Ellen Hogan & Associates
Land Development Service
P.O. Box 658
Mansfield Vic 3722

25 May 2021

Planning Department
Mitchell Shire Council
113 High Street
BROADFORD 3658

Dear Sir/Madam

Reference No. **PLP358/20**
Address: **35 Upper Goulburn Road, Tallarook Vic 3659**
Proposal: **6 Lot Residential Subdivision and**

I refer to your request for further information and provide the following:

1. Please find attached revised plans showing the location of the accessways to each lot *(Bundalong Engineering).* It is proposed to limit the number of accessways to the allotment directly from the Upper Goulburn Road. These shared accessways will cross the rail trail that runs along the road reserve at the front of the property. This type of access has been assessed as the most efficient in reducing the loss of native vegetation for the road reserve and within the site.

   It is suggested that these crossovers be developed with limited impact on the surrounding landscape and that the use of signs, such as already in place, be installed to advise rail trail users of the crossovers.

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Sign outside existing dwelling and crossover at the subject site

Looking west along the rail trail in front of the remainder of the subject site

2. A report from Bill (W.E.) Richdale: Consulting Ecologist BSc., Dip EnvSc., MAppSc. (Member of the Ecological Society of Australia) is also attached that discusses tree removal on each site

An additional permit requirement is triggered as vegetation will be lost within the VPO.
Lot 1 is a pre-existing fenced-off residential lot that is approximately 0.3843 hectares in size. This this lot is not subject to any proposed developments. The other five lots (Lots 2 to 6) are all 4,000 square metres or more in size, meaning that any native vegetation located on a new lot *will not* automatically be deemed lost (Planning Clause 52.17).

Lots 2 to 6 are subject of the vegetation assessment report. All these lots are included in the VPO. From the report at page 12 the following summary is provided as to vegetation loss and access directly off the Upper Goulburn Road at Tallarook.

In summary:

The proposed common driveway between lots 5 and 6 (Driveway 1, Patch 6 April 21) falls within a patch of road reserve native vegetation and the driveway construction will remove some native vegetation from the roadside.

The second common driveway (Driveway 2, Patch 13 April 21) between lots 3 and 4 impacts a small area of native vegetation.

No roadside Eucalyptus trees will be lost in the construction of this driveway.

However, two Eucalyptus trees within lot 3 and 4 (development area) will be impacted by the proposed driveway. These trees will not require removal

The common driveway (Driveway 3) between lots 1 and 2 does not impact any patch of native vegetation.

Further details regarding the individual driveways, potentially compromised patches of native vegetation and scattered trees are included in the report at page 12.

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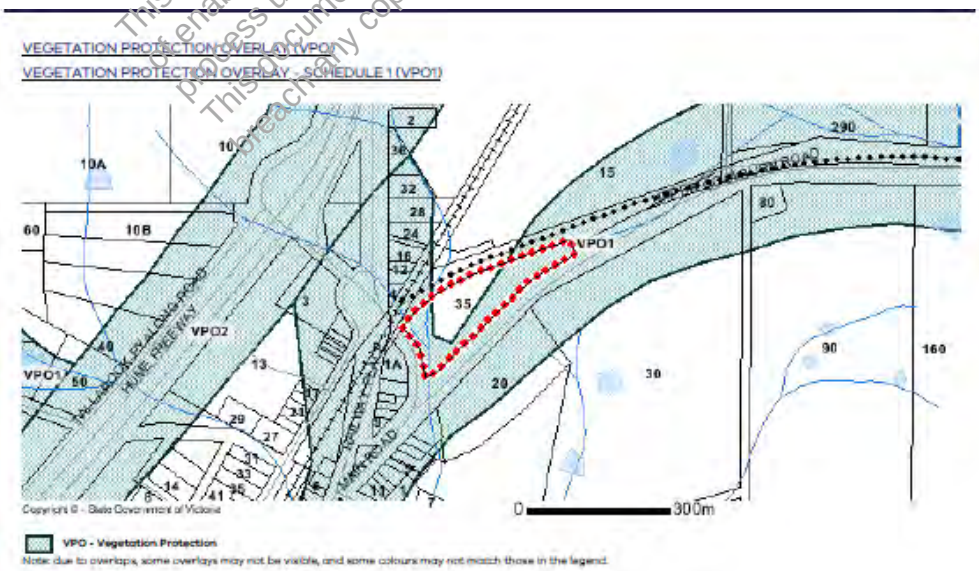

The VPO is located inside the boundary of the site and extends well into the road reserve.

There is no opportunity to locate an internal road within the site due to the size of the land and the greater impact on native vegetation. An internal road running parallel with the boundary fence would do more damage to more trees that the shared accessways being proposed directly off the Upper Goulburn Road. An internal road would require the removal of more trees in each of the allotments to cater for the building and effluent envelopes.

The conclusion of the report states, amongst other things:

> *The proposed subdivision and development of 35 Upper Goulburn Road, Tallarook, into 6 lots (with lot 1 being a pre-existing dwelling) with 3 driveways situated between each lot, has been designed to minimise any potential damage or loss to the surrounding native vegetation. (Page 22)*

3. Traffic Works (Stuart Redman) has undertaken a sight line assessment in support of the Planning Permit Application for a 6 lot residential subdivision and the creation of 3 new access driveways off the Upper Goulburn Road. Lot 6 has an existing access.

   The assessment reviewed sight distances for the three new access driveways. This assessment was undertaken in conjunction with the native vegetation report to ensure the best possible outcome for native vegetation given the location of the VPO along the road reserve.

   This assessment provides that site distances are suitable and stopping distances adequate.

Please do not hesitate to contact me to discuss on 0400 418 422

Yours faithfully

Ellen Hogan

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PLANNING PERMIT APPLICATION

6 LOT RESIDENTIAL SUBDIVISION

35 UPPER GOULBURN ROAD, TALLAROOK 3659

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Prepared by:

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Date: December 2020

Contents

1. PROPOSAL 3
2. LOCALITY 4
3. PLANNING PROVISIONS – MITCHELL PLANNING SCHEME 5
   - 3.1 STATE PLANNING POLICY FRAMEWORK 5
   - 3.2 LOCAL PLANNING POLICY FRAMEWORK 7
   - 3.3 TOWNSHIP ZONE 8
   - 3.4 OVERLAYS 9
   - 3.5 CLAUSE 36.04 Road Zone 9
   - 3.6 CLAUSE 52.17 - NATIVE VEGETATION REMOVAL 9
4. GENERAL PROVISIONS 10
5. APPENDICES 12

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1. PROPOSAL

The application is for the subdivision of 35 Upper Goulburn Road, Tallarook into six residential allotments. The site currently contains one dwelling located on its north eastern boundary. The balance of the land is vacant with native vegetation throughout.

The six allotments will be subdivided from one irregular shaped block of land that is gently undulating in nature and sloping to the south/southwest with falls of up to 5%. The allotments will be bound by the Upper Goulburn Highway to the south, the disused rail line to the north and Main Road to the west. The Upper Goulburn Road, Tallarook, being a road zone Category 1. An ephemeral waterway dissects the site north south along the western boundary.

The land owner is Camp Caravan Cabin Pty. Ltd. and site can be described as Crown Allotment 32H, Parish of Seymour (Volume 10314 Folio 958).

The total size of the land is 3.347 hectares. Subdivided lots will vary between 1.33ha down to the smallest being 384sqm. The average lot size will be 5570sqm providing appropriately sized parcels of land for housing development in the Township of Tallarook.

A Land Capability Assessment (LCA) was been completed to assess each sites ability to contain effluent disposal systems and appropriate envelopes have been included on the subdivision layout plan. Building envelopes have also been indicated on the subdivision layout plan based on the LCA information.

All lots are appropriately orientated to achieve excellent solar access and are of an adequate size to allow for the construction of dwelling and associated outbuildings. Each allotment will have ample space for open gardens and car parking onsite. Mains water and electricity supplies are located at the front of the site.

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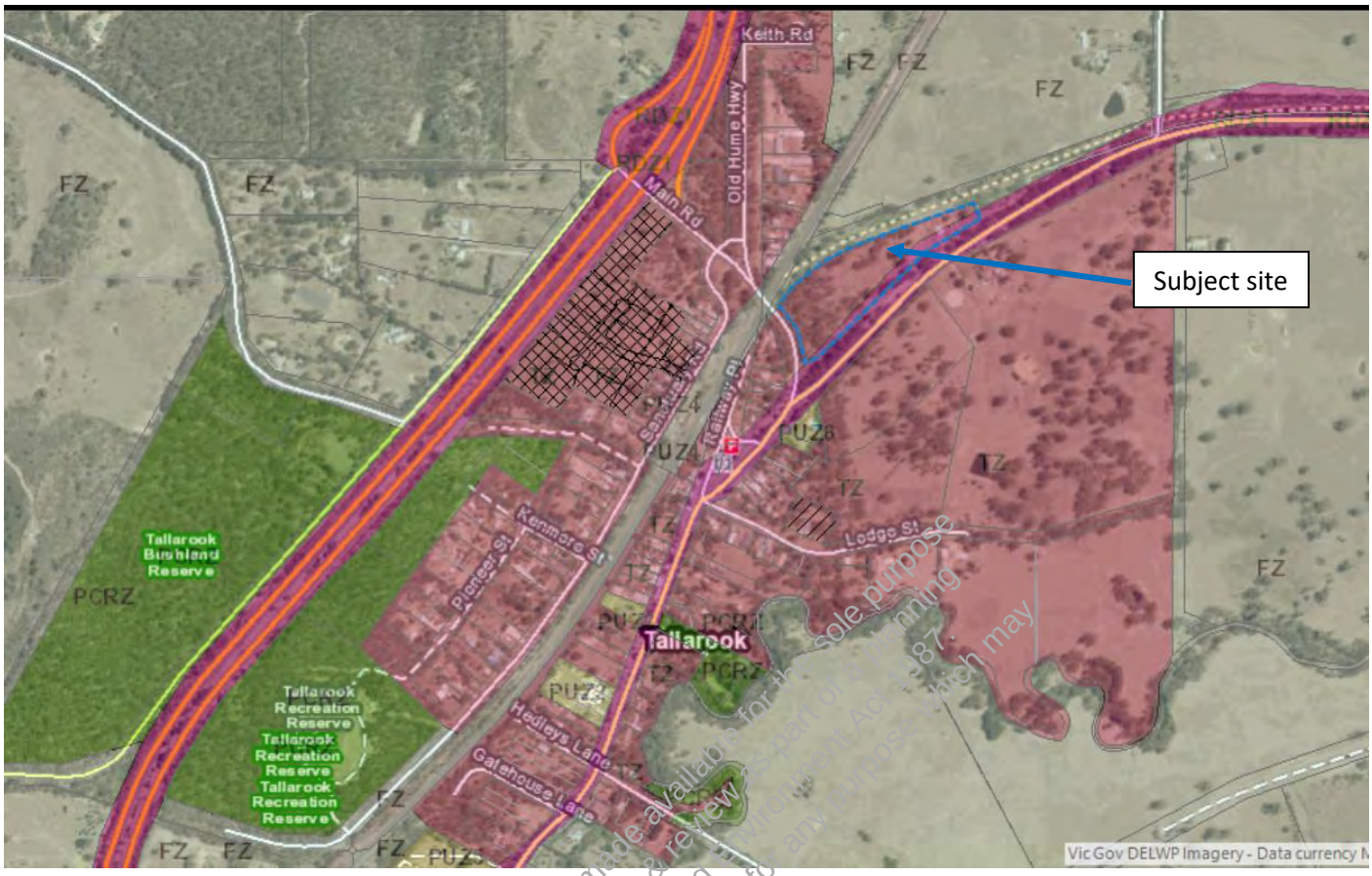
Conceptual subdivision layout plan

2. LOCALITY



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The site is located on the north east side of the Tallarook Township on the Upper Goulburn Highway.

The Melbourne to Sydney rail line passes through the Township and also the Melbourne to Seymour line. The Township boasts a train station with the Seymour service available on the hour. This is an excellent commute to Melbourne and return on the same day.

Tallarook is also located adjacent to the Hume Highway linking Melbourne along the Hume corridor and beyond to Sydney.

Melboune is 99.49 km south on the Hume Highway with Seymour 1.88km to the north.

LPPF

> *Tallarook has an estimated population of about 300 persons and is located at the base of the Tallarook State Forest. It has a monthly Farmers Market which attracts people to the town and an active arts community based at the historic Mechanics Institute hall. Tallarook is the starting point for the Goulburn River High Country Rail Trail.*

3. PLANNING PROVISIONS – MITCHELL PLANNING SCHEME

3.1 STATE PLANNING POLICY FRAMEWORK

Clause 11 SETTLEMENT

Clause 11.02-1S Supply of urban land

- *The ensure sufficient supply of land is available for residential use.*

The subdivision will increase the supply of lots in the Tallarook Township. The development can be integrated with existing infrastructure such as water and power, walking distance to the Avenel centre, the Avenel Train Station and located off the Hume Highway to either Melbourne or Sydney.

Clause 12 ENVIRONMENTAL AND LANDSCAPE VALUES

Clause 12.01-2S Native Vegetation Management

- *To ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.*

A full assessment of the native vegetation has been undertaken by Bill Richdale, Ecologist and is included as part of this application. The subdivision has sought to limit tree removal or impact to tree protection zones.

Access is required off Upper Goulburn Road as any internal access road would render the subdivision not feasible given the extent of tree removal and soil disturbance.

It is intended to undertake the least amount of soil disturbance to create accessways, shared where possible to the allotments. This approach will also reduce the impact to tree protection zones along the road reserve.

Clause 15 BUILT ENVIRONMENT AND HERITAGE

Clause 15.01-3S Subdivision Design

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- *To ensure the design of subdivisions achieves attractive, safe, accessible, diverse and sustainable neighbourhoods.*

Refer to Appendix 7 Clause 56 Assessment for further information. The subdivision complies with all the standards set out in Clause 56.

Clause 15.01-4S Healthy Neighbourhoods

- *To achieve neighbourhoods that foster healthy and active living and community wellbeing.*

Lots will be accessible to all existing facilities such as the Tallarook town centre and community facilities including open space areas and bicycle paths such as the rail trail that runs parallel with the southern boundary of the site and the Upper Goulburn road.

Clause 15.01-5S Neighbourhood Character

- *To recognise, support and protect neighbourhood character, cultural identity, and sense of place.*

The proposed subdivision meets this objective, Refer to Section 3 Neighbourhood Character for further information.

Clause 16 HOUSING

- *Planning should provide for housing diversity and ensure the efficient provision of supporting infrastructure.*
- *Planning should ensure the long-term sustainability of new housing, including access to services, walkability to activity centres, public transport, schools and open space.*
- *Planning for housing should include the provision of land for affordable housing.*

Clause 16.01-1S Integrated housing

- *To promote a housing market that meets community needs.*

The subdivision will increase the supply of lots in an existing urban area.
The allotments can satisfy the requirements where reticulated sewerage is not available.
The size of the allotments are in keeping with allotment sizes in the Tallarook Township.

Clause 16.01-2S Location of Residential Development

- *To locate new housing in designated locations that offer good access to jobs, services and transport.*

Lots will be accessible to all existing facilities such as shops, train station, major highway networks and will enble landowners to work from home and enjoy the township lifestyle.

Clause 16.01-3S Housing diversity

- *To provide for a range of housing types to meet increasingly diverse needs.*

The allotments can provide housing diversity and choice. All lots are appropriately orientated and are of adequate size to allow for the construction of dwellings and associated outbuildings with plenty of space for gardens and additional car parking onsite.

Clause 16.01-4S Housing affordability

- *To deliver more affordable housing closer to jobs, transport and services.*

Refer to the above notes regarding housing diversity. Lots are sized accordingly to be affordable for the low-income households and still have access to jobs, transport and services.

The subdivision proposed can achieve the objectives of the State Planning Policy Framework.

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3.2 LOCAL PLANNING POLICY FRAMEWORK

CLAUSE 21.02 SETTLEMENT

This clause provides local content to support Clause 11 (Settlement) of the State Planning Policy Framework. Specific references to individual towns are also included in Clause 21.11 (Local Areas).

Key issues

- *Development pressures associated with metropolitan urban growth.*
- *The lack of services in smaller settlements.*
- *The growth of towns and smaller settlements.*

Objective 1

To plan for the orderly development of existing settlements.

Clause 21.11-7 Tallarook

Tallarook has an estimated population of about 300 persons and is located at the base of the Tallarook State Forest. It has a monthly Farmers Market which attracts people to the town and an active arts community based at the historic Mechanics Institute hall. Tallarook is the starting point for the Goulburn River High Country Rail Trail.

Settlement
Ensure infill residential development on vacant land only occurs where it can be serviced by efficient disposal methods which can contain all sullage within the site.

Environmental and landscape values
Protect the strong environmental and landscape setting of the town.

Built environment and heritage
Protect the historical character and cultural setting of the town.

Infrastructure
Implement the strategies and management recommendations outlined in the Mitchell Shire Domestic Wastewater Management Plan Final Report, RMCG, November 2006.

Comment
The proposal is infill development located in the Township Zone. It is located on the eastern side of the Tallarook Township along the Upper Goulburn Road.

The aLlotments sizes are large and meet the standard subdivision size of a Township that requires onsite waste water management.

The proposal has been assessed a Land Capability Assessment for effluent disposal in accordance with the EPAS Code of Practice Onsite Wastewater management, AS/NZS 1547 Onsite domestic wastewater management, Domestic Wastewater Management Plan (DWMP) and SEPPS (Waters of Victoria)

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3.3 TOWNSHIP ZONE

Purpose

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To provide for residential development and a range of commercial, industrial and other uses in small towns.*
- *To encourage development that respects the neighbourhood character of the area.*
- *To allow educational, recreational, religious, community and a limited range of other non-residential uses to serve local community needs in appropriate locations.*

CLAUSE 32.05-1 Neighbourhood character objectives

A schedule to this zone may contain the neighbourhood character objectives to be achieved for the area

Comment

No neighbourbood character objectives are included in a schedule in relation to the Tallarook Township.

CLAUSE 32.05-5 Subdivision

Before deciding on an application, in addition to the decision guidelinesin Clause 65, the responsible authority must consider, as appropriate:

- *The Municipal Planning Strategy and the Planning Policy Framework.*
- *The pattern of subdivision and its effect on the spacing of buildings.*
- *For subdivision of land for residential development, the objectives and standards of Clause 56.*
- *Any other decision guidelines specified in a schedule to this zone.*

Each lot must be provided with reticulated sewerage, if available. If reticulated sewerage is not available, the application must be accompanied by:

- *A land assessment which demonstrates that each lot is capable of treating and retaining all wastewater in accordance with the State Environment Protection Policy (Waters of Victoria) under the Environment Protection Act 1970.*
- *A plan which shows a building envelope and effluent disposal area for each lot*

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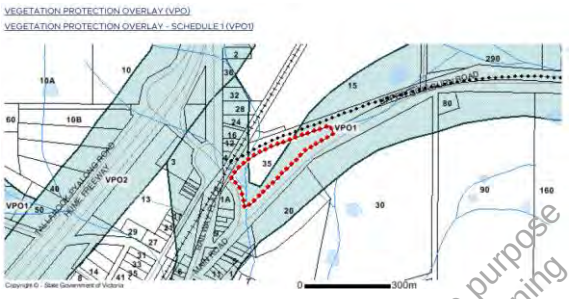
Comment

The allotments are large enough to enable good separation between dwellings and support the pattern of development in the Tallarook Township on large allotments. See Clause 56 report attached.
The site has been assessed through a Land Capability Assessment prepared by Taylors Consultaning Engineers Pty. Ltd. and is attached as part of this application.

The subdivision plans include both building and effluent disposal areas for each allotment.

3.4 OVERLAYS



SCHEDULE 1 TO CLAUSE 42.02 Vegetation Protectio Overlay

Roadside and Corridor Protection 1.0

Statement of nature and significance of vegetation to be protected

Roadsides vegetation and wildlife corridors are a significant feature of the Mitchell Shire.
Many roadsides and corridors throughout the area contain pockets of remnant indigenous vegetation, rare, vulnerable and significant flora species. Some of the roadsides and corridors provide a valuable source of native seed stock and important habitat for wildlife. The conservation and protection of these areas is an important strategy

Comment

A full assessment of the vegetation included in this Overlay and associated with access, both building and effluent envelopes has been undertaken by Mr. Bill Richdale, Ecologist.

This report is more specific to the trees on site and along the Upper Goulburn Road Reserve. The proposal seeks to limit any impact to the roadside vegetation and that located within the property boundaries.

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3.5 CLAUSE 36.04 Road Zone

The site fronts the Upper Goulburn Road which is classified as RDZ1 or a Category 1 road

Notice of this application will be required to be referred to VicRoads North East Region.

3.6 CLAUSE 52.17 - NATIVE VEGETATION REMOVAL

- *The location of the native vegetation to be removed.*
- *A description of the native vegetation to be removed, including the area of the patch of native vegetation and/or the number of any scattered trees to be removed.*

Comments

A full report and offsets required are attached as part of this application for planning permit.

An addendum will be submitted in support of native vegetation.

4. GENERAL PROVISIONS

APPROVAL OF AN APPLICATION TO SUBDIVIDE LAND CLAUSE 65.02

Before deciding on an application to subdivide land, the responsible authority must also consider, as appropriate:

- *The suitability of the land for subdivision.*

The site is suitable for subdivision, the layout of the subdivision is consistent with surrounding land use and lot sizes have been assessed to cater for on-site wastewater management. Water and electricity are available at the front of the site to service each of the allotments.

The existing use and possible future development of the land and nearby land.

