incident occur. If 2 or more code red days are in a row, they would cancel the camp.

BAL-40 construction as an enhanced measure was considered however as the construction is to take place on the west side of the building where there is already >60m or BAL-12.5 defendable space distance already in place this was considered un-necessary.

The camp accommodation building already has sufficient defendable space to the north and the west without further work taking place. For this application we have created two Fuel Management Zones based on fire behaviour to the east and south. Implementing a Fuel Management Strategy in these areas would be in the camp community's best interest, a net community benefit and a vast improvement upon existing conditions at the site. These Fuel Management Zone were discussed with Mark Sacco (FRV Fire Safety Officer) in pre-application discussions, no final outcome was reached.

The basic premise for the Outer Fuel Management Zone is that fires in the canopy cannot be sustained for very long without surface fuel and an independent crown fire ie one that burns in canopy fuels without aid of a supporting surface fire occur rarely and are short lived (Van Wagner, C.E. 1993. Prediction of crown fire behaviour in two stands of jack pine. Can. J. For. Res. 23: 442-449).

In the enclosed example to the east, we have calculated a flame length of 3.6m in an area with tree heights of >20m.

The *BAL Tool* calculation showing that with minimal Understory fuel, allow for some litter between clean-ups and some bark fuel a total of say 4t/ha, that over the extended distance of 50m that any approaching canopy fire will drop down from the canopy prior to reaching the buildings.

While quite often it is not the case, on this occasion we can confirm that the aerial photo contained in this report is relatively close to the current situation and there has been little change to the vegetation in the area. However, it should be noted that aerial photos, (particularly Google Maps/Earth which can make the canopy look denser than the generally finer and more accurate detail that NearMap provides) can be misleading and should not be used without a physical inspection of the area.

To comply with the Victorian Planning Provisions an application must demonstrate that all fire protection requirements for: **i)** "*Defendable Space*" **ii)** "*Construction Standards*" **iii)** "*Water Supply*" and **iv)** "*Access*" have been considered and incorporated.

In regard to **i)** *Defendable Space*; the vegetation around the building must be maintained to the distances and standards set out in this report.

In regard to item **ii)** *Construction Standards* we have submitted this report using VPP clause 53.02-5 “Defendable Space” Table 2 and an unspecified Alternative Measure using the AS3959 Method 2 *BAL Tool* calculator.

We believe it would be appropriate for a relevant authority to rate this application for:

Gembrook-Launching Place Rd 2904, Gembrook at: BAL–29

Your Planning Permit application for this work should include this report and before submission to council your building plans and drawings must include a site layout drawing which clearly shows the size and location of the required **iii)** *Water Supply* and **iv)** Vehicle *Access* requirements as set-out in this report. Note the water tank is to be made from non-combustible material such as concrete or steel.

The Planning Policy Framework (PPF) states at clause 13.02-1S, Bushfire planning strategies and principles; that the overarching strategy is to “Prioritise the protection of human life *over other policy considerations*.” We understand this to mean that more weight will be given to the requirements of the BMO vegetation management rather than environmental or vegetation protection overlays or zoning that may be also on the site.

The proposed works shall be designed and constructed to meet the requirements of AS3959-2018 Construction of Buildings in Bushfire-prone Areas (Standards Australia).

The BAL rating applied to your property sets minimum standards for design and construction. However, we would always recommend that you should endeavour to comply with high levels of protection. Ember protection should always be a priority.

Note that there is a clause about "Shielding" (AS3959 clause 3.5) where you can drop one BAL level (to a minimum of BAL-12.5) on building faces not exposed to the source of bushfire attack. Shielding does not apply to subfloors or roofs. Shielding will not apply to this application.

Note that Building Regulation 156 (2018) simply put requires the Relevant Building Surveyor to accept the BAL rating applied to the property on the Planning Permit. Therefore, a further assessment in accordance with AS3959 is not required for your Building Permit.

Requirements detailed in this document do not guarantee survival of the buildings or the occupants in a bushfire event for reasons including, as detailed in the foreword to AS3959 *Construction of Buildings in Bushfire-prone Areas*, the degree of {future} vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions. The occupants are strongly encouraged to develop and practice a bushfire survival plan and in accordance with CFA advice a policy of "leave early" is always recommended.

As far as practical, could you please check the basic information upon which this report is based and notify us if you find any discrepancies.

Should you require further information or have any questions with regard to any of the enclosed information please contact [redacted]

Yours Sincerely

[redacted]

BAL Assessments

Enclosed: Planning and Property Information / Bushfire Management Statement (BMS) / Site Photos / Site Maps / Site Layout / Client BEP / Bushfire Hazard Landscape Assessment / Bushfire Hazard Site Assessment / AS3959 Method 2 Calculations / BAL Description

Attachments: Bushfire Management Plan (BMP)

For more information regarding our methodology please visit ***www.BAL.net.au***
We work all over Victoria and specialize in:

- *Simplified Procedure for determining the* ***BAL - Method 1 and*** *Detailed Method* ***Method 2*** *(Appendix B)*
- *Bushfire Management Overlay (****BMO****) – Site, Vegetation and Hazard assessments*
- *Bushfire Risk Assessments under* ***PPF 13.02***
- ***Experts' reports*** *for VCAT, the Building Appeals Board and Panel Hearings*

Planning and Property Information

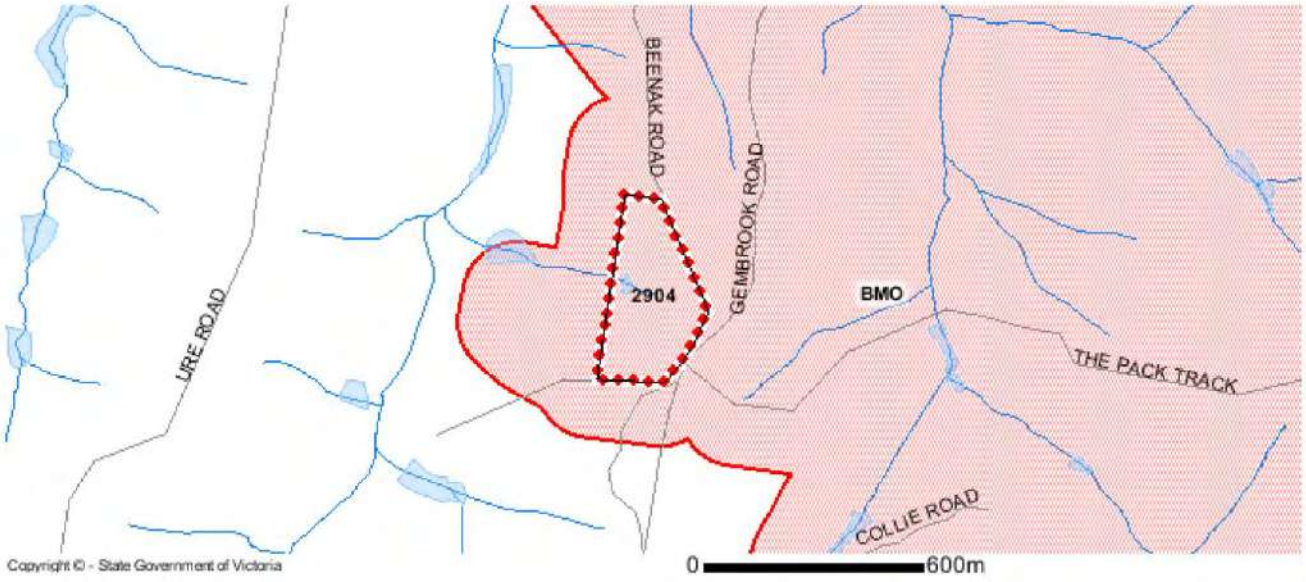
Approx. Land size: 10.4ha

Address: 2904 GEMBROOK-LAUNCHING PLACE ROAD GEMBROOK 3783
Lot and Plan Number: Lot 3 PS401903
Standard Parcel Identifier (SPI): 3\PS401903
Local Government (Council): CARDINIA **Council Property Number:** 2321301700
Directory Reference: Melway 299 A4

Planning Zone Summary

Planning Zone: RURAL CONSERVATION ZONE (RCZ)
RURAL CONSERVATION ZONE - SCHEDULE 2 (RCZ2)
Planning Overlays: BUSHFIRE MANAGEMENT OVERLAY (BMO)
ENVIRONMENTAL SIGNIFICANCE OVERLAY (ESO)
ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1 (ESO1)

Bushfire Management Overlay (BMO)



Bushfire Management Statement

Pursuant to the *Bushfire Management Overlay; clause 53.02* of the Victorian Planning provisions requires that development is only permitted if the risk to life, property and community infrastructure can be reduced to an acceptable level. Clause 53.02 contains various Objectives, Approved Measure (AM), Alternative Measures (AltM) and Decisions Guidelines.

The following table demonstrates how the requirements have been achieved and complied with:

REQUIREMENTS	*COMPLIANCE*
53.02-3 Dwellings in Existing Settlements – Bushfire Protection objective	
To specify bushfire design and construction measures for a single dwelling or alteration and extension to an existing dwelling that reduces the risk to life and property to an acceptable level.	*Not Applicable*
Approved Measure 1.1	
A building is sited to ensure the site best achieves the following: • The maximum separation distance between the building and the bushfire hazard. • The building is in close proximity to a public road. • Access can be provided to the building for emergency service vehicles.	*Not Applicable* *Not Applicable* *Not Applicable*
Approved Measure 1.2	
A building provides the defendable space in accordance with Columns A, B, C, D or E of Table 1 and Table 6 to Clause ~~52.47-3~~ 53.02-5. Adjoining land may be included as defendable space where there is a reasonable assurance that the land will remain or continue to be managed in that condition as part of the defendable space. A building is constructed to the bushfire attack level: • That corresponds to the defendable space provided in accordance with Table 1 to Clause 53.02-5, or • The next lower bushfire attack level that corresponds to the defendable space provided in accordance with Table 1 to Clause 53.02-5 where all of the following apply: ▪ A private bushfire shelter (a Class 10c building within the meaning of the Building Regulations 2006) is constructed on the same land as the dwelling. ▪ A minimum bushfire attack level of BAL12.5 is provided in all circumstances.	*Not Applicable* *Not Applicable* *Not Applicable*

