Murrindindi Shire Council

NOTICE OF AN APPLICATION FOR PLANNING PERMIT

The land affected by the application is located at:	**410 O'Gradys Road KINGLAKE CENTRAL, (LOT: 3 LP: 94810)**
The application is for a permit to:	**Use and development of the land for a dwelling**
The applicant for the permit is:	**C R Daniels**
The application reference number is:	**2024/17**
You may look at the application and any documents that support the application by visiting our website via the following web address:	**www.murrindindi.vic.gov.au/Planning Comment**

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

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

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

The responsible authority will not decide on the application before:	**26 March 2024**

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

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

Office Use Only

VicSmart? ☐ YES ☐ NO

Specify class of VicSmart application:

Application No.: Date Lodged: / /

Murrindindi Shire Council

Planning Enquiries
Phone: (03) 5772 0333
Email: planning@murrindindi.vic.gov.au
Web: www.murrindindi.vic.gov.au

Application for a **Planning Permit**

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

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

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

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

ⓘ Click for further information.

Clear Form

Application Type

Is this a VicSmart application?*

◉ No ○ Yes

If yes, please specify which VicSmart class or classes:.....

⚠ If the application falls into one of the classes listed under Clause 92 or the schedule to Clause 94, it is a VicSmart application.

Pre-application Meeting

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

☐ No ☑ Yes If 'Yes', with whom?:

Date: 2023 day / month / year

The Land ⓘ

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

Street Address *

Unit No.: St. No.: 410 St. Name: O'Grady's Road

Suburb/Locality: Kinglake Central Postcode: 3757

Formal Land Description *
Complete either A or B.

⚠ This information can be found on the certificate of title.

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

A Lot No.: 3 ○ Lodged Plan ○ Title Plan ○ Plan of Subdivision No.: LP94810

OR

B Crown Allotment No.: Section No.:

Parish/Township Name:

The Proposal

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

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

Build a dwelling to uphold Agriculatural proposes and to have presense to deterr aminals that are destroying the Australian native flowers on the property.

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

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

Cost $ 200,000

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

If the application is for land within **metropolitan Melbourne** (as defined in section 3 of the *Planning and Environment Act 1987*) and the estimated cost of the development exceeds $1 million (adjusted annually by CPI) the Metropolitan Planning Levy **must** be paid to the State Revenue Office and a current levy certificate **must** be submitted with the application.
Visit www.sro.vic.gov.au for information.

Existing Conditions

Describe how the land is used and developed now *

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

Currently the property is used for agriculatical reasons- growing of Australian native flowers.1/3 is being returned back to bush to encourage endangerous animals and the remaining of the property is Hay. There is also the manfacturating of spirit on the property and a tasting room.
The Dwelling is Off-grid. Solar system is already installed.

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

Title Information

Encumbrances on title *

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

☐ Yes (If 'yes' contact Council for advice on how to proceed before continuing with this application.)

◉ No

☐ Not applicable (no such encumbrance applies).

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

Applicant and Owner Details

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

Applicant *

The person who wants the permit.

Name:
Title: Ms | First Name: Chantal | Surname: Daniels
Organisation (if applicable):
Postal Address: | If it is a P.O. Box, enter the details here:

[redacted]

Please provide at least one contact phone number *

Contact information for applicant OR contact person below

[redacted]

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

Contact person's details*
Same as applicant ✔
Name:
Title: | First Name: | Surname:
Organisation (if applicable):
Postal Address: | If it is a P.O. Box, enter the details here:
Unit No.: | St. No.: | St. Name:
Suburb/Locality: | State: | Postcode:

Owner *

The person or organisation who owns the land

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

Same as applicant ✔
Name:
Title: | First Name: | Surname:
Organisation (if applicable):
Postal Address: | If it is a P.O. Box, enter the details here:
Unit No.: | St. No.: | St. Name:
Suburb/Locality: | State: | Postcode:

[redacted]

Information requirements

Contact Council's planning department to discuss the specific requirements for this application and obtain a planning permit checklist.

Is the required information provided?

☐ Yes ☐ No

Declaration

This form must be signed by the applicant *

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

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

[redacted]

Checklist

Have you:

- ✔ Filled in the form completely?
- ☐ Paid or included the application fee? — Most applications require a fee to be paid. Contact Council to determine the appropriate fee.
- Provided all necessary supporting information and documents?
  - ✔ A full, current copy of title information for each individual parcel of land forming the subject site.
  - ☐ A plan of existing conditions.
  - ✔ Plans showing the layout and details of the proposal.
  - ☐ Any information required by the planning scheme, requested by council or outlined in a council planning permit checklist.
  - ☐ If required, a description of the likely effect of the proposal (for example, traffic, noise, environmental impacts).
  - ☐ If applicable, a current Metropolitan Planning Levy certificate (a levy certificate expires 90 days after the day on which it is issued by the State Revenue Office and then cannot be used). Failure to comply means the application is void.
- ✔ Completed the relevant council planning permit checklist?
- ✔ Signed the declaration above?

Need help with the Application?

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

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

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

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

Lodgement

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

Murrindindi Shire Council
PO Box 138
Alexandra VIC 3714

Shire Offices
Perkins Street
Alexandra VIC 3714

Contact information:
Phone: (03) 5772 0317
Fax: (03) 5772 2291
Email: planning@murrindindi.vic.gov.au

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

The Victorian Government acknowledges the Traditional Owners of Victoria and pays respects to their ongoing connection to their Country, History and Culture. The Victorian Government extends this respect to their Elders, past, present and emerging.

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

VOLUME 08935 FOLIO 555

Security no : 124112657654G
Produced 14/02/2024 09:10 PM

LAND DESCRIPTION

Lot 3 on Plan of Subdivision 094810.
PARENT TITLE Volume 03254 Folio 712
Created by instrument LP094810 31/07/1972

REGISTERED PROPRIETOR

Estate Fee Simple
Joint Proprietors
CHANTAL RUTH DANIELS
SAMUEL IRELAND LOWE both of ELIZABETHAN HOUSE HIGH STREET LITTLEBURY ESSEX CB11 4TD UK
AG627416X 14/07/2009

ENCUMBRANCES, CAVEATS AND NOTICES

MORTGAGE AG627417V 14/07/2009
COMMONWEALTH BANK OF AUSTRALIA

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

DIAGRAM LOCATION

SEE LP094810 FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

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

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

Street Address: 410 OGRADYS ROAD KINGLAKE CENTRAL VIC 3757

ADMINISTRATIVE NOTICES

NIL

eCT Control 15940N COMMONWEALTH BANK OF AUSTRALIA
Effective from 23/10/2016

DOCUMENT END

Imaged Document Cover Sheet

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

Document Type	**Plan**
Document Identification	**LP094810**
Number of Pages (excluding this cover sheet)	**1**
Document Assembled	**14/02/2024 21:10**

