

PP267/2018-1

2235 Birregurra Forrest Road FORREST

Lot: 1 TP: 126624 V/F: 9391/039

Construction of Dwelling

PG & SL Scott Pty Ltd

Officer - Erin Sonego

EXHIBITION FILE

This document is made available for the sole purpose of enabling its consideration and review as part of a planning process under the Planning and Environment Act 1987. The document must not be used for any purpose which may breach any Copyright.

Submissions to this planning application will be accepted until a decision is made on the application.

If you would like to make a submission relating to a planning permit application, you must do so in writing to the Planning Department

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Colac Otway
SHIRE

Planning Enquiries
Phone: (03) 5232 9400
Web: www.colacotway.vic.gov.au

Clear Form

Office Use Only

Application No.: PP267/2018-1

Date Lodged: / /

Application for a Planning Permit

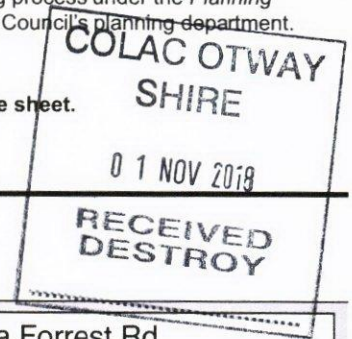
If you need help to complete this form, read MORE INFORMATION at the end of this form.

Any material submitted with this application, including plans and personal information, will be made available for public viewing, including electronically, and copies may be made for interested parties for the purpose of enabling consideration and review as part of a planning process under the Planning and Environment Act 1987. If you have any questions, please contact Council's planning department.

Questions marked with an asterisk (*) must be completed.

If the space provided on the form is insufficient, attach a separate sheet.

Click for further information.



The Land

Address of the land. Complete the Street Address and one of the Formal Land Descriptions.

Street Address *

Unit No.:	St. No.: 2235	St. Name: Birregurra Forrest Rd
Suburb/Locality: Forrest		Postcode: 3236

Formal Land Description *

Complete either A or B.

This information can be found on the certificate of title.

If this application relates to more than one address, attach a separate sheet setting out any additional property details.

A Lodged Plan Title Plan Plan of Subdivision

OR

B

The Proposal

You must give full details of your proposal and attach the information required to assess the application. Insufficient or unclear information will delay your application.

For what use, development or other matter do you require a permit? *

A house for management purposes on the land. The land is being developed for a summer fruits orchard (180 fruit trees) and native plant production for cut flowers.

Provide additional information about the proposal, including: plans and elevations; any information required by the planning scheme, requested by Council or outlined in a Council planning permit checklist; and if required, a description of the likely effect of the proposal.

Estimated cost of any development for which the permit is required *

Cost \$250,000

You may be required to verify this estimate. Insert '0' if no development is proposed.



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Existing Conditions i

Describe how the land is used and developed now *

For example, vacant, three dwellings, medical centre with two practitioners, licensed restaurant with 80 seats, grazing.

Pasture

Provide a plan of the existing conditions. Photos are also helpful.

Title Information i

Encumbrances on title *

Does the proposal breach, in any way, an encumbrance on title such as a restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope?

- Yes (If 'yes' contact Council for advice on how to proceed before continuing with this application.)
- No
- Not applicable (no such encumbrance applies).

Provide a full, current copy of the title for each individual parcel of land forming the subject site. The title includes: the covering 'register search statement', the title diagram and the associated title documents, known as 'instruments', for example, restrictive covenants.

Applicant and Owner Details i

Provide details of the applicant and the owner of the land.

Applicant *

The person who wants the permit.

Name:

Title: First Name: Surname:

Organisation (if applicable):

Postal Address:

If it is a P.O. Box, enter the details here:

Suburb/Locality: State: Postcode:

Please provide at least one contact phone number *

Contact information for applicant OR contact person below

Business phone: Email:

Mobile phone: Fax:

Where the preferred contact person for the application is different from the applicant, provide the details of that person.

Contact person's details* Same as applicant

Name:

Title: First Name: Surname:

Organisation (if applicable):

Postal Address:

If it is a P.O. Box, enter the details here:

Suburb/Locality: State: Postcode:

Owner *

The person or organisation who owns the land

Where the owner is different from the applicant, provide the details of that person or organisation.

Owner * Same as applicant

Name:

Title: First Name: Surname:

Organisation (if applicable):

Postal Address:

If it is a P.O. Box, enter the details here:

Suburb/Locality: State: Postcode:

Owner's Signature (Optional): Date:

day / month / year



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Declaration

This form must be signed by the applicant *

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

I declare that I am the applicant; and that all the information in this application is true and correct; and the owner (if not myself) has been notified of the permit application.

Signature:

P. G. Scott

Date:

31/10/2018
day / month / year

Need help with the Application?

General information about the planning process is available at planning.vic.gov.au

Contact Council's planning department to discuss the specific requirements for this application and obtain a planning permit checklist. Insufficient or unclear information may delay your application.

Has there been a pre-application meeting with a council planning officer?

No Yes

If 'Yes', with whom?: Helen Evans

Date: /10/2018

day / month / year

Checklist

Have you:

Filled in the form completely?

Paid or included the application fee?

Most applications require a fee to be paid. Contact Council to determine the appropriate fee.

Provided all necessary supporting information and documents?

A full, current copy of title information for each individual parcel of land forming the subject site.

A plan of existing conditions.

Plans showing the layout and details of the proposal.

Any information required by the planning scheme, requested by council or outlined in a council planning permit checklist.

If required, a description of the likely effect of the proposal (for example, traffic, noise, environmental impacts).

Completed the relevant council planning permit checklist?

Signed the declaration above?

Lodgement

Lodge the completed and signed form, the fee and all documents with:

Colac Otway Shire
PO Box 283
Colac VIC 3250
2-6 Rae Street
Colac VIC 3250

Contact information

Phone: (03) 5232 9400

Email: ing@colacotway.vic.gov.au

Deliver application in person, by post or by electronic lodgement.

150 Seven Bridges Road
GERANGAMETE VIC 3249

Wednesday, October 31, 2018

The Planning Department
Colac Otway Shire
2-6 Rae Street
COLAC VIC 3250

Dear Sir / Madam

Please find enclosed my application for a planning permit for permanent onsite management residence at 2235 Birregurra Forest Road, Forrest.

Applicant – P & S Scott

Purpose: The purpose of this application is to seek a planning permit to construct a dwelling on the above property.

Zoning - FARMING ZONE (FZ)
SCHEDULE TO THE FARMING ZONE (FZ)
PUBLIC CONSERVATION AND RESOURCE ZONE (PCRZ)
SCHEDULE TO THE PUBLIC CONSERVATION AND RESOURCE ZONE (PCRZ)

Overlays

BUSHFIRE MANAGEMENT OVERLAY (BMO)
EROSION MANAGEMENT OVERLAY (EMO)
EROSION MANAGEMENT OVERLAY - SCHEDULE 1 (EMO1)
HERITAGE OVERLAY (HO)
HERITAGE OVERLAY SCHEDULE (HO193)
LAND SUBJECT TO INUNDATION OVERLAY (LSIO)
LAND SUBJECT TO INUNDATION OVERLAY SCHEDULE (LSIO)

Background:

This application is for a planning permit to construct a dwelling. The proponent is in the process of developing a summer fruits garden and orchard on the 10 hectare property at Forrest

The 9.6 ha property adjoins the Barwon River West Branch on its Southern side and adjoins private forest to the west, it has no adjoining link to farm land with a small rural life style property next to the north. The planning overlays denote that this approximately 50% of the land is subject to inundation. These factors together with the heritage overlay of the old Tiger Trail bridge limit the type of agricultural use for the land.

The current owners of the property PG & SL Scott own property approx. 7 kl away at 150 Seven Bridges Road Gerangamete.

In Clause 21.05 the Colac Otway Planning Scheme seeks to protect agricultural industries and recognizes that they are critical to the economic and social well

being of the Shire. Currently this land is isolated from adjoining farming land and is not able to realize its potential as agricultural land.

The rural land strategy has acknowledged *that to maintain viability, many farms will have to increase in size or look to more intensive, alternative enterprises.*

In order to maintain the agricultural viability of the 9.6 hectares which is separated from adjoining farming land, the proponents aim to intensively farm the land. The location makes it unsuitable to intensively farm livestock on the property. The proponents have a planted a summer fruits orchard (cherries blueberries plums, apricots, nectarines, peaches, grapefruit, apples nuts and pears which will be supplemented by growing native flowers for the cut flower market. This will enable the land to be intensively farmed as an alternate enterprise.

In order to gain maximise the benefit from the orchard and ensure that the trees, pants and fruit it reach mazimum bearing capacity it will need a resident manager. There is a need to build be a residential dwelling so that the orchard can reach its best production levels possible.

The existing property has the benefit of a licence to take water from the Barwon River which will enhance the success of the orchard.

Dwelling

The location of the house is on the rise which is located 57 metres in from the north and east boundaries so as to provide a defensible space as per the bushfire management plan.

The location of the house has been located within the property so as to best preserve the agricultural land around it. In doing so it was necessary to have a defensible space around the house and ensure the dwelling was not built on land subject to inundation.

Rain water will be captured from the tank for household use and stored in tanks with the capacity to hold up to 15,000 litres.

The track will be constructed to a minimum standard load of at least 15 tonnes with an average grade of no more than 1 in 7 and a maximum grade of no more than 1 in 5 for no more than 50 metres. A passing bay will constructed approximately half way along the track for passing vehicles and a turning bay in front of the existing shed.

There is an existing shed on the property of a steel structure which will remain for farm use.

Power will be able to be taken from an existing power pole located approximately 40 metres south of the shed.

The house has been designed with a low elevation which will sit within the current treescape of the adjoining properties. A colour scheme has not been determined at this stage however the proponents are willing to take advice on this issue.

A septic system will be put in for all waste water to meet current health standards as determined by the Colac Otway Shire Environmental Officer.

SCHEDULE TO THE PUBLIC CONSERVATION AND RESOURCE ZONE (PCRZ)

A small portion of the property which adjoins the Barwon River West Branch sits is subject to PCRZ. There is no plan to change or develop the land detailed in the map under this schedule

Cultural Heritage Management Plan (CHMP)- While the property has the above overlay the aav.nrms advise that this is not required for the construction of a dwelling

EROSION MANAGEMENT OVERLAY - SCHEDULE 1 (EMO1)

A geotechnical assessment in relation to the site has been carried out and is attached for your information

BUSHFIRE MANAGEMENT OVERLAY (BMO)

Please find attached a bushfire management statement prepared by Bruce St Clair and including the Site assessment, landscape assessment and Bushfire Management Statement as required.

HERITAGE OVERLAY SCHEDULE (HO193)

The land is subject to the above heritage overlay referring to Railway Bridge Remnants adjoining 2315 Birregurra Forrest Road, Forrest. The building of a dwelling will have no impact on Site H0 193. This site sits in the south west corner of the property where the bridge has crossed the West Tributary of the Barwon River.

LAND SUBJECT TO INUNDATION OVERLAY (LSIO)

Approximately 50% of the land at 2235 Birregurra Forrest Road has a LSIO overlay. The siting of the dwelling is planned for the North East corner of the property which sits out side the inundation overlay and will be accessible by a track also constructed outside the overlay area.

IMPACT ON ADJOINING LAND

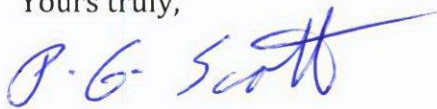
The adjoining land to the property is comprised of state forest, river frontage and a residential rural property. The location is surrounded by state forest and sits in the heart of the State Forrest surrounded by BMX tracks. There is likely to be little impact on adjoining land, however with a resident manager property maintenance such as weed control should be able to be maintained to a higher level.

Please find attached the following document

- Site maps
- Planning Zones
- Copy of Titles
- Geotechnical Assessment
- Land Capacity Assessment Report
- Bushfire Management Statement
- Floor plans
- Elevation plans for dwelling

In order to make the 9.6 hectares at the 2235 Birregurra Forrest Road a successful agricultural venture it is necessary to change the use of the property and intensively farm it. The land is not suitable for intensive husbandry such as poultry or a piggery but is suitable for orchards. In order to successfully run a orchard on the property it would need a on-site manager and in order to be successful this would require a management dwelling

Yours truly,



Peter Scott
PG & SL Scott



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REGISTER SEARCH STATEMENT (Title Search) Transfer of Land Act 1958 Page 1 of 1

VOLUME 09391 FOLIO 039

Security no : 124074497134H
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LAND DESCRIPTION

Lot 1 on Title Plan 126624U.
PARENT TITLE Volume 02125 Folio 827
Created by instrument J061812 10/07/1980

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors
PETER GERARD SCOTT
SANDRA LYNN SCOTT both of 150 SEVEN BRIDGES ROAD GERANGAMETE VIC 3243
AL695351W 19/02/2015

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AL695352U 19/02/2015
CLARKE & BARWOOD LAWYERS COLAC LTD

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 TP126624U 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: 2235 BIRREGURRA-FORREST ROAD FORREST VIC 3236

See MI309994U for WATER FRONTAGE LICENCE details

DOCUMENT END



Imaged Document Cover Sheet

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Document Type	Plan
Document Identification	TP126624U
Number of Pages (excluding this cover sheet)	2
Document Assembled	19/10/2018 09:59

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TITLE PLAN		EDITION 2	TP 126624U
Location of Land Parish: YAUGHER Township: Section: A Crown Allotment: 1C(PT) Crown Portion: Last Plan Reference: Derived From: VOL 9391 FOL 039 Depth Limitation: NIL		Notations WATERWAY NOTATION: LAND IN THIS PLAN MAY ABUT CROWN LAND THAT MAY BE SUBJECT TO A CROWN LICENCE TO USE ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN	

EASEMENT INFORMATION					THIS PLAN HAS BEEN PREPARED FOR THE LAND REGISTRY, LAND VICTORIA, FOR TITLE DIAGRAM PURPOSES AS PART OF THE LAND TITLES AUTOMATION PROJECT COMPILED: 30/08/1999 VERIFIED: EWA
Legend: A - Appurtenant Easement E - Encumbering Easement R- Encumbering Easement (Road)					
Easement Reference	Purpose	Width (Metres)	Origin	Land Benefitted / In Favour Of	
E-1	WATER SUPPLY PIPELINE	SEE DIAG	AL133434F	VOL.8060 FOL.003	

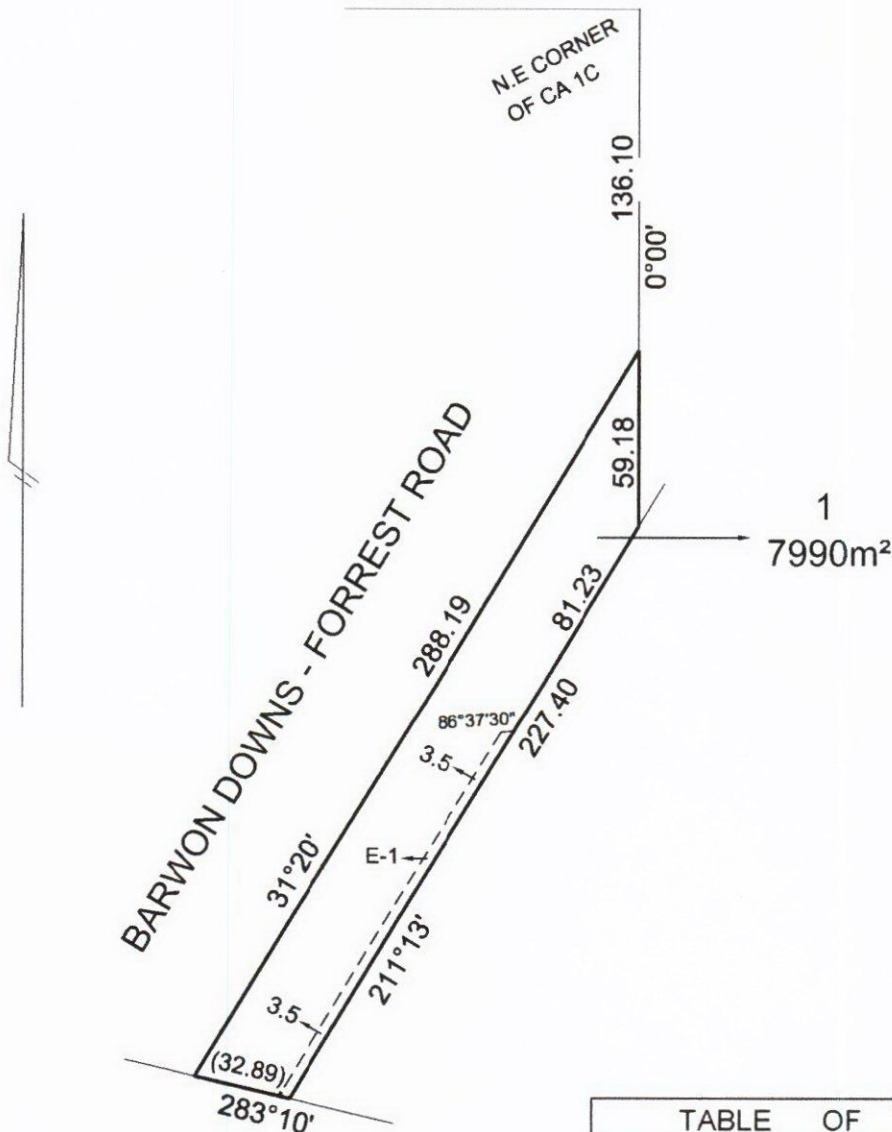
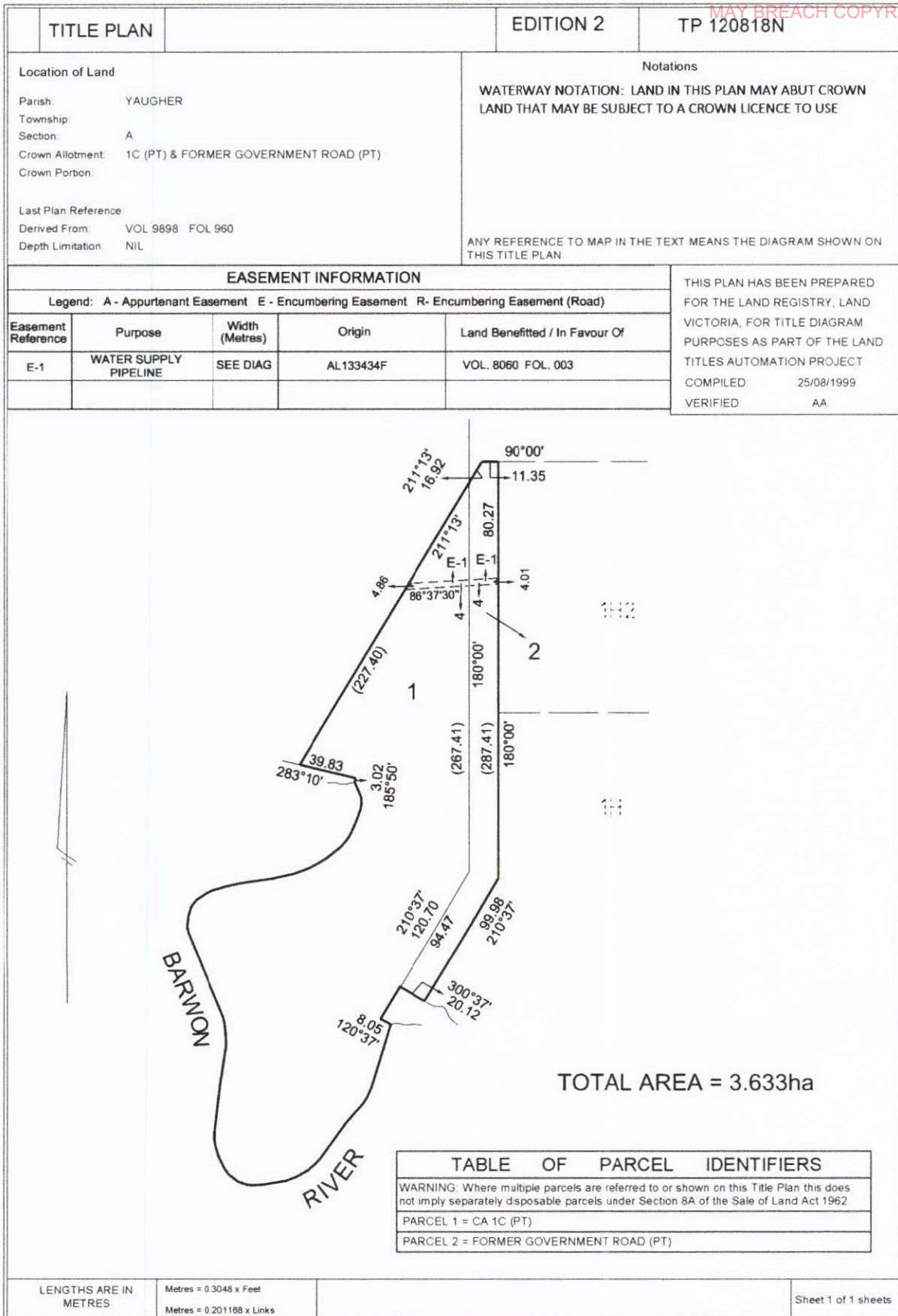


TABLE OF PARCEL IDENTIFIERS
WARNING: Where multiple parcels are referred to or shown on this Title Plan this does not imply separately disposable parcels under Section 8A of the Sale of Land Act 1962
PARCEL 1 = CA 1C (PT)

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

VOLUME 09898 FOLIO 960

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LAND DESCRIPTION

Lots 1 and 2 on Title Plan 120818N.
PARENT TITLE Volume 09391 Folio 040
Created by instrument P108086C 04/04/1989

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors
PETER GERARD SCOTT
SANDRA LYNN SCOTT both of 150 SEVEN BRIDGES ROAD GERANGAMETE VIC 3243
AL695351W 19/02/2015

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AL695352U 19/02/2015
CLARKE & BARWOOD LAWYERS COLAC LTD

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DIAGRAM LOCATION

SEE TP120818N 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)

See MI309994U for WATER FRONTAGE LICENCE details

DOCUMENT END

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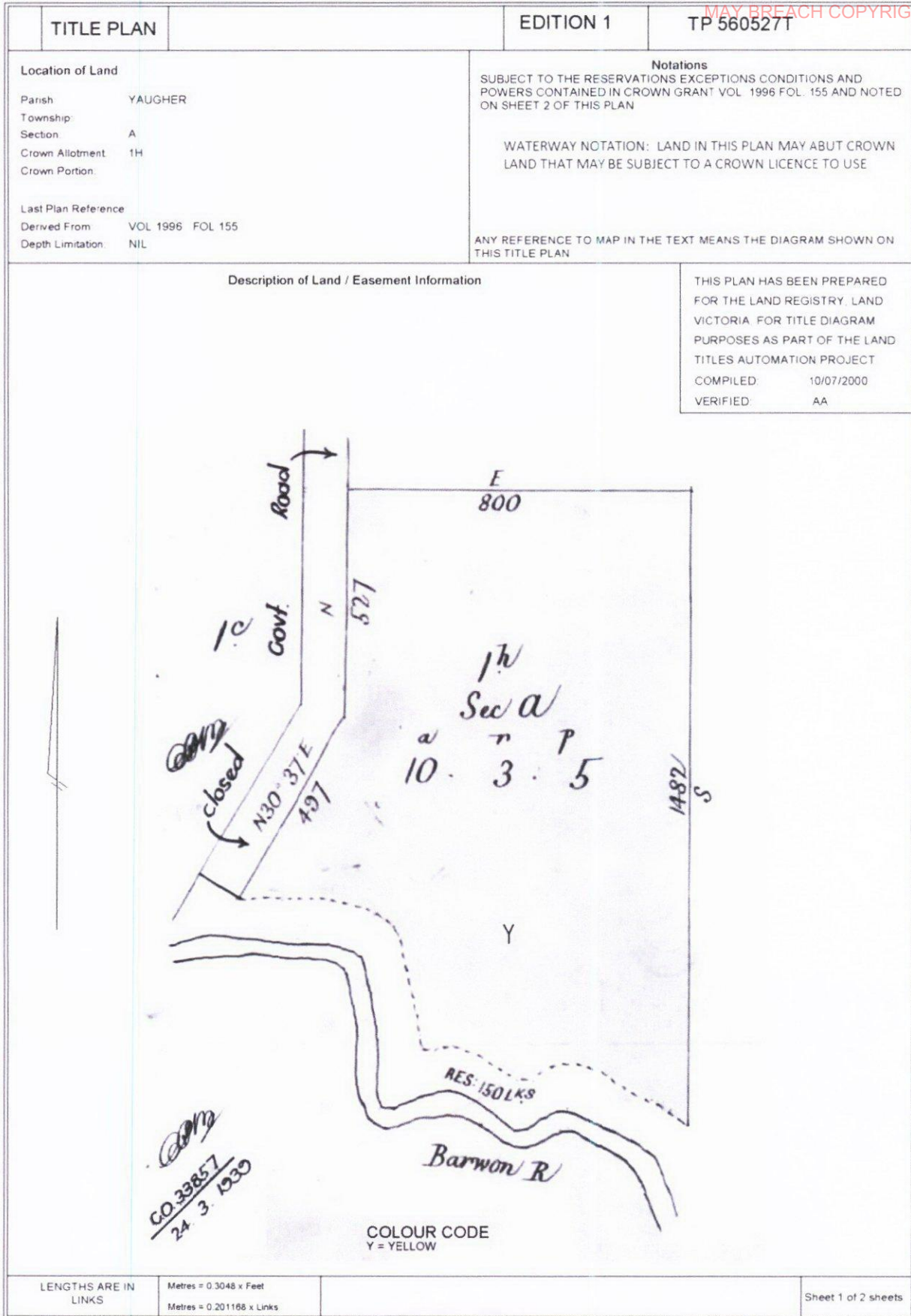
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TITLE PLAN	TP 560527T	
<p style="text-align: center;">LAND DESCRIPTION INCLUDING RESERVATIONS EXCEPTIONS CONDITIONS AND POWERS SHOWN ON THE CROWN GRANT</p>		
<p style="text-align: center;"><i>All THAT PIECE OF LAND in the said Colony containing <u>ten acres three roods and five perches more or less being Allotment one H of Section A in the Parish of Yaungher County of Adelaide.</u></i></p>		
<p>delineated with the measurements and abuttals thereof in the map drawn in the margin of these presents and therein colored yellow</p>		
<p>EXCEPTING however unto us our heirs and successors all gold and auriferous earth or stone and all mines containing gold within the boundaries of the said land AND ALSO reserving to us our heirs and successors free liberty and authority for us our heirs and successors and our and their agents and servants at any time or times hereafter to enter upon the said land and to search and mine therein for gold and to extract and remove therefrom any gold and any auriferous earth or stone and for the purposes aforesaid to sink shafts erect machinery carry on any works and do any other things which may be necessary or usual in mining PROVIDED ALWAYS that it shall be lawful for us our heirs and successors at any time on paying full compensation to the said GRANTEE</p>		
<p>his heirs executors administrators or assigns for the full value other than auriferous of the said piece of land or so much thereof as may be resumed as hereinafter mentioned and of the improvements upon the said piece of land or the part so resumed such value in case of disagreement to be ascertained by arbitration to resume the said piece of land or any part thereof for mining purposes</p>		
<p>AND THAT the terms conditions and events upon which such land may be resumed and the manner in which such arbitration may be conducted may be determined by regulations in such manner as the Governor in Council may from time to time direct or if at any time no such regulations shall be in force then by the regulations concerning the resumption of land for mining purposes in force at the date of this Grant unless Parliament shall otherwise determine.</p>		
<p>LENGTHS ARE IN LINKS</p>	<p>Metres = 0.3048 x Feet Metres = 0.201168 x Links</p>	<p>Sheet 2 of 2 sheets</p>

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

VOLUME 01996 FOLIO 155

Security no : 124074496701D
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CROWN GRANT

LAND DESCRIPTION

Crown Allotment 1H Section A Parish of Yaughter.