Bushfire Management Statement

Approved Measure 1.3	
A building is provided with: • A static water supply for fire fighting and property protection purposes specified in Table 4 to Clause 53.02-5. The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies. • Vehicle access that is designed and constructed as specified in Table 5 to Clause 53.02-5.	*Not Applicable* *Not Applicable*
53.02-4 Bushfire Protection objectives	
53.02-4.1 Landscape, Siting and Design objectives	
Development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape. Development is sited to minimise the risk from bushfire. Development is sited to provide safe access for vehicles, including emergency vehicles. Building design minimises vulnerability to bushfire attack.	*A Bushfire Hazard Landscape Assessment, in accordance with the DELWP Technical Guide (Planning Permit Applications Bushfire Management Overlay) has been undertaken and enclosed herewith. Using this guide we have rated the site at the lower end of Landscape Type 3 and according to the CFA guideline Applying the Bushfire Hazard Landscape Assessment in a Bushfire Management Overlay if we apply the Approved Measures of the Victorian Planning Provisions clause 53.02-4 then it should mitigate the risk from the wider landscape to an **"acceptable level"**.* *Compliance with AS3959, as required by PPF 13.02, shows the risk has been reduced to an acceptable level on a local scale.* *This application can successfully meet the Approved and/or Alternative Measures of the BMO VPP clause 53.02-4 and therefore we believe the risk is reduced both on a landscape scale and a local scale to an acceptable level.*
Approved Measure 2.1	
The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.	*It is considered that the fire risk from the wider landscape is no greater than that assumed by AS3959 and therefore adequately dealt with by the VPP defendable space tables and/or Radiant Heat modelling.*
Approved Measure 2.2	
A building is sited to ensure the site best achieves the following: • The maximum separation distance between the building and the bushfire hazard. • The building is in close proximity to a public road. • Access can be provided to the building for emergency service vehicles.	*The site does meet the Defendable Space setback requirements of the "BMO" when calculated using VPP clause 53.02-5 "Defendable Space" Table 2 and an unspecified Alternative Measure using the AS3959 Method 2 BAL Tool calculator.* *The siting of the extension is fixed by the location of the existing building.* *The building is approx. 80m from the road where safe egress and access is easily available.* *This application will comply with the requirement as contained in Table 5 to Clause 53.02-5.*

Bushfire Management Statement

Approved Measure 2.3	
A building is designed to be responsive to the landscape risk and reduce the impact of bushfire on the building.	*The design of the extesion to the appropriate BAL level will reduce the risk of entry of embers as far as practical.* *Gutter leaf guards must be fitted to the roof* ***For a complete list of upgrade features please refer to the body of the report.***
53.02-4.2 Defendable space and construction objectives	
Defendable space and building construction mitigate the effect of flame contact, radiant heat and embers on buildings	*As demonstrated below by the compliance with all applicable Approved Measures and/or Alternative Measure it has been shown that this development will reduce the Bushfire risk to an acceptable level.*
Approved Measure 3.1	
A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises is provided with defendable space in accordance with: • Table 2 Columns A, B or C and Table 6 to Clause 53.02-5 wholly within the title boundaries of the land; or • If there are significant siting constraints, Table 2 Column D and Table 6 to Clause 53.02-5. The building is constructed to the bushfire attack level that corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-5.	*Not Applicable.*
Approved Measure 3.2	
A building used for accommodation (other than a dwelling or dependent person's unit), a child care centre, an education centre, a hospital, leisure and recreation or a place of assembly is: • Provided with defendable space in accordance with Table 3 and Table 6 to Clause 53.02-5 wholly within the title boundaries of the land. • Constructed to a bushfire attack level of BAL12.5.	*Refer to Alternative Measure 3.6* *The building works will be constructed to* ***BAL-29***
Alternative Measure 3.3	
Adjoining land may be included as defendable space where there is a reasonable assurance that the land will remain or continue to be managed in that condition as part of the defendable space.	*Not Applicable*

Bushfire Management Statement

Alternative Measure 3.4	
Defendable space and the bushfire attack level is determined using Method 2 of AS3959:2009* Construction of buildings in bushfire prone areas (Standards Australia) subject to any guidance published by the relevant fire authority. *{superseded by 2018 edition}	*The site does meet the Defendable Space setback requirements of the "BMO" when calculated using VPP clause 53.02-5 "Defendable Space" Table 2 and an unspecified Alternative Measure using the AS3959 Method 2 BAL Tool calculator.*
Alternative Measure 3.5	
A building used for a dwelling (including an extension or alteration to a dwelling) may provide defendable space to the property boundary where it can be demonstrated that: • The lot has access to urban, township or other areas where: ▪ Protection can be provided from the impact of extreme bushfire behaviour. ▪ Fuel is managed in a minimum fuel condition. ▪ There is sufficient distance or shielding to protect people from direct flame contact or harmful levels of radiant heat. • Less defendable space and a higher construction standard is appropriate having regard to the bushfire hazard landscape assessment. • The dwelling is constructed to a bushfire attack level of BAL FZ. This alternative measure only applies where the requirements of AM 3.1 cannot be met.	*Not Applicable*

Bushfire Management Statement

Alternative Measure 3.6	
A building used for accommodation (other than a dwelling or dependent person's unit), child care centre, education centre, hospital, leisure and recreation or place of assembly may provide defendable space in accordance with Table 2 Columns A, B or C and Table 6 to Clause 53.02-5 where it can be demonstrated that: • An integrated approach to risk management has been adopted that considers: ▪ The characteristics of the likely future occupants including their age, mobility and capacity to evacuate during a bushfire emergency. ▪ The intended frequency and nature of occupation. ▪ The effectiveness of proposed emergency management arrangements, including a mechanism to secure implementation. • Less defendable space and a higher construction standard is appropriate having regard to the bushfire hazard landscape assessment.	*The site does meet the Defendable Space setback requirements of the "BMO" when calculated using VPP clause 53.02-5 "Defendable Space" Table 2 and an unspecified Alternative Measure using the AS3959 Method 2 BAL Tool calculator* *It is camp accommodation with occupants generally having good mobility and capacity to evacuate* *The camp is partially closed on Code Red days* *The camp has their own bushfire emergency procedures – enclosed in this report* *The building works will be constructed to* ***BAL-29***
Other unspecified Alternative Measures	
	The basic premise for the Primary Fuel Management Zone is that fires in the canopy cannot be sustained for very long without surface fuel and an independent crown fire ie one that burns in canopy fuels without aid of a supporting surface fire occur rarely and are short lived (Van Wagner, C.E. 1993. Prediction of crown fire behaviour in two stands of jack pine. Can. J. For. Res. 23: 442-449). *In the enclosed example to the east, we have calculated a flame length of 3.6m in an area with tree heights of >20m.* *The BAL Tool calculation showing that with minimal Understory fuel, allow for some litter between clean-ups and some bark fuel a total of say 4t/ha, that over the extended distance of 50m that any approaching canopy fire will drop down from the canopy prior to reaching the buildings.*

Bushfire Management Statement

53.02-4.3 Water supply and access objectives	
A static water supply is provided to assist in protecting property. Vehicle access is designed and constructed to enhance safety in the event of a bushfire.	*As demonstrated below by the compliance with all applicable Approved Measures and/or Alternative Measure it has been shown that this development will reduce the Bushfire risk to an acceptable level.*
Approved Measure 4.1	
A building used for a dwelling (including an extension or alteration to a dwelling), a dependant person's unit, industry, office or retail premises is provided with: • A static water supply for fire fighting and property protection purposes specified in Table 4 to Clause 53.02-5. • Vehicle access that is designed and constructed as specified in Table 5 to Clause 53.02-5. The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies.	*Not Applicable* *Not Applicable*
Approved Measure 4.2	
A building used for accommodation (other than a dwelling or dependent person's unit), child care centre, education centre, hospital, leisure and recreation or place of assembly is provided with: • A static water supply for fire fighting and property protection purposes of 10,000 litres per 1,500 square metres of floor space up to 40,000 litres. • Vehicle access that is designed and constructed as specified in Table 5 to Clause 53.02-5. • An integrated approach to risk management that ensures the water supply and access arrangements will be effective based on the characteristics of the likely future occupants including their age, mobility and capacity to evacuate during a bushfire emergency. The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies.	*Not Applicable* *A 20,000L (minimum) water tank outlet is within 60m of the building for firefighting purposes. The tank outlet will be positioned so that a fire brigade vehicle can get to within 4m of the outlet.* *This application will comply with the requirement as contained in Table 5 to Clause 53.02-5.* *The camp has their own bushfire emergency procedures – enclosed in this report*
Other unspecified Alternative Measures	
	Not Applicable

Bushfire Management Statement

53.02-4.4 Subdivision objectives	
To provide lots that are capable of being developed in accordance with the objectives of Clause 53.02. To specify at the subdivision stage bushfire protection measures to develop a lot with a single dwelling on land zoned for residential or rural residential purposes	*Not Applicable*
Approved Measure 5.1	
An application to subdivide land, other than where AM 5.2 applies, demonstrates that each proposed lot is capable of meeting: • The defendable space in accordance with Table 2 Columns A, B or C and Table 6 to Clause 53.02-5. • The approved measures in Clause 53.02-4.1 and Clause 53.02-4.3.	*Not Applicable*
Approved Measure 5.2	
An application to subdivide land zoned for residential or rural residential purposes must be accompanied by a plan that shows: • Each Lot satisfies the approved measure in AM 2.1 • A building envelope for a single dwelling on each lot that complies with AM 2.2 and provides defendable space in accordance with: ▪ Columns A or B of Table 2 to Clause 53.02-5 for a subdivision that creates 10 or more lots; or ▪ Columns A, B or C of Table 2 to Clause 53.02-5 for a subdivision that creates less than 10 lots. • The bushfire attack level that corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-5 must be noted on the building envelope • Defendable space wholly contained within the boundaries of the proposed subdivision. Defendable space may be shared between lots within the subdivision. Defendable space for a lot may utilise communal areas, such as roads, where that land can meet the requirements for defendable space. • Vegetation management requirements in accordance with Table 6 to implement and maintain the defendable space required under this approved measure. • Water supply and vehicle access that complies with AM 4.1.	*Not Applicable*

Bushfire Management Statement

Approved Measure 5.3	
An application to subdivide land to create 10 or more lots provides a perimeter road adjoining the hazardous vegetation to support fire fighting.	*Not Applicable*
Approved Measure 5.4	
A subdivision manages the bushfire risk to future development from existing or proposed landscaping, public open space and communal areas.	*Not Applicable*
Alternative Measure 5.5	
A building envelope for a subdivision that creates 10 or more lots required under AM 5.2 may show defendable space in accordance with Table 2 Column C and Table 6 to Clause 53.02-5 where it can be demonstrated that: • All other requirements of AM 5.2 have been met. • Less defendable space and a higher construction standard is appropriate having regard to the bushfire hazard landscape assessment.	*Not Applicable*
Other unspecified Alternative Measures	
	Not Applicable