LP94810

EDITION 1

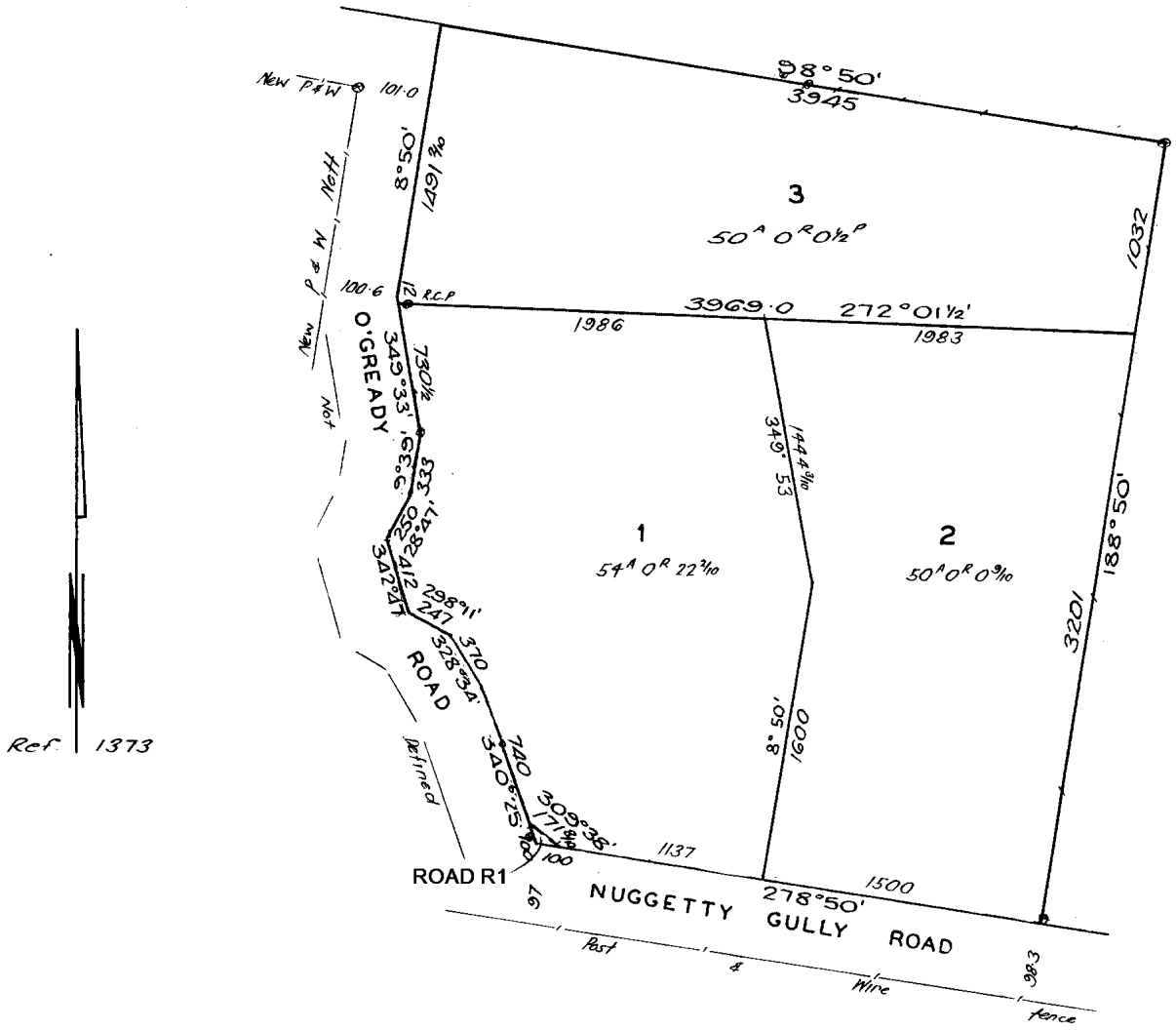
APPROVED 29/6/72

PLAN OF SUBDIVISION OF:	APPROPRIATIONS	ENCUMBRANCES & OTHER NOTATIONS
PART OF CROWN ALLOTMENT 18 SECTION C PARISH: FLOWERDALE COUNTY: ANGLESEY	BROWN -- WAY	

Measurements are in Links
Conversion Factor
LINKS X 0.201168 = METRES

VOL. 3254 FOL. 712

COLOUR CONVERSION
R1 = BROWN



410 O'Gradys' Road
Kinglake Central

Whole-Farm Land Management Plan
Agricultural Business Operational Plan

Prepared
Sam Lowe
Chantal Daniels
12th Feb 2024

Whole-Farm Land Management Plan
Agricultural Business Operational Plan

Contents

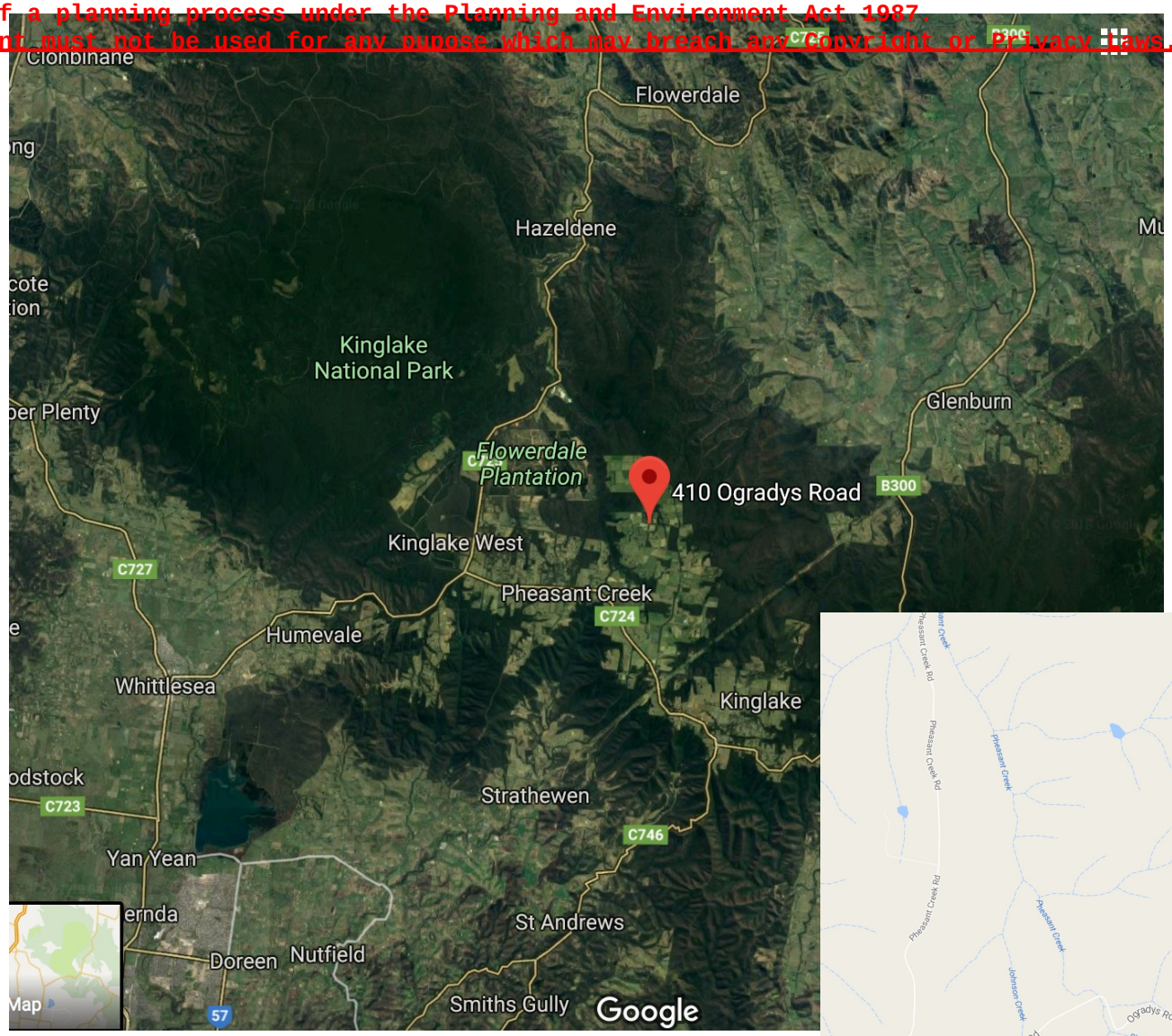
Whole-Farm Land Management Plan
Agricultural Business Operational Plan

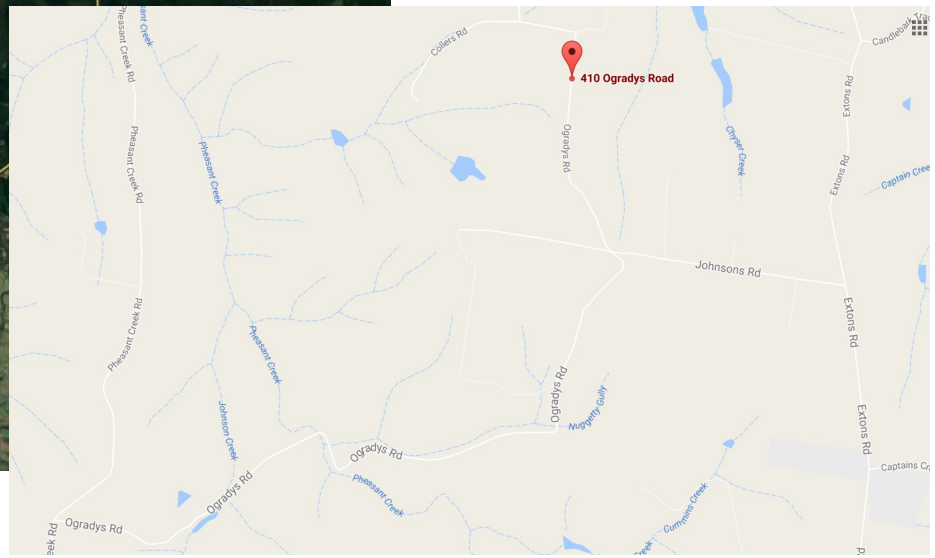
Name of Landowners: Samuel Ireland Lowe and Chantal Ruth Daniels
Trading names (if applicable): Kinglake Distillery Pty Ltd
Property name (if applicable):
Property address: 410 O'Grady's Road, Kinglake Central, VIC **Postcode:** 3757
Lot Number: Lot 3 on plan of subdivision 094810 PARENT TITLE Volume 03254 Folio 712
Council Property Number: 6948 (Murrindindi Shire Council)
Planning Zone: Farming Zone
Planning Overlay: Environmental Significance Overlay ES01
Size: 52 Acres (21 Hectares)
Phone (Business): [redacted]
Mobile: [redacted]
Email: [redacted]

410 O'Grady's Road
Kinglake Central

410 O'Gradys Road

Kinglake Central





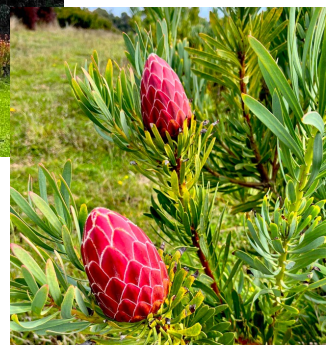
Whole-Farm Land Management Plan
Agricultural Business Operational Plan

1. What is the Primary use of the property?

1.1 Commercial Cultivation of Flowers

Approximately 1/3 of the property (7 Hectares) is dedicated to commercial cultivation of Protea's, Leucadendrons and Australian native flowers. This is and has been the primary focus use of the property since first purchased by current owners.