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors

PETER GERARD SCOTT
SANDRA LYNN SCOTT both of 150 SEVEN BRIDGES ROAD GERANGAMETE VIC 3243
AL695351W 19/02/2015

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AL695352U 19/02/2015
CLARKE & BARWOOD LAWYERS COLAC LTD

Any crown grant reservations exceptions conditions limitations and powers noted on the plan or imaged folio set out under DIAGRAM LOCATION below. For details of any other encumbrances see the plan or imaged folio set out under DIAGRAM LOCATION below.

DIAGRAM LOCATION

SEE TP560527T 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: 2235 BIRREGURRA-FORREST ROAD FORREST VIC 3236

See MI309994U for WATER FRONTAGE LICENCE details

DOCUMENT END

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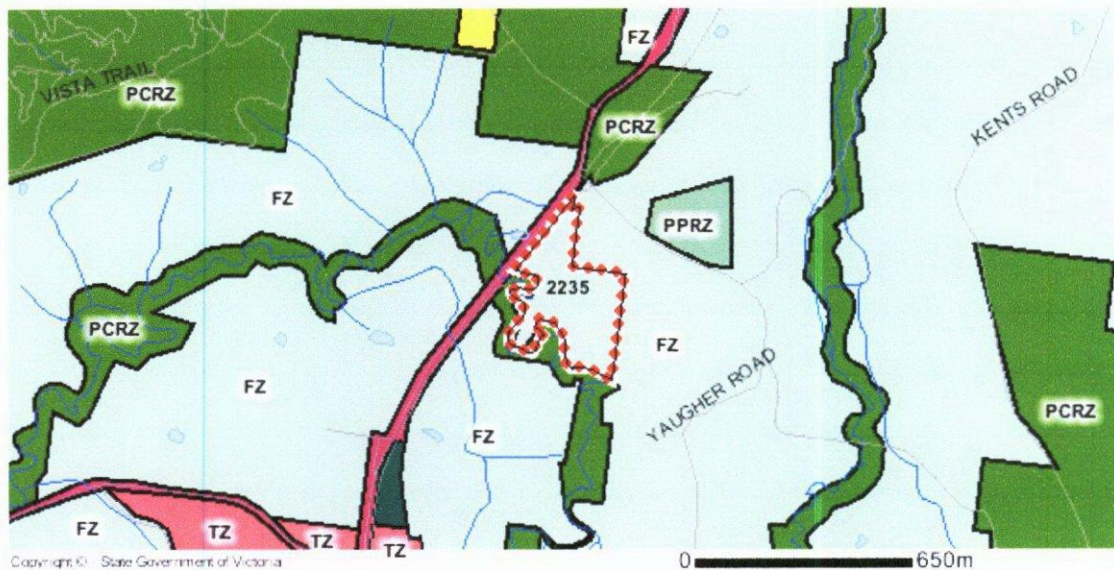
Planning Zones

[FARMING ZONE \(FZ\)](#)

[SCHEDULE TO THE FARMING ZONE \(FZ\)](#)

[PUBLIC CONSERVATION AND RESOURCE ZONE \(PCRZ\)](#)

[SCHEDULE TO THE PUBLIC CONSERVATION AND RESOURCE ZONE \(PCRZ\)](#)



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

Zones Legend

ACZ - Activity Centre	IN1Z - Industrial 1	R1Z - General Residential
B1Z - Commercial 1	IN2Z - Industrial 2	R2Z - General Residential
B2Z - Commercial 1	IN3Z - Industrial 3	R3Z - General Residential
B3Z - Commercial 2	LDRZ - Low Density Residential	RAZ - Rural Activity
B4Z - Commercial 2	MUZ - Mixed Use	RCZ - Rural Conservation
B5Z - Commercial 1	NRZ - Neighbourhood Residential	RDZ1 - Road - Category 1
C1Z - Commercial 1	PCRZ - Public Conservation & Resource	RDZ2 - Road - Category 2
C2Z - Commercial 2	PDZ - Priority Development	RGZ - Residential Growth
CA - Commonwealth Land	PPRZ - Public Park & Recreation	RLZ - Rural Living
CCZ - Capital City	PUZ1 - Public Use - Service & Utility	RUZ - Rural
CDZ - Comprehensive Development	PUZ2 - Public Use - Education	SUZ - Special Use
DZ - Dockland	PUZ3 - Public Use - Health Community	TZ - Township
ERZ - Environmental Rural	PUZ4 - Public Use - Transport	UFZ - Urban Floodway
FZ - Farming	PUZ5 - Public Use - Cemetery/Crematorium	UGZ - Urban Growth
GRZ - General Residential	PUZ6 - Public Use - Local Government	Urban Growth Boundary
GWAZ - Green Wedge A	PUZ7 - Public Use - Other Public Use	Lake, waterbody
GWZ - Green Wedge	PZ - Port	

Railway
 Tram
 River, stream
 Lake, waterbody

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Planning Property Report

from www.planning.vic.gov.au on 31 October 2018 01:28 PM

Address: 2235 BIRREGURRA-FORREST ROAD FORREST 3236

Lot and Plan Number: Lot 1 TP120818

Local Government (Council): COLAC OTWAY **Council Property Number:** 23850

Directory Reference: VicRoads 101 D2

This property has 4 parcels.

For full parcel details get the free Basic Property report at [Property Reports](#)

See next page for planning information

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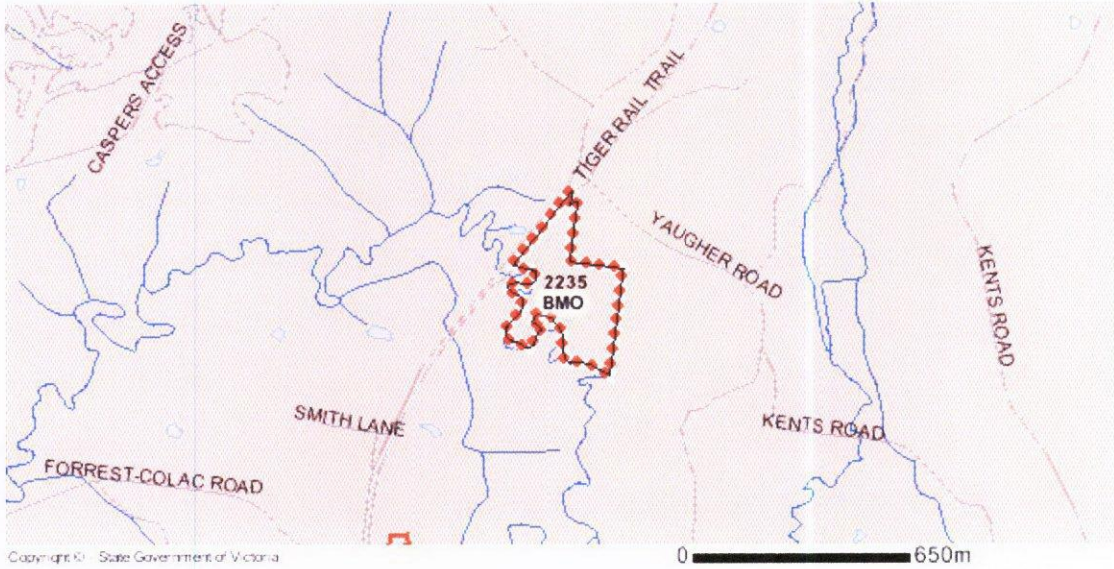
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Department of Environment, Land, Water and Planning

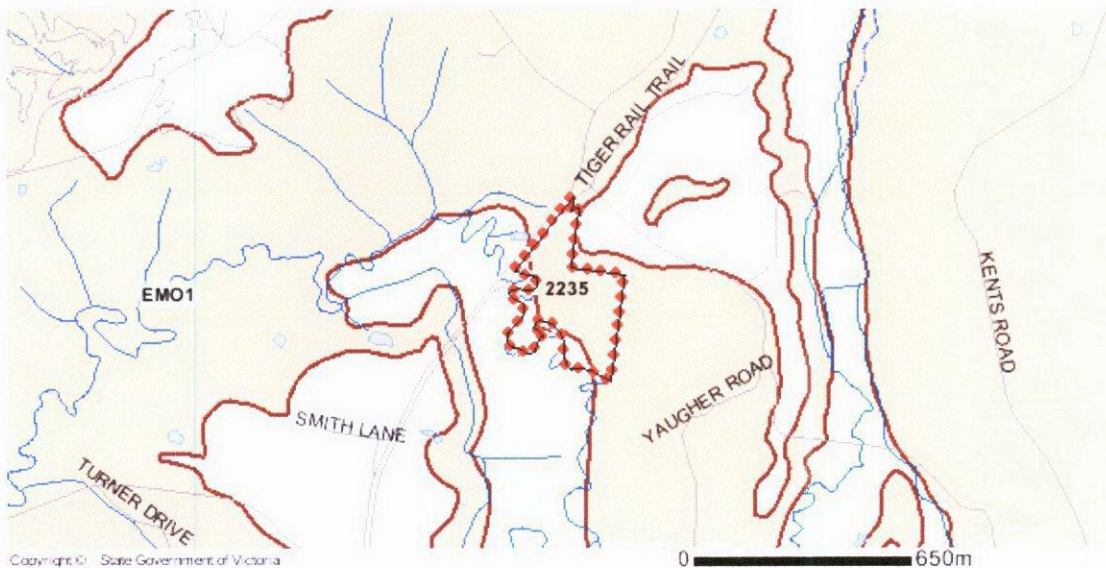
Planning Overlays

BUSHFIRE MANAGEMENT OVERLAY (BMO)



EROSION MANAGEMENT OVERLAY (EMO)

EROSION MANAGEMENT OVERLAY - SCHEDULE 1 (EMO1)



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Planning Overlays

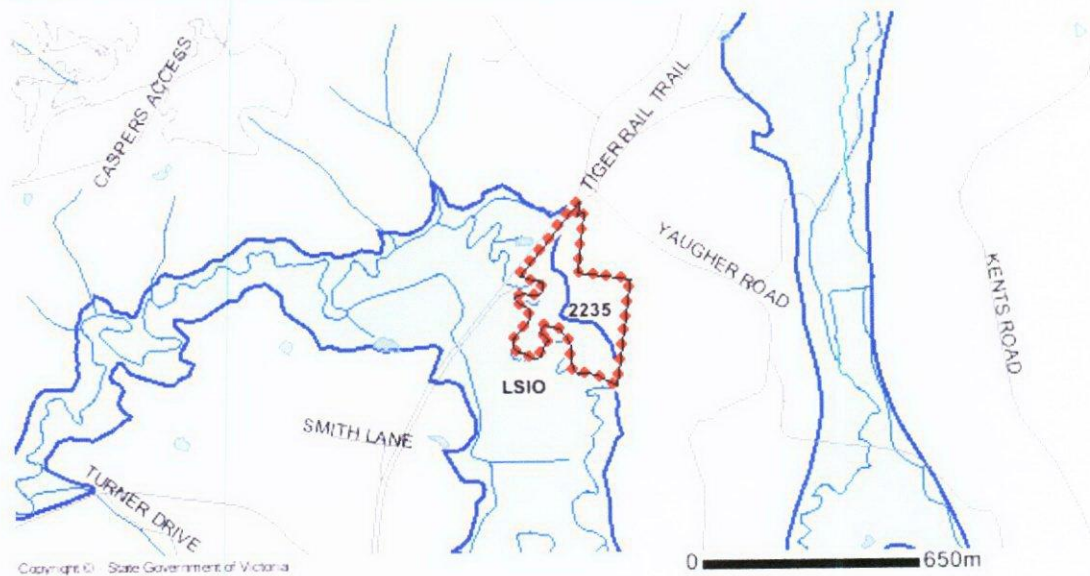
HERITAGE OVERLAY (HO)

HERITAGE OVERLAY SCHEDULE (HO193)



LAND SUBJECT TO INUNDATION OVERLAY (LSIO)

LAND SUBJECT TO INUNDATION OVERLAY SCHEDULE (LSIO)



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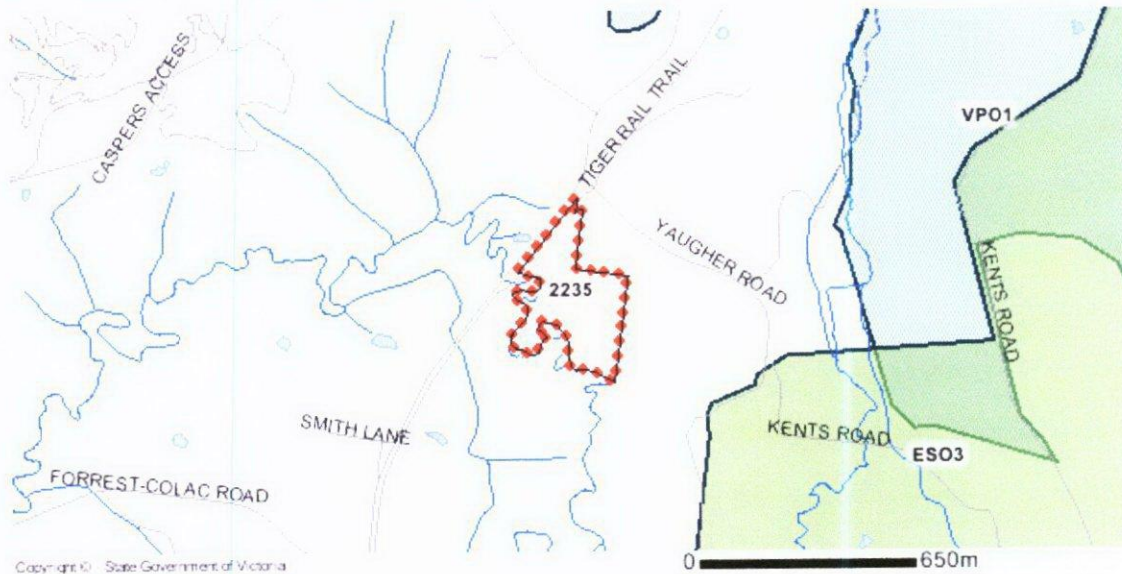
Planning Overlays

OTHER OVERLAYS

Other overlays in the vicinity not directly affecting this land

ENVIRONMENTAL SIGNIFICANCE OVERLAY (ESO)

VEGETATION PROTECTION OVERLAY (VPO)



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Overlays Legend

- | | |
|--|--------------------------------------|
| AEO - Airport Environs | IPO - Incorporated Plan |
| BMD - Bushfire Management | LSIO - Land Subject to Inundation |
| CLPD - City Link Project | MAEO1 - Melbourne Airport Environs 1 |
| DCPD - Development Contributions Plan | MAEO2 - Melbourne Airport Environs 2 |
| DDD - Design & Development | NCO - Neighbourhood Character |
| DDDPT - Design & Development Part | PO - Parking |
| DPO - Development Plan | PAD - Public Acquisition |
| EAO - Environmental Audit | RD - Restructure |
| EMD - Erosion Management | RCO - Road Closure |
| ESO - Environmental Significance | SBO - Special Building |
| FO - Floodway | SLD - Significant Landscape |
| HO - Heritage | SMD - Salinity Management |
| ICPD - Infrastructure Contributions Plan | SRD - State Resource |
| Railway | Tram |
| River, stream | Lake, waterbody |

Note: due to overlaps some colours on the maps may not match those in the legend.

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Areas of Aboriginal Cultural Heritage Sensitivity

All or part of this property is an 'area of cultural heritage sensitivity'.

'Areas of cultural heritage sensitivity' are defined under the Aboriginal Heritage Regulations 2007, and include registered Aboriginal cultural heritage places and land form types that are generally regarded as more likely to contain Aboriginal cultural heritage.

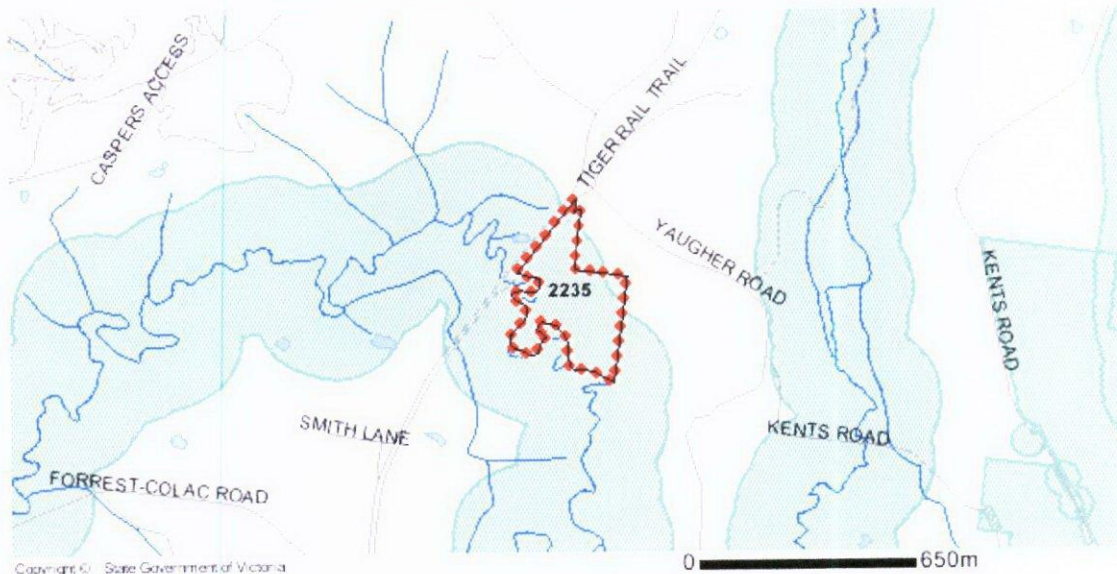
Under the Aboriginal Heritage Regulations 2007, 'areas of cultural heritage sensitivity' are one part of a two part trigger which require a 'cultural heritage management plan' be prepared where a listed 'high impact activity' is proposed.

If a significant land use change is proposed (for example, a subdivision into 3 or more lots), a cultural heritage management plan may be triggered. One or two dwellings, works ancillary to a dwelling, services to a dwelling, alteration of buildings and minor works are examples of works exempt from this requirement.

Under the Aboriginal Heritage Act 2006, where a cultural heritage management plan is required, planning permits, licences and work authorities cannot be issued unless the cultural heritage management plan has been approved for the activity.

For further information about whether a Cultural Heritage Management Plan is required go to <http://www.aav.nrms.net.au/aavQuestion1.aspx>

More information, including links to both the Aboriginal Heritage Act 2006 and the Aboriginal Heritage Regulations 2007, can also be found here - <https://www.vic.gov.au/aboriginalvictoria/heritage/planning-and-heritage-management-processes.html>



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Further Planning Information

Planning scheme data last updated on 17 October 2018.

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, local, particular and general 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 [Planning Schemes Online](#)

This report is NOT a **Planning Certificate** issued pursuant to Section 199 of the Planning & Environment Act 1987.

It does not include information about exhibited planning scheme amendments, or zonings that may affect the land.

To obtain a Planning Certificate go to [Titles and Property Certificates](#)

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 [Planning Maps Online](#)

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

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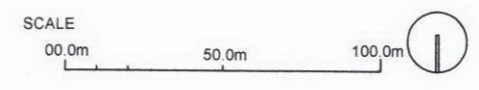
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-  SUBJECT LAND
-  SHED/S
-  BUILD EVELOPE
20m x 30m
-  ACCESS
-  10m
CONTOURS TO AHD(V.G)
-  GUM TREES
-  CYPRESS
-  BLACKWOOD

SUBJECT LAND-RECREATION RESERVE: 138m
 BUILDING ENVELOPE-ADJOINING DWELLING 214m
 SUBJECT LAND-RAIL TRAIL FOOT BRIDGE: 17m
 NO VEGETATION SCHEDULED FOR REMOVAL

2235 FORREST-BIRREGURRA RD
 FORREST VICTORIA
 SITE AND FEATURE SURVEY
 2020ENGINEERING SOLUTIONS
 OCT 2018



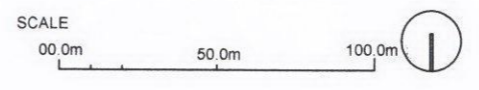
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- SUBJECT LAND
- SHED/S
- BUILD ENVELOPE 20m x 30m
- ~ ACCESS
- ~ CONTOURS TO AHD(VVG)
- ⊗ GUM TREES
- CYPRESS
- ⊙ BLACKWOOD

SUBJECT LAND-RECREATION RESERVE; 138m
 BUILDING ENVELOPE-ADJOINING DWELLING 214m
 SUBJECT LAND-RAIL TRAIL FOOT BRIDGE; 17m
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2235 FORREST-BIRREGURRA RD
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 2020ENGINEERING SOLUTIONS
 OCT 2018

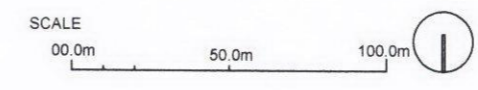


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-  SUBJECT LAND
-  SHED/S
-  BUILD EVELOPE 20m x 30m
-  ACCESS
-  160m CONTOURS TO AHD(VVG)
-  GUM TREES
-  CYPRESS
-  BLACKWOOD
- SUBJECT LAND-RECREATION RESERVE; 138m
- BUILDING ENVELOPE-ADJOINING DWELLING 214m
- SUBJECT LAND-RAIL TRAIL FOOT BRIDGE; 17m
- NO VEGETATION SCHEDULED FOR REMOVAL

2235 FORREST-BIRREGURRA RD
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West Elevation

SCALE 1:100



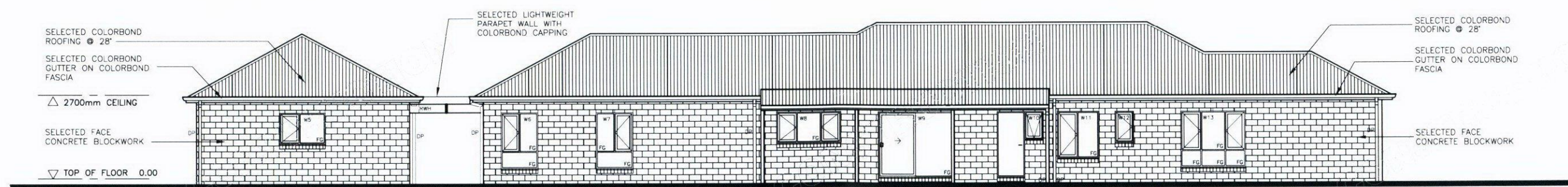
East Elevation

SCALE 1:100



North Elevation



SCALE 1:100



South Elevation

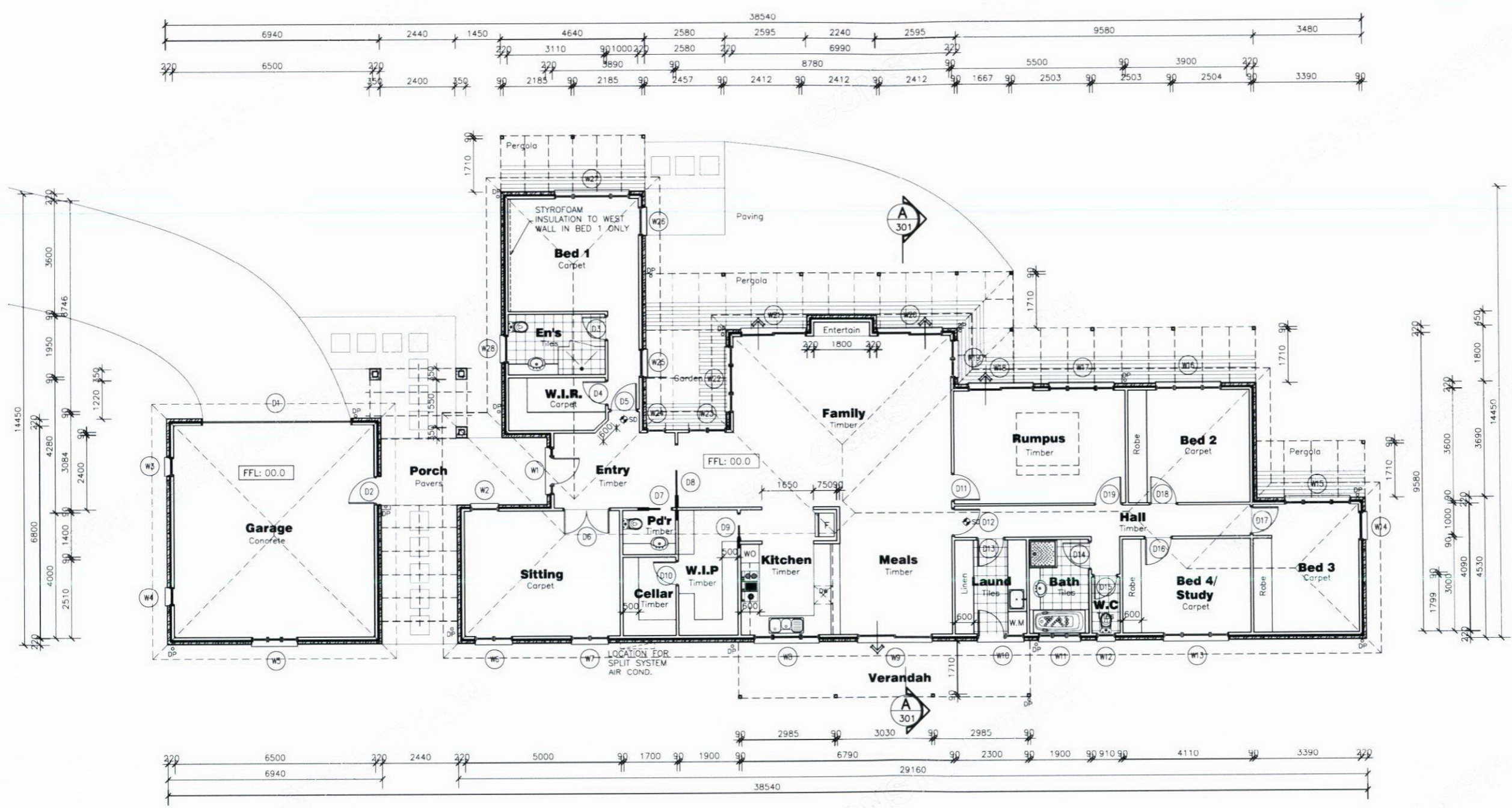
SCALE 1:100

S:\SOLAR SOLUTIONS\SOLARS\STUDY SETS\COUNTRY-004\WD-201A.DWG

Client : COUNTRY 004 STUDY SET	Drawing : ELEVATIONS	REVISIONS	Note: All work shall conform to the specification and other relevant drawings. Figured dimensions take precedence over scaled dimensions. Check all dimensions on site. Shop drawings shall be submitted to this office for approval before the commencement of any fabrication. © Copyright Solar Solutions Design & Drafting 2005	 Solar Solutions Design & Drafting Solar Solutions Pty. Ltd.	Suite 2/199 Stud Road Wantirna, Victoria 3152 Phone. (03) 9801 7247 Fax. (03) 9801 7707 Website www.solarsolutions.au.com	 MEMBER Building Designers Association Victoria
Project : NOT FOR CONSTRUCTION NOT FOR CONSTRUCTION NOT FOR CONSTRUCTION	Job No : 99777 Date : 13/02/06	No : Amendments : Date :				
	Scale : 1:100 Drawn : D.W Checked : D.P.E					
	Drg. No : SS-201 Amendment No : -					



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Area	
GROUND	260.25m ² 28.02 SQ.
GARAGE	50.81m ² 5.47 SQ.
TOTAL	311.06m ² 33.49 SQ.



