as part of a planning process under the Planning and Environment Act 1987.

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NOTICE OF AN APPLICATION FOR PLANNING PERMIT

The land affected by the application is	426 Back Eildon Road THORNTON,
located at:	(LOT: 1 TP: 862583)
The application is for a permit to:	Use of part of the land for a place of assembly
The applicant for the permit is:	Bondtrace Pty Ltd
The application reference number is:	2023/201
You may look at the application and	www.murrindindi.vic.gov.au/Planning
any documents that support the	Comment
application by visiting our website via	
the following web address:	

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

An objection must be sent to the responsible authority in writing, with the full name and postal address of the objector and include the reasons for the objection, and state how the objector would be affected.

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

The responsible authority will not decide on the application before:	05 March 2024
--	---------------

If you object, the responsible authority will tell you its decision.

The planning unit can be contacted on (03) 5772 0333 or planning@murrrindindi.vic.gov.au.

as part of a planning proffer secondler the Planning and Environment Act 1987. used for any pupose which may breach amps Copyrightoor Specify class of VicSmart application: Date Lodged: Application No.: Application for a Planning Permit Planning Enquiries Phone: (03) 5772 0317 If you need help to complete this form, read MORE INFORMATION at the back of this form. Email: planning@murrindindi.vic.gov.au Web: www.murrindindi.vic.gov.au 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 concerns, 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. Clear Form Click for further information. **Application Type** No No O Yes Is this a VicSmart application?* If yes, please specify which VicSmart class or classes: If the application falls into one of the classes listed under Clause 92 or the schedule to Clause 94, it is a VicSmart application. Pre-application Meeting Has there been a If 'Yes', with whom?: Cam Fraser pre-application meeting Yes O No with a Council planning officer? day / month / year The Land 🕕 Address of the land. Complete the Street Address and one of the Formal Land Descriptions. Street Address * St. Name: Back Eildon Road Unit No.: St. No.: 426 Postcode:3712 Suburb/Locality: Thornton Formal Land Description * No.: 862583Y Title Plan O Plan of Subdivision Lot No .: Complete either A or B. A This information can be found on OR the certificate of title. Section No. Crown Allotment No.: В If this application relates to more than one address, attach a separate sheet setting out any additional property details. Parish/Township Name

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This copied document is made available for the sole purpose of enabling paire Propostanning process under the Planning and Environment Act 1987. lowent must not be used for any purose which max breach any Copyright or Insufficient or unclear information will delay your application. For what use, development or other matter do you Change of use require a permit? * 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. A You may be required to verify this estimate Cost \$50,000 Insert '0' if no development is proposed. Estimated cost of any If the application is for land within metropolitan Melbourne (as defined in section 3 of the Planning and Environment Act 1987) and the estimated cost of the development exceeds \$1 million (adjusted annually by CPI) the Metropolitan Planning Levy must development for which the be paid to the State Revenue Office and a current levy certificate must be submitted with the application. permit is required * Visit www.sro.vic.gov.au for information Existing Conditions III Describe how the land is Farm, shed, farmhouse and associated buildings. Please refer used and developed now * For example, vacant, three attached planning report. dwellings, medical centre with two practitioners, licensed restaurant with 80 seats, grazing. Provide a plan of the existing conditions. Photos are also helpful. Title Information 💵 Does the proposal breach, in any way, an encumbrance on title such as a restrictrive covenant, section 173 agreement or other obligation such as an easement or building envelope? Encumbrances on title * Yes (If 'yes' contact Council for advice on how to proceed before continuing with this application.) 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

part of a planning process under the Planning and Environment Act 1987.
Applicant and Owner Details which may breach any Copyright Provide details of the applicant and the owner of the land Applicant * Name: Surname: Title: First Name: The person who wants the permit. Organisation (if applicable): BONDTRACE PTY LTD If it is a P.O. Box, enter the details here: Contact information for applicant OR contact person below Please provide at least one contact phone number * Same as applicant Contact person's details* Where the preferred contact person for the application is different from the applicant, provide the details of Surname: Harrington First Name: Tom Title: Mr that person. Organisation (if applicable): Navy Blue Planning Ltd If it is a P.O. Box, enter the details here: Owner * Same as applicant Name: The person or organisation Surname: First Name: Title: who owns the land Organisation (if applicable): Bondtrace Pty Ltd Where the owner is different from the applicant, provide the details of that If it is a P.O. Box, enter the details here Postal Address: person or organisation. St. Name: St. No.: Unit No.: Postcode: State: Suburb/Locality: Owner's Signature (Optional): Date day / month / year Contact Council's planning department to discuss the specific requirements for this application and Information obtain a planning permit checklist. requirements Is the required information O Yes O No provided? Declaration III This form must be signed by the applicant * Remember it is against the law I declare that I am the applicant; and that all the information in this application is true and to provide false or misleading correct; and the owner (if not myself) has been notified of the permit application. information, which could result in a heavy fine and cancellation of the permit.

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Thecklist in part of a planning	The cests the few completely Planning and Environment Act 1987.
e Hand Ment must not	be used for any pupose which maxio breach any Copyright 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).
	If applicable, a current Metropolitan Planning Levy certificate (a levy certificate expires 90 days after the day on which it is issued by the State Revenue Office and then cannot be used). Failure to comply means the application is void.
	Completed the relevant council planning permit checklist?
	Signed the declaration above?

Need help with the Application?

If you need help to complete this form, read More Information at the end of this form.

For help with a VicSmart application see Applicant's Guide to Lodging a VicSmart Application at www.planning.vic.gov.au

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

Assistance can also be obtained from Council's planning department.

Lodgement III

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

Murrindindi Shire Council PO Box 138 Alexandra VIC 3714

Shire Offices **Perkins Street**

Alexandra VIC 3714

Contact information:

Phone: (03) 5772 0317

Fax: (03) 5772 2291

Email: planning@murrindindi.vic.gov.au

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

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REGISTER SEARCH STATEMENT (Title Search) Transfer of

Page 1 of 1

VOLUME 09402 FOLIO 905

Land Act 1958

Security no : 124110006446E Produced 24/10/2023 03:03 PM

LAND DESCRIPTION

Lot 1 on Title Plan 862583Y.
PARENT TITLE Volume 07823 Folio 110
Created by instrument H934192 09/04/1980

REGISTERED PROPRIETOR

Estate Fee Simple
Sole Proprietor
BONDTRACE PTY LTD of 18 CHAPMAN PLACE EAGLE FARM QLD 4007
AH602733R 09/11/2010

ENCUMBRANCES, CAVEATS AND NOTICES

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 TP862583Y 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: 426 BACK EILDON ROAD THORNTON VIC 3712

DOCUMENT END

Title 9402/905 Page 1 of 1

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Delivered by LANDATA®, imestamp 24/10/2023 15:04 Page 1 of 1 This copied document is made available for the sole purpose of enabling its consideration and planning process under the Planning and Environment Act 1987 used for any pupose which may **EDITION** Notations LOCATION OF LAND Parish: **EILDON** WATERWAY NOTATION: LAND IN THIS PLAN MAY ABUT CROWN Township: LAND THAT MAY BE SUBJECT TO A CROWN LICENCE TO USE Section: Crown Section: A (PT) KNOWN AS EILDON PRE-EMPTIVE RIGHT Crown Portion: Last Plan Reference:-VOL. 9402 FOL. 905 Derived From: Depth Limitation: NIL ANY REFERENCE TO MAP IN THE TEXT MEANS THE DIAGRAM SHOWN ON THIS TITLE PLAN THIS PLAN HAS BEEN PREPARED Description of Land/Easement Information BY LAND REGISTRY, LAND VICTORIA FOR TITLE DIAGRAM **PURPOSES** COMPILED: Date: 13/10/06 VERIFIED: A. DALLAS Assistant Registar of Titles COVT ROAD LOT 1 37.35 ha

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

LOT 1 = CROWN SECTION A (PT)

GOULBURN

LENGTHS ARE IN METRES

Metres = 0.3048 Feet Metres = 0.201168 x Links

Sheet 1 of 1 sheets



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Urban and Regional Planning Specialists

VERSION HISTORY

Prepared for:	Bondtrace Pty Ltd	
Prepared by:	Navy Blue Planning Pty Ltd	
Contact	admin@navyblueplanning.com.au	
Version No:	1.1	
Date:	19 December 2023	

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Attachment	Description	Author
1	Copy of Title	
2	Site Survey	Prepared by Linear Surveying
3	Plans of the Proposal.	Prepared by About Architecture

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4	Land Capbility Report	Prepared by Edwards Envionmental
5	Integrated Farm Management / Land Management Plan	Prepared by NR Links

1 INTRODUCTION

This planning report has been prepared by Navy Blue Planning Pty Ltd to support a planning permit application for a Place of Assembly at 426 Back Eildon Road, Thornton. Bondtrace Pty Ltd is the applicant for the proposal. The report and the supporting reports and plans provide the details and justification for the proposal.

2 THE PROPOSAL

This proposal seeks the use of land at 426 Back Eildon Road, Thornton for a "Place of Assembly". The proposal would see the use of an existing shed as a wedding venue for hire.

The shed is located on a scenic rural property referred to as "Shrublands." Shrublands provides an idyllic setting for weddings with existing on-site accommodation, manicured gardens and views to rolling hills. An executive summary of the proposal is as follows:

- Land Use: The proposal is confined to a change of use. The existing shed (pictured right) would be used as a Place of Assembly on an infrequent basis for events.
- Buildings: All buildings on the site are existing. No new buildings or works external to a building are proposed.
- Access: Access is via the existing driveway from Back Eildon Road.
- Landscape & Vegetation: No native vegetation is proposed to be removed as a result of the proposal. The subject land contains well established managed gardens and perimeter planting.
- Car parking: A front paddock is proposed to be used for car parking and is serviced by the existing driveway.
- Land Management: Detailed Land Management initiatives are proposed to further improve the site.
- Waste Management: A wastewater management system is proposed. The system is designed and sited so as to protect water quality.







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2.1 Technical Reports & Plans

This planning report is prepared to respond to the requirements of the Murrindindi Planning Scheme and is informed by the attached technical reports and plans:

Att	Description	Author	Description
2	Site Survey	Linear Surveying	A site survey has been undertaken to idetify the site boundaries and site features across the site. The site survey provides base by which site plans have been prepared. Please refer Attachment 2 .
3	Site Plans and Plans of the proposal.	About Architecture	Site pans have ben prepared to show the existing conditions on the site as well as internal changes to the shed to enable its use as a Place of Assembly. The plans substantiate that no other buildings or works are required across the site. Please refer Attachment 3.
4	Land Capbility Report	Edwards Envionmental	A Land Capability Assesment has been prepared to demonstrate that the waste can be appropriately treated in accordfance with EPA requirements through the installation of a new treatment plant on the site. Please refer Attachment 4 .
5	Integrated Farm Management / Land Management Plan	NR Links	An Integrated Farm / Land Management Plan has been prepared. The Plan identifies zones within the property for Domestic, Farming, and Conservation use so as not to compromise the farming potential of the land. The Plan assists in substantiating the appropriate the use of the land having regard to the Decision Guidelines at Clause 35.07-6. We would expect a planning permit condition referencing use of the land in accordance with the Plan. Please refer Attachment 5.

2.2 Summary of planning requirements

A planning permit is required for the change of use of the existing shed for use as a "Place of Assembly" under Clause 35.07-1 the Murrindindi Planning Scheme.

Note:

- The proposal is confined to a change of the use of land only.
- All works are internal to an existing shed.
- No external buildings, works or subdivision of the land are proposed.

2.3 Proposed Site Layout Plan

A proposed Site Layout Plan is provided in Figure 1 *below.* The proposal is confined to the use of the former hangar (shed) as a Place of Assembly. All buildings on the site are existing.

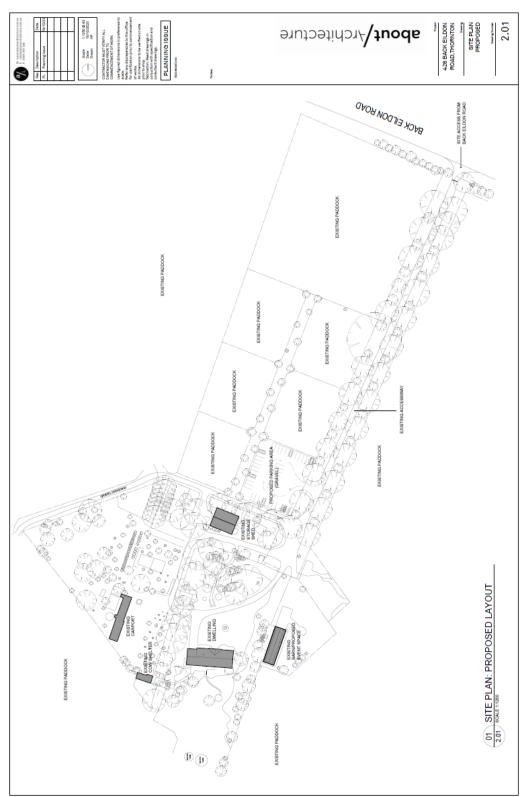


Figure 1 - Site Layout Plan

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3 BACKGROUND

3.1 Existing use

The subject land has traditionally been used for grazing purposes (stud bulls) and has formed part of a family farm for a considerable period. The subject land is currently occupied by: House, Shed (former heliport), farmsheds managed gardens, pasture and windbreaks.

3.2 New complimentary value adding use

There is an opportunity to maintain the traditional farming activities on the land while also providing new, value adding uses. It is proposed to use an existing shed on the property at 426 Back Eildon Road as a suitable venue for events to be held (Place of Assembly).

The shed (former heliport) is of sufficient size and aesthetic appeal for community events. Events would be held infrequently with minor modifications to the interior of the existing shed.

The property is appealing for such use given its existing domestic and rural buildings, managed gardens and scenic surrounding landscape. The ability to complement the existing use of the land as a farm with a new value adding use on part of the property will assist in generating new income stream to assist in sustain property and farmland.

The proposal adds to the growth and diversification of rural economy by connecting agriculture, tourism, and hospitality. It will provide a small-scale venue at a location accessible to other tourist locations within the Shire.

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4 EXISTING CONDITIONS

4.1 The Subject Land

The subject land is located at 436 Back Eildon Road, Thornton. The land fronts Back Eildon Road to the north, Farming properties to the east and west, and the Goulburn River to the south. The subject land has relative proximity to the townships of Thornton to the west and Eildon to the east. The land is currently farmed with stud bulls and has mature windbreaks to most boundaries. Please refer **Figure 3** below.



Figure 2 - Aerial photo 246 Back Eildon Road, Thornton.



Figure 3 – Shed proposed for use as a venue

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Figure 4 - Feature entrance driveway to the site from Back Eildon Road



Figure 5 – Front paddocks and proposed visitor parking area

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Figure 6 - Existing farmhouse



Figure 7 – Existing managed gardens

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Figure 8 - Existing farm sheds

4.2 Title details

Address	Title Details	
426 Back Eildon Road, Thornton	Lot 1 on Title Plan 862583Y.	
	VOLUME 09402 FOLIO 905	
	Refer Attachment 1 for Copy of Title.	

4.3 Site servicing

- The subject land is connected to power.
- The subject land is not connected to sewer.
- The subject land is not connected to reticulated water. The property relies on rainwater (160,000L onsite storage tank with UV and filtration system).
- The farmhouse on the property is connected to a septic tank.

A Land Capability Report has been prepared by Edwards Environmental and is provided in **Attachment 4**. The report recommends the installation of a secondary treatment plant to service the shed for use as a Place of Assembly.

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4.4 Surrounding context

The subject land is located approximately 4km from the township of Thornton. Surrounding the site may be described as follows:

North	Land to the north is separated by Back Eildon Road. Land further to the north us used for farming purposes.
East	Land to the east is used for farming purposes.
South	Land to the south is separated by the Goulburn River. Land further to the south us used for farming purposes.
West	Land to the west is used for farming purposes.

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5 PLANNING ASSESSMENT

The Murrindindi Planning Scheme seeks to ensure that the objectives of planning in Victoria (as set out in Section 4 of the Planning and Environment Act 1987) are fostered through appropriate land use and development planning policies and practices which integrate relevant environmental, social and economic factors in the interests of net community benefit and sustainable development. The planning framework applicable to the site is described below.

The following provides an assessment of the merits of the planning permit application against the relevant requirements of the Murrindindi Planning Scheme. The assessment has been undertaken having regard to consistency with:

- The Municipal Planning Strategy
- The relevant Zones & Overlays
- The Planning Policy Framework
- The Particular & General Provisions
- Relevant local planning strategies and guidelines

Please refer tables below and overleaf.

5.1 Municipal Planning Strategy

Clause	Description	Response
2.02 - Vision	Council seeks to enhance the liveability, amenity and quality of life in the municipality. A strong economy will attract people to the municipality, creating further opportunities for lifestyle choice, business investment and prosperity. Increased economic growth and investment will enhance population growth, employment and social and cultural benefits for the municipality.	The proposal supports the strategic directions for the Shire as outlined within the Municipal Vision through the creation of new value adding uses which enhance liveability, assist in attracting people to the municipality, and associated investment benefits.
2.03 Strategic Directions - Natural Resource Management	 Protecting high quality agricultural land for ongoing agricultural use. Protecting rural land for productive agricultural uses and compatible rural uses. Ensuring that the use and development of rural land protects and enhances agricultural potential and the productive capacity of the land and surrounding land. Supporting existing agricultural production activities, including beef and sheep grazing, horticulture, cropping, vegetable growing, aquaculture, timber production and niche products. Supporting emerging agricultural industries that are compatible with existing agricultural practices, including horticulture, intensive animal production, agroforestry, farm gate 	The proposal responds to the Strategic Detections by: Protecting high quality agricultural land through the definition of domestic, agricultural, and conservation zones within the property. Utilising the existing domestic area for the proposed use. Restricting use of the balance of the property for agricultural and conservation use. Identifying measures to support sustainable agricultural use of the subject land. This will in-turn lead to improvements in agricultural production. Protecting water catchments.

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	 agricultural sales, boutique, niche agriculture, agricultural processing, value adding industries and carbon farming. Supporting the evolution of agriculture in response to improved practices and climate change. Ensuring that agricultural land is not developed for primarily residential purposes. Discouraging the fragmentation of rural land into lots incapable of productive agricultural and rural use. Protecting water catchments from inappropriate use and development, particularly the Goulburn River valley and its tributaries. 	Refer Land Capability Assessment at Attachment 4 and Integrated Land Management / Farm Management Plan provided at Attachment 5.
2.03 Strategic Directions – Economic Development	Facilitating the growth of home-based business, small businesses, niche industries and rural based industries. Supporting new and emerging industries. Encouraging sustainable growth in tourism, leveraging Murrindindi Shire's natural assets, proximity to Melbourne and links with neighbouring regions. Facilitating development of new tourism accommodation options and conference centres. Encouraging small enterprises in tourism, creative arts, home-based businesses, overnight visitor accommodation and farm enterprises and markets that showcase local produce.	The proposal responds to the Strategic Directions by: • Establishing a new small business / small enterprise on the subject land. • Supporting the growth of tourism and visitation of the Shire through the creation of a boutique hospitality venue. • Providing the opportunity for expenditure in nearby and surrounding towns through overnight stays, use of local goods and services. • Providing the opportunity to showcase the Shire's outstanding natural landscapes and amenity.

5.2 Planning Policy Framework

Clause	Description	Response
12.01-1S - Protection of	Objectives include: • To protect and enhance Victoria's	No native vegetation is proposed to be removed as a result of the proposal.
Biodiversity	biodiversity.	No external works are proposed which may impact biodiversity.
		Further, measures are proposed within the to protect biodiversity. Please refer Attachment 4 for Land Capability Report and Attachment 5 for Integrated Farm Management / Land Management Plan.
12.05-1S - Environmentally sensitive areas & 12.05-2S - Landscapes	To protect and conserve environmentally sensitive areas. To protect and enhance significant landscapes and open spaces that	No native vegetation is proposed to be removed as a result of the proposal. All buildings on the site are existing. There is to be no impact of the proposal on surrounding landscape values.

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	contribute to character, identity and sustainable environments.	
Clause 14.01- 1S Protection of agricultural land	To protect the state's agricultural base by preserving productive farmland. Relevant strategies include: Protect productive agricultural land from unplanned loss due to permanent changes in land use. Prevent inappropriately dispersed urban activities in rural areas. Protect strategically important agricultural and primary production land from incompatible uses. In considering a proposal to use, subdivide or develop agricultural land, consider the: Desirability and impacts of removing the land from primary production, given its agricultural productivity. Impacts on the continuation of primary production on adjacent land, with particular regard to land values and the viability of infrastructure for such production. Compatibility between the proposed or likely development and the existing use of the surrounding land. The potential impacts of land use and development on the spread of plant and animal pests from areas of known infestation into agricultural areas.	The proposal has provided careful consideration of the impact on the protection of agricultural land and values: • All buildings on the site are existing. • No external works are proposed. • The proposal makes use of an existing domestic area, buildings, and managed gardens on the property. There is minimal (if any) loss of agricultural land arising from the proposal. • The location of the proposed use is well separated from surrounding land not in same ownership. • There is to be no adverse impact on agricultural values on the property. • There is to be no adverse impact on agricultural values on surrounding land. • There is no adverse impact on land capability. The proposed use is to be supported by a new secondary treatment system. Please refer: • Attachment 3 for Site Layout Plans, Attachment 4 for Land Capability Report, • Attachment 5 for Integrated Farm Management / Land Management Plan.
14.02-1S – Catchment Planning and Management	To assist the protection and restoration of catchments, waterways, estuaries, bays, water bodies, groundwater, and the marine environment.	The proposal is confined to a change of use. No external buildings or works are proposed. No changes to access to the property are proposed. The proposal provides for an appropriate waste treatment solution. There is no impact on catchment management planning objectives.
Clause 17.01- 1S and 17.01- 1R	Objectives include: To strengthen and diversify the economy. Strategies include: Support rural economies to grow and diversify. Encourage appropriate new and developing forms of industry, agriculture, tourism and alternative energy production.	The proposal adds to the growth and diversification of rural economy by connecting agriculture, tourism, and hospitality. The venue will be compatible with the surrounding activities and will be accessible to other tourist locations of the Shire.

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Clause 17.04- 1S and 17.04- 1R	To encourage tourism development to maximise the economic, social and cultural benefits of developing the state as a competitive domestic and international tourist destination. Strategies include:	The proposal adds to the growth and diversification of rural economy by connecting agriculture, tourism, and hospitality. The venue will be compatible with the surrounding activities and will be accessible to other tourist locations of the Shire.
	 Facilitate rural tourism activities that support agricultural enterprises such as cellar door and farm gate sales and accommodation in appropriate locations. Promote tourism facilities that preserve, are compatible with and build on the assets and qualities of surrounding activities and attractions. Create innovative tourism experiences. Encourage investment that meets demand and supports growth in tourism. 	
18.02-3S Road System	To manage the road system to achieve integration, choice and balance by developing an efficient and safe network and making the most of existing infrastructure.	The proposal is connected to the surrounding road system.

5.3 Zones & Overlays

The site is located within Murrindindi Shire Council. The Murrindindi Planning Scheme is the relevant planning instrument. The key planning provisions applicable to the application are detailed below.

Zone	Description	Response
Farming Zone (FZ)	 The purpose of the Farming Zone is as follows: The subject land is wholly contained within the Farming Zone. The purpose of the zone includes: To implement the Municipal Planning Strategy and the Planning Policy Framework. To provide for the use of land for agriculture. To encourage the retention of productive agricultural land. To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture. To encourage the retention of employment and population to support rural communities. 	 The proposal is located on an existing lot. No buildings, works or subdivision are proposed. The proposal will not adversely impact farming or domestic activities on surrounding land. Access is proposed via an existing all-weather driveway. Dimensions are suitable to accommodate emergency vehicles. The proposal will not result in any adverse impact on these parts of the site. Reticulated water supply to the property is not available.

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 To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.

The relevant decision guidelines include:

- The Municipal Planning Strategy and the Planning Policy Framework.
- Any Regional Catchment Strategy and associated plan applying to the land.
- The capability of the land to accommodate the proposed use or development, including the disposal of effluent.
- How the use or development relates to sustainable land management.
- Whether the site is suitable for the use or development and whether the proposal is compatible with adjoining and nearby land uses.
- How the use and development makes use of existing infrastructure and services.

- The proposal will be supported by water tanks suitable to provide a domestic water supply.
- Reticulated sewerage is not available.
 Wastewater will be treated and
 retained within the lot in accordance
 with the requirements of the
 Environment Protection Regulations
 under the Environment Protection Act
 2017 for an on-site wastewater
 management system.
- 9. The shed is connected to a reticulated electricity supply.
- A site survey identifies the existing features of the site. This has informed the preparation of the attached technical reports ad plans.
- 11. The proposal is supported by a Land Management Plan prepared to address the rural, environmental, accommodation, design and siting issues identified within the Zone. Detailed site investigations have occurred. Please refer attached report prepared NR Links.
- 12. No vegetation is required to be removed as a result of the proposal.

General issues:

The subject land is capable of accommodating the proposed use, including the effluent disposal. The proposal is compatible with the adjoining and nearby land uses.

Agricultural issues and the impacts from non-agricultural uses:

The subject land is currently used for farming which will support the proposed use and vice versa. There will be no discernible impact on agriculture.

Accommodation issues:

The subject land already contains a dwelling. The proposal will not adversely impact the operation and expansion of any adjoining and nearby agricultural use.

Environmental issues:

Any impact from the effluent and stormwater management of the proposed development will not reduce the soil and water quality of the area. As stated above, a Land Capability Assessment has been provided to demonstrate that wastewater will be treated and retained within the lot in accordance with the requirements of the Environment Protection Regulations under the Environment Protection Act 2017 for an on-site wastewater management system.

Design and siting issues:

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Environmental Significance Overlay – Schedule 1	Purposes include: • To implement the Municipal Planning Strategy and the Planning Policy Framework. • To identify areas where the development of land may be affected by environmental constraints. • To ensure that development is compatible with identified environmental values.	The proposal makes use of an existing building well separated from activities on adjacent land. The proposal has been prepared to ensure the protection of water quality and water yield, as required by ESO1. A permit is not triggered by the Overlay. No buildings, works, or additional structures are proposed. No native vegetation removal is required. 1. The site survey provided in Attachment 2 and plans provided in Attachment 3 show the location of site features. 2. A Land Capability Assessment is provided at Attachment 4. The Land Capability Assessment demonstrates that the proposal can be serviced
Floodury	The publicat land is subally contained within the	without compromising water quality and environmental health. 3. An Integrated Farm Management / Land Management Pan is provided in Attachment 5 . The Plan has been prepared following detailed site investigations.
Floodway Overlay (FO)	The subject land is wholly contained within the Floodway Overlay. Objectives include: • To identify waterways, major floodpaths, drainage depressions and high hazard areas which have the greatest risk and frequency of being affected by flooding. • To ensure that any development maintains the free passage and temporary storage of floodwater, minimises flood damage and is compatible with flood hazard, local drainage conditions and the minimisation of soil erosion, sedimentation and silting. • To reflect any declarations under Division 4 of Part 10 of the Water Act, 1989 if a declaration has been made. • To protect water quality and waterways as natural resources by managing urban stormwater, protecting water supply catchment areas, and managing saline discharges to minimise the risks to the environmental quality of water and groundwater. • To ensure that development maintains or improves river and wetland health, waterway protection and flood plain health.	No development which may contribute to flooding or be impacted by flood hazards is proposed. As such, there is to be no impact on water quality, river or wetland health arising from the proposal. All buildings and structures are already present. The objectives, requirements, and conditions of the Overlay can be met.

Other		
Areas of Aboriginal Cultural Heritage	Part of the subject land is mapped as an area of Aboriginal Cultural Heritage Sensitivity owing to its location within 200m of a watercourse.	No earthworks, buildings, use of the land, or vegetation removal are proposed within the mapped area.
Sensitivity		A Cultural Heritage Management Plan is not required.
		There is no potential for impact on Areas of Aboriginal Cultural Heritage Sensitivity.
Designated Bushfire Prone Area	The land (and all surrounding land) is located within a Designated Bushfire Prone Area.	The site (along with all surrounding land) is identified as a Designated Bushfire Prone Area. No buildings or works are proposed.
		Council may require preparation of a Bushfire Emergency Management Plan prior to the commencement of the use. The Bushfire Emergency Management Plan would provide direction for the management of the proposed use in the event of a bushfire.

5.4 General Provisions

Clause	Requirements	Response
65.01 – Approval of an Application or Plan	 Before deciding on an application or approval of a plan, the responsible authority must consider, as appropriate: The Municipal Planning Strategy and Planning Policy Framework. The purpose of the zone, overlay or other provision. Any matter required to be considered in the zone, overlay or other provision. The orderly planning of the area. The effect on the amenity of the area. The proximity of the land to any public land. Factors likely to cause or contribute to land degradation, salinity or reduce water quality. Whether the proposed development is designed to maintain or improve the quality of stormwater within and exiting the site. The extent and character of native vegetation and the likelihood of its destruction. Whether native vegetation is to be or can be protected, planted or allowed to regenerate. The degree of flood, erosion or fire hazard associated with the location of the land and the use, development or management of the land so as to minimise any such hazard. 	The Municipal Planning Strategy and Planning Policy Framework have been addressed under separate headings in the body of the report.

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6 KEY ISSUES

6.1 Use & Operation

It is intended that Shrublands will be utlised as an event venue on an infrequent basis. The ethos behind the proposal is for the owners to generate revenue from the underutlised domestic area on the property to assist in maintaining the existing farm.

The proposal has been carefully considered to respond to the site conditions, rural context and planning framework which apply to the land. There are some important distinctions between this proposal and other proposals which may be received by Council on rural land:

- 1. The proposal is supported by a detailed Integrated Land Management / Farm Management Plan.
- 2. The proposal provides an appropriate waste treatment solution and supporting Land Capability Assessment.
- 3. Zones within the property are established for domestic use, agricultural use and conservation. Each zone reflects the existing use of land. There are no significant changes to the use of the property required to enable the new use to proceed.
- 4. The proposal is confined to the use of existing buildings and managed gardens within the property which are located within the exiting domestic area. No additional buildings or works are required.
- Access is restricted to the existing point of access to the property from Back Eildon Road. This point of access services the domestic areas of the property.
- 6. The balance of the property is restricted to use for agriculture and conservation.

Please refer Plans provided at **Attachment 3**, Land Capability Assessment at **Attachment 4** and Integrated Land Management / Farm Management Plan provided at **Attachment 5**.

The use of the property as a Place of Assembly is appropriate for the site, meets the policy tests contained within the Murrindindi Planning Scheme, and will have no adverse impact on the site or surrounds. We would expect a condition on the permit requiring the use of the facility in accordance with an Operational Management Plan to be approved by Council.

6.2 Protection of agricultural land

The proposal is not expected to result in the loss or fragmentation of agricultural land. The proposal involves the use of existing buildings. No further buildings or works are proposed. The location of these buildings has previously been considered under previous approvals, taking account of site characteristics, landscape, access.

The location of the proposed Place of Assembly is well setback from adjoining land. Existing perimeter vegetation also provides effective screening between agricultural and domestic activities. There will be no adverse impact in terms of noise, dust, glare, or lightspill. Similarly, there are no agricultural activities on surrounding land which may adversely impacted.

An Integrated Farm / Land Management Plan is provided at **Attachment 5** and establishes zones within the site. The proposal is to be located within the domestic area. All domestic activities are limited to this area. This is to protect the balance of the property for environmental and agricultural purposes.