Site Photographs

≈ site proposed works

≈ North of proposed works

Site Photographs

≈ East of proposed works

≈ South of proposed works

Site Photographs

≈ West of proposed works

≈ East of proposed works

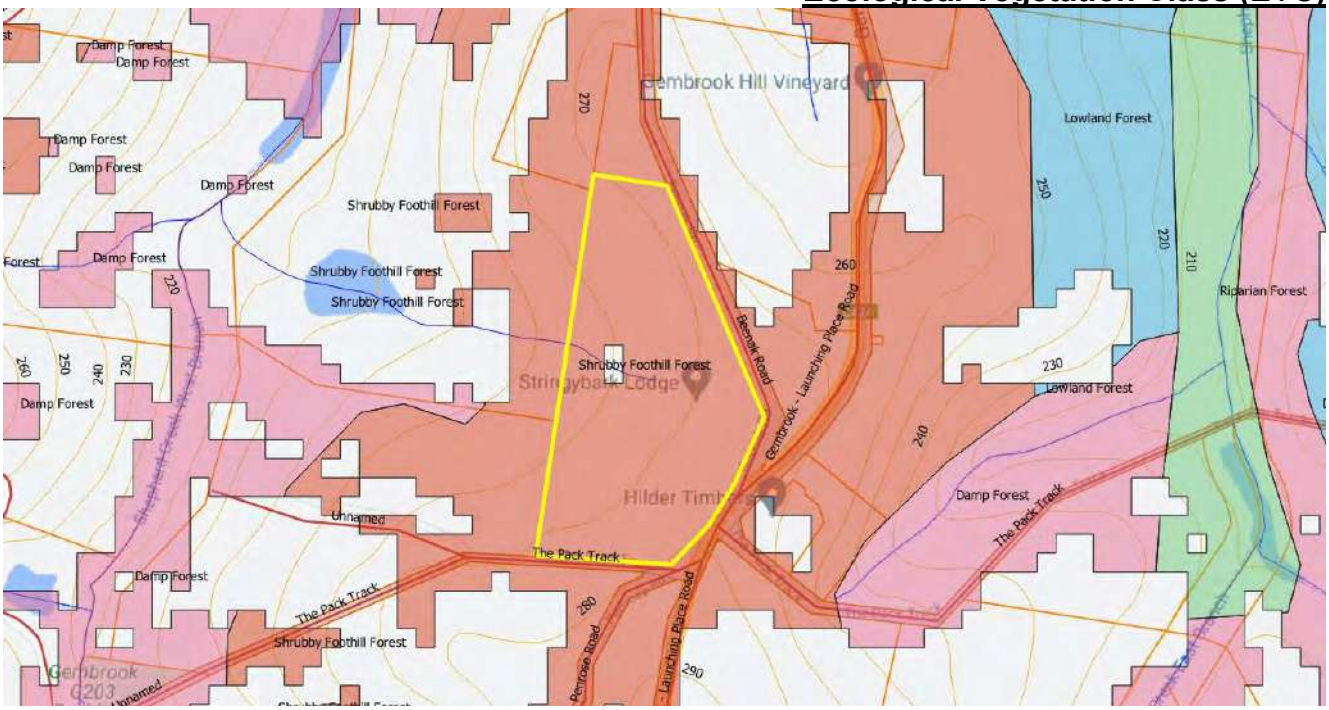
Site Photographs

≈ East of proposed works

≈ South of proposed works

Site Maps

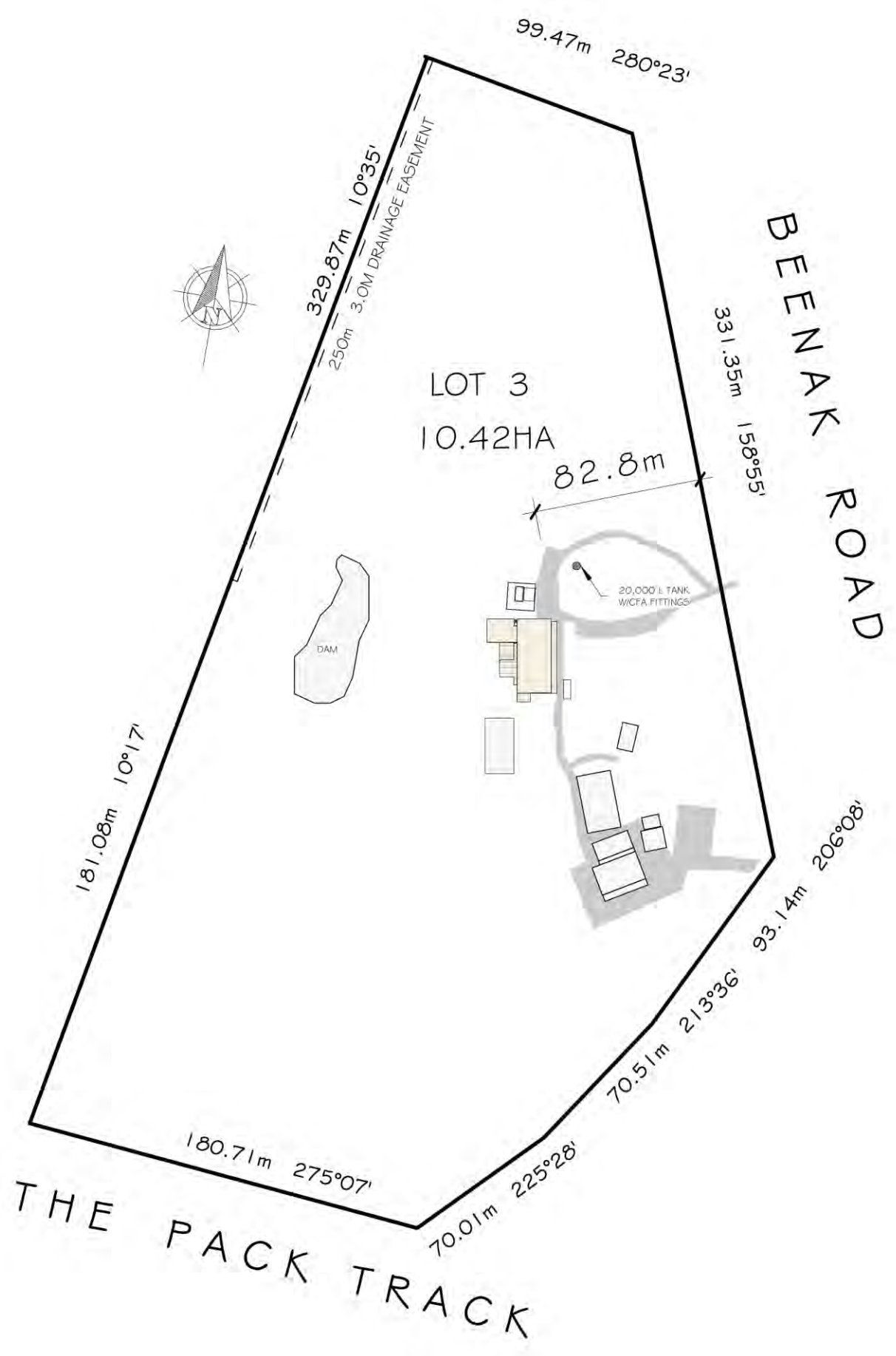
Ecological Vegetation Class (EVC)



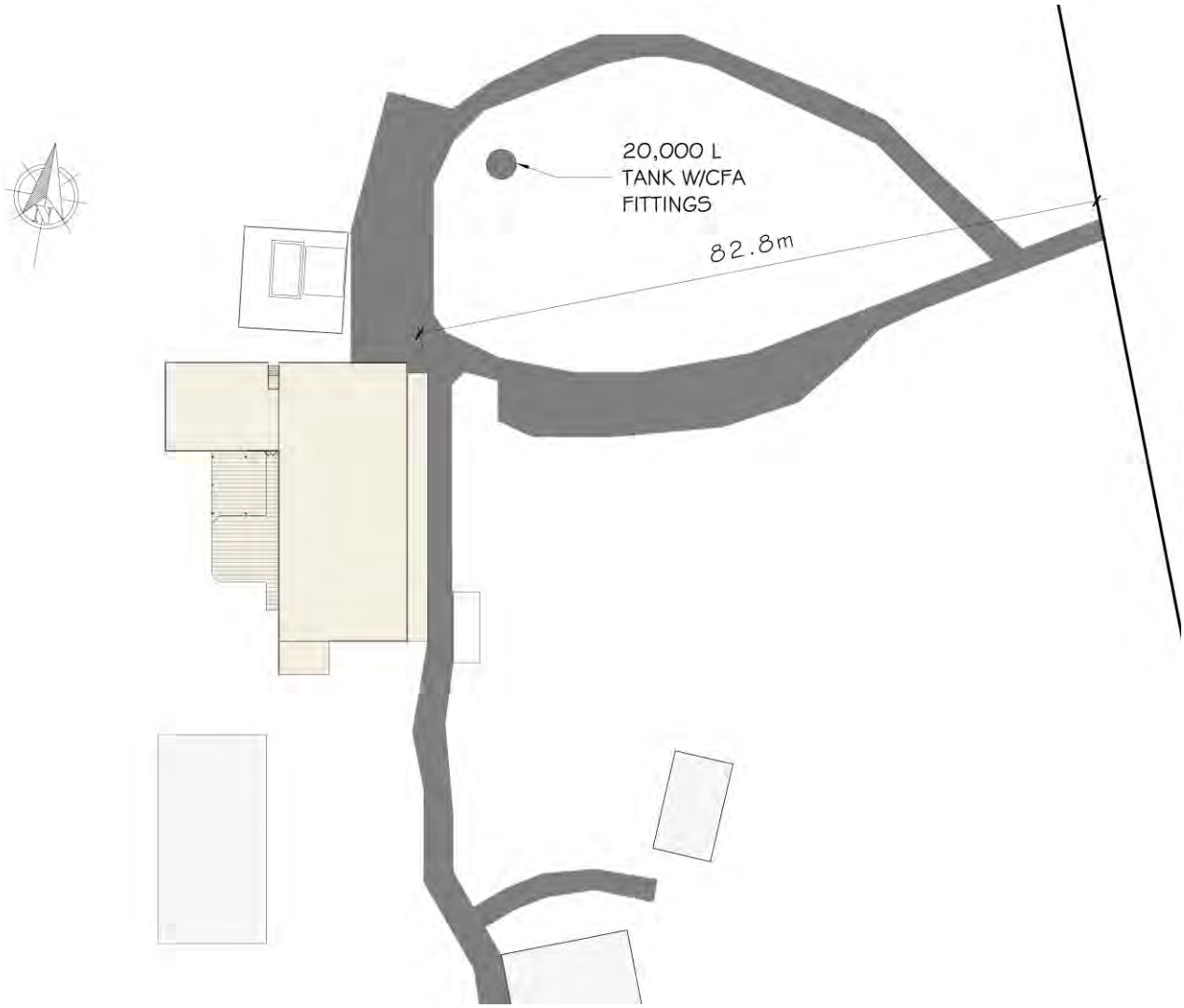
SFF = EVC 45, Shrubby Foothill Forest (EVC Benchmarks: Trees to 25m ht, 40% canopy cover)
DF = EVC 29, Damp Forest (EVC Benchmarks: Trees to 30m ht, 40% canopy cover)
LF = EVC 16, Lowland Forest (EVC Benchmarks: Trees to 25m ht, 30% canopy cover)