Variety	Name	Quantity of bushes
Safari Sunset	Leucadendron Laureolum Hybrid	5000
Gold Strike	Leucadendron strobolinum x laureolum	4000
Venus	Protea Repens x Aristata	2500
Red Ice	Protea Compacta x Susannae	3000
Cootamundra Wattle	Acacia baileyana	500



1. What is the Primary use of the property?

1.2 Secondary property uses.

Secondary use	Amount of Land	Description
Hay / Animal grazing	6 Hectares	1/3 of the property is currently used for hay / animal grazing but can be converted for cultivation of additional proteas and other flowers
Distillery / Farmgate Business	0.25 Hectares	Small area of property used for farm-gate distillery business, Kinglake Distillery
Revegatation and endangered species habitat	6 Hectares	1/3 of the property has been set aside under 100-year covenant to be re-forested and revegetated back to original Kinglake bush. This will provide sanctuary and habitat for wildlife in an area of Kinglake that is otherwise largely pastureland.

2. Description of the Neighborhood

The Surrounding properties are 80% pastoral and used for the grazing of cattle or horses. Approximately 20% are uncleared bush and so will help provide a wildlife corridor to the habitat section of our property.

3. What are the aims for your property?

Our aims for the property are as follows:

1. **Continue to develop a sustainable, long-term agri-business cultivating Proteas, Leucadendrums and Australian native flowers.**
2. Continue to manage a **portion of the property that provides a natural habitat** for endangered native species of Flora and Fauna. Continually work to reduce the threat of invasive species of plants and animals.
3. Continue to build a long-term **carbon-neutral distillery farmgate business** that has no detrimental affect to either the Agri-business or the habitat portion of the property.
4. **Build a small dwelling** that will allow us to reduce the damage caused to the cultivated flowers by browsing animals and prevent losses by a higher degree of oversight in general.

3. What are the aims for your property?

3.1 Farming Activity – Agri-business.

The primary land use of the property will continue to be cultivation of flowers for sale at the Melbourne Wholesale Fruit and Vegetable market

The Kinglake Micro-climate of wetter winters and higher humidity than lower areas of Victoria, combined with its history as a heavily forested area make Kinglake a very fertile area for the growing of produce. Historically, first berries and then potatoes have been major crops in Kinglake. Nowadays it is well-known for producing some of Australia's best proteas and native flowers

Planted 10 years ago, the properties bushes are now producing well but far too many mature bushes are being lost to browsing animals.

Invasive deer species destroy bushes with their antlers, Kangaroo's jump on bushes and rabbits eat young bushes. Maintaining a human presence on the property, close to the cultivated area will mitigate the problem whilst still using native animal friendly fencing.

Large animals, native Kangaroo's and Wallabies and invasive deer are shy and stay away from human presence. Smaller invasive animals such as rabbits can be reduced by Guardian animals such as dogs when owners reside on property.

3. What are the aims for your property?

3.2 Natural Habitat.

6-7 Hectares of the property have been re-vegetated with the aim of providing carbon sequestration and natural habitat. This area is protected by covenant for 100 years. We aim to continue to develop and manage this area as a habitat. BY maintaining a presence on the property, we can far better manage and mitigate the damage done in this area by Invasive animal species such as deer, rabbits and foxes.

Summary of KD revegetation project

Overall, 8,604 stems planted from 21 species local to Damp Forest and Shrubby Foothill Forest. Planting map, species planted list and state government reference/modelled ecological information email June 28th.

Carbon

Estimated carbon sequestration from 6.04ha planting from May 2022 to May 2122 is 15,719.1 tonnes (2602.50 t/ha). Figure derived from CSIRO's FullCam carbon modelling which models above and below ground biomass generated from environmental plantings at a geographic location with specific biophysical attributes (soil types, aspect, slope, rainfall, etc).

3.2 Natural Habitat.

Biodiversity

Listed species

Planting included a small portion (50) of *Pomaderris vacciniifolia* (Round-leaf Pomaderris), a critically endangered endemic species to Damp Forest and Shrubby Foothill Forests of north-east Melbourne.

In addition to *P. vacciniifolia*, GF's habitat restoration will benefit recently listed endangered *Petauroides Volans* (greater glider), vulnerable *Phascogale tapoatafa* (brush tailed phascogale, vulnerable *Petaurus australis australis* (yellow-bellied glider (south-eastern) and potentially the endangered *Dasyurus maculatus* (Spotted Tailed Quoll), although recent sightings within adjacent Kinglake National have been rare.

Planting also provides habitat for *Phascolarctos cinereus* (Koala) to assist the 400+ population that were translocated from French Island to Kinglake National Park following Black Saturday. It's worth noting that Koala are not currently listed in Victoria.

3.3 Farmgate Business.

Kinglake Distillery is a thriving farmgate business and has provided an income whilst the cultivated area matures. The aim of this business is very much to work closely within, and to help protect, its natural environment. As such, Kinglake Distillery was the first (and is still the only) carbon neutral whisky in Australia.

Climate Active Carbon Neutral PRODUCT

HANDMADE AUSTRALIAN KINGLAKE DISTILLERY EST SINGLE MALT 2018

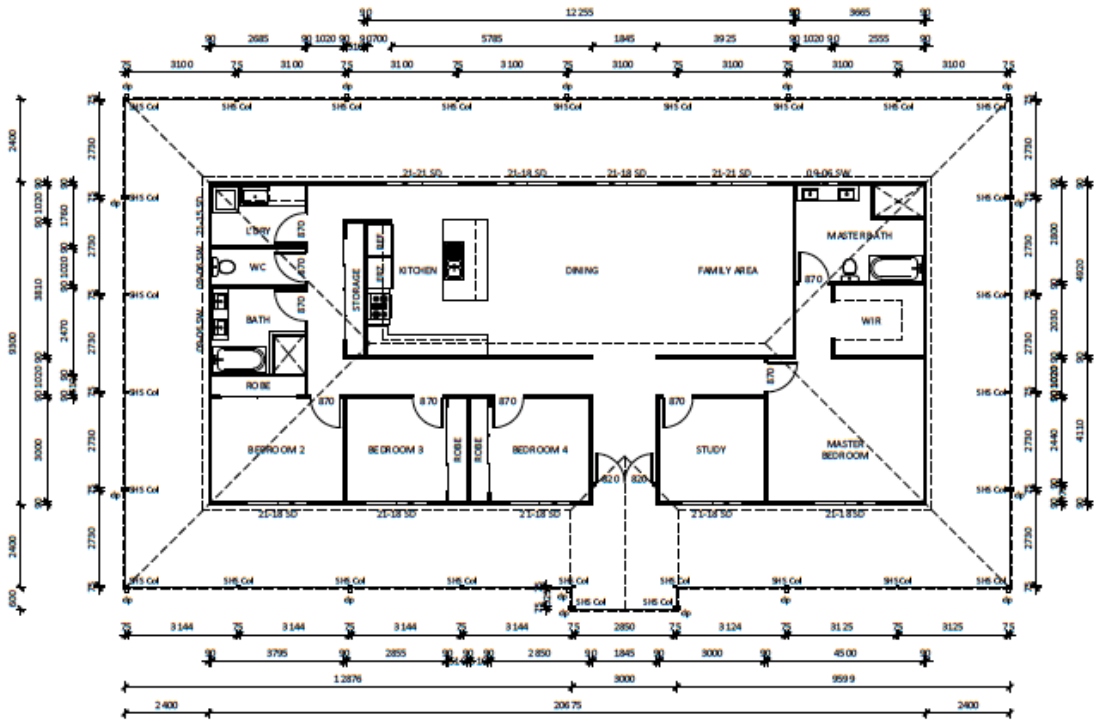
3. What are the aims for your property?

3.4 Build a small dwelling

All the land uses of this property will benefit from an ongoing presence.

In particular, the farmed area of cultivated flowers is suffering unsustainable damage to bushes that have taken 10 years to mature. For this business to be successful after such an enormous commitment of time, a residential presence on the property is essential.

When owner resides on the property smaller invasive species damaging crops can be kept at bay by Guardian Animals (dog). Larger animals (invasive and otherwise) will be kept away from crops by human presence.