6.3 Access

An existing crossover and driveway from Back Eildon Road will continue to be utilised. The location of the driveway and point of access to the site has previously been selected and approved to provide safe access to the property, and avoid on-site features (vegetation, drainage lines). The driveway is lined by elms and will remain permeable to reduce any impact vegetation or drip zones. Access on site for the proposed use will be

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restricted to this driveway only. The proposed access is also designed to accommodate emergency vehicle access (width and construction), whilst also minimising distance within the property. Refer site layout plans at **Attachment 3**.

6.4 Car Parking

A car parking area is set aside in an existing paddock to the west of the driveway. The paddock is fenced from the balance of the property. Gravel will be placed within the paddock to enable vehicle parking. A Place of Assembly carries a statutory carparking rate of 0.3 per each patron. A total of 37 spaces will be provided. This is slightly in excess of the statutory requirement of 36 spaces for 120 patrons. No earthworks greater than 100mm are required. All structures (fencing) are existing to define the car parking area. Refer site layout plans at **Attachment 3**.

6.5 Landscape & Vegetation

Whilst traditionally used for grazing purposes, the site contains perimeter vegetation adjacent to roadways and some patches of remnant vegetation. No native vegetation is proposed to be removed as a result of the proposal. The proposal has been designed so as to protect existing vegetation, including mature exotic vegetation which is a feature of the property. All buildings on the site are existing. The proposal will have no impact on Landscape or Vegetation values.

6.6 Land Capability

A Land Capability Assessment (LCA) is undertaken for high-risk sites and/or where the site is in a Declared Water Supply Catchment (refer to EPA 891.4 July 2016, p34 -36) A Land Capability Assessment was carried out by Edwards Environmental and is provided at **Attachment 4** to this report.

A new wastewater management system is proposed. The system is designed and sited so as to protect water quality. The results indicate the site is capable of sustainable management of secondary treated wastewater. Plans accompanying the proposal are developed accordingly.

6.7 Catchment Management & Planning

The proposal is confined to a change of use. No external buildings or works are proposed. No changes to access to the property are proposed. The proposal provides for an appropriate waste treatment solution. There is no impact on catchment management planning objectives.

6.8 Flooding

All buildings and structures are already present. No development which may contribute to flooding or be impacted by flood hazards is proposed. As such, there is to be no impact on water quality, river or wetland health arising from the proposal.

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7 SUMMARY

Shrublands is a scenic rural property on the banks of the Goulburn River between located between the townships of Thornton and Eildon on the Back Eildon Road. It is intended that Shrublands will be utilised as an event venue on an infrequent basis.

The proposal has been carefully considered to respond to the site conditions, rural context and planning framework which apply to the land:

- 1. The proposal is supported by a detailed Integrated Land Management / Farm Management Plan.
- 2. The proposal provides an appropriate waste treatment solution and supporting Land Capability Assessment.
- 3. Zones within the property are established for domestic use, agricultural use and conservation. Each zone reflects the existing use of land. There are no significant changes to the use of the property required to enable the new use to proceed.
- 4. The proposal is confined to the use of existing buildings and managed gardens within the property which are located within the exiting domestic area. No additional external buildings or works are required.
- 5. Access is restricted to the existing point of access to the property from Back Eildon Road. This point of access services the domestic areas of the property.
- 6. The balance of the property is restricted to use for agriculture and conservation.

We submit that the use of the property as a Place of Assembly is appropriate for the site, meets the policy tests contained within the Murrindindi Planning Scheme, and will have no adverse impact on the site or surrounds.

The proposal will provide a new hospitality asset for the Shire and in-turn deliver economic benefits through the form of visitation and consumer spending within surrounding locations.

For these reasons, we submit the proposal is suitable for Council's consideration and approval.

Navy Blue Planning

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Planning Report

Disclaimer

This report dated 19 December 2023 incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Navy Blue Planning's opinion in this report.

Navy Blue Planning prepared this report on the instructions, and for the benefit only, of Bondtrace Pty Ltrd (Instructing Party) for the purpose of supporting a planning permit application required for the land at 426 B Back Eildon Road Thornton (purpose) and not for any other purpose or use. To the extent permitted by applicable law, Navy Blue Planning expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this report for any purpose other than the Purpose, and to any other person which relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

In preparing this report, Navy Blue planning was required to make judgements which may be affected by unforeseen future events, the likelihood and effects of which are not capable of precise assessment. All forecasts, projections and recommendations contained in or associated with this report are made in good faith and on the basis of information supplied to Navy Blue Planning at the date of this report, and upon which Navy Blue Planning relied.

Whilst Navy Blue Planning has made all reasonable inquiries it believes necessary in preparing this report, it is not responsible for determining the completeness or accuracy of information provided to it. Navy Blue Planning is not liable for any errors or omissions, including in information provided by the Instructing Party or another person or upon which Navy Blue Planning relies, provided that such errors or omissions are not made by Navy Blue Planning recklessly or in bad faith. This report has been prepared with due care and diligence by Navy Blue Planning and the statements and opinions given by Navy Blue Planning in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

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ATTACHMENTS

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426 Back Eildon Road, Thornton, Vic 3712

DATE: 16/10/2023

CLIENT:

SCHEDULE OF DRAWINGS: ARCHITECTURAL

Sheet Number	Drawing Title	Revision	Revision/Comments	Sheet Issue Date
0.00	Drawing Register	TP1		
1.00	Lot Plan			
2.00	Site Plan - Existing			
2.01	Site Plan - Proposed			
3.00	Event Space - Site Plan			
3.01	Event Space - Floor Plans			
3.02	Event Space - Existing Elevations			
4.00	Car Parking - Existing Conditions			
4.01	Car Parking - Proposed Conditions			

AUTHORITIES/CONSULTANTS

MUNICIPALITY: ARCHITECT: BUILDING SURVEYOR: STRUCTURAL ENGINEER: GEOTECHNICAL ENGINEER:

Murrindindi Edwina Thompson To Be Confirmed To Be Advised To Be Advised

REG# 20017 PH: 0409 394 260

Rev.	Description	Date
TP0	Planning Issue	16/10/23
TP1	Planning RFI	24/01/24

1:100 @ A3 16/10/2023 KP

CONTRACTOR MUST VERIFY ALL DIMENSIONS PRIOR TO COMMENCEMENT OF WORK

Use figured dimensions in preference to

scale.

Refer any discrepencies to this office
for clarificiation prior to commencement
of works.

All dimensions to be verified on site
prior to shop
fabrication. Read drawings in
conjuction with specification and
consultant drawings.

PLANNING ISSUE

426 BACK EILDON ROAD, THORNTON

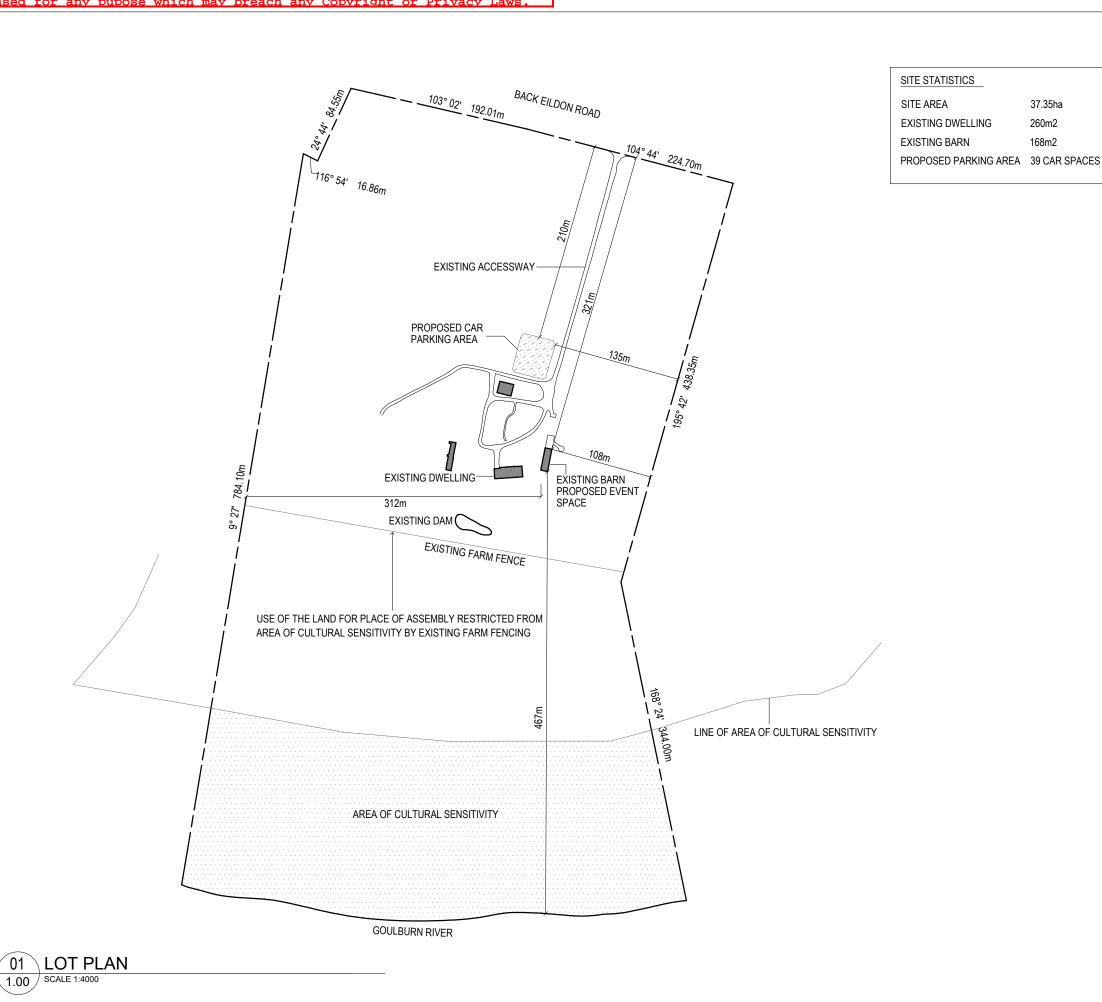
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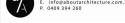
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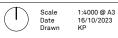
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Rev.	Description	Date
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PLANNING ISSUE

Notes

about/Architecture

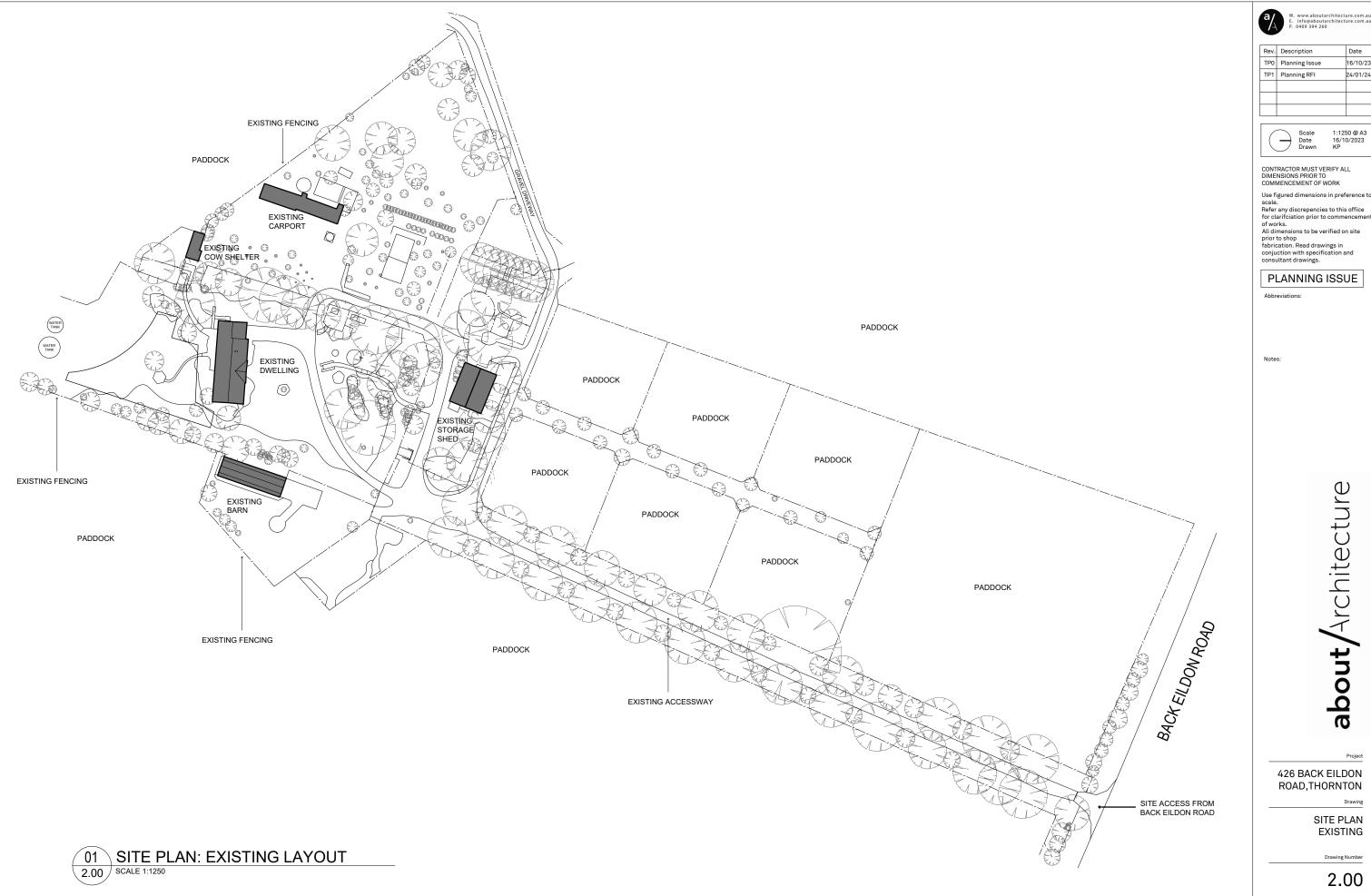
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LOT PLAN

Drawing Number

1.00

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Rev.	Description	Date
TP0	Planning Issue	16/10/23
TP1	Planning RFI	24/01/24

1:1250 @ A3 16/10/2023 KP

PLANNING ISSUE

about/Architecture

426 BACK EILDON

ROAD, THORNTON

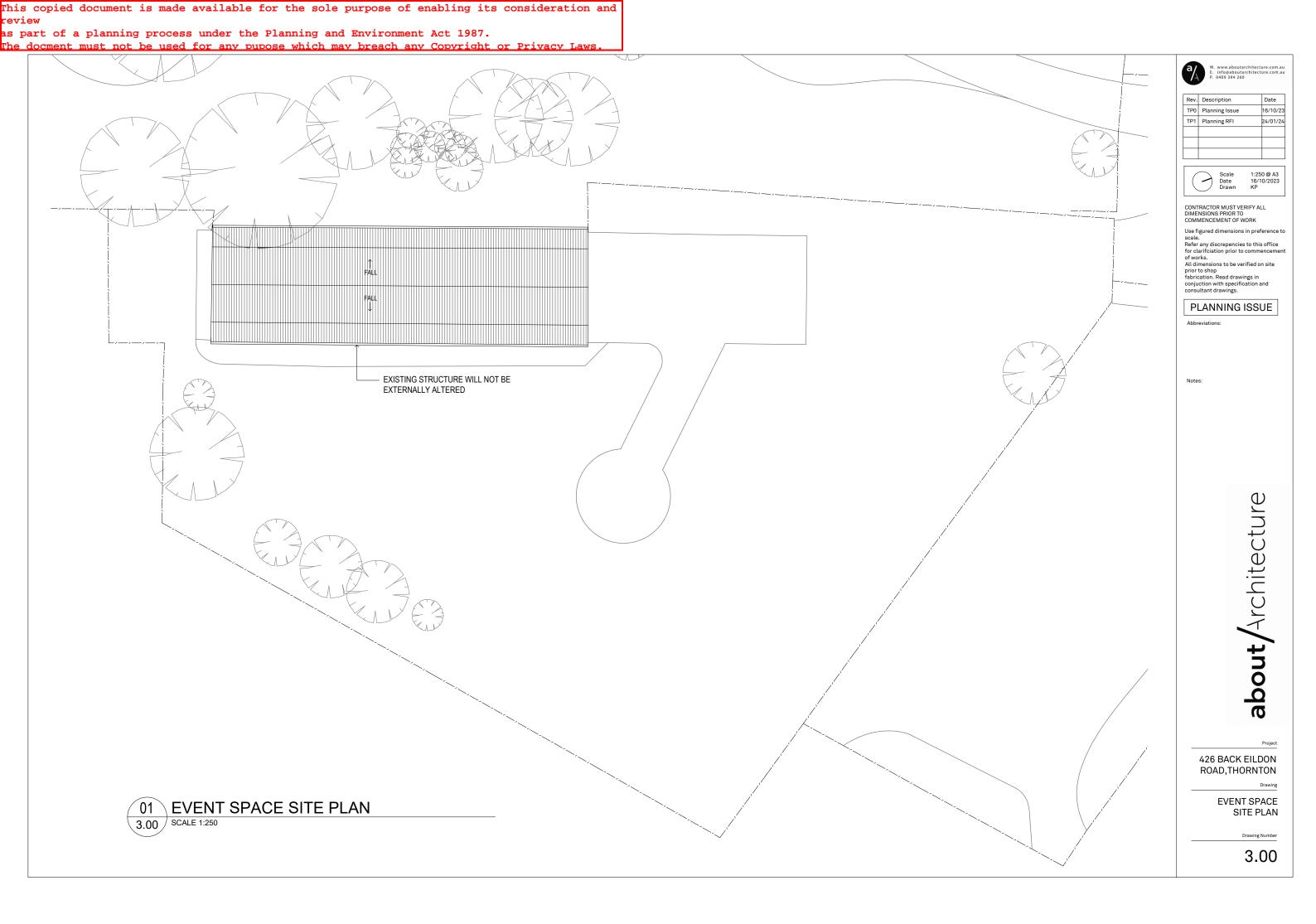
SITE PLAN

Drawing Number

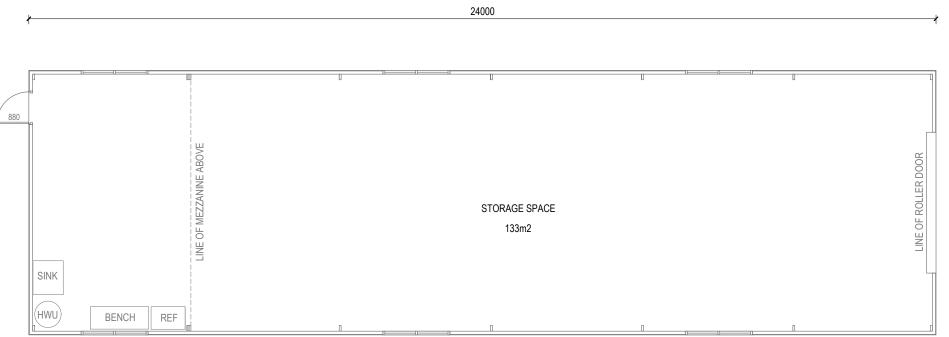
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01 EXISTING FLOOR PLAN 3.01 SCALE 1:100

24000 ACCESSIBLE LINE OF ROLLER DOOR **EVENT** SPACE 133m2 RECONFIGURED KITCHENETTE (HWU) BENCH REF

NOTE: NO EXTERNAL WORKS TO BUILDING

02 PROPOSED FLOOR PLAN
3.01 SCALE 1:100

Rev.	Description	Date
TP0	Planning Issue	16/10/23
TP1	Planning RFI	24/01/24

1:100 @ A3 16/10/2023 KP

Scale Date Drawn

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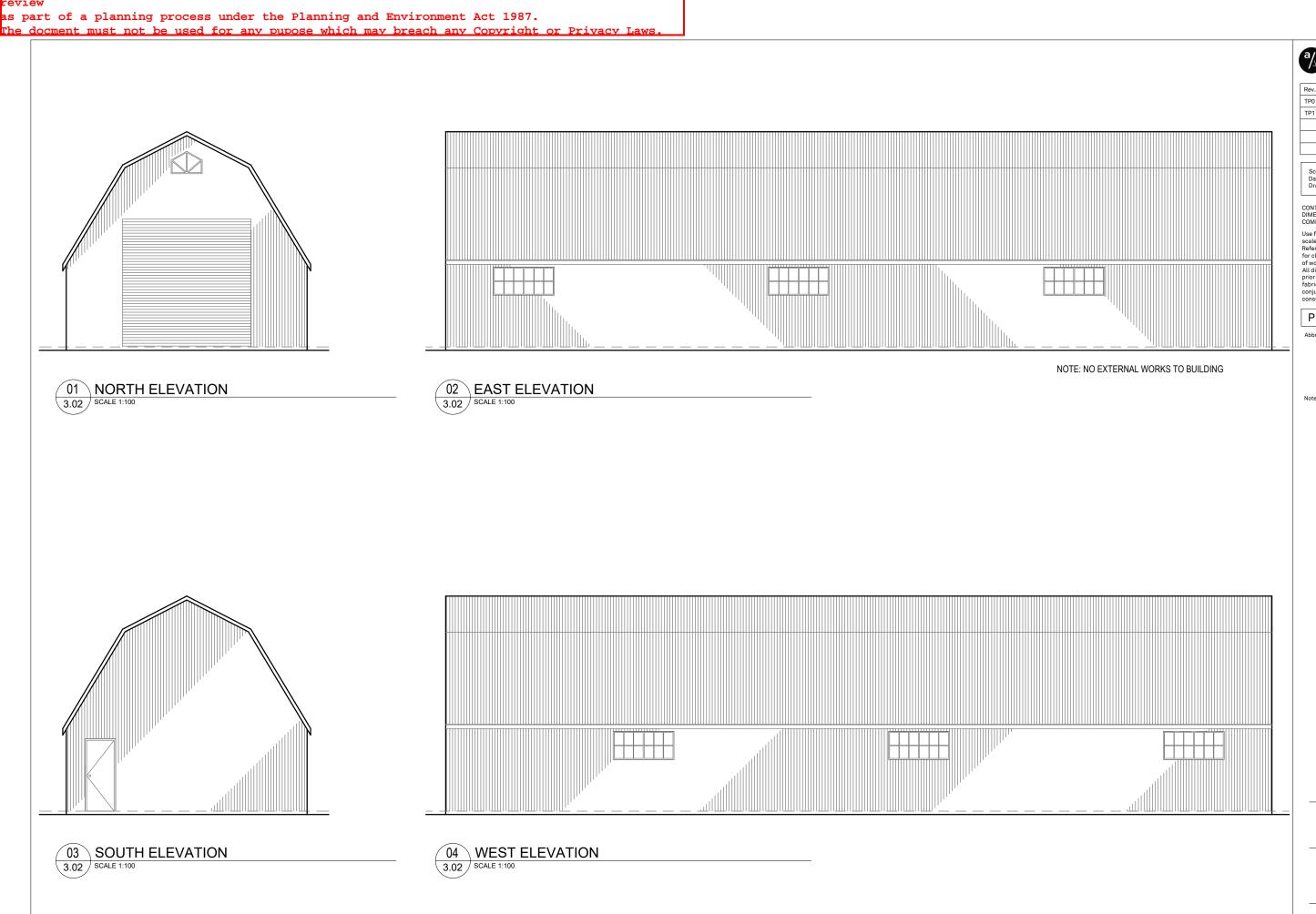
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EVENT SPACE FLOOR PLANS

Drawing Number

3.01



Date Rev. Description TP0 Planning Issue 16/10/23 TP1 Planning RFI 24/01/24

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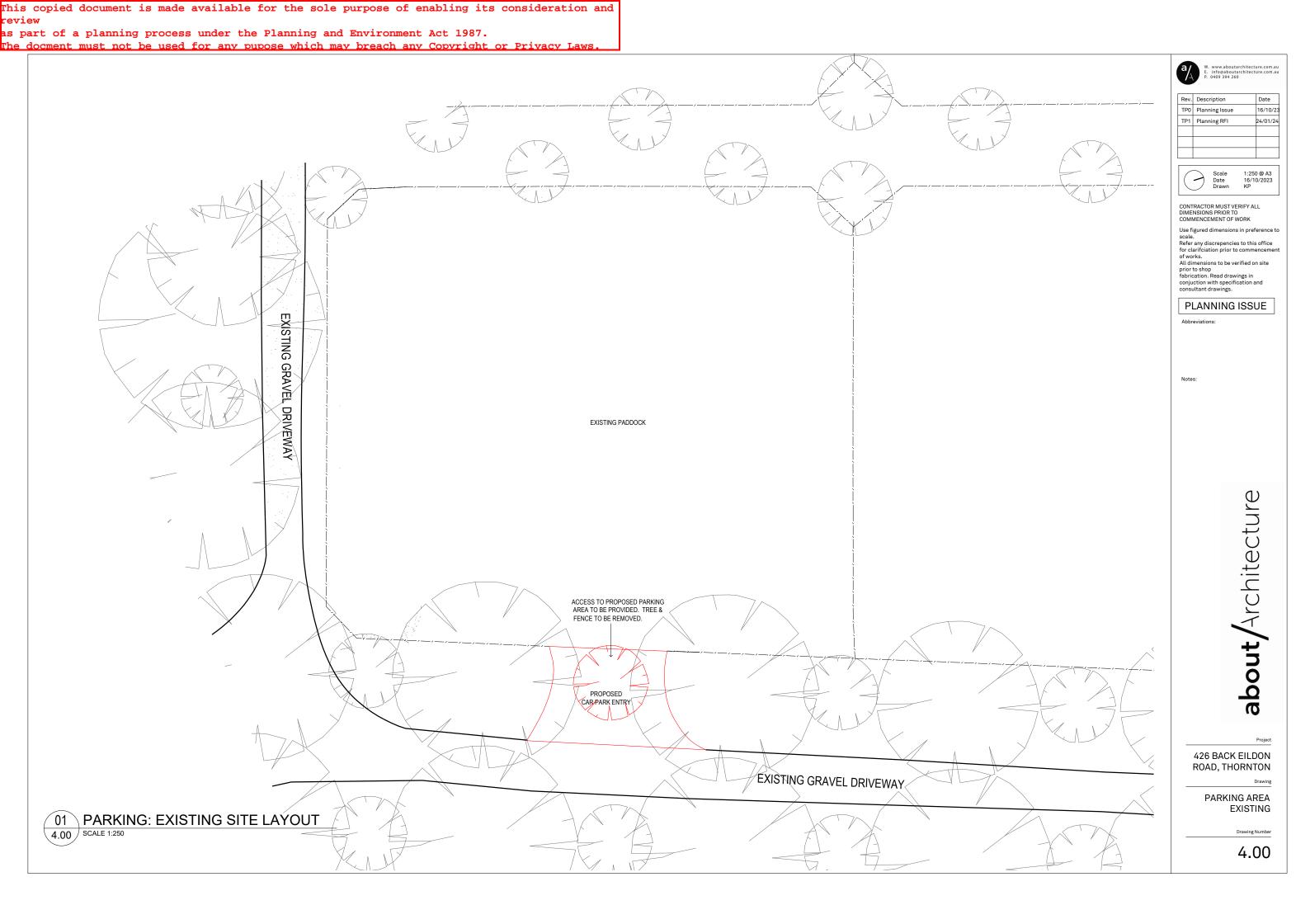
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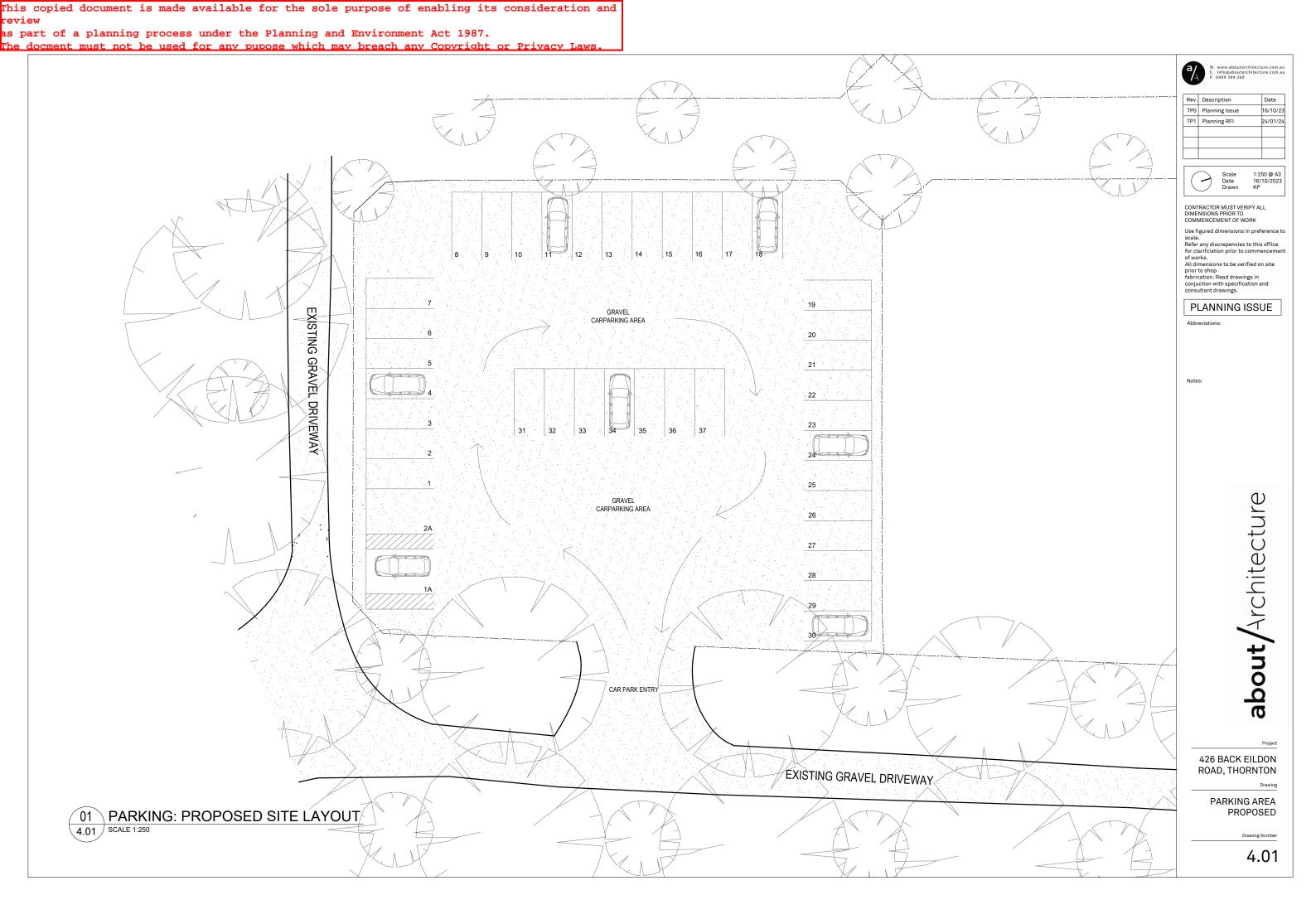
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EVENT SPACE ELEVATIONS

Drawing Number

3.02





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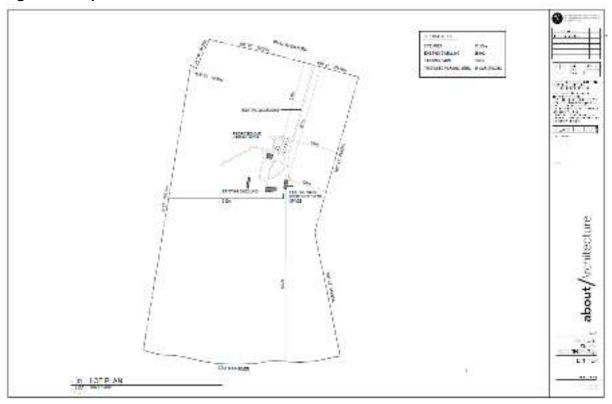
With reference to the attached RFI from Council, we can confirm:

- 1. The application relates to part of the lot only. We are comfortable Council referring to the application in this manner. *Please refer Figure 1 below*.
- 2. The proposal is well clear of potential areas of cultural heritage sensitivity (refer green area to the south of the property below). *Please refer to Figure 2 below*.
- 3. Use of the land for Place of Assembly restricted from this area by existing farm fencing. *This can be seen in Figure 3 below.*

We maintain that:

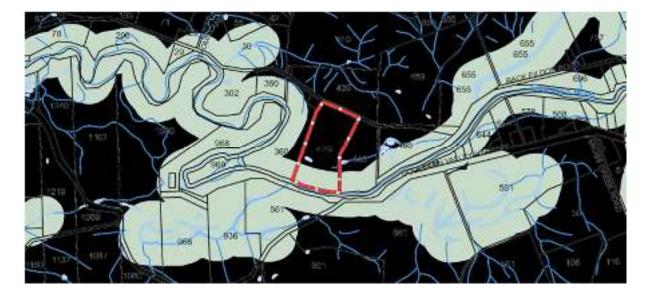
- A cultural heritage management plan is not required.
- No physical changes to the proposal are required.