Floor Plan
SCALE 1:100

S:\SOLAR SOLUTIONS\SOLARS\STUDY SETS\COUNTRY-004\WD-101.DWG

Client : COUNTRY 004 STUDY SET	Drawing : FLOOR PLAN	REVISIONS	Note: All work shall conform to the specification and other relevant drawings. Figured dimensions take precedence over scaled dimensions. Check all dimensions on site. Shop drawings shall be submitted to this office for approval before the commencement of any fabrication. © Copyright Solar Solutions Design & Drafting 2005	 Solar Solutions Design & Drafting Solar Solutions Pty. Ltd.	Suite 2/199 Stud Road Wantirna, Victoria 3152 Phone: (03) 9801 7247 Fax: (03) 9801 7707 Website www.solarsolutions.au.com	 MEMBER Building Designers Association Victoria			
Project : NOT FOR CONSTRUCTION NOT FOR CONSTRUCTION NOT FOR CONSTRUCTION	Job No : 99???	Date : 13/02/06					No : _____	Amendments : _____	Date : _____
	Scale : 1:100	Drawn : D.W					Checked : D.P.E		
	Drg. No : SS-101	Amendment No : -							

Water Supply and Climate

The land currently holds a 1mg licence to take water from the West Barwon for domestic and stock purposes. It is not planned to use this water for the orchard. There is no plan to install a dam or additional water catchment.

The land on the river flats is only 5-10 meters from the water table.

The property is ideally situated with a high rainfall it will have adequate rainfall to sustain the orchard and develop an organic vegetable garden.

It is proposed to install 15,000 litres of water storage at the house to meet fire fighting and domestic water requirements. Given that the minimum mean rainfall in any month is over 40mm this should be adequate to meet all house and farm requirements. There will also be the ability to install tanks on the shedding for additional water for watering trees and plants if necessary.

There is no plan to install a dam or bores on the property.

The attached figures from the Australian Bureau of Meteorology indicate the better than average rainfall and temperatures suitable for this type of venture.

Climate statistics for Australian locations

Monthly climate statistics

All years of record

Site information

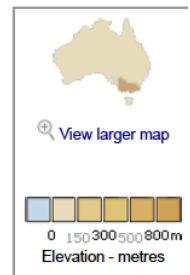
Site name: FORREST STATE FOREST
 Site number: 090040
 Latitude: 38.52 °S Longitude: 143.72 °E
 Elevation: 203 m
 Commenced: 1898 Status: Open
 Latest available data: 31 Aug 2017

Additional information

Additional site information

Nearest alternative sites

- 090134 GELLIBRAND RIVER FORESTRY (15.3km)
- 090174 ELLIMINYT (17.4km)
- 090083 WEEAPROINAH (21.7km)



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
Temperature														
Mean maximum temperature (°C)	24.6	24.0	22.4	18.1	14.6	12.1	11.7	12.6	14.9	17.0	18.6	21.8	17.7	18 1949 1975
Mean minimum temperature (°C)	10.3	11.4	10.0	7.5	5.8	3.9	3.4	3.7	4.7	6.1	7.4	8.9	6.9	18 1949 1975
Rainfall														
Mean rainfall (mm)	45.3	47.7	57.1	80.3	98.0	111.3	119.7	130.3	109.8	99.6	76.5	59.5	1038.2	104 1898 2017
Decile 5 (median) rainfall (mm)	41.5	33.5	50.0	71.2	93.2	107.2	116.4	125.5	108.7	90.2	65.9	57.1	1042.0	111 1898 2017
Mean number of days of rain ≥ 1 mm	5.2	5.0	6.7	8.3	10.9	12.0	13.4	13.7	12.1	10.5	8.1	6.9	112.8	105 1898 2017

Other daily elements

Weed Management Plan

The following weeds have been identified as weeds that are or have been on the property:

Weed	Frequency	Treatment
Blackberries	Slight occurrence	Sprayed
Ragwort	NO - eradicated	
Thistles	Random	Dug out / sprayed

PG & SL Scott are aware of the weeds detailed below being listed as potential weeds in the region. At this stage they have not been found on the property.

Should they be identified then treatment method shall be decided on, pending advise from relevant government agency at that time

Hemlock	No
Agapanthus (African Lily)	No
Montbretia	NO
Ox-eye Daisy	NO
St John's Wort	NO
Wild Watsonia	NO
Asparagus Fern	NO
Banana Passionfruit	NO
Blue Periwinkle	NO
Bluebell Creeper	NO
English Ivy	NO
Wandering Trad (Wandering Creeper)	NO
Sweet Briar (Briar Rose)	NO
Gorse	NO
Flax-leaf Broom	NO
English Broom (Scotch Broom)	NO
Cape Broom (Montpellier Broom)	NO
Spanish Heath	No
Sweet Pittosporum	No

Weed Action Plan

To be reviewed annually

Year	Action	When	How	Completed
1	Control Blackberry	Autumn	Spray	
1	Thistles	Autumn	Spray	
1	Check for other weeds			
1	Review Management Plan	End of year one		
2	Repeat year 1			

Pest Animal Management

The management principles for pest animals are:

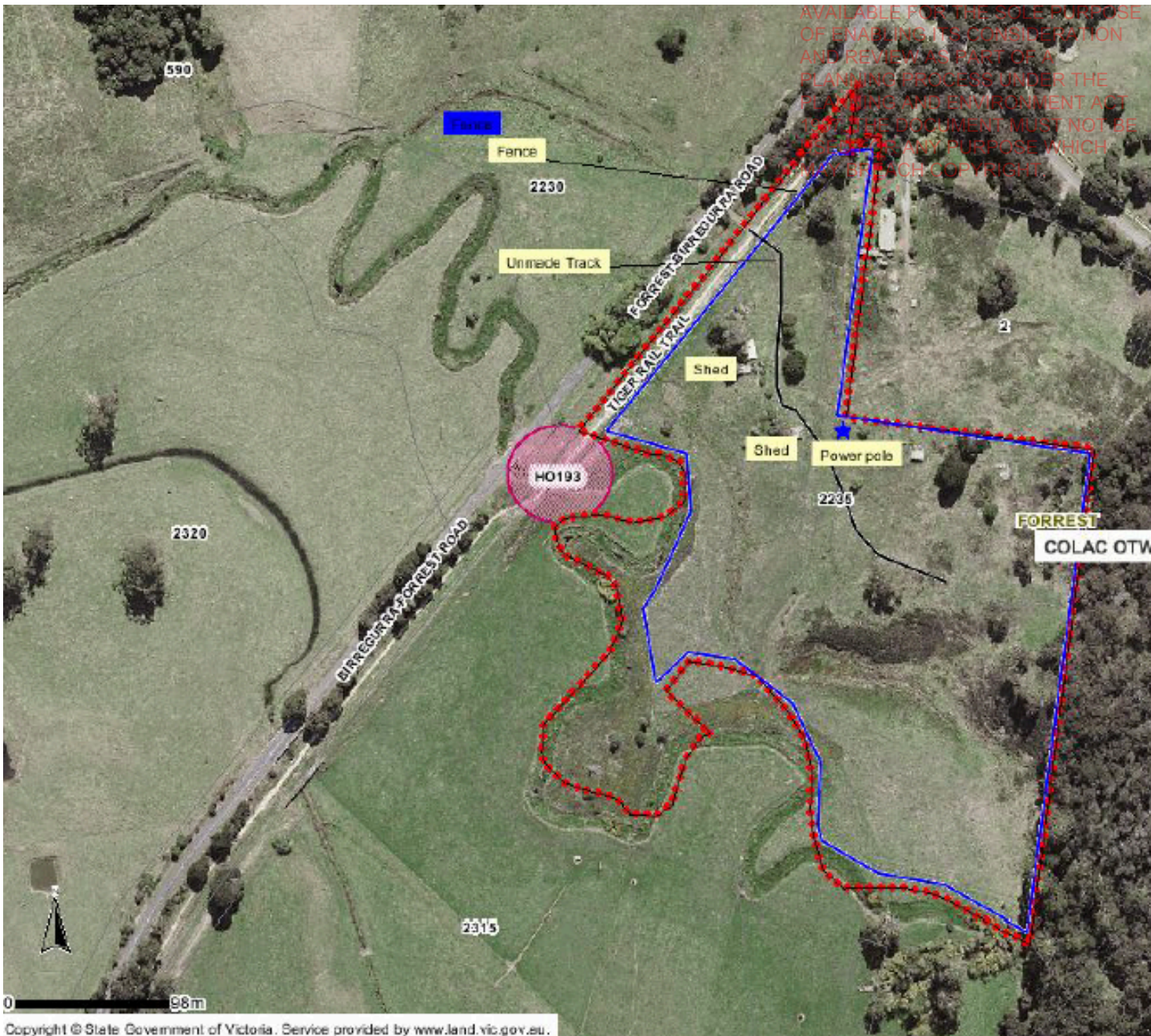
- Reduce numbers
- Destroy burrows and harbor
- Prevent reinvasion

Pest	Numbers	Evidence	Type of Management
Deer	NO		N/A
Wild pig	NO		N/A
Rabbits	Low in numbers	Little evidence	Monitor numbers / ripping of burrows if required
Foxes	Low in number	Little evidence	Monitor / Shoot
Possums	No		N/A
Birds	Seasonal	Sited	Net plants

Biodiversity and Native Vegetation

The property has been developed into pasture over the years with no native grasses or shrubs apart from bracken fern. There are a number of native trees mainly peppermint and messmate gum. The location of these in most cases is close to the boundary and they are indicated on the aerial photo below.

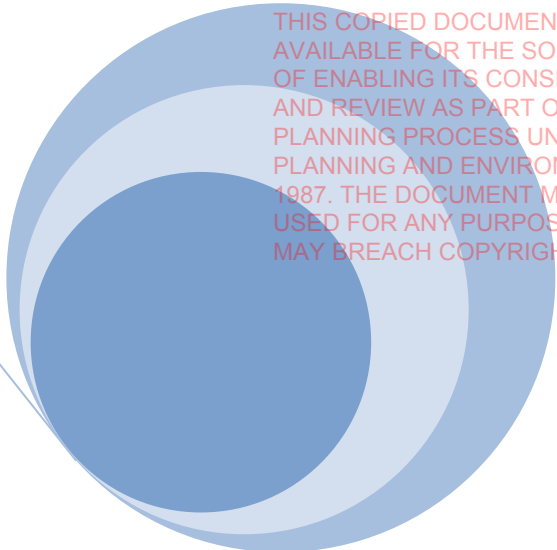
Animal	Habitat
Kangaroo	Come across to graze from adjoining state forest putting significant on the grazing potential of the property - no intervention
Gums – one manna gum, peppermint and messmate	There is no plan to do anything around the trees - there location can be seen on the aerial photo in current farm plan
Birds (varying species)	Netting of fruit trees to prevent damage will be the only intervention in regards to birds. No change to the existing native trees in the area
	No known native habitats on the property – however animals do enter from the adjoining state forest



Qualifications, knowledge and experience

This plan was prepared in conjunction with the following people

Peter Scott,	Farmer with 45 years experience specialising in potato and cattle (but not limited to) Member Potato Growers Association (past branch president) Past member and branch president of the United Dairy Farmers of Victoria
Sandra Scott,	Farmer with 35 years experience
David Scott,	Farmer with 12 years experience Diploma in Horticulture, Secretary Otway Potato Growers Association Chemical administration Licence. Australian Vegetable growers ass selected representative for industry tour of USA and Canada



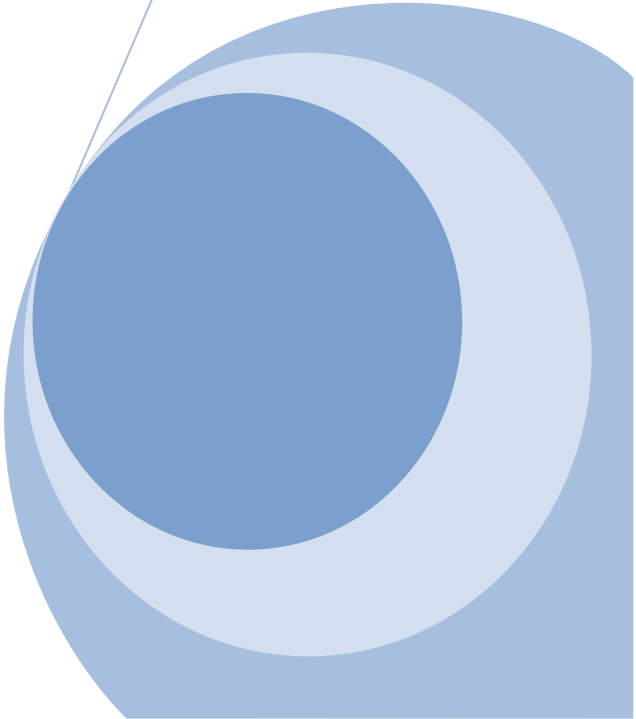
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LAND CAPABILITY ASSESSMENT

2235 Birregurra-Forrest Rd. Forrest, Victoria

2020Engineering Solutions

11/22/2018



Welcome to our new format LCA.

Section 1.

Contains relevant information is presented in a concise, logical, trail following from regional perspective to site specific characteristics. Sample water balance calculations are incorporated to inform the Land Application Area tables

Section 2.

Contains the balance of information required under the DWMP, MAV and EPA 891.4

Section 3.

Property Management Report.

REPORT CONTENTS

REPORT SUMMARY/EXECUTIVE SUMMARY

SECTION ONE

1. Introduction & Background
2. Planning Reports
3. Declared Water Catchment Area
4. Topography (Planning Maps On Line)
5. Groundwater Bores (VVG)
6. Regional Land Use
7. Site Inspection & Field Investigations
8. Proposal
9. BORELOG
10. Soil Analysis
11. System Selection
12. Sizing The Effluent Disposal System
 - 12.1 Site Plan
 - 12.2 Applicable Setback Distances (From As1547:2012)
- 13 Planning Authority Land Capability Assessment/Confirmation

SECTION TWO

MAV Tables

SECTION THREE

Site Management Plan

INSURANCE CERTIFICATE OF CURRENCY

DISCLAIMER

REPORT SUMMARY/EXECUTIVE SUMMARY

This Report finds that the property can sustainably manage primary treated wastewater within boundaries to EPA requirements based upon water balance calculations, suitably sized Land Application Area of 130m². (12m x 12 m), containing 52m² of base area.

SECTION ONE

1 INTRODUCTION & BACKGROUND

This Report has been prepared to support Planning Application PP267/2018-1 Construction of a dwelling. Detailed plans were not available at the time of reporting, however a four bedroom dwelling on tank water with water reduction fittings will be the basis for the report.

Address

2235 Birregurra-Forrest Rd. Forrest

Title

Lot 1 TP120818

Zoning

FZ

Overlays

BMO EMO(Part) LSIO(Part) HO

Size

10.Ha

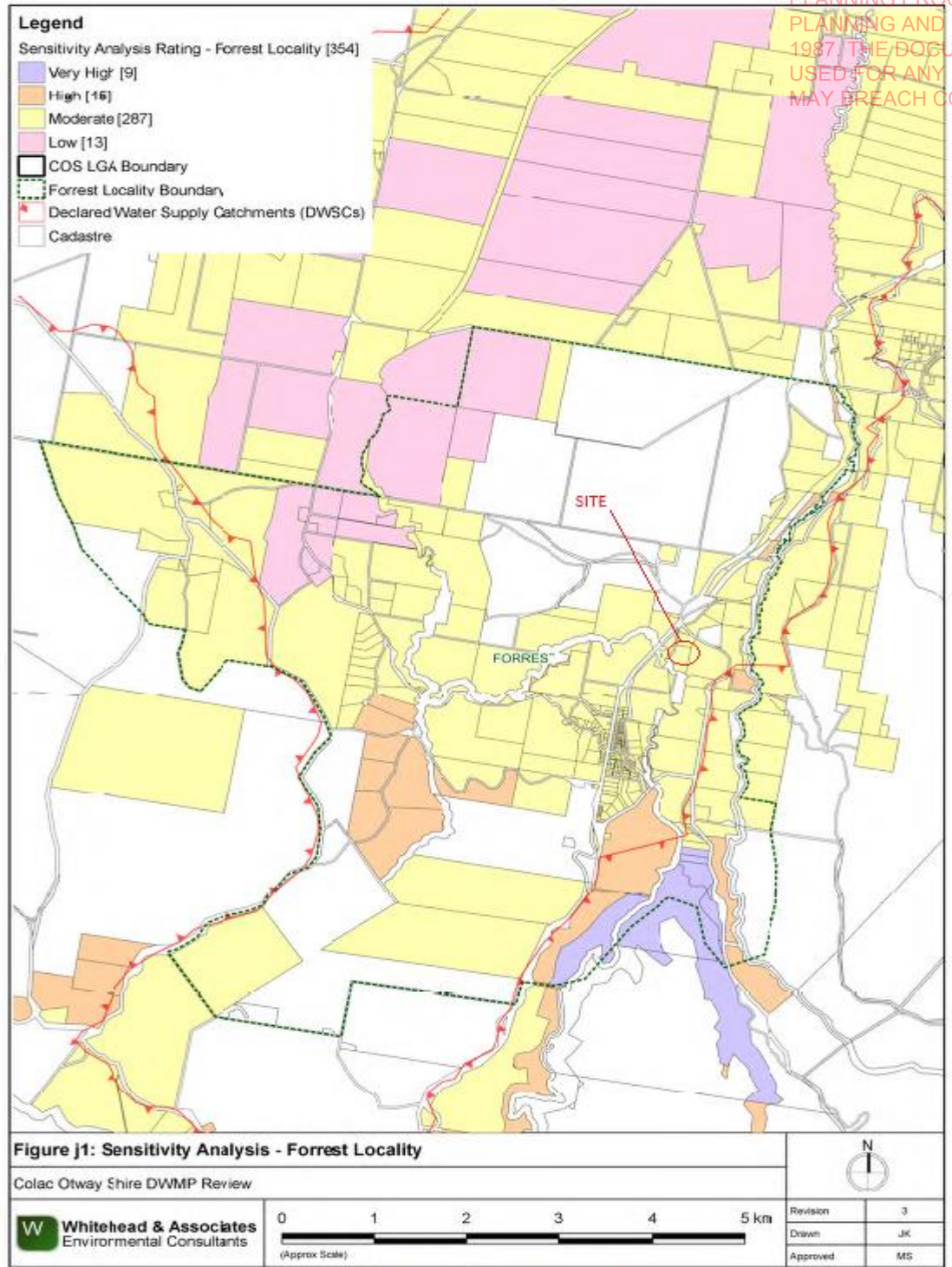
Sensitivity Analysis Rating

Moderate (DWMP)(See attached)

Declared Water Catchment Area

Not in water catchment area

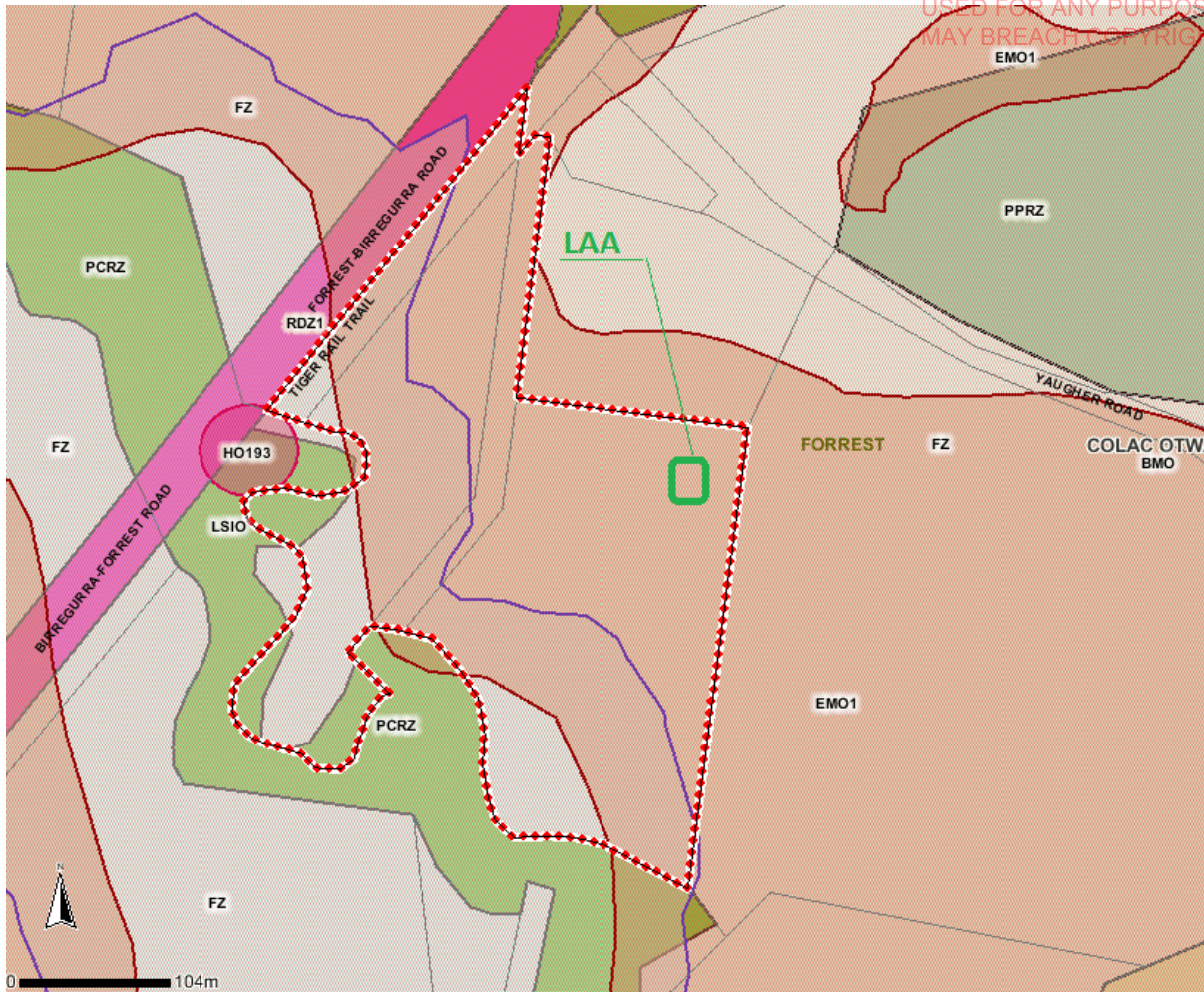
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Moderate Sensitivity (DWMP) Standard Report.(DWMP)

DWMP mapping also indicates site not within water catchment zone

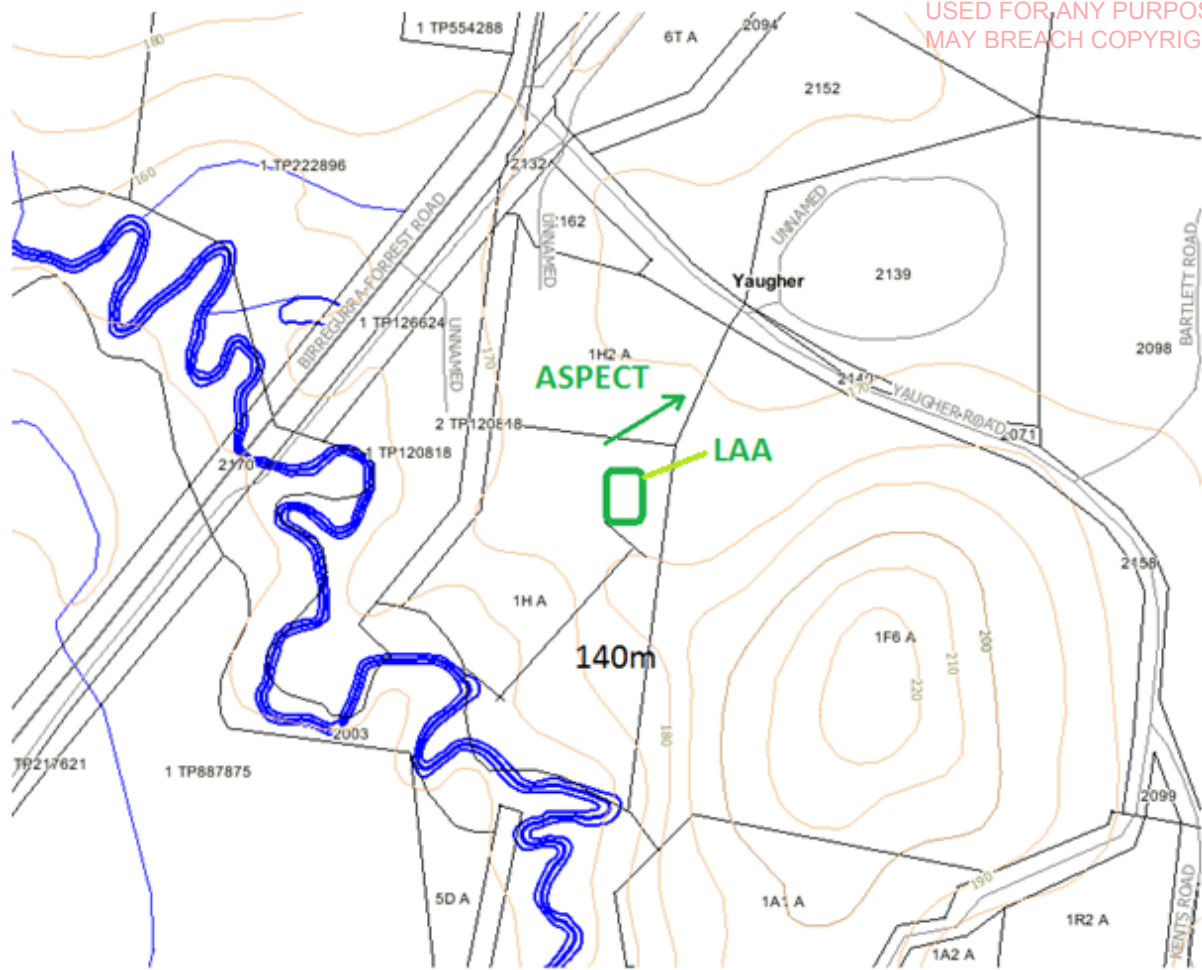
2 PLANNING REPORT



Location of LAA with respect to overlays. (Planning maps online)

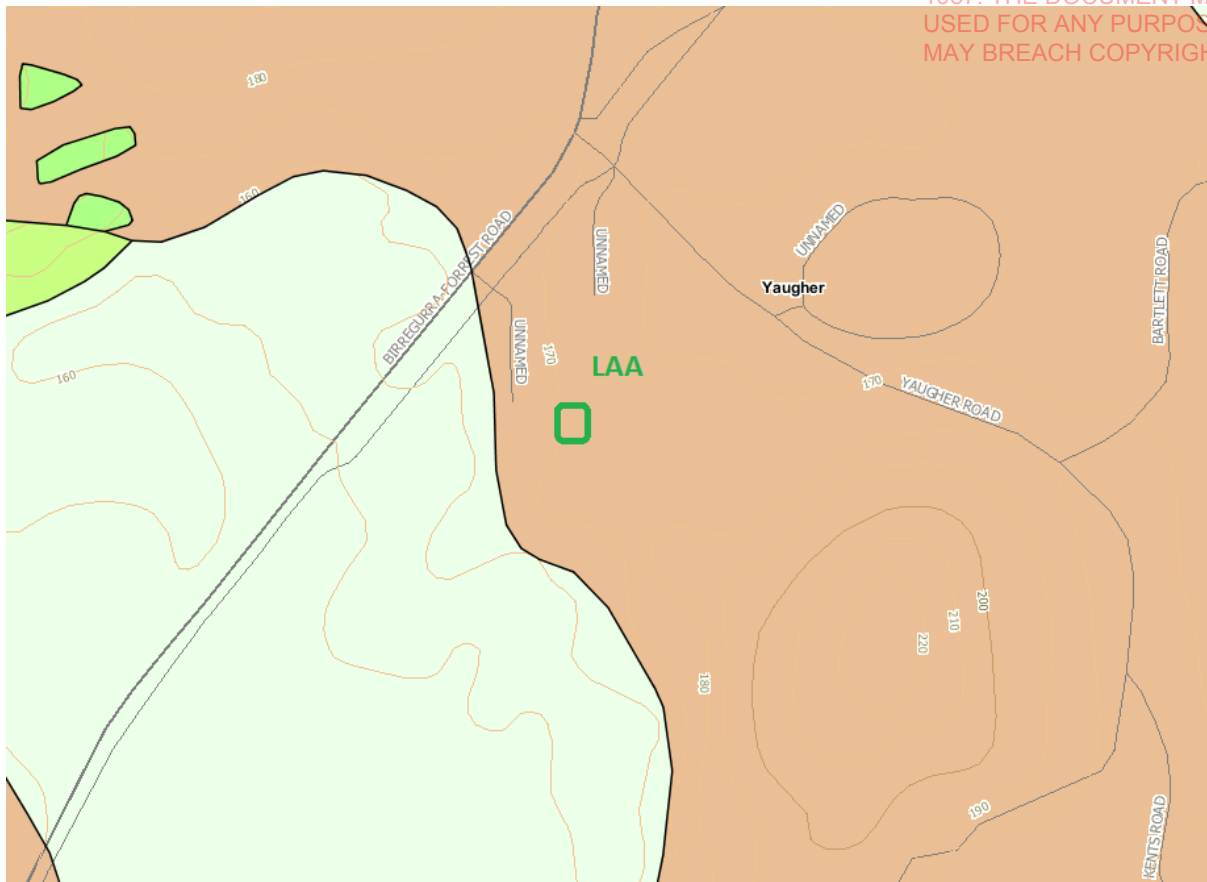
Note; LAA located outside Land Subject To Inundation.