Proposed Dwelling

4. Planning Zones and Overlays

Address: 410 OGRADYS ROAD KINGLAKE CENTRAL 3757
Lot / Plan: Lot 3 LP94810
Local Government (Council): MURRINDINDI **Council Property Number:** 6948
Directory Reference: VicRoads 61 G9

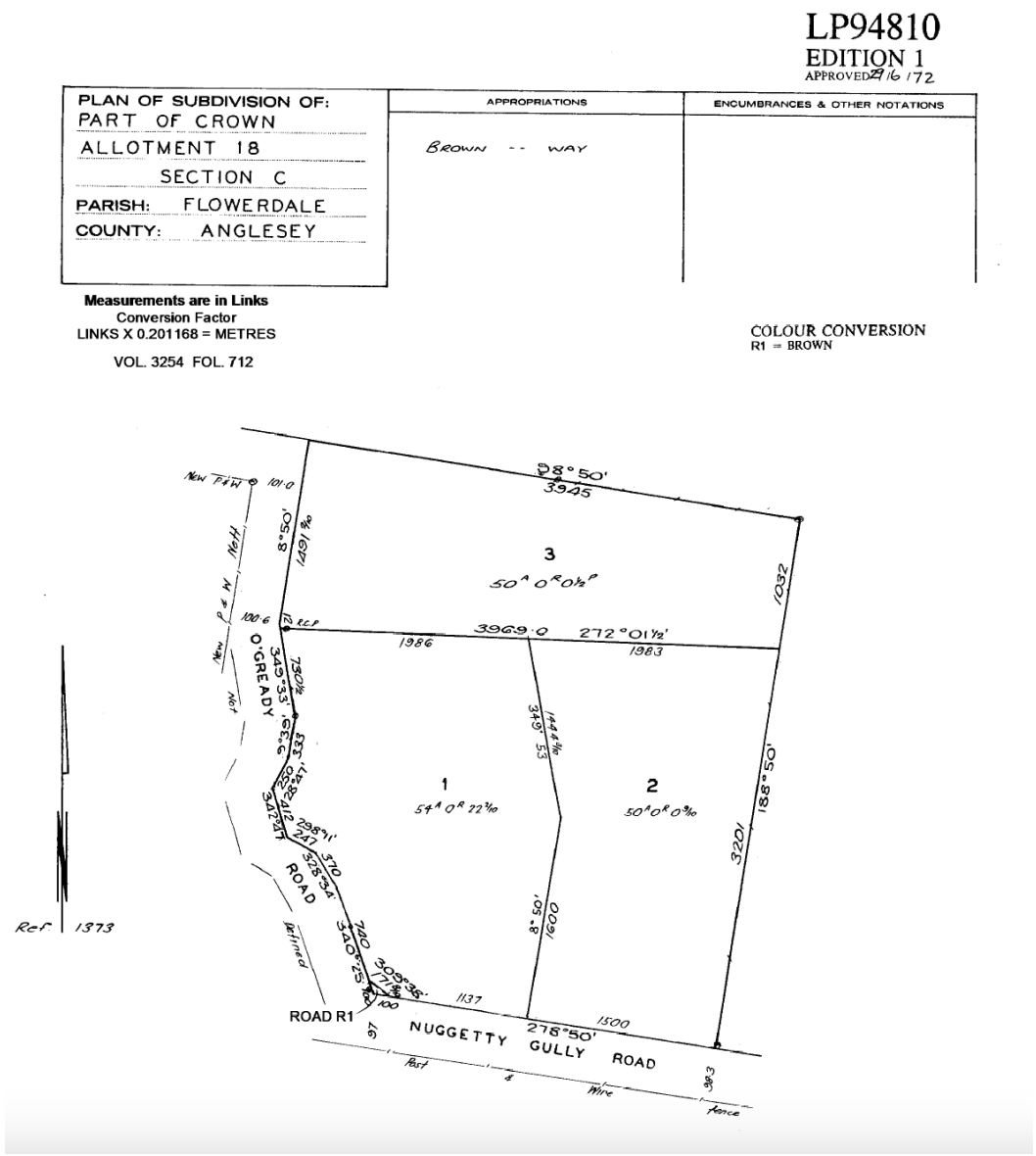
Planning Zone

Planning Overlay: Environmental Significance Overlay ES01

FARMING ZONE (FZ)
SCHEDULE TO THE FARMING ZONE (FZ)

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

4. Planning Zones and Overlays



LP94810
EDITION 1
APPROVED 29/6/72

PLAN OF SUBDIVISION OF:	APPROPRIATIONS	ENCUMBRANCES & OTHER NOTATIONS
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410 O'Gradys' Road
Kinglake Central

Whole-Farm Land Management Plan
Agricultural Business Operational Plan

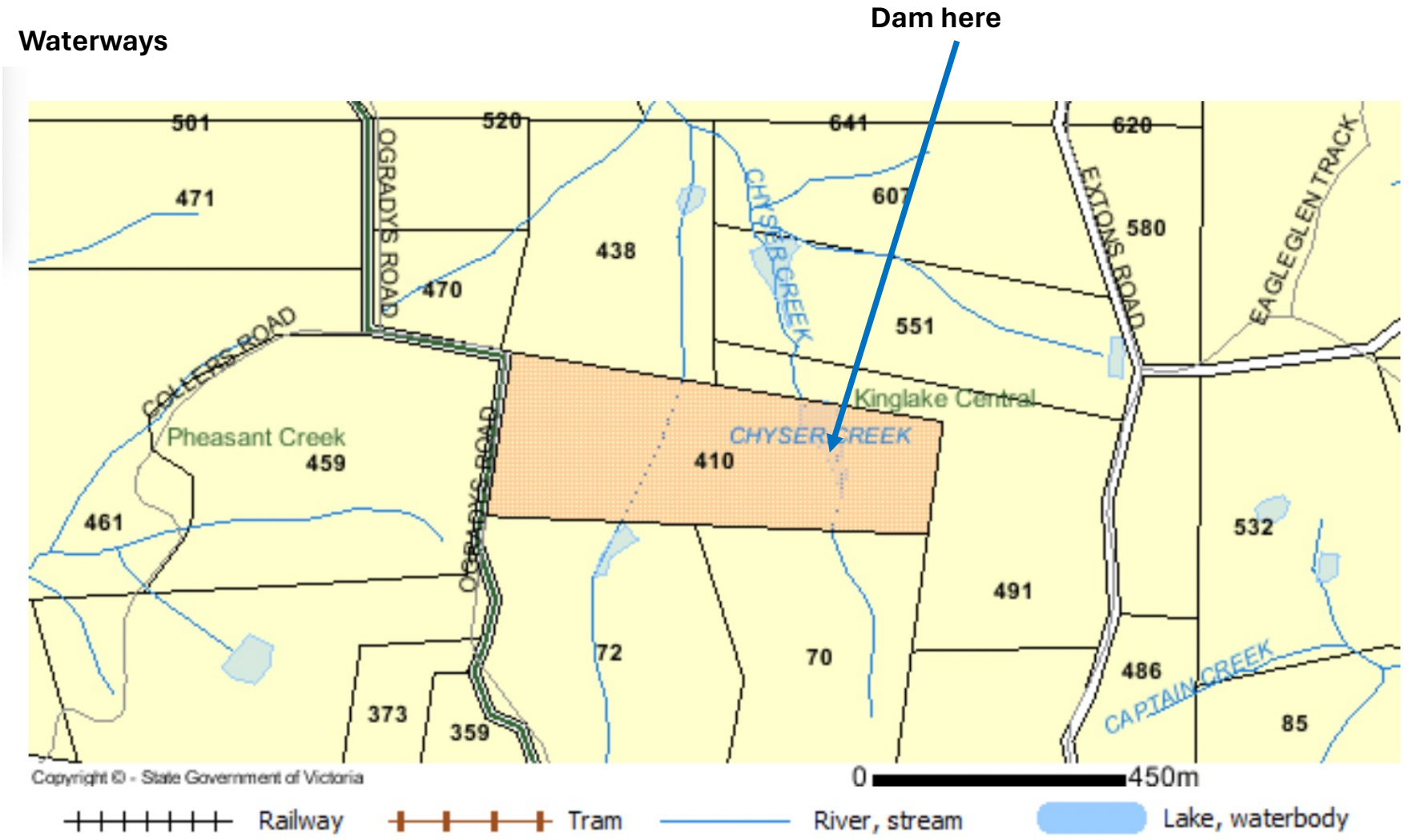
5. Site Plans

The plans are to include:

- Existing native vegetation patches/scattered trees
- Exotic trees
- Proposed and existing structures
- Areas of pest plants and animals (e.g. rabbit warrens)
- Waterways
- All vegetation proposed for removal
- Any proposed fencing
- Any proposed planting (windbreaks etc.)
- Any revegetation
- Methods of protecting existing vegetation
- Proposed alignment of any services (power etc)
- Proposed dams and bores