Figure 1 - Proposed Plan



2. Potential areas of cultural heritage sensitivity

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1. Existing farm fencing



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Land Capability Assessment

426 Back Eildon Road Thornton 3712

Prepared for Caitlin Williams

December 2023 Version 1.0

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Assessors' Academic Qualifications and Professional Memberships

Luke Collins is an environmental consultant with Edwards Environmental. Luke has a Bachelor of Engineering (Environmental Engineering) (Honours) specialising in groundwater. Luke has seven years' experience in environmental assessments working on contaminated land projects, civil construction and natural resource management. Luke is a member of the Australian Land & Groundwater Association (ALGA). Site assessments, sampling, preparation of site plans and compilation of reports are undertaken by Luke Collins.

Dean Edwards is the Principal consultant at Edwards Environmental. He has a Bachelor Applied Science (Chemistry) and a Master of Science. Dean has almost 20 years' experience in the environmental industry including 10 years at EPA Victoria. Dean is a member of the Australian Land & Groundwater Association (ALGA). The results of site assessment, analytic results and report were reviewed by Dean Edwards.

NATA Accredited Laboratory

Edwards Environmental engages only NATA accredited laboratories for analytic testing.

Professional Indemnity Insurance

Class of Policy Professional Indemnity

Insurer FTA Insurance

Policy No. 2308ProEdwarEnv

Period of cover 17-08-23 – 17-08-24

Policy Limit \$2 million any one claim and \$4 million in the aggregate

Limitations

This document was prepared for the purpose as described in the introduction of the report. The conclusion and recommendations of this assessment are based upon evidence obtained through personal interviews, site investigations, representative sampling, data and information supplied by the client, and professional opinion and judgement.

All reasonable care has been taken to ensure that the data and information on which the assessment is based is accurate and complete. The conclusions and recommendation are based on evidence collected at the time of the investigation and Edwards Environmental disclaims all liability for any changes that may have occurred at the site since the investigation. This report shall not be amended or reproduced without written approval from Edwards Environmental.

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Land Capability Assessment. 426 Back Eildon Road Thornton 3712

Distribution

Version	Date	Copies	Recipient
1.0	December 2023	Electronic	

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Prepared for

Prepared by

Edwards Environmental

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www.edwardsenvironmental.com.au

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ABBREVIATIONS (So	ource: EPA 891.4, July 2016)
AS/NZS	Australian Standard/New Zealand Standard
AWA	Australian Water Association
AWTS	Aerated wastewater treatment system
BOD ₅	Biochemical oxygen demand (5-day test)
CaLP	Catchment and Land Protection Act
CDO	Council delegated officer
CFU	Colony forming units
DIR	Design irrigation rate
DELWP	Department of Environment, Land, Water and Planning
DLR	Design loading rate
DWMP	Domestic wastewater management plan
DSE	Department of Sustainability and Environment
EC	Electrical conductivity
EHO	Environmental health officer
EPA	Environment Protection Authority
EPAI	Environment Protection Agency, Ireland
ETA	Evapo-transpiration absorption (bed)
EVT	Evapo-transpiration
FOG	Fats, oils and grease
IWRG	Industrial Wastewater Resource Guidelines
LCA	Land capability assessment
LAA	Land application area
LPED	Low-pressure effluent distribution system
MAV	Municipal Association of Victoria
NA	Not allowed/Not applicable
PIA	Planning Institute of Australia
PIC	Plumbing Industry Commission
SAR	Sodium absorption ratio
SEPP (GoV):	State Environment Protection Policy (Groundwaters of Victoria)
SEPP (WoV)	State Environment Protection Policy (Waters of Victoria)
SS	Suspended solids
STED	Septic tank effluent drainage
STEG	Septic tank effluent gravity
STEP	Septic tank effluent pump
TDS	Total dissolved salts
TSS	Total suspended solids
UDT	Urine-diversion toilets
UV	Ultraviolet
VBA	Victorian Building Authority
WELS	Water Efficiency Labelling and Standards

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Executive Summary

Edwards Environmental was engaged by Caitlin Williams, to undertake an LCA for 426 Back Eildon Road Thornton 3712. The property is number 2431 in the local government area of Murrindindi Shire Council, and shown in Appendix 2 Location Map. The size of the property is approximately 358,741m² and it is zoned Farming Zone (FZ) under the State Planning Scheme.

The site contains an existing residential dwelling containing 5 bedrooms; this dwelling is serviced by a primary treatment system with absorption trenching, the system appeared in good working order.

The proposal is to utilise a pre-existing building as a function/ wedding venue with a maximum of 130 patrons per event, 8-12 times per year. The report presents the results of the LCA undertaken during spring, on 23/10/2023. The results indicate the function centre is capable of sustainable management of secondary treated wastewater on a <u>separate</u> secondary treatment system and balance tank with discharge to sub surface irrigation; using a land application area of 750 square meters.

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1 Introduction

1.1 Background

Edwards Environmental was engaged by Caitlin Williams, to undertake an LCA for 426 Back Eildon Road Thornton 3712. The property is number 2431 in the local government area of Murrindindi Shire Council, and shown in Appendix 2 Location Map. The size of the property is approximately 358,741m² and it is zoned Farming Zone (FZ) under the State Planning Scheme. The site contains an existing residential dwelling containing 5 bedrooms; this dwelling is serviced by a primary treatment system with absorption trenching, the system appeared in good working order. The proposal is to utilise a preexisting building as a function/ wedding venue with a maximum of 130 patrons per event, 8-12 times per year serviced on a separate treatment system. The results indicate the function centre is capable of sustainable management of secondary treated wastewater on a separate secondary treatment system and balance tank with discharge to sub surface irrigation; using a land application area of 750 square meters.

The Report assumes WELS-rated water-reduction fixtures and fittings - minimum 4 Stars for dual-flush toilets, shower flow restrictors, aerator taps, flow/pressure control valves and minimum 3 Stars for all appliances (EPA 891.4 July 2016 Table 4: Note 3). A detailed irrigation system design (i.e. sizing of pumps and pipework) is beyond the scope of this report. Detailed design for the irrigation system should be undertaken by a qualified professional and submitted for council approval.

1.2 Aims

Developments in areas without reticulated sewers require wastewater management to protect human health, amenity, resources and the environment. A Land Capability Assessment (LCA) is undertaken for high-risk sites and/or where the site is in a Declared Water Supply Catchment (refer to EPA 891.4 July 2016, p34 -36). The aims of the report are to:

- assess the capability of the site to sustainably manage wastewater within the allotment boundaries;
- quantify the wastewater volume and nutrient load due to the development;
- determine the effluent quality the treatment system must achieve having regard to site capability;
- design a land application area (LAA) and layout having regard to site capability;
- provide advice to the landowner/occupier to ensure safe on-site disposal of wastewater into the future.

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2 Method

Edwards Environmental follows best practice LCA methodology as per EPA 891.4: 2016. Soil samples are collected in accordance with Edwards Environmental Soil Sampling Procedures. Chain of custody forms are completed for all samples submitted to laboratories. Refer to Appendices for Sample Receipt Advice & Chain of Custody documentation.

The land capability assessment criteria are from the Victorian Land Capability

Assessment Framework, 2014 ('the framework') and based on AS/NZS 1547:2012. There are two broad sets of criteria: site features, and soil chemical/physical features. The levels of constraint (minor, moderate, major) are defined in the framework.

The quantity of wastewater and the organic loading due to the development is estimated from Table 4 of EPA 891.4 Code of practice – Onsite Wastewater Management (July 2016) based on information provided by the client (for example the number of occupants).

The level of wastewater treatment (primary, secondary, tertiary) is determined as a function of site constraints, soil constraints and offsite constraints such as sensitivity of the catchment, density of development in the catchment, location of surface waters and other considerations pertaining to long term acceptance rate (LTAR), such as Council's Domestic Wastewater Management Action Plan.

The method of land application (absorption, irrigation etc) is determined by effluent quality, site and soil constraints in an iterative process (refer to Selection of Land Application System: Appendix K of AS/NZS 1547:2012 On-Site Domestic Wastewater Management).

The Design Irrigation Rate or Design Loading Rate are determined based on indicative soil permeability (i.e. based primarily on soil structure characteristics, refer AS/NZS 1547:2012 On-Site domestic Wastewater Management Tables L1(p145) and M1(p160)). A conservative estimate of soil permeability is typically the cost-effective approach to design. The client's agreement is required prior to undertaking a soil permeability test as it incurs an additional fee.

The land application area for primary treated effluent systems is calculated from equation L1 (AS/NZS 1547:2012, p.144) and assumes that beds and trenches will be designed in accordance with Table L2 p146 AS/NZS 1547:2012 or the most current version of the Standard.

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The land application area for irrigation systems is calculated by the approved method Nominated Area Water Balance for Zero Storage (Victorian Land Capability Assessment Framework, 2014). The calculations use the following inputs:

- Volume of waste water due to the development
- Design irrigation rate
- Crop factor (based on grasses in Victoria)
- Rainfall runoff factor (function of soil type, slope, cut-off drains etc)
- Rainfall and evaporation data (meteorological station in proximity to site)

The following site details are provided in the report (or appendices to the report):

- a. Site address (lot number and street address)
- b. Title boundaries
- c. Council zoning and significance overlays
- d. Type of catchment (potable, special, declared)
- e. North direction
- f. Location, depth and specified use of groundwater bores in vicinity
- g. Contour lines at maximum 10m intervals, direction and degree of slope
- h. Location of soil sample sites (Bore holes BH) or profile pits
- i. Infrastructure and utilities (existing or proposed)
- j. Depth to groundwater in winter
- k. Site features and/or constraints (springs, floodplains, surface waters)
- I. Rock outcrops,
- m. Shallow bedrock, impervious layers
- n. Setback distance to surface waters
- o. Drainage lines and springs
- p. Flood potential
- q. Landslip or erosion potential
- r. Location of significant vegetation
- s. Relevant set back distances
- t. Proposed storm water drains and cut offs
- u. Actual and proposed buildings, paths, driveways, paddocks
- v. Actual and proposed infrastructure (drains, swimming pools, dams)
- w. Adjoining land use features/constraints
- x. Location of wastewater treatment plant (dimensions)
- y. Proposed land application area (LAA) with dimensions and off sets
- z. Duplicate LAA with dimensions and off sets

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3 Land Capability Assessment

3.1 Development Proposal & Hydraulic Load Estimates

The land capability assessment is for the treatment and disposal on-site of wastewater resulting from the proposed development of the land. The site contains an existing residential dwelling containing 5 bedrooms; this dwelling is serviced by a primary treatment system with absorption trenching, the system appeared in good working order and will not be altered during the development.

The proposal is to utilise a pre-existing building onsite as a function/ wedding venue. The proposal is to construct a toilet block to service patrons of the function centre. For the purposes of determining the design wastewater quantity for the toilet block, the hydraulic load from the existing 5-bedroom dwelling has been included in the maximum peak load for the single title.

The design wastewater quantity for the existing residential dwelling is estimated to be 1,080L/day (Table 1). The maximum allowable wastewater quantity for the function centre is calculated at 3,920 L/day. 5,000 L/day (max. per title) – 1,080 L/day (existing dwelling) = 3,920 L/day (function centre). The relationship between hydraulic load and number of patrons is taken from Table 4 of the EPA Code of practice – Onsite Wastewater Management (2016), 30L/person/day for restaurants/ function centres with >50 seats. A hydraulic load of 3,900L/day was determined based on a maximum capacity of 130 patrons.

TABLE 1: HYDRAULIC LOADING							
Source	Typical waste water load L/person/day						
Residential Dwelling: Households with standard water- reduction fixtures	180	5	1	1,080			
	Typical waste water load L/person/day No. of Patrons						
Function Centre	30 130		3,900L/day				
Total hydraulic load				4,980L/day			

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3.2 Site

3.2.1 Site Description

The site investigation was completed on the 23 October 2023 and the following notes were recorded:

- The weather had been dry over the past week
- The proposed effluent field is not impacted by stormwater run-on
- There is no evidence of a shallow water table
- Rock outcrops were not found on site

TABLE 2: SITE DETAILS					
Address	426 Back Eildon Road Th	nornton 3712			
Crown Description	1/ \TP862583				
Council Area	Murrindindi Shire Council	2431			
Allotment Size	358,741 m ²				
Planning Details (see Appe	ndix 1 Property Planning Rep	ort)			
Planning Zone	Farming Zone (FZ)				
Planning Overlays	Floodway Overlay (FO) Environmental Significance Overlay (ESO) Environmental Significance Overlay - Schedule 1				
Planning Overlays in the vicinity but not directly affecting the land	Bushfire Management Overlay (BMO) Heritage Overlay (HO)				
Infrastructure					
Domestic Water Supply	Yes □ Supplier:		No ⊠		
Design Wastewater Load	3,900L/day (function centre only)				
Availability of Sewer	Yes □ No ⊠				
Surface Waters					
Declared Water Supply Catchment?	Yes □		No ⊠		

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3.2.2 Site Risk Assessment

Characteristic	Level of Constraint					
Characteristic	Nil or Minor	Moderate	Major	Constraint for Site		
Declared Water Supply Catchment	No		Yes	MINOR		
Reticulated sewer available			No	MAJOR		
Aspect (affects solar radiation received)	North / North-East / North-West	East / West / South-East / South-West	South	MINOR		
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	MINOR		
Erosion (or potential for erosion)	Nil or minor	Moderate	Severe	MINOR		
Exposure to sun and wind	Full sun and/or high wind or minimal shading	Dappled light	Limited patches of light and little wind to heavily shaded all day	MINOR		
Fill (imported)	No fill or minimal fill, or fill is good quality topsoil	Moderate coverage and fill is good quality	Extensive poor quality fill and variable quality fill	MINOR		
Flood Frequency (ARI)	Less than 1 in 100 years	Between 100 and 20 years	More than 1 in 20 years	MINOR		
Groundwater bores	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)	MODERATE		
Land area available for LAA	Exceeds LAA and duplicate LAA and buffer distance requirements	Meets LAA and duplicate LAA and buffer distance requirements	Insufficient area for LAA	MINOR		
Landslip (or landslip potential)	Nil	Minor to moderate	High or Severe	MINOR		
Rock outcrops (% of surface)	<10%	10-20%	>20%	MINOR		
Slope Form (affects water shedding ability)	Convex or divergent side-slopes	Straight side-slopes	Concave or convergent side-slopes	MINOR		

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Cl 1 1 -	Level of Constraint							Assessed Level of
Characteristic	Nil or Minor	Moderate		Major		Constraint for Site		
Slope Gradient % for subsurface irrigation	<10%		10-30%		>30%		MINOR	
Soil Drainage (qualitative)	No visible signs or likelihood of dampness, even in wet season		Some signs or likelihood of dampness		standing water i	ture-loving plants, n pit; water ponding il pit fills with water	MINOR	
Stormwater run-on	Low likelihood of stormwo	ater run-on			High likelihood of inundation by stormwater run-on		MINOR	
Surface waters - setback distance (m)	Setback distance complies with requirements in EPA Code of Practice 891.3 (as amended)					Setback distance does not comp 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		Limite	ed variety of vegetation	1	Sparse vegetati	on or no vegetation	MINOR
Soil Drainage (Field Handbook definitions)	Rapidly drained. Water removed from soil rapidly in relation to supply, excess water flows downward rapidly. No horizon remains wet for more than a few hours after addition	Well draine removed fr soil readily, flows dowr Some horiz remain we several day addition	rom the excess nward. cons may t for	Moderately well drained. Water removed somewhat slowly in relation to supply, some horizons may remain wet for a week or more after addition	slow suppon wet	erfectly drained. ter removed very tly in relation to oly, seasonal iding, all horizons for periods of eral months, some ttling	Poorly/Very poorly drained. Water remains at or near the surface for most of the year, strong greying. All horizons wet for several months	MODERATE

Leaend:

Nil or Minor: If all constraints are minor, conventional/standard designs are generally satisfactory.

Moderate: For each moderate constraint an appropriate design modification over and above that of a standard design, should be outlined.

Major: Any major constraint might prove an impediment to successful on-site wastewater management, or alternatively will require in-depth investigation and incorporation of sophisticated mitigation measures in the design to permit compliant onsite wastewater management.

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3.3 Soil

3.3.1 Soil investigation

The complete set of analytical results is provided in Appendix 5. The site map illustrates the location of boreholes and or test pits – Appendix 2, and borelogs are presented in Appendix 4. A summary of the analytical results is presented below in Table 4.

TABLE 4 SOIL ANALYSIS RESULTS					
Analytes	Units	BH-01	BH-02		
рН	pH units	5.3	5.5		
EC@25°C	dS/m	0.007	0.006		
Exchangeable Calcium	mg/kg	420	349		
Exchangeable Magnesium	mg/kg	68	71		
Exchangeable Potassium	mg/kg	40	61		
Exchangeable Sodium	mg/kg	9	6		
CEC	MEQ%	2.8	2.5		
ESP	%	1.4	1.0		
Sodicity Rating		Non-Sodic	Non-Sodic		
SAR		0.02	0.02		
*Emerson Testing – 2 Hours		2,2	2,2		
*Emerson Testing – 20 Hours		2,2	2,2		

^{*}Emmerson testing conducted as air dried aggregates/remoulded ped.

The pH of the soils is considered slightly acidic with low salinity concentrations. The soils are non-sodic however prone to dispersion. The addition of gypsum will form natural aggregation of soil particles which will lead to good soil structure, and hence improved soil permeability refer to Appendix 10.

3.3.2 Soil Category/ Design Irrigation Rate (DIR)

Brown dry LOAMS followed by pale brown strongly structured LOAMS were observed in both boreholes. Soil lithologies taken during boreholes sampling have been attached refer to Appendix 4.

Soil Category: Strongly Structured Loams (3a)

Design Irrigation Rate: 4mm/day (taken from EPA Code 891.4 Appendix A: Table 9 3a Loams for subsurface irrigation)

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3.3.3 Soil Risk Assessment

Characteristic		Assessed Level of					
Characteristic	Nil or Minor	Moderate	Major	Constraint for Site			
Electrical Conductivity	<0.8	0.8 - 2	>2	MINOR			
(ECe) (dS/m) as a measure of soil salinity	EC test result infers the salinity of the soi (2007) for interpretation of EC test result D.P., Smolenaars, S. and Kelly, J. (200 Victoria.						
Emerson Aggregate Class	4, 5, 6, 8	7	1, 2, 3	MAJOR			
(consider in context of sodicity)		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).					
Gleying (see Munsell Soil Colour Chart)	Nil	Some evidence of greenish grey / black or bluish grey / black soil colours	Predominant greenish grey / black, bluish grey / black colours	MINOR			
Mottling (see Munsell Soil Colour Chart)	Very well to well-drained soils generally have uniform brownish or reddish colour	Moderately well to imperfectly drained soils have grey and/or yellow brown mottles and in the mottled areas occur higher in the profile the less well-drained the soil	Poorly drained soils have predominant grey colours with yellow brown or reddish-brown mottles located along root channels, large pores and cracks	MINOR			
		rration (permanent watertable), while c eriods of drying (perched or seasonal w	orange, yellow and red mottles indicate ratertable).				
pH (favoured range for plants)	5.5 - 8 is the optimum range for a wide range of plants; 4.5 - 5.5 suitable for many acid-loving plants		<4.5, >8	MINOR			
	additives (e.g. lime for acidity). pH <4		build be ameliorated by use of chemical se toxicity; pH>8 may reduce availability dment to lower sodicity.				

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a	Level of Constraint				
Characteristic	Nil or Minor	Moderate	Major	Constraint for Site	
Rock Fragments	0 – 10%	10 – 20 %	>20%	MINOR	
(size & volume %)	Coarse rock fragments displace soil vo	lume and therefore can limit assimilative	e capacity of soils.		
Sodicity	<6%	6 – 8%	>8%	MINOR	
(ESP %)	soil structure. Refer to Hazelton & Murph	ny (2007). Effluent and greywater containon-sodic soil but it depends on the ty	cles. ESP >6% may cause damage to the n sodium. A value of ESP = 6% is taken as pe of clay mineral in the soil. Soils with		
Soil Depth to Rock or	>1.5 m	1.5 – 1 m	<1 m	MINOR	
impermeable layer (m)	Deeper soils generally have a greater assimilative capacity for effluent (depending on soil type).				
Soil Structure (pedality)	Highly or Moderately structured	Weakly-structured	Structureless, Massive or hardpan	MINOR	
Soil Texture	Cat. 2b (1.4 - 3.0)	Cat. 4b (0.12 – 0.5)	Cat. 1 & 2a (>3.0)	MINOR	
	Cat. 3a (1.5 – 3.0)	Cat. 4c (0.06 – 0.12)	Cat. 5b & 5c (0.06 < 0.06)		
(Indicative Permeability (K _{sat})(m/d))	Cat. 3b (1.5 – 3.0) Cat. 4a (0.5 – 1.5)	Cat. 5a (0.12 – 0.5)	Cat. 6a, b, c (<0.06 - 0.06)		
	Rates in Table 9 of the EPA Code of Prostructure combination, but these may be	actice. Indicative permeability ranges t	ign Loading Rates and Design Irrigation nave been allotted to each texture and ors such as sodicity and dispersibility. Soil method outlined in AS/NZS 1547: 2012		
Watertable Depth	>2 m	2 – 1.5 m	<1.5 m	MINOR	
m) below the base of the The required soil depth to protect groundwater depends on soil type; high permeability soils generally require a greater separation distance (soil depth).					

Legend:

Nil or Minor: If all constraints are minor, conventional/standard designs are generally satisfactory.

Moderate: For each moderate constraint an appropriate design modification over and above that of a standard design, should be outlined.

Major: Any major constraint might prove an impediment to successful on-site wastewater management, or alternatively will require in-depth investigation and incorporation of sophisticated mitigation measures in the design to permit compliant onsite wastewater management.

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4 Design Response to Identified Constraints

The Major Constraints (from Tables 3 and 4) are summarised in Table 5 with the recommended controls to reduce the risks and/or mitigate the impacts. The controls are incorporated into the design of the treatment and land disposal systems, and the long-term management plan. Soil risk factors can be exacerbated by construction activities particularly if undertaken when the soil is wet. Construction traffic should be kept off the land application areas; trenching and installation should be carried out only when the soil moisture content is below field capacity (i.e. not saturated).

TABLE 5: MANAGEMENT TOOLS/OPTIONS – FOR MODERATE & MAJOR CONSTRAINTS		
Site/Soil Constraint	Management Tool/Option	
Sewer Availability	Wastewater proposed to be treated and disposed of on-site in a sustainable manner.	
Climate	Land application area based on AS/NZS 1547:2012 equation L1 (page 144)	
Surface Water	Treat effluent to a Secondary Standard (reducing the setback distance from 60m for primary systems to 30m for secondary systems).	
Dispersive Topsoil	To reduce surface crusting and promote establishment of grasses, application of gypsum or lime is recommended (see 'Use of Lime and Gypsum' in Appendix). Application of organic mulch around young plants to moderate fluctuations in soil moisture during summer. Choose low sodium detergents, soaps and washing powders. Maintain solar exposure of the LAA: large trees should NOT be planted where the shade will impinge on the LAA.	
Dispersive Sub-Soil /Emmerson Aggregate Class	Design trench depth to avoid exposing the dispersive sub-soil. Place gypsum at the rate of 1kg/square metre in the bottom of trenches prior to placement of aggregate. Supply additional gypsum to the soil surface at 5 – 10-year internals. See 'Use of Lime and Gypsum' in Appendix for more information.	
Water usage	A full water balance was undertaken. Occupiers need to monitor and, if necessary, adjust their water use as the land application area may not be large enough if the design water use is exceeded.	
Waste management and system monitoring	Follow the "Advice to home owner / occupier" provided in Section 6.	

Treating effluent to a secondary standard and discharge to sub surface absorption trenches will provide adequate protection of surface waters, groundwater and the surrounding environment.

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5 Wastewater treatment & discharge systems

A detailed irrigation system design (i.e. sizing of pumps and pipework) is beyond the scope of this report. Detailed design for the irrigation system should be undertaken by a qualified professional and submitted for council approval (see Appendices for an overview of the application process).

The following recommendations are in accordance with the Victorian Land Capability Assessment Framework (2013), EPA Publication 891.4 2016 and AS/NZS 1547:2012.

5.1 Wastewater Treatment System and Balance Tank

An <u>approved secondary treatment system</u> is recommended. The <u>secondary effluent</u> quality required is:

- BOD <20mg/L
- SS <30mg/L

A <u>balance tank</u> is also required to buffer peak loads observed during events. A balance tank is installed to provide sufficient capacity to store wastewater and slow/balance treatment times and wastewater discharge within the secondary treatment tank.

A 2,000L secondary treatment system with 10,000L of storage (within 1 or 2 balance tanks) is sufficient to treat the proposed peak load. The use of 10,000L of storage (within 1 or 2 balance tanks) provides more than two peak storage days (in the event of back-to-back weddings), reduces the BOD loading to fall within secondary treatment systems range and the balance tank provide flexibility in the event peak limits are exceeded (22% buffer during peak times).

The EPA website lists approved systems that are available for selection by the owner https://www.epa.vic.gov.au/your-environment/water/onsite-wastewater/onsite-wastewater-systems. 'EPA approved' secondary treatment systems are able to achieve the desired effluent quality when operated and maintained properly. The property owner has the responsibility to select an approved secondary treatment system (for tips on selecting a system see "Useful factors to consider when selecting ..." in appendices). Details of the selected system should be submitted for approval by Council using the application form: Septic Tank Permit to Install available from council websites (for an overview of the process see "Council Septic Tank Permit Application Process" in appendices).

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5.2 Effluent Discharge: Pressure Compensating Subsurface Irrigation.

<u>Description</u>: Subsurface irrigation comprises a network of drip-irrigation pipes especially designed for use with wastewater. The pipe incorporates pressure compensating emitters (drippers) that employ a biocide to prevent build-up of slimes and inhibit root penetration. The lateral pipes are usually installed at 0.6 to 1.0 m apart and laid parallel with the land contour. Installation depth is 100-150 mm (within the plant root-zone) in accordance with AS/NZS 1547:2012 Onsite Domestic Wastewater Management.

<u>Advantages</u>: subsurface irrigation provides even and widespread dispersal of the treated effluent within the root-zone of plants. The plants use up nutrients and transpire water.

It is critical that the irrigation pump be sized properly to ensure adequate pressure and delivery rate to the irrigation network.

5.3 Size of Land Application Area (effluent disposal field)

A 2,000L secondary treatment system with a minimum of 10,000L of storage (within 1 or 2 balance tanks) is sufficient to treat the proposed peak load. A maximum of 2,000L of waster will be treated and dispersed per day via subsurface irrigation.

Using the nominated area method, the LAA required to balance all inputs and outputs 750m² for the Hydraulic load and 664m² for the Nitrogen load is calculated. Therefore, the hydraulic capacity determines the minimum size of the effluent field. Copies of the water balance and nitrogen balance calculations are included in the Appendices.

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5.4 Buffer Distances and Maintenance Considerations

The Site Map (refer to Appendix 2) shows the dimensioned offset distances from the land application area (LAA). The location of the treatment plant and the LAA achieves the required buffer/setback distances to as per (EPA 891.4 July 2016 Table 5:) (a copy of "Setback Distances for Primary and Secondary Treatment Plants" is included in appendices). The effluent field must not be subject to high foot traffic. Vehicles and livestock must not have access to the area.

The effluent field must be planted with shallow rooting grasses and/or shrubs that tolerate wet conditions and have a high evapotranspiration capacity, see appendices for a list of plants that are suitable. The plantings should be harvested regularly as it will stimulate the evapotranspiration process, for example, regular mowing of grass species and regular pruning of hedges, rushes and shrubs. Clippings should be utilised or disposed of outside the LAA to minimise nutrient build-up.

All buffer distances are achieved.

5.5 Design and Installation of the Effluent System

The design of the septic system shall be completed by an irrigation specialist and constructed by a person registered or licensed with the Victorian Building Association in Plumbing (Drainage) works.

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6 Management Plan

6.1 Landowner/occupiers Responsibilities

The landowner or occupier has a responsibility to ensure proper operation, management, maintenance and reporting on the system operation. Table 6 summarises these responsibilities. Further guidance and clarification of these responsibilities are provided in Section 6.2 to 6.5 below. For the meaning of technical terms, please see the "Glossary" provided in appendices.

TABLE 6: MANAGEMENT RESPONSIBILITIES			
Task	Frequency		
Proper system operation	Daily		
Conservation of water	Daily		
Monitoring	Especially during and after wet weather		
Maintenance	As specified by systems manufacturer, and/or in Council Certificate and immediately in the case of malfunction.		
Reporting	As required by council or other authorities. Service records should be kept in a safe place and provided to Council upon request.		

6.2 Advice to home owner/occupier on use of the system

For the on-site wastewater system to work well, there are some good habits to encourage and some bad habits to avoid:

- a) In order to reduce sludge building up in the tank:
 - i. Scrape all dishes to remove fats, grease, etc before washing;
 - ii. Keep all possible solids out of the system;
 - iii. Don't use a garbage grinder unless the system has been specifically designed to carry the extra load;
 - iv. Don't put sanitary napkins and other hygiene products into the system.
- b) In order to keep the bacteria working in the tank and in the land-application area:
 - i. Use biodegradable soaps;
 - ii. Use a low-phosphorus detergent;
 - iii. Use a low-sodium detergent in dispersive soil areas;
 - iv. Use detergents only in the recommended quantities;
 - v. Don't use powerful bleaches, whiteners, nappy soakers, spot removers and disinfectants as it may kill the microorganisms;
 - vi. Don't put chemicals or paint down the drain.
- c) Conservation of water will reduce the volume of effluent requiring disposal to the landapplication area; help make the area last longer and improve its performance.

Conservation measures include:

- i. Installation of water-conservation fittings;
- ii. Taking showers instead of baths;
- iii. Only washing clothes when there is a full load;
- iv. Only using the dishwasher when there is full load.
- Avoid overloading the system by spacing out water use as evenly as possible.
 Examples: Do not do all the washing on one day. Do not run the washing machine and dishwasher at the same time.