The site has one only dwelling with the majority of the site being vacant residential land. Nearby land to south is also zoned Township. See locality plan

- *The availability of subdivided land in the locality, and the need for the creation of further lots.*

There is undeveloped Residential land in the Tallarook Township with little supply of developed allotments available.

- *The effect of development on the use or development of other land which has a common means of drainage.*

Stormwater will be designed in accordance with Councils requirements. Discussions with the councils engineering department will assist to establish drainage outcomes. Each site will have a effluent disposal system.

- *The subdivision pattern having regard to the physical characteristics of the land including existing vegetation.*

The six allotments will be subdivided from one irregular shaped block of land that is gently undulating in nature and sloping to the south/southwest with falls of up to 5%. The allotments will be bound by the Upper Goulburn Highway to the south, the disused rail line to the north and Main Road to the west.

A ephemeral waterway crosses the site north south on the western boundary. The site does have existing vegetation and subdivision pattern has been considered to retain and protect as much of the vegetaton as possible.

- *The density of the proposed development.*

The total size of the land is 3.347 hectares. Subdivided lots will vary between 1.33ha down to the smallest being 384sqm. The average lot size will be 5570sqm providing appropriately sized parcels of land for housing development in the Township of Tallarook.

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- *The area and dimensions of each lot in the subdivision.*

See subdivision layout plan attached

- *The layout of roads having regard to their function and relationship to existing roads.*

No internal roads are proposed. Any internal roads would ensure the removal of more native vegetation

- *The movement of pedestrians and vehicles throughout the subdivision and the ease of access to all lots.*

Direct access to the Upper Goulburn Road and the rail trail at the fronyt of the site.

- *The provision and location of reserves for public open space and other community facilities.*

N/A

- *The staging of the subdivision.*

The subdivision will not be not staged.

- *The design and siting of buildings having regard to safety and the risk of spread of fire.*

All proposed buildings within the subdivision are required to meet the requirements of ResCode Clause 54, Clause 55. The Building Code of Australia and other relevant standards that set out the regulations relating to siting of buildings regarding fire risk.

- The provision of off-street parking.

Each site is of ample size to reduce any off-street parking

- *The provision and location of common property.*

There are no common areas proposed as part this subdivision.

- *The functions of anybody corporate.*

There are no common areas proposed as part this subdivision.

- *The availability and provision of utility services, including water, sewerage, drainage, electricity and gas.*

Water and electricity are located along the southern boundary of the site.

- *Whether, in relation to subdivision plans, native vegetation can be protected through subdivision and siting of open space areas.*

Refer to Section 5.5 Native Vegetation Removal Clause 52.17 for further information.

The subdivision proposed can achieve the objectives of the Clause 65.02.

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5. APPENDICES

Appendix 1:	Plan of Subdivision
Appendix 2:	Feature Survey – building and effluent envelopes
Appendix 3:	Land Capability Assessment
Appendix 4:	Title Particulars
Appendix 7:	Clause 56 Assessment
Appendix 8:	Native vegetation assessment report

If you require any further information please contact me on 0400 418 422 or ellen.hogan@bigpond.com

Ellen Hogan

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CLAUSE 56 ASSESSMENT
35 UPPER GOULBURN ROAD, TALLAROOK
6 LOT SUBDIVISION

Clauses 56.03-5, 56.04-2 to 56.04-5, 56.05-1, 56.06-2, 56.06-4, 56.06-5, 56.06-7 and 56.06-8 to 56.09-4.

SUBDIVISION SITE AND CONTEXT DESCRIPTION AND DESIGN RESPONSE	
CLAUSE 56.03-5 Neighbourhood character objective • To design subdivisions that respond to neighbourhood character. Standard C6 Subdivision should: • Respect the existing neighbourhood character or achieve a preferred neighbourhood character consistent with any relevant neighbourhood character objective, policy or statement set out in this scheme. • Respond to and integrate with the surrounding urban environment. • Protect significant vegetation and site features	There are no *relevant neighbourhood character objectives, policy or statement set out in this scheme in relation to preferred neighbour character.* The allotment sizes in this location will complement the existing Township subdivision pattern and layout. Native Vegetation will be protected as much as possible
CLAUSE 56.04 **LOT DESIGN**	
CLAUSE 56.04-2 **LOT AREA AND BUILDING ENVELOPES** **Objective** To provide lots with areas and dimensions that enable the appropriate siting and construction of a dwelling, solar access, private open space, vehicle access and parking, water management, easements and the retention of significant vegetation and site features.	The total size of the land is 3.347 hectares. Subdivided lots will vary between 1.33ha down to the smallest being 384sqm. The average lot size will be 5570sqm providing appropriately sized parcels of land for housing development in the Township of Tallarook. The lots are suitably dimensioned to allow for the future construction of a dwelling, private open space area, vehicle access and parking. Building and effluent envelopes have been included on the subdivision layout plan.
CLAUSE 56.04-3 **SOLAR ORIENTATION OF LOTS** **Objective** To provide good solar orientation of lots and solar access for future dwellings.	Lots are appropriately orientated with the majority of lots being generally orientated east-west or north-south to maximize energy efficiency. Solar access can be achieved on each of the allotments due to their size and orientation.
CLAUSE 56.04-4 **STREET ORIENTATION** **Objective** To provide a lot layout that contributes to community social interaction, personal safety and property security.	All lots will have direct frontage to the Upper Goulburn Road. Each allotment will have good surveillance for social interaction, personal safety and property security.

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CLAUSE 56.04-5 **COMMON AREA** **Objective**	There are no common areas proposed as part this subdivision.
CLAUSE 56.05 **URBAN LANDSCAPE**	
CLAUSE 56.05-1 **INTEGRATED URBAN LANDSCAPE** **Objectives** • To provide attractive and continuous landscaping in streets and public open spaces that contribute to the character and identity of new neighbourhoods and urban places or to existing or preferred neighbourhood character in existing urban areas. • To incorporate natural and cultural features in the design of streets and public open space where appropriate. • To protect and enhance native habitat and discourage the planting and spread of noxious weeds. • To provide for integrated water management systems and contribute to drinking water conservation.	If required street planting will be undertaken in accordance with Councils current Policy using species native to the area which will be of appropriate height and width once mature. The frontage of the site has established native vegetation along its full length.
CLAUSE 56.06 **ACCESS AND MOBILITY MANAGEMENT**	
CLAUSE 56.06-2 **WALKING AND CYCLING NETWORK** **Objectives** • To contribute to community health and well being by encouraging walking and cycling as part of the daily lives of residents, employees and visitors. • To provide safe and direct movement through and between neighbourhoods by pedestrians and cyclists. • To reduce car use, greenhouse gas emissions and air pollution.	The Goulburn River Rail Trail runs parallel with the southern boundary fence of the site.
CLAUSE 56.06-4 **NEIGHBOURHOOD STREET NETWORK** **Objective** To provide for direct, safe and easy movement through and between neighbourhoods for pedestrians, cyclists,	Share accessways between two allotments where possible has been incorporated into the subdivision layout. This was to both reduce the amount of native vegetation that could be impacted by the subdivision and to reduce the number of crossovers on the Goulburn River Rail Trail. To incorporate an internal road within the lot to avoid crossovers could see the loss of more

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public transport and other motor vehicles using the neighbourhood street network.	trees from the site and impacts on protection zones of trees in the road reserve
CLAUSE 56.06-5 **WALKING AND CYCLING NETWORK DETAIL** **Objectives** • To design and construct footpaths, shared path and cycle path networks that are safe, comfortable, well constructed and accessible for people with disabilities. • To design footpaths to accommodate wheelchairs, prams, scooters and other footpath bound vehicles.	See Clause 56.06-4 above
CLAUSE 56.06-7 **NEIGHBOURHOOD STREET NETWORK DETAIL** **Objective** To design and construct street carriageways and verges so that the street geometry and traffic speeds provide an accessible and safe neighbourhood street system for all users.	No new roads are proposed as part of this subdivision application. Access to the allotments is proposed from the Upper Goulburn Road. This section of road is a 60KMP zone.
CLAUSE 56.06-8 **LOT ACCESS** **Objective** To provide for safe vehicle access between roads and lots.	All lots will be provided with vehicle crossovers to Council's specifications and the Infrastructure Design Manual.
CLAUSE 56.07 **INTEGRATED WATER MANAGEMENT**	
CLAUSE 56.07-1 **DRINKING WATER SUPPLY** **Objectives** • To reduce the use of drinking water. • To provide an adequate, cost-effective supply of drinking water.	The supply of drinking water will be designed and constructed in accordance with the requirements of Goulburn Valley Water.
CLAUSE 56.07-2 **REUSED AND RECYCLED WATER** **Objective** To provide for the substitution of drinking water for non-drinking purposes with reused and recycled water.	The use of recycled water is not proposed as part of this development. Individual landowners may wish to incorporate a rainwater tank to recycle water and assist with stormwater retention.
CLAUSE 56.07-3 **WASTE WATER MANAGEMENT**	Each allotment has been assessed under a Land Capability Assessment and effluent disposal fields have been incorporated in the subdivision layout plan.

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Objective To provide a waste water system that is adequate for the maintenance of public health and the management of effluent in an environmentally friendly manner.	The LCA recommends the following: *This report identifies and proposes the installation of a wastewater management system (treatment system and land application system) for each allotment which includes a septic tank and Sand Filter or AWTS dispersing a secondary treated effluent into an adequately sized pressure compensated subsurface irrigation field while adhere to the requirements of the EPA Cod of Practice Onsite Wastewater Manager AS/NZS 1547 Onsite Domestic wastewater management, the Local Shire Domestic Wastewater Management Plan (DWMP) and SEPP's (Waters of Victoria)*
CLAUSE 56.07-4 **URBAN RUN-OFF MANAGEMENT** **Objectives** • To minimise damage to properties and inconvenience to residents from urban run-off. • To ensure that the street operates adequately during major storm events and provides for public safety. • To minimise increases in stormwater run-off and protect the environmental values and physical characteristics of receiving waters from degradation by urban run-off.	The urban stormwater management system will be designed and managed in accordance with the requirements and to the satisfaction of the Council. Discussions with the councils engineering department will assist to establish drainage outcomes. Each lot is large enough to retain areas for permeability.
CLAUSE 56.08 **SITE MANAGEMENT**	
CLAUSE 56.08-1 **SITE MANAGEMENT** **Objectives** • To protect drainage infrastructure and receiving waters from sedimentation and contamination. • To protect the site and surrounding area from environmental degradation or nuisance prior to and during construction of subdivision works. • To encourage the re-use of materials from the site and recycled materials in the construction of subdivisions where practicable.	Appropriate measures will be undertaken during construction works to ensure that the site and surrounding area, including drainage infrastructure and receiving waters, are protected from degradation, sedimentation and contamination to Council's satisfaction. Recycled material will be used for the construction of the subdivision area, where appropriate. It will be the requirement of the contractors and supervising engineer to ensure that any disturbance to the surrounding neighbourhood is kept to a minimum and that clean and safe work practised are carried out.
CLAUSE 56.09 **UTILITIES**	
CLAUSE 56.09-1 **SHARED TRENCHING**	Shared trenching will be utilised throughout the subdivision area, where appropriate as a cost-effective measure and to reduce ground disturbance.

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Objectives • To maximise the opportunities for shared trenching. • To minimise constraints on landscaping within street reserves.	
CLAUSE 56.09-2 **ELECTRICITY, TELECOMMUNICATIONS AND GAS** **Objectives** • To provide public utilities to each lot in a timely, efficient and cost effective manner. • To reduce greenhouse gas emissions by supporting generation and use of electricity from renewable sources.	The supply of electricity will be designed in accordance with the requirements, and provided to the boundary of all lots, to the satisfaction of the relevant electricity supplier. The telecommunication system will be designed in accordance with the requirements, and provided to the boundary of all lots, to the satisfaction of the relevant authority.
CLAUSE 56.09-3 **FIRE HYDRANTS** **Objective** To provide fire hydrants and fire plugs in positions that enable fire fighters to access water safely, effectively and efficiently.	Fire hydrants will be provided in accordance with the specified standard and the CFA requirements throughout the proposed subdivision area if required.
CLAUSE 56.09-4 **PUBLIC LIGHTING** **Objectives** • To provide public lighting to ensure the safety of pedestrians, cyclists and vehicles. • To provide pedestrians with a sense of personal safety at night. • To contribute to reducing greenhouse gas emissions and to saving energy.	Public lighting will be provided in accordance with the specified standard throughout the proposed subdivision area. Public lighting will be designed in accordance with the relevant Australian Standards and to the satisfaction of the Mitchell Shire Council.

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TAYLOR
CONSULTING ENGINEERS

LAND CAPABILITY ASSESSMENT
SITE RATING: MODERATE

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ADDRESS:	35 UPPER GOULBURN ROAD, TALLAROOK
CLIENT:	CAMP CARAVAN CABIN PTY LYD
PROPOSAL:	SIX LOT SUBDIVISION FOR RESIDENTIAL PURPOSES
SITE INVESTIGATION DATE:	29/06/20
REPORT DATE:	06/08/20
PREPARED BY:	Tara Linkhorn - TAYLOR CONSULTING ENGINEERS
REFERENCE NO:	TCECCC2020
REVISION:	REV 1 – AUGUST 2020

TABLE OF CONTENTS

1. INTRODUCTION 3
1.1 SUMMARY OF FINDINGS AND SYSTEM DESIGN 3
1.2 SITE AND DEVELOPMENT OVERVIEW 3
1.3 INVESTIGATION METHOD 4
1.4 SITE PHOTOS 4
2. SITE AND SOIL ASSESSMENT 6
2.1 SITE KEY FEATURES 6
2.2 SOIL ASSESSMENT 8
2.2.1 PUBLISHED SOILS INFORMATION 8
2.2.2 SOIL SURVEY AND ANALYSIS 8
3. LAND CAPABILITY RATING 12
4. EDIS ALGORITHM 13
5. RECOMMENDED SYSTEM DESIGN 14
5.1 WASTEWATER GENERATION 14
5.2 PROPOSED WASTEWATER MANAGEMENT SYSTEM 14
5.2.1 SEPTIC TANK 14
5.2.2 SAND FILTER OR ALL WASTE TREATMENT SYSTEM 15
5.2.3 PUMP PIT 15
5.2.4 PRESSURE COMPENSATED SUBSURFACE IRRIGATION FIELD 15
5.2.5 BUFFER DISTANCES 16
5.2.6 SURFACE DRAINAGE 17
5.2.7 SOIL RENOVATION AND VEGETATION 17
5.2.8 LOAD BALANCING TANK 17
6. MAINTENANCE, MONITORING AND INSPECTIONS 18
7. CONCLUSIONS 19
8. APPENDICES 19

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1. INTRODUCTION

The owner of 35 UPPER GOULBURN ROAD, TALLAROOK proposes to develop six allotments (lots) for residential purposes. Currently the site contains an existing dwelling (proposed Lot 1) and several grassed paddocks (proposed Lots 2-6). Proposed Lot 1 will not be developed beyond being excised off the other five lots. Taylor Consulting Engineers (TCE) were engaged to determine appropriate on-site wastewater management systems to cater for the proposed development of Lots 2 – 6.

As each of the allotments (Lots 2 – 6) could have a variety of dwelling sizes constructed upon them in the future, treatment and disposal systems have been designed for dwellings with a range of 3 to 5 bedrooms. Each of the allotments vary in size and shape.

The six separate allotments will be subdivided from one irregular shaped block of land that is gently undulating in nature and sloping to the south/southwest with falls of up to 5%. The allotments are bounded by Upper Goulburn Road to the south and Main Road of Tallarook township to the west with farming zoned land to the north and east. The Hume Highway lies a short distance further north.

Under the Mitchell Planning Scheme all the allotments lie within a Township Zone and are affected to various degrees by a Vegetation Protection Overlay.

1.1 SUMMARY OF FINDINGS AND SYSTEM DESIGN

This report identifies and proposes the installation of a wastewater management system (treatment system and land application system) for each allotment which includes a septic tank and Sand Filter or AWTS dispersing a secondary treated effluent into an adequately sized pressure compensated subsurface irrigation field while adhering to the requirements of the EPA Code of Practice Onsite Wastewater Management, AS/NZS 1547 Onsite domestic wastewater management, the Local Shire Domestic Wastewater Management Plan (DWMP) and SEPPs (Waters of Victoria).

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1.2 SITE AND DEVELOPMENT OVERVIEW

Address	35 Upper Goulburn Road, Tallarook
Lot Plan	Allot. 32 TP071256A
Owner/Developer	Camp Caravan Cabin Pty Ltd
Proposal	Six lot subdivision for residential purposes
Property Size	Total = 3.347 ha
Property Status	Existing dwelling and garage, grassed
Municipality	Mitchell Shire Council
Property Zoning	Township Zone
Overlays	Vegetation Protection Overlay (partial coverage)
Housing Density	20-40/km²
Declared Water Supply Catchment (if applicable)	N/A
Sub catchment (if applicable)	N/A
Reticulated Water Supply Available	No – onsite roof water collection only
Reticulated Sewer Available	No – area unlikely to be sewered in the further due to low development density in the area.

1.3 INVESTIGATION METHOD

An investigation of five of the lots (subject sites which excludes Lot 1 which contains the existing dwelling) was undertaken by Taylor Consulting Engineers personnel on 29th June 2019. The investigation method involved drilling a borehole using a 100mm diameter mechanical auger on each of the allotments in a location where effluent disposal is most appropriate and assessment and logging of the soil profile at each location.

Soil samples were subsequently sent to a soil testing laboratory for analysis for soil texture and colour, pH, EC, and other analysis as required. In-situ permeability testing was conducted onsite in the upper clays of the limiting horizon using a constant head permeameter test.

The results of the soil assessment have been used to inform the land capability report which has been prepared in accordance with the requirements of:

- EPA Code of Practice Onsite Wastewater Management Publication 891.4 (July 2016)
- AS/NZS 1547:2012 On-site domestic wastewater management
- Local Shire Domestic Wastewater Management Plan (DWMP)
- SEPPs (Waters of Victoria)

1.4 SITE PHOTOS

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Photo 1. Lot 2

Photo 2. Lot 3

Photo 3: Lot 4

Photo 4: Lot 5

Photo 5: Lot 6

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2. SITE AND SOIL ASSESSMENT

2.1 SITE KEY FEATURES

Figure 1 below is a locality plan and indicates the location of the subject sites of the proposed development. The key features of the sites are summarised in Table 1 below.

Figure 1: Locality Plan

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Table 1: Site Assessment

Feature	Description	Level of Constraint	Mitigation Measures
Buffer Distances	All buffer distances in Table 5 of the Code (2016) are achievable from the proposed LAA positions for all five lots.	LOW	Conduct a water balance to determine adequate effluent field size and ensure adequate irrigation line length and spacing.
Climate/Rainfall	Seymour Shire Council rainfall station data was sourced from the Bureau of Meteorology website along with pan evaporation data from the Lake Eildon evapouration station. Main climate conditions are: Temperate climate with mild/warm summers and cold winters. Maximum average monthly rainfall: 64.7mm Annual average rainfall: 595.9mm Annual average Pan evaporation: 959.9mm	MODERATE	Conduct a water balance to determine adequate effluent field size

Feature	Description	Level of Constraint	Mitigation Measures
	Annual average 9th decile rainfall: 763.7mm		
Drainage and Subsurface Drainage	No signs of dampness or spring activity were observed in the proposed LAA locations or in the immediate vicinity. No hydrophilic vegetation was present.	MODERATE	Position LAA away from low lying area
Erosion and Landslip Potential	No evidence of sheet or rill erosion or landslips.	LOW	NN
Exposure and Aspect	All LAAs provide varying degrees of exposure to the east and west with low-moderate sun and low wind exposure. Some shading will occur at different times of the day.	MODERATE	NN
Flood Potential	No flood potential, fields are positioned on a rise.	LOW	NN
Groundwater	The depth to the water table is 5-10m. According to records there is one groundwater bore located within 500m of the proposed LAAs. Available records indicate that the bore is utilised for domestic and stock watering purposes. (information sourced from Visualising Victoria's Groundwater website).	MODERATE	Secondary treatment and disposal recommended.
Imported Fill	Some presence of any imported fill in proposed LAAs and across the sites, due to a possible old roadworks/railway storage site.	LOW	NN
Land Available for LAA	There is sufficient land available for land application of treated effluent on all allotments.	LOW	NN
Landform	The sites are creek-side plains and considered as linear planar as per AS/NZS1547:2012	LOW	NN
Rocks and Rock Outcrops	No rocky outcrops or surface rocks evident in the vicinity of the three LAAs.	LOW	NN
Slope	The proposed disposal fields for all five lots slope moderately to the south-southwest with gradients of up to 5%.	LOW	Ensure adequate irrigation line length and spacing.
Stormwater Run-on and Runoff	Potential for run-on to and runoff from all of the LAAs.	MODERATE	Install cut-off drains
Surface waters	There are two tributaries of a creek located within the proposed Lot 6 near the western boundary – they enter across the northern boundary of the lot and join mid-way to form one waterway before exiting across the southern boundary. The creek coalesces with Dabyminga Creek approximately 450m further south. There are no other surface waters located within the remaining proposed lots.	LOW	Secondary treatment and irrigation disposal recommended. Ensure buffer distances are achieved.
Vegetation	A mixture of pasture grass cover is present in all the LAAs. Root zone depth is approximately 250mm.	LOW	NN

*None Necessary

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2.2 SOIL ASSESSMENT

The soils of the five allotments (propsed Lots 2 – 6) have been assessed for their suitability for onsite wastewater management by a combination of soil survey and desktop review of published soil survey information as outlined below.