3 TOPOGRAPHY (Planning Maps Online)



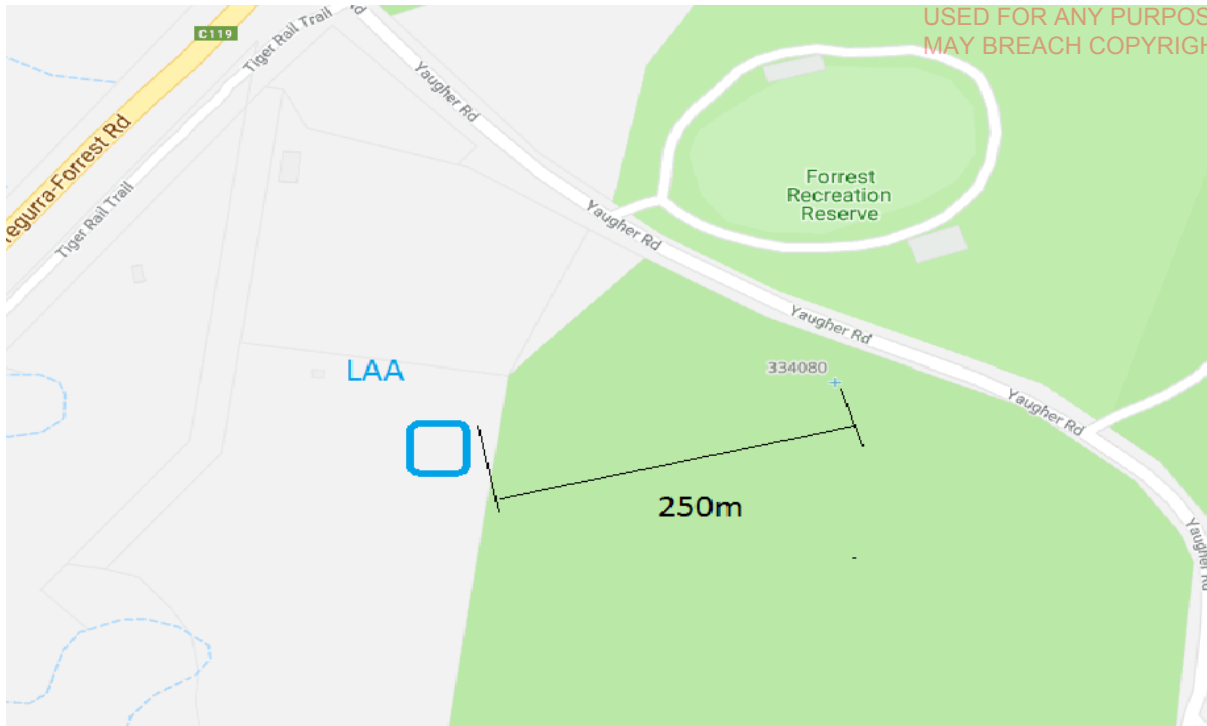
Land Application Area displays a NE aspect and is 140m from nearest water course.

4 GEOLOGY

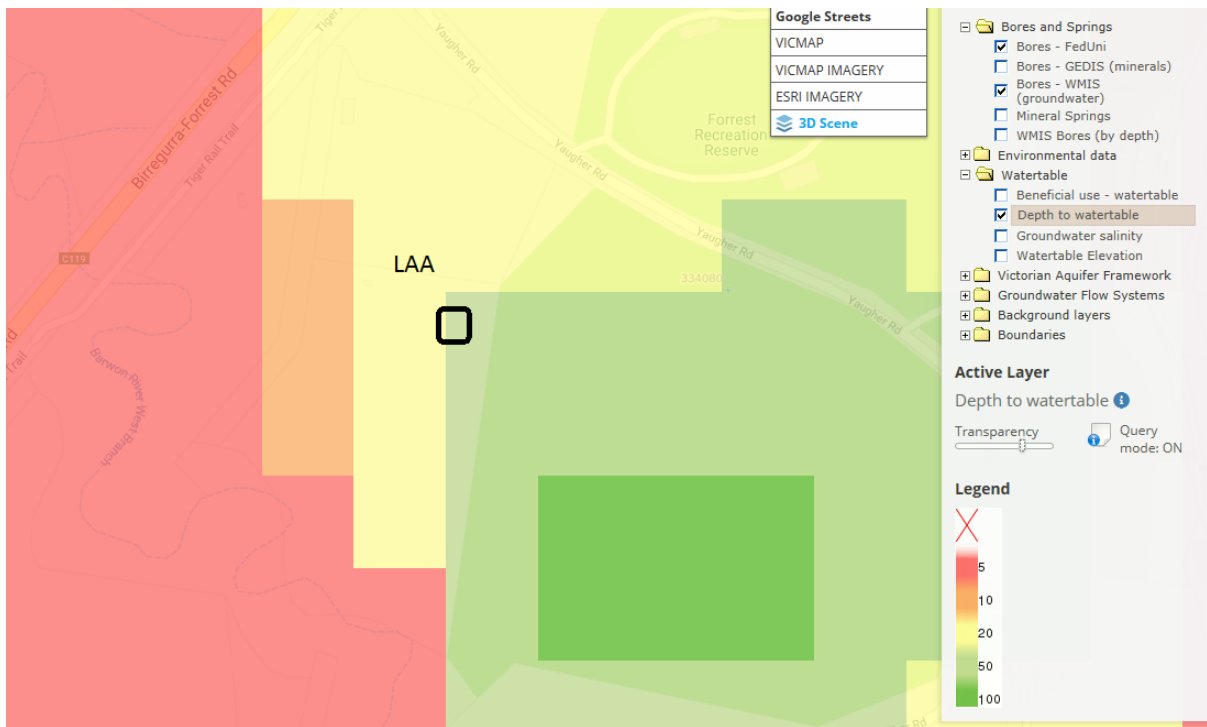


Published geological maps of the area indicate the property includes a range of TERTIARY AGE, Demons Bluff Formation material and Quaternary Age on the river flats, with the proposed building/disposal zones on an elevated portion of the Tertiary Age material.

5. GROUNDWATER BORES (VVG)



No bores within buffer zones of proposed LAA.(VVG).



Ground water indicated at about 50m. (VVG)

6. REGIONAL LAND USE



Aerial image indicates surrounding land use, cleared, open grassland, adjoining an area of bush.
(Planning Maps Online)

Proposed LAA site appears to have a long history as part of an extensive grazing operation and at the time of inspection contained improved pasture.

7. SITE INSPECTION & FIELD INVESTIGATIONS



View to north across build envelope, with LAA to right.(Source; Author).



View to NE from edge of build envelope LAA surface comprises slightly undulating, open, cleared area of grassland currently used for grazing. Existing vegetation displays vigorous bracken growth.

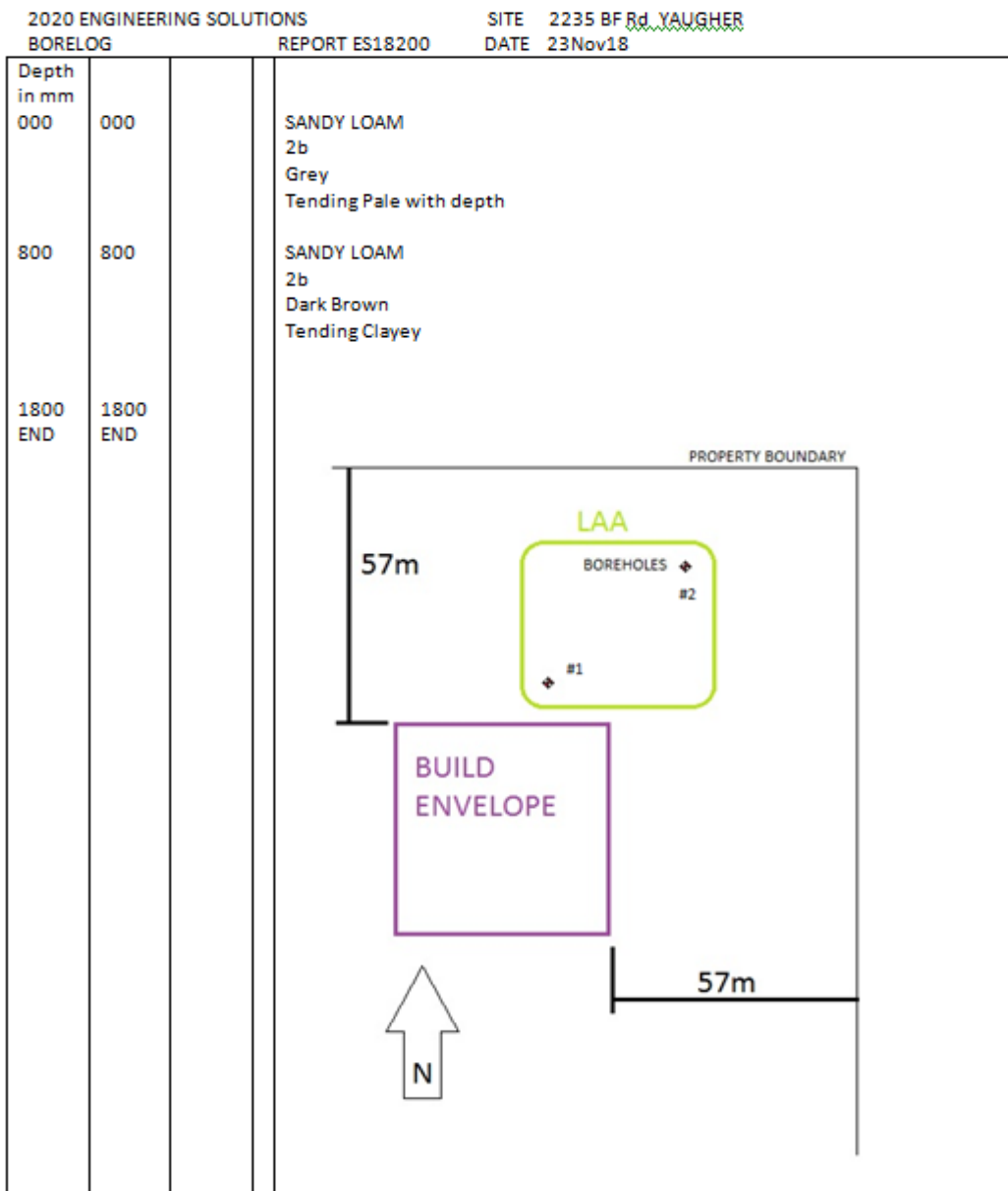
8.0 PROPOSAL

Proposed Plan indicating deemed wastewater production based upon 4 bedrooms, as (4 + 1) x 150 l/d = 750 l/d. Table 4 EPA 891.4

Full water reduction plumbing fittings give a deemed production rate of 150 l/d person or a total of 750 l/d. Table 4 EPA 891.4

Detailed plans were not available at the time of inspection and reporting.

9.0 BORELOG



10.0 SOIL ANALYSIS

IN FINAL REPORT

11 SYSTEM SELECTION

Based upon the site inspection, the size of the allotment, the local environment and the guidelines within the controlling documents, this report recommends primary treatment system discharging to ETA trenches.

Sizing Tables for each system type were created using conservative monthly water balances, following methods described in the MAV Model LCA, 2014. The water balances used monthly 70th percentile rainfall and average evapotranspiration data for Gellibrand, as it was compared with that of Forrest and found to be very similar, with very little size differences in water balance results. The climate data for Gellibrand was sourced from SILO (Scientific Information for Land Owners) climate databases, which are managed by the Queensland Government. The SILO databases use accurate meteorological data collected throughout Australia over long time periods.

The Design Loading Rates (DLRs) and Design Irrigation Rates (DIRs) were taken from the current EPA Code of Practice. Where the Code of Practice has precluded use of a particular type of system on a certain soil type, it is shown as 'Not Applicable' for that soil type in the Sizing Tables. Where the evapotranspiration deficit requires unrealistically large land application areas for a particular system on a certain soil type, it is also shown as 'Not Applicable' for that soil type in the Sizing Tables. Detailed, site-specific LCAs and system designs would be required to further investigate the feasibility of systems deemed 'Not Applicable' in the sizing tables. Mitigation measures (such as importation of topsoil to appropriate depths in the land application area), may be required to sustainably achieve land application of effluent on constrained properties/parcels. .(DWMP)

Based upon the commentary from the Colac Otway Domestic Wastewater Management Plan and with a controlling soil type of SANDY LOAM the indicated, conservative, DIR is 15. (Table L1, AS1547:2012).NOTE; INCONSISTENCY BETWEEN EPA 891.4 AND DWMP.

The following spread sheet/s produce a range of results for calculations. The water balance spread sheet indicates a trench base area of 51m² will be required, (85 x 0.6), supported by the DWMP which advises a similar figure of 52m².

Following the spread sheets is a scale plan of the LAA within the subject land.

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12 SIZING THE EFFLUENT DISPOSAL SYSTEM

Victorian Land Capability Assessment Framework	
Trench & Bed Sizing	
FORMULA FOR TRENCH AND BED SIZING	
L = Q/DLR x W	From AS/NZS 1547:2012
Where:	Units
L = Trench or bed length	m
Q = Design Wastewater Flow	L/day
DLR = Design Loading Rate	mm/day
W = Trench or bed width	m
INPUT DATA	
Design Wastewater Flow	Q 750 L/day
Design Loading Rate	DLR 15.0 mm/day
Trench basal area required	B 50.0 m ²
Selected trench or bed width	W 0.6 m
	As selected by designer/installer
OUTPUT	
Required trench or bed length	L 83.3 m
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

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Victorian Land Capability Assessment Framework

Please read the attached notes before using this spreadsheet

Irrigation area sizing using Nominated Area Water Balance for Zero Storage

Site Address: **Forrest**

Date: **MD** Assessor: **MD**

INPUT DATA

Design Wastewater Flow	Q	750	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2013)											
Design Irrigation Rate	DIR	15.0	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	500	m ²	1											
Crop Factor	C	0.6-0.8	unitless	Estimates evapotranspiration as a fraction of pan evaporation; varies with season and crop type ²											
Rainfall Runoff Factor	RF	1.0	unitless	Proportion of rainfall that remains onsite and infiltrates, allowing for any runoff											
Mean Monthly Rainfall Data	Silo														
Mean Monthly Pan Evaporation Data	Silo														

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	42	41	51	72	85	101	102	115	95	88	66	54	910
Evaporation	E		mm/month	131	108	89	55	34	23	26	39	56	82	99	121	863
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	0.80

OUTPUTS

Evapotranspiration	ET	Exc	mm/month	105	86	62	39	20	14	16	23	39	66	79	97	646
Percolation	B	DIR*D	mm/month	465.0	420	465.0	450.0	465.0	450.0	465.0	465.0	450.0	465.0	450.0	465.0	5475.0
Outputs		ET+B	mm/month	569.8	506.4	527.3	488.5	485.4	463.8	480.6	488.4	489.2	530.6	529.2	561.8	6121.0
Retained Rainfall	RR	RxRF	mm/month	42	41	51	72	85	101	102	115	95	88	66	54	910
Applied Effluent	W	(QxD)/L	mm/month	46.5	42.0	46.5	45.0	46.5	45.0	46.5	46.5	45.0	46.5	45.0	46.5	547.5
Inputs		RR+W	mm/month	88.5	83.0	97.5	117.0	131.5	146.0	148.5	161.5	140.0	132.5	111.0	100.5	1467.5

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	0.0
Storage for the month	S	(RR+W)-(ET+B)	mm/month	-481.3	-423.4	-429.8	-371.5	-353.9	-317.8	-332.1	-328.9	-349.2	-398.1	-418.2	-461.3	-461.3
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	0.0
Maximum Storage for Nominated Area	N		mm	0.00												
	V	hxL	L	0												

LAND AREA REQUIRED FOR ZERO STORAGE: 44 m²

MINIMUM AREA REQUIRED FOR ZERO STORAGE: 63.0 m²

CELLS

PLEASE ENTER DATA IN BLUE CELLS

RED CELLS ARE AUTOMATICALLY POPULATED BY THE SPREADSHEET

DATA IN YELLOW CELLS IS CALCULATED BY THE SPREADSHEET. DO NOT ALTER THESE CELLS

NOTES

Victorian Land Capability Assessment Framework

Please read the attached notes before using this spreadsheet

Nitrogen Balance

Site Address: **Forrest**

SUMMARY - LAND APPLICATION AREA REQUIRED BASED NITROGEN BALANCE **249** m²

INPUT DATA¹

Wastewater Loading			Nutrient Crop Uptake		
Hydraulic Load	L/day	Crop N Uptake	kg/ha/yr	which equals	mg/m ² /day
Effluent N Concentration	750	220	60.27		
% N Lost to Soil Processes (Geary & Gardner 1996)	25				
Total N Loss to Soil	0.2				
Remaining N Load after soil loss	3750				
	150000				

NITROGEN 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	m ²	Nominated LAA Size	m ²
	249	Predicted N Export from LAA	500
		Minimum Buffer Required for excess nutrient	-5.53
			0

CELLS

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

NOTES

- ¹ Model sensitivity to input parameters will affect the accuracy of the result obtained. Where possible site specific data should be used. Otherwise data should be obtained from a reliable source such as:
 - EPA Guidelines for Effluent Irrigation
 - Appropriate Peer Reviewed Papers
 - Environment and Health Protection Guidelines: Onsite Sewage Management for Single Households
 - USEPA Onsite Systems Manual

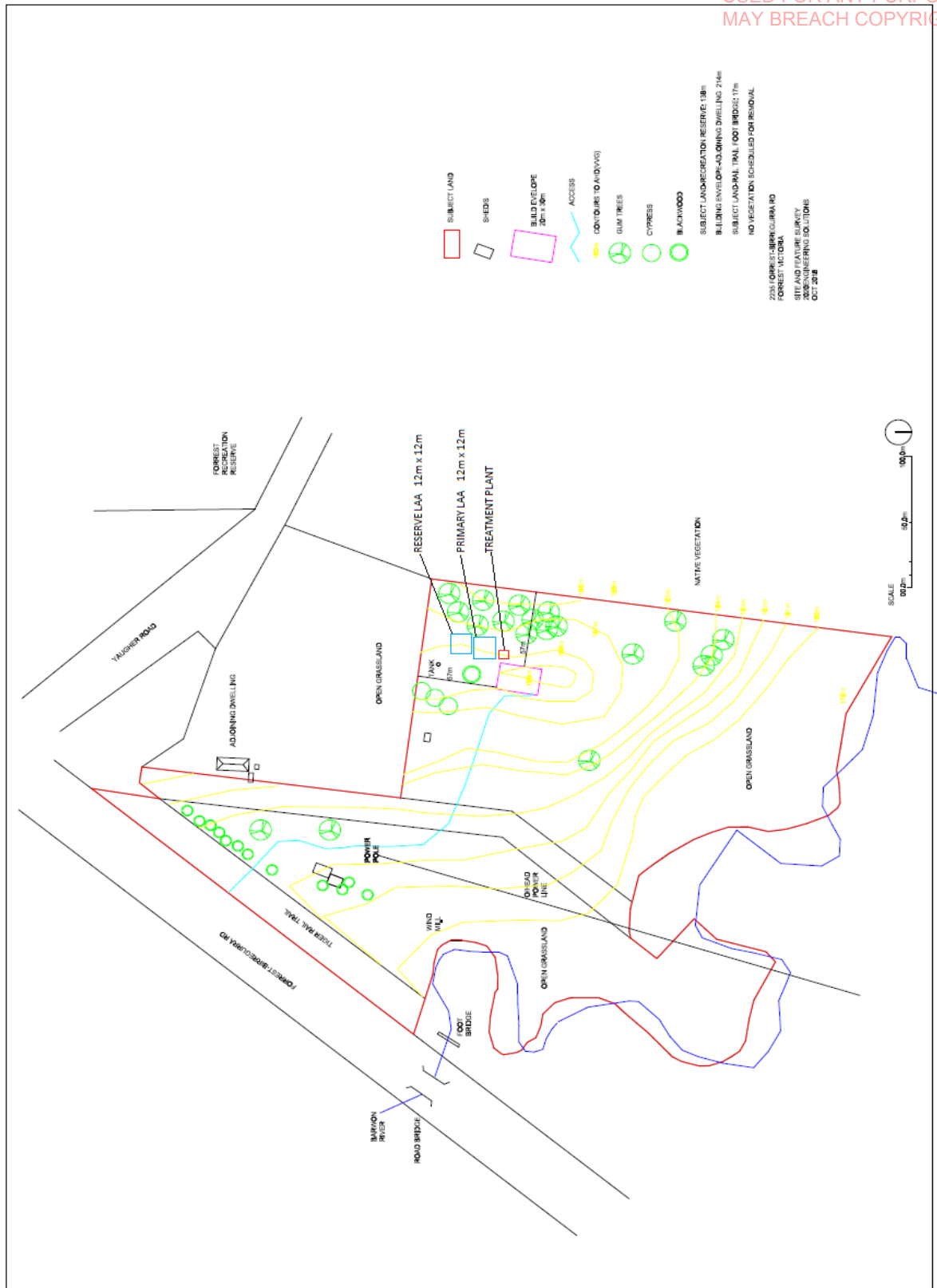
Coloac Otway Shire Council Domestic Wastewater Management Plan - Technical Document

Forrest											
Drip and Spray Irrigation Systems* - Secondary Treated Effluent only											
Development Type	Soil Category	DIR (mm)	Gravels & Sands (1)	Sandy Loams (2)		Clay Loams (3)		Medium to Heavy Clays (6)			
				5	4	3.5	3	2			
5 + bedroom residence	1,080	360	286	804	1,288	1,681	Total min. irrigation area required for zero wet weather effluent storage (m ²) not including spacing or setbacks				
4 bedroom residence	900	317	489	670	1,068	1,568					
1-3 bedroom residence	720	254	391	538	854	1,254					
Note: * Irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012.											
Conventional Absorption Trenches and Beds - Primary Treated Effluent											
Development Type	Soil Category	DIR (mm)	Gravels & Sands (1)	Sandy Loams (2)		Weak Loams & High/Mod Clay Loams (3 & 4)		Light Clays (5)	Massive Clay Loams (4)	Medium to Heavy Clays (6)	
				4	3	2					
5 + bedroom residence	1,080	360	286	804	1,288	1,681	Not supported (Alternative Land Application System Required)				
4 bedroom residence	900	317	489	670	1,068	1,568					
1-3 bedroom residence	720	254	391	538	854	1,254					
Evapotranspiration-Absorption Trenches and Beds - Primary Treated Effluent (Category 1 to 5) and Secondary Treated Effluent only (Category 6)											
Development Type	Soil Category	DIR (mm)	Gravels & Sands (1)	Sandy Loams (2)		Clay Loams (3)	Weak/Massive Loams (3b)	High/Mod Clay Loams (4a)	Weak Clay Loams (4b) & Strong Light Clays (5a)	Massive Clay Loams (4c) and Mod & Weak Light Clays (5b, 5c)	Medium to Heavy Clays (6) - Secondary Effluent Only
				4	3						
5 + bedroom residence	1,080	360	286	804	1,288	1,681	144	114	197	431	5
4 bedroom residence	900	317	489	670	1,068	1,568	120	96	154	300	
1-3 bedroom residence	720	254	391	538	854	1,254	96	76	131	288	
Note: * Irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012.											
LPED Irrigation Systems - Primary or Secondary Treated Effluent											
Development Type	Soil Category	DIR (mm)	Gravels & Sands (1)	Sandy Loams (2)		Clay Loams (3)	Clay Loams (4)	Light Clays (5)	Medium to Heavy Clays (6)		
				4	3.5						
5 + bedroom residence	1,080	360	286	804	1,288	1,681	N/A	N/A	N/A		
4 bedroom residence	900	317	489	670	1,068	1,568	(Alternative Land Application System Required)	(Alternative Land Application System Required)	(Alternative Land Application System Required)		
1-3 bedroom residence	720	254	391	538	854	1,254	716				
Note: * Irrigation system sizes are based on the assumption that the land application area is less than 10% slope. Reductions in DIR apply for slopes above 10% according to Table M2 of AS1547:2012.											
Wick Trenches and Beds - Secondary Treated Effluent Only											
Development Type	Soil Category	DIR (mm)	Gravels & Sands (1)	Sandy Loams (2)		Weak High/Mod Clay Loams (4a,b)	Massive Clay Loams (4)	Strong Light Clays (5a)	Moderate Light Clays (5b)	Weak Light Clays (5c)	Medium to Heavy Clays (6)
				4	3						
5 + bedroom residence	1,080	360	286	804	1,288	1,681	144	114	197	431	N/A
4 bedroom residence	900	317	489	670	1,068	1,568	120	96	154	300	(Alternative Land Application System Required)
1-3 bedroom residence	720	254	391	538	854	1,254	96	76	131	288	(Alternative Land Application System Required)

Whitehead and Associates Environmental Consultants
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12.1 SITE PLAN



Scale drawing of proposed disposal area within subject land.(Planning Maps Online)