5. Site Plans

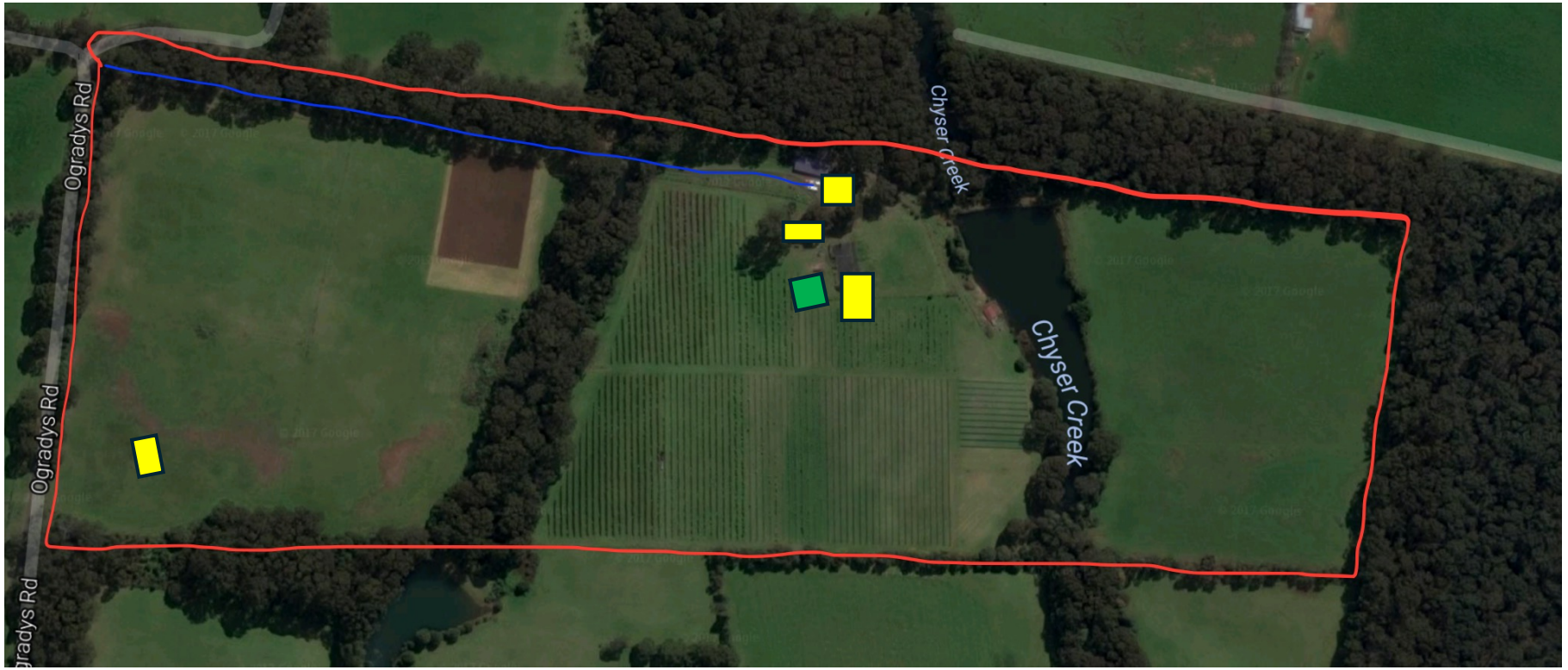
Waterways



5. Site Plans

Existing Structures:

Proposed Structure:



5. Site Plans

Zone of Existing and proposed building.

- No new dams or bores are proposed
- No additional planting proposed
- No new fencing proposed
- No vegetation proposed for removal except invasive blackberries
- Proposed dwelling will use existing off-grid solar system
- Pest species and blackberries located throughout the site

6. Land Classification and Uses

Most properties have a range of different soil types and slopes. Each of these areas has different potential risks and needs to be managed differently. For example, steep slopes are more prone to soil erosion than moderate slopes and can dry out quickly depending on wind direction. In determining land capability of sections of your property you will need to determine the different land classes. Following is a simplified guide of five different land classes.

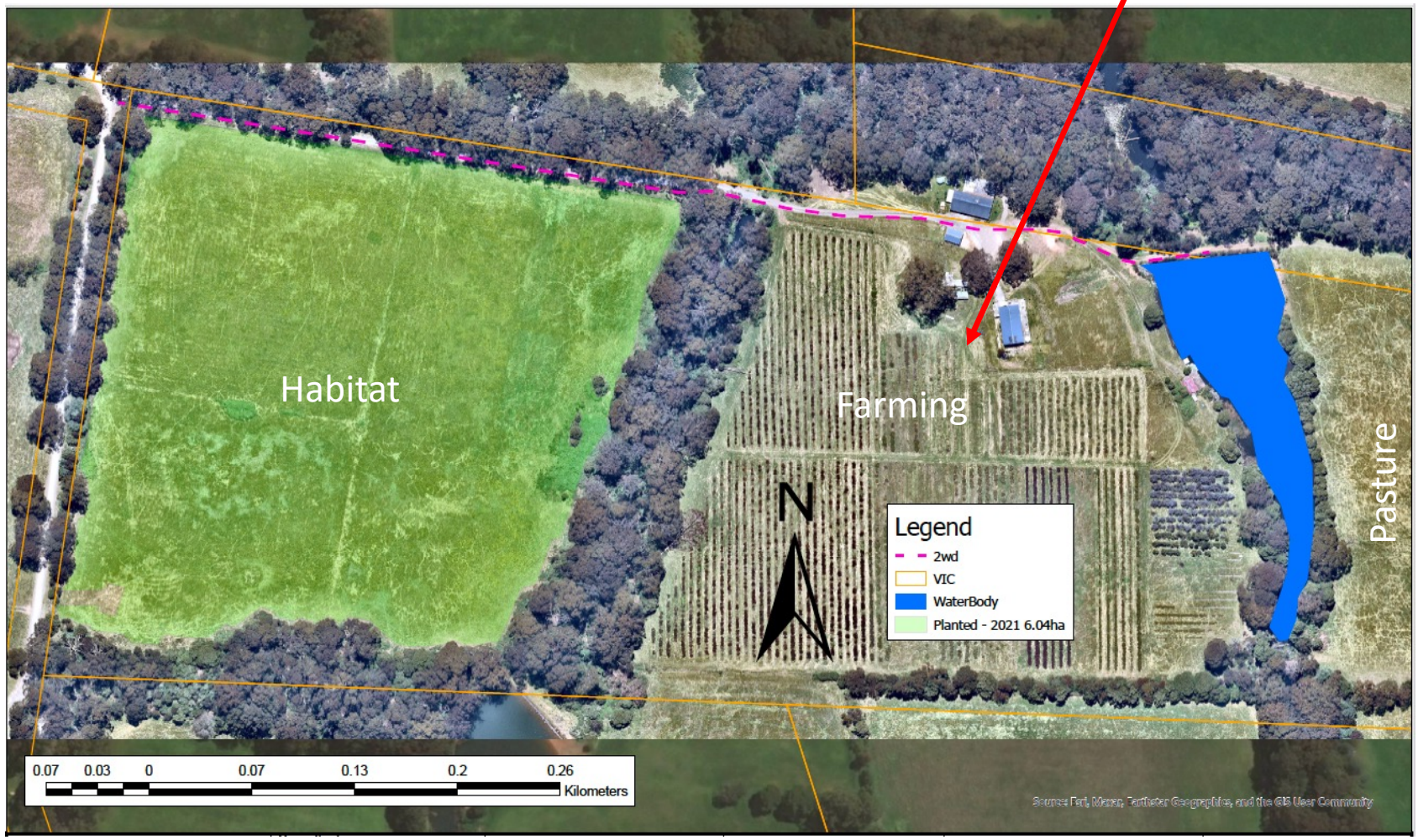
Land class	Description	Livestock access
1	Little risk of degradation and able to support a wide range of uses (e.g. gentle slopes, well-drained soil, good vegetation cover).	All year
2	Some risk of degradation under certain conditions (e.g. prone to waterlogging in winter).	Restricted
3	Land with moderate risk of degradation and will require active management (e.g. sloping land with poor soil structure).	
4	Land with severe degradation potential (e.g. steep slopes, erosion potential, poor soil structure).	Prohibited
5	Land that, if not already degraded, would be at serious risk of degradation (e.g. extreme slopes, prone to erosion or area of high value native vegetation).	

6. Land Classification and Uses

Land zone	Description including native and exotic vegetation	Proposed land use	Land Class
Pasture	Grass	Hay and Grazing. Currently being rested to aid pastoral renovation	1
Revegetation Conservation Zone	Eucalypts Native Acacia Various native understorey species	Habitat, revegetation, conversation, carbon sequestration	1
Farming – Flower Culivation	Leucandendrums Proteas Wattle	Cultivation	1
Waterway Zone	Grass, Eucalypts, some invasive blackberry		1
Proposed Dwelling Zone	Grass, some invasive blackberry	Dwelling	1

Soil quality and characteristics are consistent across the property and there are no erosion issues evident.

6. Land Classification and Uses



7. Water

What is the current water supply?