Contour Map

Site Layout



Site Layout



Stringybark Lodge Camp
www.stringybarklodge.com.au

HALLS OUTDOOR EDUCATION
www.hallsoutdoored.com.au

Phone: 5968 1739

WILD FIRE PROCEDURES AND POLICY

The details are outlined below

- CFA Gembrook are given a list of who is staying at Stringybark Lodge for 1st term and 4th term each year
- CFA Gembrook are given the student numbers of groups attending Stringybark Lodge
- CFA Gembrook will notify Stringybark Lodge of any impending fires that may require evacuation or to stay at the Lodge
- Stringybark Lodge is assessed every 3 years for bushfire safety (and included in our camps association accreditation)
- Each assessment so far has stated that Stringybark Lodge is well situated for wildfire with cleared lands to the east, north east and west and only a small amount of bushland to the north and south of the building
- Staff training is held before 1st term each year and includes sessions from a wildfire expert
- A designated safe area for marshalling is part of Stringybark Lodges fire safety procedures
- Ventura Bus Lines and Cardinia Transit are our nearest providers of bus transport and will if necessary be available for group evacuation. An option of providing on site mini bus transport for the entire group is also available.
- The Camp has landline communications. Halls Outdoor Education uses satellite phones and mobile phones (not all networks reliable at the Lodge)
- A series of trigger points have been identified in relation to the new fire danger rating
    - At rating of high, and very high – schools will be instructed that students carry fire resistant clothing. Daily communication to be held with all mobile groups
    - At rating of severe – conditions monitored hourly, regular communications with each group giving updated fire ratings, possible change of activities, and walking routes
    - At rating of extreme – change of activities, restricted to hardtop venue only
    - At rating of catastrophic – change program to area minimal fire risk where possible or cancellation of program in areas where catastrophic rating called

      In addition, School Holiday programs will use the following triggers:
      - On Code Red Days – one off days: the program will relocate to Casey Ark swim centre (Narre Warren) for the day via Cardinia Bus Lines during the day. if more than one Code Red Days in a row, management will move to cancel the program and evacuate all staff and children.
      - On Severe and Extreme Days – activities modified to remain on site at Stringybark Lodge with close vigilance and communication as to possible fire risk.

If you require more information than described here please call to discuss your needs.

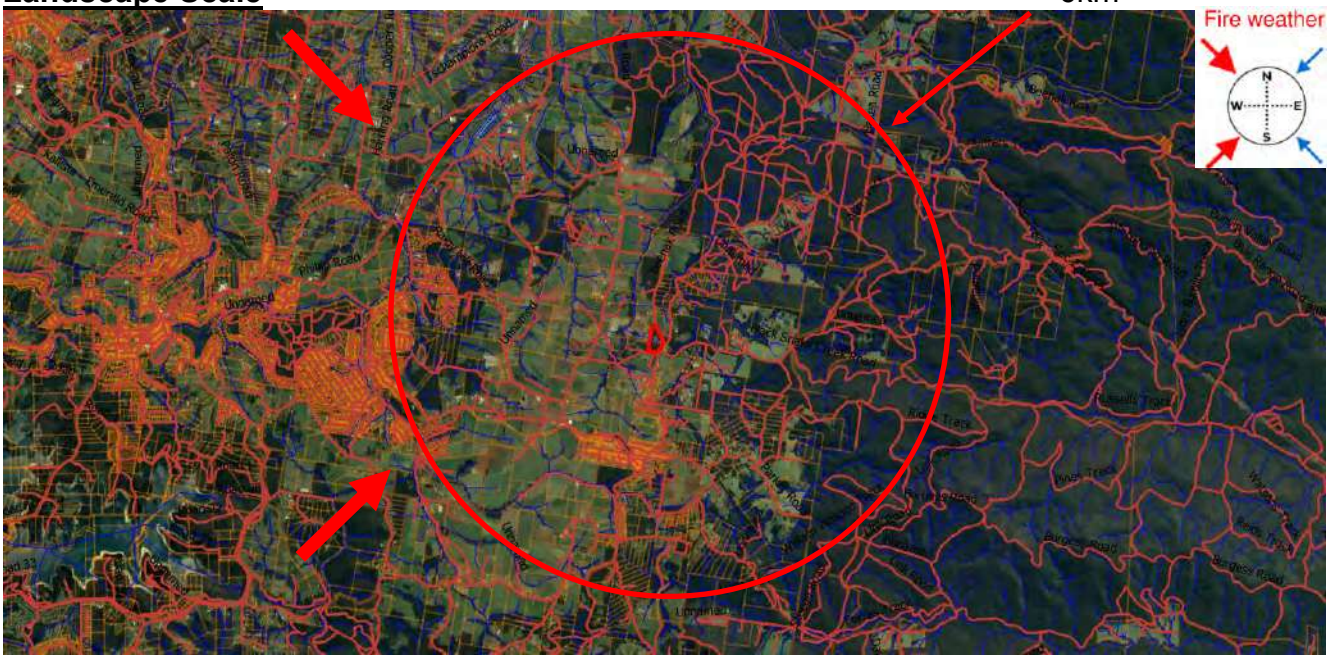
Regards,

[redacted]
Manager
Stringybark Lodge Camp

Bushfire Hazard Landscape Assessment

Neighbourhood Scale 1.5km

Landscape Scale 6km



It is considered that the fire risk from the wider landscape is no greater than that assumed by AS3959 and therefore adequately dealt with by the AS3959/VPP defendable space tables and/or Radiant Heat modelling and building construction controls

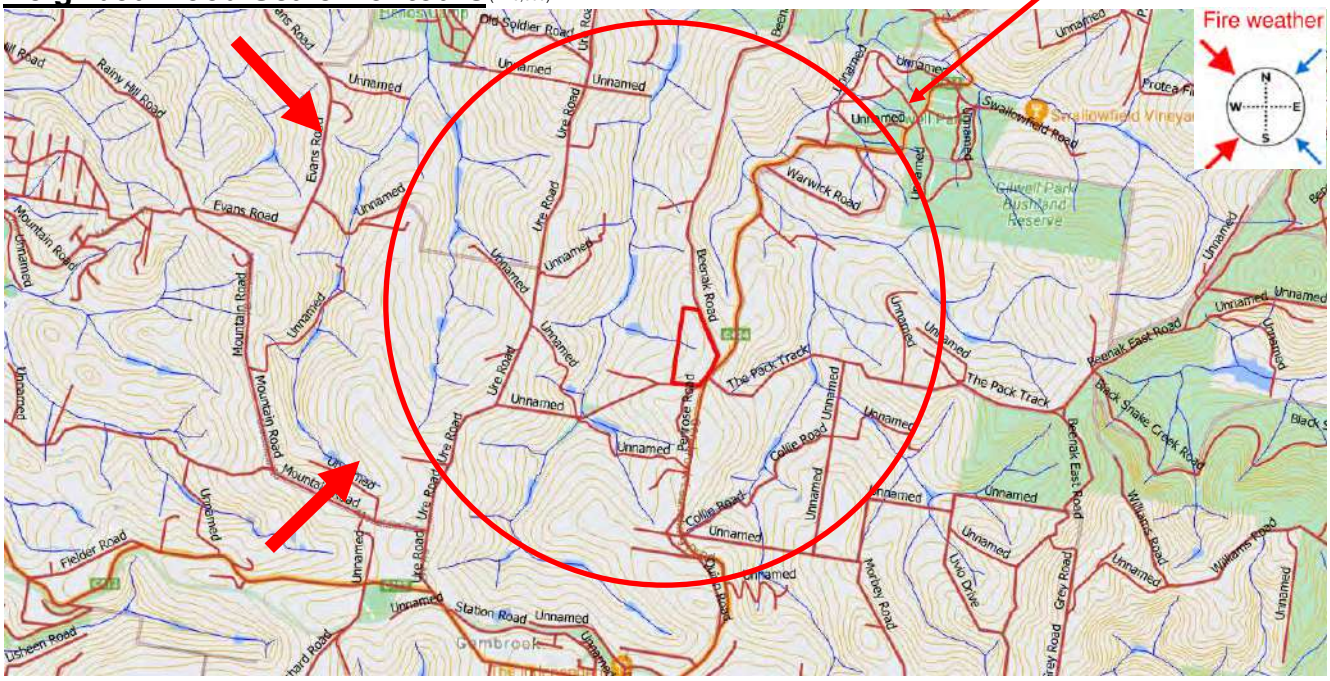
The main fire weather comes from the North-West followed by the South-West (*Long, M (2006) A climatology of extreme fire weather days in Victoria*). There is sufficient distance of modified vegetation, mainly pasture, in these directions to ameliorate any landscape fire and any risk can be credibly dealt with by the AS3959/VPP defendable space and building construction controls.

In accordance with the DELWP Technical Guide *(Planning Permit Applications Bushfire Management Overlay, September 2017)* we believe this site is situated at the lower end of a "Broader Landscape Type 3" area. The landscape risk to this site is not extreme and is less than large parts of Victoria. With the required measures in place development is appropriate.

Bushfire Hazard Landscape Assessment

Neighbourhood Scale Contours (1:25,000)