12.2 Applicable Setback Distances (from AS1547:2012)

Landscape Feature / Structure	* Setback Distances (m)					
	Primary Treated Effluent	Secondary Sewage & Grey water Effluent	Advanced Secondary Grey water Effluent			
BUILDING						
Wastewater field up-slope of building	<input checked="" type="checkbox"/>	6	<input type="checkbox"/>	3	<input type="checkbox"/>	3
Wastewater field down-slope of building	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	1.5	<input type="checkbox"/>	1.5
Wastewater field up-slope of cutting/escarpment	<input checked="" type="checkbox"/>	15	<input type="checkbox"/>	15	<input type="checkbox"/>	15
ALLOTMENT BOUNDARY						
Wastewater field up-slope of adjacent lot	<input checked="" type="checkbox"/>	6	<input type="checkbox"/>	3	<input type="checkbox"/>	1
Wastewater field down-slope of adjacent lot	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	1.5	<input type="checkbox"/>	0.5
SERVICES						
Water supply pipe	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	1.5	<input type="checkbox"/>	1.5
Wastewater field up-slope of potable supply channel	<input checked="" type="checkbox"/>	300	<input type="checkbox"/>	150	<input type="checkbox"/>	150
Wastewater field down-slope of potable supply channel	<input checked="" type="checkbox"/>	20	<input type="checkbox"/>	10	<input type="checkbox"/>	10
Gas supply pipe	<input checked="" type="checkbox"/>	3	<input type="checkbox"/>	1.5	<input type="checkbox"/>	1.5
In-ground water tank	<input checked="" type="checkbox"/>	15	<input type="checkbox"/>	4	<input type="checkbox"/>	3
Stormwater drain	<input checked="" type="checkbox"/>	6	<input type="checkbox"/>	3	<input type="checkbox"/>	2
RECREATION AREAS						
Children's grassed playground	<input checked="" type="checkbox"/>	6	<input type="checkbox"/>	3	<input type="checkbox"/>	2
In-ground swimming pool	<input checked="" type="checkbox"/>	6	<input type="checkbox"/>	3	<input type="checkbox"/>	2
SURFACE WATERS UP-SLOPE OF						
Dam, lake or reservoir (potable water supply)	<input checked="" type="checkbox"/>	300	<input type="checkbox"/>	150	<input type="checkbox"/>	150
Waterways (potable water supply)	<input checked="" type="checkbox"/>	100	<input type="checkbox"/>	100	<input type="checkbox"/>	50
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high-tide mark; dams, lakes or reservoirs (stock & domestic, non-potable)	<input checked="" type="checkbox"/>	60	<input type="checkbox"/>	30	<input type="checkbox"/>	30
GROUNDWATER BORES						
Category 1 & 2a soils		NA	<input type="checkbox"/>	50	<input type="checkbox"/>	20
Category 2b – 6 soils	<input checked="" type="checkbox"/>	20	<input type="checkbox"/>	20	<input type="checkbox"/>	20
WATERTABLE						
Vertical depth from base of trench to highest seasonal water table	<input checked="" type="checkbox"/>	1.5	<input type="checkbox"/>	1.5	<input type="checkbox"/>	1.5
	<input checked="" type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Vertical depth from irrigation pipes to highest seasonal water table		NA	<input type="checkbox"/>	1.5	<input type="checkbox"/>	1.5
			<input type="checkbox"/>		<input type="checkbox"/>	

* X indicates compliance

13 PLANNING AUTHORITY LAND CAPABILITY ASSESSMENT/CONFIRMATION

Date Received:

1. Forwarded to Referral Authority: Yes No

Authority Name:

Date Forwarded:

Response within Statutory Time Frame: Yes No

Referral Authority Advice Conforming: Yes No

Reason for Non-Conformance:

2. Forwarded to Referral Authority: Yes No

Authority Name:

Date Forwarded:

Response within Statutory Time Frame: Yes No

Referral Authority Advice Conforming: Yes No

Reason for Non-Conformance:

Planning Authority Advice Conforming: Yes No

Date Assessed:

Responsible Planning Officer:

SECTION TWO

MAV TABLES

Table 1: Key Site Features		
Feature	Explanation	Assessment Process
Aspect	The aspect or the direction that a slope is facing influences solar exposure.	NE aspect, good exposure
Climate	Seasonal rainfall, evaporation and temperature patterns influence potential evapotranspiration in land application areas.	Incorporated into water balance spread sheet/s and LAA sizing from DWMP
Erosion and Landslip	Unstable areas (steep, unvegetated, dispersive soils etc.) are usually unsuitable for LAAs without mitigation.	No
Fill (imported)	Capacity to assimilate effluent depends on the physical and chemical characteristics of the imported fill material(s).	No fill.
Flooding	Requirements for siting onsite wastewater infrastructure (including LAAs) away from areas subject to flooding can vary between Councils.	No
Ground-water	Adequate depth of soil to protect groundwater resources largely depends on soil type and climate.	Not noted in boreholes
LandSuitability	An LCA is used to determine which land is suitable and unsuitable for LAAs.	All land suitable.
Landform	Landform shape and the position of LAAs on slopes influence drainage and runoff characteristics both onto any potential LAAs as well as downslope of them (i.e. will runoff be evenly shed, or concentrated or dispersed flows?).	See attached site plan Broad even run-off

Feature	Explanation	Assessment Process
Rock Outcrops	Rock outcrops displace soil horizons and therefore can limit the assimilative capacity of LAAs for effluent. Outcrops can indicate shallow bedrock. Some rocks are strongly fissured and permeable and others are not.	No Rock
Setback Distances	Determining the most appropriate position for LAAs should be prioritised over placement of building areas.	See included table from AS1547;2012
Site Drainage	LAAs should be located in areas of good surface and subsurface (soil) drainage.	Good drainage, slight slope on land allowing slow run-off but no pooling.
Stormwater Run-on and Runoff	LAAs should not be located in areas with high run-on, without mitigation such as upslope diversion structures. Downslope runoff diversion may be useful.	LAA near crest of hill, no storm water issues
Slope	Land application of effluent becomes increasingly constrained with increasing slope gradient, increasing the chances of effluent runoff or subsurface seepage.	Slope of land generally <5.0%
Surface Waters	Whether the setback distances specified in the Code can be achieved from LAAs.	Adequate setback from Barwon River, East Branch.
Vegetation	Good vegetation cover is important to prevent erosion as well as for uptake of water and nutrients from effluent.	Grasses/bracken.

Table 2: Description of Key Chemical and Physical Soil Features		
Feature	Explanation	Assessment Process
Cation Exchange Capacity	Influences the ability of the soil to hold and exchange cations; a major controlling agent for soil structural stability, nutrient availability for plants and the soil's reaction to fertilisers and other ameliorants (refer to Hazelton & Murphy, 2007).	
Colour and Mottling	Gleyed soils indicate permanent saturation (permanent watertable), while orange, yellow and red mottles indicate seasonal saturation with intermittent periods of drying (perched or seasonal watertable).	No mottling noted
Electrical Conductivity (EC)	EC test result infers the salinity of the soil and its potential impact on plant growth on the LAA. Refer to Hazelton & Murphy (2007) for interpretation of EC test results. Application of effluent increases salt content of soils over time.	

Feature	Explanation	Assessment Process
Emerson Aggregate Class	EAC results infer dispersibility (as ped slaking, soil dispersion or both). LAAs should not be installed in soils with moderate or high dispersibility, without adequate mitigation (e.g. addition of gypsum, use of irrigation).	
Permeability and Design Loading Rate	The rate at which water moves through the soil reflects the soil's permeability and determines the rate at which effluent is applied to land in litres per square metre per day (mm per day). The application rate for each type of land dispersal and recycling system is listed in Table 9 in the Code. Whilst the loading rate for LAA design is based on the permeability, it is less than the true permeability.	Adopted DIR, 15.
pH	Acid soils (pH <5) or alkaline soils (pH >8) may constrain plant growth and should be ameliorated by use of chemical additives (e.g. lime for acidity).	
Rock Fragments	Coarse rock fragments displace soil volume and therefore can limit assimilative capacity of soils.	No
Sodicity [Exchangeable Sodium Percentage (ESP)]	The percentage of sodium compounds on cation exchange sites on soil particles. ESP >6% may cause damage to the soil structure. Refer to Hazelton & Murphy (2007). Effluent and greywater contain sodium.	
Sodium Absorption Ratio (SAR)	The ratio of sodium to calcium and magnesium (beneficial elements) in the soil solution, with higher ratios potentially damaging to plants and soils.	

Feature	Explanation	Assessment Process
Soil Depth	Deeper soils generally have a greater assimilative capacity for effluent (depending on soil type).	>1.8m
Soil Texture	Soil textures are categorised as 1. Gravels and Sands 2. Sandy Loams 3. Loams 4. Clay Loams 5. Light Clays, or 6. Medium to Heavy Clays (AS/NZS1547:2012).	Cat. 2
Watertable (depth to)	The required soil depth to protect groundwater depends on soil type; high permeability soils generally require a greater separation distance (soil depth).	20.0m – 50.0m

Table 3: Risk Assessment of Site Characteristics

Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	Nil or Minor	Moderate	Major	
Aspect (affects solar radiation received)	North / North-East / North-West	East / West / South-East / South-West	South	NIL
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	MAJOR
Erosion ¹ (or potential for erosion)	Nil or minor	Moderate	Severe	NIL
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	NIL
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	NIL
Flood frequency (ARI) ³	Less than 1 in 100 years	Between 100 and 20 years	More than 1 in 20 years	NIL
Groundwater bores ⁴	No bores onsite or on neighbouring properties	Setback distance from bore complies with requirements in EPA Code of Practice 891.3 (as amended)	Setback distance from bore does not comply with requirements in EPA Code of Practice 891.3 (as amended)	NIL

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Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	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	NIL
Landslip (or landslip potential) ⁵	Nil	Minor to moderate	High or Severe	NIL
Rock outcrops (% of surface)	<10%	10-20%	>20%	NIL
Slope Form (affects water shedding ability)	Convex or divergent side-slopes	Straight side-slopes	Concave or convergent side-slopes	MODERATE
Slope gradient ⁶ (%)				
(a) for absorption trenches and beds	<6%	6-15%	>15%	NIL
(b) for surface irrigation	<6%	6-10%	>10%	
(c) for subsurface irrigation	<10%	10-30%	>30%	
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 with water	NIL

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Characteristic	Level of Constraint			Assessed Level of Constraint for Site
	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)⁵	Setback distance complies with requirements in EPA Code of Practice 891.3 (as amended)		Setback distance does not comply with requirements in EPA Code of Practice 891.3 (as amended)	MINOR
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
	Nil or Minor	Moderate	Major	
Soil Drainage⁵ (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	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	MINOR
	Well drained. Water removed from the soil readily, excess flows downward. Some horizons may remain wet for several days after addition		Poorly/Very poorly drained. Water remains at or near the surface for most of the year, strong gleying. All horizons wet for several months	

The above MAV tables indicate one Moderate, (slope shape), and one MAJOR, (winter rainfall) constraints.

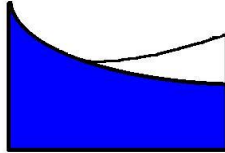
Slope shape, waxing plainer, is difficult to mitigate however trenches constructed along the contours will mitigate the constraint. Likewise with the elevated location, the LAA will have minimal stormwater run-on and the deep sandy soil will handle elevated rain fall producing a safe disposal method.

SECTION THREE

SITE MANAGEMENT PLAN

Attached

 Yes

 No


**2020
ENGINEERING
SOLUTIONS**

2020 Engineering Solutions

1745 Colac-Forrest Road

COLAC VIC 3249

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ABN 57 215 499 312 ACN 11 9460 865

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PROPERTY MANAGEMENT PLAN

SITE: 2235 Birregurra- Forrest Rd Forrest.

DEVELOPER: Scott

REPORT NUMBER: ES18232

DATE: 27/11/2018

REPORTING TO: AS 1547:2012

On-site domestic wastewater management

EPA Publication 891.4 July 2016

Code of Practice Onsite Wastewater Management

Barwon Water / Wannon Water

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1 PREAMBLE

This Property Management Plan is intended for use by property owners in Barwon Water /Wannon Water drinking water supply catchments. It is written for occupancies with onsite wastewater treatment systems, but also applies to other developments where management of risk to downstream water quality is required.

This document must not be considered a definitive plan or control for all properties and wastewater systems. The landowner property management plan is drafted with consideration to planning permit requirements, EPA Publication 891.4 “Code of Practice Onsite Wastewater Management”, the Land Capability Assessment, and AS1547:2012 “On-site domestic wastewater management”.

The plan must be maintained by the landowner and amended when required. Any increased loading on the property or system failure requires the review of the existing Land Capability Assessment and Waste Water Management System. Any amendment to the plan must be submitted to Barwon/Wannon Water for endorsement.

The plan must be kept on site and be available for inspection by Council or other government agencies.

1.1 Property Owner Responsibilities

Property owners and occupiers are responsible for reducing risks to downstream water quality that originate from their property. This includes:

- ensuring pipework & wastewater systems don't leak;
- keeping wastewater systems well maintained & in good repair;
- appropriately managing herbicides, pesticides & other chemicals;
- minimising erosion & sediment movement;
- maintaining buffers of native vegetation around watercourses;
- compliance with Council and EPA requirements; and
- implementing this Property Management Plan.

2 EMERGENCY CONTACT NUMBERS

PROPERTY MANGEMENT PLAN	
EMERGENCY OR ONSITE WASTEWATER MAINTENANCE CONTACT NUMBERS	
POLICE, AMBULANCE, FIRE	000
PLUMBER	To be advised
ELECTRICIAN	To be advised
COUNCIL ENVIRONMENTAL HEALTH OFFICER	COLAC OTWAY SHIRE 03 5232 9400
EPA	1300 372 842
SYSTEM SUPPLIER	COLAC CEMENT PRODUCTS 03 5231 5231 or other
SYSTEM SERVICE AGENT	COLAC CEMENT PRODUCTS 03 5231 5231 or other
SEPTIC PUMPOUT TANKER	RICHARDSON'S LIQUID WASTE 03 5234 6585 or other
BARWON WATER	1300 656 007

If any of the following incidents, which could impact on downstream water quality, occur on site they should be reported to Barwon/Wannon Water immediately:

Chemical spill Fuel spill Bushfire Landslip

3 SITE PLAN

Site plans drawn to scale (attached) show dimensions and include the following details:

- the site address, including lot number & street number;
- title boundaries;
- direction of north;
- location of groundwater bores on the site & adjacent properties;
- contour lines (at 1 - 10 m intervals), or direction of slope & slope in percent;
- location of dams & waterways onsite & within 100m of the property;
- drainage lines & springs;
- stormwater cut-off drains adjacent to land application area & treatment system;
- location of actual & proposed buildings, sheds, driveways, paths & paddocks;
- location of actual & proposed infrastructure, especially drains;
- location & dimensions of the wastewater treatment plan; and
- location & dimensions of the land application area.

The site plan must be amended when any of the above details change (including on issue of as-constructed drawings), and the amended plan must be provided to Barwon Water.

4 DETAILS OF THE WASTEWATER TREATMENT SYSTEM

The plan requires the following details of the wastewater treatment system:

- manufacturer's manuals & spare parts list;
- as-installed drawings;
- copy of EPA Certificate of Approval;
- copy of Council wastewater system permit;
- description of the maintenance regime, to meet manufacturer's recommendations & the maintenance, monitoring & reporting requirements of the Council permit & the EPA certificate of approval; and
- in the case of a secondary treatment system, a copy of a current service contract with an accredited or experienced trained service technician to implement the maintenance regime.

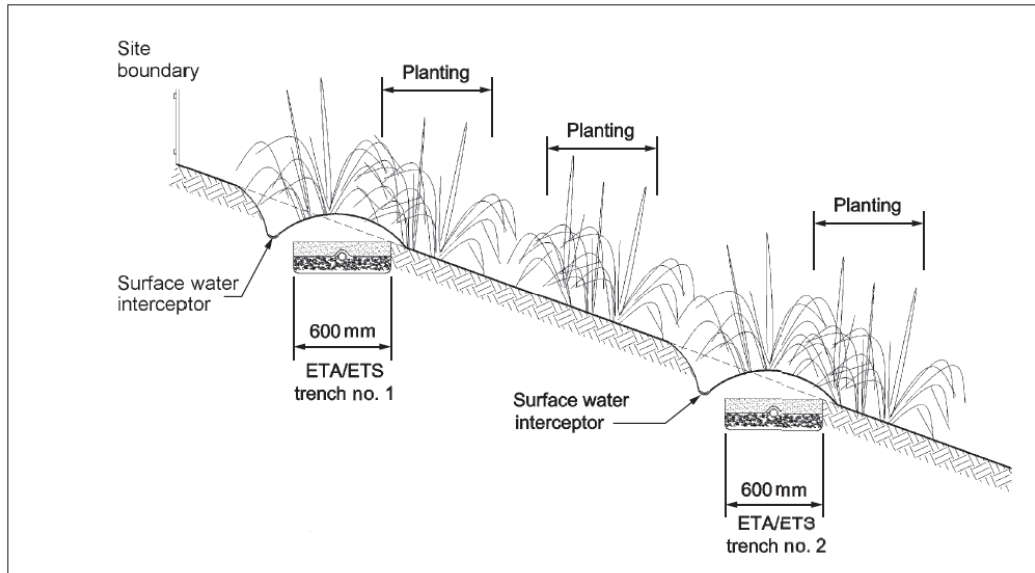
All details relevant to the above will be available and submitted after issue of the permit as they are post developmental.

Sewage Treatment Plants

Developer to select suitable primary treatment plant with EPA approval.

NOTE: Developer can supply following information post construction as most documentation relies upon approval to construct development and install a system. Included as example only. 2020Eng is independent and does not recommend particular systems.

5 DETAILS OF THE EFFLUENT DISPOSAL SYSTEM



NOTES:

- 1 An LPED line can be used to dose load the ETA/ETS trenches.
- 2 Each ETA/ETS trench is constructed to disperse effluent into downslope topsoil so that plantings can provide assistance by evapotranspiration.

FIGURE L7 ETA/ETS TRENCHES

The plan requires the following details of the effluent disposal system:

- manufacturer's manuals & spare parts list for components including pumps, valves, and filters;
- as-installed drawings; and
- description of the maintenance regime, to meet manufacturer's recommendations & the maintenance, monitoring & reporting requirements of Council & the EPA. At a minimum, visual inspection of the land application area is required whenever the treatment system is inspected.

All details relevant to the above will be available and submitted after issue of the permit as they are post developmental.

6 WASTEWATER TREATMENT SYSTEM MAINTENANCE

The waste water treatment system, including its pipework shall:

- be inspected & maintained as per the maintenance regime;
- be protected from vehicle, farm machinery or livestock damage;

- have any grease trap inspected at least quarterly & cleaned out regularly;
- have any vents kept clear & access covers in working order;
- be visually checked for damage especially after being pumped out - damage is to be repaired; and
- be replaced if not operating adequately.

Inspections of treatment units are to be recorded on the operation and maintenance log as well as any defects and repairs undertaken.

7 LAND APPLICATION AREA (Effluent Disposal) OPERATION & MAINTENANCE

The following measures shall be implemented:

- the land application area & disposal system shall be inspected & maintained as per the maintenance regime;
- any evapotranspiration areas shall be designed to exclude vehicle, farm machinery, or stock access;
- surface water diversion drains shall be maintained upslope of & around the land application area & kept clean; and
- roof water drainage / hard stand drainage must be diverted away from the land application area.

Evapotranspiration and irrigation areas shall:

- have their grass mown & plants maintained to ensure these areas take up nutrients with maximum efficiency;
- be checked for wet spots, uneven grass colour & symptoms of emitter blockage (evidenced by under-irrigated dry areas or over-irrigated wet areas); and
- have blocked or damaged irrigation lines replaced.

Equipment shall be checked in the following manner:

- the manufacturer's instructions for maintaining & cleaning pumps, siphons & septic tank & outlet filters shall be followed;
- disc filters or filter screens on irrigation-dosing equipment shall be cleaned at least annually by rinsing back into the primary wastewater treatment unit; and
- irrigation lines shall be flushed at least annually to scour out any accumulated sediment.

Inspections are to be recorded on the Operations Log as well as any defects and repairs undertaken.

8 HOUSEHOLD MANAGEMENT OF WASTEWATER

The following measures should be implemented for optimum performance of system.

8.1 Sludge Build Up Reduction

- food waste including fats, grease & oils shall be disposed of in composting bin or worm farm
- no food waste disposal unit shall be installed
- sanitary napkins & hygiene products shall be disposed of in garbage

8.2 Encourage Bacteria

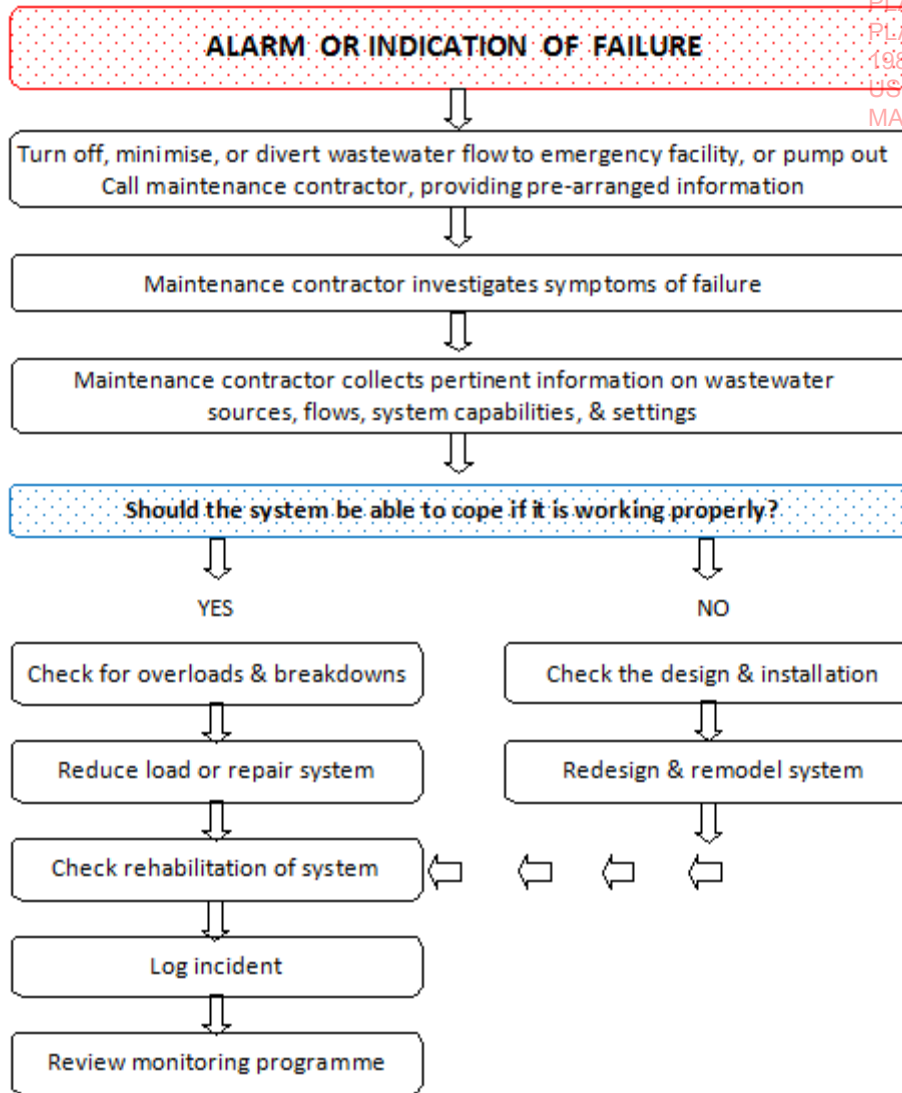
- use biodegradable soaps
- use low-phosphorus detergent
- use low-sodium detergent where soils are dispersive
- limit the use of cleaners such as bleaches, whiteners, nappy soakers & disinfectant, especially for toilet/shower cleaning
- do not put chemicals, thinners or paint down the drain or gulley trap

8.3 Reduce Effluent Volume Load

- install & use water conserving fittings ie. shower heads & appliances
- wash full loads only in dishwasher & washing machine
- avoid system overload ie. 1 washing machine load per day & run washing machine & dishwasher at different times
- do not install a spa bath

9 CONTINGENCY PLAN

The plan below shall be followed for a sudden failure of the wastewater system. A generalised flow chart of actions to be taken is:



(Figure 6.3 from AS1547:2012)

10 SITE OPERATIONS & MAINTENANCE LOG

A site operation and maintenance log shall be kept for any wastewater system. This will assist in the determination of recurring problems/trends. The maintenance log is to show when scheduled maintenance is due. Matters to be recorded in the log include:

- pump out records;
- service records;
- inspections; and
- records of all irregular operation & response actions.

Copies of programmed maintenance and pump out (desludging) works performed by maintenance contractors, as required by the Council (septic tank) permit, are to be

forwarded to the Council Environmental Health Officer. A copy of the latest maintenance certificate is to be retained with this property management plan and recorded on the maintenance log.

11 IDENTIFICATION, RISK ASSESSMENT & CONTROLS FOR OTHER POTENTIAL THREATS TO DOWNSTREAM WATER QUALITY

The landholder is required to identify and assess the risk of other potential threats to downstream water quality, resulting from the development and use of the property ie.

- erosion risks; and
- risks from storage & application of chemicals.

Construction methods should be carried out in a manner which will minimise soil, sediment and nutrient movement from the property to water courses during development and use of the property. Potential sources of sediment movement to consider are:

- tracks& driveways;
- high traffic areas (vehicular, human, animal); and
- construction areas (occupancy, roads, fencing).

The design of stormwater run-off from the site should be described. Activities to encourage native vegetation retention and re-establishment within a 30 metre buffer zone along waterways, and to exclude stock from waterways, should be described. Activities to prevent the spread of noxious weeds should be described.

Chemicals such as herbicides and pesticides can be a risk to downstream water quality. The landowner should follow manufacturer's instructions and be familiar with the advice available from: <http://www.depi.vic.gov.au/agriculture-and-food/farm-management/chemical-use>. Procedures for chemical application and storage should be described in the Property Management Plan.

Businesses should contact Barwon Water to determine if a water quality monitoring program immediately up and down stream of works that pose a significant threat to water quality is required. This may include:

- analytical monitoring of turbidity following large-scale activities that could potentially result in sediment movement (e.g. cultivation, harvesting); and
- monitoring of the active ingredients within herbicides and pesticides following intensive and broad scale herbicide/pesticide applications.

Appendix 1 Maintenance Log Template

Treatment System Inspections, Maintenance & Repairs			
Due Date (if scheduled)	Actual Date of Activity	Name of Inspector/ Contractor	Description of Work, Observations & Comments

Effluent Disposal Area Inspections, Maintenance & Repairs			
Due Date (if scheduled)	Actual Date of Activity	Name of Inspector/ Contractor	Description of Work, Observations & Comments

INSURANCE CERTIFICATE OF CURRENCY



Integro Insurance Brokers Limited
 2nd Floor • 100 Leadenhall Street • London
 EC3A 3BP
 Telephone: (0)20 7444 6000
 Fax: (0)20 7444 6001
 Website: www.integrouk.com

WEDNESDAY, 16 AUGUST 2017

CERTIFICATE OF CURRENCY

POLICY NUMBER: IL1705880

TYPE: PROFESSIONAL INDEMNITY INSURANCE as may be more fully defined in the policy wording.

INSURED: 2020 Engineering Solutions

ADDRESS: 17/5 Colac-Forrest Road
Colac VIC 3249
Australia

PERIOD OF INSURANCE: From: 21st August 2017
To: 31st August 2018

Both days at 16.00 Hours Local Standard Time at the Principal Address of the Insured

LIMIT OF INDEMNITY: AUD 2,000,000 any one Claim and in the aggregate including Costs and Expenses plus one reinstatement

PLACED WITH: 100% Certain Underwriters at Lloyd's

For and on behalf of Integro Insurance Brokers Limited

This certificate is a summary of the policy and is not intended to amend, extend, replace or override the policy terms and conditions. In the event of any consistency between this certificate and the policy, the policy prevails.

Authorised and regulated by the Financial Conduct Authority under reference number 305496
 Registered Office: 2nd Floor, 100 Leadenhall Street, London, EC3A 3BP
 Registered Company No. 2957627

DISCLAIMER

2020 Engineering Solutions Pty Ltd ("2020") Geotechnical Report Limitations

The report to which this document has been attached assesses risks arising from land slope instability and proposes risk minimisation solutions. Absolute risk avoidance cannot be assured, principally due to assessment cost factors. It is therefore necessary to rely on instructions and make assumptions.