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6.3 Advice on maintenance

- a) <u>Secondary Treatment Systems</u> must be managed in accordance with manufacturers specifications.
- b) All land-application areas need protection as follows:
 - Irrigation areas are not play areas for children and access should be restricted:
 - Any evapotranspiration areas should be designed to deter pedestrian traffic;
 - iii. No vehicles or stock should be allowed on trenches or beds;
 - iv. Deep rooting trees or shrubs should not be grown over absorption trenches or pipes;
 - v. The surface water diversion drains protecting the land-application area should be kept clear of weeds and tree seedlings so that rain water/storm water can drain away from the LAA;
 - vi. The baffles or valves in the distribution system should be periodically (monthly or seasonally) changed to direct effluent into alternative trenches or beds, as required by the design.
- c) Within LAA, grass and plants should be kept mown/trimmed to maximise uptake of water and nutrients by evapo-transpiration process. Dispose of clippings outside the LAA to minimise nutrient build-up in the soil.
- d) Check equipment and:
 - i. Follow the manufacturer's instructions for maintaining and cleaning pumps, siphons and tank filters;
 - ii. Clean disc filters or filter screens on irrigation-dosing equipment periodically by rinsing back into the wastewater-treatment unit;
 - iii. Flush drip irrigation lines periodically to scour out any accumulated sediment.

6.4 Advice on operating problems

Problems can occur with systems which have not been maintained and where the field has become blocked or clogged. The warning signs are obvious:

- Absorption field is wet or soggy with wastewater ponding on the surface of the ground.
- b) There is a smell of "sewage" near the septic tank or absorption area.
- c) The drains and toilets run slowly.
- d) The grease trap is full or blocked.

6.5 Advice on the consequences of failure

A failed treatment system and land-application system is a serious health and environmental hazard and can lead to:

- a) Spread of infectious diseases.
- b) Breeding of mosquitos and attraction of flies and rodents.
- c) Nuisance and unpleasantness
- d) Pollution and infection of waterways, beaches, streams and shellfish beds.
- e) Contamination of bores, wells and groundwater.
- f) Alteration of the local ecology.

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7 Conclusions

On completion of the site assessment the following conclusions have been made:

- Sewer is not available at the property
- The property is not located within a Declared Water Supply Catchment
- The hydraulic loading for the function centre has been determined at 3,900L/day Balance tank/s are required; a minium of 10,000L of storage is recommended. The proposal is to utilise a 2,000L secondary treatment system.
- The property has sufficient and suitable land for a Land Application Area
- A Land Application Area has been calculated at 750m²
- A reserve Land Application Area of 750m² has been designated
- All required buffer distances comply with the Code of Practice

From the Land Capability Assessment, it is concluded that sustainable on-site wastewater management is achievable by implementing management options as per Table 5 and the recommendations of this report (see following Section 8).

8 Recommendations

- I. Installation of a <u>Secondary treatment system with balance tank/s (minimum</u> 10,000L storage) with discharge to sub-surface irrigation;
- II. <u>Land application of treated effluent on not less than 750m² of sub-surface irrigation;</u>
- III. The design of the septic system shall be completed by an irrigation specialist and constructed by a person registered or licensed with the Victorian Building Association in Plumbing (Drainage) works.
- IV. Operation and management of the treatment and disposal system in accordance with manufacturer's recommendations, the EPA Certificate of Approval, EPA Publication 891.4 2016 and this report.

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9 References

TABLE 7: REFERENCES/BIBLIOGRAPHY

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AS/NZS 1546.2 – Waterless composting toilets

AS/NZS 1546.3 - Aerated wastewater treatment systems

AS/NZS 1546.4:2017 - Onsite domestic wastewater treatment units - part 3: secondary treatment systems

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Environment Protection Authority Victoria (1996), Code of Practice – Septic Tanks (Publication 451), Victorian Government, Melbourne

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Environment Protection Authority Victoria (2016), Code of Practice – Onsite Wastewater Management (Publication 891.4), Victorian Government, Melbourne

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Simon Gibbs (2000) Salinity Notes (ISSN 1 325-4448)

Soil Conservation Service NSW (1994) Soils - their properties and management, Sydney University Press

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10 Appendices

Appendix 1

Property Planning Report

as part of a planning process under the Planning and Environment Act 1987





From www.planning.vic.gov.au at 11 August 2023 07:52 AM

PROPERTY DETAILS

Address: **426 BACK EILDON ROAD THORNTON 3712**

Lot and Plan Number: Lot 1 TP862583 Standard Parcel Identifier (SPI): 1\TP862583

Local Government Area (Council): MURRINDINDI www.murrindindi.vic.gov.au

Council Property Number: 2431

Murrindindi Planning Scheme - Murrindindi Planning Scheme:

Vicroads 62 F6 Directory Reference:

UTILITIES STATE ELECTORATES

Rural Water Corporation: Goulburn-Murray Water Legislative Council: **NORTHERN VICTORIA**

Legislative Assembly: Urban Water Corporation: Goulburn Valley Water **EILDON**

Melbourne Water: Outside drainage boundary

Power Distributor: **AUSNET OTHER**

Registered Aboriginal Party: Taungurung Land and Waters

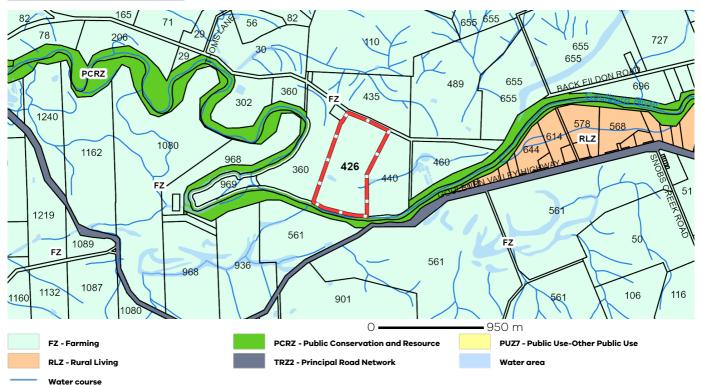
Council Aboriginal Corporation

Planning Zones

View location in VicPlan

FARMING ZONE (FZ)

SCHEDULE TO THE FARMING ZONE (FZ)



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

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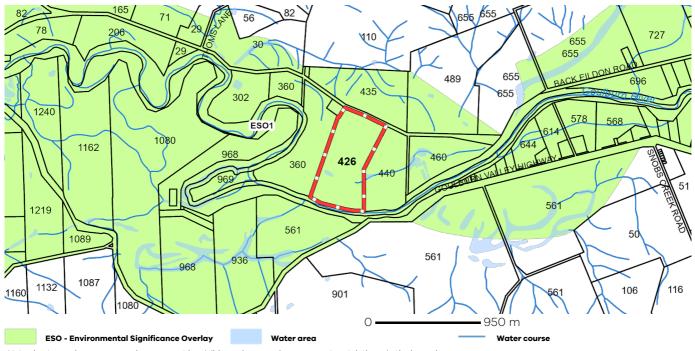
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Planning Overlays

ENVIRONMENTAL SIGNIFICANCE OVERLAY (ESO)

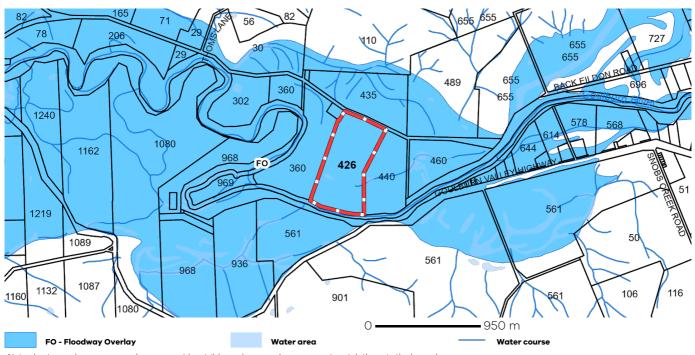
ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1 (ESO1)



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

FLOODWAY OVERLAY (FO)

FLOODWAY OVERLAY SCHEDULE (FO)



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

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Planning Overlays

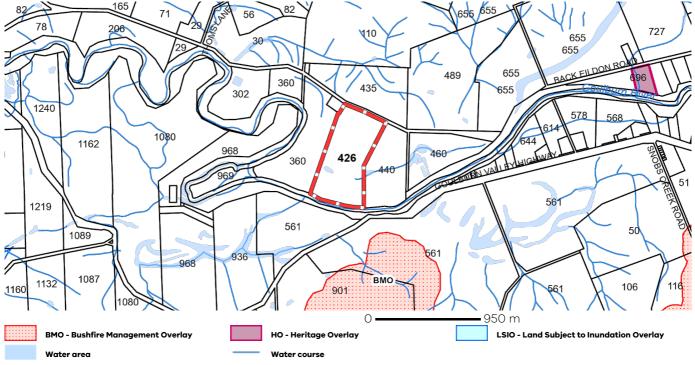
OTHER OVERLAYS

Other overlays in the vicinity not directly affecting this land

BUSHFIRE MANAGEMENT OVERLAY (BMO)

HERITAGE OVERLAY (HO)

LAND SUBJECT TO INUNDATION OVERLAY (LSIO)



Note: due to overlaps, some overlays may not be visible, and some colours 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 2018, and include registered Aboriginal cultural heritage places and land form types that are generally regarded as more likely to contain Aboriginal cultural heritage.

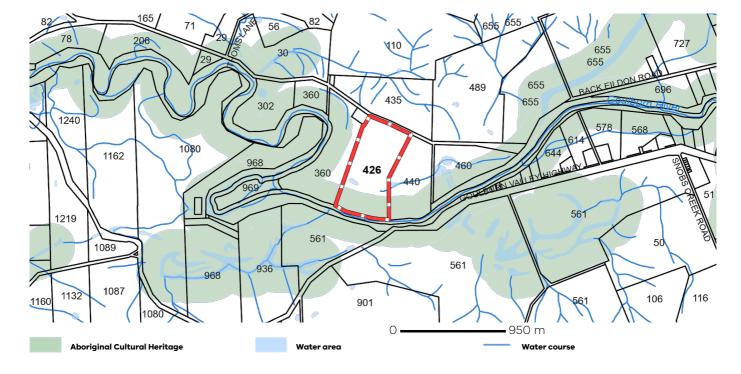
Under the Aboriginal Heritage Regulations 2018, 'areas of cultural heritage sensitivity' are one part of a two part trigger which require a 'cultural heritage management plan' be prepared where a listed 'high impact activity' is proposed.

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 reauirement.

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 2018, can also be found here - https://www.aboriginalvictoria.vic.gov.au/aboriginal-heritage-legislation



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Further Planning Information

Planning scheme data last updated on 7 August 2023.

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

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

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

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

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

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Notwithstanding this disclaimer, a vendor may rely on the information in this report for the purpose of a statement that land is in a bushfire prone area as required by section 32C (b) of the Sale of Land 1962 (Vic).

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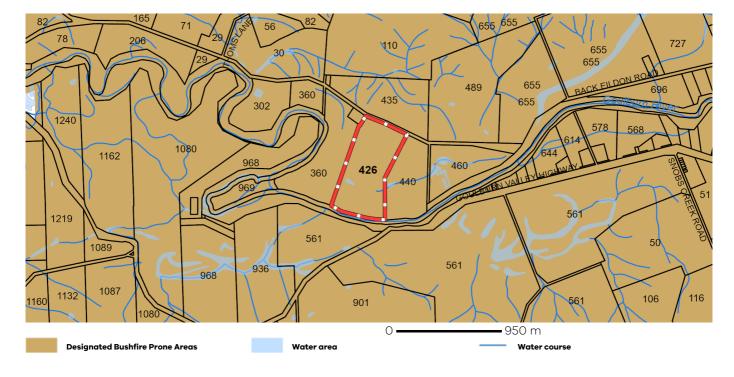


Designated Bushfire Prone Areas

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

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

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



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

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

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

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

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

Native Vegetation

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

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

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

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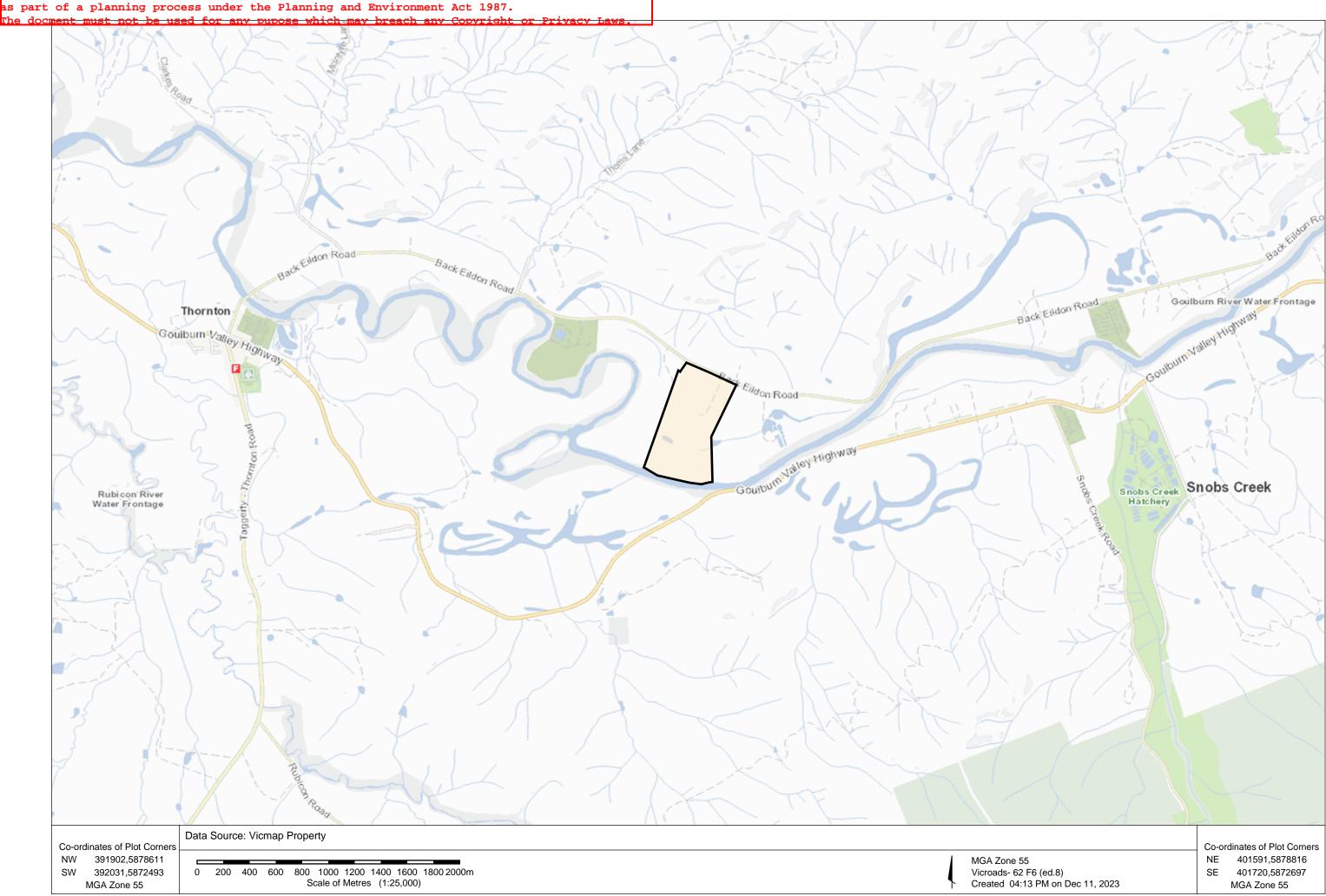
PLANNING PROPERTY REPORT: 426 BACK EILDON ROAD THORNTON 3712

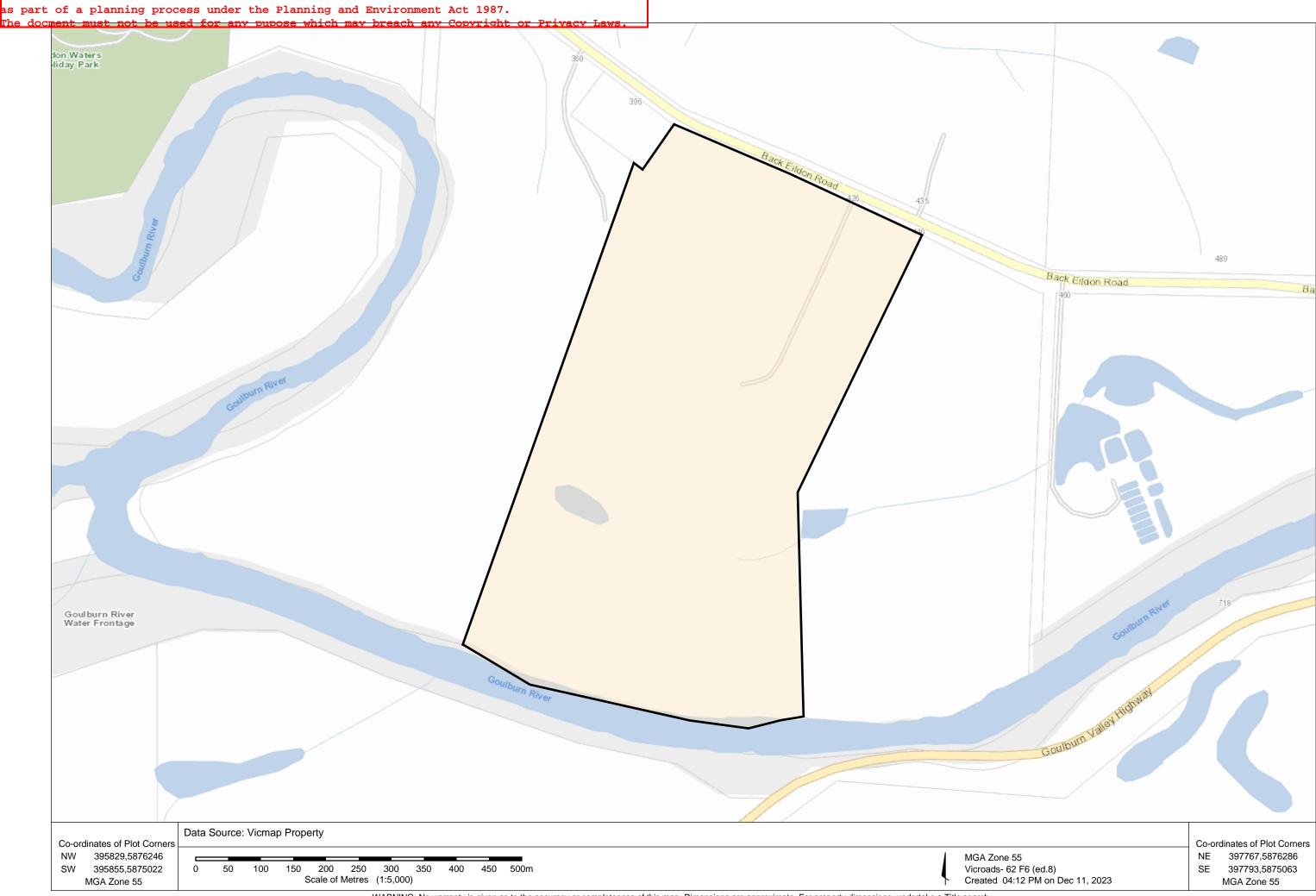
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Appendix 2

Site Location Maps & Site Map





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This copied document is made available for the sole purpose of enabling its consideration and as part of a planning process under the Planning and Environment Act 1987. EXISTING ABSORPTION TRENCH (APPROX) SERVICING DWELLING FUNCTION CENTRE -3M SETBACK FROM **EXISTING DWELLING** 20m PROPOSED SECONDARY TREATMENT BH01 ~110m -25m LAA 625m² 25m BH02 40.5m RAISED ARBOR 1.5m SETBACK APPLIES 60m PROPOSED
PRIMARY
TREATMENT LAA 875m² 30m 3mSOURCE: LASSI Drawing Title: Client: KEY: GENERAL NOTES: SITE MAP WATERWAY / DAM PARCEL BOUNDARY PROPOSED LAA -THE AERIAL MAP IS PROVIDED FOR ILLUSTRATIVE PURPOSE AND MAY NOT REFLECT CURRENT SITE CONDITIONS Drawn: LC Project - Drawing No. Project: #913 LCA

-BOUNDARIES, DIMENSIONS AND AREA SHOWN ON THIS PLAN ARE APPROXIMATE ONLY AND SUBJECT TO SURVEY edwards

11 MATCHETT DRIVE STRATHDALE, VICTORIA, 3550.

(03) 5406 0522 admin@edwardsenvironmental.com.au

environmental

Location:

THORNTON

VICTORIA

426 BACK-EILDON,

#913 - 12/23

Figure No. 1 Rev. A

Date: 11-12-2023

CONTOUR

LINE

INFRASTRUCTURE

REVISION

BOREHOLE

SAMPLE LOCATION

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Appendix 3

Site Photographs



1. Proposed Effluent Field – facing north-east



2. Proposed Effluent Field – facing north

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3. Proposed Effluent Field – facing west



4. Proposed Effluent Field – facing west

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5. Soil Sampling – BH01



6. Soil Sampling – BH02

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Appendix 4

Soil Bore Logs

SOIL BOI	RE LOG				FIELD ID: BH01	
Client:					Logged by	Luke Collins
Location	1: 426 E	Back Eildo	n Road, Th	nornton	Drilling Method:	Direct Push
Date:	24 O	ctober 20	23		Bore Diameter:	40mm
Notes:	Refe	r to Appe	ndix 2 Site	Map for Borehol		
Depth (m)	Sample	Moffles	Coarse Fragments		Description: Structure &	Colour Moisture
				LOAMS Brown strongly str dry LOAMS	ructured	
0.25	X	No	No	pale brown strongly structure slightly moist	d	
0.5						
0.75						
1.0						
1.25						
1.50						

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SOIL BOI	RE LOG				FIELD ID: BH02	
Client:					Logged by	Luke Collins
Location	1: 426 E	Back Eildo	n Road, Th	nornton	Drilling Method:	Direct Push
Date:	24 O	ctober 20	23		Bore Diameter:	40mm
Notes:	Refe	r to Appe	ndix 2 Site	Map for Borehol	e Locations	
Depth (m)	Sample	Moffles	Coarse Fragments		Description: Structure &	Colour Moisture
				LOAMS		
				Brown strongly str	ructured	
				dry		
				LOAMS		
0.25	Х	No	No	pale brown		
				strongly structure	d	
				slightly moist		
0.5						
0.5						
0.75						
1.0						
		<u> </u>				
1.25						
1.50						
1.50						

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Appendix 5

Chain of Custody,

Sample Receipt Advice,

Nata Laboratory Results

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Groundswell laboratories

" A New Force in Analytical Testing"

CERTIFICATE OF ANALYSIS

Client Name: Edwards Environmental

Client Address: 11 Matchett Drive, East Bendigo VIC

Client Phone #:

0413 066 065 Client Mobile #: Project Manager: Dean Edwards

E-mail: reports@edwardsenvironmental.com.au

Project Sample Manager: Luke Collins

E-mail: admin@edwardsenvironmental.com.au

Groundswell Batch #: Project Name:

GS23815 Thornton LCA LCA Suite

Project #: 26/10/2023 Date Samples Received: Sample Matrix: Soil

Sample # Submitted: 2

Groundswell Quote #: Not Applicable Date CofA Issued: 8/11/2023

Paul Woodward Managing Director paul@groundswelllabs.com.au

Reference AF56.Rev4 Date Issued: 19/5/2014

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Soil Analysis Results

Client Sample ID			BH01-Thorn	BH02-Thorn		
Laboratory Sample Number			GS23815-1	GS23815-2		
Date Sampled			23/10/2023	23/10/2023		
Analytes	Units	LOR				
рН	pH Units	0.1	5.3	5.5		
Electrical Conductivity @ 25°C	dS/m	0.005	0.007	0.006		
Exchangeable Calcium	mg/Kg	1	420	349		
Exchangeable Magnesium	mg/Kg	1	68	71		
Exchangeable Potassium	mg/Kg	1	40	61		
Exchangeable Sodium	mg/Kg	1	9	6		
CEC	MEQ%	0.1	2.8	2.5		
ESP	%	0.1	1.4	1.0		
Sodicity Rating			Non-Sodic	Non-Sodic		
SAR		0.01	0.02	0.02		

Reference AF56.Rev4 Date Issued: 19/5/2014

Comments:

- 1- pH & electrical conductivity determined & reported on a 1:5 soil:water extraction
- 2- CEC determined by soil chemical method 15B1 'Exchangeable bases and cation exchange capacity 1M amonium chloride at pH 7.0, no pre-treatment for soluble salts'
- 3- ESP, sodicity rating & SAR determined by calculation using the exchangeable cation results
- 4- Measurement Uncertainty available upon request

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Soil Analysis Results

Client Sample ID			BH01-Thorn	BH01-Thorn	BH02-Thorn	BH02-Thorn
Laboratory Sample Number			GS23815-1	GS23815-1	GS23815-2	GS23815-2
Date Sampled			23/10/2023	23/10/2023	23/10/2023	23/10/2023
Analytes	Units	LOR				
Sample Type			Air Dried Aggregates	Re-moulded Ped	Air Dried Aggregates	Re-moulded Ped
Emerson Aggregate Class - 2 Hours			Slaking / Some Dispersion	Slaking / Some Dispersion	Slaking / Some Dispersion	Slaking / Some Dispersion
Emerson Class Number			Class 2	Class 2	Class 2	Class 2
Emerson Aggregate Class - 20 Hours			Slaking / Some Dispersion	Slaking / Some Dispersion	Slaking / Some Dispersion	Slaking / Some Dispersion
Emerson Class Number			Class 2	Class 2	Class 2	Class 2
Addition of 1M HCl						
1:5 Soil:Water 10 minute extraction						
Emerson Class Number			 Reference A	 F56.Rev4 Date Issued : 19/5/2014		

Comments:

1- Classification conducted in accordance with Emmerson 'A classification of soil aggregates based on their coherence in water', 1967 & AS1289.C8.1-1980

as part offoundpred Bathy: 652385ss under the Planning and Environment Act 1987.

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Inorganics Quality Control Report

Client Sample ID							
Laboratory Sample Number	•						
			Metho	od Blank	Labo	oratory Control Stand	ard (LCS)
			Method Blank	Within GSL Acceptance Criteria (<lor) (Pass/Fail)</lor) 	LCS (%R)	LCS (%R) Acceptance Criteria	Within GSL Acceptance Criteria (Pass/Fail)
Analyte	Units	LOR					
рН	pH units	0.1	NA	NA	4.09	4.00 ± 0.1 pH Unit	Pass
Conductivity	dS/m	0.005	<0.005	Pass	102%	80-120%	Pass
Exchangeable Calcium	mg/Kg	1	<1	Pass	107%	70-130%	Pass
Exchangeable Magnesium	mg/Kg	1	<1	Pass	95%	70-130%	Pass
Exchangeable Potassium	mg/Kg	1	<1	Pass	105%	70-130%	Pass
Exchangeable Sodium	mg/Kg	1	<1	Pass	80%	70-130%	Pass
CEC	MEQ%	0.1	NA	NA	NA	NA	NA
ESP	%	0.1	NA	NA	NA	NA	NA
SAR		0.01	NA	NA	NA	NA	NA

Reference AF56.Rev4 Date Issued: 3/11/2010

Comments:

- 1- Exchangeable cations LCS values based on independent water standards
- 2- NA = Not Applicable

The docment must not be used for any supe

review

as part of age 1 affiling process under the Planning and Envi GHAINt OF CUSTODY

Refer	en	ce	:	AF	06	.R	ev

COC Reference :

Date Issued: 11/3/2011

Groundswell laboratories	CLIENT / PROJECT DETA	ILS	Groundswell Quote #:
NATA Accreditation # 17067	Company Name : EDWARDS ENVIRONMENTAL		Ph : 0429594020
116 Moray Street	Company Address : 11 Matchett Drive, East Ber	ndigo Vic	Fax :
SOUTH MELBOURNE VIC 3205	Project Manager : Luke Collins	Contact E-mail: a	dmin@edwardsenvironmental.com
Ph (03) 8669 1450	Project Name: THORN TON LCA.	Project Number :	
Fax (03) 8669 1451	Project Sample Manager : Luke Collins		Mobile : 0429594020
e-mail : admin@groundswelllabs.com.au	TAT: 1day / 2 days / .7days / Date Required:	Report	Format :

Lab ID	Sample ID	Sample	S	San	ple	T	T	/ola	atil	e C	rg	anic	:	Ser	ni-	Vol	atil	e .	M	eta	ls*	V.			C)th	er A	na	yte	8				С	omi	nen	ıts	
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Date / Time: 26/10/23 Date / Time: 24八0 adward 11.15an Relinquished By : Luke Collins Received By: Received By: Relinquished By : Date / Time : Date / Time :

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Appendix 6

Irrigation Sizing Calculations

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Victorian Land Capability Assessment Framework

Please read the attached notes bef		•														
ation area siz	<u>ing ι</u>	<u>using N</u>	<u>omin</u>	<u>ated</u>	<u> Area V</u>	<u>Vater</u>	Bala	nce	for Z	<u>ero S</u>	tora	<u>ge</u>				
te Address:					426	Back E	Eildon l	Road,	Thornt	ton Vic	toria					
Date:	11th	December	r 2023		Assess	or:		LC								
INPUT DATA																
Design Wastewater Flow	Q	2,000	L/day	Based on	maximum pot	tential occı	upancy and	d derived t	from Table	4 in the E	PA Code	of Practic	e (2013)			
Design Irrigation Rate	DIR	4.0	mm/day	Based on	soil texture cl	ass/perme	ability and	derived fr	om Table	9 in the El	PA Code o	of Practice	(2013)			
Nominated Land Application Area	L	750	m ²	1												
Crop Factor	С	0.6-0.8	unitless	Estimates	s evapotranspi	iration as a	fraction of	f pan evar	oration: v	aries with	season ar	nd crop tvi	oe ²			
Rainfall Runoff Factor	RF	0.9	untiless	4	n of rainfall tha							' ''				
Mean Monthly Rainfall Data	Eildo	n Fire Tower (0	88164)	- '	ion and numbe				, 3	,						
Mean Monthly Pan Evaporation Data	Spring C	reek Basin Two	(088153)	BoM Stati	ion and numbe	er										
Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D	Tomala	days	31	28	31	30	31	30	31	31	30	31	30	31	365
Rainfall	R		mm/month	43.2	38.2	41.6	50.9	55	69.1	65.5	75.1	63.4	57.7	58.5	50.6	668.8
Evaporation	E		mm/month	214.1	189	145	78	48.7	31.8	37.7	51.9	69.8	103.1	141.3	194	1304.4
Crop Factor OUTPUTS	С		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	
	ET	ExC	mm/month	171	151	102	55	29	19	23	31	49	82	113	155	980.22
Evapotranspiration Percolation	В	DIRxD	mm/month	124.0	112	124.0	120.0	124.0	120.0	124.0	124.0	120.0	124.0	120.0	124.0	1460.0
Outputs		ET+B	mm/month	295.3	263.2	225.5	174.6	153.2	139.1	146.6	155.1	168.9	206.5	233.0	279.2	2440.2
INPUTS																
Retained Rainfall	RR	RxRF	mm/month	36.72	32.47	35.36	43.265	46.75	58.735	55.675	63.835	53.89	49.045	49.725	43.01	568.48
Applied Effluent	W	(QxD)/L	mm/month	82.7	74.7	82.7	80.0	82.7	80.0	82.7	82.7	80.0	82.7	80.0	82.7	973.3
Inputs		RR+W	mm/month	119.4	107.1	118.0	123.3	129.4	138.7	138.3	146.5	133.9	131.7	129.7	125.7	1541.8
TORAGE CALCULATION																
s month		(RR+W)-(ET+B)	mm/month	0.0 -175.9	0.0 -156.1	0.0 -107.5	0.0 -51.3	0.0 -23.8	0.0 -0.3	0.0 -8.3	0.0 -8.6	0.0 -35.0	0.0 -74.8	0.0 -103.3	0.0 -153.5	
		(1(1(+1))-([[1+]])	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	
				0.00												
	V	NxL	L	0												
AREA REQUIRED FOR	ZERO S	TORAGE	m ²	240	243	326	457	582	747	682	679	522	394	327	263	
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				747.0	m ²											
 																