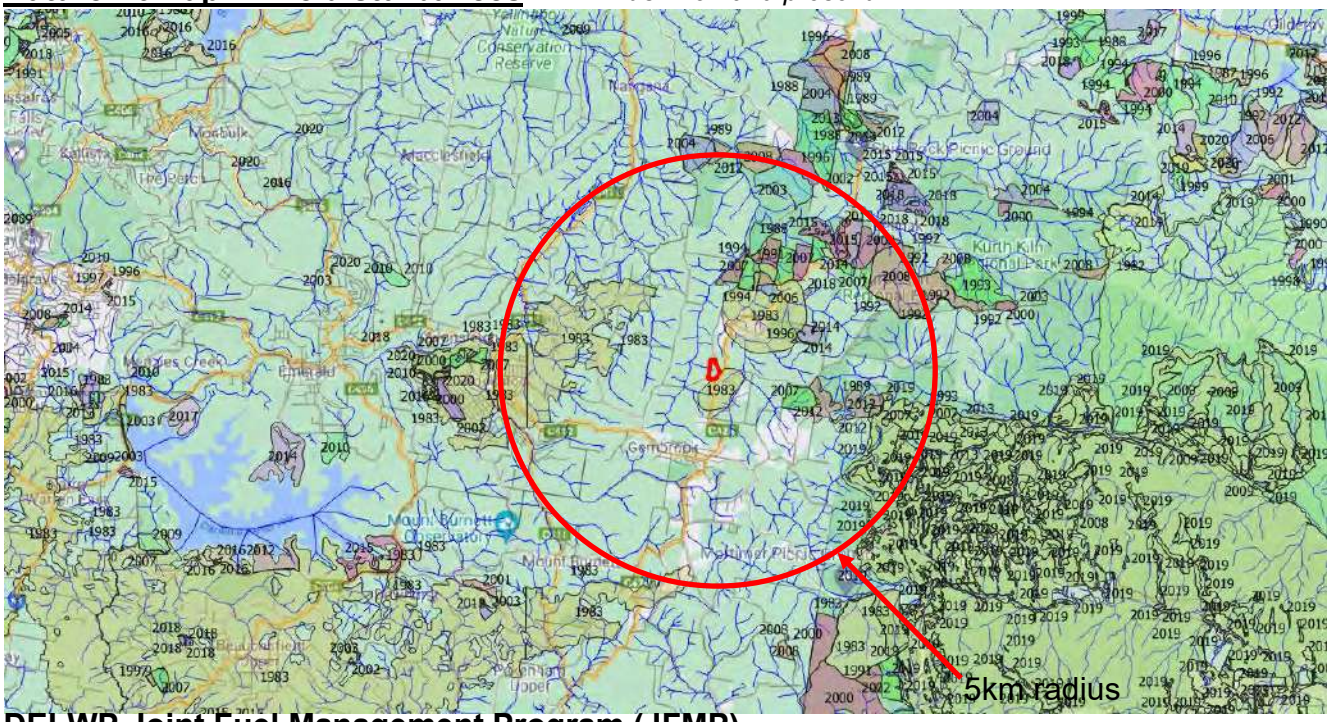
2km radius circle



Bushfire Hazard Landscape Assessment

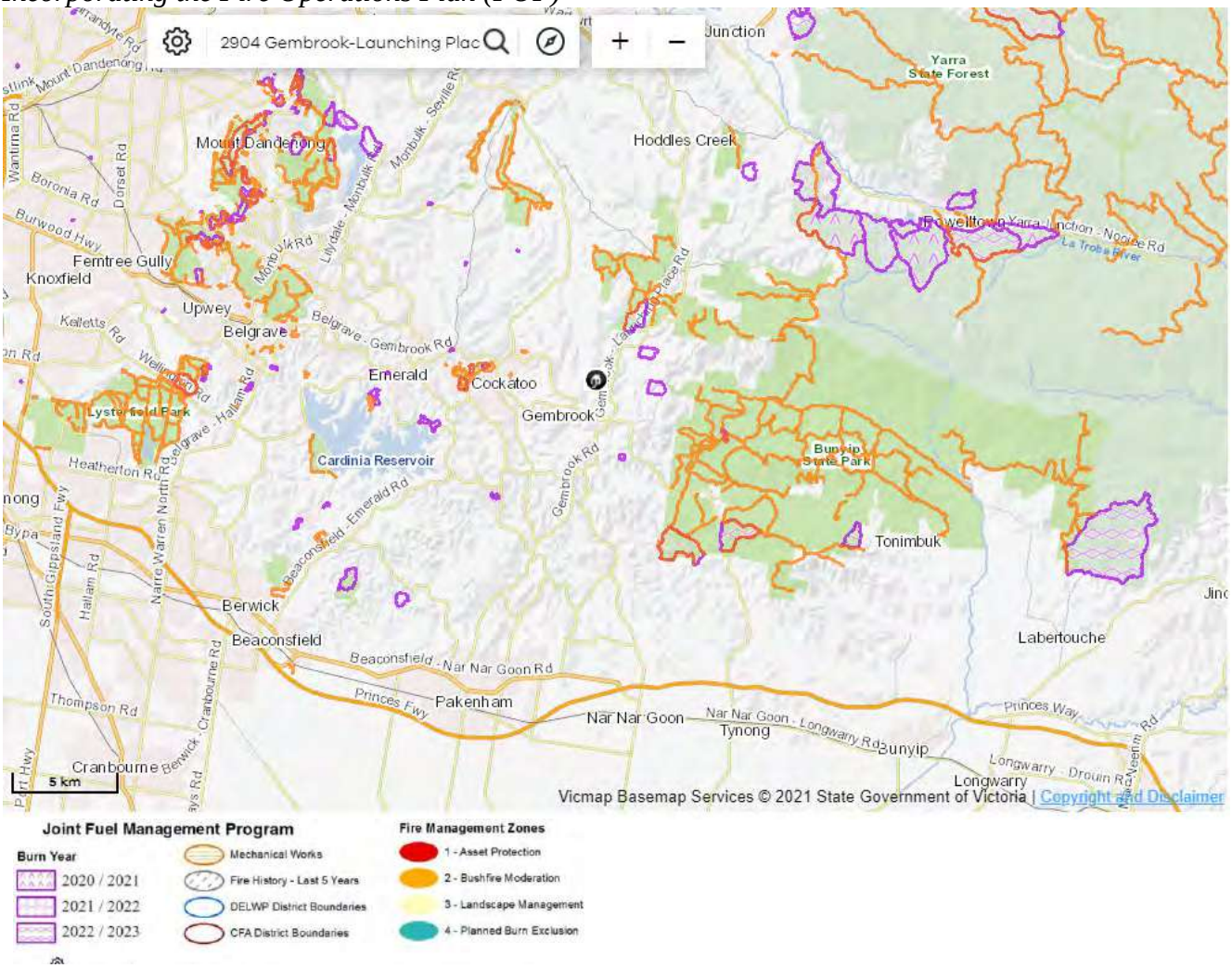
NatureKit Map – Fire disturbances

= Bushfire 1970-present



DELWP Joint Fuel Management Program (JFMP)

Incorporating the Fire Operations Plan (FOP)



Bushfire Hazard Landscape Assessment

Bushfire Place of Last Resort

A 'Neighbourhood Safer Place' also known as a 'Bushfire Place of Last Resort' (NSP-BPLR) is a place of last resort when all other bushfire plans have failed. People need to make their own investigations into the most appropriate Neighbourhood Safer Place and route for their particular circumstance at the time.

https://www.cfa.vic.gov.au/plan-prepare/neighbourhood-safer-places

Gembrook (Community Centre Carpark) Neighbourhood Safer Place

Cnr Beenak East Road and Gembrook Road (entry off Gembrook Road) Gembrook 3783 Get directions

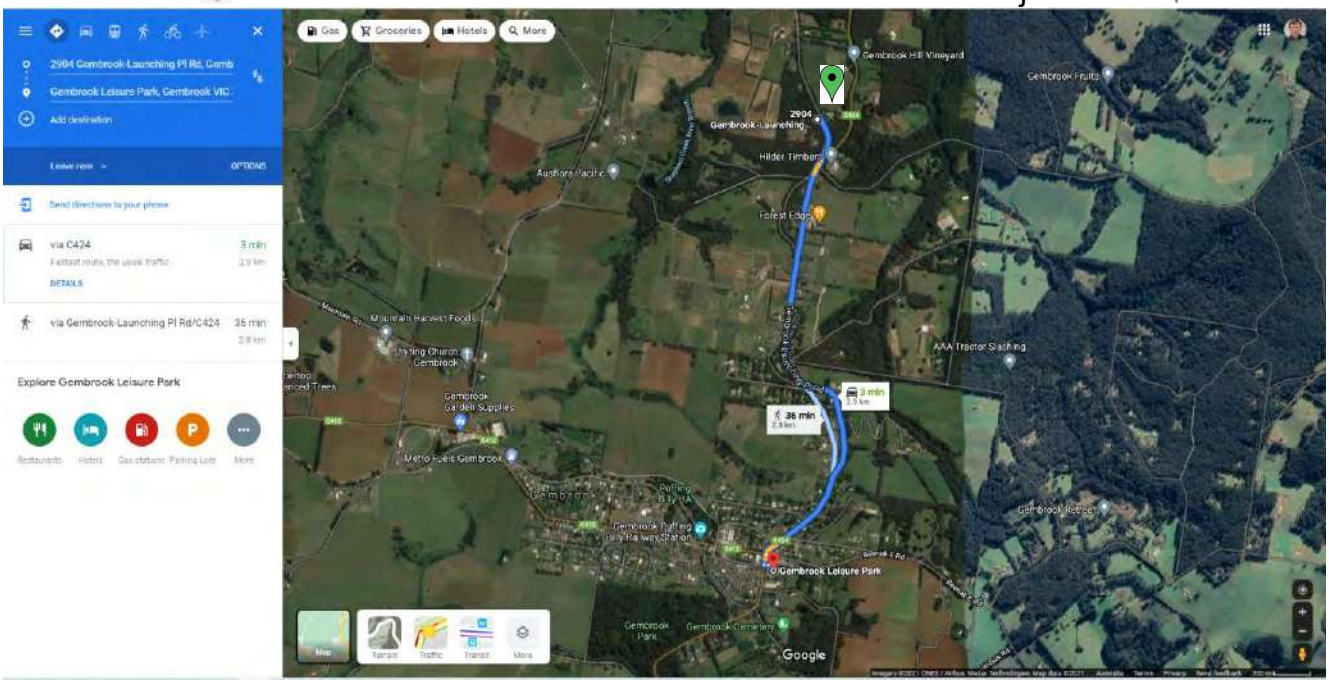
Cockatoo (Community Complex) Neighbourhood Safer Place

Pakenham Road (between McBride Street and Alexander Road) Cockatoo 3781 Get directions

Emerald (Pepi's Land Netball Courts & Car Park) Neighbourhood Safer Place

16 Beaconsfield-Emerald Road Emerald 3782 Get directions

NSP-BPLR = Subject Site =



BAL Assessments

[redacted]

With reference to Australian Standard AS3959

Site Address:		Lat. South:	
		Long. East:	
Name:		email:	[redacted]
		Phone:	

Bushfire Hazard Site Assessment: *(B2)* **FDI**: 100 = Location of proposed works