Domestic water supply	Proposed tank on dwelling and existing tanks already on property.
Current number of dams and bores	1 x 18 Mega-litre dam
Creeks, wetlands or watercourses	Chyser Creek watercourse
Annual rainfall	1195.7 mm
Fire water supply	1 x 10,000 litre exclusive tank. 25,000 litre other tanks Dam
Water supply for Stock and/or cropping	Dam

7. Water

7. Water

- Water from the dam is currently used to irrigate flower crops when initially planted and during exceptionally dry periods only.
- A small amount of water from the dam is also used in the production of whisky.
- All usage is monitored by meter installed by Goulburn Valley Water
- Any water usage is curtailed if dam should fall below certain level.

No changed are proposed to this usage. Domestic water requirements will be provided by tank water. The dwelling is not proposed to interfere or interact with the watercourse.

8. SOIL ASSESSMENT

A preliminary soil assessment was conducted at the time of the site inspection. The assessment included drilling at 3 borehole locations (shown in Figure 1) to a maximum terminated depth of 1.3mbgl using hand auger techniques.

Detailed soil borehole logs are presented in Appendix C.

8.1 SOIL PROFILE

A shallow layer of silty clay topsoil was observed at each of the boreholes to a maximum depth of 0.1mbg. This A horizon was noted to be brown, of low plasticity, soft and damp. The A horizon graded into a silty clay, which was noted to be brown with black and red mottling, low to medium plasticity, stiff, dry and contained weathered gravels at depth. Refusal on rock was not encountered during the assessment.

8.2 LIMITING SOIL HORIZON

The B Horizon silty clay was identified as the most limiting soil layer, which must be considered for the long-term absorption of effluent. The soil displays the properties of a light clay when manipulated into a moist bolus with reference to its plasticity and silt content in line with McDonald (1990).

8.3 SOIL PERMEABILITY

Soil permeability is the rate which soil transmits water and air. EPA 891.4 (2016) outlines two procedures for estimating soil permeability; in-situ constant head permeability testing or indicative rates based on key soil properties (such as texture, structure, depth, colour and mottling). The indicative permeability rates for a light clay are <0.06-0.5m/d (soil categories: 5a-5c).

The *Talsma Constant Head Soil Permeability Measurement* as outlined in AS/NZS 1547:2012 was used to measure in-situ the permeability of the limiting layer at BH1. The average permeability rate was calculated at 0.02m/day. This permeability is representative of a weakly structured light clay which will be considered for water balance calculations.

Detailed results of the constant head permeability testing can be found in Appendix D.

8.4 SOIL SAMPLING

Soil sampling was conducted at selected borehole locations. Samples of all discrete soil layers were collected for subsequent laboratory analysis of pH, electrical conductivity (EC) and modified Emerson Aggregate test. A soil analysis summary is outlined in Table 3.

Table 3: Soil Analysis Summary

Sample no.	Borehole	Depth (m)	pH	EC (dS/m)	EAC
1	BH1/1	0.1	5.5	0.07	Slake 2
2	BH1/2	0.6	5.7	0.03	Slake 2
3	BH2/1	0.7	5.4	0.03	Slake 2

8.4.1 Soil Reaction

The soil reaction (pH) of 1:5 soil/water suspensions were measured using a hand-held pH/EC meter. The soil reaction reported an average pH of 5.5, indicating an acceptable range to support plant growth.

8.4.2 Soil Salinity

The soil salinity was assessed in the laboratory using a 1:5 soil/water suspension using a hand-held pH/EC meter. The soil salinity and indicative electrical conductivity was measured at between 0.03-0.07dSm^{-1} for each sample. For a light clay this is considered non-saline and should not affect plant growth.

8.4.3 Soil Aggregate Stability

The EAC test is used to determine the soil stability for effluent stability and identify any susceptibility to erosion, with results indicating minor slaking. Soil renovation is recommended as is outlined in Section 10.8 to improve soil structure.

9. What are the main Land Management Issues of the site?

9.1 Pest Animals.

Pest animals include rabbits, cats, deer, hares, foxes and other declared pest animals in accordance with the CaLP. Rabbits and foxes are typically associated with blackberry and gorse for food and shelter, and as such an integrated weed approach is required. Pest animals degrade land quality and agricultural productivity.

The management principles for pest animals are:

- Reduce numbers
- Destroy burrows and harbor
- Prevent reinvasion

Management Techniques

A combination of methods including:

- Poisoning
- Fumigation
- Ripping of burrows
- Destruction of harbor
- Fencing
- Shooting

Where poisoning or shooting is required, the procedure used must conform strictly to the recommendations and regulations set out by the Department of Environment, Land, Water Environment and Planning (DELWP).

9. What are the main Land Management Issues of the site?

9.1 Pest Animals.

Pest animal species	Evidence - found on site of pest animals such as burrow/dens, scats, diggings	Control method(s) for an integrated approach	Monitoring techniques	Timing of treatment/control	Treatment Options over 3 years.
Foxes	Den and odour, sightings	Baiting and Shooting. Destroy burrows.	Identify activity hot spots, map these.	Den removal – August and September	• Baiting • Den fumigation • Shooting • Property hygiene • Guardian
Rabbits	Burrows and scats, sightings	Baiting and Shooting. Destroy burrows.	Identify activity hot spots, map these.	Den removal – August and September	• Baiting • Den fumigation and • ripping • Property hygiene • Guardian
Deer	Damaging to crops and flowers, sightings	Shooting and more presence on property	Night-time observation and logging.	All year round	• Shooting • Property hygiene • Guardian

9. What are the main Land Management Issues of the site?

9.2 Weed Management.

Include the weeds present on site on your site plan.

Declared noxious weeds in Victoria are plants that have been proclaimed under the **Catchment and Land Protection (CaLP) Act 1994**. These plants cause environmental or economic harm or have the potential to cause such harm. They can also present risks to human health. The Act defines four categories of noxious weeds:

- State Prohibited Weeds (SPW)
- Regionally Prohibited Weeds (RPW)
- Regionally Controlled Weeds (RC)
- Restricted Weeds (R)
- Environmental Weeds (EW)
- Agricultural Weeds (AW)

Weeds evident on site:

Common Name	Scientific Name	Classification	Treatment	Timing	Frequency
Blackberry Bushes	Rubus Fruticosus L.agg.	Invasive plants	They are Sprayed Jan – April and Sep to Dec	They Flower Nov – Jan	

9. What are the main Land Management Issues of the site?

9.2 Weed Management.

Weed Management Strategy:

We currently follow this management pattern:

- Application of a registered herbicide
- Physical removal
- Mulching

Action	Timing	Who	How
Blackberries are Sprayed	Jan – April	Landowner	Chemical Herbacide
Bushes removed, Burnt and mulched	April - Oct	Landowner	Manually
Blackberries are Sprayed	Sep to Dec	Landowner	Chemical Herbacide
Keep uninfected areas clear of blackberry/ monitor for new growth	All year	Landowner	Visually

Leucadendron Gold Strike

Leucadendron strobolinum x laureolum **'Gold Strike'**

APPEARANCE : Small shrub native to the Cape region of South Africa. This hybrid variety has longlasting lime to gold bracts surrounding cone flowers in winter and early spring.
USES: Feature shrub, mixed with natives, in a large container, for cut flowers in the home.
LOCATION: Plant in full sun. Free-draining soil. Suitable for coastal. Will grow back after fire.
CARE: Mulch and water regularly until the plant is established. Drought tolerant once mature, and should only need supplementary water in dry spells.
HEIGHT & WIDTH: 2 m H x 1.5 m W.

Appendix: 1

VENUS

PROTEA REPENS X ARISTATA

Protea Venus is an excellent screen or display plant. Ideal for low maintenance, low water use gardens. Spectacular spring flowers, fresh or dried.

PBR NAME: VENUS

PLANT DIMENSIONS

HEIGHT: 3.0M

WIDTH: 2.0M

POSITION

FULL SUN

WATER USAGE

LOW WATER USE

FLOWERING TIME

SPRING

FROST TOLERANCE

MODERATE FROST

SOIL TYPE

WELL DRAINED ACIDIC SOIL, LOW PH

SUITABLE FOR

HOME GARDEN, COMMERCIAl, FLORISTRY

Appendix: 1

Acacia baileyana - Cootamundra wattle

Resilient adaptable wattle, with feathery delicate mimosa foliage and masses of iconic lemon-yellow powderpuff flowers in winter. It's perhaps the epitome of Aussie acacia, appearing in stamps, in song and in artworks; and like an Aussie backpacker, has travelled round the globe and made itself at home.
Will grow happily anywhere, even frost locations - a little too happily sometimes, so use judgement when planting, especially in more rural locations. Check your local council advice on plants.