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should be the largest of t	ho followin	ag: land applica	tion area r	oguired ha	sad on the ma	et limitina	nutrient ha	lance or a	ninimum a	roo roouis	od for zora	o etoroge				
should be the largest of t		•	uon area re	equired bas	seu on me mo	ost iirriitiing	nullieni Da	nance of f	illillillillillillillillillillillillill	rea require	eu ioi zero	siorage				
Values selected are suitable for pas	ture grass	in Victoria														

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Please read the attached notes be		ng this spre	adsheet						
<u>Nitrogen Balance</u>	2								
Site Address:	426 B	ack Eild	on Roa	nd, Thornton Vi	ctoria				
SUMMARY - LAND APPLICA	TION AF	REA REQU	JIRED BA	SED NITROGEN BA	LANCE			664	m ²
INPUT DATA ¹									
astewater	Loading				N	lutrient Crop	Jptake		
				Crop N Uptake	220	kg/ha/yr	which equals	60.27	mg/m²/day
ion		25	mg/L			, - ,			, ,
oil Processes (Geary & Gardn	er 1996)	0.2	Decimal						
Soil		10000	mg/day						
d after soil loss		40000	mg/day						
Minimum Area required with zero	buffer 664	m ²	Nominated L	on of Buffer Zone Size for a AA Size ffer Required for excess nutric		750 -1.90	m ² kg/year m ²		
put paramete d from a reliable s nes for Effluent Irrigati iate Peer Reviewed Paper	XX XX ers will affo ource suc	Data in yello	re automation cells is c	ue cells cally populated by the special calculated by the spreads result obtained. Where	sheet, DO	NOT ALTE			nerwise data

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Appendix 7

Glossary

Term	ource: EPA 891.4, July 2016) Meaning
Absorption trench system	The area of land utilised for the disposal of partially treated sewage to ground via a soi absorption trench. The base of the trench is typically dug 400 mm below the ground surface. The trench is built or filled in to a height of 250 mm and then a layer of 150 mm of native soil is backfilled on top to bring the soil up to the original ground level. The trench location and design will include setback distances from existing and proposed buildings, patios, drains, driveways fences etc.
Aerobic	Organisms and processes that require oxygen (i.e. microbiological digestion and assimilation organic matter by using oxygen).
Anaerobic	Living or occurring without oxygen (i.e. microbiological digestion and assimilation of organic matter in the absence of oxygen).
Biochemical Oxygen Demand (BOD5)	The amount of oxygen consumed by chemical processes and micro-organisms to break down organic matter in water over a 5-day period, measured in milligrams per litre (mg/L).
Blackwater	Wastewater from toilets containing faeces and urine.
Declared Water Supply Protection Area	Applicable to groundwater as defined in section 27 of the Water Act (as amended).
Design Loading Rate	The long-term acceptance rate (LTAR) expressed in Litres/m²/day or mm/day as applied to a land-application area.
Desludging (pump-out)	The removal of biological sludge and inert sediment from a septic tank, including the surface crust (scum) material. A pump-out should not drain tanks dry, because some residual sewage is needed to provide a seed source of digesting microorganisms.
Dispersal field	The distribution of treated effluent through the biologically-active topsoil layer.
Disposal field	The area of land utilised for the disposal of partially treated sewage to ground via a soil absorption trench
Drinking water	Water suitable for human consumption or for purposes connected with human consumption such as preparation of food or making ice for consumption or for the preservation of unpackaged food.
E. coli	Escherichia coli: a species of bacteria in the faecal coliform group found in large numbers in the intestines of animals and humans. Its presence in freshwater indicates recent faeca contamination and is measured in 'colony-forming units' (cfu) per 100 mL of water.
Evapo-transpiration	Transfer of water from the soil to the atmosphere through evaporation and plant transpiration.
Greywater	Domestic wastewater from sources other than the toilet, urinal or bidet (e.g. from showers baths, spas, hand basins, clothes washing machines, laundry troughs, dishwashers and kitcher sinks).
Groundwater	All underground water contained in the void spaces within and between the rocks and soil excluding water travelling between the ground surface and the water table (Oxford Dictionary of Earth Sciences).
Infiltration	The gradual movement of water into the pore spaces between soil particles.
Irrigation	The artificial supply of water to land and vegetation.
LPED irrigation	Shallow sub-surface irrigation of primary or secondary effluent into high quality loamy topsoi through low pressure effluent distribution (LPED) lines. The pressurised line is a twin construction consisting of a perforated pipe with drilled squirt holes inside a rigid slotted PVC pipe or aggie pipe.
Micro-organism	An organism that is invisible or barely visible to the unaided eye (e.g. bacteria, viruses protozoa).
Nutrients	Organic and inorganic substances used in an organism's metabolism which must be taken in from the environment (e.g. carbohydrates, fats, such as proteins and vitamins). Nutrients are molecules that include elements such as carbon, nitrogen, phosphorus, potassium, calcium, magnesium and a range of trace elements.
Onsite wastewater management system	Onsite wastewater management system. It is the same as a 'septic tank system' as defined in the Environment Protection Act,1970. It includes an onsite wastewater treatment system (primary or secondary standard) plus the subsequent disposal/recycling system.

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SELECTED GLOSSARY (So	ource: EPA 891.4, July 2016)
Term	Meaning
Onsite wastewater treatment system	A treatment system that treats up to 5,000 L/day of wastewater on the allotment where it was generated
Pathogen	A disease-causing micro-organism.
Permeability	The ability of water to move, through soil which depends upon the soil particle sizes, pore space sizes, soil texture, soil structure and water content.
Pollution	Any harmful or undesirable change in the physical, chemical or biological quality of air, water or soil as a result of the release of chemicals, heat, radioactivity or organic matter.
Potable water supply catchment	An area declared as a Special Water Supply Catchment under Schedule 5 of the Catchment and Land Protection Act 1994 and used as a source of drinking water by a Water Corporations.
Primary treatment of wastewater	The physical processes of screening, filtration, sedimentation, flocculation and flotation to remove organic and inorganic matter from wastewater.
Recycling	Using treated wastewater for an appropriate use (e.g. 10/10/10 greywater used for toilet flushing or 20/30 effluent used for sub-surface irrigation).
Reserve area	A duplicate land disposal area reserved for use when the original land disposal area needs to be rested.
Reuse	Using a waste product in its present form for another purpose, e.g. diverting (reusing) untreated greywater to water the garden.
SAR	see Sodium Adsorption Ratio.
Scum	Material that floats on top of the liquid in an anaerobic sewage treatment tank (i.e. septic tank).
Septic tank	A tank that temporarily holds wastewater. In a septic tank, wastewater is primarily treated through filtration, sedimentation, flocculation and flotation to remove organic and inorganic matter from wastewater in combination with anaerobic microbiological digestion.
Sewage	As defined within the Environment Protection Act 1970 (section 53J) "means any waste containing human excreta or domestic wastewater".
Sludge	The material that rests on the bottom of a septic tank. It can include inert matter (such as sand, glass and plastics) and biosolids (organic material produced by biological processes).
Soil Absorption Trench	An infiltration or soak-away trench installed generally at a depth of 300 to 600 mm below ground level, which facilitates the disposal of primary treated sewage.
Special Water Supply Catchment	One of the areas listed in Schedule 5 of the Catchment and Land Protection Act 1994.
STEP/STEG	Septic Tank Effluent Pump/Septic Tank Effluent Gravity: an effluent sewer system utilising both gravity and pumps to discharge effluent from septic tanks to a reticulated sewer system.
Sullage	Household greywater that does not contain human excreta, but may still contain pathogens, nutrients and potentially harmful chemicals.
Suspended solids (SS)	A measure of the solids in water, expressed in milligrams per litre (mg/L).
Sustainable	Able to continue indefinitely without any significant negative impact on the environment or its inhabitants.
Treatment	A process or series of processes that remove contaminants from wastewater, whereby the physical, chemical and biological characteristics of wastewater are altered.
Topsoil	The top layer of the soil, typically containing plant roots, organic material and an active microbiological ecosystem, which is usually more fertile than the underlying layers.
Total suspended solids (TSS)	A measure of the solids in water, expresses in milligrams per litre (mg/L).
Turbidity	The cloudy appearance of water that is an indication of fine solids suspended in the water, measured by a light penetration test and expressed in nephelometric turbidity units (NTU).
Unsewered area	Land where no sewer pipes are adjacent to the allotment boundaries.
Urine-diversion toilet (UDT)	A toilet bowl designed to separate urine from solid excrement. The UDT may be attached to a dry composting toilet chamber or a water-flush blackwater treatment system or sewer system. A 'dam' wall, which extends between the two side of the toilet bowl, creates a front and back well from which the excrement drains or is flushed away.
Watertable	The upper surface of groundwater or the level below which an unconfined aquifer is permanently saturated with water.
Waterway	As defined by the Water Act 1989 (as amended):
WELS	Water Efficiency Labelling and Standards scheme www.waterrating.gov.au

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Appendix 8

EPA 891.4 – Application Process

Factors to Consider

Set back Distances

Soil Categories and Recommended Maximum Design
Loading/Irrigation Rates (DLR/DIR) for Land Irrigation Systems

Septic tanks

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COUNCIL SEPTIC TANK PERMIT APPLICATION PROCESS

(Source: EPA Code of Practice – Onsite Wastewater Management (Appendix B))

Overview of the main steps in applying for a Council Septic Tank Permit:

- 1. The property owner contacts the local <u>Council Planning Department</u> to determine whether a Planning Permit is required or whether planning conditions apply.
- The property owner contacts the local Council Environmental Health Unit to collect a Septic Tank
 Permit application form, to determine which documents are required to accompany the
 application form and what level of detail is required for the land capability assessment (if
 applicable).
- 3. The property owner engages a land capability assessor, wastewater consultant and/or plumber to carry out the required investigations and write a report which will include maps and plans.
- 4. The property owner applies for their **Planning Permit**.
- 5. The property owner engages a land capability assessor (where applicable) to undertake the land capability assessment (LCA) and create a report for Council. The completed Septic Tank Permit, LCA report, any other required documents and the prescribed fee can be submitted to the Environmental Health Unit by the owner, builder or plumber.
- 6. The Planning Department refers the Planning Permit application to the relevant Water Corporations, the Environmental Health Unit and other agencies as required under the Planning and Environment Act.
- 7. Where the Planning Permit application is satisfactory the Planning Department issues the property owner with a Planning Permit, with the condition that the property owner must apply for a Septic Tank Permit.
- 8. The Planning Permit and LCA report are attached to the Septic Tank Permit application to ensure that all conditions on the Planning Permit are included in the Septic Tank Permit.
- 9. When the Environmental Health Unit is satisfied the application meets all requirements it issues a Septic Tank Permit to Install or Septic Tank Permit to Alter.
- 10. When the treatment system and indoor recycling and/or land application system are installed but not buried, the installer contacts Council to arrange an inspection of the installation.
- 11. When the Council Environmental Health Unit has received:
- a. the **Plumbing Compliance Certificate**
- b. the 'As Laid Plan', and
- c. the commissioning form from the plumber and is satisfied the system is installed correctly in accordance with the manufacturer's Installation Manual and the Council Permit to Install/Alter, Council issues a Certificate to Use to the property owner.

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USEFUL FACTORS TO CONSIDER WHEN SELECTING AN EPA-APPROVED ONSITE WASTEWATER TREATMENT SYSTEM

(Source: EPA Code of Practice – Onsite Wastewater Management (Appendix C))

Physical features

Dimensions of the treatment plant

Location of treatment unit – above-ground or below-ground

Number and power of pumps, aerators and other electrical components

Size of effluent storage tank

Type of treatment processes

Type of disinfection used if applicable

Chemicals used

Capital and installation costs

Council Permits - e.g. Permit to Install, Permit to Alter and Certificate to Use

Capital and delivery charge for the treatment system components including the septic tank, sump and sump pump (if applicable) and effluent storage tank

Cost of manoeuvring the treatment unit into the back yard (i.e. is vehicular access or is a crane required or can it be carried by several people?)

Cost of digging the hole and removing the debris (if applicable)

Concrete pad (if required)

Cost of electrician's work to lay power cords to connect the treatment plant to the house, including a dedicated weather-proof power point and any modifications required to the switch board)

For greywater systems – cost of internal plumbing for toilet flushing, washing machine, backflow prevention device and automatic diversion valve to sewer

Cost of the plumber/drainer digging trenches and laying pipes to connect the treatment system to the house

Cost of land application/irrigation system including ancillary equipment (e.g. effluent pump, disc or mesh filter, vacuum breakers, scour valves, soil moisture sensors or rain gauges)

Cost of the audio-visual alarm system and/or remote monitoring system

Performance

Minimum and maximum daily volumes that can be effectively treated

Effluent quality (primary, secondary 10/10/10, 10/10, 20/30/10 or 20/30)

Commissioning time to achieve approved effluent quality

Total pump run time per day

How does the system cope with:

large shock loads or surge flows?

toxic substances like bleach, oil, paint thinners etc.?

24-hour power failure? 72-hour power failure?

being switched off for 1 week, 1 month, 3 months?

no inflow for 1 week, 1 month, 3 months?

kWh of electricity per kilogram of BOD removed

Estimated lifetime of the treatment systems and its component parts

Sustainability features of the treatment system

Maintenance

Desludging frequency or what is the fate of the biosolids?

Number of service visits per year

Number of hours of maintenance per year

Expected maintenance tasks during each service call

Qualifications and training of service technicians

Ongoing costs

Electricity usage per day; electricity cost per kL of wastewater; electricity cost per year

Service fees per year (labour and travel costs)

Annual cost of chemicals used

Annual cost of replacing the UV lamp, membranes

Annual cost of testing any backflow prevention devices

Average annual cost of consumables, spare parts, pumps and desludging per year (annualised over 30 years)

Annual effluent monitoring cost

Cost of desludging the system every 3 to 5 years

Total annual cost to run the treatment plant (including annualised spare parts and desludging)

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SETBACK DISTANCES FOR PRIMARY & SECONDARY TREATMENT PLANTS & EFFLUENT DISPOSAL/IRRIGATION AREAS IN SEWERED & UNSEWERED AREAS (WHERE APPLICABLE)

(Source: EPA Code of Practice – Onsite Wastewater Management (Table 5))

	Setback distances (m)			
Landscape Feature or Structure	Primary Sewage & Greywater Systems	Secondary Sewage & Greywater Systems	Advanced Sewage & Greywater Systems	
Building				
Wastewater field up-slope of building ⁷	6	3	3	
Wastewater field down-slope of building	3	1.5	1.5	
Wastewater field up-slope of cutting/escarpment ¹²	15	15	15	
Allotment boundary				
Wastewater field up-slope of adjacent lot	6	3	1	
Wastewater field down-slope of adjacent lot	3	1.5	0.5	
Services				
Water supply pipe	3	1.5	1.5	
Wastewater up-slope of potable supply channel	300	150	150	
Wastewater down-slope of potable supply channel	20	10	10	
Gas supply pipe	3	1.5	1.5	
In-ground water tank ¹⁴	15	7.5	3	
Stormwater drain	6	3	2	
Recreational areas		•		
Children's grassed playground ¹⁵	6	316	216	
In-ground swimming pool	6	316	216	
Surface waters (up-slope of:)		•		
Dam, lake or reservoir (potable water supply) ^{8, 13}	300	3004	150	
Waterways (potable water supply) ^{9, 13}	100	1004, 5, 17	50	
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high-tide mark; dams, reservoirs or lakes (stock and domestic, non-potable) ^{8,9}	60	30	30	
Groundwater bores				
Category 1 and 2a soils	NA ¹¹	5019	20	
Category 2b to 6 soils	20	20	20	
Watertable				
Vertical depth from base of trench to the highest seasonal water table 18	1.5	1.5	1.5	
Vertical depth from irrigation pipes to the highest seasonal watertable ¹⁸	NA	1.5	1.5	

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NOTES: SETBACK DISTANCES FOR PRIMARY & SECONDARY TREATMENT PLANTS & EFFLUENT DISPOSAL/IRRIGATION AREAS IN SEWERED & UNSEWERED AREAS (WHERE APPLICABLE)

(Source: EPA Code of Practice – Onsite Wastewater Management (Table 5))

- 1. Distances must be measured horizontally from the external wall of the treatment system and the boundary of the disposal/irrigation area, except for the 'Watertable' category which is measured vertically through the soil profile. For surface waters, the measuring point shall be from the 'bank-full level'.
- 2. Primary water-based sewerage systems must only be installed in unsewered areas; secondary sewerage systems must only be installed and managed in sewered areas by Water Corporations; secondary greywater systems can be installed in sewered and unsewered areas (see Section 3.12.3).
- 3. Advanced secondary greywater systems treating effluent to =10/10/10 standard.
- 4. The setback distance in a Special Water Supply Catchment area may be reduced by up to a maximum of 50% conditional on the following requirements (otherwise the setback distances for primary treatment systems apply):
 - effluent is secondary treated to 20/30 standard as a minimum
 - a maintenance and service contract, with a service technician accredited by the manufacturer, is in place to
 ensure the system is regularly serviced in accordance with Council Septic Tank Permit conditions and
 - Council is satisfied the reduction in set-back distance is necessary to permit the appropriate development of the site and that risks to public health and the environment are minimised.
- 5. Effluent typically contains high levels of nutrients that may have a negative impact on native vegetation and promote the growth of weeds. When determining setbacks, Council should consider not only the potential impact of nutrients from the proposed onsite wastewater management system, but the cumulative impact of the existing onsite wastewater management systems in the area.
- 6. Establishing an effluent disposal/irrigation area upslope of a building may have implications for the structural integrity of the building. This issue is beyond the scope of this Code and should be examined by a building professional on a site-by-site basis.
- 7. Does not apply to dams, lakes and reservoirs located above ground-level which cannot receive run-off.
- 8. Means a waterway as defined in the Water Act 1989.
- 9. The setback distances for flat land are equivalent to 'down-slope' setback distances.
- 10. See Table 9 for other land application options for Category 1 and 2a soils.
- 11. A cutting or escarpment from which water is likely to emanate.
- 12. Applies to land, adjacent to a dam, lake, reservoir or waterway that provides water for a public potable water supply, which is:
 - a. subject to a Planning Scheme Environmental Significant Overlay (ESO) that designates maintenance of water quality as the environmental objective to be achieved (contact the relevant Water Authority to determine whether the ESO is in a potable water supply catchment) and/or
 - b. within a Special Water Supply Catchment Area listed in Schedule 5 of the Catchment and Land Protection Act 1994.
- 14. It is recommended that any primary or secondary treatment system and its associated land application system are installed downslope of an in-ground water tank.
- 15. Means a school, council, community or other children's grassed playground managed by an organisation which may contain play equipment (but does not mean a sports field).
- 16. Sub-surface irrigation only.
- 17. Where an intermittent stream on a topographic or orthographic map is found through ground-truthing to be a drainage line (drainage depression) with no defined banks and the bed is not incised, the setback distance is 40 m (SCA 2010). The topography of the drainage line must be visually inspected and photographed during the LCA site inspection and reported upon in writing and photographs in the LCA report.
- 18. The highest seasonal watertable occurs when the watertable has risen up through the soil profile and is closest to the ground surface. This usually occurs in the wettest months of the year.
- 19. The setback distance to a groundwater bore in Category 1 and 2a soils can be reduced to 20 m where treated and disinfected greywater or sewage (20/30/10 or better standard) is applied and the property owner has a service contract with an appropriately qualified technician to regularly maintain the treatment system.
- 20. See Section 3.9 of EPA 891.4 for more details on setback distances from treatment tanks and land application areas.

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SOIL CATEGO	ORIES AND RECO	MMENDED MAX	IMUM DESIGN LC	ADING/IRRIGATIO	N RATES (DLR/DIR) FOR	LAND APPLICA	TION SYSTEMS			
(Source: EPA (Code of Practice –	Onsite Wastewate	er Management (1	able 9))						
				Design Loading Rates and Design Irrigation Rates (DLR / DIR) (mm/day)						
Soil Texture	Soil Structure	Soil Category	Indicative permeability (Ksat) (m/d)	Absorption trenches/beds and Wick Trench & Bed Systems 6 for primary effluent (see Table L1 in AS/NZS 1547:2012)	(ETA) Evapotranspiration absorption beds and trenches (see Table L1 in AS/NZS 1547: 2012)	Secondary treated effluent applied to Wick Trench & Bed System 4	Sub-surface and surface irrigation (see Table M1 in AS/NZS 1547: 2012)	LPED (see Table M1 in AS/NZS 1547: 2012)	Mounds (basal area) (see Table N1 in AS/NZS 1547: 2012)	
Gravels and sands	Structureless (massive)	1	>3.0	NA ³	NA ³	25	5 6 (see Note 2 in Table M1)	NA ³	24	
Sandy Ioams	Weakly structured	2a	>3.0						24	
	Massive	2b	1.4 - 3.0	15	15	30		4	24	
Loams	High / moderate structured	3a	1.5 – 3.0	15	15	30	4 (see Note 1 in Table M1)		24	
	Weakly structured or massive	3b	0.5 – 1.5	10	10	30		3.5	16	
Clay loams	High / moderate structured	4 a	0.5 – 1.5	10	12	30	3.5 (see Note 1 in Table M1)	3	16	
	Weakly structured	4b	0.12 - 0.5	6	8	20			8	
	Massive	4c	0.06 – 0.12	4	5	10			5(see Note 1 in Table N1)	
Light clays	Strongly structured	5a	0.12 – 0.5	5	8	12	3 (see Note 1 in Table M1)	2.5 (see Note 4 in Table M1)	8	
	Moderately structured	5b	0.06 - 0.12	(see Notes 2 and 3 in Table L1)		10				
	Weakly structured or massive	5c	<0.06		5	8				
Medium to heavy clays	Strongly structured	6a	0.06 – 0.5				5 (see Note 2 in Table M1)	2 (see Note 1 in	NA	5
	Moderately structured	6b	<0.06			Table L1)				
	Weakly structured or massive	6C	<0.06			Table MT)	Table M1)			

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

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SEPTIC TANKS

(Source: EPA Code of Practice – Onsite Wastewater Management (Appendix D: Septic Tanks))

Commissioning

After installation or desludging, and before use, a septic tank must be two-thirds filled with clean water to:

- provide ballast in the tank to prevent groundwater lifting the tank out of the ground
- reduce odours
- enable any subsequent secondary treatment plant to be switched on, commissioned and used immediately.

When domestic wastewater from the dwelling flows into the septic tank it contains sufficient microbiological organisms to start and continue the treatment process. There is no need to 'feed' or dose a new or desludged septic tank with starter material or micro-organisms. If odour occurs after the commissioning of a system, a cup of garden lime can be flushed down the toilet each day until the odour disappears. If the odour persists, the property should seek professional advice from a

plumber.

Sludge and scum

As organic matter from the wastewater and inert material, such as sand, settle to the bottom of the tank a layer of sludge forms. This layer contains an active ecosystem of mainly anaerobic micro-organisms which digest the organic matter and reduce the volume of sludge. Scum forms as a mixture of fats, oils, grease and other light material floats on top of the clarified liquid that has separated from the solids. When the clarified liquid flows out of the septic tank it is called 'primary treated effluent'

It is not necessary or recommended that householders pour commercial products that are reputed to dissolve sludge buildup, down the toilet or sink. A teaspoon of granulated yeast flushed down the toilet once a fortnight may assist with microbial activity, though such a procedure is not an alternative to regular sludge and scum pump-out (Lord 1989).

Desludging septic tanks

Over time, the sludge and scum layers build up and need to be removed for the tank to function properly. The level of solids accumulation in the tank cannot be accurately predicted, and will depend on the waste load to the tank. Therefore, the sludge and scum depth should be checked annually by a contractor. If a septic tank is under a maintenance contract, regular assessment (every 1 to 3 years) of the sludge and scum layers must be part of the maintenance agreement. The sludge and scum need to be pumped-out with a vacuum suction system when their combined thickness equals 50%

- of the operational depth of the tank. The frequency of pump-out depends on:

 whether the tank is an adequate size for the daily wastewater flow
 - the composition of the household and personal care products
 - the amount of organic matter, fat, oil and grease washed down the sinks
 - the use of harsh chemicals such as degreasers
 - overuse of disinfectants and bleaches
 - the use of antibiotics and other drugs, especially dialysis and chemotherapy drugs
 - whether any plastic or other non-organic items are flushed into the tank.

A well-functioning septic tank – one that is not overloaded with liquid, organic matter or synthetic material – typically only needs to be desludged once every 3 to 8 years (depending on the size of the tank). A septic tank connected to a home with a frequently used dishwasher will need to be pumped out more frequently (typically every 3 to 4 years) than a home with no dishwasher connected (typically every 5 to 6 years). A holiday home will need to be pumped out less frequently. Large (6,000 L) domestic septic tanks which are common in New Zealand and the USA and have started to be installed in Victoria, have been proven to require desludging only once every 10 to 15 years (Bounds, 1994).

After pump-out, tanks must not be washed out or disinfected. They should be refilled with water to reduce odours and ensure stability of plumbing fixtures. A small residue of sludge will always remain and will assist in the immediate reestablishment

of bacterial action in the tank.

Householders should keep a record of their septic tank pump-outs and notify the local Council that a pump-out was undertaken in accordance with the Council Permit.

Septic tank failure

It is critical that a septic tank is not used as a rubbish receptacle. Septic tanks are designed solely for the treatment of water and organic materials. Items such as sanitary napkins, tampons, disposable nappies, cotton buds, condoms, plastic bags, stockings, clothing and plastic bottles will cause the septic tank to fail and require costly removal of these items. If a tank is contaminated or poisoned by household materials it should be pumped out immediately to enable the microbiological ecosystem to re-start. Without the removal of the scum and sludge, sewage biosolids will increasingly be discharged into the soil absorption

trenches and will eventually cause them to fail. This can force untreated sewage onto the ground surface and cause:

- noxious odours
- a boggy backyard
- a health hazard to the family, pets, visitors and neighbours from the pathogens in the sewage
- environmental degradation of the property, surrounding area and waterways from the nutrients, organic matter and
- other pollutants in the discoloured water, and
- a public health risk to drinking water supplies in potable water supply catchments.

Positive actions a property owner can take to help a septic tank function well:

• Use soapy water (made from natural unscented soap), vinegar and water or bi-carbonate of soda and water to clean toilets and other water fixtures and fittings.

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SEPTIC TANKS

(Source: EPA Code of Practice – Onsite Wastewater Management (Appendix D: Septic Tanks))

- Read labels to learn which bathroom and laundry products are suitable for septic tanks. Generally plain, noncoloured, unscented and unbleached products will contribute to a well-functioning septic tank.
- Use detergents with low levels of salts (e.g. liquid detergents), sodium absorption ratio, phosphorus and chlorine (see www.lanfaxlabs.com.au).
- · Wipe oils and fats off plates and saucepans with a paper towel and dispose of in the kitchen compost bin.
- Use a sink strainer to restrict food scraps entering the septic system.
- Ensure no structures such as pavements, driveways, patios, sheds or playgrounds are constructed over the tank
 or absorption trench area.
- Ensure the absorption trench area is not disturbed by vehicles or machinery.
- Engage a service technician to check the sludge and scum levels, pumps and alarms annually.
- Keep a record of the location of the tank and the trenches and all maintenance reports (including the dates of tank pump-outs, tank inspections and access openings) and ensure the service technician sends a copy of the maintenance report to the local Council
- Have the tank desludged when the combined depth of the scum and sludge is equal to the depth of the middle clarified layer.

Indications of failing septic tanks and soil absorption trenches

- Seepage along effluent absorption trench lines in the soil
- Lush green growth down-slope of the soil absorption trench lines
- Lush green growth down-slope of the septic tank
- Inspection pits and/or the soil absorption trenches consistently exhibiting high water levels
- Soil absorption trench lines become waterlogged after storms
- General waterlogging around the land disposal area
- Presence of dead and dying vegetation (often native vegetation) around and down-slope of the land disposal areas
- A noxious odour near the tank and the land disposal area
- · Blocked water fixtures inside the house, with sewage overflowing from the relief point
- High sludge levels within the primary tank (within about 150 mm of inlet pipe)
- Flow obstructed and not able to pass the baffle in the tank
- The scum layer blocking the effluent outflow.

Decommissioning treatment systems

Septic tanks

When a septic tank is no longer required it may be removed, rendered unusable or reused to store stormwater. The contents of the tank must first be pumped out by a sewage sludge contractor. The contractor must also hose down all inside surfaces of the tank and extract the resultant wastewater. Where the tank will no longer be used but will remain in the ground, the contractor must first disinfect the tank by spreading (broadcasting) hydrated lime over all internal surfaces in accordance with the WorkSafe safety precautions associated with using lime (i.e. wearing gloves, safety goggles and not using lime on a windy day).

Under no circumstances should anyone enter the tank to spread the lime or for any other reason, as vapours in confined spaces can be toxic.

A licensed plumbing practitioner must disconnect the tank from the premises and from the absorption trench system. The inlet and outlet pipes on the tank must be permanently sealed or plugged. To demolish a tank, the bottom of the tank is broken and then the lid and those parts of the walls that are above ground are collapsed into the tank. The tank is then filled with clean earth or sand.

Before a tank may be used to store stormwater a licensed plumbing practitioner must disconnect it from the premises and the trench system and connect an overflow pipe from the tank to the stormwater legal point of discharge. Before disinfecting the tank, it must be pumped out, the inside walls hosed down and then pumped out again. The tank is to be filled with fresh water and disinfected, generally with 100 mg/L of pool chlorine (calcium hypochlorite or sodium hypochlorite) to provide a resultant minimum 5 mg/L of free residual chlorine after a contact time of 30 minutes. However, advice should be obtained from a chemical supplier about safety precautions, dosage and concentrations to provide adequate disinfection for any tank. The chlorine is not to be neutralised, but be allowed to dissipate naturally for at least 1 week, during which time the water must not be used. Pumps may be installed to connect the tank to the irrigation system. The contents of the tank must not be used for any internal household purposes or to top-up a swimming pool. The water may only be used for garden irrigation. The tank and associated irrigation system must be labelled to indicate the water is unfit for human consumption in accordance with AS/NZS 3500: Plumbing and Drainage (Blue Mountains City Council 2008).

Secondary treatment systems

All treatment systems must be decommissioned by a licensed plumbing practitioner.