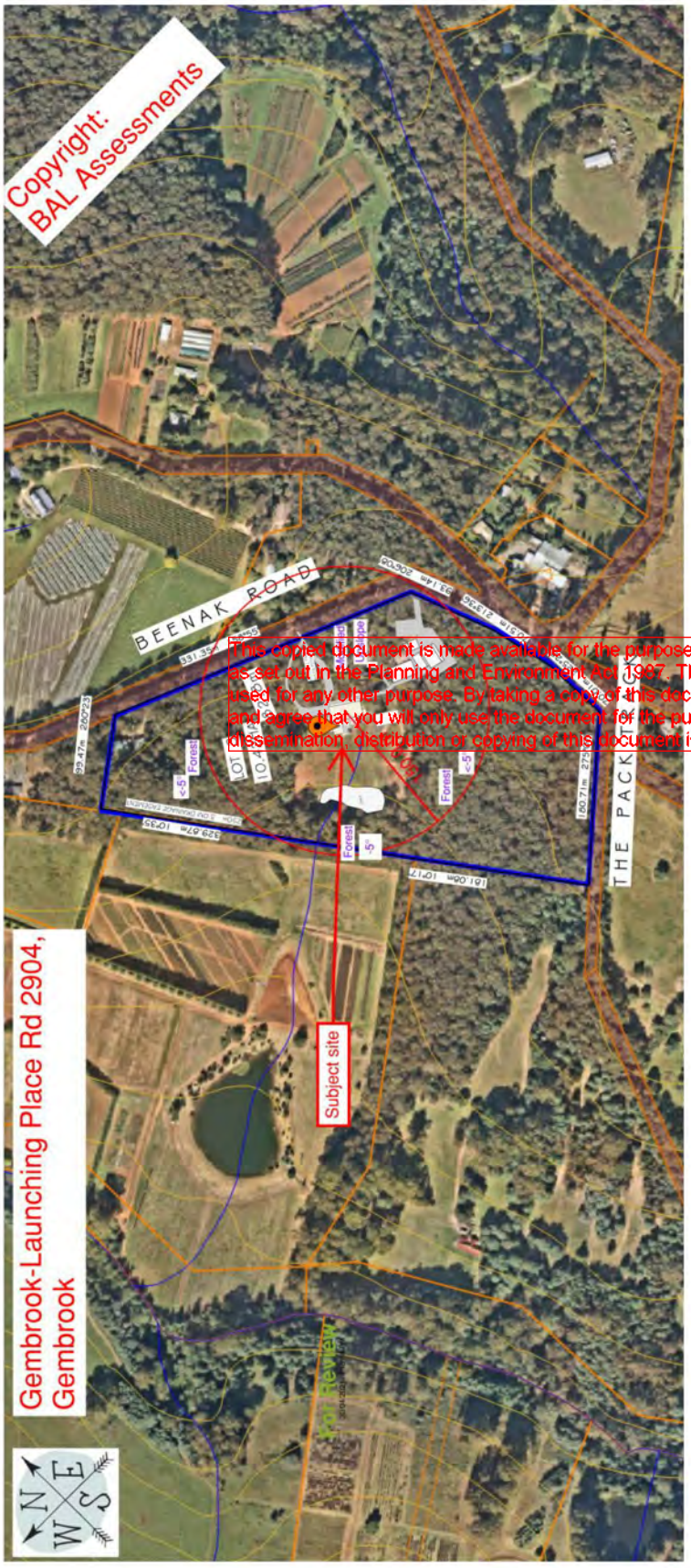
	(B3) *(01 to 28 Fig. 2.3)*	*(B5)* θ	*(B6)*	*(B4)* θ	*(B8)*	*(TB2)* Veg. Ht (Class 10 to 15)	*(FB1)* Ht (*h*) of Receiver	
≈*N*	Forest	<-5 θ	32m	<-5 θ	100m	n/a	≈3m	
≈*E*	Forest (Understory Mng)	Upslope	50m	Upslope	100m	n/a	≈3m	
≈*E*	Forest (2m Canopy Sep)	Upslope	25m	Upslope	100m	n/a	≈3m	
≈*S*	Forest (Understory Mng)	<-5 θ	50m	<-5 θ	100m	n/a	≈3m	
≈*S*	Forest (2m Canopy Sep)	<-5 θ	32m	<-5 θ	100m	n/a	≈3m	
≈*W*	Forest	-5 θ	32m	-5 θ	100m	n/a	≈3m	

*1 Vegetation within 150m excluded under AS3959 Clause 2.2.3.2.f
*2 Grassland greater than 50m excluded under AS3959 Table 2.4
*3 Modified vegetation is where it does not fit into the classifications in AS3959 because it has been modified/altered or has different fuel loads from AS3959 or limited understory or is not Low-Threat vegetation
*4 Windbreaks are excluded under AS3959 Clause 2.2.3.2.f. Generally considered to be a single row of trees used as a screen.

Site BAL: 29

Assessor(s): [redacted] Date: 5 / 04 / 2021

[redacted]



Name of Assessor(s)	[redacted]
Date of assessment	Desk

Calculation of Flame Height within Outer Fuel Mng Zone with No canopy involvement

Location of Assessment

Gembrook-Launching Place Rd 2904, Gembrook

Direction of assessment	East	
Fire Danger Index *FDI*	100	
Vegetation classification	Modified	
Understorey Fuel Load (t/ha) *w*	4	
Total Fuel Load (t/ha) *W*	4	
Vegetation height (m) *VH*	n/a	
Slope to Vegetation (θ)	0	Upslope
Slope under Vegetation (θ)	0	Upslope
d		
Flame Width (m) *Wf*	100	
Flame Temperature (K) *Tf*	1090	
Steady State ROS (km/hr) *Rslope*	0.5	
Height of Receiver (m) *h*	1.8	
Sustained Flame Length (m) *Lf*	3.6	

BAL Assessments

www.BAL.net.au

John Burke

0417 885 747 John@BAL.net.au

BAL-29

(a basic summary extracted from AS 3959-2018)

There is an increased risk of Ember Attack and burning debris ignited by windborne embers and a likelihood of exposure to an increased level of radiant heat.
The construction elements are expected to be exposed to a heat flux not greater than 29 kW/m2

Appropriate Construction Requirements for BAL 29

Subfloor Supports
Enclosure by non-combustible or naturally bushfire-resisting timber wall external wall or by steel, bronze or aluminium mesh or a combination. Where the subfloor is unenclosed there shall be non-combustible supports or naturally bushfire-resisting timber.

Floors
Concrete slab on ground or enclosure by external wall, metal mesh as above or flooring less than 400 mm above ground level to be non-combustible, naturally bushfire-resisting timber or protected on the underside with sarking or mineral wool insulation.

External Walls
Non-combustible material (masonry, brick veneer, mud brick, aerated concrete, concrete), timber framed, steel framed walls sarked on the outside and clad with 6 mm fibre cement sheeting or steel sheeting or bushfire-resisting timber.

External Windows
5 mm toughened glass with openable portion screened and frame of metal or metal reinforced PVC-U, or bushfire-resisting timber and portion within 400 mm of ground, deck etc screened.

External Doors
Protected by bushfire shutter, or screened with steel, bronze or aluminium mesh or non-combustible, or 35 mm solid timber for 400 mm above threshold or 6 mm toughened glass. Metal or bushfire-resisting timber framed tight-fitting with weather strips at base.

Roofs
Non-combustible covering. Roof/wall junction sealed. Openings fitted with non-combustible ember guards. **Roof to be fully sarked**, on a sheet roof a foil-backed insulation blanket maybe installed over the roof battens.

Verandas Decks etc
Enclosed sub-floor space or non-combustible or bushfire-resisting timber supports. Decking to be non-combustible or bush-bushfire-resisting timber.

Bushfire-resisting Timber – Tested Species:

Standard Trade Name	Botanical Name
Ash, Silvertop	Eucalyptus sieberi
Blackbutt	Eucalyptus pilularis
Gum, Red, River	Eucalyptus camaldulensis
Gum, Spotted	Corymbia maculata
	Corymbia henryi
	Corymbia citriodora
Ironbark, Red	Eucalyptus sideroxylon
Kwila (Merbau)	Intsia bijuga
Turpentine	Syncarpia glomulifera

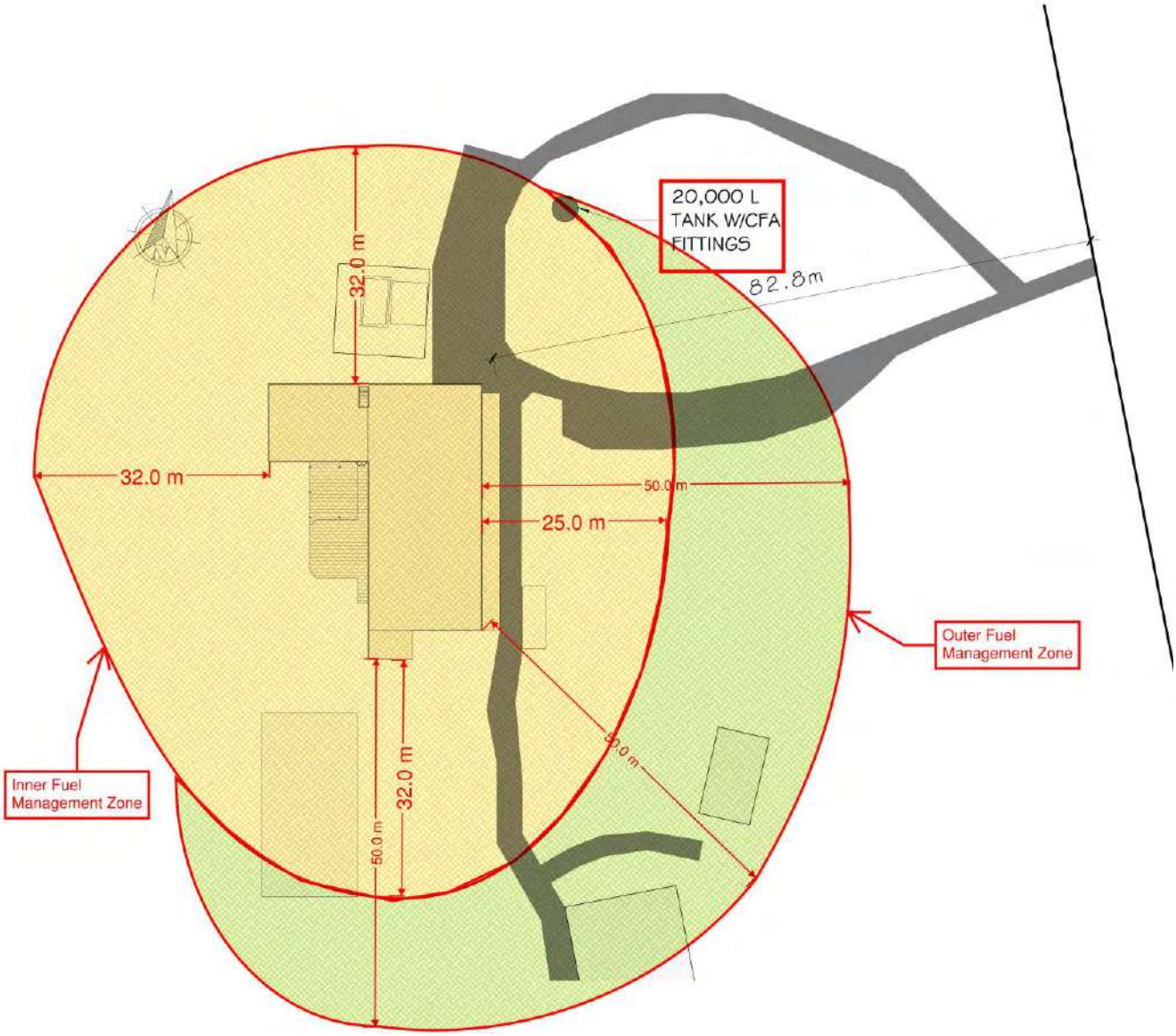
Refer also to AS3959 Appendix E for uses of timber species with densities of ≥750 kg/m3.