APPEARANCE : Fast-growing native wattle, forms a large shrub or small tree , taller and straighter in more open sunny locations. Grey feathery foliage in young and old growth alike; and from winter into spring abundant bright yellow flowers.
USE FOR : Informal hedging, fast colour, feature shrub in native gardens. Short living to 10 - 15 years.
CLIMATE : Frost-hardy, drought tolerant. Reliable in dry gardens and areas of low rainfall (once established).
PLANTING : Plant in any well-drained soil in full sun. Self-seeds, so do not plant near any natural bushlands or waterways, especially in areas with reliable rainfall.
CARE : Mulch and water regularly until the plant is established, usually around 12 weeks, and protect from frost while young. Responds well to pruning if you need to - use the branches for decor indoors; apply a slow release native fertiliser afterwards to promote healthy growth.
HEIGHT & WIDTH : 8 m H x 5 m W.
YOUR PLANTS : These are tubestock plants, healthy young plants with new roots that will establish quickly.

Appendix: 1

Red Ice

PROTEA COMPACTA X SUSANNAE

SPECIES: No
INDIGENOUS: Yes

FLOWER/FOLIAGE COLOUR: Red
FLOWERING TIME: Jan - Apr
SPECIAL FEATURES: Attracts Birds / Feeds Honeybees
SIZE: 250cm (height) x 200cm (width)
HEIGHT RANGE: 2m - 2.5m

DESCRIPTION
A very hardy variety, Red Ice is well suited to low maintenance, low water use gardens. Spectacular flowers, fresh or dried.

PLANT DIMENSIONS

HEIGHT: 2.5M

WIDTH: 2.0M

POSITION

FULL SUN

WATER USAGE

LOW WATER USE

FLOWERING TIME

AUTUMN / WINTER

FROST TOLERANCE

MODERATE FROST

SOIL TYPE

WELL DRAINED ACIDIC SOIL, LOW PH

SAFARI SUNSET

LEUCADENDRON LAUREOLUM HYBRID

Leucadendron Safari Sunset is the gold standard of Leucadendrons, producing stunning burgundy red flowers. With long stems and strong roots, this vigorous variety is perfect for cut flower growers and the home garden.

Medium sized handsome shrub 6-8'x6' with bright yellow "tulip-like" flower heads in winter. Male flower heads are much brighter than the female. Flowers are brighter in full sun location than semi-shaded position. Excellent cut flower, screen or hedge. Frost tolerant and growing well in Ojai.

Biological Name: Leucadendron laureolum
Common Name: Yellow Tulip
Family: Proteaceae
Origin: South African
Exposure: Full Sun
Irrigation: Drought tolerant once established
Frost: Moderately Frost Tolerant 25F (-4C)
Soil: Well-drained to poorly drained soils
Flower Color: Yellow
Flower Time: Winter-spring
Height:6-8'

Appendix: 2 2.1 Bio-Diversity Links

https://www.environment.vic.gov.au/__data/assets/pdf_file/0019/440371/267-Greater-Glider-2019-Action-Statement.pdf;https://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-20160525.pdf),

http://www.environment.gov.au/biodiversity/threatened/species/pubs/87600-conservation-advice-02032022.pdf)

http://www.environment.gov.au/biodiversity/threatened/species/pubs/87600-conservation-advice-02032022.pdf)

https://www.australiangeographic.com.au/news/2019/04/scat-hints-at-presence-of-spotted-tailed-quoll-colony-in-victoria-for-the-first-time-in-30-years/critically; https://www.swifft.net.au/cb_pages/sp_spot-tailed_quoll.php

https://landmanagementweb.wordpress.com/2017/06/13/whittleseas-koalas-where-are-they/; https://www.abc.net.au/news/2022-02-19/victoria-koala-population-struggling-in-some-locations/100828136

https://www.savethekoala.com/about-koalas/the-koala-endangered-or-not/).

Appendix: 2

2.2 Planting List

Greenfleet

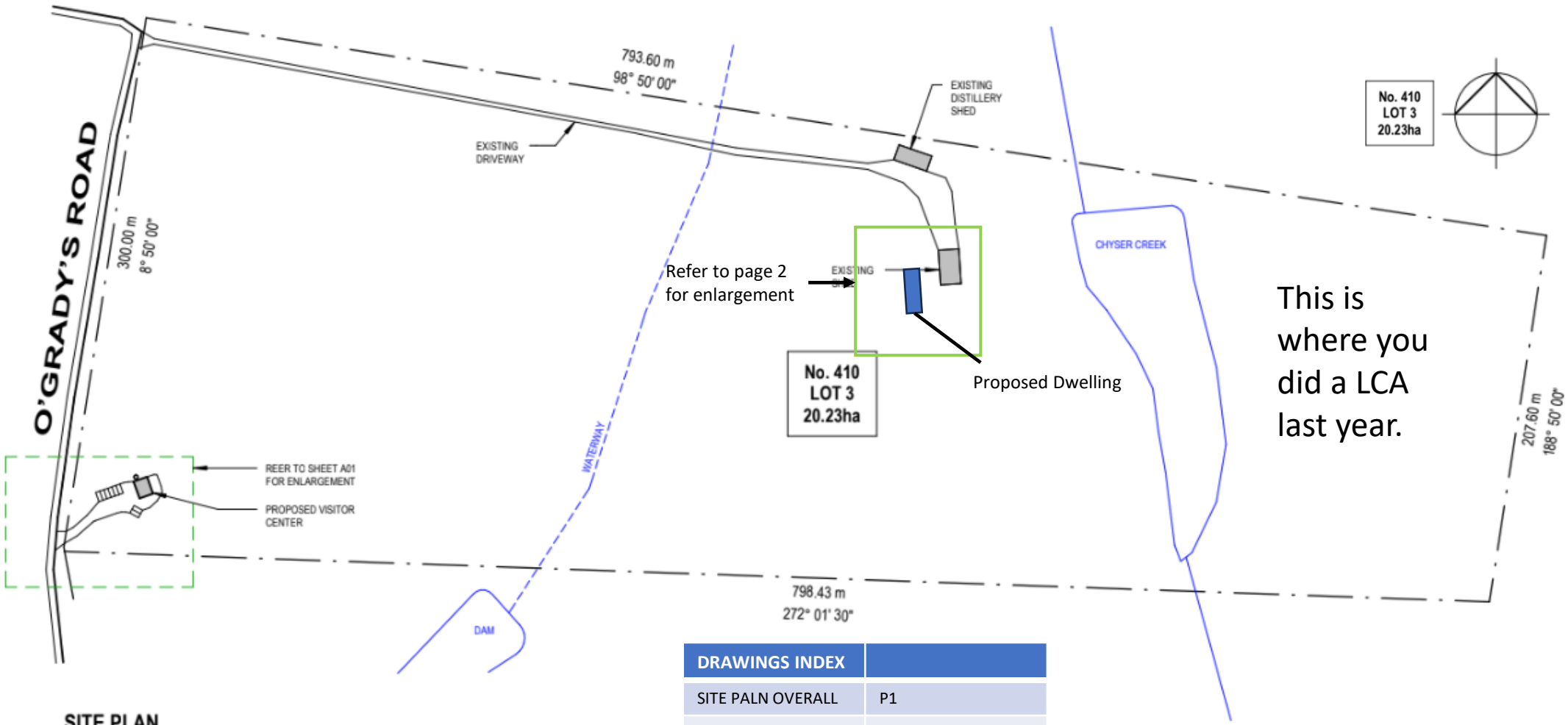
Site: O'gradys Road - 6ha; *observed on site
Nursery: TBC

Botanical Name	Common Name	Planted	EVC	Comments *(e.g. threatened in Victoria)*
Canopy Species (>20m)				
Eucalyptus obliqua*	Messmate	1000	29; 45	High elevation/well drained slopes.
Eucalyptus sieberi*	Silvertop Ash	320	45	Mid & high elevation.
Eucalyptus baxteria s.l.	Brown Stringybark	0	45	
Eucalyptus radiata s.l.*	Narrow-leaf Peppermint	1240	45	Mid & high elevation.
Eucalyptus globulus ssp bicostata*	Eurabbie Blue Gum	1000	29	Low, mid, & high elevation. Riparian.
Eucalytus cypellocarpa*	Mountain Grey Gum	960	29	Low & mid elevation. Riparian.
Canopy Total		4520		
Midstorey Species (5-20m)				
Acacia melanoxylon*	Blackwood	700	29	Riparian.
Acacia dealbata*	Silver Wattle	640	29, 45	Riparian and non-riparian
Olearia argophylla	Musk Daisy Bush	30	29	Riparian.
Pomaderris aspera *	Hazel Pomaderris	343	29	Riparian.
Prostanthera lasianthos	Vic Christmas Bush	0		Riparian.
Midstorey Total		1713		
Understorey Species (1-5m)				
Acacia verticillata*	Prickly Moses	700	29	
Cassinia arculeata*	Dogwood	340	29	
Coprosma quadrifida	Prickly Current Bush	100	29	
Goodenia ovata*	Hop Goodenia	360	29	
Kunzea ericoides	Burgan	0		
Olearia lirata	Snowy Daisy Bush	320	29	
Solanum avilculare	Kangaroo Apple	0		
Lomatia ilicifolia	Holly Lomatia	80	45	
Spyridium parvifolium*	Dusty Miller	120	45	
Correa reflexa	Common Correa	0		
Amperea xiphoclada var. xiphoclada*	Broom Spurge	61	45	
Pultenaea muelleri var. muelleri*	Mueller's Bush-pea	0		
Goodia lotifolia*	Golden-tip	120	29	
Pomaderris vaccinifolia	Round-leaf Pomaderris	50	45, 29	
Understorey Total		2251		
Ground-layer Species (<1m)				
Tetratheca ciliata	Pink Bells	80	45	
Dillwynia phylicoides	Small-leaf Parrot-pea	40	45	
Ground-layered Total		120		
Total		8604		
Canopy Species (>20m)		53%	#DIV/0!	
Midstorey Species (5-20m)		20%	#DIV/0!	
Understorey Species (1-5m)		26%	#DIV/0!	
Ground-layer Species (<1m)		1%	#DIV/0!	