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Appendix 9

Suitable Plants

SUITABLE INDIGENOUS PLANTS AND GRASSES (Source: City of Greater Bendigo)		
Botanical Name	Common Name	
Large Shrubs		
Acacia dealbata*	Silver Wattle	
Acacia mearnii*	Late Black Wattle	
Acacia melanoxylon*	Blackwood	
Acacia retinodes	Wirilda	
Callistemon sieberi	River Bottlebrush	
Dodonaea viscosa	Sticky Hop Bush	
Hymenanthera dentata	Tree Violet	
Melaleuca decussata	Totem Poles	
Melaleuca lanceolata	Moonah	
Melaleuca parvistamina*	Rough-barked Honey-myrtle	
Melaleuca uncinata	Broom Honey-myrtle	
Melaleuca wilsonii	Violet Honey-myrtle	
Small Shrubs		
Indigofera australis	Austral Indigo	
Goodenia varia	Sticky Goodenia	
Grasses, Sedges and Rushes		
Carex appressa	Tall Sedge	
Carex tereticaulis	Basket Sedge	
Dianella longifolia	Smooth Flax-lily	
Dianella revoluta	Black-anther Flax-lily	
Eleocharis acuta	Common Spike-rush	
Juncus pallidus	Pale Rush	
Lomandra longifolia	Spiny-headed Mat-rush	
Microlaena stipoides	Weeping Grass	
Poa labillardierei	Common Tussock-grass	

PLANTS AND GRASSESS (Source: EPA Code of Practice – Septic Tanks (1996))		
Botanical Name	Common Name	
Phragmites australis		
Canna x generalis	Canna Lily, Calla Lily, ginger Lily	
Acacia Howittii	Sticky Wattle	
Callistemon citrinus	Crimson Bottlebrush	
Callistemon macropunctatus	Scarlet Bottlebrush	
Leptospermum lanigerum	Wooley Tea - tree	
Melaleuca decussata	Cross-leaf Honey Myrtle	
Melaleuca ericifolia	Swamp Paperbark	
Melaleuca halmaturorum	Salt paperbark	
Tamarix juniperina	Flowering Tamarisk	
Eleocharis acuta	Cannas	
	Common spike rush	
	Buffalo	
	Kikuyu	
	Geranium	
	Hydrangeas	
	Tall wheat grass	
	Strawberry clover	
	White clover	

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Appendix 10

Use of Lime or Gypsum

USE OF LIME OR GYPSUM (Source: Soils their properties and management (1994) & AS/NZS1547:2012.) **Indications**

Calcium compounds are used to improve soil structure.

Gypsum is effective at any soil pH < 8 but lime is preferred for soils with pH <5.5 as lime has additional benefits for plant growth.

Lime should not be used with soils of pH >6 as it is no longer soluble (making it ineffective).

Gypsum

A naturally occurring hydrated from of calcium sulphate: CaSO₄2H₂O. It is also available as 'dump gypsum', a by-product of the manufacture of phosphoric acid.

Application rates of up to 5 tonne/hectare = $5kg/10 \text{ m}^2 = 0.5kg/1 \text{ m}^2$. Ensure the product has been tested for flocculating potential as quality varies.

AS/NZS 1547:2012 - In dispersive soils, apply **gypsum at the rate of 1kg/m² to the bottom of the trench or bed** (L7.2). It is suggested gypsum will need to be applied again in 5 to 10 years (CL7.2).

Lime

A naturally occurring calcareous material: $CaCO_3$. Processed forms include hydrated lime, $Ca(OH)_2$ and burnt lime, CaO. Lime is used to improve soil structure in soils of pH <5.5 and may reduce soil acidity and associated manganese toxicity, aluminium toxicity, and improve molybdenum availability.

When the primary purpose is to reduce soil acidity a 'Lime Requirement Test' should be performed as the rate of lime required varies greatly depending on the soil type **from as little as 0.5 t/ha to over 10 t/ha**. Use a grade of lime with a fine particle size as it is more 'active' and incorporate lime into the top few centimetres of soil for best effect.

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INTEGRATED LAND MANAGEMENT

PLAN

426 BACK EILDON ROAD, THORNTON (Lot 2 PS69330)

FOR

Black Angus Bull Stud

JOB NO: 2540

"Farm well, improve soil and protect the environment to secure food and biodiversity for our future".



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Your Planning & Permit Consultants

Integrated Management Plan for the planning application for use for a wedding venue

Project: 2540

Report prepared by: Julie Lee of Natural Resource Link Pty Ltd Town Planner (MPIA), Post grad. Dip Planning, Post grad Dip Bushfire Planning & Management, Post grad Cert. Regenerative Agriculture, Dip Conservation and Land Management, Coastal/Water Management and Cert. Horticulture

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REV	DATE	DETAILS
	5/12/2023	FINAL

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Image. 52 Benchmark-trees- Example	
Image. 52 Lifeforms- example	
Images 53 and 54 Graminoides and cover example	
Images 55 Typical species of an EVC	
Image. 56 Typical Image of Box Ironbark Forest-example	
Image 58 example of 10-20% cover	
Image 59 example of 30-50% cover	

Property Management Summary

Land Management Plans can take many forms and include Whole Farm Plans, Property ManagementPlans, Conservation Management Plans.

Land Management Planning is the process of planning, property design/layout and management based annatural resources and economic factors.

This plan will set out the goals, objectives and management for this property. The site is within the Farming Zone that looks to balance Agriculture, Biodiversity and as this site is adjunct to a major waterway it balances water quality and habitat.

These plans set the goals and priorities for successful land/property management. These plans will identify the need to manage:

retain cover to 90% to ameliorate risk of erosion and protect water quality.

Protecting and managing vulnerable flora and fauna

Building resilience against climate change

Manage Biodiversity on site in perpetuity.

Monitor and maintain weeds and pest animals.

Fence off riparian area from stock

Please note this report has been produced to assist the landowner to manage the site wherever you see this symbol below; you need to take not of your responsibilities.

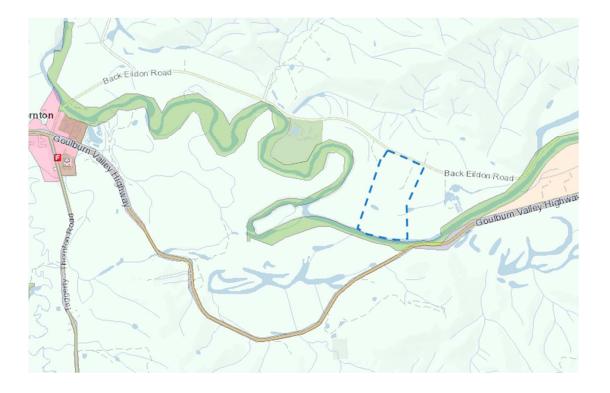


Introduction

Applicant	Natural Resource Link Pty Ltd
Proposal	Change of use for a wedding venue
Location	426 Back Eildon Road, Thornton
Legal Description	Lot 1 TP 862583
Zone	Farming Zone (FZ) Schedule to Farming Zone
Surrounding Zone	Farming Zone (FZ) –
Overlay(s)	Environmental Significant Overlay (ESOO) Environmental Significant Overlay -Schedule.1 Flood Overlay (FLO)
Aboriginal Cultural Heritage Area	Covers Part of the site
Lot Size	35.35 ha
Responsible Authority	Murrundindi Shire
Prepared By	Natural Resource Link Pty Ltd

Natural Resource Link has been engaged by the owners to complete a Land Management Plan and report to address the requirements of the Farming Zone.

Object Site and Site Content



 $Image.1\ Landscape\ context\ (Image\ above\ sourced\ from\ Vic\ Plan\ 5/12/2023)$

The site is located within a large area of Farming Zone along the Back Eildon Road approximately 4km past the township of Thornton. The land is currently farmed with stud bulls and has mature windbreaks to most boundaries and has good pasture with high levels of cover. There is a strip of remnant trees and shrubs along the south boundary that is along the Goulburn River.

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Image. 2 Landscape EVC (Source Naturekit 5/12/2023)

The current mapped vegetation on site is EVC 56 Flood plain Riparian Woodland whichc is Endangered in the CVU Bioregion. The mapping in Image 2 shows vegetation along a drainage line that consists of a stand of remnant trees only and towards the middle of the block is within the developed garden of the site and contains exotic trees. The edge of the riparian area does contain old growth large Eucalyptus camaldulensis that is the predominant tree in EVC 56. A copy of this EVC Benchmark is included in Appendix.3

This community is an important EVC to the waterways of the Goulburn Catchment Management Authority with 88% cleared since settlement and the vegetation contributes to habitat, ameliorates stream bank erosion and is habitat for threatened species.

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Image.3 Drainage lines on site (Source Google Earth dated March 2023 Assessed 5/12/2023)

The site has small parts of mapped waterways detailed on Vic Plan however the site has ephemeral drainage lines on site which can often be picked up on aerials during dry seasons such as shown on Image.3. The drainage lines on site have been mapped on the Existing Plan and the importance of these is that grazing these soils when wet contributes to pugging risk (erosion) then the debris can be carried across site to lead to increase turbidity in the Goulburn River.

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Image.4 Drainage lines on site (Source Google Earth dated September 2020 Assessed 5/12/2023)

Image.4 above demonstrates that the site has been used to crop fodder for grazing in September and this may continue and is well off the drainage lines and waterways to limit the impacts on the waterway.

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Site review photos



Image.5 lower drainage line in Paddock.10 where water collects in a drainage line.



Image.6 Lower drainage line that has been dammed between paddocks 9 and 7.

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The drainage lines to the south of the property have been dammed by road access and I am not sure of image 6 as there were stock in the paddock. In Image 6 the water has sat still and has collected nutrient across the paddocks which has led to eutrophication of the water.

There is a requirement to let waters traverse across the site and avoid waters sitting and becoming eutrophic. This will mean that pipes will need to be put under the roadway and waters allowed to traverse naturally across to the adjacent lot where there is a registered waterway.



Image.7 Aerial of the south of 360 and 426 Back Eildon Road, Thornton (Source Google Earth dated March 2017 Assessed 5/12/2023.

In image 7 above the red are drainage lines and the blue a waterway; the red arrows show how the water traverses over the landscape in the past. The box is the road where pipes will need to be put in place to allow the natural drainage across the site to occur. If this dam shown in Image 6 is to be used for stock and was a constructed dam then the dam will require full fencing and have graminoides established to the perimeter to filter the water that runs into the dam as shown in the Farm Management Plan. It may mean lower the spillway on the boundary of Paddocks 7 and 9 to allow the dam to spill out more easily in a rainfall event. The other issue could be back flow from the adjacent site with a nutrient load that has also contributed to the eutrophication of the water way. As shown in Image. 8

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Image.8 open soil for cropping nutrient loads from this land use could be back flushing into the dammed water between Paddocks 7 and 9. The south of 360 and 426 Back Eildon Road, Thornton (Source Google Earth dated March 2017 Assessed 5/12/2023.



Image.9 Aerial of the south of 360 and 426 Back Eildon Road, Thornton (Source Google Earth dated March 2023 Assessed 5/12/2023.

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Image.9 above shows how the soil is lower and moist and not used for cropping (red arrow) in March 2023 and since then the dammed area does not seem evident at this time (blue arrow). The green arrow is potential back flushing from the adjacent land use that would contribute to eutrophication. Polluted waters travelling across the site with nutrients and algae can find their way to parts of the waterway and will contribute to a decline in water quality.



Image 10 Dam to Paddock.8 shows the water to be clear and could be flushed in periods of rain.

I can only surmise that the waterway between paddocks 7 and 9 have been poor water quality from a variety of issues such as lack of fencing from Paddock 9, backflushing from adjacent land use and lack of environmental flushing in rain events. The Farm Management Plan will demonstrate how this can be ameliorated to ensure that the land waters retain a higher level of water quality for stock and pose a lower risk to the Goulburn River.

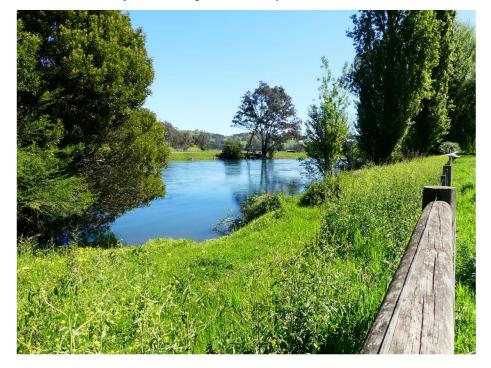
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Image. 11 Goulburn River from the southeast corner neat access gate

It is evident that the riparian area is highly modified from adjacent land use (pasture species) and weeds. This area needs to be maintained to a much lower level of weeds and will need to be conducted in a dry period of year and silt traps placed along the new fencing to catch any sediment across the site from entering the waterway.



 $Image.\ 12\ South\ boundary\ of\ the\ site\ showing\ existing\ fences\ to\ approximately\ 5m\ width.$

Currently the south boundary is fenced to around 5m from the waterway and has a mixture of exotic, other native and indigenous vegetation with an almost 100% substratum of weeds. This area will need to be increased to a minimum of 30m wide and revegetated to ensure there is sufficient buffering to trap sediments and nutrients will be limited in paddocks 9 and 10 to dry periods to ensure the risk to the waterway is minimised to an appropriate level to manage the risk to water quality.



 $Image. 13 \ Populars \ and \ Willow \ along \ the \ waterway$

The waterway will require removal of pest and exotic species such as poplar and willow trees to ensure that the area can be vegetated with suitable indigenous riparian species in line with the Benchmark for EVC 56. Salix (Willow) is a restricted weed in the catchment.



Image. 14 substratum pasture grass and sticky weed (Galium aparine)

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 $Image. I5\ stock\ grazing\ to\ the\ water's\ edge\ creating\ erosion\ on\ 561\ Goulburn\ Valley\ Road,\ Thornton.$



Image.16 East side of Paddock 9 showing an excellent cover crop.

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Image.17 River Red Gum and Blue Gum along the waterway with weed species.



Image. 18 Blue Gum (Eucalyptus globulus) along the waters edge

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Image. 19 Erosion and loss of cover from stock seeking shelter and walking Paddock.10



Image.20 Bursaria along waterway.

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Image.21 Hemlock along waterway (Conium maculatum)

Hemlock and Blackberry are controlled weeds in the Goulburn Broken Catchment Management area and is poisonous to stock and needs to be controlled on site.



Image.22 Blackberry along waterway (Rubus fruiticosa)

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Image.23 Willow crowing old growth remnant Eucalyptus camaldulensis along waterfront.

When the weed species are removed from site all due care must be taken to ensure that remnant vegetation is clearly marked and that any contractors take all due care to protect the stems and root base of these trees.



Image.24 South-east corner of Paddock 10 looking to the north-west.

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Paddock management shows clear even growth of pasture species however there is a lack of diversity to ensure all year-round sequestration of carbon and to stimulate soil microbial activity for soil health.



Image. 25 west side of Paddock 10 looking north-west showing hummocks from excessive nitrogen.

These hummocks form from stock urine and this farm shows in paddock 10 that the stock congregate to the west side of the paddock as it is marginally higher than the rest of the paddock. Diving these paddocks into small paddocks and undertaking rotation grazing will ameliorate the level of urine. Paddocks can be split with temporary or permanent fencing. Regular testing of these areas along with remainder of the paddock will show a higher level of nitrogen in the soil and fertilising will need to be modified down because of urine humping.

the Planning and Environment Act 1987.





Image. 26 Indicative image of pasture species in paddock.10

Pasture management is imperative to retaining good cover and having a diversity of species will ensure all year-round growth. Grazing management considers: pasture utilisation

- soil management
- grazing strategies
- stocking rate
- fodder conservation.

It is imperative that a regular soil testing regime is undertaken, and that stock are managed to control cover at a high rate of cover (90%). Increasing diversity in the pastures to include perennials and at least two species of clover is recommended under the guidance of an Agronomist is preferred for optimum pasture management.

"Healthier soils also store much more carbon and are less likely to release nitrates such as NO₃ that are 200 times more damaging to the atmosphere than CO2"

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Image.27 Native trees between Paddock 9 and 10

Some of the tree areas contain native species and some specimens are deteriorating (mainly wattles) that are short lived. Increasing shrubs into these areas will provide habitat for birds and birds control insects in pastures.



Image. 28 Erosion to north area of dam due to uncontrolled stock access.

Most of the paddocks that do not have access to water have waterpoints for stock access this needs to be implemented in all paddocks and all waterways/dams need to be fenced to exclude

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stock. Any bare areas need to be planted with suitable grass species to filter water into these waterways.

The dead tree to the right of Image 28 will need to be retained for habitat roosting or nesting opportunities for threatened species.



Image. 29 Dandelion in pasture in paddock 10 near remnant trees along a drainage line.

Dandelions are a weed species and in pastures are an indication of low fertility and over grazing.

Once an area is cleared the dandelion will colonise into bare areas as it can tolerate low fertility and periods of dryness due to its taproot.



Image.30 Dandelion to most of this area in Paddock.10

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Image. 31 Erosion to dam in Paddock 8 dam



Image. 32 some algae in dam (Paddock.8) and scotch thistle in foreground

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Image. 33 Slight turbidity to drainage line Paddock.10 $\,$



Image.34 Thistle infestation and loss of cover Paddock.8

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Image. 35 Paddock 7 low fertility stunted grass and establishment of weeds



Image. 36 Paddock 6 lines show drainage lines.

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Image. 37 low drainage line to the south domestica area paddock that flows from Paddock.6



Image.38 Low drainage line to Paddock.6 pipes need to be installed under the road access to allow water to traverse the site.

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Installing pipes below the road network to link up low drainage lines enables water to move across the site and avoid stagnant water becoming eutrophic on site.



Image.39 zoom in on erosion (Image 38) Paddock 6

If this paddock remains wet once the pipe is installed then it is recommended that this areas be fenced and planted with graminoides (Grass-like plants) to control erosion and filter water crossing the land.



Image.40 Erosion in paddock.6

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It is evident that grazing the drainage line has led to erosion of this paddock.



Image.41 Bull in small paddocks (Paddock 2)



Image.42 water point to Paddock.2

Excluding stock from all wet areas with fencing and establishing grass species whether this is a mix of remnant and exotic grasses will filter water and protect water quality. A list of remnant species that are indicative of EVC 56 have been included in Appendix..4(marked in Green)

Management Recommendations

Pasture Management

Pasture utilisation

Cover crops need to retain a high level of cover recommended 90% so that soil health is maximised; cover crops:

- Sequest carbon deep in the soil
- Release exudates, amino acids, proteins
- Prevent erosion.
- Increase percolation.
- Require stress from grazing and mowing.
- Fix nitrogen
- Cycle nutrients
- Control weeds
- Beneficial insect habitat
- Biodiversity
- Essential is your cover crop a host to predatory insects.
- Grasses can have large fiborous roots.
- Increase oxygen.
- Increases phosphorus.
- Nutrients released from the soil.
- Favour rhizophagy and Endophytes
- Increases disease resilience.

Grazing Management

Grazing forms an essential part of the farm production and is essential to stressing the plants to forming new growth in response to predation. This response involves increasing root mass and to do this the grasses exuding essential sugars into the soil to feed the microbes; the microbes then produce carbon in the soil. Microbes in the soil co-exist and often move into the roots of the plants and lead to greater root depth (Rhyzosphere) and exudes a gluey sticky substance that glues the soil particles together and increases aggregation. Aggregation is essential in soils for the development of pore spaces and improves aeration and drainage in soils.

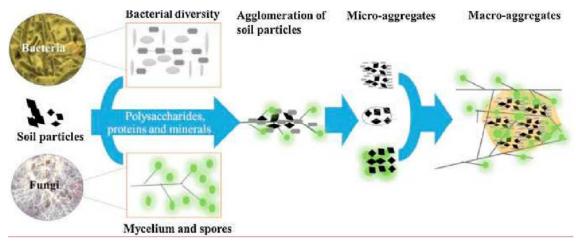


Image 43. Importance of grazing to the improvement of soil aggregates (Source: Muhammad Imtiaz Rashid, Liyakat Hamid Mujawar, Tanvir Shahzad, Talal Almeelbi, Iqbal M.I. Ismail, Mohammad Oves, (2016) Bacteria and fungi can contribute to nutrients bioavailability and aggregate formation in degraded soils, Microbiological Research, Volume 183, Pages 26-41, ISSN 0944-5013, https://doi.org/10.1016/j.micres.2015.11.007.)

Grazing needs to ensure that it is light, and that stock are rotated around the farm. Light grazing is essential to fungi and bacteria in the soil that leads to the decomposition of organic soil carbon.

Over and under grazing has a detrimental impact on the balance and health of the soil.

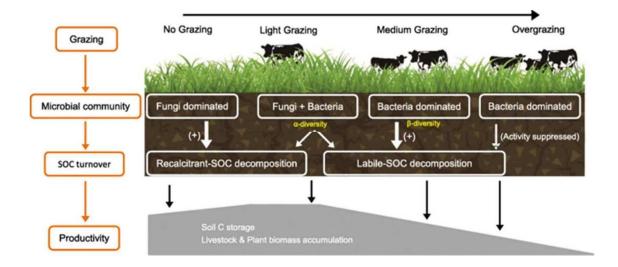


Image.44 Soil Organic Carbon from grazing strategies (Source: Xun, W., Yan, R., Ren, Y. et al. Grazing-induced microbiome alterations drive soil organic carbon turnover and productivity in meadow steppe. Microbiome 6, 170 (2018). https://doi.org/10.1186/s40168-018-0544-y)

The grazing rotation plan has been included along with this to demonstrate how important to soils, carbon sequestration and to the Farming Practice to ensure that soils are improved as this is an important aspect of the planning scheme.

Cover Crops

Cover crops need to be diverse suggested types of cover crops are:

- Safflower
- Rye
- Fava Bean
- Barley
- Mustard, Black, White and Yellow
- Oat
- Triticale
- Barley
- Fescue

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- Your Planning & Permit Consultants
 - Clover strawberry, Subterranean,- Great for wet areas
 - Vetch-White
 - Lucerne
 - Wheat
 - Canola
 - Ethiopian Cabbage
 - Tillage Radish
 - Graza
 - Winfred
 - Pidgeon Pea •
 - Yarrow
 - Forbes
 - Alfalfa
 - Buckwheat
 - Soya Bean great for vegetables

Nutrient Management

Nutrient requirements will need to be undertaken across the site by an Agronomist I could not access many paddocks on the site survey due to Bulls.

Calcium and Boron essential for plant health- calcium often needed to be supplemented not in soils.

Soils usually don't supply Ca, S, B Cu

Tillage Management

Tillage management is essential to regenerative farming as ripping and tillage of soils releases essential carbon in the soil. It is recommended that a No-Till system of re sowing is undertaken on this site. Tillage also destroys the aggregates in the soil especially if tilled wet and leads to compaction and the soil becoming hydrophobic.

No-tillage or zero tillage is a farming system in which seeds are directly placed into untilled soil which has retained the previous crop residues. It is also referred to as no-till. Special no-till seeding

equipment with discs (low disturbance) or narrow tine coulters (higher disturbance) open a narrow slot into the residue covered soil which is only wide enough to put the seeds into the ground and cover them with soil.

The aim is to move as little soil as possible in order not to bring weed seeds to the surface and not stimulating them to germinate. No other soil tillage operation is done. The residues from the previous crops will remain largely undisturbed at the soil surface as mulch.

Soil Health

Soil health is strongly supported by the Federal government with the release and funding of the National Soil Strategy.

"The National Soil Strategy is Australia's first national policy on soil. It sets out how Australia will value, manage and improve its soil for the next 20 years. It was released in May 2021. The Strategy prioritises soil health, empowers soil innovation and stewards, and strengthens soil knowledge and capability." (Source: Australian Government (5 Dec 2023), National Soil Strategy, https://www.agriculture.gov.au/agriculture-land/farm-food-drought/natural-resources/soils)-Assessed 5/12/2023

"Healthy soils are central to human health and wellbeing. They support the production of food and fibre we need to survive and support the ecosystems which enable clean water, pure air, biodiversity and environmental quality. Soil is a mix of mineral particles, organic matter, gases, water and living organisms. A teaspoon of soil is estimated to contain several thousand species of micro-organisms, and other invertebrates such as nematodes (round worms), annelids (earth worms), and microarthropods (springtails and mites). These soil organisms play very important roles such as breaking down organic matter and providing nutrients to plants.

Soils provide the physical substrate that supports our buildings and infrastructure in urban and rural areas. Healthy soils are also vital to our region's economic prosperity, helping to generate

"Soils are the lifeblood of the catchment, providing environmental services that give life to flora, fauna and primary production.

more than \$1.66 billion worth of agricultural production to the region's economy each year.

Land degradation leading to loss of ecosystem services from soils and associated decreases in the function and productive capacity of soils is a pressing ecological and economic concern. Whilst production has increased and landholders have shown the capacity to adapt to changing climatic

and economic conditions, the evidence is that the long-term capacity of soils to provide services is under threat.

Healthy, functioning soils are essential for landscape health and provide primary services as shown in table 1. Importantly, these services underpin sustainable land use and fundamental ecological processes in the catchment for rural communities. As the soil ecosystem functions degrade so do the services they provide and at the same time, the disservices increase.

By application of external energy, we have managed to often maintain or increase economic productivity from our soils. However, this has been at the expense of inherent productivity, and we are masking a decline in the health of our soils. Examples of some disservices that have increased because of a decline in ecosystem services of soils are soil erosion, soil acidification, soil salinisation and soil organic matter decline.

The consequence of this is that it threatens our capacity to continue to provide the very necessary services that our rural communities and environment rely on.

The Goulburn Broken CMA has a strong commitment to building community capacity and understanding of soil health through its partner agencies, Landcare groups, production groups and general community. "

Source: Goulburn Broken Land Health Strategy 2017-2020 https://www.gbcma.vic.gov.au/our-region/land_and_biodiversity/land_health Assessed 5 Dec 2023

Landforms

This landform is limited as 1.1Ffc7-17 and the Centre for and protection Victoria lists this to have the following risk:

• Compaction 3 (Moderate

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- Leaching (Nutrients) 3 (Moderate)
- Mass Movement 1 (Nil)
- Salinisation 1 (Low)
- Water erosion 1 (Low)
- Water logging 3 (High)
- Wind erosion 1 (Low)

(Source Land Systems Victoria Jan 2000, Edition 3 (Version2) Technical Report 56)

Soils

Chromosol is mapped on site.

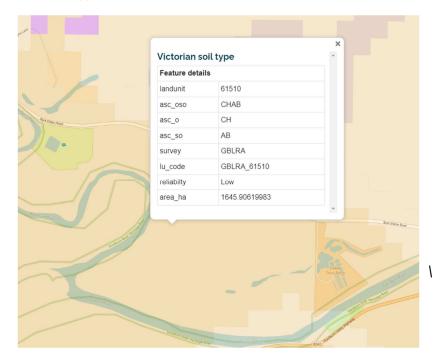


Image... Soil Mapping (Source Soil CRC assessed 6/12/2023

"Brown and Yellow Chromosols generally have poorer drainage than the Red Chromosols and have either whole-coloured or mottled subsoils (B horizons). Surface horizons are often fine sandy or silty and can be dispersive and result in reduced infiltration. This occurs due to hard setting of the surface soil on drying and reverting back into a liquid state when there is a small increase in moisture content. Some of these soils may also be sodic in the deeper subsoil and be prone to land degradation (e.g. in the area east of Seymour)." (Source VRO 9 Sept 2020, https://vro.agriculture.vic.gov.au/dpi/vro/gbbregn.nsf/pages/soil_soil_gbb assessed 6/12/2023)

Comment":

Soils: An Agronomist will need to consider how to improve the soil drainage, nutrient levels, pugging risk and rotation grazing will alleviate compaction risk to the soils.

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Applicable risks

Current threats

Current threats to the site as detailed in this report from the site visit are:

Pugging- Erosion risk

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- Drainage
- Compaction of soils
- Crop diversity
- Soil Infertility
- Carbon sequestration- Climate abatement
- Water quality dams and river
- Existing Riparian remnants-Biodiversity

Soils

Loss of cover- Infertility

It is imperative that a high degree of cover is always maintained on the site not only for biodiversity but to reduce the loss of carbon. Cover is imperative to ameliorating the risk from erosion of movement of water on site. The pastures exhibit a loss of cover which could be due to fertility issues and drainage on site. Engaging an Agronomist will enable the soils to be monitored on a regular basis and chemical imbalances can be ameliorated on a more regular basis. Improving any soil fertility on this site will need to be undertaken when soils are dry so that the risk of nutrient run off is mitigated to as low as possible and as per best practice.

Erosion

Erosion was evident on the site visit and retaining cover to 90% cover is best practice along Riparian areas to ameliorate the risk to water quality. Diversity of cover crops will alleviate the risk to soils by improving soil health. If drainage lines on site do not fully drain after pipes are installed under the road access they will need to be fenced to exclude stock to avoid addition erosion on site.

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Compaction.

The soils are at risk of compaction and grazing with large Bulls places the soil at a high risk and increasing diversity of the cover crop and retaining cover at 90% along with o higher level of stock rotation will alleviate this risk.

Drainage

Drainage is critical to these soils and improvements will need to be undertaken along with an Agronomist to see if Calcium or Gypsum will benefit the soil drainage. Deeper perennials to the crop species will deepen soils and allow improvements to act to a deeper level.

Water Quality

This site is an alluvial plain adjunct to a major waterway and fertiliser use requires a 'best practice" to limit loads entering the waterway and drainage lines on site. Applications of fertiliser may need to be added in several applications; Nitrogen for example is limited to a maximum application of 50kgN/ha with at least 21 days between applications. Never apply N to water stressed soils, compacted soils or waterlogged soils. Sites at risk of impacting on water quality must ensure that professional advice is followed to ensure that the risk to water quality is mitigated too as low as possible. Dams that retain water will need to be fenced and vegetation will need to be increased to filter water into the dam to improve water quality.

Remnant Vegetation

This site is important for its remnant vegetation not only for biodiversity but soil stability, carbon storage, amenity and tourism.

The remnants of the riparian EVC are at risk from fragmentation and subsequently become succinct over time. The riparian area requires a 'best practice" minimum width of 30m along the south boundary which is fenced and managed for weeds. This area will require

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restoration that is indicative of at least 60% of the benchmark EVC to provide for biodiversity and filtering of run off from entering the waterway.

Climate abatement

Climate abatement is an important factor in all farming enterprises and retaining cover, increasing biodiversity, increasing root depth, plantation of trees, restoring poor drainage will all store or contribute to the loss of carbon and NO_2 that all contribute to climate change.

Threatened species.

This location has recorded VBA sightings for the following threatened species:

- Growling Grass Frog- Threatened FFG Act
- Platypus- Vulnerable FFG Act
- Trout Cod- Extant EPBC Act
- Eastern Snake-necked Turtle
- Royal Spoonbill

Platypus

Platypus (Ornithorhynchus anatinus) is a semi-aquatic animal, historically present in waterways throughout much of Victoria. In 2021, this species was listed as vulnerable in Victoria under the Flora and Fauna Guarantee Act 1988, in recognition of its decline in distribution and abundance in the last 30 years. Platypus tend to occur in areas that



have stable banks for burrowing, intact streamside vegetation, aquatic invertebrates for food, complex aquatic habitats (including woody structures), and reliable water flows. The species is threatened by a range of human activities, mostly related to changes in land use and waterway condition. Populations can become fragmented because of instream barriers (e.g. weirs, dams),

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reduced surface water, and poor habitat quality; this can lead to an increased risk of local extinctions after events such as floods and bushfires.

Revegetation of streamside areas and construction of 'log jams' (a complex array of wood secured into the creek bed/bank) these log jams help reduce bank erosion, encourage creation of pools and low velocity refuges, and act as refuge areas to hide from predators.