2.2.1 PUBLISHED SOILS INFORMATION

Under the Australian Soil Classification (Isbell 1996) the soils of the subject sites are classified as Sodosol (Lots 2 – 6)

SODOSOLS have a strong texture contrast between surface (A) horizons and subsoil (B) horizons. The subsoils tend to be sodic and prone to erosion as well as enhanced interflow. They have a moderate phosphorous buffering capacity and if they are well managed and ameliorated, they are a moderate risk soil, **Rating 2,** otherwise **Rating 3** (Mansfield Shire Domestic Wastewater Management Plan Attachment 1, Table 3).

2.2.2 SOIL SURVEY AND ANALYSIS

A survey of the soils at all five of the allotments (Lots – 6) was undertaken to determine their suitability for application of treated effluent. For each of the five lots topsoil and subsoil investigations were conducted at a location within the vicinity of the proposed LAA, as shown in the Appendix 1 – Site Plan and Proposed Works via an auger borehole drilled to a minimum depth of 2.0m (unless rock encountered). A full description of the soil profile at each of the locations is provided in Appendix 2. Soil samples were collected from two of the boreholes (representative of the soil types of the five lots) from within the limiting layer and sent to a soil testing laboratory for analysis for soil texture, EC, sodicity and other analysis as required. In-situ permeability testing was carried out onsite.

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BOREHOLE 1 – Lot 6 (GPS Coordinates: -37.0903516 Latitude, 145.1055530 Longitude)

Depth (mm)		Observation	Comments	Symbol	Moisture Condition	Test
0		Topsoil		T		
100						
200		Light Brown Clayey Silt		LBCS	W	
400						
600		Yellow Silty Clay		YSC	M	
800						
1000						
1200		Red Gravelly Clay		RGC	SM	
1300						
1400		Yellow Gravelly Clay		YGC	D	
1600						
1800						
2000++		BHT – No Refusal				

BOREHOLE 2 – Lot 5 (GPS Coordinates: -37.0901433 Latitude, 145.1059373 Longitude)

Depth (mm)		Observation	Comments	Symbol	Moisture Condition	Test
0		Topsoil		T		
50						
100		Light Brown Clayey Silt		LBSC	VM	
200						
400		Yellow Brown Gravelly Clayey Silt		YBGCS	M	
600						
700		Yellow Brown Gravelly Silty Clay		YGSC	M	SOIL SAMPLE
800						
900						
1000						
1100		Light Brown/Cream Gravelly Silty Clay		LB/CGSC		
1200						
1400						
1600						
1800						
2000++		BHT – No Refusal				

BOREHOLE 3 – Lot 4 (GPS Coordinates: -37.0899384 Latitude, 145.1062652 Longitude)

Depth (mm)		Observation	Comments	Symbol	Moisture Condition	Test
0		Topsoil		T		
100						
150		Light Brown Clayey Silt		LBCS	SM	
200						
400		Orange Silty Clay		OSB	M	
600						
700						
800						
1000						
1100					D	
1200						
1300						
1400						
1500		Yellow Silty Clay		YSC	VD	
1600						
1800						
2000++		BHT – No Refusal				

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BOREHOLE 4 – Lot 3 (GPS Coordinates: -37.0895640 Latitude, 145.1064724 Longitude)

Depth (mm)		Observation	Comments	Symbol	Moisture Condition	Test
0		Topsoil		T		
50						
100		Brown Silt		BS	SM	
200						
300		Orange Silty Clay		OSC	M	SOIL SAMPLE
400						
500						

600						
700						
800		Light Brown Yellow Clay		LBYC	M	
900						
1000						
1200		Light Brown Yellow Gravelly Clay		LBYGC	SM	
1300						
1400		Yellow Silty Clay		YSC	D	
1600						
1800						
2000++		BHT – No Refusal				

BOREHOLE 5 – Lot 2 (GPS Coordinates: -37.0893810 Latitude, 145.1072294 Longitude)

Depth (mm)		Observation	Comments	Symbol	Moisture Condition	Test
0		Topsoil				
50						
100		Brown Gravely Silt		BGS	S	
200						
400		Yellowy Brown Silty Clay		YBSC	M	
600						
800						
1000		Light Brown Silty Clay		LBSC	D	
1200						
1400						
1600						
1800						
2000++		BHT – No Refusal				

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Table 2 below provides an assessment of the physical and chemical characteristics of the soils encountered on the site.

Table 2: Soil Assessment - Sodosol

Feature	Assessment	Level of Constraint	Mitigation Measures
Cation Exchange Capacity (CEC)	BH2 Subsoil: 14.85 BH4 Subsoil: 15.41	**Low (>10),** Moderate (5-10), High (<5)	NN
Electrical Conductivity (EC) Soil Salinity (dS/m)	BH2 Subsoil: 0.116 BH4 Subsoil: 0.0538	**Low (<0.8),** Moderate (0.8-1.5), High (1.5-4), Limiting (>4)	NN
Dispersion Index (DI)	BH2 Subsoil: 9 BH4 Subsoil: 12	Low (0), Moderate (1-8), **High (8-15),** Limiting (>15)	Rip base of irrigation field and apply gypsum at a rate of 1.0 kg/m². Conduct Water and Nutrient Balance, use a conservative DIR rate, ensure adequate irrigation field size and line spacing
pH (1:5 Water)	BH2 Subsoil: 5.9		NN

Feature	Assessment	Level of Constraint	Mitigation Measures
	BH4 Subsoil: 5.6	Low (5.5-8), Moderate (4.5-5.5), High (<4.5 or >8)	
Rock Fragments	None observed during the field investigation	Low (<10), Moderate (10-20), High (20-40), Limiting (>40)	NN
Sodicity (ESP)	BH2 Subsoil: 10.15 BH4 Subsoil: 3.3	Low (<5), Moderate (5-8), High (>8<15), Limiting (>15)	Pressure compensated subsurface drip irrigation recommended. Rip base of irrigation field and apply gypsum at a rate of 1.0 kg/m². Conduct Water and Nutrient Balance, use a conservative DIR rate, ensure adequate irrigation field size and line spacing
Soil Profile Thickness	Subsoil: Total depth range across the lots >2.0m (borehole terminated, no refusal). Refer borehole location map for details	Low (>1.5m), Moderate (1.0m to 1.5m), High (0.75m to 1.0m), Limiting (<0.75m)	NN
Soil Permeability (Geometrical Mean)	BH2 and BH4 Subsoil: Indicative permeability from AS/NZS 1547:2012 is <0.06-0.12m/day	Low (0.15 – 0.3), Moderate (0.03 – 0.15, 0.3 – 0.6), High (0.01 – 0.03, 0.6 – 3.0), Limiting (> 3.0 < 0.03)	Conduct a water balance based on the indicative saturated hydraulic conductivity. Peak deep seepage is conservatively estimated at 4.3mm/day for Lots 2 – 6. Adopt a DIR rate of 2.0mm for all lots.
Soil Texture and Structure	BH2 Subsoil: Light reddish brown Medium Clay, moderate structure BH4 Subsoil: Light reddish brown Heavy Clay, moderate structure	Moderate	Conduct a water balance based on the adopted saturated hydraulic conductivity.
Water Table Depth	Lots 2 – 6: 5-10m	Moderate	
Soil Mottling	Subsoil: No mottling observed in two boreholes drilled during investigation	None, Slight, Moderate or Extensive mottling	NN

*None Necessary

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3. LAND CAPABILITY RATING

The following identifies key land features and soil characteristics to establish an LCA rating for the site, to be used as part of the EDIS algorithm.

Table 3: LCA rating

LAND	LAND CAPABILITY RISK RATING				S
FEATURE	LOW	MODERATE	HIGH	LIMITING / UNSUITABLE	
Available land for LAA	Exceeds LAA and duplicate LAA requirements	Meets LAA and duplicate LAA requirements	Meets LAA and partial duplicate LAA requirements	Insufficient LAA area	2
Aspect	North, north-east or north-west	East, west, or south-west	South or south-east	South – full shade	1
Exposure	Full sun and/or high wind or minimal shading	Partial shade	Limited light, little wind, heavily shaded area	Perpetual shade	2
Slope Form	Convex or divergent side slopes	Straight sided slopes	Concave or convergent side slopes	Locally depressed	2
~~Slope Gradient Trenches & beds~~	~~< 5%~~	~~5 – 10%~~	~~10 – 15%~~	~~> 15%~~	
Slope Gradient Subsurface Irrigation	< 10%	10 – 30%	30 – 40%	> 40%	1
Site drainage Run off / run on	LAA backs onto crest or ridge	Moderate likelihood	High likelihood	Cut off drain not possible	2
Landslip *	Potential	Potential	Potential	Existing	1
Erosion Potential	Low	Moderate	High	No practical amelioration	1
Flood / inundation	Never	< 1 AEP	5% AEP	> 5% AEP	1
Distance to surface waters (m)	Buffer distances exceeds all Code requirements	Buffer distances complies with all Code requirements	Buffer distances do not comply with all/some Code requirements	< 40 metres	2
Distance to groundwater bores (m)	No bores on site or within a significant distance	Buffer distances comply with the Code	Buffer distances do not comply with the Code	No suitable treatment method	1
Vegetation	Plentiful / healthy vegetation	Moderate vegetation	Sparse or limited vegetation	Propagation not possible	2
Depth to water table (potentiometric) (m)	> 2 m	2 – 1.5 m	1.5 m	1.5 m - Surface	1
Depth to water table (seasonal parched) (m)	> 1.5 m	< 0.5 m	0.5 – 1.5 m	0.5m - Surface	1
Rainfall ** (9th decile) (mm)	< 500 mm	500 – 750 mm	750 – 1000 mm	> 1000 mm	3
Pan evaporation (mean) (mm)	1250 – 1500 mm	1000 – 1250 mm	750 – 1000 mm	< 750 mm	3
Structure	High or moderately structured	Weakly structured	Structureless, massive or hardpan		1
Fill materials	Nil or mapped good quality topsoil	Mapped variable depth and quality materials	Variable quality and / or uncontrolled filling	Uncontrolled poor quality / unsuitable filling	2
~~Trenches & beds~~	~~> 1.4 m~~	~~>1.4m~~	~~< 1.4 m~~	~~< 1.2 m~~	
Subsurface irrigation	> 1.5 m	1 – 1.5 m	1- 0.75 m	< 0.75 m	1
Permeability *** (limiting horizon) (m / day)	0.15 – 0.3	0.03 – 0.15 0.3 – 0.6	0.01 – 0.03 0.6 – 3.0	> 3.0 < 0.03	2
Permeability **** (buffer evaluation) (m / day)	< 0.3	0.3 – 3	3 – 5	> 5	1

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4. EDIS ALGORITHM

The following EDIS algorithm assesses the risk factors according to their potential impact on a potable water catchment and determines a site rating.

Table 4. EDIS Algorithm

Risk rating for values of individual site factors (R)					Score
	Factor	LOW (1)	MODERATE (2)	HIGH (3)	
R1	Distance to reservoir	>15 km	2 – 15 km	<2 km	**1**
R2	Soil type rating*	1	2	3	**3**
R3	Distance to river	>80m	40 – 80m	<40m	**1**
R4	Distance to stream	>80m	40 – 80m	<40m	**3**
R5	Distance to drain	>40m	10 – 40m	<10m	**1**
R6	Lot size	>10ha	2 – 10ha	0.2 – 2ha	**3**
R7	Density (houses/km^2)	<20/km^2	20 – 40/km^2	>40/km^2	**2**
R8	LCA Rating	1	2	3-4	**3**
R9	System fail rate	<5%	5-10%	>10%	**1**

*Soil rating SODOSOL in reference to soil maps and soil results

Rn = ((R1 + R2) x (R3 + R4 + R5 + R6) + (2 x R8) + (3 x R9 x R7))/10

= ((1 + 3) x (1 + 3 + 1 + 3) + (2 x 3) + (3 x 1 x 2))/10

= ((4 x 8) + 6 + 6)/10

Rn = 4.4

Low Risk individual site rating: An Rn value less than 2.5

Moderate Risk individual site rating: An Rn value of 2.5 – 5

High Risk individual site rating: An Rn value greater than 5

SITE RATING = MODERATE RISK

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5. RECOMMENDED SYSTEM DESIGN

The following system design is based on the requirements of the EPA Code of Practice Onsite Wastewater Management, AS/NZS 1547 Onsite domestic wastewater management, the Local Shire Domestic Wastewater Management Plan (DWMP) and SEPPs (Waters of Victoria).

Before any work commences on the wastewater management system, a permit to install a septic tank system will be required from The Local Shire Council.

5.1 WASTEWATER GENERATION

The system will cater for both black and grey water (all wastes).

Future developments could have a range of bedroom numbers therefore daily wastewater flows have been calculated for dwellings with three, four and five bedrooms.

According to Table 4 EPA Code of Practice Onsite Wastewater Management of the Minimum daily wastewater flow rates and organic flow rates, the Design hydraulic flow rates for Households with full water reduction features is 150L/person/day. In addition to the features, it is recommended that flow reduction valves be introduced at the main water supply point.

The following flow rate calculation uses the figures above to determine the total anticipated wastewater flow rate (Q) for each number of bedrooms:

(No. of Bedrooms + 1) x 150 litres flow per person per day = Q (litres flow per day)

Therefore:

Three Bedrooms

(3 + 1) x 150 = 600 litres flow/day

Four Bedrooms

(4 + 1) x 150 = 750 litres flow/day

Five Bedrooms

(5 + 1) x 150 = 900 litres flow/day

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5.2 PROPOSED WASTEWATER MANAGEMENT SYSTEM

The following sections provide an overview of the wastewater management system (treatment system and land application system) that is appropriate for the subject sites. An outline of the suitable system, with sizing and design considerations and justifications for its selection are provided.

Treatment System
It is recommended that a system that provides secondary treatment be installed on each of the lots. Indicative target effluent quality must meet or exceed the following:

- BOD_5 < 20 mg/L
- TSS < 30 mg/L

Land Application System
The recommended land application system is pressure compensating subsurface irrigation. This system will provide even, and widespread dispersal of highly treated effluents loads within the root zone of plants.

5.2.1 SEPTIC TANK

Adhering to the requirements of the AS/NZS1547 Table J1, one 3,200L All-waste septic tank is to be placed on each of the lots as shown in Appendix 1 – Site Plan and Proposed Works.

- Septic Tanks to be installed on min 100mm of sand, and to be surrounded by sand or compacted soil;
- The inlet pipe to the septic tanks shall be a minimum 1:60;
- All Septic Tanks to be installed a minimum 4m from any foundations on nearby buildings;
- Septic Tanks must be All-waste type;
- Fall from top of septic tanks to top of sand filter to be min. 250mm.

5.2.2 SAND FILTER OR ALL WASTE TREATMENT SYSTEM

The Sand Filter system is required to have an area to cater for a Min. 50L/m^2. The areas required for three, four and five bedroom dwellings are as follows:

Three Bedrooms
With a maximum load of 600L/day a 12m^2 area sand filter is adequate; this equates to a 4m by 3m rectangular sand filter and is to be constructed as per details shown in Appendix 1 – Site Plan and Proposed Works.

Four Bedrooms
With a maximum. load of 750L/day a 15m^2 area sand filter is adequate; this equates to a 5m by 3m rectangular sand filter and is to be constructed as per details shown in Appendix 1 – Site Plan and Proposed Works.

Five Bedrooms
With a maximum. load of 900L/day a 18m^2 area sand filter is adequate; this equates to a 6m by 3m rectangular sand filter and is to be constructed as per details shown in Appendix 1 – Site Plan and Proposed Works.

All filter sand to be clean washed sand with:

- Effective size between 0.60 and 1.00mm;
- Uniformity co-efficient less than 4;
- Clay and fine silt less than 5% by volume.

As an alternative, an adequately sized **All Waste Treatment System** can be used in place of a septic tank and sand filter – these are not recommended for holiday homes as constant use is required.

5.2.3 PUMP PIT

A pump pit is to be installed at the outlet of the sand filter.
The Pump Pit must comply with the following:

- Minimum 1,000L emergency storage capacity or the equivalent of one day's flow adopt the larger value;
- A self-priming submersible pump set (as per plumber's specifications) activated by a float switch (usually located at 400L capacity) and non-return valve fitted to the outlet pipe (min 40mm outlet pipe);
- A high-level alarm and audio (buzzer) fitted and located in an appropriate place to inform the household of a pump failure;
- A disc filter shall be installed after the pump pit to reduce the risk of blockages in the subsurface irrigation field.

5.2.4 PRESSURE COMPENSATED SUBSURFACE IRRIGATION FIELD

Due to category 6 medium and heavy clay soils being present in the proposed effluent disposal areas within the five lots, peak deep seepage is conservatively estimated at 4.3mm/day for all five lots (Lots 2 – 6). A DIR rate of 2.0mm has been adopted for all of the lots.

A water and nutrient balance was carried out (refer to Appendix 4 - Water and Nutrient Balance) in accordance with AS/NZS 1547 Onsite domestic wastewater management for the five lots for three, four and five bedroom dwellings. The irrigation field areas required for each bedroom scenario are described below.

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Lots 2 – 6: Three Bedrooms

With zero storage and an irrigation rate of 2.0mm/day, 300m² of subsurface irrigation field is required.

Based on the nutrient balance assuming 30mg/litre Nitrogen (N) present in effluent, 20mg/litre Phosphorous, denitrification rate of 20% and N uptake of 220kg/ha/year it is recommended that a minimum LAA of 239m² is required. The subsurface irrigation field must be planted with varieties of ryegrass, clover, buffalo grass, tall fescue, C cunn'a, couch grass or Lucerne to achieve a N uptake of 220kg/ha/yr.

A pressure compensated subsurface irrigation field of **300m²** total is required.

Lots 2 – 6: Four Bedrooms

With zero storage and an irrigation rate of 2.0mm/day, 375m² of subsurface irrigation field is required.

Based on the nutrient balance assuming 30mg/litre Nitrogen (N) present in effluent, 20mg/litre Phosphorous, denitrification rate of 20% and N uptake of 220kg/ha/year it is recommended that a minimum LAA of 299m² is required. The subsurface irrigation field must be planted with varieties of ryegrass, clover, buffalo grass, tall fescue, C cunn'a, couch grass or Lucerne to achieve a N uptake of 220kg/ha/yr.

A pressure compensated subsurface irrigation field of **375m²** total is required.

Lots 2 – 6: Five Bedrooms

With zero storage and an irrigation rate of 2.0mm/day, 450m² of subsurface irrigation field is required.

Based on the nutrient balance assuming 30mg/litre Nitrogen (N) present in effluent, 20mg/litre Phosphorous, denitrification rate of 20% and N uptake of 220kg/ha/year it is recommended that a minimum LAA of 358m² is required. The subsurface irrigation field must be planted with varieties of ryegrass, clover, buffalo grass, tall fescue, C cunn'a, couch grass or Lucerne to achieve a N uptake of 220kg/ha/yr.

A pressure compensated subsurface irrigation field of **450m²** total is required.

For all lots the Subsurface Irrigation Field must comply with the following:

- Dripper spacing as per manufacturers specifications, typical 1m spacing;
- All lines must be installed parallel to the contours;
- Drip lines to be installed 150mm below the surface, first 100mm of soil should be tilled for line installation;
- Delivery/Flush line to be 25mm-30mm, irrigation line diameter to be 12-16mm, plumber to provide specifications
- Where ground fall exceeds 3m over effluent disposal area, 2 or more subsurface irrigation zones are required;
- A flush discharge (subsoil drain) and flush control valve shall be provided min. 6m x 0.6m, Min. 400 layer of 20-25 aggregate downslope of the field or alternatively the flush control valve can direct effluent to return to the sand filter for flushing purposes;
- Air relief valves upslope of the delivery lines are required;
- If a mud bucket is used to scrape off topsoil in effluent disposal area, ensure clay layer is scarified prior to installation of drip lines to achieve a smooth, free draining surface;
- Drip rates shall not vary more than 10% over entire system, pressure compensated subsurface irrigation.

5.2.5 BUFFER DISTANCES

The following buffer distances as described in EPA Code of Practice Onsite Wastewater Management apply to the subsurface irrigation field and must be taken into consideration prior to set out and construction.

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Table 5. Applicable Setback Distances

Landscape feature or structure	Setback distances for secondary sewage and greywater effluent
Building	
Wastewater field up-slope of building	3
Wastewater field down-slope of building	1.5
Wastewater up-slope of cutting/escarpment	15
Allotment boundary	
Wastewater field up-slope of adjacent lot	3
Wastewater field down-slope of adjacent lot	1.5
Services	
Water supply pipe	1.5
Wastewater up-slope of potable supply channel	150
Wastewater field down-slope of potable supply channel	10
Gas supply pipe	1.5
Ground water tank	4
Stormwater drain	3
Surface waters (up-slope of:)	
Dam, lake or reservoir (potable water supply)	300*
Waterways (potable water supply)	100*
Waterways, wetlands (continuous or ephemeral, non-potable); estuaries, ocean beach at high tide mark; dams, lakes or reservoirs (stock and domestic, non-potable)	30

*Setback distance in a SWSC area may be reduced by up to a maximum of 50% conditional on the requirements as listed in EPA Code of Practice 891.4, July 2016

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5.2.6 SURFACE DRAINAGE

The calculations for the subsurface irrigation field have allowed for rainfall on the area but not for surface runoff. A cut-off drain up slope of each of the six effluent disposal areas shall be constructed as per Appendix 1 – Site Plan and Proposed Works. Any site works upslope of the effluent disposal areas shall be adequately drained away from the area.

5.2.7 SOIL RENOVATION AND VEGETATION

On all lots it is recommended to rip the bottom of the field and apply gypsum at a rate of 1.0 kg/m² to increase calcium content of the soil which provides for optimum grass growth.

The subsurface irrigation field must be planted with varieties of ryegrass, clover, buffalo grass, tall fescue, C cunn'a, couch grass or Lucerne to achieve a N uptake of 220kg/ha/yr.