Changed Conditions

The report may be invalidated by changed conditions including:-

1. topography.
2. soil moisture content.
3. above or below ground structures.
4. soil and substrate profiles.
5. location of site boundaries.

Causes of Changed Conditions

Changed conditions may occur due to:-

1. extreme conditions such as flood, drought, cold, heat or fire.
2. human activities.
3. natural processes.
4. planning or design requirements.

Client to inform 2020 of any changes

2020 will endeavour to identify any reasonably foreseeable risk factors on the site which may cause changed conditions. Samples are taken at reasonable intervals bearing in mind the cost to the client. In the absence of specific instructions or patent conditions it will be assumed that conditions observed in samples are consistent across the site.

This document is provided to inform the client that their responsibility for risk is shared with 2020. The client will be responsible for inaccurate instructions or failure to instruct in relation to changed conditions, events that may cause changed conditions or when it becomes evident that assumptions may be invalid. Failure to do so could result in substantial and costly damage and disputes.

Interpretation

The report must be considered in its entirety. Each part of the report may be dependent on other parts for meaningful interpretation. The report should also only be used by the client. It may not be relied upon by any other person without first conferring with 2020. The report should only be acted upon and interpreted by persons qualified and competent in the activities contemplated in the report.



**2020
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GEOTECHNICAL ASSESSMENT



SITE; 2235 Birregurra-Forrest Road
Forrest, VICTORIA. 3236

DEVELOPER; P & S Scott

REPORT NUMBER; ES18200

DATE; 10/09/2018

REPORTING TO; COLAC OTWAY SHIRE
Planning Scheme, Erosion Management
Overlay Procedures (EMO), 2013.
Amendment C68

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Executive Summary

Maximum Annual probability of loss of life, Barely Credible
This figure is below the advised acceptable limit
Property Risk would be Low
This is also below the advised acceptable limit.

Succinct Recommendations

- a) The proposal be allowed as the calculated risk is within the acceptable ranges for Life and Property
- b) Landslip Risk Assessment is not required

Preamble

Note; This document reports to Schedule One to the Erosion Management Overlay as in operation at the time of commissioning.

The Shire contains areas of land that are susceptible to landslip..... In areas susceptible to landslips, it is necessary to assess the potential impact of buildings, works and vegetation removal on the environment, in order to minimise risk to life and property.
(EMO Policy Basis)

The proposal comprises the construction of a management dwelling for a summer fruits orchard

This report considers the geotechnical implications of the proposal.

1.0 Consultant

Michael Daniel Delahunty
'Culliamurra'
1745 Colac – Forrest Road
Colac Victoria Australia.

1.1 Details of Qualifications, Experience and Expertise

Bachelor Degree in Mining Engineering University of Ballaratt.

2001-2003 Civiltest, Geotechnical technologist

2006- to current 2020Engineering Solutions P/L
Managing Director, Principal Engineer

Member Institute of Engineers Australia Member # 2274072

1.2 Specific Expertise

Over the past eighteen years I have personally conducted several hundred site and soil investigations across SW Victoria. This work, along with academic qualifications, has equipped me with an understanding of typical and atypical sub-soil conditions.

The author has valid professional indemnity insurance at the time of inspection and reporting. As part of a commitment to on-going professional development the author is undertaking the process of accreditation and attainment of chartered status.

1.3 Equipment

Kobelco 007 hydraulic mounted auger
100mm hand auger
GMC Digital spirit level
Manual measuring devices
Computer hardware and software

2.0 Date of Assessment

10thSept2018

2.1 Reporting Date

12thSept2018

3.0 Site Description

The subject property comprises a cleared, allotment in a rural lifestyle area overlooking the Barwon West River Valley. Landscape ranges from elevated plateau, moderate to steep hill-side, to river flats.

3.1 Address

2235 Birregurra-Forrest Rd. Forrest. 3236

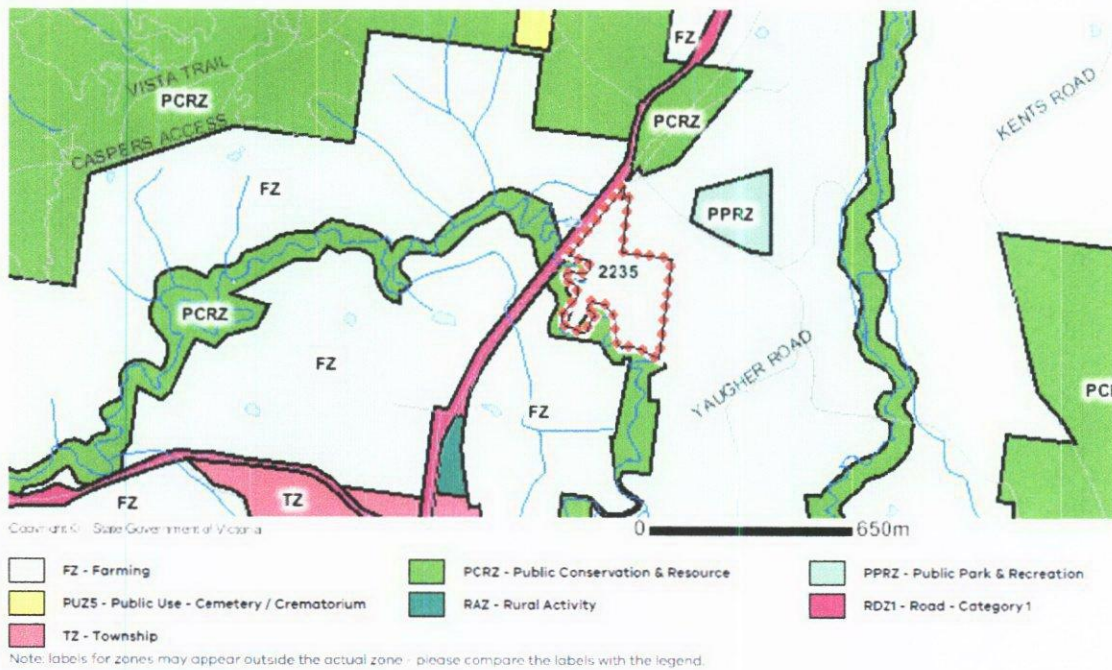


Fig 1. Planning Maps Online, subject land in red outline.

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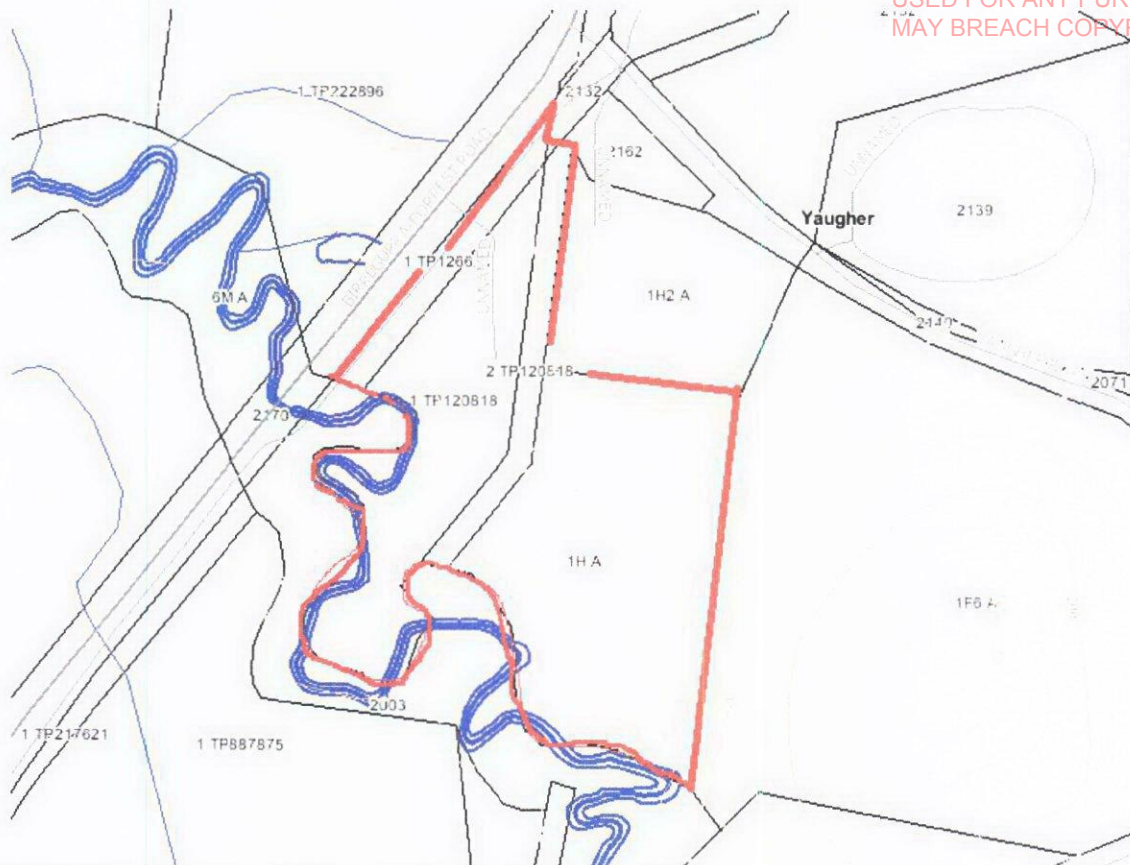


Fig 2. Planning Maps Online, subject land in red outline.

3.2 Title Details

Lot 1 TP1266

Lot 1 TP120818

Lot 2 TP120818

Lot 1 H A Note; proposed development within this allotment

3.2.1 Property Owner

P & S Scott

3.3 Developer

P & S Scott

3.4 Responsible Authority

Colac Otway Shire

Rae St Colac 3250

3.4.1 Planning Details

Planning Application; TBA.

4.0 Site Assessment Plans

Detailed development plans were not available at the time of assessment, this Report is to the proposed build envelope.

5.0 Surface Conditions



Fig 3. Mixed title/vegetation image.(Source; Planning Maps Online). Build site comprises an elevated grassed area with bush to the west, Cypress trees to the north and moderate to steeply dipping ground to the west and south.

There was evidence of relic anthropogenic activity which has resulted in unusual soil formations, that are not evidence of instability.



Fig 4. View to north across proposed build envelope. (Source; Author)

5.1 Subsurface Conditions

Based upon numerous sub-surface drilling and investigations conducted by the author throughout the district, it is our opinion that the weathered in-situ subsurface profile comprised a Silty Sand over a deep Sandy Clay.

5.2 Groundwater

No discharge areas were noted on or near the propose build envelope, however there were some plant species on the lower slopes indicate zones which may have shallow groundwater during winter.

5.3. Geology

Published geological maps of the area indicate the property includes a range of TERTIARY AGE, Demons Bluff Formation material and Quaternary Age on the river flats, with the proposed building envelope on an elevated portion of the Tertiary Age material.

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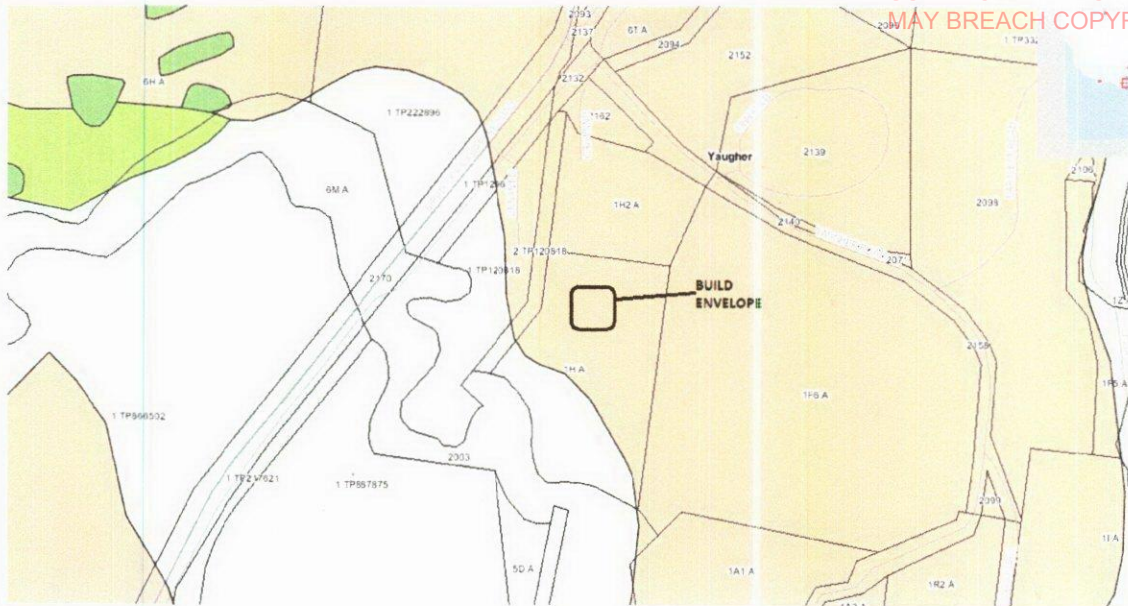


Fig 5. Site Geology (Source; Geovic)

5.4 Geomorphic Process

Generally the geomorphic process that takes place throughout the Otways involves deeply weathered material, due to high rainfall, on steep slopes being subjected to a 'trigger' event such as extreme rainfall or anthropogenic activity. This proposed build envelope is on Tertiary Age, Demons Bluff, sediments which have a moderate tendency to display mass movement but generally when subject to high slope angles.

Mitigating this risk will involve building placement and careful management of drainage and stormwater.

6.0 Regional Instability

6.1 Mapped

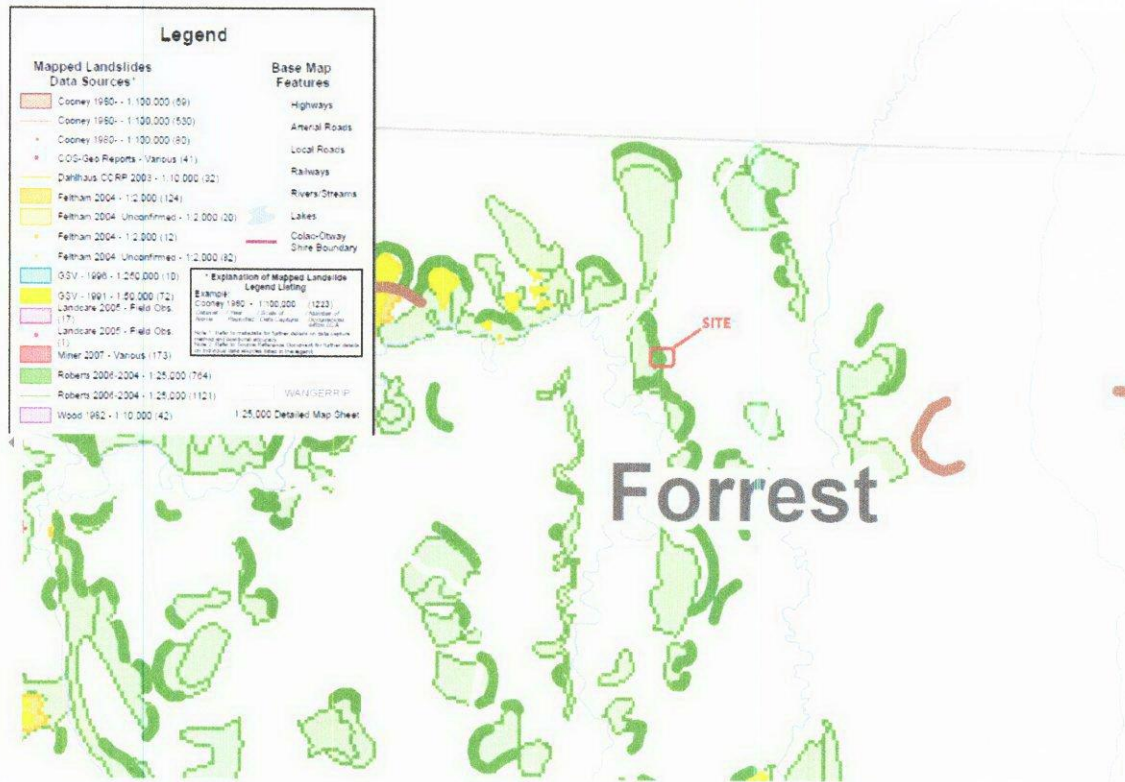


Fig 6. Mapped Slip Systems (Source; Colac Otway Shire)

Inventory of Landslides, Colac Otway Shire Map, shows numerous slip systems near the subject land and a major slip under the proposed site.

Based upon the site inspection it appears the data base compiler has incorrectly identified the aforementioned anthropogenic activity as a slip system.

6.2 Unmapped

No evidence of mass land instability was noted on or within impact distance of the proposed build envelope. Minor earth creep may be occurring on the steep slopes to the south of the build envelope but none of the unmapped systems have the potential to impact upon the proposed build envelope due to the slope of the build site and the distance from the systems.

7.0 Assessment Methodology

The principal assessment methodology of instability analysis for this development was visual and sub-surface soil logging informing a considered opinion and providing input for the following slope model.

7.1 Slope Model

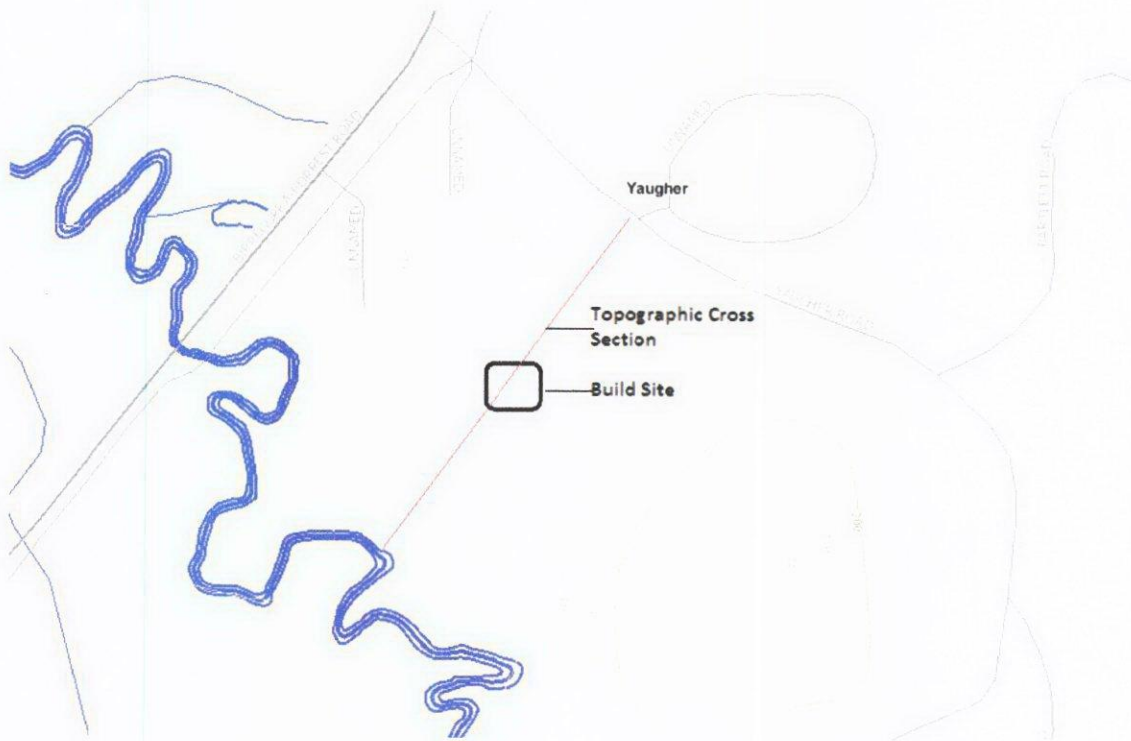


Fig 7. Cross Section of Site

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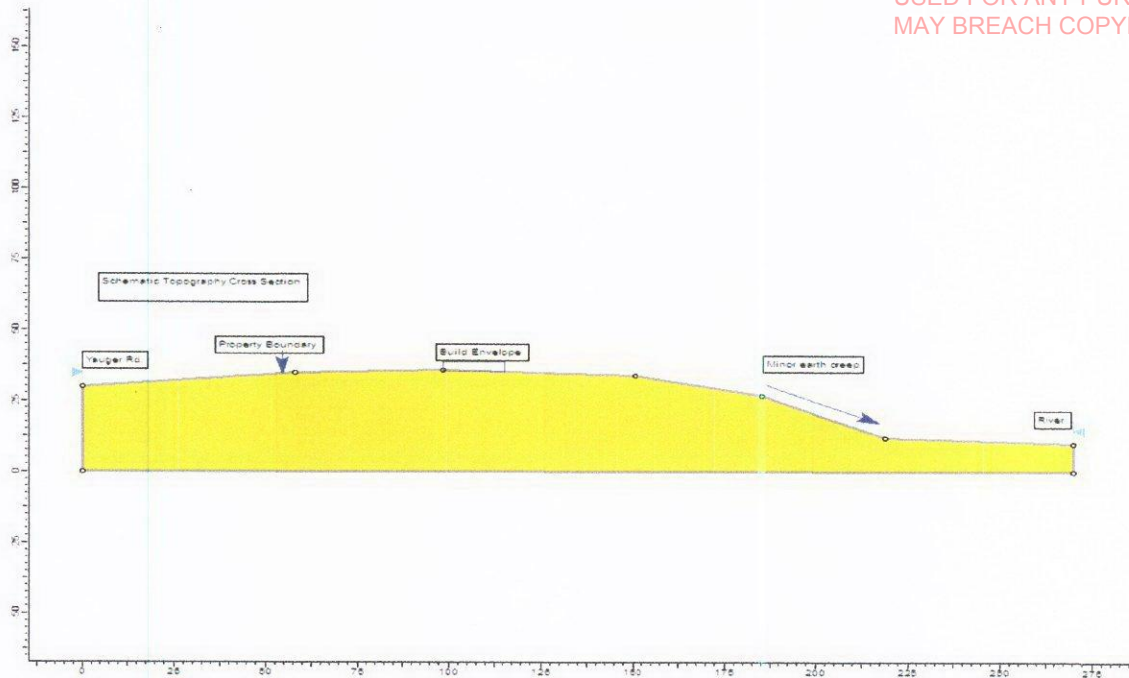


Fig 8. Topographic Slope Model.

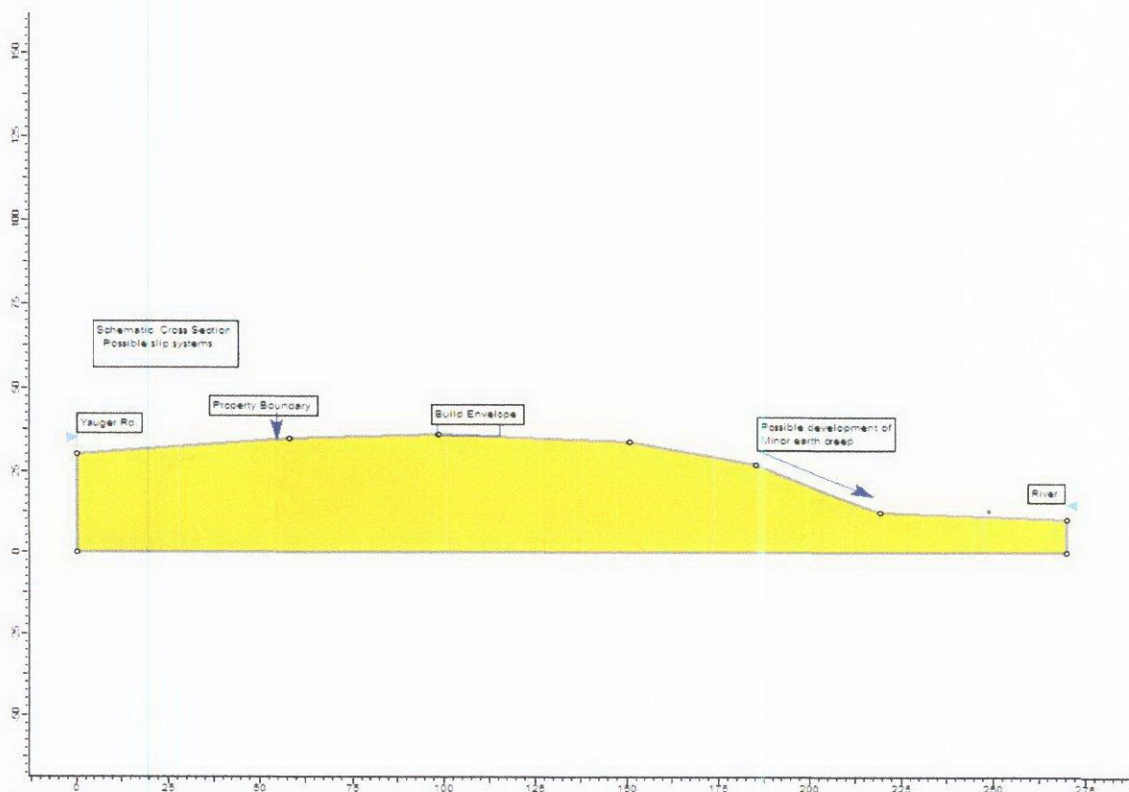


Fig 9. Slope model with possible failure modes.

8.0 Plausible Failure Modes

Of the 10 types of landslide systems, AGS Figure B1, and with reference to the information obtained during the site investigation there is no plausible failure mode with potential to impact on the proposed development.

Earth Creep may occur on the steep bank but the passage of time has indicated that the slope is relatively stable, an opinion reinforced by the proposal to plant shrubs across the slope.

8.1 Elements at risk

Given the proposal is for part of a dwelling, Life will be an element at risk, as will the proposed development. No third party exposure is expected.

8.2 Failure analysis

Based upon the foregoing assessment, and site inspection and expert opinion, failure analysis is not applicable.

9.0 Risk Analysis

Risk Analysis brings together Probability and Consequence

9.1 Consequence Analysis

If the entire dwelling was involved it probably would not collapse in a catastrophic fashion, avoiding serious injury, also an occupant may have a reasonable time to evacuate.

Life, Injury, 0.5Property, Medium, 20%

9.2 Probability Analysis

The annual probability of a slope failure affecting this proposed building envelope will be considered as less than Rare or 10^{-5} .

9.3 Vulnerability Analysis

Vulnerability for Property would be unity with Life at 0.1.

9.4 Spatial Factor

Factor incorporating probability of person being in that part of building that is the extension and is damaged by a slope failure, 0.1.

9.5 Risk analysis

Combining remote possibility, spatial factor and vulnerability generates a maximum annual probability of loss of life, Barely Credible
This figure is below the advised acceptable limit
Property Risk would be Low
This is also below the advised acceptable limit.

10.1 Footing structure and Foundation Materials

Conventional

10.2 Cut and Fill Earthworks

No significant earthworks required due to almost flat surface.

Some work may be required for the access track, with site cuts and fill zones battered to a suitable angle of around 26 degrees and vegetated with perennial vegetation.

10.3 Soil Retention Structures

All steep cut or fill batters over 1.0m require engineer designed retaining walls.

10.4 Drainage

Roof water should be directed to suitable legal point of discharge.

10.5 Building Design and Structural System

Conventional.

10.6 Vegetation

At the time of inspection the site contained a surface covering of grass. No trees were on the proposed build envelope, none are proposed to be removed.

10.7 Wastewater Management

As per LCA.

10.8 On-going Maintenance and Mitigation Measures

This report does not recommend specific on-going erosion mitigation measures apart from general good practice in maintaining plumbing fittings, culvert cleaning, etc.

10.9 Development Timeframe

There is no geotechnical timeline for this development

10.10 Additional Geotechnical Requirements

Additional geotechnical requirements not required.

11.0 Landslip Risk Assessment Statement

Landslip Risk Assessment is not required due to the moderate slope angles across the property in association with the low slope angles under and around the build envelope.