Foreword from AS 3959-2018
"It should be borne in mind that the measures contained in this Standard cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the degree of vegetation management, the unpredictable nature and behaviour of fire, and extreme weather conditions."

Specialist advice should be obtained regarding complying with all BAL levels and the requirements of the construction elements.
The above is for general information only and should not be used for design or construction. Please refer to AS3959-2018 for full details.

Bushfire Management Plan

The building works will be designed and constructed to BAL-29



Bushfire Management Plan

The bushfire protection measures forming part of the permit or shown on the endorsed plans, including those relating to construction standards, defendable space, water supply and access, must be maintained to the satisfaction of the responsible authority on a continuing basis. This condition continues to have force and effect after the development authorized by the permit has been completed.

1. Defendable Space

1.1 Inner Fuel Management Zone

Defendable space *to a distance of 25m to the east and 32m in all other directions around the building* is provided and is managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3m of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least ~~5~~ 2 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

1.2 Outer Fuel Management Zone

Defendable space *to a distance of 50m to the east and south around the building* is provided and is managed in accordance with the following requirements:

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

2. Construction standards

The building works shall be designed and constructed to BAL-29.

3. Water Supply

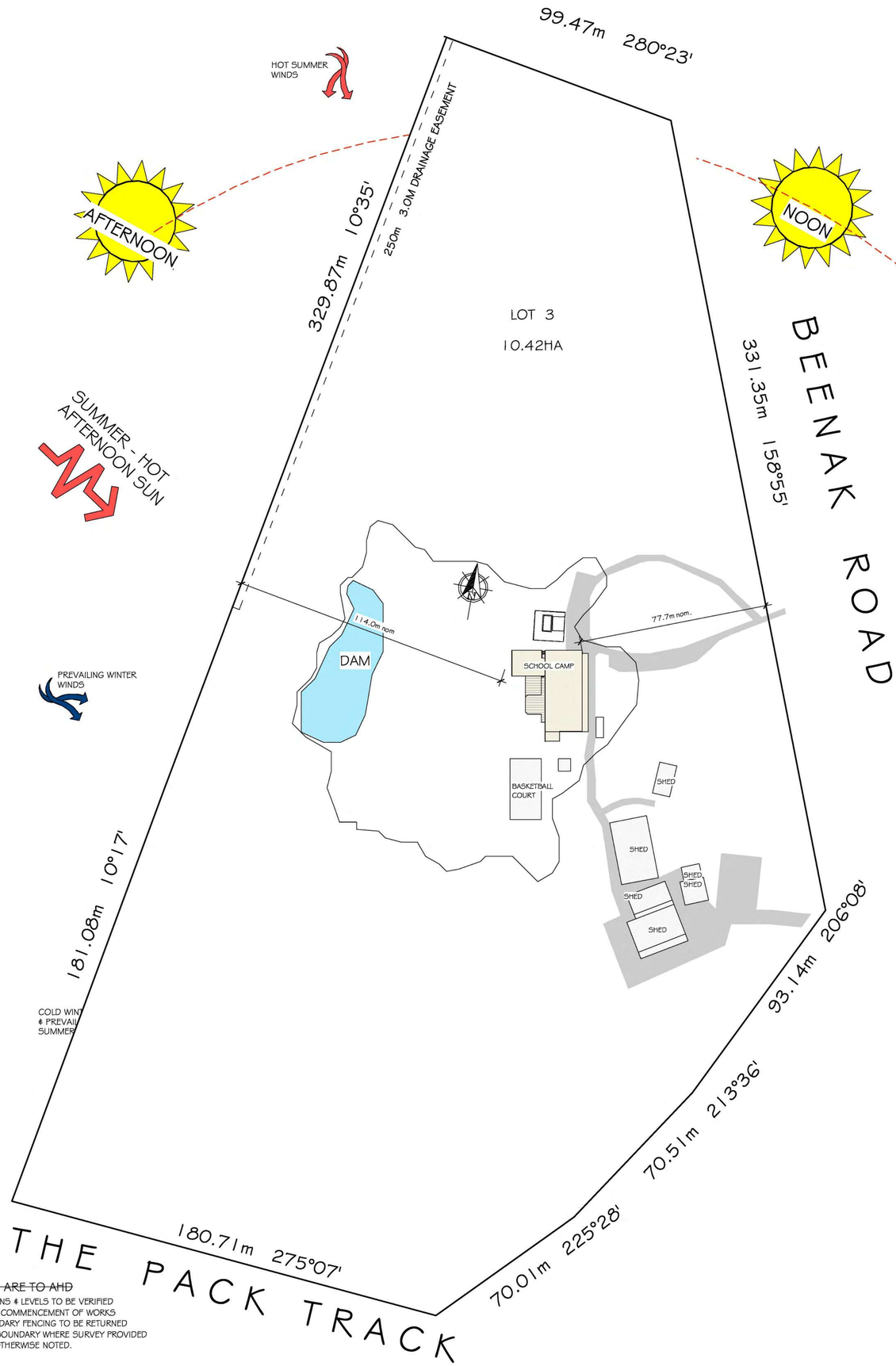
20,000 litres of effective water supply for fire fighting purposes which meets the following requirements:

- Be stored in an above ground water tank constructed of concrete or metal.
- Have all fixed above-ground water pipes and fittings required for fire fighting purposes be made of corrosive resistant metal.
- Include a separate outlet for occupant use.
- The water supply must also –
    - Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority.
    - Be located within 60m of the outer edge of the approved building.
    - The outlets/s of the water tank must be within 4 metres of the accessway and be unobstructed.
    - Incorporate a separate ball or gate valve (British Standard Pipe (BSP) 65mm) and coupling (64 mm CFA 3 thread per inch male fitting).
    - Any pipework and fittings must be a minimum of 65 mm (excluding the CFA coupling).

4. Access

Access for firefighting purposes which meets the following requirements:

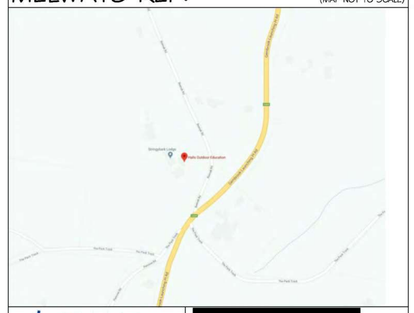
- Fire authority vehicles should be able to get within 4 metres of the water supply outlet.
- All weather construction.
- A load limit of at least 15 tonnes.
- Provide a minimum trafficable width of 3.5 metres.
- Be clear of encroachments for at least 0.5m on each side and 4m vertically.
- Curves must have a minimum inner radius of 10m.
- The average grade must be no more than 1 in 7 (14.4 %) (8.1 degrees) with a maximum grade of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50m.
- Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.



~~LEVELS ARE TO AHD~~

DIMENSIONS & LEVELS TO BE VERIFIED PRIOR TO COMMENCEMENT OF WORKS
ALL BOUNDARY FENCING TO BE RETURNED TO TITLE BOUNDARY WHERE SURVEY PROVIDED UNLESS OTHERWISE NOTED.

MELWAYS REF: (MAP NOT TO SCALE)



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[redacted]

Job Address:
2904 GEMBROOK-LAUNCHING PLACE, GEMBROOK VIC 3783

Melways Ref. LOT 3 PS 401903V
V. 10312 F. 188

Title: PROPOSED EXTENSION TO SCHOOL CAMP BUILDING

NOTE: PLANNING DRAWINGS ARE NOT TO BE USED FOR BUILDING PERMIT APPLICATIONS

Issue Amendments:

Issue	Date	Description	Issue	Date	Description
B	AUG23	CHANGE PERGOLA ROOF			

REGISTERED Building Practitioner DP-AD 72656
Design Matters Member
Enable, advocate and celebrate good building design

Issue:	TP_B	Sheet	1 of 4
Date:	OCT 20	Dwg. No:	20-130
Scale:	As indicated	Drawn:	AF

CLEARED
AGRICULTURAL LAND

FOREST

BEENAK ROAD

ALL WEATHER GRAVEL ROADS - MIN4.5M WIDE, MIN HEIGHT CLEARANCE 4.0M

EFFLUENT FIELD AREAS APPROX AS TRACED FROM APPROVED PERMIT. BUILDER TO CONFIRM LOCATION ON SITE PRIOR TO WORKS

TREE REMOVAL AND MANAGEMENT AREA

20,000 L TANK W/CFA FITTINGS

EXISTING POOL AREA

IRRIGATION FIELD AREA 1

32m

NO VEGETATION WITHIN 15m OF PROPOSED WORKS

PROPOSED EXTENSIONS

RELOCATE ENCROACHMENT OF EFFLUENT FIELD AREA AS REQUIRED

DAM

32m

PROPOSED DECK EXTENSION

MIN 1.0M

PROPOSED

OPEN LAWN

EXISTING VERANDAH

OUTER FUEL MANAGEMENT ZONE

INNER FUEL MANAGEMENT ZONE

25m

50m

EXISTING PERGOLA

UNDEFINED CREEK BED (NOT VISIBLE ON SITE)