5.2.8 LOAD BALANCING TANK

Loading in excess of the expected daily load may occur due to holidays, entertainment, guests etc. If excess loading may occur, we recommend installing a load balancing tank at the construction stage which will retain effluent during peak load periods and distribute to the effluent disposal area during times of low load.

6. MAINTENANCE, MONITORING AND INSPECTIONS

Before any work commences on the wastewater management systems, a permit to install a septic tank system will be required for each system from The Local Shire Council.

To ensure adequate functioning of the waste water management system, owner/residents must ensure the following:

- Pump outs of the septic tank every 3 years or earlier if necessary
- Standard water saving features (excluding top loading automatic washing machines) are to be used in the building process;
- Flow rate reduction valves are to be used at the water supply point
- Appendix D: Septic Tanks – from the "Code of Practice - Onsite Wastewater Management" are to be displayed in an appropriate location for reference (copy attached);
- It is recommended owners read and understand the facts about Sand Filters, refer copy attached – FACT SHEET 3 - SEPTIC TANK WITH SAND FILTER
- Aerated treatment plants and sand filters should be serviced at least once a year (or as recommended by the certificate of approval), effluent should be sampled and analysed as required by the EPA certificate of approval. The manufacturers recommendations and specifications are to be adhered to.
- Low phosphorous and low sodium detergents should be used;
- Toxic and flammable products shall not be placed in the tanks including paint;
- Grease and other similar products should be disposed of by another method and not be put into the tanks.

To ensure adequate functioning of the effluent disposal area, owner/residents must ensure the following:

- The effluent disposal area is to be fenced with a permanent barrier to prevent vehicular or livestock traffic over the effluent field;
- Any overland flow from the area above the effluent disposal area should be diverted by means of appropriate cut-off drains if necessary;
- Gypsum is to be re-spread over the effluent disposal area if required every 5 years, a soil test can be conducted to determine the quantity required

Monitoring and Inspections

- Inspection of the septic tank condition is to be carried out every three months and any pump-out is to be recorded and reported to the Local Shire Council;
- Inspection of the entire waste water management system (septic tank, sand filter, disc filter, pump pit (including audio/visual alarm) and subsurface irrigation field) is to be carried out annually (after spring rainfall) and after prolonged/heavy rainfall of the function and integrity of the system and effluent disposal area by the installer or his nominated agent, or other qualified person, and a copy of the inspection report be submitted to the Local Shire Council;
- Mandatory testing and reports is recommended as described in the EPA Code of Practice Onsite Wastewater Management;
- The effluent disposal area should be inspected monthly (weekly during wet months/high rainfall) for wet areas, seepage and vegetation growth;
- As the wastewater system ages, more frequent inspections and monitoring is required.

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7. CONCLUSIONS

Based on the findings of the site investigation and assessment it is concluded that sustainable onsite wastewater management is achievable with appropriate mitigation measures, for the proposed development at 35 Upper Goulburn Road, Tallarook. Refer to the tables below for sand filter and effluent field size.

Effluent Field Size

	3 bedroom	4 bedroom	5 bedroom
Lot 2 – 6	300m²	375m²	450m²

Sand Filter Size

	3 bedroom	4 bedroom	5 bedroom
Lot 2 – 6	12m² (4m x 3m)	15m² (5m x 3m)	18m² (6m x 3m)

8. APPENDICES

1. SITE PLAN AND PROPOSED WORKS
2. RAINFALL AND 9TH DECILE
3. WATER AND NUTRIENT BALANCE
4. CODE OF PRACTICE ONSITE WASTEWATER MANAGEMENT – APPENDIX D: SEPTIC TANKS
5. COMMUNITY EDUCATION FACT SHEET 3: SEPTIC WITH SAND FILTER

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APPENDIX 2

LOCAL RAINFALL AND REDISTRIBUTION DATA

The following data has been adopted for preparing a water and nutrient balance for the proposed system.

Table 1 – Weather Station and Rainfall Details

Weather Station: **SEYMOUR SHIRE COUNCIL**							Number: **88053**						
Data timeframe: **1880 – 2019**				Latitude: **37.03° S**			Longitude:**146.15° E**			Elevation:**145m**			
Statistic	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Mean	35.3	34.3	39.4	43.8	54.8	64.7	60.2	63.0	56.3	52.9	46.0	39.1	595.9
Lowest	0.0	0.0	0.0	0.0	0.0	10.9	1.5	0.0	6.0	0.0	0.5	0.0	237.7
5th %ile	1.2	0.0	1.2	4.6	12.0	17.4	19.1	15.9	17.9	6.3	7.8	3.2	339.6
10th %ile	4.3	2.1	4.4	6.8	15.1	20.2	25.5	21.0	21.9	13.8	14.3	7.1	421.3
Median	25.2	23.1	29.0	38.4	47.5	64.2	56.8	60.3	49.3	45.8	37.0	31.5	608.8
90th %ile	74.6	79.0	90.9	89.7	106.0	110.4	100.3	109.1	103.1	104.2	88.1	79.2	763.7
95th %ile	100.6	105.9	107.3	94.4	114.6	125.2	117.6	117.0	116.9	120.7	104.1	99.4	831.8
Highest	173.5	202.5	174.0	193.7	161.2	164.3	151.2	144.3	149.3	164.4	170.6	195.8	1010.1

Table 2 – Redistribution of Rainfall

Weather Station: **SEYMOUR SHIRE COUNCIL**							Number: **88053**						
Data timeframe: **1880 – 2019**				Latitude: **37.03° S**			Longitude:**146.15° E**			Elevation: **145m**			
Statistic	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
Mean	35.3	34.3	39.4	43.8	54.8	64.7	60.2	63.0	56.3	52.9	46.0	39.1	595.9
Deviation	1	0	5	10	21	30	26	29	22	19	12	5	178
9th Decile Wet Year	36	34	44	53	74	93	85	90	77	70	57	44	758

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WATER/NITROGEN BALANCE (20/30 irrigation)

NO WET MONTH STORAGE

Rainfall Station: Seymour **Evaporation Station:** Lake Eildon (G-M Water)

TAYLOR CONSULTING ENGINEERS

Location: 35 Upper Goulburn Road, Tallarook
Date: Jul-20
Client: Camp Caravan Cabin Pty Ltd

ITEM	UNIT	#	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Days in month:		D	31	28	31	30	31	30	31	31	30	31	30	31	365
Evaporation (Mean)	mm	A	161	137	109	57	31	18	19	31	51	84	117	146	960
Rainfall (9th Decile wet year adjusted)	mm	B1	36	34	44	53	74	93	85	90	77	70	57	44	758
Effective rainfall	mm	B2	29	27	35	42	59	75	68	72	62	56	46	35	606
Peak seepage Loss[1]	mm	B3	133	120	133	129	133	129	133	133	129	133	129	133	1570
Evapotranspiration(IXA)	mm	C1	113	96	76	34	16	8	7	14	28	54	82	102	630
Waste Loading(C1+B3-B2)	mm	C2	217	189	174	121	90	62	73	75	95	131	165	200	1594
Net evaporation from lagoons (10(0.8A-B1xlagoon area(ha)))	L	NL	0	0	0	0	0	0	0	0	0	0	0	0	0
Volume of Wastewater	L	E	18600	16800	18600	18000	18600	18000	18600	18600	18000	18600	18000	18600	219000
Total Irrigation Water(E-NL)/G	mm	F	62	56	62	60	62	60	62	62	60	62	60	62	730
Irrigation Area(E/C2)annual.	m^2	G													300
Surcharge/Storage	mm	H	-155	-133	-112	-61	-28	-2	-11	-13	-35	-69	-105	-138	**0**
Actual seepage loss	mm	J	-22	-13	21	63	106	127	122	120	94	64	24	-5	
Direct Crop Coefficient:		I	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture

Rainfall Retained:	80	%	K
Lagoon Area:	0	ha	L
Wastewater(Irrigation):	600	L	M
Seepage Loss (Peak):	4.3	mm	N
Irrig'n Area(No storage):	300	m^2	P2
Application Rate:	2.0	mm	Q
Nitrogen in Effluent:	30	mg/L	R
Denitrification Rate:	20	%	S
Plant Uptake:	220	kg/ha/yr	T
Average daily seepage:	2.0	mm	U
Annual N load:	5.26	kg/yr	V
Area for N uptake:	239	m^2	W
Application Rate:	2.5	mm	X

1. Seepage loss (peak) equals deep seepage plus lateral flow: 4.8mm (<8% ksat after renovation)

CROP FACTOR

0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Shade
0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	Fescue
1	1	1	1	1	1	1	1	1	1	1	1	Woodlot

NITROGEN UPTAKE

Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH
Ryegrass	200	5.6-8.5	Bent grass	170	5.6-6.9	Grapes	200	6.1-7.9
Eucalyptus	90	5.6-6.9	Couch grass	280	6.1-6.9	Lemons	90	6.1-6.9
Lucerne	220	6.1-7.9	Clover	180	6.1-6.9	C cunn'a	220	6.1-7.9
Tall fescue	150-320	6.1-6.9	Buffalo (soft)	280	6.1-6.9	P radiata	150	5.6-6.9
Rye/clover	220		Sorghum	90	5.6-6.9	Poplars	115	5.6-8.5

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WATER/NITROGEN BALANCE (20/30 irrigation)

NO WET MONTH STORAGE

Rainfall Station: Seymour Evaporation Station: Lake Eildon (G-M Water)

TAYLOR CONSULTING ENGINEERS

Location: 35 Upper Goulburn Road, Tallarook
Date: Jul-20
Client: Camp Caravan Cabin Pty Ltd

ITEM	UNIT	#	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Days in month:		D	31	28	31	30	31	30	31	31	30	31	30	31	365
Evaporation (Mean)	mm	A	161	137	109	57	31	18	19	31	51	84	117	146	960
Rainfall (9th Decile wet year adjusted)	mm	B1	36	34	44	53	74	93	85	90	77	70	57	44	758
Effective rainfall	mm	B2	29	27	35	42	59	75	68	72	62	56	46	35	606
Peak seepage Loss[1]	mm	B3	133	120	133	129	133	129	133	133	129	133	129	133	1570
Evapotranspiration(IXA)	mm	C1	113	96	76	34	16	8	7	14	28	54	82	102	630
Waste Loading(C1+B3-B2)	mm	C2	217	189	174	121	90	62	73	75	95	131	165	200	1594
Net evaporation from lagoons (10(0.8A-B1xlagoon area(ha)))	L	NL	0	0	0	0	0	0	0	0	0	0	0	0	0
Volume of Wastewater	L	E	23250	21000	23250	22500	23250	22500	23250	23250	22500	23250	22500	23250	273750
Total Irrigation Water(E-NL)/G	mm	F	62	56	62	60	62	60	62	62	60	62	60	62	730
Irrigation Area(E/C2)annual.	m^2	G													**375**
Surcharge/Storage	mm	H	-155	-133	-112	-61	-28	-2	-11	-13	-35	-69	-105	-138	**0**
Actual seepage loss	mm	J	-22	-13	21	63	106	127	122	120	94	64	24	-5	
Direct Crop Coefficient:		I	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture

Rainfall Retained:	80	%	K
Lagoon Area:	0	ha	L
Wastewater(Irrigation):	750	L	M
Seepage Loss (Peak):	4.3	mm	N
Irrig'n Area(No storage):	**375**	m^2	P2
Application Rate:	**2.0**	mm	Q
Nitrogen in Effluent:	30	mg/L	R
Denitrification Rate:	20	%	S
Plant Uptake:	220	kg/ha/yr	T
Average daily seepage:	2.0	mm	U
Annual N load:	6.57	kg/yr	V
Area for N uptake:	**299**	m^2	W
Application Rate:	**2.5**	mm	X

1. Seepage loss (peak) equals deep seepage plus lateral flow: 4.8mm (<8% ksat after renovation)

CROP FACTOR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Wastewater(Irrigation):	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture
Seepage Loss (Peak):	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Shade
Irrig'n Area(No storage):	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	Fescue
Application Rate:	1	1	1	1	1	1	1	1	1	1	1	1	Woodlot

NITROGEN UPTAKE

Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH
Ryegrass	200	5.6-8.5	Bent grass	170	5.6-6.9	Grapes	200	6.1-7.9
Eucalyptus	90	5.6-6.9	Couch grass	280	6.1-6.9	Lemons	90	6.1-6.9
Lucerne	220	6.1-7.9	Clover	180	6.1-6.9	C cunn'a	220	6.1-7.9
Tall fescue	150-320	6.1-6.9	Buffalo (soft)	280	6.1-6.9	P radiata	150	5.6-6.9
Rye/clover	220		Sorghum	90	5.6-6.9	Poplars	115	5.6-8.5

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WATER/NITROGEN BALANCE (20/30 irrigation)

NO WET MONTH STORAGE

Rainfall Station: Seymour **Evaporation Station:** Lake Eildon (G-M Water)

TAYLOR CONSULTING ENGINEERS

Location: 35 Upper Goulbrn Road, Tallarook
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Evaporation (Mean)	mm	A	161	137	109	57	31	18	19	31	51	84	117	146	960
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Effective rainfall	mm	B2	29	27	35	42	59	75	68	72	62	56	46	35	606
Peak seepage Loss[1]	mm	B3	133	120	133	129	133	129	133	133	129	133	129	133	1570
Evapotranspiration(IXA)	mm	C1	113	96	76	34	16	8	7	14	28	54	82	102	630
Waste Loading(C1+B3-B2)	mm	C2	217	189	174	121	90	62	73	75	95	131	165	200	1594
Net evaporation from lagoons (10(0.8A-B1xlagoon area(ha)))	L	NL	0	0	0	0	0	0	0	0	0	0	0	0	0
Volume of Wastewater	L	E	27900	25200	27900	27000	27900	27000	27900	27900	27000	27900	27000	27900	328500
Total Irrigation Water(E-NL)/G	mm	F	62	56	62	60	62	60	62	62	60	62	60	62	730
Irrigation Area(E/C2)annual.	m^2	G													**450**
Surcharge/Storage	mm	H	-155	-133	-112	-61	-28	-2	-11	-13	-35	-69	-105	-138	**0**
Actual seepage loss	mm	J	-22	-13	21	68	106	127	122	120	94	64	24	-5	
Direct Crop Coefficient:		I	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture

Rainfall Retained:	80	%	K
Lagoon Area:	0	ha	L
Wastewater(Irrigation):	900	L	M
Seepage Loss (Peak):	4.3	mm	N
Irrig'n Area(No storage):	**450**	m^2	P2
Application Rate:	**2.0**	mm	Q
Nitrogen in Effluent:	30	mg/L	R
Denitrification Rate:	20	%	S
Plant Uptake:	220	kg/ha/yr	T
Average daily seepage:	2.0	mm	U
Annual N load:	7.88	kg/yr	V
Area for N uptake:	**358**	m^2	W
Application Rate:	**2.5**	mm	X

1. Seepage loss (peak) equals deep seepage plus lateral flow: 4.4mm (<8% ksat after renovation)

CROP FACTOR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Wastewater(Irrigation):	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture
Seepage Loss (Peak):	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	Shade
Irrig'n Area(No storage):	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	Fescue
Application Rate:	1	1	1	1	1	1	1	1	1	1	1	1	Woodlot

NITROGEN UPTAKE

Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH	Species:	Kg/ha.yr	pH
Ryegrass	200	5.6-8.5	Bent grass	170	5.6-6.9	Grapes	200	6.1-7.9
Eucalyptus	90	5.6-6.9	Couch grass	280	6.1-6.9	Lemons	90	6.1-6.9
Lucerne	220	6.1-7.9	Clover	180	6.1-6.9	C cunn'a	220	6.1-7.9
Tall fescue	150-320	6.1-6.9	Buffalo (soft)	280	6.1-6.9	P radiata	150	5.6-6.9
Rye/clover	220		Sorghum	90	5.6-6.9	Poplars	115	5.6-8.5

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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 build-up, 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 re-establishment 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.

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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.
- Read labels to learn which bathroom and laundry products are suitable for septic tanks. Generally plain, non-coloured, 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).

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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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TOWARDS BETTER ONSITE WASTEWATER MANAGEMENT IN VICTORIA - COMMUNITY EDUCATION SERIES

FACT SHEET 3: SEPTIC TANK WITH SAND FILTER

If you live in a country town, have a septic system that treats your wastewater, and live on a small block, then it is possible that you also have a sand filter. This fact sheet focuses on sand filters, their issues and some ideas to help manage them.

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Please note,information and facts contained in this publication were correct at the time of printing and production.

Printed: December 2012

3.1 WHAT IS A SAND FILTER?

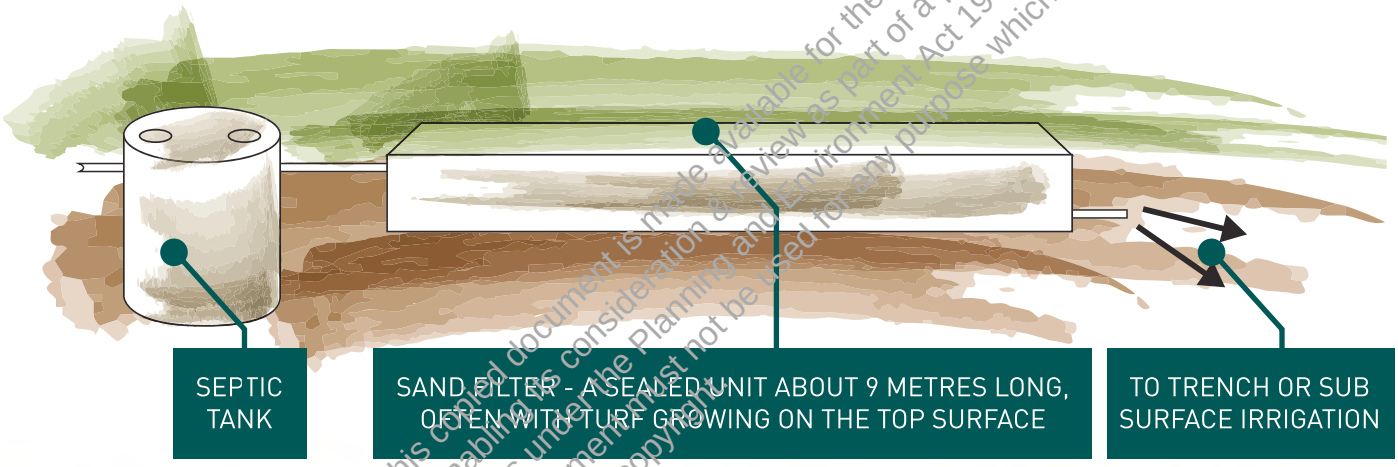
Sand filters are large, generally subsurface structures filled with sand that treat your wastewater to a higher standard than your septic tank alone. Sand filters are not a new technology, but they are an extremely effective method for reducing risks to the environment and for increasing your wastewater disposal options.

3.2 HOW DOES IT WORK?

The effluent from the septic tank percolates through the sand in the sand filter. The sand captures any remaining solid material and provides a good environment for good bugs (aerobic bacteria) to digest wastewater and reduce pollution.

Once treated in the sand filter, the effluent is then disposed into underground trenches, or sub-surface irrigation systems or another method approved by your local government environmental health practitioner (EHP or EHO).

DIAGRAM 1: A BASIC SYSTEM



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3.3 WHAT ARE THE COMMN ISSUES WITH SAND FILTERS THAT YOU SHOULD BE AWARE OF:

Sand filters, like your septic system, will not last forever. Their major function is to filter particles out of wastewater and facilitate growth of good bugs to treat wastewater to a higher standard. After a few years, these very small particles and bacterial colonies will begin to clog parts of your sand filter and it will not work quite as effectively. Any issues that affect septic tanks and package treatment plants will have an impact on your sand filter.

These issues include:

- Too much sludge. This can result in untreated wastewater heavy with solids leaving the tank and clogging up pipes and absorption trenches;
- Too much water going into the septic tank and trenches. This can also result in solids being pushed out of the tank and clogging up the pipes and the trenches because of poor wastewater flow rate calculations or overuse of the system;
- Toxic chemicals, such as bleach or disinfectants, going into the system. This can result in the good bugs being killed off, halting the digestion process;
- Common signs of a failing septic tank system are the water draining away too slowly; pipes making noises or gurgling when draining; sewage smells; or water ponding above the sand filter.

3.4 A FEW SIMPLE STEPS TO A HEALTHY SAND FILTER AND WALLET:

- De-sludge your septic tank every 3 to 5 years, depending on use. Sludge forms a crust on the surface of the sand filter, which blocks the wastewater from moving through the filter;
- Install water saving devices to limit the flow of wastewater through the system;
- At the first sign of pump failure or water ponding on the surface of the sand filter, call a licensed plumbing practioner;
- You might consider upgrading your sand filter to include a pressurised distribution system, which allows more even distribution of the wastewater across the surface area of the filter and helps it to work more effectively;
- Do not build structures like garages or sheds over the septic system or the sand filter;
- Do not cover the sand filter with concrete or pavers.

3.5 KEEP YOUR WASTEWATER ON YOUR BLOCK:

If you have an ageing sand filter on a small block, it is likely that your wastewater management system was designed to discharge treated wastewater offsite. This is an historic method of designing wastewater systems that was frequently employed in townships with small lots. Systems designed in this way commonly discharge to the kerbside gutter.

This method of offsite discharge is no longer permitted due to impacts on the natural environment and the health of the public. However, there is no need to panic just yet. If your system has been designed in this way, it is unlikely that you will be required to change it unless one or more of the following circumstances arise:

- Your system fails and requires repair or replacement;
- The risk of environmental degradation or health impacts becomes too great;
- A reticulated sewer becomes available in your area;
- You alter your house design or any plumbing fixtures attached to your septic tank system;
- Your sand filter no longer meets the water quality standards it is required to achieve; or
- You have been given an order by your local government or other relevant wastewater or environmental protection agency to upgrade the wastewater management system.