12. Report Recommendations

a) The proposal be allowed as the calculated risks are within the acceptable range.

13. Report Restrictions

Should the final proposal differ substantially from the assessed proposal, the testing and resultant recommendations, may not be valid. It also assumes the 'as tested' conditions are consistent across the site. If this is not the case, the client would be advised to contact the author, should encountered conditions vary from those reported. 2020Engineering Solutions takes no responsibility for errors or omissions contained in sourced material. This report should be read in entirety and not selectively reproduced.

14. Professional Compliance Statement

The author has valid professional indemnity insurance at the time of inspection and reporting. As part of a commitment to on-going professional development the author is undertaking the process of accreditation and attainment of chartered status.

15 Controlling and Referenced Documents;

AS1726-1993 (incorporating amendments to #2-1994)

AS4360-2005 Risk Management Set

AS4200-2000 General Conditions of Contract for Engagement of Consultants

AS2870-2011 Residential Slabs and Footings

Colac Otway Shire

Planning Scheme, Erosion Management Overlay Procedures (EMO)

Schedule 1

Geographic Information System (GIS) Data base

Geological Survey of Victoria (GSV)

Colac 7621-3 Zone 54

1:50,000 Map Series

Tickell S.J. 1990.

Report 103 (Department of Agriculture, Energy and Minerals)

2020ES JSA 01.27.07.18


www.dse.vic.gov.au

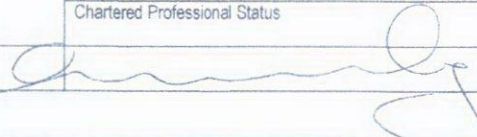
16. Site Condition Photo.



Fig 10. Surface conditions of build envelope, in foreground. (Source; Author)

17. Geotechnical Declaration

FORM	A	Geotechnical Declaration and Verification Development Application	
Office Use Only			
<p>To be submitted with planning application. It must accompany the Geotechnical Assessment and/or Landslip Risk Assessment. This form is essential to verify that the Geotechnical Assessment and/or Landslip Risk Assessment has been prepared in accordance with CI 44.01 of the Colac Otway Planning Scheme and that the author of the Assessment/s is a geotechnical engineer or engineering geologist as defined by this clause.</p>			
Section 1		Related Application	
Planning Application Number (if known)		TO BE ADVISED	
Site Address		2235 BIRREGURRA-FORREST ROAD, FORREST. VICTORIA. 3236	
Applicant		P & S SCOTT	
Section 2		Geotechnical Assessment and /or Landslip Risk Assessment	
Details		Report Title: GEOTECHNICAL ASSESSMENT	
Author's Company/ Organisation Name:		2020 ENGINEERING SOLUTIONS	Report Reference No: ES18200
Author:		MR MICHAEL DELAHUNTY	Dated: 18/09/2018
Section 3		Checklist	
<p><i>Geotechnical Requirements</i> (Tick as appropriate either Yes or No)</p>		<p>The following checklist covers the minimum requirements to be addressed in a Geotechnical Assessment and/or Landslip Risk Assessment. The report must also cover any additional matters required by Clause 44.01. This checklist must accompany each report. Each item is to be cross-referenced to the section or page of the Geotechnical Assessment and/or Landslip Risk Assessment which addresses that item.</p>	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	A review of readily available history of slope instability in the site or related land as per <SECTION 6 >	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	An assessment of the risk posed by all reasonably identifiable geotechnical hazards as per <SECTION 6.1 >	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Plans and sections of the site and related land as per <SECTIONS 17 >	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Presentation of a geological model as per <SECTION 8 >	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Photographs and/or drawings of the site as per < SECTION 16 >	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	A conclusion as to whether the site is suitable for the development proposed to be carried out either conditionally or unconditionally as per <SECTION 12 >	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If any items above are ticked No, an explanation is to be included in the report to justify why < >	
Is the approval subject to recommendations and conditions relevant to:			
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Selection and construction of footing systems.	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Earthworks.	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Surface and sub surface drainage.	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Recommendations for the selection of structural systems consistent with the geotechnical assessment of the risk.	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Any conditions that may be required for the ongoing mitigation and maintenance of the site and the proposal from a geotechnical viewpoint.	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Highlighting and detailing the inspection regime to provide the <PCA> and builder with adequate notification for all necessary inspections.	
FIFTY _____ Years		State the Design Life of the Structure adopted in the Geotechnical Assessment and/or the Landslip Risk Assessment.	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Are the risk mitigation measures as recommended in the Geotechnical Assessment and/or the Landslip Risk Assessment suitable for the design life of the structure?	
NOTE:		<Add Reference> - Add in the relevant section or page number of the listed Geotechnical Assessment and/or Landslip Risk Assessment which addresses each item	

FORM	A	Geotechnical Declaration and Verification Development Application				<i>FIG 4.</i>
Section 4		List of Drawings referenced in Geotechnical Assessment and/or Landslip Risk Assessment				
Design Documents	Description	Plan or Document No.	Revision or Version No.	Date	Author	
	<i>SUBJECT LAND</i>	<i>FIG 1.</i>			<i>PLANNING MAPS ON LINE</i>	
	<i>SUBJECT LAND</i>	<i>FIG 2.</i>			<i>PLANNING MAPS ON LINE</i>	
	<i>MIXED TITLE/VEG IMAGE</i>	<i>FIG 3.</i>			<i>PLANNING MAPS ON LINE</i>	
	<i>SITE GEOLOGY</i>	<i>FIG 5.</i>			<i>GEOVIC</i>	
	<i>MAPPED SLIP SYSTEMS</i>	<i>FIG 6.</i>			<i>COS</i>	
	<i>CROSS SECTION</i>	<i>FIG 7.</i>			<i>PLANNING MAPS ON LINE</i>	
	<i>TOPOGRAPHIC MODEL</i>	<i>FIG 8.</i>			<i>M DELAHUNTY</i>	
	<i>POSSIBLE FAILURE MODE</i>	<i>FIG 9.</i>			<i>M DELAHUNTY</i>	
Section 5		Declaration				
Declaration (Tick all that apply)		I am a geotechnical engineer or engineering geologist as defined by the Colac Otway Planning Scheme and on behalf of the company below:				
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	I am aware that the Geotechnical Assessment and/or Landslip Risk Assessment I have either prepared or am technically verifying (referenced above) is to be submitted in support of a planning application for the proposed development site (referenced above) and its findings will be relied upon by the Colac Otway Shire Council in determining the planning application				
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> N/A	I prepared the Geotechnical Assessment and/or Landslip Risk Assessment referenced above in accordance with the Colac Otway Planning Scheme and the AGS Guidelines 2007 as defined in the planning scheme.				
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> N/A	I technically verify that the Geotechnical Assessment and/or Landslip Risk Assessment referenced above has been prepared in accordance with the Colac Otway Planning Scheme and the AGS Guidelines 2007 as appropriate.				
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	I technically verify that the Geotechnical Assessment prepared for the planning application for the site confirms the land can meet the acceptable risk criteria specified in the schedule to Clause 44.01 of the Colac Otway Planning Scheme taking into account the total development and site disturbance proposed.				
<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	I technically verify that the Landslip Risk Assessment prepared for the planning application for the site confirms the land can meet the tolerable risk criteria specified in the schedule to Clause 44.01 of the Colac Otway Planning Scheme taking into account the total development and site disturbance proposed.				
Section 6		Geotechnical Engineer or Engineering Geologist Details				
Company/ Organisation Name		2020 ENGINEERING SOLUTIONS PTY LTD				
Name (Company Representative)	Surname:	DELAHUNTY	Dr / Mr / Mrs / Ms / Miss			
	Given Name(s)	MICHAEL				
	Chartered Professional Status		Registration Number			
Signature					Dated: 18/09/2018	

Reference: AGS Guidelines 2007c "Practice Note Guidelines for Landslide Risk Management", Australian Geomechanics Society, Australian Geomechanics, V42, N1 March 2007.

Note: N/A = Not Applicable

April 2013.

18. The Geotechnical Assessment

The initial level of assessment requires a report known as a "Geotechnical Assessment". A primary purpose of the Geotechnical Assessment is the collection of base information about the site. This is to include:

- A detailed site description typically including aspects of the site geomorphology, site drainage and site physiography including slope and aspect.
- It is expected that the site description also includes other site features such as existing development, access roads, retaining walls and site excavations and/or fills.
- Site assessment plans and cross sections of the subject site and related lands that may contribute to or be affected by instability at the site. This should include contours and ground slopes drawn to scale and dimensioned from a survey and recent field measurements. The plan and section should be separate from any geological model or stability model provided as additional analysis/assessment information.
- A detailed assessment of subsurface conditions including both surface and subsurface geology. Such information is vital in developing a geological model for the site and should include any exposures or outcrops as well as groundwater discharges or seeps
- The above information should then be summarised in a description of a geological/ geotechnical model for the site
- Details of all site investigations and any other information used in developing the Geotechnical Assessment.

The purpose of the base information is to effectively describe key aspects of the site in detail so as to clearly establish a context for the site conditions prior to the proposed development.

The next aim of the Geotechnical Assessment is to establish relevant features of the slope stability conditions of the site. This should include:

- A statement indicating whether there are natural slopes on or immediately adjacent to the subject lot which exhibit evidence of possible or past slope instability such as landslide, rockfall or erosion.
- The Geotechnical Assessment should list all credible, potential modes of failure.

By combining an understanding of the site conditions and aspects of slope stability, a primary finding from the Geotechnical Assessment must be:

- A statement indicating risks for all slope stability hazards identified are of an ACCEPTABLE RISK level (as defined by the schedule) and that these risks will remain at an ACCEPTABLE RISK level over the design life of the development.

An ACCEPTABLE RISK level by necessity must be defined by COS, but is expected to be in line with risk levels recommended in the Australian Geomechanics Society's (AGS) Landslide Risk Management Guidelines (AGS 2007c and d). For a typical low rise residential development, ACCEPTABLE levels of risk as recommended by AGS are as follows:

Risk Type for low rise residential development	ACCEPTABLE RISK level (as per AGS 2007 c and d)
Risk to Property and Infrastructure (Qualitative Assessment)	LOW
Risk to Life for existing slopes and development (Quantitative Assessment)	1 x 10 ⁻⁵
Risk to Life for new slopes and new development (Quantitative Assessment)	1 x 10 ⁻⁶

Note other combinations of building importance and slope conditions can result in different levels of ACCEPTABLE risk (e.g. a hay shed has less stringent criteria whilst heavily used building such as schools or recreation centers will require more stringent criteria). The AGS guidelines offer detailed recommendations on this aspect of ACCEPTABLE RISK.

If the Geotechnical Assessment cannot make the statement regarding ACCEPTABLE RISK levels for all slope hazards, then the assessment must proceed to a second more detailed assessment known as a "Landslide Risk Assessment".

It is generally not expected that detailed risk calculations would be included in a Geotechnical Assessment however a consultant may choose to include some calculations if they feel the need to justify the required statement regarding ACCEPTABLE RISK levels.

Other recommendations regarding the development must also be included in the Geotechnical Assessment where they have influence on the final recommendation for approval. These include:

- Determination of appropriate founding depths
- Location and depth of cuts and fills,
- Construction of retention systems
- Details of surface and sub-surface drainage
- Vegetation retention
- Drainage and effluent disposal
- Need for ongoing mitigation measures
- Timeframes for completion of works
- Any other geotechnical approvals

Finally the Geotechnical Assessment must include a statement on whether or not the next level assessment i.e. a Landslip Risk Assessment is required.

The Landslip Risk Assessment

A Landslip Risk Assessment may be required in one of two ways:

1. Where the Geotechnical Assessment cannot make the statement regarding all potential slope hazards are at an ACCEPTABLE risk level and hence the call for a more detailed assessment or;
2. Where landform data indicates the natural slopes on or immediately adjacent to the subject lot exceed certain slope angle thresholds for various geologic units (as defined in the schedule). In the case of the spatially extensive Eumeralla Formation (Otway Group) this threshold angle is 14°.

The Landslip Risk Assessment must include the initial Geotechnical Assessment OR must include all information required in a Geotechnical Assessment where the initial level of assessment was bypassed by the slope threshold requirement.

The Landslide Risk Assessment then requires a full risk assessment in accordance with the requirements of the AGS2007 guidelines.

This includes an assessment for risks for all reasonably identified geotechnical hazards and must be undertaken for risks to life and risk to property/infrastructure. Qualitative and quantitative calculations must be included in this assessment.

The Landslip Risk Assessment must include a specific statement as follows:

- A statement that the subject lots are suitable or can be made suitable for the proposed development and that the subject lot or the proposed development can meet the TOLERABLE RISK criteria as defined in the schedule.

As before, a TOLERABLE RISK level will need to be defined by COS but is again expected to be in line with risk levels recommended in the Australian Geomechanics Society's Landslide Risk Management Guidelines (AGS 2007c and d). For a typical low rise residential development TOLERABLE levels of risk as recommended by AGS are as follows:

Risk Type for low rise residential development	TOLERABLE RISK level (as per AGS 2007 c and d)
Risk to Property and Infrastructure (Qualitative Assessment)	MODERATE
Risk to Life for existing slopes and development (Quantitative Assessment)	1 x 10 ⁻⁴
Risk to Life for new slopes and new development (Quantitative Assessment)	1 x 10 ⁻⁵

It is again noted that different combinations of building importance and slope conditions may result in different levels of tolerable risk.

19. Report Limitations

2020 Engineering Solutions Pty Ltd ("2020") Geotechnical Report Limitations

The report to which this document has been attached assesses risks arising from land slope instability and proposes risk minimisation solutions. Absolute risk avoidance cannot be assured, principally due to assessment cost factors. It is therefore necessary to rely on instructions and make assumptions.

Changed Conditions

The report may be invalidated by changed conditions including:-

1. topography.
2. soil moisture content.
3. above or below ground structures.
4. soil and substrate profiles.
5. location of site boundaries.

Causes of Changed Conditions

Changed conditions may occur due to -

1. extreme conditions such as flood, drought, cold, heat or fire.
2. human activities.
3. natural processes.
4. planning or design requirements.

Client to inform 2020 of any changes

2020 will endeavour to identify any reasonably foreseeable risk factors on the site which may cause changed conditions. Samples are taken at reasonable intervals bearing in mind the cost to the client. In the absence of specific instructions or patent conditions it will be assumed that conditions observed in samples are consistent across the site.

This document is provided to inform the client that their responsibility for risk is shared with 2020. The client will be responsible for inaccurate instructions or failure to instruct in relation to changed conditions, events that may cause changed conditions or when it becomes evident that assumptions may be invalid. Failure to do so could result in substantial and costly damage and disputes.

Interpretation

The report must be considered in its entirety. Each part of the report may be dependent on other parts for meaningful interpretation. The report should also only be used by the client. It may not be relied upon by any other person without first conferring with 2020. The report should only be acted upon and interpreted by persons qualified and competent in the activities contemplated in the report.

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Bushfire Management Statement - Proposed New Class 1a Building in a Bushfire Management Overlay

Property Address: 2235 Birregurra-Forrest Road, Forrest
Date : 30 October, 2018

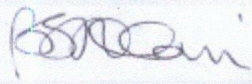
PREPARED FOR:	
Client name	Peter Scott
Address	150 Seven Bridges Road, Gerangamete
Telephone Number	0419 003 045
PREPARED BY:	
Consultant name and Signature	Bruce St Clair 
Address	Essendon North, 3014
Telephone	0435 892 799
Email	brucestc@hotmail.com

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Disclaimer -

Effective Thermal Solutions has taken the necessary steps to ensure that an accurate document has been prepared, but no liability is accepted for any damages or loss incurred as a result of reliance placed upon the report or its contents. Bruce St Clair visited the site on 16 October, 2018. Requirements detailed in this document do not guarantee survival of the building or the occupants. The client is strongly encouraged to develop and practice a bushfire survival plan.

Definitions, Abbreviations & Acronyms

AS 3959 - Australian Standard 3959-2009 Construction of Buildings in Bushfire Prone Areas

Clause - relates to a specific piece of legislation within the Planning Scheme

CFA - Country Fire Authority

BAL - Bushfire Attack Level

BPA - Bushfire Prone Area

BMO - Bushfire Management Overlay

BMS - Bushfire Management Statement

Defendable Space - an area of modified vegetation to mitigate the impact of a bushfire

Method 1 - refers to the methodology in AS 3959 for determining a BAL using a number of predetermined inputs

Method 2 - refers to methodology in AS 3959 for determining a site specific BAL

Pathway 1 - refers to an application pathway in Planning Clause 53.02

Pathway 2 - refers to an application pathway in Planning Clause 53.02

Pathway 3 - refers to an application pathway in Planning Clause 53.02

1. Introduction

The 10ha site contains four parcels and is on the northern fringe of the township of Forrest. This submission has identified a suitable area (approximately 35m x 50m) in which to erect a Class 1a building in the future. The proposed building area provides for construction to BAL 12.5 with the required defendable space contained within the site boundaries.

Date of visit	16 October, 2018
Summary of proposal	A new Class 1a building in an Farm Zone
Pathway from PN65	Pathway 2 and AS 3959 Method 1
Access requirements met	Yes
Defendable space met	Yes
Proposed BAL construction	BAL 12.5
Native vegetation removal	No vegetation removal will be required

This Bushfire Management Statement (BMS) responds to Clauses 13.02, 44.06 and 53.02 in the Victorian Planning Provisions. This BMS is in two parts :

Part 1 : Site description, locality description and hazard assessments

Part 2 : Bushfire Management Plan (page 10) and a Bushfire Management Statement (page 11) describe how the development responds to Clauses 13.02, 44.06 & 53.02.

1.1 Relevant standards

Standard	Applicable	Provide justification for any standards that are not applicable.
44.06 – Bushfire Management Overlay	Yes	
53.02 – Planning for Bushfire	Yes	
53.02-4.1 Landscape, siting and design objectives		
- Approved Measure 2.1	Yes	
- Approved Measure 2.2	Yes	
- Approved Measure 2.3	Yes	
53.02-4.2 Defendable space and construction objectives		
- Approved Measure 3.1	Yes	
- Approved Measure 3.2	No	Not used for accommodation
53.02-4.3 Water supply and access	Yes	
- Approved Measure 4.1	Yes	
- Approved Measure 4.2	No	Not used for accommodation

2 Locality and site description

2.1 Application requirements

With regards to this application, there are three application requirements set out in Planning Clause 52.47. These are :

- A **Bushfire Hazard Landscape Assessment** including a plan that describes the bushfire hazard of the general locality more than 150 metres from the site. Photographs or other techniques may be used to assist in describing the bushfire hazard. This requirement does not apply in the case of a new dwelling in a Township Zone that includes all of the approved measures specified in 53.02; and
- A **Bushfire Hazard Site Assessment** including a plan that describes the bushfire hazard within 150 metres of the proposed development. The description of the hazard must be prepared in accordance with Sections 2.2.3 to 2.2.5 of Australian Standard 3959 : 2009 Construction of Buildings in Bushfire Prone Areas, excluding paragraph (a) of Section 2.2.3.2. Photographs or other techniques may be used to assist in describing the bushfire hazard; and
- A **Bushfire Management Statement (BMS)** describing how the proposed development responds to the requirements of the clause and Clause 44.06. If the application proposes an alternative measure, the bushfire managements statement must explain how the alternative measure meets the relevant objective. If in the opinion of the responsible authority any part of these requirements is not relevant to the assessment application, the responsible authority may waive, vary or reduce the requirement.

2.2 The site

2.2.1	Site shape, dimensions, size and planning controls
The shape of the site is:	Irregular
Dimensions of the site :	Various
The site's total area :	Approximately 10ha
The zoning of the site is:	Farm Zone
The overlays that apply to the site are:	The site is subject to a : <ul style="list-style-type: none"> • Bushfire Management Overlay BMO (whole) • Land Subject to Inundation Overlay (southern section) • Erosion Management Overlay (most of the site)
2.2.2	Existing use and development on the site
The current use of the site is:	The site has some shedding near the existing access track and a ploughed area on the river flats for an orchard
The buildings or works located on the site are:	The site is fenced
2.2.3	Existing access arrangements
The main vehicle access to the site is provided from:	Directly off the Birregurra-Forrest Road
Roads and access within the site :	An ill-defined track leads to the proposed house site or building area.

2.2.4	Existing vegetation
Describe the vegetation on the site, including the type, location, extent :	The site is 10ha and is covered in grass with the occasional mature tree on the elevated area in the northeast section of the site.
2.2.5	Other
Describe other features and constraints on the site that may be relevant to bushfire hazard & may influence future use and development of the site:	Although zoned FZ, the majority of the site is river flats and subject to an LSIO and EMO 1. The whole of the site is subject to the Bushfire Management Overlay (BMO) and there is an established home on the neighbouring developed lot to the northwest. The eastern boundary of the site abuts the Otway Forest Park with vegetation of remnant Messmate eucalypts and an understorey of bracken, grasses and grass trees. The potential house sites are situated in the elevated part of the site.

2.3 The locality and surrounding land

2.3.1	Existing use and development on adjacent sites
Describe the land and existing land uses in all directions around the subject land:	The majority of the surrounding land is zoned FZ. However, the land to the north that incorporates the Forrest Riding Club and the Recreation Facilities is zoned PCRZ; and the land just beyond the site's southern boundary and land to the northwest is zoned PCRZ. There is open farmland to the south and west of the site. There is remnant vegetation beyond the Recreation Facilities
2.3.2	Access to infrastructure and existing road networks
Describe the infrastructure and constraints on the site :	The subject site will be have access to power but will rely on tank water.
2.3.3	Landscape
Describe the surrounding landscape	Forrest is situated in the foothills of the Otways. The surrounding landscape is undulating with some rolling hills and open river flats. Much of the surrounding landscape contains remnant vegetation. The West Barwon Reservoir is just to the south of Forrest and the Barwon River West Branch runs through the town. To the south of Forrest the landscape becomes more rugged with ridgelines, deep gullies and remnant vegetation.
2.3.4	Other characteristics
Other features in the area relevant to bushfire hazard?	The new Forest Fire Management Victoria base at Barwon Downs will provide rapid response to bushfires and other emergencies in the Otway District. There is no recent fire history and there is no designated Neighbourhood Safer Place in Forrest, although the open farmland around Forrest or Barwon Downs could be a suitable refuge.

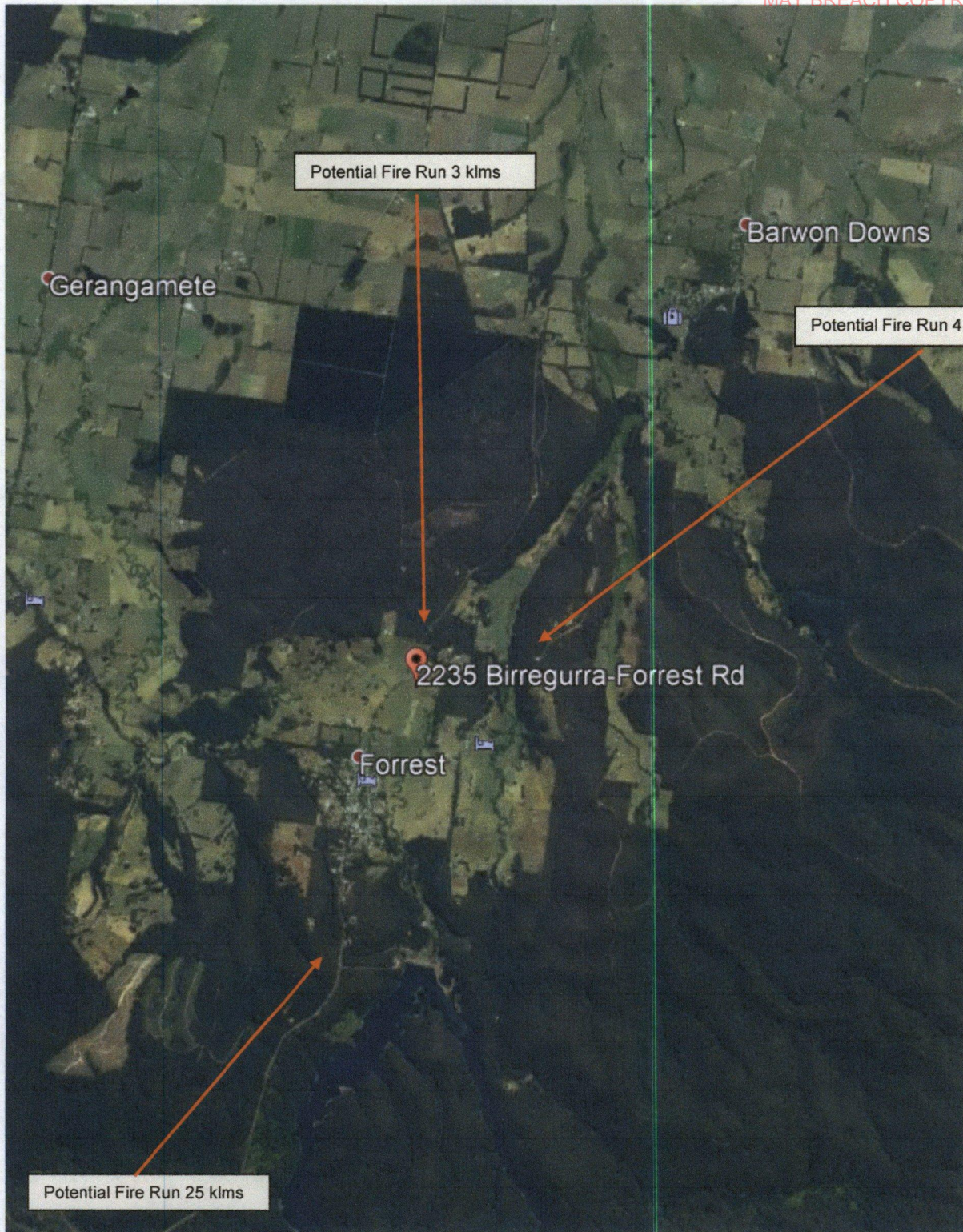
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Aerial View of the Site with Contours and Proposed Siting
Courtesy of Colac Otway Shire GIS
Scale 1cm = 45m

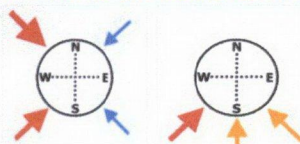


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Aerial View of the Landscape Scale 1cm = 500m



Dominant wind directions in summer



Bushfire Hazard Landscape Assessment

The landscape risk of a site is an important consideration and it is the combination of a number of elements in the surrounding landscape, including the extent of the vegetation, the area available to a landscape fire, the main landscape features, the steepness of the terrain, accessibility to low threat areas and the quality of the road networks around the site. The topography (or slope) of the land is particularly important as it influences the rate of spread and intensity of a fire. Fire burns faster uphill, as flames and radiant heat pre-heat the vegetation ahead of the fire and for every 10 degree of slope fires will double in speed.

The site is located just to the north of the township of Forrest and has approximately 300m of frontage to the sealed Birregurra-Forrest Road. The majority of the site is river flats and covered in managed grassland with a few scattered mature trees on the elevated section (the bluff) to the northeast. The Barwon River West Branch forms the southern boundary, the Otway Forest Park abuts the eastern boundary and the Tiger Tail Walking Track is just inside the western boundary. The Forrest Riding School and Recreation Park is to the north, across Yaughar Road. The land to the south and west is open, grassy farmland.

The proposed building site is to be situated on the elevated area in the northeast section of the site. The Otway Forest Park and Bald Hill is upslope to the east and the open farmland is relatively flat to the south and west, although the elevated section falls away at around 20 degrees for the initial 25m of downslope. There is a marshy area below the bluff. The exposed southern edge of the flat and cleared area, providing outstanding views to the south. The area is in the foothills of the Otway State Forest surrounding landscape is characterized by undulating hills and valleys that give way to steeper and more rugged hills and valleys as you head into the temperate forest of the Great Otway National Park.