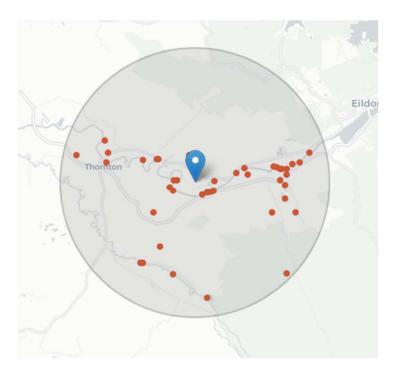


Image.45 recorded sightings of Platypus (103 records) near the site (ALA sourced 6/12/2023)

What you need to manage?



Restore riparian vegetation.

Fence riparian area to exclude stock.

Prevent farming activities such as fertilising from impacting on water quality. Control pest animals such as cats and foxes. his copied document is made available for the sole purpose of enabling its consideration and eview
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Eastern Snake-necked Turtle

The Eastern Snake-necked Turtle (Chelodina longicollisa)lives in freshwater environments and feeds on aquatic invertebrates, tadpoles and small fishes.

As its name suggests, this turtle has a long neck, which is usually about half the length of its carapace (shell). It has webbed feet used for swimming and digging. The colour of



the carapace varies through shades of brown.

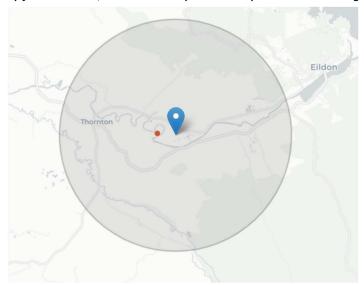
Most of the Eastern Snake-necked Turtle's time is spent in the water, but it can make overland movements in search of new waterholes and nesting areas.

The Eastern Snake-necked Turtle feeds on aquatic invertebrates, tadpoles and small fishes.

Also known by another common name of 'stinker', the Eastern Snake-necked Turtle can eject pungent liquid gland secretions from its 'armpits' and groin when handled or disturbed.

In summer, female Eastern Snake-necked Turtles dig holes in sand or in soft sediments along stream banks and lay about ten eggs.

The Eastern Snake-necked Turtle's eggs occasionally provide a meal for Water-rats and lizards. Hatchlings are eaten by fish and birds, and adults may be killed by cars while moving overland.



What you need to manage?



Restore riparian vegetation.

Fence riparian area to exclude stock.

Prevent farming activities such as fertilising from impacting on water quality.

Control pest animals such as cats and foxes.

Trout Cod

The Trout Cod Maccullochella
macquariensis is a moderately large
freshwater percicthyid fish endemic to the
Murray-Darling River system in southeastern Australia. It has suffered a



catastrophic decline in range and abundance, to the point where just one natural population remains in the wild. The Trout Cod is Listed as Endangered under the Australian Government Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). The first national Recovery Plan for the Trout Cod was prepared in 1994 (Douglas et al. 1994), and revised in 1998 (Brown et al. 1998). This version builds on these earlier plans and relies heavily on the information and ideas contained in those plans. This plan details the species' distribution and biology, conservation status, threats, and recovery objectives and actions necessary to ensure the longterm survival of the Trout Cod. At present only two potentially sustainable, breeding populations of Trout Cod are known: a naturally occurring population in the Murray River (NSW) downstream of the Yarrawonga Weir between Yarrawonga and Barmah (Cadwallader & Gooley 1984; Ingram et al. 1990; Douglas et al. 1994), and the translocated population in Seven Creeks below Polly McQuinns Weir (Vic) (Cadwallader 1979; Morison & Anderson 1987; Richardson & Ingram 1989). There have been no recent records of wild adult Trout Cod in the Murray River downstream from Echuca (NSW, SA), Macquarie River (NSW), Murrumbidgee River (NSW, ACT), and the Goulburn, Broken, Campaspe, Ovens, King, Buffalo and Mitta Mitta Rivers (Vic). The wild populations formerly occurring in these rivers are now probably extinct.

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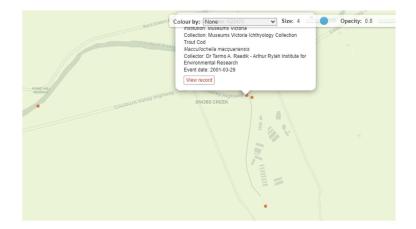


Image.47. could still be in the area as a recent siting from the Arthur Ryall Institute.

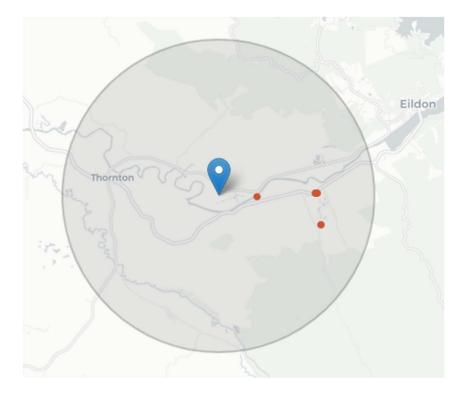


Image.48. recorded sightings of Trout Cod (6 records) near the site (ALA sourced 6/12/2023)

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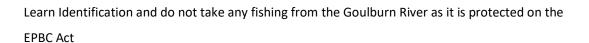
What you need to manage?

Restore riparian vegetation.

Fence riparian area to exclude stock.

Prevent farming activities such as fertilising from impacting on water quality.

Control pest animals such as cats and foxes.



Growling Grass Frog

The Growling Grass Frog Litoria raniformis, also known as the Southern Bell Frog or Warty Bell Frog is distributed across southeastern Australia, being found in New South Wales (Riverina area), Victoria, Tasmania and south-eastern South Australia. It is a large diurnal frog that



was common and widespread across its range but declined quite suddenly from about 1990 and is now uncommon and threatened. It was listed as a threatened species under the Victorian Flora and Fauna Guarantee Act 1988 in 2001 and declared endangered in 2002 due to a significant decline across much of its range. The conservation status was changed from endangered to vulnerable as part of the Conservation Status Assessment Project in 2020, it is now considered Vulnerable (FFG Threatened list 2022). Distinguishing features are bright to olive-green colour, warty back (with brown blotches in the adult), dorso-lateral fold, and distinct tympanum (ear). The Growling Grass Frog needs still or slow moving water with emergent vegetation around the edges and mats of floating and submerged plants. They can live in artificial waterbodies, such as farm dams, irrigation channels and disused quarries. Favourable habitat features include abundant aquatic vegetation, minimal tree canopy cover, waterbodies with salinity less than 7.0 mS/cm or (7000 EC) which hold water for at least six months of the year. A cluster of waterbodies

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(within 700 m) allows frogs to move between sites as conditions change. They usually move on rainy nights.

Grass and shrub cover on the banks is also important for the emerging froglets to gain protection from predators and to acquire insect prey as a food source. The Growling Grass Frog has been recorded 200 metres from water, so they will readily migrate from a drying site to a stable site with suitable habitat. This species inhabits a wide variety of habitats from wet to very dry and this needs to be taken into account when decisions are being made relating to their survival. Breeding begins in August when calling males begin being able to attract females, although females usually don't begin to lay eggs until October – November.

Males will continue calling until the end of March but females don't usually respond unless the season is very wet and warm.

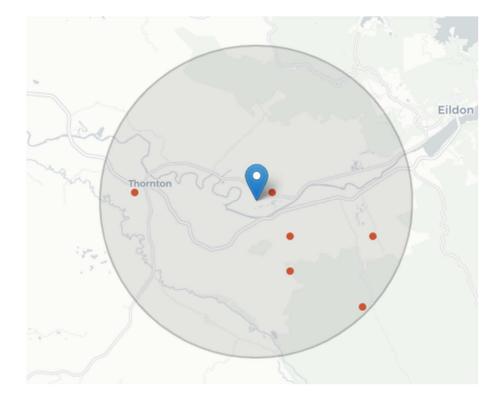


Image.49 recorded sightings of Growling Grass Frog (23 records) near the site (ALA sourced 6/12/2023)

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What you need to manage?

Restore riparian vegetation.

Fence riparian area to exclude stock.

Prevent farming activities such as fertilising from impacting on water quality.

Control pest animals such as cats and foxes.

Revegetate dams on site for frog habitat.



The Royal Spoonbill is a large white waterbird with a black spoon-shaped bill. Their facial skin, legs and feet are also black in colour. During the breeding season, it has a distinctive crest on the back of head or nape of neck, which can be up to 20 cm long in male birds.

Females also have a crest during breeding season but is smaller than the males. The crest can be erected during mating displays to show bright pink skin underneath.

They have a yellow patch above the eye and a red patch in the middle of the forehead, in front of the crest feathers. Their large spoon-shaped bills easily distinguish



spoonbills from all other water birds. Its black face, bill and legs all distinguish the Royal Spoonbill from the slightly larger, Yellow-billed Spoonbill, which has a yellow bill and legs. The Royal Spoonbill forms pairs for the duration of the breeding season and nest in colonies alongside many other waterbirds, including Yellow-billed Spoonbills, ibis, herons and cormorants. Nest sites of a solid bowl-shaped nest is built of sticks in the crown of a tree and may be reused year after year. Both sexes incubate the eggs and feed the young. The young are often fed by both parents for several weeks after fledging and young birds will forage alongside their parents for some time before the family group disperses.

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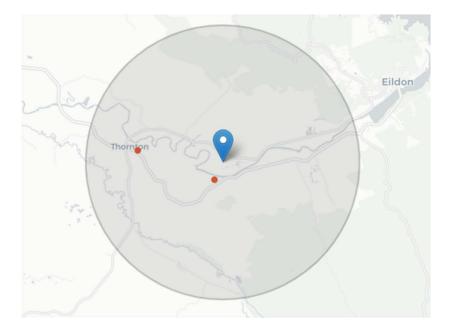


Image.50 recorded sightings of Royal Spoonbill (3 records) near the site (ALA sourced 6/12/2023)

What you need to manage?



Restore riparian vegetation.

Do not overgraze paddocks along riparian areas.

Fence riparian area to exclude stock.

Prevent farming activities such as fertilising from impacting on water quality.

Control pest animals such as cats and foxes.

Pests

Pest animals evidence noted on site and advised by the owner are rabbits and deer. These species must be monitored, and control of numbers need to be undertaken to ensure that there is no increase in decline of biodiversity. These pest species are difficult to control on just one site and require a landscape response to have an impact of numbers.

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Pest animals-Rabbits

Evidence of rabbit burrow were not evident on the site visit, but I did not have access to the full site and as these are a high-risk pest that can impact the biodiversity and water quality and require ongoing monitoring.



What you need to manage?



- Identify burrows and destroy burrows.
- Avoid storing debris on site that can become habitat for rabbits.
- Avoid baits due to raptors in the area that can be impacted (Secondary) due to predation.
- Purchase vials of the Callici virus and follow instructions for use.
- Shooting of rabbits if safe to do and in consultation with adjacent landholders.

Pest animals-Foxes

No scats or evidence of foxes were seen on the site visits however they are quite cryptic and often not seen.

What you need to manage?

- Monitor for fox scats.
- Monitor for fox dens.
- Destroy any dens found.
- Baiting can be undertaken by a qualified professional.
- Sooting or trapping is difficult in built up areas.



How to tell if management of pest species is not working:

- Animals are regularly sighted on the property.
- Loss of native vegetation and destruction of soil is increasing.

At this point bring in a professional is imperative.



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Ecology

As discussed earlier the site is mapped to be EVC 56 Floodplain Riparian Woodland and a copy of the benchmark is in Appendix.3

This following is an explanation of how to understand a EVC Benchmark with example images (from other sites) to educate the landowner to understand how to understand the ecology of the site.

Native Vegetation, Logs and Coarse Woody Debris



Image 51 old logs on a site- example

Native vegetation, logs and coarse woody debris contribute to the ecological value and character of the site, including providing habitat for native fauna species.

What you need to manage?

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• Ensure all native vegetation, both dead or alive, is retained including standing dead trees, fallen logs, branches and leaf litter, outside the defendable space on site.

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- Harvesting or collecting of timber for firewood or other uses is not permitted. Removal of
 exotic trees and shrubs for weed control is permitted; Tree removal must ensure that bunds
 are used to control any soil movement into the waterway to ensure water quality.
- Ecological thinning of regenerated canopy trees, or recruits from other species of native
 vegetation is recommended should the survival of existing individuals be negatively
 impacted, or if the fire risk within the site is significantly increased from current levels. This
 would need to be verified by a consultant arborist and with the approval of Council.
- Installation of logs is permitted to increase habitat value for fauna and to provide habitat.
- Fire risk within the site is not increased; and,
- Only weeds or out of balance native species are removed.

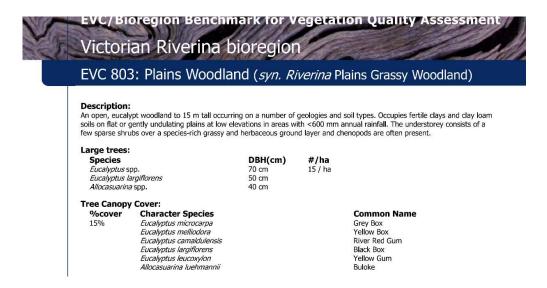


Image. 52 Benchmark-trees- Example

To understand how to manage the site and to understand what parts of the site requires attention is to learn how the benchmark components relate to the site.

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The benchmark is contained in Appendix.4.

So if you find any trees on site with a measurement of 2.1 then that trees is deemed to be a large old growth tree and most likely reaching the age when it will have hollows that support (tree) arboreal mammals and nesting areas for birds. These are essential important to your site.

There are listed tree species that you find in this EVC; your site contains:

- Eucalyptus goniocalyx
- Eucalyptus leucoxylon
- Eucalyptus macrorhyncha

Understore	y:
-------------------	----

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	ΙΤ
Medium Shrub	2	1%	MS
Small Shrub	1	1%	SS
Large Herb	1	5%	LH
Medium Herb	11	25%	MH
Small or Prostrate Herb	2	5%	SH
Large Tufted Graminoid	1	5%	LTG
Medium to Small Tufted Graminoid	15	45%	MTG
Medium to Tiny Non-tufted Graminoid	2	5%	MNG
Bryophytes/Lichens	na	10%	BL

Image. 52 Lifeforms- example

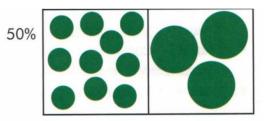
To understand this you will need to refer to Appendix.5.. that explains the lifeforms.

For example your site to be of benchmark quality for the Medium to small tufted graminoid should have 15 species with a coverage if 45% of the site



Medium to Small Tufted Graminoid (MTG)

'Tussock' grass or grass-like plant between 10 cm and 1 m tall.



Images 53 and 54 Graminoides and cover example.

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LF Code MS MS MS MS SS SS SS LH LH MH MH MH	Species typical of at least part of EVC range Acacia montana Acacia acinacea s.l. Acacia pycnantha Pittosporum angustifolium Pimelea curvifiora s.l. Eutaxia microphylla var. microphylla Enchylaena tomentosa var. tomentosa Sclerolaena diacantha Ajuga australis Senecio quadridentatus Calocephalus citreus Maireana enchylaenoides Einadia hastata	Common Name Mallee Wattle Gold-dust Wattle Golden Wattle Weeping Pittosporum Curved Rice-flower Common Eutaxia Ruby Saltbush Grey Copperburr Austral Bugle Cotton Fireweed Lemon Beauty-heads Wingless Bluebush Saloop
MH SH SH SH LTG MTG MTG MTG	Einadia nutans ssp. nutans Crassula sieberiana Actinobole uliginosum Oxalis perennans Calotis hispidula Austrostipa aristiglumis Austrodanthonia caespitosa Dianella revoluta s.l. Austrostipa scabra Enteropogon acicularis	Nodding Saltbush Sieber Crassula Flannel Cudweed Grassland Wood-sorrel Hairy Burr-daisy Plump Spear-grass Common Wallaby-grass Black-anther Flax-lily Rough Spear-grass Spider Grass

Images 55 Typical species of an EVC



Image. 56 Typical Image of Box Ironbark Forest-example

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Recruitment: Continuous

Organic Litter:

10 % cover

Logs: 10 m/0.1 ha. Pic.32

Image. 57 Benchmark showing recruitment, organic litter and logs-example.

Recruitment means growth of new plants and this should occur on an ongoing basis (continuous).

Monitoring- Native Vegetation

Monitoring of native vegetation is best taken using Photo points as noted on the Land Management Plan. You use these points to take pictures over time and can make a comparison of how the area has changed over time.

How to tell if management of vegetation is not working:

The site begins to degradation of vegetation and habitat quality.



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Weeds on site

Blackberry

Rubus fruiticosa spp.agg (Blackberry)

It is a semi-prostrate to almost-erect shrub, with arching and entangling stems arising from a woody crown and forms thickets up to several metres high. The root/crown system is the only perennial part of the plant.

Blackberry stems are erect, or semi-erect, canes that arch or trail up to 7 m long. They can be green, purplish or red, smooth or moderately hairy, round or angled, with numerous curved or straight prickles of different sizes and sometimes with small, stalked glands.

Life cycle Germination: Seed

germinates September to November. Blackberries can also spread by daughter plants.

Noxious Blackberry fruit are eaten by birds, foxes Blackberry is an extremely and other mammals which distribute seeds over wide areas. Seeds are transported by serious agricultural threat, owing to its rapid growth and water along creeks, drains and rivers. ability to reproduce through Movement of contaminated soil and Flowering: December to various methods. It is a highly cultivationand spread blackberry. invasive species that will Infestations increase in size via the Fruiting: February to April readily establish on disturbed formation of daughter plants at the end of sites and infest large areas. canes, up to 6 m from the crown. Blackberry Once established it is seedlings are not very vigorous in their fist expensive to manage and can year but after a woody crown is formed, even be a fire hazard due to they become firmly established. New canes large amounts of dead canes. are produced from the crown each spring and frequently project horizontally for over 3 m from the crown after one growing season.



Along waterlines to the north-east corner of the site spreading from the adjacent lot to the north

Control options within the site

Prescribed measures for the control is: Application of a registered herbicide

Physical removal

Removal along waterways is best undertaken by a registered consultant to avoid any impacts of the herbicide on the aquatic life and water quality.

Spear Thistle

Cirsium vulgare (Spear Thistle) Description

An annual or short-term perennial herb with erect Germination: Autumn to Noxious growth to 1.5 m tall. Stems have spiny wings and are cobwebby. Leaves

are obovate to lanceolate (spear-like), to 30 cm long and toothed to deeply lobed with spiny margins. Upper leaf surface is dark green and rough while the lower surface is white with short matted hairs. The purple flower-heads are 12-40 mm diameter surrounded by long recurved spiny bracts. Fruit is an achene 3-6 mm long with a pappus (a ring of hairs that aid wind dispersal) 2-3

Life cycle Dispersal methods

Spread by vehicles, on clothes and by stock Flowering: December to passing. Seed is readily dispersed by the wind. February Fruiting: March-April

Distribution across the site

Minimal through the site and only recent germination occuring so quick control is likely to bring the infestation under control

Control options within the site

Control options on site are hand removal while the plant is young. Older plants are best controlled with the use of a herbicide. The use of herbicide near water is best undertaken by a contractor that is able to ensure that impacts are avoided.

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Sweet Vernal Grass

Description	Life cycle	Status	Dispersal methods
A sweetly fragrant, tufted perennial grass with green to golden brown, compact, cylindrical seed heads. The tussock of leaves is usually about 25 cn high and wide with many simple stems about 50 cm tall holding the seed heads well above the leaves. Tolerates trampling and full sun to light shade. It is quite tolerant of dense native vegetation especially in wet areas.	Germination: Autumn Flowering: September n to January Fruiting: Summer	Environmental weed	Spread by seed and rhizomes. May produce more than 1250 seeds perplant. Most seed germinates with a year or two but some appears to remain dormant for several years.



Distribution across the site

Minor in low wet areas on site

Control options within the site

Control is by herbicide spray during the growth season (spring) care needs to be taken to avoid drifting spray onto nearby vegetation. The use of a cone on a spray lance is suggested. Repeat spraying of emergent seeds in Autumn.

Willow

Willow removal to be undertaken in consultation with the Goulburn Broken Catchment Management Authority. This copied 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.
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Weed Control

Large Woody Weeds

Large woody weeds (over 25cm circumference) are controlled with a drill and fill method, use the following method:

- Drill hole to 2-3 cm deep, as close to eh base of the tree as possible.
- Fill the hole immediately with a recommended herbicide for woody weeds.
- Repeat this process at intervals of 3-5cm around the base including any exposed roots.



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Small to medium woody weeds

Any smaller woody weed use the following method:

- Make a clean cut with a saw or loppers as close to the base as possible.
- Immediately apply a suitable herbicide for woody weeds to the base of the cut
- Do not use this method in hot dry conditions as the herbicide is not taken up well in dry periods.
- Cut stems with seed and flowers; cover and remove to a waste station do not sore on site

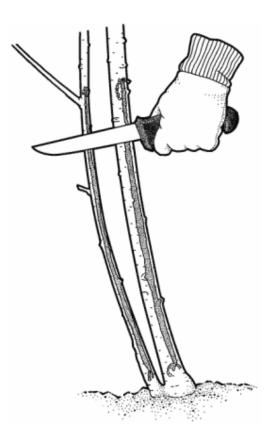


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Vines and scrambler weeds

For vines and scramblers with woody stems use the following method:

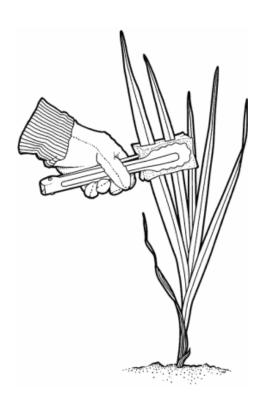
- Using a knife, and starting from the base, scrape
 20–100 cm of the stem to expose the sapwood, just below the bark.
- Within 20–30 seconds, apply undiluted herbicide to the scraped area.
- Try to scrape all the main stems.
- Do not ringbark the stem: scrape only one third of the diameter or less.
- Stems larger than 1 cm in diameter can be scraped on both sides.



Bulbs

For bulbs, tubers, corms or any green non-woody plants use this method:

- Remove and bag any seed or fruit.
- Using a weed wiper, start at the base and wipe all the stems and/or leaves with a dilute mix of herbicide.
- If leaves have soil on them, wipers must be regularly washed.
- Take great care when wiping: do not allow the herbicide
 to touch your skin or to run off into the soil, or to get on a
 non-target plant. Wear safety glasses to avoid being
 splashed.



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Spraying

Smaller non woody plants can be controlled using this method:

- First read above about using herbicides, safety precautions, the conditions of use, when to treat with herbicide,
- Spray at the correct stage of a plant's growth, at the right time of day, and when there is no wind.
- Spray at low volume, using the minimum amount of herbicide.
- Spray low: it is often best to cut a weed down to near ground level, then spray the regrowth.
- Avoid off-target damage from spray drifting on to desirable plants.
- Do not spray near watercourses.
- Keep children and pets away from the sprayed area until the next day.

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Land Management Plan

	MANAGEMENT TIME LINE						
	WEED SEEDLINGS	WEED PLANT	Pest Animals	Fencing	Other as required	Completed	
	Monitor and spray	Monitor and spray	Organise release of virus on site	Monitor and erect	House any cats in		
	any emergent weeds	flowering Blackberry and	if required	fencing to riparian	permanent house/runs to		
		Sweet Vernal		area-immediately	ensure they cannot		
					predate on wildlife.		
JANUARY							
JANOAN	Monitor and spray	Monitor and spray	Monitor for evidence of rabbit	Maintain existing	Post fire all hollow		
	any emergent weeds	' '		fences to riparian	bearing trees to be		
	, , , , , , , , , , , , , , , , , , , ,	,	dens and organise a contractor to	•	tagged and guards placed		
			control once their presence is		to stop arboreal mammals		
			confirmed. Manage with		from gaining access to		
			shooting and or ferreting		trees and predating on		
FEBRUARY					bird species		
1 2511071111	Monitor and spray	Monitor and spray	Monitor for evidence of rabbit	Maintain existing	Report any sightings of		
	seedlings of Sweet	flowering Spear Thistle,	and fox scats, dens. Destroy and	fences to riparian	threatened species on		
	Vernal	Blackberry	dens and organise a contractor to	area	site		
		·	control once their presence is				
			confirmed. Manage with				
			shooting and or ferreting				
MARCH							
	Monitor and spray	Monitor and spray	Monitor for evidence of rabbit	Maintain existing	Install nesting boxes to		
	seedlings of Sweet	,	and fox scats, dens. Destroy and	fences to riparian	riparian area.		
	Vernal	Blackberry	dens and organise a contractor to	area			
			control once their presence is				
			confirmed. Manage with				
			shooting and or ferreting				
APRIL							

This report explains
how to understand
the site and how risks
can be amelliorated..
This report covers a
10 Year period and
should be ongoing.
Management of highrisk weeds and pest
animals are a primary
objective and this is
covered in the
management of each
zone.

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	MANAGEMENT TIME LINE						
	WEED SEEDLINGS	WEED PLANT	Pest Animals	Fencing	Other as required	Completed	
	Monitor and spray	Monitor and spray any	Monitor for evidence of rabbit	Maintain existing	Clear weeds out of		
	seedlings of Spear	weeds	1	•	riparain area- immediate		
	Thistle and Sweet		dens and organise a contractor to	area			
	Vernal		control once their presence is				
			confirmed. Manage with				
			shooting and or ferreting				
MAY							
	Monitor and spray	Monitor and spray any	Monitor for evidence of rabbit	Maintain existing	Work with CMA to clear		
	seedlings of Spear	weeds	and fox scats, dens. Destroy and	fences to riparian	Willow		
	Thistle		dens and organise a contractor to	area			
			control once their presence is				
			confirmed. Manage with				
JUNE			shooting and or ferreting				
	Monitor and spray	Monitor and spray any	Monitor for evidence of rabbit	Maintain existing	Look for a source of		
	seedlings of Spear	weeds	and fox scats, dens. Destroy and	fences to riparian	Indigenous Vegetation		
	Thistle		dens and organise a contractor to	area			
			control once their presence is				
			confirmed. Manage with				
JULY			shooting and or ferreting				
	Monitor and spray	Monitor and spray any	Monitor for evidence of rabbit	Maintain existing	Order tree species, plant		
	seedlings of Spear	weeds		fences to riparian	(late Winter) and		
	Thistle		dens and organise a contractor to	area	maintain		
			control once their presence is				
			confirmed. Manage with				
AUGUST			shooting and or ferreting				

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MANAGEMENT TIME LINE						
	WEED SEEDLINGS	WEED PLANT	Pest Animals	Fencing	Other as required	Completed
SEPT	Monitor and spray seedlings of Blackberry	Monitor and spray flowering Sweet Vernal	Monitor for evidence of rabbit and fox scats, dens. Destroy and dens and organise a contractor to control once their presence is confirmed. Manage with shooting and or ferreting	Maintain existing fences to riparian area	Order shrub and grass species, plant (Late Winter) and maintain cover (Replace lost plants)	
ОСТ	Monitor and spray seedlings of Blackberry	Monitor and spray flowering Sweet Vernal	Monitor for evidence of rabbit and fox scats, dens. Destroy and dens and organise a contractor to control once their presence is confirmed. Manage with shooting and or ferreting	Maintain existing fences to riparian area	Reduce pasture size to 1ha size (temporary fence)and rotate stock, maintain 90% cover at all times	
NOV	Monitor and spray seedlings of Blackberry	Monitor and spray flowering Sweet Vernal	Monitor for evidence of rabbit and fox scats, dens. Destroy and dens and organise a contractor to control once their presence is confirmed. Manage with shooting and or ferreting	Maintain existing fences to riparian area	Organise Agronomist to check soil health and work with recommendations	
DEC	Monitor and spray any emergent weeds	Monitor and spray flowering Blackberry, Sweet Vernal	Monitor for evidence of rabbit and fox scats, dens. Destroy and dens and organise a contractor to control once their presence is confirmed. Manage with shooting and or ferreting	Maintain existing fences to riparian area	Allow natural drainage across site, install pipes, fence off wet areas when grazed.	

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Riparian Restoration

Watercourses and the adjacent riparian areas are important for farming as they are important assets for biodiversity. They rely on suitable vegetation clear of weeds and pest animals to provide habitat for many threatened species and are essential for protecting water quality.

Why are these important for a farm?



Filters nutrients and debris from adjacent paddocks and maintains water quality that can be used for the farm.

Slows run off and reduces erosion and prote4cts soils

Stabilises banks from erosion.

Dissipates flood energy and reduces intensity of flooding downstream

Slows water movement and deposits sediment on the adjacent plains to increase fertility

Increases property value (amenity value)

Provides nesting opportunities and brings in birds that predate on insects.

Provides shade to livestock.

Stock exclusion protects:

Trampling of banks and slumping

Allows for protection of habitat and vegetation

Minimises bacterial levels (faeces) and the impacts on wtaer quality and

transmission of diease to other farms

Supports old growth trees habitat from loss supporting threatened species.



Restoration

The EVC Benchmark is in Appendix 3 with a plant list in Appendix.4 and the lifeforms are decribed in Appendix.5 In restoration it is imperative to purchase Indigenous plants from within 100km of the site to be similar in providence.

The benchmark has trees to 15% cover and after the weed species are removed then the coverage can be estimated and the required species planted to ensure a 15% coverage.

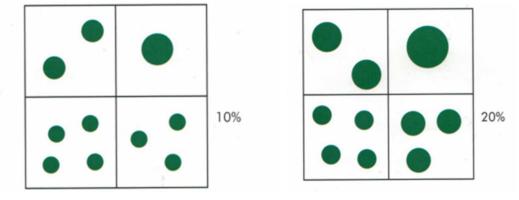


Image 58 example of 10-20% cover

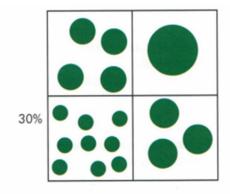
The trees are an important factor in the restoration so a revegetation close to the benchmark is preferred for this site due to its potential for habitat.

The species of trees are listed in Appendix.4 and marked in Purple

Shrubs have an optimum coverage of 26% so restoration should aim to at least 60% with a desired coverage of 16%- these are marked in Orange on the planting list

Herbs maybe difficult to source and the benchmark has a coverage of 21% and 60% of that is a cover of 13%- these are marked in Red on the planting list

The Graminoides (Grass-like) are listed as 40% cover on the benchmark and it is imperative for habitat and water quality that the restoration area aim towards this level of coverage- these are marked in Green on the planting list.



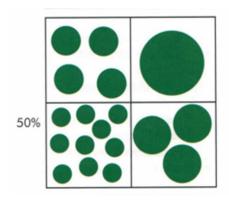


Image 59 example of 30-50% cover

Land Management Zones

There are 3 zones on site:

- Domestic area
- Farming
- Conservation Zone- Riparian

Domestic zone

All buildings, structures and works are to be contained within this zoner. All domestic activity is to be limited to this area and any domestic animals contained to this zone using internal fencing or suitable enclosures. This is the only zone where vehicle access is allowed.

Conservation Zone -Riparian

The objective of the conservation area is for the protection of the native vegetation and faunal habitat.



Management objectives apply to this area:

- Fencing must be maintained in good order and repaired immediately if necessary.
- No grazing by livestock
- There is no stockpiling/storage, soil disturbance or any vehicles.
- Landowner must maintain and protect all whether live or dead native vegetation and allow for natural regeneration.
- Area to be restored with Indigenous vegetation
- Weeds must be monitored and maintained as they emerge.
- Photo points are to be established and images collected each year to understand how the area is responding to management.
- Fencing must ensure that all barbed wire is removed and replaced with single wire strand or plastic covered wire.
- Nesting boxes can be installed throughout this area for threatened species.