Therefore, it is in your interest to maintain your wastewater management system to the highest standard possible in order to protect the natural environment, your community, your family's health and your hip-pocket.

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3.6 WHO TO CONTACT:

PRODUCED AND FUNDED BY:

LODDON SHIRE

LA TROBE UNIVERSITY

ehpa Improve - Maintain - Protect

* ALL WASTEWATER IS TO BE RETAINED ON THE PROPERTY

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www.trafficworks.com.au

Project No. 200642

16 April 2021

Ellen Hogan
Ellen Hogan and Associates
PO Box 658
Mansfield VIC 3724

Via email: ellen.hogan@bigpond.com

Dear Ellen

RE: Upper Goulburn Road, Tallarook - Sight Line Assessment

Trafficworks has been engaged to undertake a sight line assessment to support a planning application to Mitchell Shire Council (the Council) for the consolidation of a 6 lot residential subdivision and the creation of 3 access driveways. The subject site is located on the north side of the Upper Goulburn Road within the rural community of Tallarook.

This assessment reviewed sight distances for the three proposed new access driveways. The subject site and surrounding road network are shown in Figure 1.

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Figure 1: Subject site (Source: VicPlan website)

Department of Transport – Section 55 Further Information Required

It is understood that an initial assessment has been made by the Department of Transport (DoT) and Officers have requested the following additional information for the proposal to be properly considered and assessed:

1) *At the location for which access is being sought to the arterial road from all proposed lots, Approach Sight Distance (ASD) and Safe Intersection Sight Distance (SISD) measurements must be undertaken at the location of the proposed crossovers in accordance with:*

   a) *Section 3 of the Austroads (2017) Guide to Road Design Part4A; and*

   b) *VicRoads' supplement to the Austroads Guide to Road Design Part 4A.*

2) *The ASD and SISD checks must confirm that ASD and SISD is met for a reaction time of no less than:*

   a) *A reaction time of 2 seconds; and*

   b) *At an operating speed of 10 km/hr above the posted speed limit in accordance with VicRoads supplement to the Austroads Guide to Road Design Part 3, Section 3.4.2.*

   The above sight distance measurement must be undertaken by a VicRoads pre-qualified consultant.

   The Department advises that the SISD assessment, if not addressed satisfactorily as required above, will compromise its ability to support the application for the creation of access to the arterial road.

3) *Should the proposed location for the crossover(s) achieve ASD and SISD, the crossover(s) must clearly label on a plan the ASD and SISD sight line triangles.*

   Advice must be provided on whether or not any vegetation removal is required in order for SISD to be achieved.

4) *Any vegetation to be removed must be clearly marked on a plan and submitted as part of this Further Information letter.*

5) *The largest design vehicle which is expected to access the land from the arterial road (e.g. 19 metre semi-trailer etc) in order to specify the appropriate standard crossover from the arterial road.*

6) *Should either ASD or SISD not be achieved, then vehicular access to the arterial road will not be supported and must be located where it will be achieved.*

The Head, Transport for Victoria also wishes to provide the following preliminary comments:

1) *The application appears to show 5 crossovers for the proposed 6-lot subdivision.*

   This number of crossovers is not supported, and the number of crossovers to the 6-lots must be minimised to be no more than 2 crossovers.

   Reducing the number of crossovers will limit the number of conflict points for both the arterial road and the shared user path for those vulnerable road users.

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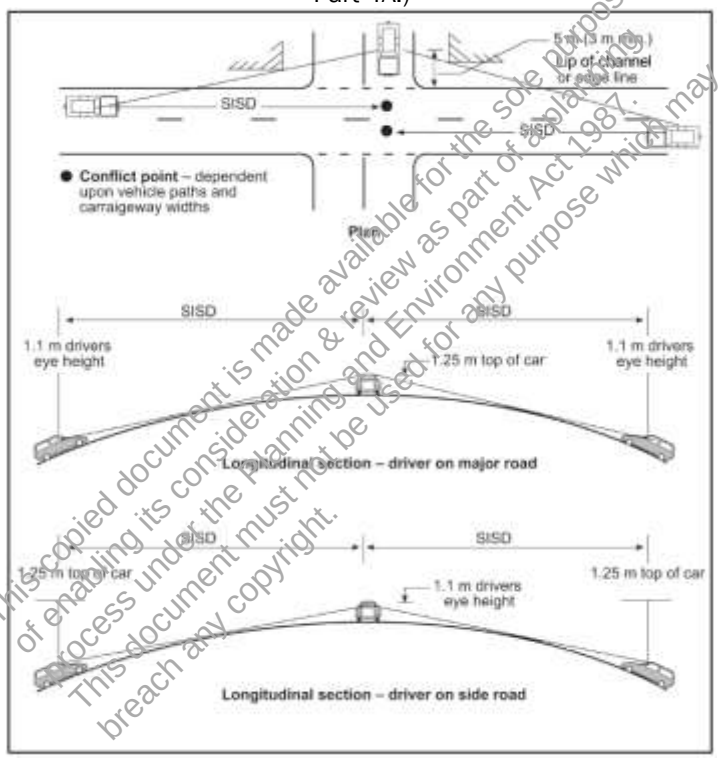
2) *Any existing access gates that are redundant as a result of the 6-lot subdivision must be shown on the resubmitted plan to be removed along with all associated crossover infrastructure.*

Sight distance assessment

Safe Intersection Sight Distance (SISD)

The visibility criterion normally applied to intersections and accesses to major traffic generators is Safe Intersection Sight Distance (SISD). This is nominated in the Austroads Guide to Road Design, Part 4A (AGRD4A) as the minimum distance which should be provided on the major road at any intersection (refer to Section 3.2.2 in AGRD4A) and provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle from the minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes) and to decelerate to a stop before reaching the collision point (refer Figure 2).

Figure 2: Safe Intersection Sight Distance (SISD). (Source: Figure 3.2 from Austroads Guide to Road Design Part 4A.)



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The minimum SISD criterion specified in Table 3.2 of the Austroads Guide requires clear visibility for a desirable minimum distance of 285 m, relating to the general reaction time RT of 2.0 seconds and a design speed[1] of 110 km/h. It should be noted that the speed zone reduces to 60 km/h approximately 130 m northeast of the intersection with Main Road.

It should be noted that SISD applies to intersections and accesses to major traffic generators. Therefore, considering that the five (consolidated) properties are not major traffic generators, SISD should not apply to the three proposed accesses.

[1] Design speed is the posted speed limit plus 10 km/h

- **Conclusion 1:** considering the six residential properties will not be major traffic generators, the Safe Intersection Sight Distance (SISD) requirement for the driveways is considered not applicable.

Approach Sight Distance (ASD)

The Approach Sight Distance (ASD) is:

- the minimum level of sight distance which must be available on the minor road approaches to all intersections to ensure that drivers are aware of the presence of an intersection
- also desirable on the major road approaches so that drivers can see the pavement and markings within the intersection and should be achieved where practicable. However, the provision of ASD on the major road may have implications (e.g. cost; impact on adjacent land and features) in which case Stopping Sight Distance (SSD) is the minimum sight distance that should be achieved on the major road approaches to the intersection and within the intersection
- measured from a driver's eye height (1.1 m) to 0.0 m, which ensures that a driver is able to see any line marking and kerbing at the intersection.

Considering the minor approaches in this assessment are access driveways whereby the owner of the subject site would be familiar with the conditions / location of the driveway and gate, this requirement is considered not applicable.

Conclusion 2: considering the minor approaches are access driveways, the Approach Sight Distance (ASD) requirement for the minor road (driveways) is considered not applicable.

Stopping Sight Distance (SSD)

Stopping Sight Distance (SSD) is the minimum requirement for sight distance along the major road frontage. This is the distance to enable a normally alert driver, travelling at the design speed on wet pavement, to perceive, react and brake to a stop before reaching a hazard on the road ahead.

Australian Standards AS/NZS 2980.1 Parking Facilities – Part 1: Off-street car parking, section 3.2.4 indicates that SSD is the minimum sight distance requirement for vehicles exiting an access driveway of a domestic property to traffic on the frontage road as seen in Figure 3a and 3b.

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Figure 3a: Sight distance requirements at driveways (Source: Figure 3.2 from AS/NZS 2890.1)

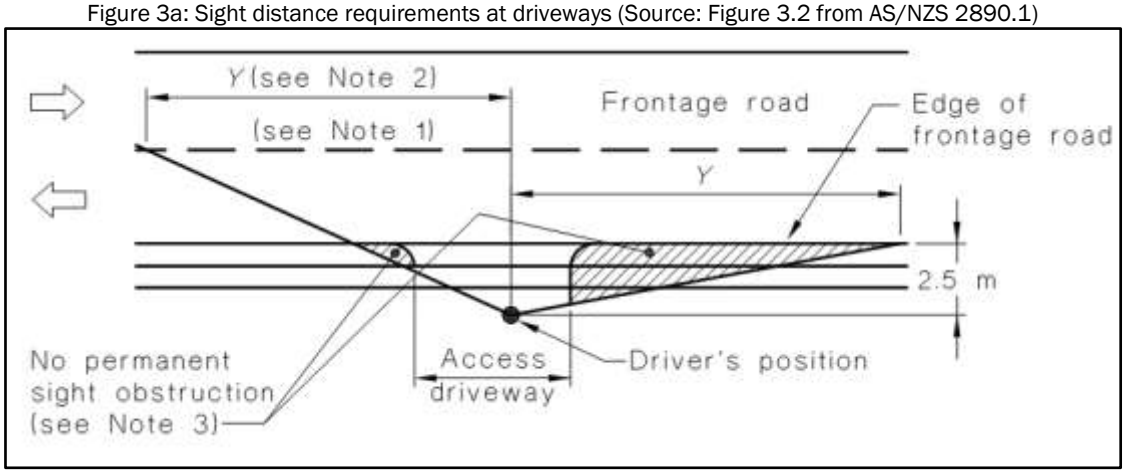

Figure 3b: Sight distance requirements at driveways (Source: Figure 3.2 from AS/NZS 2890.1)

Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Based on a general reaction time RT of 2.0 seconds, the desirable minimum SSD for the frontage road speed[2] of 110 km/h, the sight distance along the frontage road from a driver's position 2.5 m from the edge of the frontage road is 190 m to achieve minimum SSD.

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Proposed development

The proposed development consists of subdividing land to create 6 residential lots, with three direct accesses to Upper Goulburn Road. Lots 1 and 2, Lots 3 and 4, and Lots 5 and 6 would share driveways (refer the Figure 4 below). It should be noted that the access driveway to Lots 5 and 6 is approximately 180 m northeast of the intersection with Main Road.

Figure 4: Proposed layout for the creation of 6 residential lots (Source: client)

[2] A conservative value of the posted speed limit + 10 km/h was used in this assessment

Access driveway for proposed Lots 1 and 2

The sightlines for the proposed access driveway for Lots 1 and 2 were found to satisfy the SSD for both approaches to the access driveway, (refer to Photos 1 and 2 and Attachment A, Figures A1 and A2).

Photo 1: Visibility to the northeast at the proposed access driveway is 210 m over the slight crest

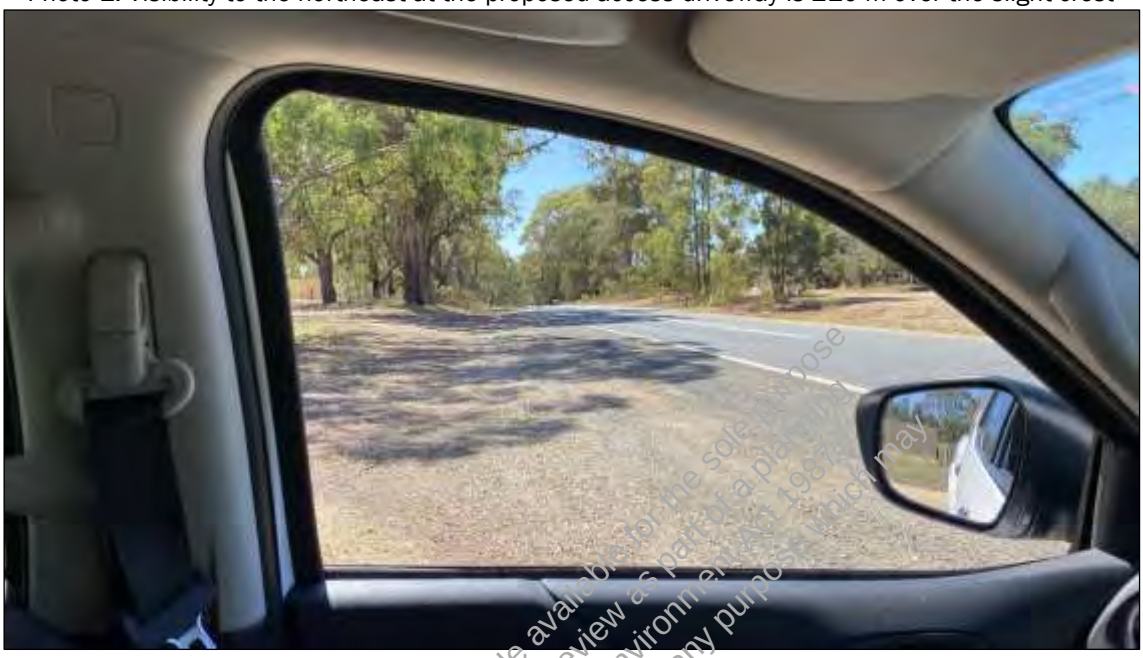
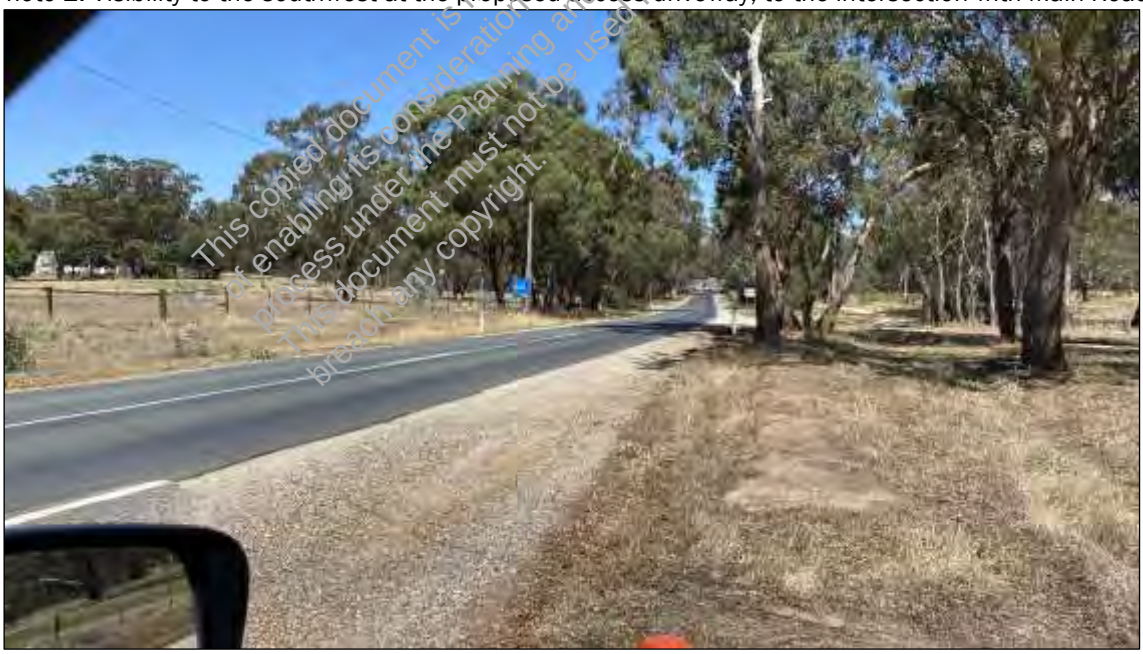


Photo 2: Visibility to the southwest at the proposed access driveway, to the intersection with Main Road



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Conclusion 3: SSD criteria, as outlined AS/NZS 2890.1, is satisfied to the southwest and northeast for the location of the access driveway for proposed Lots 1 and 2.

Access driveway for proposed Lots 3 and 4

The sightlines for the proposed access driveway for Lots 3 and 4 were found to satisfy the SSD requirement for both approaches to the access driveway, (refer to Photos 3 and 4 and Attachment A, Figures A3 and A4).

Photo 3: Visibility to the northeast at the proposed access driveway is 200 m over the slight crest

Photo 4: Visibility to the southwest at the proposed access driveway, to the intersection with Main Road

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Conclusion 4: SSD criteria, as outlined AS/NZS 2890.1, is satisfied to the southwest and northeast for the location of the access driveway for proposed Lots 3 and 4.

Access driveway for proposed Lots 5 and 6

The sightlines for the proposed access driveway for Lots 5 and 6 were found to satisfy the SSD requirement for the north-eastern approach to the access driveway, refer to Photo 5 (Attachment A, Figure A5).

Photo 5: Visibility to the northeast at the proposed access driveway is 260 m

With respect to the southwestern approach, the location of the proposed driveway access is approximately 180 m from the intersection with Main Road, which is less than the SSD criteria. Furthermore, approximately 50 m south west of the proposed access driveway is the transition from the 60 km/h speed zone to the 100 km/h default rural speed zone. Therefore vehicles approaching from the southwest approach the driveway at less than 100km/h, and the full 190 m SSD is not required.

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Photo 6: Visibility to the southwest at the proposed access driveway, to the intersection with Main Road

Therefore the sightlines for the proposed access driveway for Lots 5 and 6 were found to satisfy the applicable SSD requirement for the south-western approach to the access driveway.

Conclusion 5: SSD criteria, as outlined AS/NZS 2890.1, is satisfied to the southwest and northeast for the location of the access driveway for proposed Lots 5 and 6.

Number of accesses

It is acknowledged that from the initial assessment by DoT officers the preliminary advice is that the 6-lot subdivision be accessed by no more than two crossovers. As noted earlier in this report, the six residential properties will not be major traffic generators, and this assessment has determined that the SSD criteria, as outlined AS/NZS 2890.1, is satisfied at all of the proposed access locations.

Furthermore, the reduction of accesses from three to two would require the driveways to traverse 30 to 40 m laterally through the road reserve which will require extensive vegetation removal. The current three access locations minimise vegetation removal and allow vehicles to travel via the most direct route to the frontage road.

Conclusion 6: the proposed three access locations satisfy the SSD criteria and minimise the impact on the roadside vegetation.

Proposed access driveways

Based on the sight distance assessment at the subject site on Upper Goulburn Road in Tallarook, the key findings are summarised below:

- considering the six properties are not major traffic generators, Safe Intersection Sight Distance (SISD) requirement for the driveways is considered not applicable
- considering the minor approaches are access driveways, the Approach Sight Distance (ASD) requirement for the minor road is considered not applicable
- Stopping Sight Distance (SSD) criteria, as outlined AS/NZS 2890.1, is satisfied to the southwest and northeast for the location of the access driveway to the:
    - proposed Lots 1 and 2
    - proposed Lots 3 and 4
    - proposed Lots 5 and 6.
- the proposed three access locations satisfy the SSD criteria, and minimise the impact on the roadside vegetation

VicRoads Guideline Drawing – Typical Access to Rural Properties (GD4010)

All of the access driveways should be constructed generally in accordance with VicRoads guideline drawing for typical access to rural properties (GD4010), refer Attachment B.

- **Recommendation 1:** All access driveways should be constructed generally in accordance with VicRoads guideline drawing for typical access to rural properties (GD4010)

Please contact me on (0456) 115 051 if you would like to discuss this further.

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Yours sincerely,

Stuart Redman
Associate

ATTACHMENT A –Sight line Assessment Plans

Reference Documents:

- Australian Standards AS2890.1 Part 1 – Parking Facilities Part 1: Off-Street car parking
- Austroads Guide to Road Design, Part 4A Unsignalised and Signalised Intersections
- VicRoads guideline drawing for typical access to rural properties (GD4010)

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VEGETATION QUALITY ASSESSMENT FOR 35 Upper Goulburn Road Tallarook

April 2021

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Contents **Page Number**

1 Introduction 1
1.1 Site Description 2
1.1.2 Bioregion and Ecological Vegetation Classes (EVCs) occurring on the property 3
2 Planning & Legislation 4
2.1 Planning 4
2.1.2 Planning Clause 52.17 4
2.2 Environment Protection and Biodiversity Conservation Act 1999 5
2.3 The Victorian Flora and Fauna Guarantee Act 1988 6
2.4 Wildlife Protection Act 1975 6
2.5 Victorian Catchment and Land Protection Act 1994 7
3 Methodology 7
3.1 Tree Retention Zone (TRZ) 9
3.2 Significant Fauna 10
3.3 Limitations 10
4 Discussion & Results 10
4.1 Driveway and Road Reserve Vegetation 11
4.2 Development Area Native Vegetation 14
4.2.1 Scattered Trees 15
4.2.2 Patches of Native Vegetation 16
4.3 DELWP Native Vegetation Removal Report (NVR) 19
4.3.1 Avoid and minimise statement 20
4.4 Weeds 20
4.5 Threatened Plant Species 21
4.5.1 Diurnal vertebrate species observed at the property 21
4.6 Threatened animal species recorded within 5 kilometres of the study site 21
5 Conclusion 22
5.1 References 23

Appendices:
Appendix 1: table 1: table of native vegetation identified on the road reserve
Table 1.1: native species found within the dwelling and wastewater envelopes
Appendix 2: Development Plans
Appendix 3: Topography image
Appendix 4: Photographs of the site, taken March-April 21
Appendix 5: Location of patches & trees
Appendix 6: Location of patches and scattered trees that are lost to the development
Appendix 7: Threatened animal species recorded within 5 kilometres of the study site

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1 Introduction

A Vegetation Quality Assessment (VQA) was undertaken in March-April 2021, at the request of Ellen Hogan & Associates P/L., concerning the proposed development and subdivision and of 35 Upper Goulburn Road, Tallarook, into six lots labelled 1 to 6 (refer to the proposed development plan).