EXISTING BUILDING

EXISTING OFFICE

FOREST

MIN 1.0M

50m

BASKETBALL COURT

IRRIGATION FIELD AREA 1

32m

50m

EXISTING STORAGE BUILDING

GAMES SHED

STORAGE

STORAGE

EXISTING SHEDS

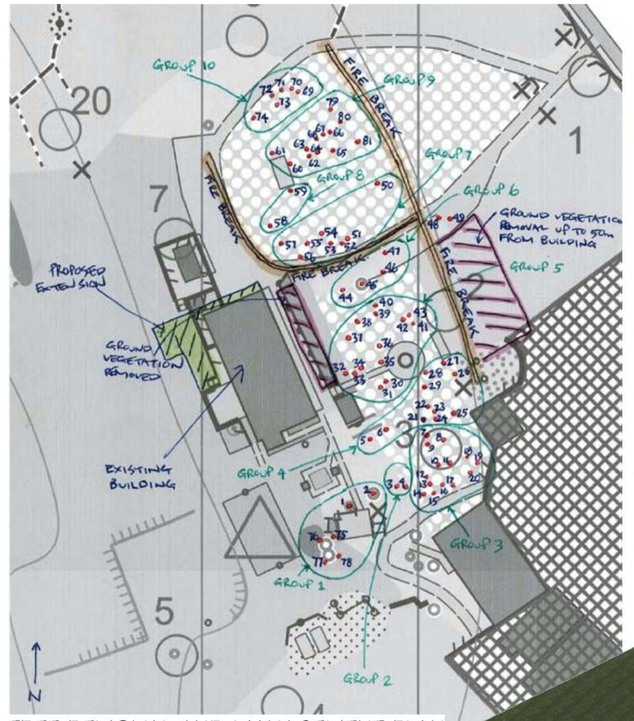
STORAGE AND STAFF

STORAGE AND STAFF

EXISTING SHEDS

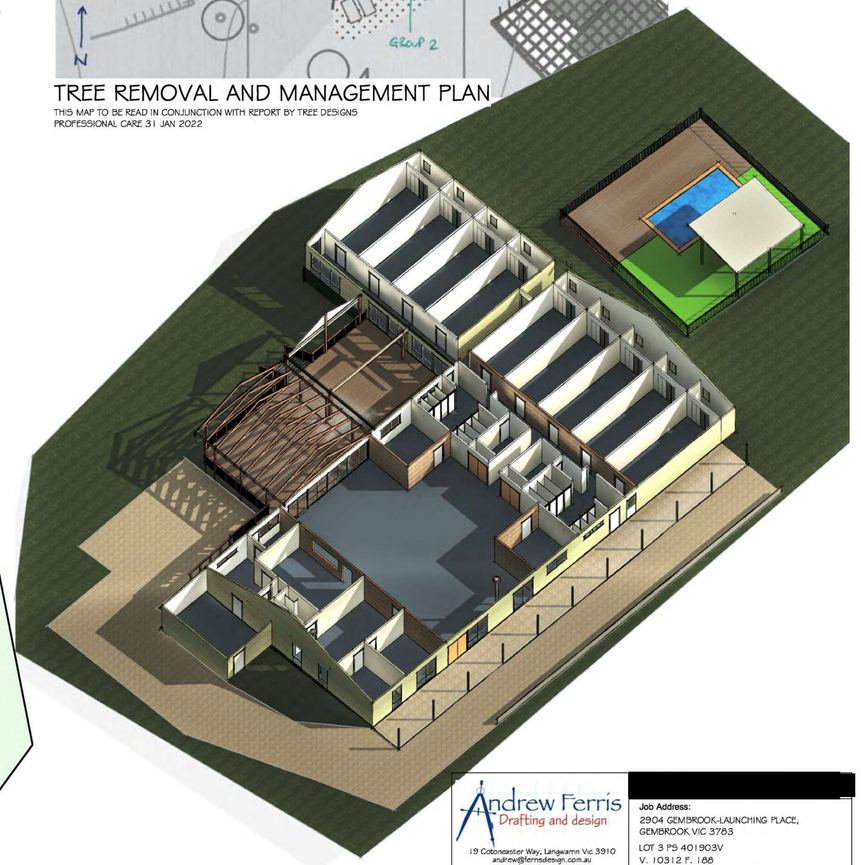
FOREST

93.14m 206°08'



TREE REMOVAL AND MANAGEMENT PLAN

THIS MAP TO BE READ IN CONJUNCTION WITH REPORT BY TREE DESIGNS PROFESSIONAL CARE 31 JAN 2022



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GEMBROOK VIC 3783

LOT 3 PS 401903V
V. 10312 F. 188

Title: PROPOSED EXTENSION TO SCHOOL CAMP BUILDING

NOTE: PLANNING DRAWINGS ARE NOT TO BE USED FOR BUILDING PERMIT APPLICATIONS

Issue Amendments:

Issue	Date	Description	Issue	Date	Description
B	AUG23	CHANGE PERGOLA ROOF			

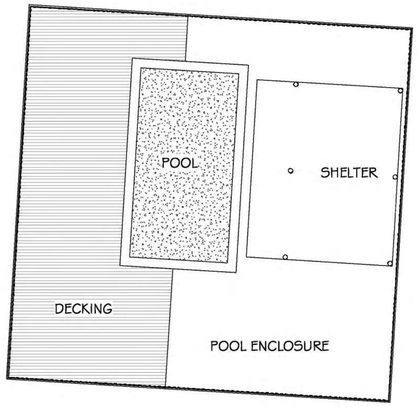
REGISTERED Building Practitioner DPAD 32656

Design Matters Member

Issue:	TP_B	Sheet	2 OF 4
Date:	OCT 20	Dwg. No:	20-130
Scale:	As indicated	Drawn:	AF

STATISTICS

SITE AREA	10.42 HA
EXISTING BUILDING	523.1m²
EXISTING DECK AND PERGOLA	82.4m²
EXISTING FRONT VERANDAH	77.3m²
PROPOSED ADDITIONAL WING	140.6m²
PROPOSED ADDITIONAL BATHROOMS	20.3m²
PROPOSED UNDER ROOFLINE STEPS	3.3m²
TOTAL NEW BUILDING AREA -CONDITIONED	684.0m²
TOTAL NEW BUILDING AREA	847.0m²
APPROX PROPOSED BUILDINGS TOTAL AREA	2302m²
SITE COVER	2302m²
SITE COVER RATIO	2.2%
DRIVEWAYS	GRAVEL
DRAINED PAVED AREAS	N/A
HARD COVER AREA:	2302m²
HARD COVER RATIO:	2.2%
GARDEN AREA REQUIREMENT:	MAX 35%
GARDEN AREA RATIO:	2.2%



EXISTING FLOOR PLAN 1:100

PROPOSED FLOOR PLAN 1:100

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Melways Ref. LOT 3 PS 401903V
V. 10312 F. 188

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Issue Amendments:

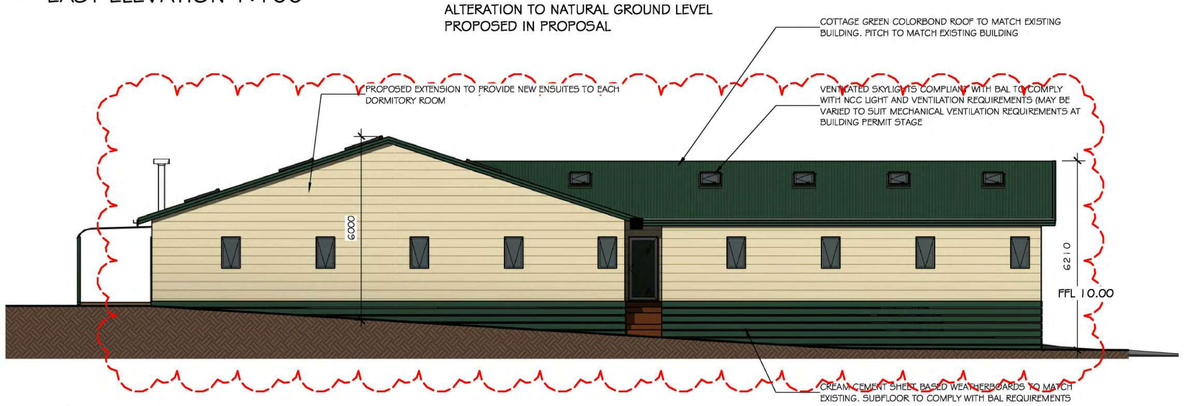
Issue	Date	Description	Issue	Date	Description
B	AUG23	CHANGE PERGOLA ROOF			

REGISTERED Building Practitioner DPAD 32666
Design Matters Member

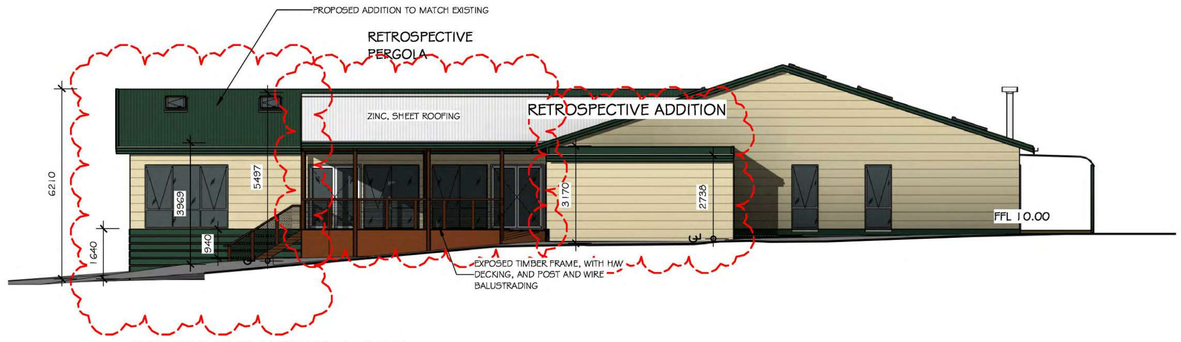
Issue:	TP_B	Sheet	3 of 4
Date:	OCT 20	Dwg. No:	20-130
Scale:	1 : 100	Drawn:	AF

EAST ELEVATION 1:100

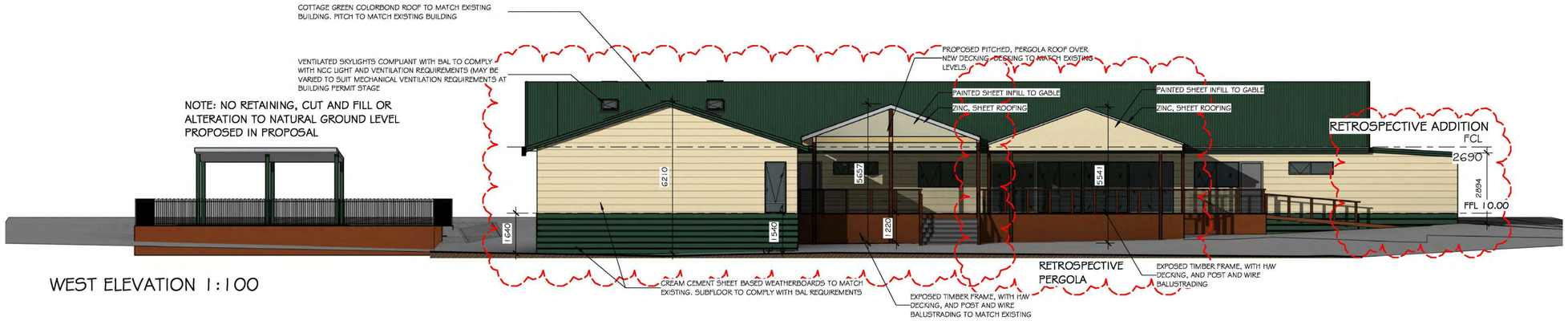
NOTE: NO RETAINING, CUT AND FILL OR ALTERATION TO NATURAL GROUND LEVEL PROPOSED IN PROPOSAL



NORTH ELEVATION 1:100



SOUTH ELEVATION 1:100



WEST ELEVATION 1:100

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B	AUG23	CHANGE PERGOLA ROOF			

REGISTERED Building Practitioner DP-AD 32606
Design Matters Member

Issue:	TP_B	Sheet	4 OF 4
Date:	OCT 20	Dwg. No:	20-130
Scale:	1:100	Drawn:	AF