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- 90% cover to be always maintained.
- The landowner must monitor for pest animals and obtain professional advice for the control especially where they are having an impact on soils and native vegetation.
- Landowner to protect this area from domestic and stock animals.
- No removal of material for firewood

Farming zone

All farming activities in this area and land holder is to ensure that the soils are regularly monitored and improved to best parctice to ensure

- Climate change is mitigated
- Water qualityis protected at all times
- Erosion is avoided
- Stock is rotated on a regualr basis to ensure cover does not fall below 90% cover
- Exclude stock from wet drainage lines with temporary fences
- Install pipes to enable waters to pass under access routes
- Large paddocks when grazed to be reduced in size to keep stock moving
- Pest weeds and animals are regularly monitored and controlled
- Dams are fenced and restored with grasses either native or exotic
- Crop diversity is increased and soil health is prioritised

Riparian weed control



The following recommendations are required during weed removal along the waterway:

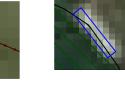
- Trees and other native to be retained must be clearly marked and their drip zone or a minimum of 4m radius from the stem must be protected by temporary fencing,
- Removal of vegetation is limited exotic and weed species.
- Removal is undertaken by a suitably qualified contractor

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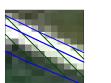
Appendix.1 Existing Plan

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DWG TITLE: FMP PLAN

DATE: MAR 2023 PROJECT NO: 2540

PROJECT: 426 Back Eildon Road, Thornton

FROM DRAWINGS DO NOT SCALE

Note:The contractor shall verify all dimensions and all underground services at the site before commencing work. The contractor shall verify all levels from the consulting engineer prior to construction.

Wellijy all levels from the Consulting engineer prior to constituction.

South

Construction

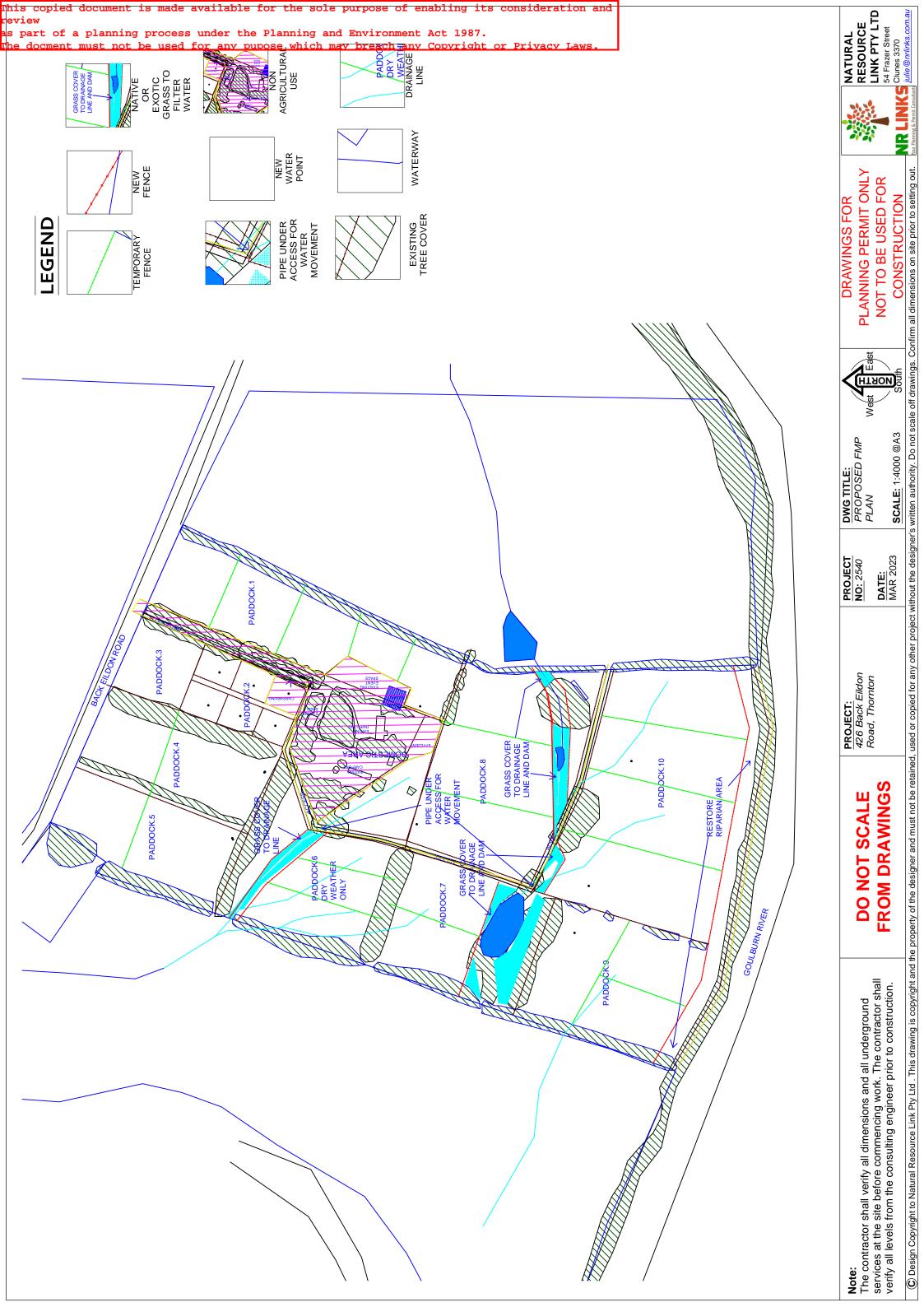
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Appendix.2 Proposed LMP Plan





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Appendix.3 EVC 56

Description:

An open woodland to 20 m tall usually dominated by Red Gum *Eucalyptus* spp. over a medium to tall shrub layer with a ground layer consisting of amphibious and aquatic herbs and sedges. Occurs along the banks and floodplains of the larger meandering rivers and major creeks, often in conjunction with one or more floodplain wetland communities. Elevation and rainfall are relatively low and soils are fertile alluviums subject to periodic flooding and inundation.

Large trees:

 Species
 DBH(cm)
 #/ha

 Eucalyptus spp.
 80 cm
 15 / ha

EVC 56: Floodplain Riparian Woodland

Tree Canopy Cover:

%coverCharacter SpeciesCommon Name15%Eucalyptus camaldulensisRiver Red-gum

Understorey:

Life form	#Spp	%Cover	LF code
Immature Canopy Tree		5%	IT
Understorey Tree or Large Shrub	2	10%	T
Medium Shrub	6	15%	MS
Sma ll Shrub	1	1%	SS
Large Herb	4	10%	LH
Medium Herb	4	10%	MH
Small or Prostrate Herb	1	1%	SH
Large Tufted Graminoid	3	10%	LTG
Large Non-tufted Graminoid	2	10%	LNG
Medium to Small Tufted Graminoid	3	10%	MTG
Medium to Tiny Non-tufted Graminoid	3	10%	MNG
Ground Fern	1	5%	GF
Scrambler or Climber	1	5%	SC
Bryophytes/Lichens	na	10%	BL

LF Code	Species typical of at least part of EVC range	Common Name
Т	Acacia dealbata	Silver Wattle
MS	Hymenanthera dentata s.l.	Tree Violet
MS	Cassinia aculeata	Common Cassinia
MS	Kunzea ericoides	Burgan
SS	Rubus parvifolius	Small-leaf Bramble
MH	Acaena novae-zelandiae	Bidgee-widgee
SH	Hydrocotyle laxiflora	Stinking Pennywort
LTG	Carex appressa	Tall Sedge
LTG	Poa labillardierei	Common Tussock-grass
LNG	Phragmites australis	Common Reed
MTG	Juncus amabilis	Hollow Rush
MTG	Cyperus Ihotskyanus	Creeping Flat-sedge
MNG	Microlaena stipoides var. stipoides	Weeping Grass
MNG	Distichlis distichophylla	Australian Salt-grass
GF	Pteridium esculentum	Austral Bracken
EP	Muellerina eucalyptoides	Creeping Mistletoe



EVC 56: Floodplain Riparian Woodland - Central Victorian Uplands bioregion

Recruitment:

Episodic/Flood. Desirable period between disturbances is 10 years.

Organic Litter:

40 % cover

Logs:

30 m/0.1 ha.

Weediness:

LF Code	Typical Weed Species	Common Name	Invasive	Impact
Т	Pinus radiata	Radiata Pine	high	high
Т	Crataegus monogyna	Hawthorn	high	high
MS	Rosa rubiginosa	Sweet Briar	high	high
MS	Ulex europaeus	Gorse	high	high
MS	Rubus fruticosus spp. agg.	Blackberry	high	high
LH	Foeniculum vulgare	Fenne l	high	high
LH	<i>Verbena bonariensis</i> s.l.	Purple-top Verbena	high	high
LH	Cirsium vulgare	Spear Thistle	high	high
LH	Sonchus oleraceus	Common Sow-thistle	high	low
LH	Plantago lanceolata	Ribwort	high	low
LH	Rumex crispus	Curled Dock	high	low
LH	Sonchus asper s.l.	Rough Sow-thistle	high	low
LH	Solanum nigrum sensu Willis (1972)	Black Nightshade	high	low
LH	Silybum marianum	Variegated Thistle	high	high
LH	Rorippa palustris	Marsh Yellow-cress	high	high
MH	Hypochoeris radicata	Cat's Ear	high	low
MH	Acetosella vulgaris	Sheep Sorrel	high	low
MH	Trifolium dubium	Suckling Clover	high	low
MH	Trifolium subterraneum	Subterranean Clover	high	low
MH	Cerastium glomeratum s.l.	Common Mouse-ear Chickweed	high	low
MH	Prunella vulgaris	Self-heal	high	low
MH	Anagallis arvensis	Pimpernel	high	low
SH	<i>Trifolium repens</i> var. <i>repens</i>	White Clover	high	low
SH	Polygonum aviculare s.l.	Prostrate Knotweed	high	low
SH	Callitriche stagnalis	Common Starwort	high	high
LTG	Phalaris aquatica	Toowoomba Canary-grass	high	high
LNG	Holcus lanatus	Yorkshire Fog	high	high
MTG	Lolium multiflorum	Italian Rye-grass	high	low
MTG	Cyperus eragrostis	Drain Flat-sedge	high	high
MTG	Bromus hordeaceus ssp. hordeaceus	Soft Brome	high	low
MTG	Lolium perenne	Perennial Rye-grass	high	ow
MTG	Vulpia bromoides	Squirrel-tail Fescue	high	ow
MTG	Critesion murinum	Barley-grass	high	low
MTG	Poa annua	Annual Meadow-grass	high	low
MTG	Bromus diandrus	Great Brome	high	ow
MTG	Bromus catharticus	Prairie Grass	high	low
MTG	Dactylis glomerata	Cocksfoot	high	high
MNG	Paspalum distichum	Water Couch	high	high
SC	Galium aparine	Cleavers	high	low
SC	Vicia sativa	Common Vetch	high	low

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Department of Sustainability and Environment

Floodplain Riparian Woodland

Threatened in the Goulburn Broken Catchment

88% of Floodplain Riparian Woodlands have been cleared. 51% of what remains is on private land.

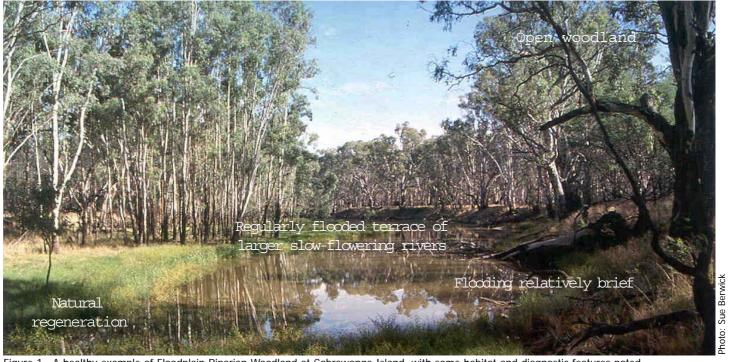


Figure 1. A healthy example of Floodplain Riparian Woodland at Cobrawonga Island, with some habitat and diagnostic features noted.



Figure 2. Floodplain Riparian Woodland in healthy condition. Important to keep to existing tracks to minimise disturbance.

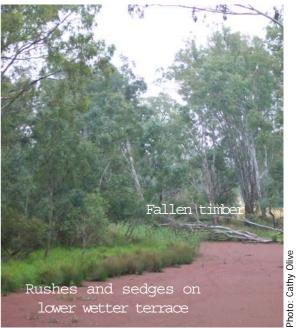


Figure 3. An example of Floodplain Riparian Woodland in good condition on the Goulburn River near Ghin Ghin.





Floodplain Riparian Woodland

Threatened in the Goulburn Broken Catchment

Description

Floodplain Riparian Woodlands occur along the banks of the regularly flooded terrace on larger, slow-moving rivers and major creeks, typically where flooding is relatively brief, and often with other floodplain and wetland communities. They occur at elevations from 100-300m with an annual rainfall of 400-700mm.

The tall woodland overstorey consists predominantly of River Red Gum. There is typically a medium to tall shrub layer of Silver Wattle, with Tree Violet and Blackwood, and occasionally Swamp Paperbark east of Seymour.

The ground layer varies between Common Tussock-grass on the drier elevated banks, and Common Reed and various rushes and sedges occur on the wetter, lower areas. Other species include Blue Devil, Goodenia and Common Sneezeweed.

Species To Look Out For

Flora: Common Joyweed, River Swamp Wallaby-grass (V) and Smooth Minuria (r). **Fauna**: Squirrel Glider (e), Barking Owl (e) and White-bellied Sea-Eagle (v).



Figure 8. Squirrel Glider Photo: Lindy Lumsden





Figure 10. White-bellied Sea-eagle Photo: Mike Carter c/o Viridans



Figures 4-7. River Red Gum, Tree Violet, Tall Sedge, Common Tussock-grass

Photos: Mary Titcumb

Why Floodplain Riparian Woodlands are Threatened

By its nature, riparian land is critical to the lifecycles of many native animals and plants, it provides wildlife corridors as well as being a refuge for animals in times of drought and fire. It is fragile, and its productivity also makes it vulnerable to over-use. It performs a vital link between land and water ecosystems.

88% of Floodplain Riparian Woodlands in the Goulburn Broken Catchment have disappeared since European settlement. Much of the remaining examples of this vegetation type are degraded. Many of the plants and animals that rely on this habitat are now also threatened, and some are extinct. Over 51% of what remains is on private land. Therefore, the support of private landholders is essential for the ongoing conservation of Floodplain Riparian Woodlands.

Current threats include, **changes to natural flooding** (changes floodplain functions, and can result in loss of native flora and fauna species and threatens the viability of remnants), **stock grazing** (causes pugging, erodes the bank, hinders native plant regeneration, increases nutrient levels, and causes loss of native species through selective grazing and trampling), lack of native **understorey** and **ground layer** (which attract insect eating birds helping keep the overstorey healthy, and improve soil health through fixing nitrogen), lack of natural **regeneration**, **weed invasion** and loss of **tree** and **ground habitat** (through timber harvesting, tidying-up of fallen timber and firewood collection).

Floodpiain Riparian Woodland

Threatened in the Goulburn Broken Catchment

Management Tips



Figure 11. Floodplain Riparian Woodland on private property in degraded condition, with pasture grasses, no shrub layer and no natural regeneration of the trees

May require expert input in decision making and planning. See your local DSE, DPI or CMA representative for further advice.



Figure 12. Floodplain Riparian Woodland on private property with some regeneration of trees and understorey.

May require expert input in decision making and planning. See your local DSE, DPI or CMA representative for further advice.

Some additional tips for erosion control

- *Stabilise bed with rock or woody debris and allow beds and bank to be colonised by grass
- *Use range of species grasses, reeds, shrubs and trees
- *Establish vegetation as far down bank as possible as well as on the bank top

Vulnerable

Endangered

Endangered

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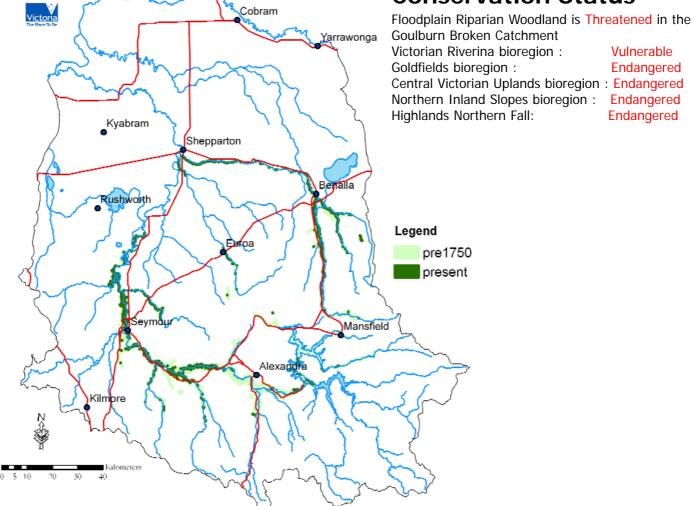


Figure 10. A representation of the pre-1750 and present day distribution of Floodplain Riparian Woodland and its mosaics and complexes in the Goulburn Broken Catchment. The boundaries of the vegetation have been exaggerated to allow for the small scale of the map. The map was produced from Base Data from DSE Corporate Library. The State of Victoria does not warrant the accuracy or completeness of information on this map. Any person using or relying upon such information does so on the basis that the State of Victoria shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

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act on DSE and Glen Johnson, Water and Biodiversity Team, North East DSE; Jenni Nunan, GIS team, DSE, Benalla for producing the maps; for Salinity & Waterfeedback and comments from the Biodiversity Team in the Goulburn Broken and NorthEast, DSE; the DPI LINKS officers and CMOs, the A USTRALIAGBCMA waterways and vegetation officers and to all who contributed photographs and support.

Compiled by: Mary Titcumb, Department of Sustainability and Environment

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Appendix.4 EVC 56 Plant list

as part of a planning process under the Transfer way breach any Copy Floodplain Riparian Woodland

Scientific Name	Common Name	Life Form	Confidence	Reveg S ita Y	Restricte d Species	Speci alis
	<u>e</u>	Tree, Small Tree o arge Shru	ery ig			
Acacia mearnsii	<u>Black Wattle</u>	Tree, Small Tree or Large Shrub	High	4	No	No
Acacia me xy	<u>Blackwood</u>	Tree, Small Tree or Large Shrub	High	4	No	No
Acaena no zel iae	<u>idgee</u> <u>idgee</u>	ediu erb	ery ig	3		No
Alisma p tag aquatica			Hig			
Alternanthera denticulata s.l.	<u>Lesser Joyweed</u>	Medium Herb	High	3	No	No
<u>Apiu annu m</u>	A al elery	Medium Herb	High	1	No	No
Austrodant	Brown-back by-g	Medium to Sma Tufted Graminoid (Gras like p nt	Hig	3	No	No
Austrodanthonia penicillata	Weeping Wallaby- grass	Medium to Small Tufted Graminoid (Grass like plant	High	3	No	No
Bursaria spinos subsp sp			Hig			
<u>Calliste</u> <u>sieberi</u>			Hig			
Calystegia sepium subsp. roseata	<u>Large Bindweed</u>	Scrambler or Climber	High	1	No	No
арр	<u>edge</u>	Large Tufted Graminoid (Grass e plant)	Very High	3	No	No
C ssi ia	С	Medi Shru	Mode e	3	N	N
Centipeda cunninghamii	<u>Common</u> <u>Sneezeweed</u>	Medium Herb	High	2	No	No
Coprosma qu rifida	<u>Prickly</u> b	Medium Shrub	High	2	No	No
	<u>mp</u>	Small or Prost te Her	Hig			
<u>Cy</u> <u>cty</u>		Medium to Tiny Non-Tufted Graminoid (Grass-like pl	Hig			
<u>Cyperus</u> <u>ky</u>	<u>Creeping</u> <u>edge</u>	Medium to Small Tufted Graminoid (Gras e p	Moderate	1	No	No
<u>repe</u>	ey	Small or Prostrate Herb	Hig			

as part of a planning process under the process and may the Central Victorian Uplands Bioregion and may Floodplain Riparian Woodland

	Common Name		Confidence	Reveg	Restricte	Speci
				S y	Sp es	а
<u>Distichlis</u> <u>distichophylla</u>	Austr grass	Medium to Tiny Non-Tufted Graminoid (Grass-like pl	ery ig			
Eleocharis acuta	<u>Common Spike</u> <u>dg</u>	Medium to Tiny Non-Tufted Graminoid (G ss-l ke pl	High	3	No	No
Eucalyptus camaldulensis	<u>-g</u>	Tree, Small Tre or Large Shrub	ry ig			
Eucalyptus ovata	Swamp Gum	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalypt		Small Tree or Large Shrub, M llee ree	High	4	No	No
Eucalyptus viminalis subsp. viminalis		Tree, Small Tre or Large Shrub	Hig			
Geranium sol de .l.	Austral Crane's b II	Medium Herb	High	2	No	No
_ly	Austr g	Medium to II Tufted Graminoid (Gras e pl	Hig			No
Hydrocotyle laxiflora	<u>Stinking</u> <u>Pennywort</u>	Small or Prostrate Herb	High	2	No	No
Hydrocotyle s bthorp	<u>Shining</u> <u>Penny ort</u>	Small or Prostrate Herb	High	1	No	No
Isolepis cer	Nodding dg	Medium II Tufted Graminoid (Grass-like plant	Hig			
<u>Isolepis fluitans</u>	<u>Floating Club</u> <u>sedge</u>	Medium to Small Tufted Graminoid (Gras like pl nt	High	1	No	No
		Medium II Tufted Graminoid (Grass-like plant	ery ig			
Juncus flavidus	Gold Rush	Large Tufted Graminoid (Grass like pl nt)	High	3	No	No
s greg		Large Tuft Graminoid (Grass-like plant)	Hig			
Juncus kraussii subsp.	<u>Sea Rush</u>	Large Non Tufted Graminoid (Grass plant)	High	3	No	No
Juncus subsecundus	<u>Finger Rush</u>	Medium to Small Tufted Graminoid (Grass-like plant	High	3	No	No

as part of a planning process under the Planning and E The Central Victorian Uplands Bioregion ich may Floodplain Riparian Woodland

Scientific Name Common Name Life Form Confidence of Sp. Rever Sp. es and sp. es	Floodplain R						
Spp. agg. Common Blown grass Medium to Small Turked Graminoid (Grass-like plant) High 3 No No No Leptosperm Ling Ily Tree, Shru Hig Ily Image: Shru Hig Image: Shru Im	Scientific Name	Common Name	Life Form	Confidence		Restricte Sp es	Speci a
Filiformis Grass Turted Graminoid (Grass-like plant Hight Free First Free Hight Free First Free Hight Free First Free Hight Free	-	<u>rg</u>		Hig			
Leptosperm obovatum			Tufted Graminoid	High	3	No	No
obovatum Lobelia irrigua Salt Pratia Small or Prostrate Herb High 1 No No Lomandrang		lly		Hig			
Prostrate Herb Large Tufted Graminoid (Grass-like pl Large Herb High 3 No No No No No No No				Hig			
	Lobelia irrigua	Salt Pratia		High	1	No	No
Signature Small Loosestrife Medium Herb High 3 No No No No No No Medicytus denta s.l. Medium Medium Medium Medium S rub Very ig 3 No No No No Medium S rub Very ig 3 No No No Medium S rub Very ig 3 No No No Medium Stipoides Very ig Stipoides Stipo		Spiny-he	Graminoid (Grass	Hig	3	No	No
Neglicytus Ediu S rub Very ig 3 No No No No	Lycopus australis		Large Herb	High	3	No	No
denta s.l. Me th Riv r Mint Medi Herb High 2 N N Microlaena stipoides var. stipoides eping Medium to Tiny Non-Tufted Graminoid (Grass-like pl ery ig No No No Muellerina e calyp ide eping Epiphyte Very ig No No No Persicaria dicip n Slender Knotweed Large Herb High 3 No No Persicaria pr mm Sp arg Hig arg arg Final minoid (Grass-like plant) ery ig arg arg Final minoid (Grass-like plant) ery ig arg arg Final minoid (Grass-like plant) ery ig arg arg Arg arg arg Final minoid (Grass-like plant) ery ig arg		Small Loosestrife	Medium Herb	High	3	No	No
Microlaena stipoides var. stipoides			ediu S rub	Very ig	3	No	No
stipoides Non-Tufted Graminoid (Grass-like pl Muellerina e calyp ide eping Epiphyte Very ig No No Persicaria d cip n Slender Knotweed di cip n Large Herb Hig 3 No No Persicaria pr rm Sp arg Hig arg Image: square law in the plant of the plant	Me th	Riv r Mint	Medi Herb	High	2	N	N
e_calyp_ide iry	stipoides var.	eping	Non-Tufted Graminoid	ery ig			
Non-Tufte Graminoid (Grass-like pl Persicaria d cip n Sp Sp arg Hig		<u>eping</u>	Epiphyte	Very ig		No	No
d cip n Persicaria pr rm Phragmi Large Tufted Graminoid (Grass-like plant) Comm of Graminoid (Gras like plant) Potamogeton crispus Potamogeton och s Potamogeton och s <td></td> <td><u>iry</u></td> <td>Non-Tufte Graminoid</td> <td>Hig</td> <td></td> <td></td> <td></td>		<u>iry</u>	Non-Tufte Graminoid	Hig			
Phragmi Large Tufted Full ted Graminoid Grass-like Graminoid Graminoid Graminoid Wery ig Graminoid Sraminoid Graminoid Graminoid Graminoid Graminoid Graminoid Graminoid Graminoid Graminoid Graminoid Graminoid High 3 No No No No Potamogeton Blunt Pondweed No No No No Potamogeton Floating P ndwee Hig		Slender Knotweed	Large Herb	High	3	No	No
Tufted Graminoid (Grass-like plant) Comm - Medium to Sma Tufted Graminoid (Grass like plant) Potamogeton Crispus Potamogeton Shunt Pondweed Medium Herb High 3 No No No No Shunt Potamogeton Shunt Pondweed Medium Herb High 3 No No No Shunt Potamogeton Shunt Pondweed Medium Herb High 3 No No No Shunt Potamogeton Shunt Pondweed High High 3 No No No Shunt Potamogeton Shunt Pondweed High High Shunt Pondweed High Shunt Pondweed High High Shunt Po		<u>Sp</u>	arg	Hig			
g Tufted Graminoid (Gras like p) Potamogeton crispus Potamogeton och s Potamogeton och s Potamogeton produced Floating P ndwee	Phragmi ———		Tufted Graminoid (Grass-like	ery ig			
crispusBlunt PondweedMedium HerbHigh3NoNoPotamogeton och sFloating tr carinHig			Tufted Graminoid	Very ig	3	No	No
och s Potamogeton tr carin Floating		<u>Curly Pondweed</u>	Medium Herb	High	3	No	No
<u>tr carin</u> P ndwee	_	Blunt Pondweed	Medium Herb	High	3	No	No
Pteridium Hig				Hig			
	Pteridium			Hig			

as part of a planning process under the Franciscon.

The dThe Central Victorian Uplands Bioregion to have breach any Co Floodplain Riparian Woodland

Scientific Name	Common Name	Life Form	Confidence	Reveg S y	Restricte Sp es	Speci a
s pa	<u>Small-lea</u> <u>Bramble</u>	Scrambl Climber	ery ig			
Rumex brownii	Slender Dock	Medium Herb	High	3	No	No
Selliera radicans	Shiny Swamp-mat	Small or Prostrate Herb	High	2	No	No
<u>Senecio</u> <u>gl ratus</u>		Large Herb	Hig		No	No
a	anga	Medium Tufted Graminoid (Grass-like plant	Hig			
Triglochin procera —	<u>Water Ribbons</u>	Large Tufted Graminoid (Grass p ant)	High	1	No	No
<u>Trig np a</u> <u>s.s.</u>	<u>Commo</u> <u>ribbons</u>	Large Tuft Graminoid (Grass-like plant)	Hig			
<u>rig a</u>	<u>Streaked</u> <u>wg</u>	Medium to Tiny Non-Tufte Graminoid (ass-like p	High	1	No	No
<u>Typha</u> <u>domingensis</u>	<u>Narrow-lea</u> <u>Cumbungi</u>	arg	Hig			

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Appendix. 5 Lifeforms

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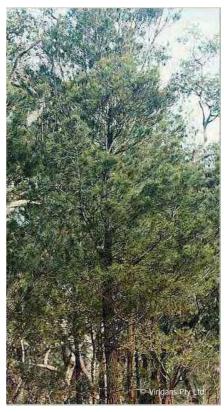
Appendix 7: Examples of vegetation quality assessment life forms

Trees



Canopy Tree

Canopy species that reaches ≥ 80% of EVC benchmark tree height – see EVC benchmark description.



Understorey Tree or Large Shrub (T)

Single-stemmed woody plant > 5 m tall that does not form part of tree canopy.



Mallee Tree (MT)

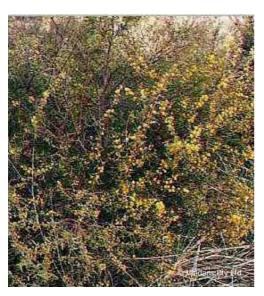
Multi-stemmed woody plant > 3 m tall. Can be a canopy tree or an understorey life form that does not form part of tree canopy.

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Appendix 7: Examples of vegetation quality assessment life forms

Shrubs



Medium Shrub (MS)
Woody plant between 1 m and 5 m tall.



Woody plant between 0.2 m and 1 m tall.



Prostrate Shrub (PS)
Prostrate or trailing woody plant ≤ 20 cm tall.

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Appendix 7: Examples of vegetation quality assessment life forms

Herbs



Large Herb (LH)
Non-woody, non-grass like plant
> 50 cm tall.



Medium Herb (MH)
Non-woody, non-grass like plant
between 5 cm and 50 cm tall.



Small or Prostrate Herb (SH) Non-woody, non-grass like plant ≤ 5 cm tall.

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Appendix 7: Examples of vegetation quality assessment life forms

Graminoids



Large Tufted Graminoid (LTG)

'Tussock' grass or grass-like plant > 1 m tall.



Medium to Small Tufted Graminoid (MTG)

'Tussock' grass or grass-like plant between 10 cm and 1 m tall.



Tiny Tufted Graminoid (TTG)

'Tussock' grass or grass-like plant ≤ 10 cm tall.



Large Non-tufted Graminoid (LNG)

'Non-tussock' grass or grass-like plant > 1 m tall.



Medium to Tiny Non-tufted Graminoid (MNG)

'Non-tussock' grass or grass-like plant, ≤ 1 m tall.

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Appendix 7: Examples of vegetation quality assessment life forms

Other life forms



Tree Fern or Palm (TF)
Trunked ferns and palms.



Arid zone tussock grass that forms a 'ring' over time.



Ground Fern (GF)
Tufted and rhizomatous (non-trunked) ferns.

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Appendix 7: Examples of vegetation quality assessment life forms

Other life forms



Epiphyte (EP) Plant growing entirely upon another plant (roots not in the ground or water).



Mosses, Lichens & Liverworts (BL)
Non-vascular plants with observable vertical height.



Scrambler or Climber (SC) Woody or non-woody plants with climbing or scrambling habit.



Soil Crust (S/C) Non-vascular plants forming a hard crust on soil surface (no observable vertical height).