Lot 1 is a pre-existing fenced-off residential lot that is approximately 0.3843 hectares in size; this lot will remain and is not subject to any proposed developments. The other five lots (Lots 2 to 6) are all 4,000 square metres or more in size, meaning that any native vegetation occurring on a proposed lot *will not* automatically be deemed lost (Planning Clause 52.17).

The subdivision will result in the development of dwellings and waste treatment envelopes that are to be situated in lots 2, 3, 4 and 5. The situation of the envelopes will result in the loss of some vegetation. In addition, some vegetation may be deemed lost within 2 metres on either side of the fence lines between the new lots. Vegetation will also be lost in the road reserve due to the construction of the driveways. Therefore, the subsequent aim of the project is to determine the extent of loss of native vegetation and the offset requirements to compensate for that loss of any native vegetation within the building and waste treatment envelopes and driveway access points.

Proposed lots 2 to 6 were subjected to a Vegetation Quality Assessment (VQA). The proposed subdivision plans for the development is given in appendix 2.

Access to lot 1 was not obtained, as there is not going to be any development occurring in this fenced-off area of the property. The proposed developments or subdivision is planned to occur in the area of the property covered by proposed lots 2 to 6.

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Figure 1:Location of property. Red outlines the property

1.1 Site Description

The property lies on the outskirts of Tallarook and consists of an existing dwelling (lot 1) and a large area of open grassy woodland that is proposed to be subdivided into 5 other lots (2 to 6) with each lot containing a dwelling and wastewater envelopes.

Presently, this open area consists of a ground covering dominated by heavily grazed, exotic and native grasses (graminoid species) and exotic forbes. In lots 5 and 6 there are areas of regenerated (re-growth) Eucalyptus saplings and seedlings, and patches of native vegetation consisting of native grasses and shrubs. Up until 2018, the land was grazed by sheep, calves and horses which accounts for the general lack of native understorey. However, some native understorey persists, and in patches, in amongst the generally weedy and degraded surroundings.

Towards the northern side of the property, near the old railway embankment, there are some scattered native shrubs as well as canopy *Eucalyptus* trees. Which will not be impacted upon by the proposed development.

The topography of the land is relatively flat with a drain or creek at the western end of the property in proposed lot 6 (a topographic contour map is given as appendix 3). There is a slight elevation of the land where lot 1 is located, at the eastern end of the property.

There are no other water bodies on the part of the property that is subject to the VQA. Proposed lot 1 of the subdivision is already fenced off with a colour bond fence from the rest of the property. From aerial images, there appears to be a dam in this part of the property.

The road reserve vegetation consists of a weedy remnant patch of woodland. A gravel bike and pedestrian path passes along the road reserve and is known as the Great Victorian Rail Trail. The rail-trail and road reserve will be cut in three places by the construction of joint gravel driveways to the housing lots.

Photographs describing the site (property) are given as appendix 4.

Note: The aerial images of property in Map Share (https://mapshare.vic.gov.au/mapsharevic/) have the Great Victorian Rail Trail running to the north of the property, whilst actually the rail trail runs along the Upper Goulburn Road reserve in front of the property.

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Figure 2: Location of property. Red outlines the property. Note: aerial image is not accurate, the property area is more open and less populated by trees than the image depicts.

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1.1.2 Bioregion and Ecological Vegetation Classes (EVCs) occurring on the property

The property lies within Central Victorian Uplands bioregion. There are two Ecological Vegetation Classes (EVCs) mapped as historically occurring (pre-1750) on the property: EVC 175_61 Grassy Woodland and EVC 56 Floodplain Riparian Woodland, which occurs within the vicinity of the creek corridor, near the western boundary of the property and along some of the flat areas facing Upper Goulburn Road. Both EVCs have a bioregional conservation status of being endangered.

Description of the EVCs:

EVC 56: “An open woodland to 20 m tall usually dominated 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 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” (DSE 2004 a).

EVC 175_61: “A variable open eucalypt woodland to 15 m tall over a diverse ground layer of grasses and herbs. The shrub component is usually sparse. It occurs on sites with moderate fertility on plains or undulating hills on a range of geologies” (DSE 2004 b).

Due to the strong presence of *Eucalyptus camaldulensis* trees on the road reserve, EVC 56 appears to be the dominant ecological vegetation class occurring on the road reserve. *Eucalyptus camaldulensis* is a character species of EVC 56. Whilst EVC 175_61 Grassy Woodland appears to be present partly in areas of the property covered by the proposed building and waste-treatment envelopes. There is an extensive presence of what appears to be heavily grazed native grasses. Within the road reserve there are scattered examples of native understorey species remaining, however, the dominant understorey vegetation consists of exotic grasses and forbs.

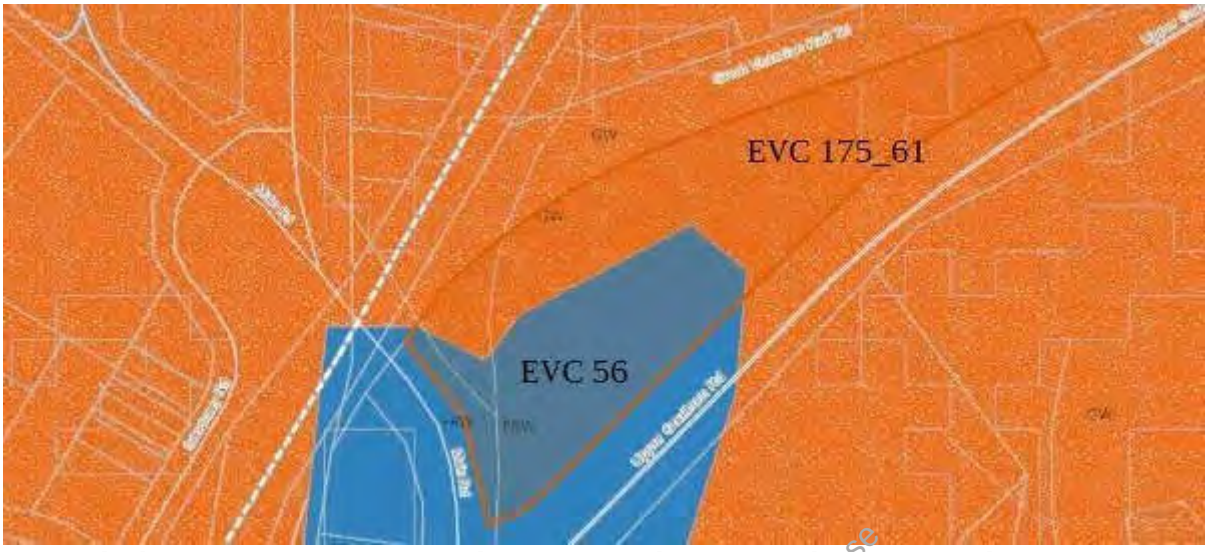

Figure 2: the historic EVCs as estimated to occur on the property by DELWP, (the property is outlined in red) (Nature Kit – DELWP).

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2 Planning & Legislation

2.1 Planning

The property lies within the Mitchell Shire and Goulburn Broken Catchment Management Authority (CMA).
Zoning: Township zone (TZ) – schedule to the Township zone (TZ)
Overlay: Vegetation Protection Overlay (VPO) and schedule to the Vegetation Protection Overlay - schedule 1 (VPO1), (VicPlan).
VPO1 is confined to the front two-thirds of the property facing Upper Goulburn Road and along the creek riparian zone. VPO1 is concerned with the protection of native vegetation within the roadside corridor. Thus, a planning permit is required to remove or lop any native vegetation (Mitchell Shire Planning Scheme).

2.1.2 Planning Clause 52.17

Under Victorias *Planning and Environment Act 1987*, planning Clause 52.17 details native vegetation provisions. This report is carried out under the provision of Planning Clause 52.17 and DELWP requirements (DELWP 2017 a & b). And, if a permit is granted to remove native vegetation, then an appropriate offset has to be met.

Under Victorias *Planning and Environment Act 1987*, planning Clause 52.17 details native vegetation provisions. This report is carried out under the provision of Planning Clause 52.17 and DELWP requirements (DELWP 2017 a & b). And, if a permit is granted to remove native vegetation, then an appropriate offset has to be met.

Under Planning Clause 52.17, which covers native vegetation – Victorian species, there is the need to:

1. Avoid the removal, destruction or lopping of native vegetation.
2. Minimise impacts from the removal, destruction or lopping of native vegetation that cannot be avoided.
3. Provide an offset to compensate for the biodiversity impact if a permit is granted to remove, destroy or lop native vegetation. (Planning Clause 52.17).

Exemptions under planning clause 52.17, pertinent to the native vegetation that may occur at the study site, are:

> The clearing along both sides of a fence when combined must not exceed 4 metres in width, except where land has already been cleared 4 metres or more along one side of the fence, then up to 1 metre can be cleared along the other side of the fence.

This means that native trees and native vegetation within one or two metres of an existing fence can be cleared without the requirement of a permit or an offset if the trees are removed.

For example, if the vegetation is already cleared on one side of the existing fence, then the native vegetation within one metre, on the other side, can be cleared. However, if native vegetation exists on both sides of the fence, then native vegetation within two metres of the existing fence line can be removed without the need for a permit or offset.

If a fence is planned to be erected, then native vegetation within one or two metres on either side has to be offset.

Planted native vegetation can also be removed without the requirement of a planning permit or an offset: “Native vegetation that is to be removed, destroyed or lopped that was either planted or grown as a result of direct seeding” (Planning Clause 52.17, DELWP 2017 b).

Re-growth native vegetation that is less than 10 years growing on previously cleared land can be cleared without a permit (Planning Clause 52.17).

Under Planning Clause 52.17 all native vegetation that is not indigenous to Victoria are considered environmental weeds. In addition, naturally occurring non-indigenous native vegetation are considered weeds (DSE 2004). For example, the native tree *Pittosporum undulatum* (Sweet Pittosporum), indigenous to the forests of East Gippsland and perhaps West Gippsland (Flora Victoria), is a significant environmental weed outside of its natural range. Thus, non-indigenous native vegetation may be cleared without the need for a permit.

2.2 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act (1999) (EPBC Act) applies to sites where proposed developments or projects may have a significant impact on ‘matters of national environmental significance’ (MNES). There are currently seven MNES:

- World Heritage Properties

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- National Heritage Place
- nationally listed threatened species and ecological communities
- listed migratory species
- Ramsar wetlands of international importance
- Commonwealth marine areas
- nuclear actions (including uranium mining).

Under the EPBC Act (1999), a proponent must refer proposed actions that may have a significant impact on matters on national environmental significance to the Australian Government Environment Minister (or delegate).

2.3 The Victorian Flora and Fauna Guarantee Act 1998

The Flora and Fauna Guarantee Act 1998 (FFG Act) was legislated to ensure the continued survival of all Victorian species of flora and fauna and all Victorian communities of plants and animals. The FFG Act provides a number of ways to assist in achieving its objectives, including:

- listing of threatened taxa, communities of flora or fauna and potentially threatening processes, and creation of Action Statements and Management Plans for all listed taxa communities of flora or fauna and processes
- declaration of a Critical Habitat if the habitat is critical for the survival of a species or a community of flora or fauna, if listed as Critical Habitat, the Minister for Environment may then make an Interim Conservation Order (ICO) to conserve the Critical Habitat (NB: no Critical Habitat has been declared in the State)
- protection of flora and fauna through listing offences such as penalties relating to not following an ICO and taking, trading in, keeping, moving or processing protected flora without a licence (NB: this does not apply to taking protected flora from private land (other than land which is part of the critical habitat for the flora) except for taking tree-ferns, grass, trees or sphagnum moss for the purpose of sale)

The Department of Environment, Land, Water and Planning (DELWP) is the referral authority for matters under the FFG Act.

2.4 Wildlife Protection Act 1975

All native wildlife in Victoria is protected by the Wildlife Protection Act (1975) and subsequent regulations.

Under the Act a person must not hunt, take or destroy endangered, notable or protected wildlife; this includes all native vertebrate animals, all kinds of deer, non-indigenous quail, pheasants, and

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partridges, and all terrestrial invertebrate animals listed under the *Flora and Fauna Guarantee Act* (1988). The Wildlife Regulations 2013 provide further detail relating to the Act, including that a person not to damage, disturb or destroy any wildlife habitat (s42). Although, this does not apply if the person is authorised to do so under any other Act such as the *Planning and Environment Act* (1987).

2.5 Victorian Catchment and Land Protection Act 1994

Under the CaLP Act 1999, a landowner must:

Under s 20 of the CaLP Act, all landowners, including the Crown, public authorities and licensees of Crown lands, must, in relation to their land, take all reasonable steps to:

- avoid causing or contributing to land degradation which causes or may cause damage to land of another landowner;
- eradicate regionally prohibited weeds;
- prevent the growth and spread of regionally controlled weeds on their land;
- prevent the spread of, and as far as possible, eradicate established pest animals.

(Agriculture Victoria)

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3 Methodology

The vegetation survey was carried out referring to the *Vegetation Quality Assessment Manual* – guidelines for applying the habitat hectares scoring method (Version 1.3 DSE, DELWP 2004). In addition, Kent and Coker (1995) were utilised. Kent and Coker (1995) provide the random walk methodology to survey the ground covering vegetation of the study site, whilst adhering to the Vegetation Quality Assessment Manual (DSE, DELWP 2004) and other DELWP guidelines.

The vegetation within the study site was initially surveyed to determine what was exotic, what was naturally occurring (not planted) or planted native vegetation, and whether any EVCs were present.

By definition, only indigenous canopy trees can be considered either scattered or a patch of native vegetation. A patch of native vegetation occurs when three or more canopy trees outer driplines touches the dripline of at least one tree, thus, forming a continuous patch of native vegetation. Additionally, a patch of native vegetation can be defined as an area where at least 25 percent of total perennial plant understorey cover is native (DELWP 2017a).

Native trees that were planted were not considered in the assessment. As aforementioned, under Planning Clause 52.17 planted native vegetation may be removed without the need of a permit or offset (Planning Clause 52.17, DELWP 2017 b).

The diameter at breast height (trunk circumference) was measured for indigenous *Eucalyptus* canopy trees. The diameter at breast height (DBH) of a tree trunk is measured at 1.3 metres above

ground level; the circumference at breast height (CBH) of a tree trunk is also measured at 1.3 metres above ground level.

Any indigenous non planted scattered canopy genera trees (*Eucalyptus* species) within the study site were GPS waypointed. If present, patches of indigenous native vegetation were measured and marked out by GPS, whilst walking *around the outer* canopy drip-line of the trees or the edge of the area of understorey vegetation. Scattered or patches of indigenous understorey were identified and large old canopy trees were noted and waypointed.

The extent and final habitat hectare results of the Vegetation Quality Assessment (VQA) for patches of native vegetation were incorporated into a shapefile. Also included in the shapefile were numbers of large and small scattered canopy size trees and including the assigned extents of coverage given to these trees. The incorporated VQA data on the shapefile was sent to DELWP to generate a Native Vegetation Removal report. However, if the patch of native vegetation and scattered trees came to a combined extent of fewer than 0.5 hectares and a detailed assessment was not required then, the Native Vegetation Information Management system (NVIM) tool (DELWP) was used to generate a Native Vegetation Removal report.

Any indigenous native vegetation present would be identified on-site and through the taking of samples, using relevant keys, texts and *Flora of Victoria*.

Large scattered indigenous canopy trees (or the removal of a canopy tree from a patch of native vegetation) are assigned an area value of 0.0707 hectares and smaller indigenous canopy trees have an area value of 0.0314 hectares per tree (DELWP-ENSym NVR tool). The large tree (*Eucalyptus* spp.) benchmark is DBH 70 centimetres (cm) or a CBH of 219 cm for EVC 175_61, Central Victorian Uplands bioregion and a DBH 80 cm or a CBH of 251 cm for EVC 56 benchmark, Central Victorian Uplands bioregion (DSE 2004 a).

The locations of native vegetation for Victoria are as follows (DELWP location categories – DELWP 2017 a):

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Extent of native vegetation	Location category		
	Location 1	Location 2	Location 3
Less than 0.5 hectares and not including any large trees	Basic	Intermediate	Detailed
Less than 0.5 hectares and including one or more large trees	Intermediate	Intermediate	Detailed
0.5 hectares or more	Detailed	Detailed	Detailed

Location 1 – includes all remaining locations in Victoria. These are low-risk areas of native vegetation loss having an impact upon the habitat for rare or threatened species (DELWP 2017 a).

Location 2 – includes locations that are mapped as endangered EVCs and or sensitive wetlands and coastal areas are not included in Location 3.

Location 3 native vegetation – includes locations where the removal of less than 0.5 hectares of native vegetation could have a significant impact on habitat for a rare or threatened species.

A full detailed survey was required in a location 2 category because more than 0.5 hectares of native vegetation may be lost to the development and the ecological vegetation classes (EVCs) mapped as occurring on the property by DELWP have a bioregional conservation status of being endangered. In addition, one or more large trees may be lost.

3.1 Tree Retention Zone (TRZ)

The Tree Retention Zones (TRZ) were calculated for the indigenous trees along the road reserve. TRZ protects the lateral tree roots, which are vital for the uptake of water, nutrients and oxygen. The root system generally extends beyond its canopy dripline and the majority of tree roots occur within the top 600 mm of the soil profile (Trees Are Good). If a tree's TRZ is compromised by more than ten percent, then the tree will be deemed lost (DSE 2011; Macedon Ranges Shire Council).

Knowing the TRZ of the trees will protect their lateral roots from being compromised by construction works.

The Tree Retention Zone (TRZ), or the Tree Protection Zone (TPZ), was calculated using the DSE guideline as per the following document: "Native Vegetation Technical Information Sheet. Defining an acceptable distance for tree retention during construction works" (DSE 2011). The TRZ was calculated by multiplying the DBH by a factor of 12, to give the radius in metres from the base of the trunk to the outer circular limit of the area that should be protected around a tree (refer to figure 2).

The TRZ of trees should be no less than 2 metres radius from the base of a trunk (DSE 2011).

Where the TRZ radius is calculated to be less than 2 metres, the tree or sapling is assigned the default radius of 2 metres. In addition, the TRZ radius should be no more than 15 metres from the base of a trunk (DSE 2011). The TRZ is the area of the circle formed by the radius out from the trunk of the tree.

For the protection of trees during construction the following activities should be excluded from the Tree Retention Zones (TRZ); (DSE 2011):

- machine excavation including trenching
- directional drilling that is less than 600 mm deep
- compaction of soil profile
- excavation for silt fencing
- storage
- preparation of chemicals, including cement products
- parking of vehicles and plant equipment
- refuelling
- dumping of waste
- placement of fill
- temporary or permanent installation of utilities and signs

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- physical damage to the tree

3.2 Significant Fauna

Threatened species records were sourced with DELWP NatureKit tool, which can be utilised to generate a Victorian Biodiversity Atlas (VBA) species list within 5 km radius of the study site. This list is cross-referenced with a EPBC Act Protected Matters Report (PMST), DELWP advisory lists, which also includes FFG listings and EPBC Act status. In addition, online sources such as Birdlife Australia and Museums Victoria are utilised. With this information, it is determined whether the site provides suitable habitat for any threatened or listed native fauna.

A general fauna survey is conducted in conjunction with the vegetation quality assessment. The search effort is conducted for a minimum of 2 person-hours (or longer), during this time the study site is slowly traversed, any species directly sighted or heard are recorded. Trees bearing hollows and burrows are recorded, animal scats and footprints are also noted.

Birds are identified on site with binoculars and listening for their species-specific vocalisations. Simpson and Day (1999) 'Field Guide to the Birds of Australia 6th edn' is referred to on-site to make identifications, in addition, a desktop search is conducted utilising sources such as Birdlife Australia to confirm identifications.

Records of species within a 5km radius of the site are given in Appendix 7,

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3.3 Limitations

Limitations were GPS drift and the estimating (subjective) process of the VQA (Habitat Hectares) methodology (DSE / DELWP 2004). Additionally, the survey was conducted during dry conditions making it difficult to accurately identify grasses. Furthermore, in some instances, there was a lack of reproductive material which made the identification of some species rather difficult. Optimal survey times are in the spring. However, many of the native species recorded are unlikely to be confused with exotics based on leaf structure.

Also, it was hard to determine within the proposed subdivision lots whether EVC 56 or EVC 175_61 was present, due to the degraded nature of the vegetation occurring on the property. Whilst there may be *Eucalyptus camaldulensis* trees, typical of EVC 56, the shrub layer was not prevalent. The property was used for grazing purposes and is now heavily grazed by kangaroos and rabbits.

The aerial images of the property and vegetation do not reflect what is seen on the ground. The property in areas is more open than what is depicted by aerial imagery. The tree shadows of the aerial imagery do not accurately represent what is in the field.

4 Discussion & Results

For the sake of clarity the discussion and results regarding the driveways and main development areas will be divided into two: 4.1 Driveway and Road Reserve Vegetation and 4.2 Development

Area Native Vegetation (and subsection 4.2.1 Scattered Trees). The possible loss of native vegetation from the construction of the three common or shared driveways and the building and waste treatment envelopes is given in these sections.

Details on weeds, native vegetation and fauna can also be found in this section.

The location of the proposed driveways is given in appendix 2, and photographs of the site (property) are given in appendix 4.