The remnant vegetation in the surrounds contains mature Messmate eucalypts with an understorey of bracken, native grasses and grass trees. The potential bushfire scenario with the highest probable impact on the exposed site involves a fire to the north, northwest or northeast. There is potential that the bushfire could be started from a "local" ignition or from a larger bushfire event in the surrounding remnant vegetation and be driven towards the site from a roughly northerly direction. The fuel loads are high and ember attack could be launched towards the site from the ridgelines within the foothills. Some bushfire mitigation could be provided by the open farmland and recreational facilities to the north and west.

Damaging bushfires in southern Victoria typically start on a hot, dry, windy day. On extreme fire weather days winds are typically northerly and push a fire front in a southerly direction. At some point the high pressure system will be pushed across the State from the introduction of a cold change (low pressure system). It is the arrival of this cold front that often causes a fire's size and intensity to increase. The introduction of the cold front usually creates westerly or south-westerly winds and turns the flank (the edge) of the existing fire into a head fire and pushes it in an easterly direction. This scenario could result in a bushfire approaching the site from the west/southwest. The site would be impacted by embers from the north under the prevailing wind conditions associated with summer or from the southwest under the wind direction typically associated with the passage of a cold front following a period of hot weather. Under either of these conditions, ember attack is certain across the landscape and ignition of the adjacent Otway Forest Park is a realistic concern.

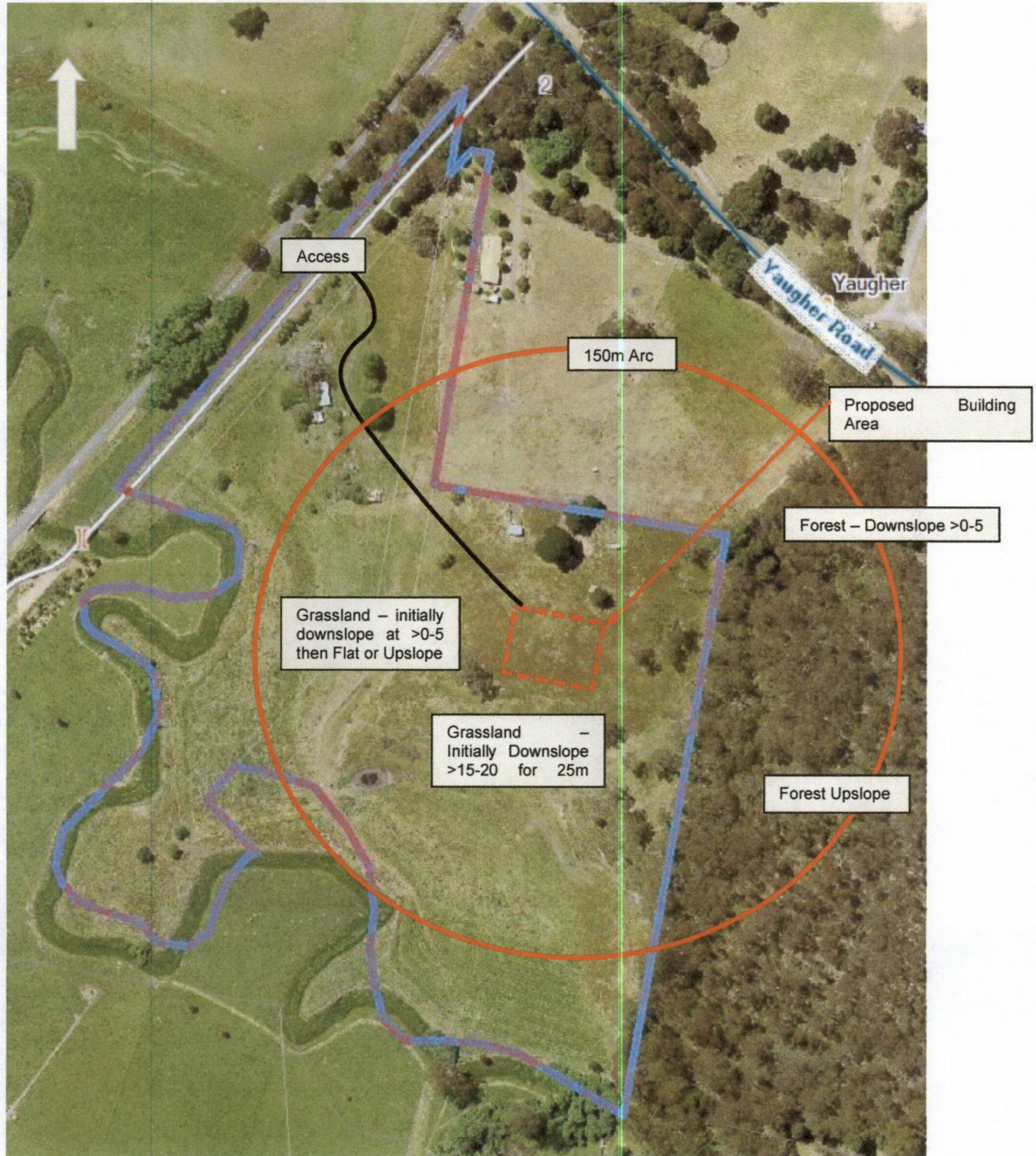
The landscape is considered to be closest to Broader Landscape Type 3 where :

- the type and extent of the vegetation located more than 150m from the site may result in neighbourhood scale destruction as it interacts with the bushfire hazard close to the site.
- Bushfire can approach from more than one direction
- The site is located in an area that is not managed in minimum fuel condition
- Access to an appropriate place that provides shelter from bushfire is not certain

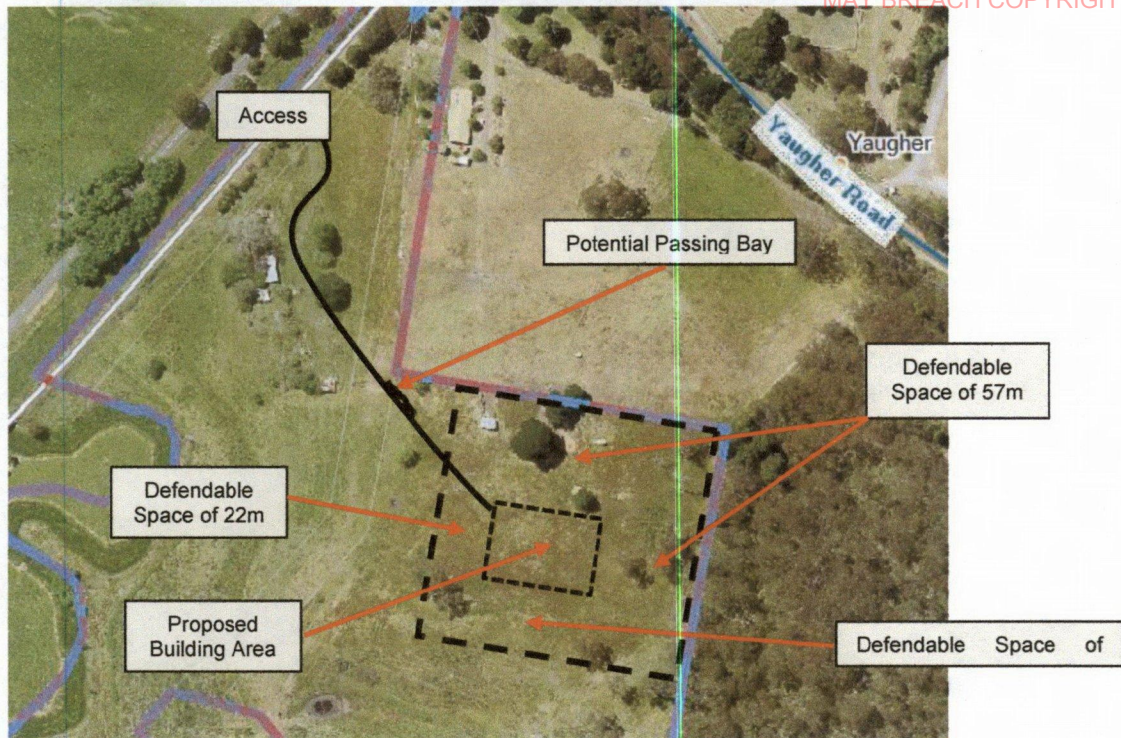
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Bushfire Hazard Site Assessment with 150m Arc
Aerial Image Courtesy of Google Earth
Scale 1cm = 30m

Building Area 35m x 50m and set in 57m from eastern & northern boundaries



Bushfire Management Plan of 30.10.2018 for Construction to BAL 12.5
Scale 1cm=35m. Defendable Space of 57m; 32; or 22m shown as — — — — —



Defendable Space

Defendable space 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 10cm in height must not be placed within 3 metres of a window or a glass feature of the building
- Shrubs must not be located under the canopy of trees
- Individual and clumps of shrubs must not exceed 5 m² in area and must be separated by at least 5m
- Trees must not overhang or touch any elements of the building
- The canopy of trees 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

Construction Requirements

- Dwelling designed and constructed to a minimum Bushfire Attack Level of **BAL 12.5** to all elevations

Access and Design Requirements

The length of the driveway is greater than 200 metres and the following design and construction requirements apply :

- All weather construction with a load limit of at least 15 tonnes and minimum trafficable width of 3.5 metres
- Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically
- Curves must have a minimum inner radius of 10 metres
- The average grade must be no more than 1 in 7 (14.4% or 8.1 degrees) with a maximum grade of no more than 1 in 5 (20% or 11.3 degrees) for no more than 50 metres
- Dips must have no more than a 1 in 8 (12.5% or 7.1 degrees) entry and exit angle

A turning area for fire fighting vehicles must be provided close to the building by one of the following :

- A turning circle with a minimum radius of 8 metres OR a driveway encircling the dwelling OR
- The provision of other vehicle turning heads- such as a Y or T head – which meet the specification of Austroad Design for an 8.8 metre Service Vehicle

Where the length of access exceeds 200 metre, passing bays must be provided at least every 200 metres and the passing bay must be a minimum of 20 metres long with a minimum trafficable width of 6 metres

Water Requirements

The following requirements apply :

- An effective capacity of **10,000L**
- Be stored in an above ground water tank constructed of metal or concrete
- Have all fixed above ground water pipes and fittings required for fire-fighting purposes, made of corrosive resistant metal
- Include a separate outlet for occupant use

Where a **10,000L** water supply is required, the following fire authority fittings and access must be provided :

- Be readily identifiable from the building or appropriate identification signage to the satisfaction of the relevant fire authority
- Be located with 60 metres of the outer edge of the approved building
- The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed
- Incorporate a separate ball or gate valve (British Standard Pipe BSP 65mm) and coupling (64mm CFA 3 thread per inch male fitting)
- Any pipework and fittings must be a minimum of 65mm (excluding the CFA coupling)

Bushfire Management Statement

53.02 : General Requirements.

To ensure that the development of the site does not result in an unacceptable risk to human life, the applicant must ensure that there are appropriate levels of defensible space and adequate water supplies to facilitate fire-fighting and property protection. The risk to existing residents, property and community infrastructure from bushfire is not increased and the proposed new dwelling is surrounded by the necessary defensible space.

53.02-4.1 Landscape, siting and design objectives

These objectives :

- The development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape
- The development is sited to minimize the risk from bushfire
- The development is sited to provide safe access for vehicles, including emergency vehicles
- Building design minimizes vulnerability to bushfire attack

Approved Measure 2.1

Requirement

The bushfire risk to the development from the landscape beyond the site can be mitigated to an acceptable level.

Response and Justification :

The 10ha site is managed grassland, but has few suitable opportunities for siting a proposed dwelling. The relatively flat and elevated area in the northeast section provides the optimum location, albeit one that is exposed. The proposed building site is positioned near the southern rim of the bluff, well away from the remnant forest beyond the eastern boundary. The access track to the building site is over 200m in length and meanders through open grassland. It is initially flat ground then climbs at around 7 degrees for 80m as it ascends to the bluff.

Approved Measure 2.2 :

Requirement

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 services**

Response and Justification :

The site is relatively complex and the elevated area contains the proposed building site. To the north, south and west is grassland that is downslope and to the east is the remnant vegetation of the Otway Forest Park – downslope to the northeast and upslope to the east. The gently upslope access track off the Birregurra-Forrest Road is approximately 240m long and provides convenient access for emergency vehicles. The proposal meets the approved measure as development in the future will :

- Be set in at least 57m from the remnant vegetation to the east and northeast
- Be surrounded by managed and maintained defensible space
- Achieve defensible space within the boundaries
- Have a gravel driveway providing convenient access for emergency service vehicles.

Approved Measure 2.3

Requirement

A building is designed to reduce the accumulation of debris and the entry of embers

Response and Justification

I am unaware of the design or the construction materials of a new dwelling into the future, but I would anticipate a simple, sleek profile to resist the accumulation of embers.

53.02-4.2 Defendable space and construction objective

The objective is to provide defendable space around the proposed building that mitigates the effects of flame contact, radiant heat and embers on buildings and to apply the corresponding construction standard (referred to as the BAL – Bushfire Attack Level).

Approved Measure 3.1 : Requirement

A building used for a dwelling (including an extension or alteration to a dwelling), a dependent person's unit, industry, office or retail premises is provided with defendable space in accordance with :

- **Table 2 Columns A, B or C of Table 6 to Clause 53.02-5 wholly within the title boundaries of the land; or**
- **If there are major 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.

Response and Justification

Land within 150m of the proposed development and beyond was examined (where possible) to determine classifiable vegetation as described in AS 3959 (Australian Standard 2009) and low threat and modified vegetation as prescribed in Planning Clause 53.02. The distance to classifiable vegetation from the proposed development was calculated as well as the various slopes under the classifiable vegetation. This information was used to determine the appropriate Bushfire Attack Level (BAL), defendable space and building construction requirements.

Defendable space is defined as an area of land around a building where vegetation is modified and managed to reduce the effects of flame contact and radiant heat associated with a bushfire.

The Bushfire Attack Level (BAL) is a means of measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact, using increments of radiant heat expressed in kilowatts/m². The BAL is also the basis for establishing the requirements for construction to improve protection of building elements from attack by bushfire. Building construction and design can be used to minimize the impact of ember attack and radiant heat on a building and construction requirements for buildings relating to a calculated BAL are prescribed in AS 3959. The BAL for this development has been calculated using a "Forest Fire Danger Index" (FFDI) of 100 and a Flame Temperature of 1090K. Appropriate construction helps the building to withstand the potential exposure from a bushfire as the fire front passes.

Building construction and design can be used to minimize the impact of ember attack and radiant heat on a building. Construction requirements for buildings relating to a calculated BAL are prescribed in AS 3959. The materials and design of a building can be used to prevent the accumulation of debris and entry of embers. Appropriate construction helps the building to withstand the potential exposure from a bushfire as the fire front passes and defendable space and building construction mitigate the effect of flame contact, radiant heat and embers on buildings.

The site is complex and has few suitable options for building. However, the proposed building area can achieve defendable space of 57m to the east and north and 22m to the west and 32m to the south, enabling construction to BAL 12.5.

There is a significant area of remnant forest to the east and northeast, within the 150m arc. This vegetation has been identified as threat vegetation and "forest" after reference to the

CFA's Land Use Planning Vegetation Guide and the Key. The slope under the forest is upslope to the east, but downslope at 4 degrees in the gully to the northeast. It was decided to use forest that was downslope at >0-5 degrees for both the north and east elevations, even though there is an extensive area of managed grass on the neighbouring property to the north. However, given the exposure of the proposed building area, a conservative approach to defendable space was considered appropriate. The open grassland to the west is downslope at 5 degrees for around 80m then levels out towards the western boundary. Similarly, the grassland to the south is initially downslope at 20 degrees for 25m and then levels out towards the river flats and the southern boundary.

For forest that is downslope at >0-5 degrees, the required defendable space is 57m for construction to BAL 12.5; 43m for construction to BAL 19; or 32m for construction to BAL 29. This submission shows that the building area achieves defendable space for construction to BAL 12.5. The required defendable space for the grassland to the west and south is 22m and 32m, respectively.

These areas of defendable space can be achieved and contained within the property's boundaries, to all elevations. The zone of defendable space should be maintained and managed during fire danger periods as per the Defendable Space Conditions noted on page 10 of this BMS. Sections 3 and 5 of AS 3959 detail the general and specific construction requirements for BAL 12.5, the minimum in Victoria.

Approved Measure 3.2 : Not applicable

53.02-5 Water supply and access objective

This objective is to provide a static water supply for all development and to ensure access on the site is designed and constructed to enhance safety in the event of a bushfire.

Approved Measure 4.1 :

Requirements

A building used for a dwelling (including an extension or alteration to a dwelling), a dependent 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 concrete or metal tank as other water supplies provided that a separate outlet is reserved for fire-fighting water supplies.

Response and Justification

The compliant static water supply as per Table 4 to Planning Clause 53.02-5 is 10,000L in a steel or concrete water tank that is positioned within 60m of the proposed dwelling. Emergency Services must be able to use the access provided to park within 4m of the tank outlet. The required water supply and signage conditions are noted on page 10 of this BMS.

The initial section of the access track is across flat land and crosses the popular Tiger Tail walking track. There is then a flat section of about 100m before an ascent of around 7 degrees for 85m to the elevated, but flat area. The overall length of the access track off the Birregurra-Forrest Road is more than 200m, so it will be required to be of all-weather construction; support a load limit of at least 15 tonnes; be relatively level with a minimum trafficable width of 3.5m; clear of encroachments for 0.5m to both sides and 4m vertically; etc. It will also require a turning circle, or Y or T head for emergency vehicles and a passing bay for each 200m of length. The required access conditions are noted on page 10 of this BMS.

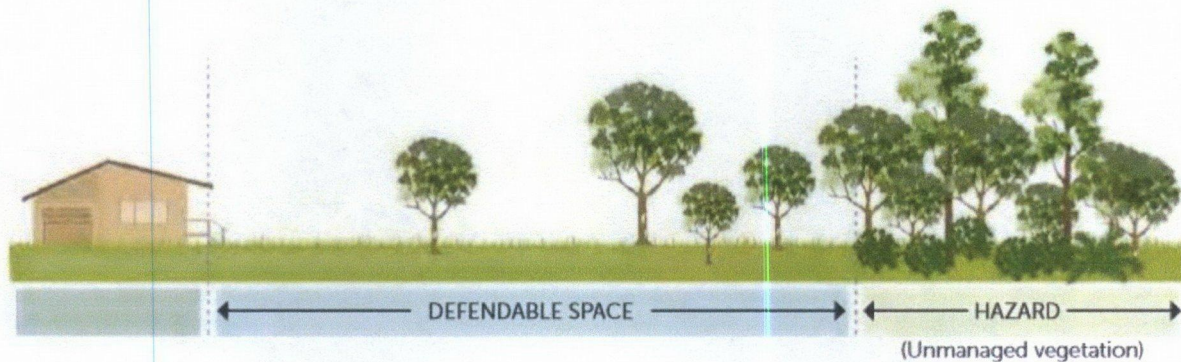
Approved Measure 4.2 : Not applicable

Dwelling BAL and Defendable Space Requirements

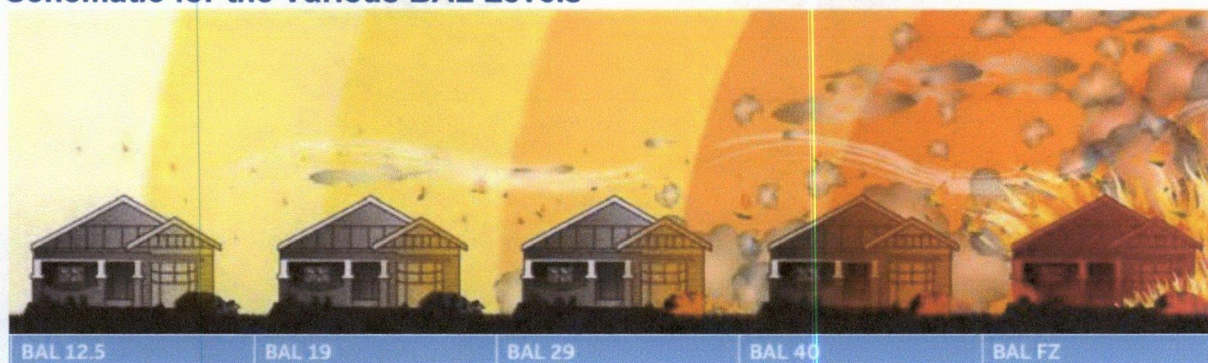
Orientation	Threat Vegetation	Slope under Vegetation	Distance to Vegetation	Defendable Space Width	BAL Level
North	Forest	Downslope >0-5	>57m	57m	BAL 12.5
East	Forest	Downslope >0-5	>57m	57m	BAL 12.5
South	Grassland	Downslope >15-20	10m	32m	BAL 12.5
West	Grassland	Downslope >0-5	10m	22m	BAL 12.5

Defendable Space

Defendable space is an area of land around a building where vegetation is modified and managed to reduce the effects of flame contact, radiant heat and embers associated with bushfire. Flame contact, radiant heat and embers are the way a bushfire attacks a building.



Schematic for the Various BAL Levels



BAL 12.5	BAL 19	BAL 29	BAL 40	BAL FZ
Ember attack radiant heat below 12.5kW/m ²	Increasing ember attack and windborne debris, radiant heat between 12.5kW/m ² and 19kW/m ²	Increasing ember attack and windborne debris, radiant heat between 19kW/m ² and 29kW/m ²	Increasing ember attack and windborne debris, radiant heat between 29kW/m ² and 40kW/m ² . Exposure to flames from a fire front likely.	Direct exposure to flames, radiant heat and embers from the fire front

Table 4 Water supply

Lot sizes (square meters)	Hydrant available	Capacity (litres)	Fire authority fittings and access required
Less than 500	Not applicable	2,500	No
500-1,000	Yes	5,000	No
500-1,000	No	10,000	Yes
1,001 and above	Not applicable	10,000	Yes

Note 1: A hydrant is available if it is located within 120 metres of the rear of the building

Note 2: Fittings must be in accordance with the published requirements of the relevant fire authority.

Vehicle access (or part thereof) of a length specified in Column A implements the design and construction requirements specified in Column B.

Column A	Column B
Length of access is less than 30 metres	Where fire authority access to the water supply is required above, fire authority vehicles should be able to get within 4 metres of the water supply outlet. There are no design and construction requirements if fire authority access to the water supply is not required above
Length of access is greater than 30 metres	The following design and construction requirements apply: <ul style="list-style-type: none"> • 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 0.5 metres on each side and at least 4 metres vertically. • Curves must have a minimum inner radius of 10 metres. • The average grade must be no more than 1 in 7 (14.4°)(8.1') with a maximum grade of no more than 1 in 5 (20°)(11.3') for no more than 50 metres.
Length of access is greater than 100 metres	A turning area for fire fighting vehicles must be provided close to the building by one of the following: <ul style="list-style-type: none"> • A turning circle with a minimum radius of eight metres • A driveway encircling the dwelling • The provision of other vehicle turning heads – such as T or Y head – which meet the specification of Austroad Design for an 8.8 metre Service Vehicle.
Length of access is greater than 200 metres	<ul style="list-style-type: none"> • Passing bays must be provided at least every 200 metres. • Passing bays must be a minimum 20 metres long with a minimum trafficable width of six metres.
Note	<i>The length of access should be measured from a public road to either the building or the water supply outlet, whichever is longer.</i>

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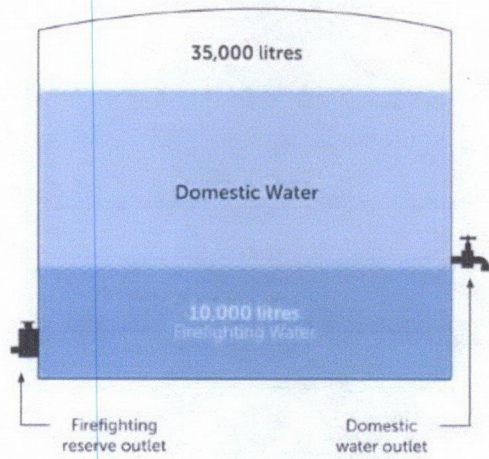
Water tank requirements

The water supply should be stored in an above ground water tank constructed of concrete, steel or corrugated iron.

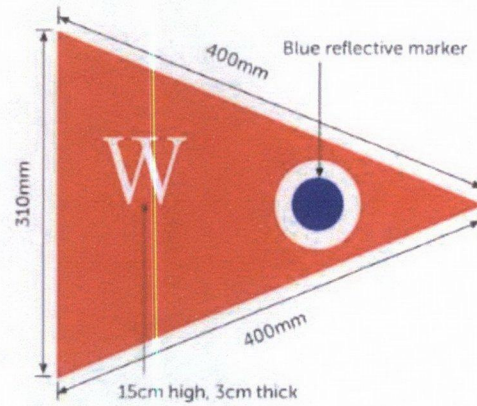
The water supply should be identified.

The water supply may be provided in the same water tank as other water supplies provided they are separated with different outlets.

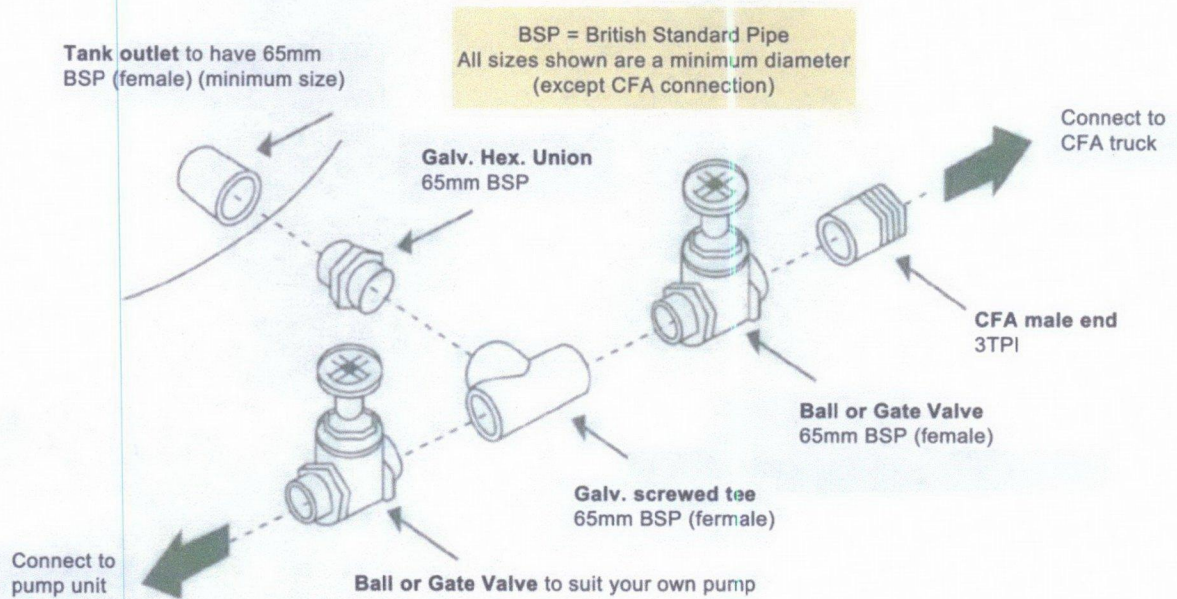
Shared water tank



Water supply identification



Water supply outlet, pipe work, valves



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View along the proposed access track to the building site



View from the river flats towards the elevated section



View from the elevated area towards the southeast



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View from the elevated area to the south



View from the elevated area to the southwest



View from the proposed building area to the north



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View from the proposed building area to the east



View of the remnant vegetation to the east



View of the gully and remnant vegetation



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View from the northern boundary to the northeast



View from the northern boundary to the north



View of the neighbouring dwelling from the northern boundary