Native species recorded within the road reserve and development area are given in appendix 1.

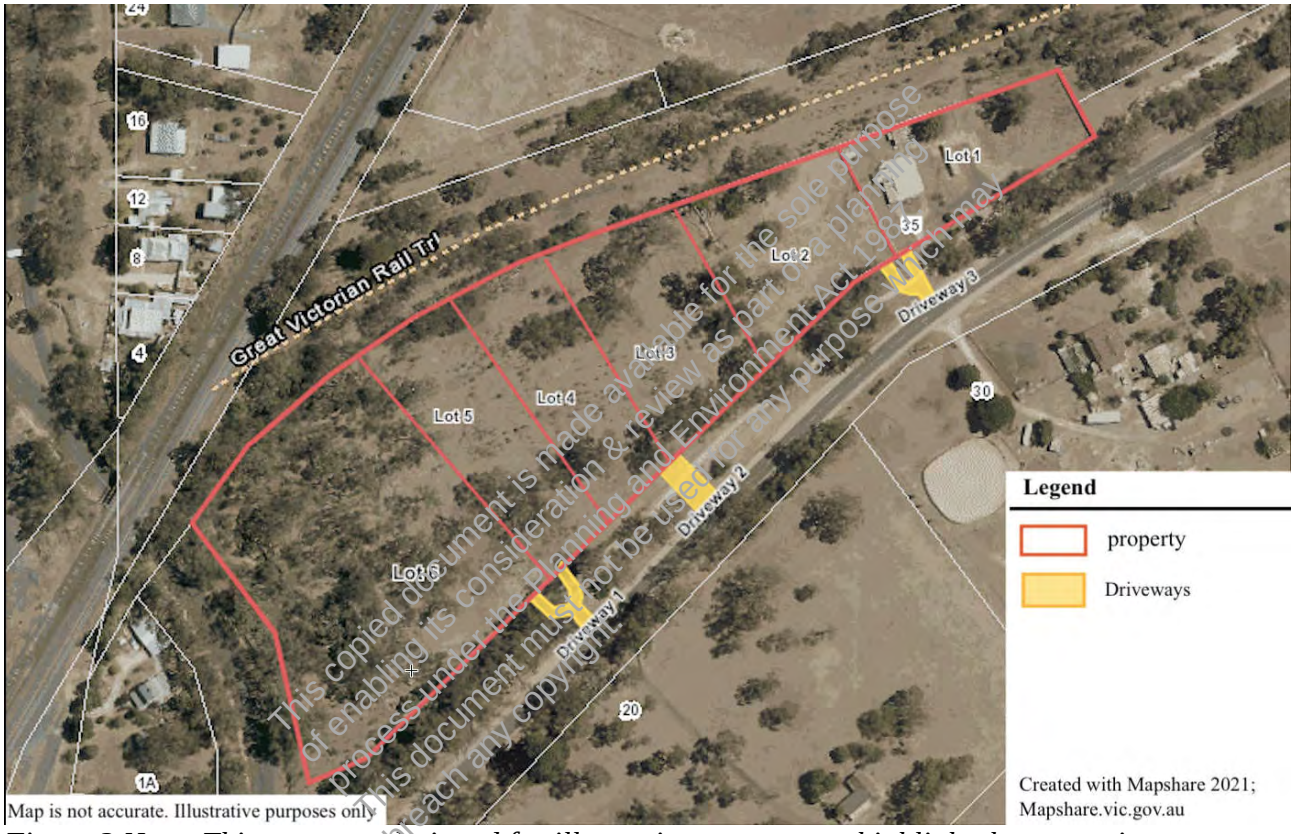

Figure 3 Note: This map was designed for illustrative purposes to highlight the approximate location of the lots and driveways. For development plans refer to appendix 2.

4.1 Driveway and Road Reserve Vegetation

The road reserve vegetation, by definition, consists of patches of native vegetation; as three or more native canopy trees outer drip-lines touch the drip-line of at least one tree, thus forming a continuous patch of native vegetation (DELWP 2017a).

The understorey native species identified in the road reserve vegetation were mostly scattered amongst exotic vegetation. There is a patch of what appears to be *Brachyloma daphnoides* in association with a few *Exocarpos cupressiformis* trees, which will be lost through the establishment of a driveway between lots 5 and 6. There is also a very small area where *Acacia paradoxa* and *Acacia melanoxylon* shrubs are quite prevalent. However, overall the native understorey vegetation of the road reserve is scattered amongst exotic grasses and forbs.

All of the proposed driveways should have no impact upon the TRZ of surrounding trees, as they are going to be constructed by laying gravel on the ground surface, without any cutting into the lateral root zone of the trees. Compaction of the soil should be at a minimum as the driveways are just for residential purposes. Thus the impact of the driveways upon surrounding trees should be negligible.

In summary:

The proposed common driveway between lots 5 and 6 (Driveway 1, Patch 6 April 21) falls within a patch of road reserve native vegetation and the driveway construction will remove some native vegetation from the roadside.

The second common driveway (Driveway 2, Patch 13 April 21) between lots 3 and 4 impacts a small area of native vegetation. No roadside *Eucalyptus* trees will be lost in the construction of this driveway. However, two *Eucalyptus* trees within lot 3 and 4 (development area) will be impacted by the proposed driveway.

The common driveway (Driveway 3) between lots 1 and 2 does not impact any patch of native vegetation.

Further details regarding the driveways, potentially compromised patches of native vegetation and scattered trees are given below.

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Driveway 1

Driveway 1 cuts through **Patch 6 April 21**, which occurs along the road reserve. The driveway entrance shared between lots 5 and 6, constitutes a partial removal of the native vegetation of patch 6 April 21 (DELWP 2018).

Patch 6 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	9
Tree Canopy Cover	5	2
Lack of Weeds	15	6
Understorey	25	10
Recruitment	10	6
Organic litter	5	5
Logs	5	2
EVC Standardiser	1x	1x
Standardised site condition score	75	40
Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of 100)	100	46
Final Score divided by a 100	1	0.46

Area of patch (hectares)		0.1960

This driveway entrance across the road reserve will result in the loss of one large *Eucalyptus camaldulensis* tree and a large dead tree and eight smaller *Eucalyptus* trees, which includes one dead tree. The canopy *Eucalyptus* trees that may be lost due to the construction of the driveway are as follows:

Waypoint	Species	EVC	DBH cm	TRZ metres
2	*Eucalyptus camaldulensis*	56	80	9.60
3	*Eucalyptus camaldulensis*	56	27	3.24
4	A dead *Eucalyptus* tree	56	29	
5	*Eucalyptus camaldulensis*	56	28.8	3.46
6	*Eucalyptus camaldulensis*	56	35.3	4.24
7	*Eucalyptus camaldulensis*	56	59.5	7.14
8	*Eucalyptus camaldulensis*	56	32.5	3.90
9	*Eucalyptus camaldulensis*	56	68.5	8.22
10	A dead *Eucalyptus* tree	56	69	

Waypoint 2 tree is a large tree (the large tree EVC 56 benchmark is 80 centimetres). Waypoint 10 whilst being a dead tree of an unknown *Eucalyptus* species is nevertheless considered to be a large tree and requires a permit for its removal (DELWP 2018). Waypoint 4 – dead tree has a DBH of less than 40 centimetres and therefore does not require a permit for its removal (DELWP 2018).

In addition to the loss of *Eucalyptus* trees, *Exocarpos cupressiformis* shrubs or small trees will be lost as well as a patch of *Brachyloma daphnoides* shrubs. *Acacia implexa* shrubs also occur within the vicinity of the proposed driveway, as well as scattered *Lomandra filiformis* subsp *coriacea Austrostipa* and *Rytidosperma* plants.

The area of vegetation cut out of patch 6 April 21 is approximately 0.0369 hectares and is designated as patch A3 April 21. An outline location of the patches of native and all the waypointed trees is given as appendix 5. Appendix 6 shows the patches of native vegetation and scattered trees that are presumed lost to the proposed development.

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Driveway 2

The second driveway located within patch 13 April 21, between lots 3 and 4, will result in the loss of a patch of understorey native vegetation (an area of approximately 0.0053 hectares): *Acacia melanoxylon* shrubs and saplings, *Eucalyptus camaldulensis* saplings, two clumps of *Dianella revoluta*, and scattered native grasses (*Rytidosperma* and *Austrostipa*).

Driveway 2 - Patch 13 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	0
Tree Canopy Cover	5	0

Lack of Weeds	15	2
Understorey	25	5
Recruitment	10	3
Organic litter	5	5
Logs	5	0
EVC Standardiser	1x	1x
Standardised site condition score	75	15
Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of 100)	100	21
Final Score divided by a 100	1	0.32
Area of patch (hectares)		0.1251

Overall, the patch area is very weedy with exotic grasses such as *Dactylis glomerata*, *Briza maxima* and *Anthoxanthum odoratum.* Blackberry (*Rubus fruticosus* species agg.) is also present within the patch as well as *Plantago lanceolata*. In the path of the proposed driveway, amongst the weeds there are some scattered Kangaroo grass (*Themeda triandra*) and Wallaby grass (*Rytidosperma* species), however, these native grasses would not constitute a patch of native vegetation.

Note: in addition, within the open paddock between lots 3 to 4, two scattered trees will be impacted upon, the details of these trees are given in **4.2.1 Scattered Trees.**

Driveway 3

The construction of driveway 3 between proposed lots 1 and 2 should have no impact upon any trees' TRZ, (the TRZ would not be compromised by more than 10 percent). The driveway is located in a clear gap in the vegetation with no understorey native vegetation. The ground covering vegetation is very weedy, consisting of exotic grasses and forbs.

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4.2 Development Area Native Vegetation

Under DELWP regulations a patch of vegetation can be defined as an area where at least 25 percent of the perennial understorey plant cover is native (DELWP 2017a). A patch of native vegetation can occur when three or more canopy trees outer drip-lines touch the drip-line of at least one tree, thus forming a continuous patch of native vegetation (DELWP2017a). However, in woodland or open-woodland ecological communities often the canopies of trees do not touch, the tree canopies are separate (McIntyre et al 2002). Scattered trees by definition, are native canopy trees that do not form part of a patch of native vegetation (DELWP 2017a).

Therefore, utilising DELWPs definition, the main property or 'development area' consists of scattered trees, with a native and exotic grassy understorey. It cannot be considered a patch of native vegetation, as the structure of the vegetation on the property does not meet either DELWP definitions of what a patch of native vegetation is considered to be (DELWP 2017a). In some places, three or more canopy trees are close enough together to form a small patch of native vegetation. However, the development plans sought to avoid most patches of native canopy trees, with only small patches of native grass being compromised or lost as a result of the proposed dwellings and wastewater envelopes.

As aforementioned, the development area is rather disturbed and degraded, having undergone extensive grazing in the past (up until 2013 the land was once utilised to graze sheep and cattle, from 2013 up until 2018 the land was grazed by horses. Presently, the land appears to be grazed by rabbits and kangaroos). Consequently, EVC 175_61 Grassy Woodland, which occurs over the development area, has become largely dominated by exotic grasses and forbes due to ecological edge effects. Nonetheless, grazed native grasses persist and were found in the development area, particularly in Lots 5 and 6 where they formed small patches amongst re-growth *Eucalyptus* saplings and seedlings. Under *Planning Clause 52.17* exemptions, re-growth of less than 10 years of age on previously cleared land can be removed without requiring a permit or subsequent offset. However, the patches of native grasses are not exempt and would most likely be deemed lost due to the proposed dwellings and wastewater envelopes, and therefore, will require a permit and offset for their removal.

There are several scattered trees that may be compromised by the proposed development. The details of these trees are given directly below; sub-section **4.2.1 Scattered Trees**.

4.2.1 Scattered Trees

The majority of the scattered trees, that may be impacted by the proposed development/subdivision, are located primarily in lots 5 and 6. This section of the proposed development was identified as being within EVC 56: Floodplain Riparian Woodland and none of the trees within this section are classified large (the large tree DBH benchmark for EVC 56 being 80 centimetres).

In addition, the TRZ of two scattered *Eucalyptus* trees, *within* lots 3 and 4, are presumed to be compromised by proposed driveway 2. These trees are waypoints 11 and 12 – both trees are large (the EVC 175_61 DBH benchmark for a large tree is 70 centimetres).

The boundary fencelines between the proposed lots does not result in the possible future loss of native trees, as no *Eucalyptus* tree is within 2 metres or closer. Any patches of understorey native vegetation that may be in the vicinity of a future fence has already been accounted for as a possible loss that needs to be offset if a permit is granted for their removal.

List of scattered trees:

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Way point	Species	DBH (cm)	TRZ (m)	Notes
11	*Eucalyptus camaldulensis*	*69.3*	*8.32*	Large tree located within lot 4. In the way of driveway 2. (EVC 175_61).
12	*Eucalyptus camaldulensis*	*82.8*	*9.94*	Large tree located within lot 3. In the way of driveway 2. (EVC 175_61)
14	*Eucalyptus camaldulensis*	76.5	9.18	Small tree located within lots 5 to 6. (EVC 56)
15	*Eucalyptus camaldulensis*	53.5	6.42	Small tree located within lots 5 to 6. (EVC 56)
16	*Eucalyptus camaldulensis*	42	5.04	Small tree located within lots 5 to 6. (EVC 56)
17	*Eucalyptus camaldulensis*	67.3	8.08	Small tree located within lots 5 to

				6. (EVC 56)
18	*Eucalyptus camaldulensis*	40.3	4.84	Located within lots 5 to 6. (EVC 56)

4.2.2 Patches of Native Vegetation

There are several patches of native vegetation that will be impacted upon by the proposed development. These small patches are comprised of native undestorey (approximately 25 percent constitutes a patch). Within these patches are numerous regenerated eucalyptus saplings and seedlings – these saplings and seedlings are regrowth of less than 10 years old and can be removed with a permit or offset (Planning Clause 52.17).

Whilst the development plans are designed to mitigate vegetation loss, it is doubtful whether future landowners will keep the patches. Consequently, the identified patches of native grasses are considered lost, even though the patches may not completely be covered by a building or waste treatment envelope.

The data from the Vegetation Quality Assessment was incorporated into a shapefile that was sent to DELWP to generate a Native Vegetation Removal report (found in **4.3**).

The patches are described below.

Patch B3 April 21 (EVC 175_61)

The size of the patch is approximately 0.1251 hectares.

The patch consists of *Rytidosperma* species (25 percent coverage). *Eucalyptus* saplings – small saplings – under a metre in height (50 percent cover) and medium-size saplings (just over a metre tall) with a coverage of about 10 percent. *Bryophytes* coverage was estimated to be 5 percent, native derived organic litter 10 percent coverage. Bare earth coverage was estimated to be at 50 percent.

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Patch B3 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	0
Tree Canopy Cover	5	0
Lack of Weeds	15	11
Understorey	25	5
Recruitment	10	5
Organic litter	5	5
Logs	5	0
EVC Standardiser	1x	1x
Standardised site condition score	75	26
Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of	100	32

100)		
Final Score divided by a 100	1	0.32
Area of patch (hectares)		0.1251

Patch C3 April 21 (EVC 175_61)

The size of the patch is approximately 0.0309 hectares.

The patch consists of heavily grazed native grass (graminoids) and *Eucalyptus* saplings. The bare earth coverage was about 50 percent. The coverage of native graminoids was estimated to be 25 percent, whilst native derived organic litter coverage was estimated to be 10 percent and *Bryophytes* coverage at 5 percent.

Patch C3 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	0
Tree Canopy Cover	5	0
Lack of Weeds	15	11
Understorey	25	5
Recruitment	10	5
Organic litter	5	5
Logs	5	0
EVC Standardiser	1x	1x
Standardised site condition score	75	26
Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of 100)	100	32
Final Score divided by a 100	1	0.32
Area of patch (hectares)		0.0309

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Patch D3 April 21 (EVC 56)

The size of the patch is approximately 0.0241 hectares.

This patch consisted of seven small *Eucalyptus camaldulensis* trees with waypoint 13 being the largest tree of the group with a DBH of 68.6 centimetres. There was also 50 percent coverage of small *Brachyloma daphnoides* shrubs and a 10 percent coverage provided by *Exocarpos cupressiformis* trees and a sapling. A *Dianella revoluta* clumps are estimated to provide 5 percent coverage, whilst heavily grazed native grasses were estimated to be at a 10 percent coverage. There was also an *Acacia paradoxa* shrub. Native derived organic litter was estimated to provide 50 percent coverage, whilst bare earth was at 25 percent coverage with a *Bryophyte* coverage of 5 percent. Exotic grass was estimated to provide 10 percent coverage.

Patch D3 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	0
Tree Canopy Cover	5	4
Lack of Weeds	15	11
Understorey	25	5
Recruitment	10	3
Organic litter	5	5
Logs	5	0
EVC Standardiser	1x	1x
Standardised site condition score	75	28
Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of 100)	100	34
Final Score divided by a 100	1	0.34
Area of patch (hectares)		0.0241

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Patch F3 April 21 (EVC 175_61)

The size of the small patch of native vegetation is 0.0010 hectares.

The patch consists of grazed native grass and would provide an estimated 30 percent coverage. The group of small *Eucalyptus* saplings would provide 25 percent coverage. Bare earth would comprise 50 percent of the patch, with native organic litter coverage of 15 percent. Heavily grazed native grass would provide an estimated 30 percent coverage, whilst exotic grass coverage would be at an estimated 10 percent. *Bryophytes* would provide about 25 percent ground coverage. This small patch appears to be located in a building envelope and would probably not be kept by a future landowner.

Patch F3 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	0
Tree Canopy Cover	5	0
Lack of Weeds	15	11
Understorey	25	5
Recruitment	10	5
Organic litter	5	5
Logs	5	0
EVC Standardiser	1x	1x
Standardised site condition score	75	26

Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of 100)	100	32
Final Score divided by a 100	1	0.32
Area of patch (hectares)		0.0010

Patch G3 April 21 (EVC 175_61)

The size of small patch of native vegetation is approximately 0.0003 hectares.

The patch consists of heavily grazed native grass, the ground coverage is approximately 50 percent. There is also a group of small *Eucalyptus saplings* within the patch (approximately 75 percent ground coverage). *Lomandra*, which has been grazed, would provide an estimated ground coverage of 5 percent. Native organic litter has an estimated 10 percent coverage, whilst there is approximately 10 percent bare earth. Exotic grass coverage is estimated to provide 10 percent ground cover. This small patch appears to be located in a building envelope and would probably not be kept by a future landowner.

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Patch G3 April 21. VQA results.	Maximum score possible	Score for study site patch of native vegetation
Large Trees	10	0
Tree Canopy Cover	5	0
Lack of Weeds	15	11
Understorey	25	5
Recruitment	10	5
Organic litter	5	5
Logs	5	0
EVC Standardiser	1x	1x
Standardised site condition score	75	26
Patch Size	10	1
Neighbourhood	10	2
Distance to Core Area	5	3
Final Habitat Score (out of a possible score of 100)	100	32
Final Score divided by a 100	1	0.32
Area of patch (hectares)		0.0003

4.3 DELWP Native Vegetation Removal Report (NVR)

The parameters of the scattered trees and the VQA result for each of the patches, including the number of large trees per patch of native vegetation, were incorporated into a shapefile which was sent to DELWP to generate a Native Vegetation Removal (NVR) report. The NVR report outlines the offset required if a permit is granted to remove the native vegetation and also the potential threat

the proposed development may have towards threatened species. The NVR report is also given as an attachment.

Assessment Pathway	Detailed Assessment Pathway
Extent including past and proposed	0.474 hectares
Extent of past removal	0.000 hectares
Extent of proposed removal	0.474 hectares
Number of large trees to be removed	4
Location category of proposed removal	Location 2 The native vegetation is in an area mapped an Endangered Ecological Vegetation Class. Removal of less than 0.5 hectares of native vegetation will not have a significant impact on any habitat for a rare or threatened species.

The offset requirement that will apply if the native vegetation is approved to be removed:

Offset Type	General Offset
General offset amount	0.149 general habitat units
Vicinity	Goulburn Broken CMA or Mitchell Shire Council
Minimum strategic biodiversity value score	0.539
Large trees	4 large trees

The offset will be met through the purchase of a third-party offset.

Scattered trees and patches that have to be offset means that they a lost to the proposed development.

4.3.1 Avoid and minimise statement

There is an effort to avoid the removal of *Eucalyptus* trees. In the subdivision plans, the placement of the lot boundaries will not result in the deemed loss of any *Eucalyptus* tree. All *Eucalyptus* trees are more than 2 metres from a proposed boundary fence.

The driveway access to the proposed lots is shared between two lots to avoid the removal of native vegetation, especially trees. Instead of having five new driveways across the road reserve, it is proposed that there is only three.

The designated building and waste treatment envelopes are confined to open areas where impacts upon native trees are kept to a minimum. There is an overall tree removal avoidance in the design and intentions of the proposed subdivision.

4.4 Weeds

The understorey or ground covering vegetation of the road reserve is dominated by weeds, grasses and forbs. The property itself is in areas rather weedy, with typical exotic pasture grasses and forbs. Although its areas there appears to be a relatively good covering of native grasses. However, this is somewhat hard to determine because the grass covering has been heavily grazed, by rabbits and

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kangaroos. Fresh kangaroo and rabbit scats were widely evident on the property.

Under the CaLP Act 1994 regionally prohibited weeds must be eradicated and controlled. Noxious weeds occurring on the property should be controlled or eliminated.

Table 2: weeds found at site

Scientific Name	Common Name	Notes
Anthoxanthum odoratum	Sweet Vernal Grass	
Asparagus asparagoides	Bridal Creeper	a restricted weed in Victoria
Briza maxima	Quaking Grass	
Crataegus monogyna	Hawthorn	
Cyperus eragrostis	Drain Flat Sedge	
Dactylis glomerata	Cocksfoot	
Hypochaeris radicata	Cat's Ear	
Oxalis corniculata	Creeping Woodsorrell	
Plantago lanceolata	Ribwort	
Rosa rubiginosa	Sweet Briar Rose	a controlled weed in the Goulburn Broken CMA
Rubus fruticosus species agg	Blackberry	controlled weed in the Goulburn Broken CMA
Schinus molle	Peppercorn tree	

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4.5 Threatened Plant species

No listed threatened or rare plant species were recorded on the road reserve or the property.

4.5.1 Diurnal vertebrate species observed at the property

At the time of the survey there was a general lack of bird species heard or sighted.
Species observed and heard:

Platycercus elegans (Crimson Rosella)

Cracticus tibicen (Australian Magpie)

4.6 Threatened animal species recorded within approximately 5 kilometres of the study site

Threatened native fauna includes species that are listed as critically endangered, endangered or vulnerable under the EPBC Act (1999); listed threatened under the FFG Act (1988); and listed as critically endangered, endangered, vulnerable or rare in Victoria's rare or threatened fauna advisory lists (DELWP/ DSE 2009, 2013).

No threatened animal species were observed during the survey. The property with its open woodland and relatively small patch open-forest occurring within the riparian zone of the creek may provide habitat for threatened bird species moving through the Tallarook area. Most of the trees on the property were small to medium, old age trees with a general lack of nesting hollows. Thus, it is unlikely that threatened animal species would be found on the property. The list of these species is given in appendix 7.

5 Conclusion

The proposed subdivision and development of 35 Upper Goulburn Road, Tallarook, into 6 lots (with lot 1 being a pre-existing dwelling) with 3 driveways situated between each lot, has been designed to minimise any potential damage or loss to the surrounding native vegetation.

The VQA consisted of two components, 1) to determine whether the proposed dwellings and wastewater envelopes (located within lots 2, 3, 4, 5 and 6) would impact upon any native vegetation; and 2) to determine the extent of native vegetation removal that would occur due to the proposed construction of 3 driveways, which cuts through sections of a vegetated road reserve.

The designated building and waste treatment envelopes are confined to open areas within each lot, where impacts upon native trees are kept to a minimum. In addition, it was determined that the erection of new fences between the proposed lots would not impact the TRZ of any Eucalyptus trees, as they are at least 2 metres away from the proposed fenceline. Nonetheless, some patches of native vegetation are assumed to be compromised and lost by the development.

The construction of the 3 driveways located between lots 1 and 2, 3 and 4, and 5 and 6, will result in the loss of patches of native vegetation. In particular, driveway 1, between lots 5 and 6, will lead to the loss of one large *Eucalyptus camaldulensis* tree, a large dead tree and eight smaller *Eucalyptus* trees (including a dead tree). And driveway 2, will result in the loss of a patch of native understorey. The TRZ of the surrounding *Eucalyptus* trees should not be impacted upon, provided the driveways are constructed of loosely compacted gravel.

In total, due to the potential loss of patches of native vegetation, particularly within the road reserve, approximately 0.474 hectares will be lost which will have to be offset.

The loss of those trees and the potential loss of the patches of native vegetation and scattered trees will have a very small localised impact upon the habitat for more common native wildlife. The loss of some native vegetation means that there is a loss of habitat for a range of localised common native species, for example, possibly Brushtail possum (*Trichosurus vulpecul*a), Huntsman spiders (family *Sparassidae*), other native invertebrates, *Platycercus elegans* (Crimson Rosella), et cetera. In addition, the loss *Eucalyptus* saplings means that a cohort of mature trees will not develop, which is a further loss of wildlife habitat. These saplings would eventually fill the empty tracks of land within the woodland canopy.

It is doubtful that the property provides habitat for threatened wildlife and whether there would be any significant impact (caused by proposed development/subdivision) upon the wildlife occurring within the Tallarook region. However, the loss of habitat is a significant reason for the decline in native species populations (IUCN: https://www.iucn.org/content/habitat-loss-blamed-more-species-decline, Lindenmayer et al 2016)**.**

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VicPlan: https://mapshare.vic.gov.au/vicplan/

Appendices

Appendix 1

Table 1: native vegetation identified on the road reserve

Scientific Name	Common Name
Acacia implexa	Lightwood, Hickory Wattle
Acacia melanoxylon	Australian Blackwood
Acacia paradoxa	Prickly Wattle, Kangaroo Thorn
Anthosachne scabra	Common Wheatgrass
Amyema species	Mistletoe
Austrostipa species	Spear grass
Brachyloma daphnoides (identified from foliage)	Daphne Heath
Bryophytes	
Cassinia sifton	Sifton Bush
Dianella revoluta	Blue flax-lily
Eucalyptus camaldulensis	River Red Gum
Eucalyptus microcarpa	Grey Box
Eucalyptus melliodora	Yellow Box
Eucalyptus ovata	Swamp Gum
Exocarpos cupressiformis	Cherry Ballart
Geranium species	
Juncus subsecundus	Finger Rush
Lomandra filiformis subsp coriacea	Wattle Mat-rush
Lomandra nana	Pale Mat-rush
Microlaena stipoides var stipoides	Weeping Grass
Oxalis perennans	Grassland Wood-sorrel
Persicaria praetermissa	Spotted Knotweed
Rytidosperma caespitosum	Common Wallaby-grass
Rytidosperma species	Wallaby Grass species
Themeda triandra	Kangaroo Grass

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Table 1.1 native species found within the dwelling and wastewater envelopes

Scientific Name	Common Name
Acacia paradoxa	Prickly Wattle, Kangaroo Thorn
Austrostipa species	Spear Grass
Brachyloma daphnoides	Daphne Heath
Bryophytes	
Cassinia sifton	Sifton Bush
Chloris truncata	Windmill Grass
Dianella revoluta	Blue flax-lily
Eucalyptus saplings and seedlings	*found in lots 6 & 5
Eucalyptus camaldulensis	River Red Gum
Eucalyptus polyanthemos	Red Box
Exocarpos cupressiformis	Cherry Ballart
Lomandra filiformis subsp coriacea	Wattle Mat-rush
Lomandra nana	Pale Mat-rush
Rytidosperma species	Wallaby Grass species

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Appendix 3

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Appendix 4: Photographs of the site, taken March – April 2021

Looking towards patch B3 - April 21: the small *Eucalyptus* saplings at the rear of the photo.

The *Eucalyptus* saplings of patch B3 April 21

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Appendix 4: Photographs of the site, taken March – April 2021

The *Eucalyptus* trees of patch D3 April 21

Brachyloma daphnoides seedlings of patch D3 April 21

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Appendix 4: Photographs of the site, taken March – April 2021

Patch C3 April 21: *Eucalyptus* saplings and seedlings

Patch C3 April 21: *Eucalyptus* saplings

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Appendix 4: Photographs of the site, taken March – April 2021

Eucalyptus saplings and *Brachyloma daphnoides* seedlings in the background of the photo. This is not a patch of native vegetation, because it consists mainly of re-growth.

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Re-growth *Eucalyptus* saplings and seedlings

Appendix 4: Photographs of the site, taken March – April 2021

Patch 6 April 21: road reserve Floodplain Riparian Woodland

Proposed shared driveway route between lots 5 and 6. Patch A3 April 21, which is a small segment of Patch 6 April 21.

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Appendix 4: Photographs of the site, taken March – April 2021

Brachyloma daphnoides, patch A6 April 21, shared driveway route between lots 5 and 6.

Patch 13 April 2021, shared driveway route between lots 3 and 4

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Appendix 4: Photographs of the site, taken March – April 2021

Dianella revoluta, patch 13 April 2021, common drive route for lots 3 and 4

Common driveway route for lots 1 and 2. The access area is clear of native vegetation

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Appendix 4: Photographs of the site, taken March – April 2021

Proposed lot 2. There is enough open space for a building and waste treatment envelopes without the need to remove any trees. The ground covering was weedy.

Open areas on the property where dwelling development would not interfere with native trees. The ground covering consists of exotic grasses and herbs, bare earth, native grasses and *bryophytes*. In areas there is also *Eucalyptus* seedlings.

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Appendix 4: Photographs of the site, taken March – April 2021

The open woodland with large open spaces for building and waste treatment envelopes

The open woodland with large open spaces for building and waste treatment envelopes. Scattered *Eucalyptus* saplings and seedlings and scattered native grasses in the foreground of the photo.

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Appendix 6

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Appendix 7

DSE/DELWP Listed
CR critically endangered
EN endangered
VU vulnerable
NT near threatened

FFG Act Listed
L listed as threatened

EPBC ACT
cr critically endangered
en endangered
vu vulnerable

*Last Victoria Biodiversity Atlas Recording of Species

Scienti c Name	Common Name	Conservation Status			Habitat	Likely occurrence	Comments
		DELWP	FFG	EPBC		VBA records*	
Birds							
Alcedo azurea (Ceyx azureus)	Azure King sher	NT			Never far from water, preferring freshwater rivers and creeks as well as billabongs, lakes, swamps and dams, usually in shady overhanging vegetation. It is sometimes seen in parks on rivers, as well as duck or gol sh ponds in urban areas (Birds in Backyards)	Unlikely 1980	The study site would not provide habitat for this species
Chrysococcyx osculans	Black-eared Cuckoo	NT			Found in drier country where species such as mulga and mallee form of open woodlands and shrublands. It is often found in vegetation along creek beds (Birds in Backyards)	Unlikely 1980	Species prefers drier country, may y over
Chthonicola sagittate	Speckled Warbler	VU	L		Lives in Eucalypt dominated woodlands and dry sclerophyll forests. Mostly seen foraging in grassy ground layer (Birdlife Australia)	likely 2007	The open-woodland may provide habitat for this species
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern ssp.)	NT			Drier woodlands, forest clearings, edges; eucalypts along streams. Often on ground fallen timber (Simpson & Day 1999)	Small possibility 1980	Study site may provide habitat for the species. Though, last sighting was quite some time ago.
Hirundapus caudacutus	White-throated Needletail	VU		vu	Migratory. Almost exclusively aerial. Cover over most habitats, particularly wooded areas, open forests and rainforests. Also occur over heathlands. Recorded to roost in trees in forests and woodlands in dense foliage in the canopy or hollows (EPBC Act 1999)	Unlikely 1979	May be seen ying over site. Site unlikely to provide adequate roosting

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Appendix 7

							habitat.
Lathamus discolor	Swift Parrot	EN	L	en	Found in dry sclerophyll forests and woodlands, suburban parks and gardens and owering fruit trees. They roost communually, often in the same tree each night. They are almost always in trees, only coming to ground to drink. Swift Parrots are mainly found in eastern NSW and southern & central Victoria during winter. Breeds in Tasmania. Specialied nectarvoires preferring Box Ironbark forests (Birds in Backyards; SWIFFT)	Small possibility 1979	The open-woodland on the property may potentially provide. some habitat for the species. Though, the site does not contain box ironbark
Melanondyras cucullata cucullata	Hooded Robin	NT			Found in lightly timbered woodland, mainly dominated by acacia and /or eucalypts; associated with edge habitats, with deep and sheltered edges considered particularly important (Birds in Backyards; SWIFFT))	Small possibility 1980	The open woodland lacks acacias, and shrubbery preferred by the species. Though it may y through site.
Pomotostomus temporalis temporalis	Grey-crowned Babbler	EN	L		Found in open forests and woodlands, favouring inland plains with an open shrub layer, little ground cover and plenty of fallen timber and leaf litter. May be seen along roadsides and around farms. In south-east Melbourne, small populations survive on golf courses (Birds in Backyards)	Small possibility 1980	The study site lacks 'plenty of fallen timber and leaf litter' and a open shrub layer. Though, may y through site.
Stagonopleura guttata	Diamond Firetail	NT	L		Mainly sedentary & often occurs in small ocks. In Victoria they occur between 300-700mm rainfall in lowlands and foothills mainly inhabit grassy woodlands or wooded farmlands containing River Red Gum, Yellow Gum, Murray Pine near permanent water but is less reliant on permanent water than the other two species in its genus (Immlemann 1982, Emison et al. 1987) (SWIFFT).	Small possibility 1980	Study site may provide habitat for the species. Though, there are no permament bodies of water, which they prefer.

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							May be seen ying though the site in search of better habitat.
Insects							
Synemon plana	Golden Sun Moth	CR	L	L	Occurs in native grasslands dominated by species from the genus *Rytidosperma* (formerly *Austrodanthonia*) Wallaby Grass, in particular *Rytidosperma carphoides*, *R. auriculata*, *R. eriantha*, and *R. setacea*…Sun moths can exist in grasslands comprised entirely of exotic Chilean Needlegrass (*Nassella neesiana*). (SWIFFT)	Unlikely 1990	Site does not possess extensive grassland dominated by *Rytidosperma*
Marsupials							
Sminthopsis crassicaudata	Fat-tailed Dunnart	NT			Subspecies Sminthopsis crassicaudata crassicaudata, occurs in less arid southern areas, including Victoria. Found only in west Victoria, concentrations occur in Volcanic Plains. Occur in a variety of habitats: open woodland, low shrublands and arid shrublands. Can also be found in agricultural settings, in hay sheds, amongst rocks and old logs (SWIFFT)	Unlikely 1970	VBA listing for species made some time ago. Population mainly found in Volcanic Plains, particularly areas of low shrubland which not present at the site.

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Native vegetation removal report

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

Date of issue: **11/05/2021**
Time of issue: **9:31 am**

Report ID: BIR_2021_007

Project ID	temp1

Assessment pathway

Assessment pathway	**Intermediate Assessment Pathway**
Extent including past and proposed	0.474 ha
Extent of past removal	0.000 ha
Extent of proposed removal	0.474 ha
No. Large trees proposed to be removed	4
Location category of proposed removal	Location 2 The native vegetation is in an area mapped as an endangered Ecological Vegetation Class (as per the statewide EVC map). Removal of less than 0.5 hectares of native vegetation in this location will not have a significant impact on any habitat for a rare or threatened species.

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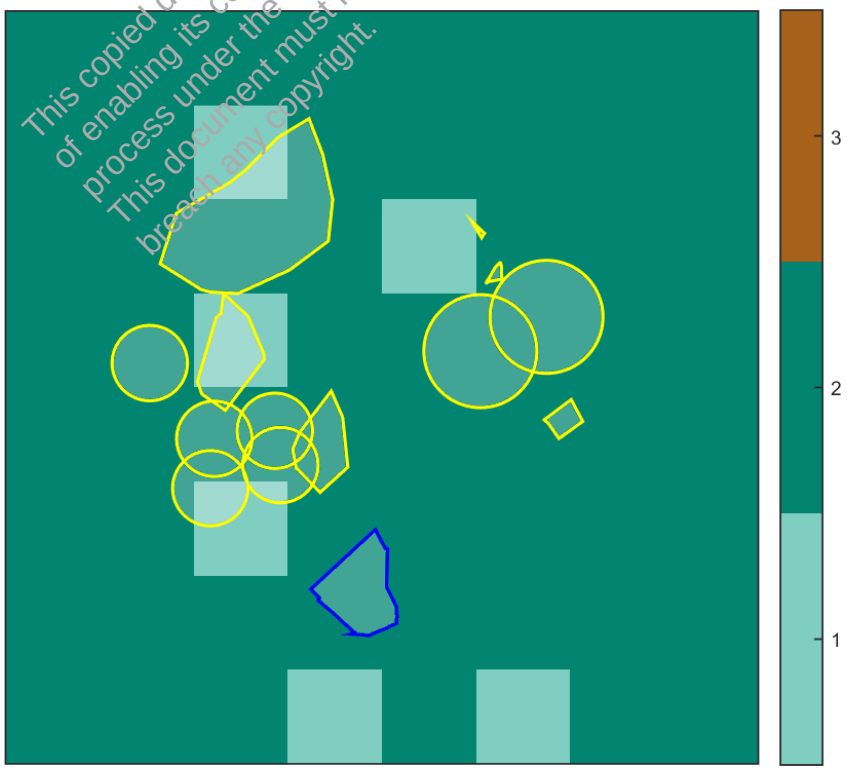
1. Location map



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Offset requirements if a permit is granted

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

General offset amount[1]	0.149 general habitat units
Vicinity	Goulburn Broken Catchment Management Authority (CMA) or Mitchell Shire Council
Minimum strategic biodiversity value score[2]	0.539
Large trees	4 large trees

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

Appendix 1 includes information about the native vegetation to be removed

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

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

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

2 Minimum strategic biodiversity score is 80 per cent of the weighted average score across habitat zones where a general offset is required

Next steps

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

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

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

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

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

Additional application requirements must be met including:

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

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Obtaining this publication does not guarantee that an application will meet the requirements of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes or that a permit to remove native vegetation will be granted.

Notwithstanding anything else contained in this publication, you must ensure that you comply with all relevant laws, legislation, awards or orders and that you obtain and comply with all permits, approvals and the like that affect, are applicable or are necessary to undertake any action to remove, lop or destroy or otherwise deal with any native vegetation or that apply to matters within the scope of Clauses 52.16 or 52.17 of the Victoria Planning Provisions and Victorian planning schemes.

www.delwp.vic.gov.au

Appendix 1: Description of native vegetation to be removed

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

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

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

Native vegetation to be removed

Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
7-B	Patch	cvu_0175_61	Endangered	0	no	0.320	0.000	0.000	0.680		0.000	General
6-B	Patch	cvu_0175_61	Endangered	0	no	0.320	0.001	0.001	0.680		0.000	General
4-A	Patch	cvu_0056	Endangered	0	no	0.340	0.024	0.024	0.680		0.010	General
3-A	Patch	cvu_0056	Endangered	0	no	0.320	0.031	0.031	0.680		0.012	General
2-A	Patch	cvu_0056	Endangered	0	no	0.320	0.125	0.125	0.680		0.050	General
1-A	Patch	cvu_0056	Endangered	0	no	0.320	0.005	0.005	0.636		0.002	General
8-A	Patch	cvu_0056	Endangered	2	yes	0.235	0.037	0.037	0.680		0.011	General
9-B	Scattered Tree	cvu_0175_61	Endangered	1	no	0.200	0.071	0.063	0.636		0.015	General
10-B	Scattered Tree	cvu_0175_61	Endangered	1	no	0.200	0.071	0.063	0.680		0.016	General
11-A	Scattered Tree	cvu_0056	Endangered	0	no	0.200	0.031	0.021	0.680		0.005	General
12-A	Scattered Tree	cvu_0056	Endangered	0	no	0.200	0.031	0.019	0.680		0.005	General
13-A	Scattered Tree	cvu_0056	Endangered	0	no	0.200	0.031	0.026	0.680		0.006	General
14-A	Scattered Tree	cvu_0056	Endangered	0	no	0.200	0.031	0.028	0.680		0.007	General

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Information provided by or on behalf of the applicant in a GIS file							Information calculated by EnSym					
Zone	**Type**	**BioEVC**	**BioEVC conservation status**	**Large tree(s)**	**Partial removal**	**Condition score**	**Polygon Extent**	**Extent without overlap**	**SBV score**	**HI score**	**Habitat units**	**Offset type**
15-A	Scattered Tree	cvu_0056	Endangered	0	no	0.200	0.031	0.031	0.680		0.008	General

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

This is not applicable in the Intermediate Assessment Pathway.

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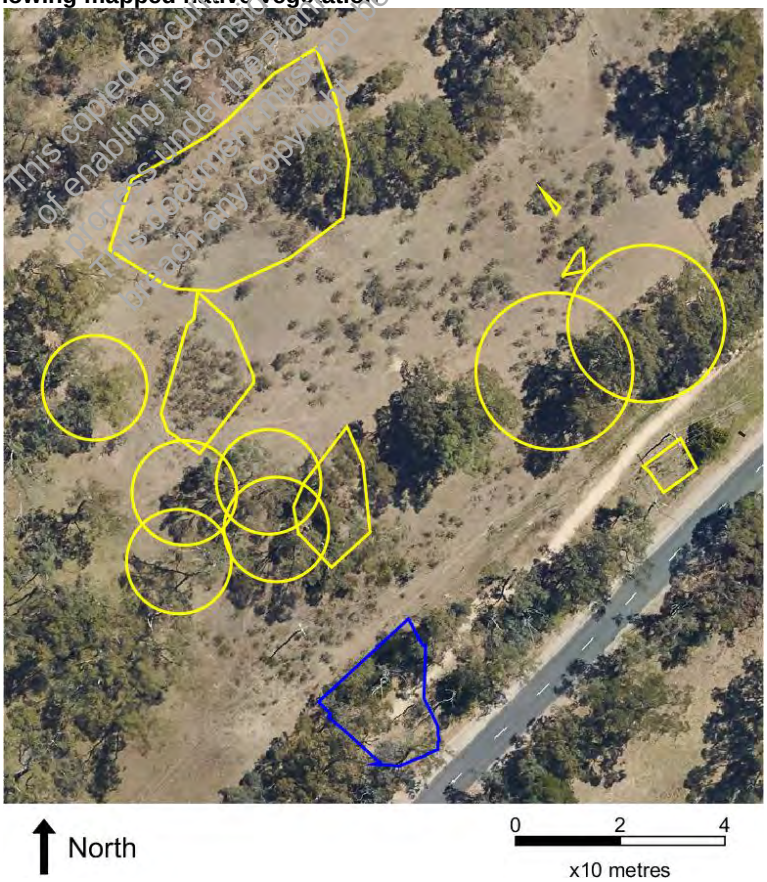
Appendix 3 – Images of mapped native vegetation

2. Strategic biodiversity values map

3. Aerial photograph showing mapped native vegetation



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4. Map of the property in context

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Yellow boundaries denote areas of proposed native vegetation removal.

Blue boundaries denote zones of partial removal with a halved condition score.