http://www.weeds.org.au/natsig.htm
Weeds of National Significance (WoNS) were prioritised using a series of questions that measured each weeds Invasiveness, Impacts, Potential for spread and Socio economic and Economic impacts.
Become informed of new and emerging weeds for your property. Visit http://www.Macedon Rangesshire.vic.gov.au/services/environment-and-waste/environment/weed_programs or http://www.depi.vic.gov.au/agriculture-and-food/pests-diseases-and-weeds/weeds for information on weeds of the local area.
All weed treatment with and the use of herbicides/chemicals is to be conducted in accordance with the **Agricultural and Veterinary Chemical Code Act 1994**.

DATE: 18/02/2024

SITE PLAN: PROPOSED DWELLING 410 O'GRADY'S ROAD, KINGLAKE CENTRAL



This is where you did a LCA last year.

SITE PLAN
1 : 2500

ADDRESS: 410 O'GRADY'S ROAD, KINGLAKE CENTRL VIC 3757

DRAWINGS INDEX	
SITE PALN OVERALL	P1
SITE PLAN ENLARGEMENT	P2
FOOR & ROOF LAYOUT	P3
EVELATIONS	P4

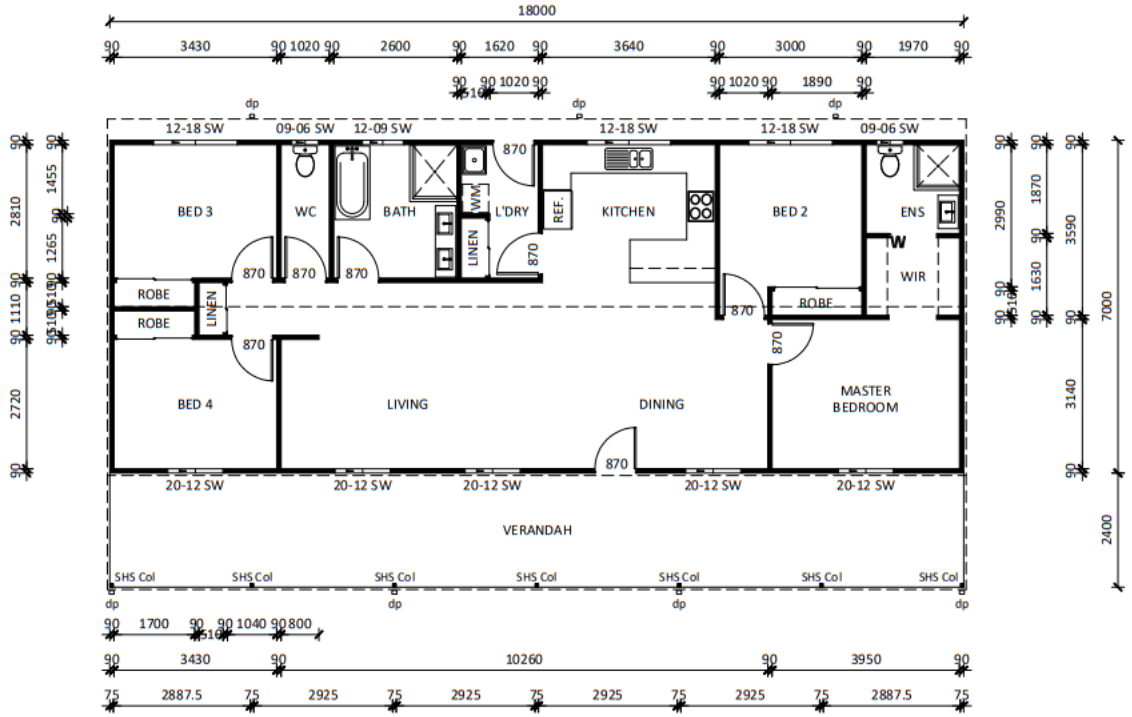
DATE: 18/02/2024

SITE PLAN- PROPOSED DWELLING ENLARGEMENT

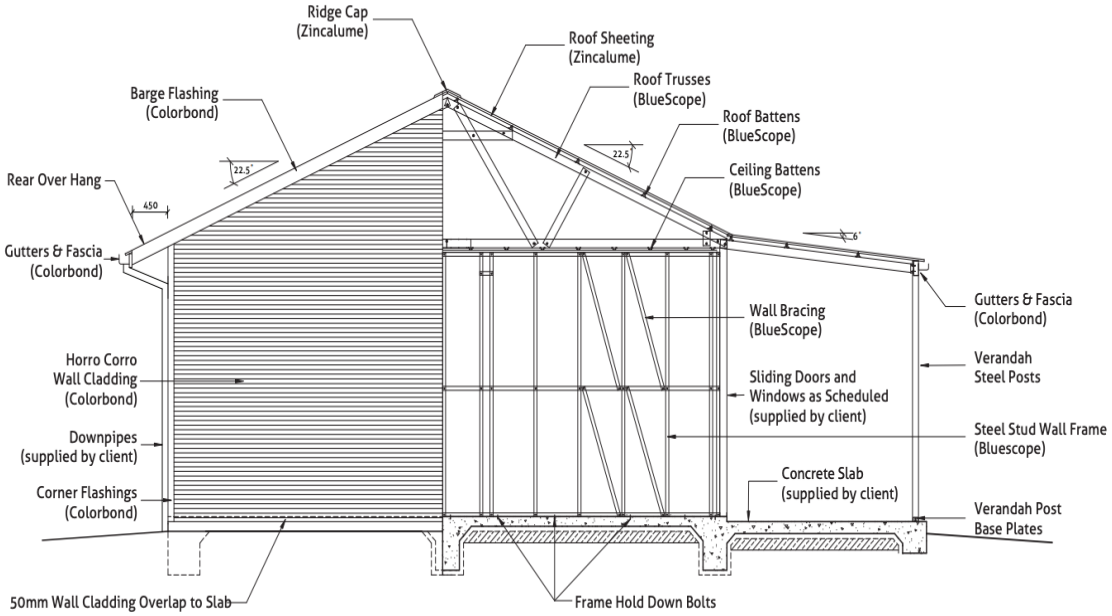
ADDRESS: 410 O'GRQDY'S ROAD, KINGLAKE CENTRAL VIC 3757

FLOOR PLAN- PROPOSED DWELLING

DATE: 18/02/2024

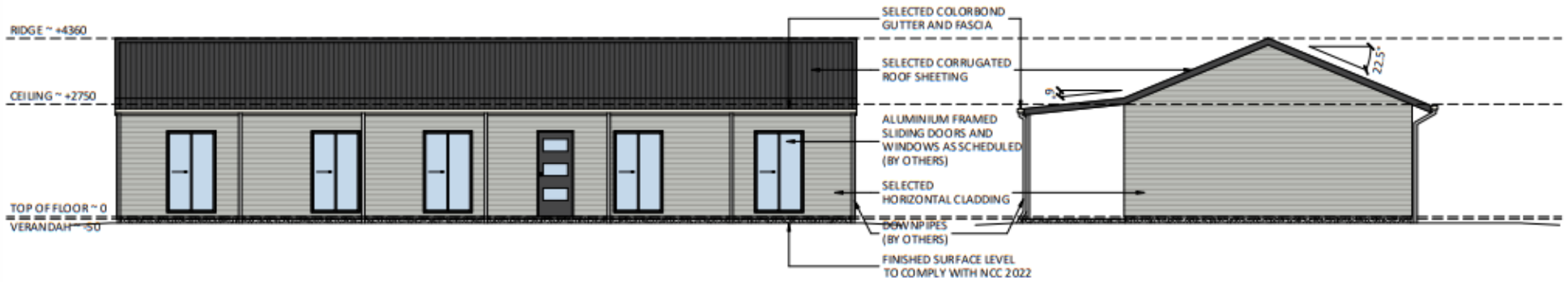


ADDRESS: 410 O'GRADY'S ROAD, KINGLAKE CENTRAL VIC 3757



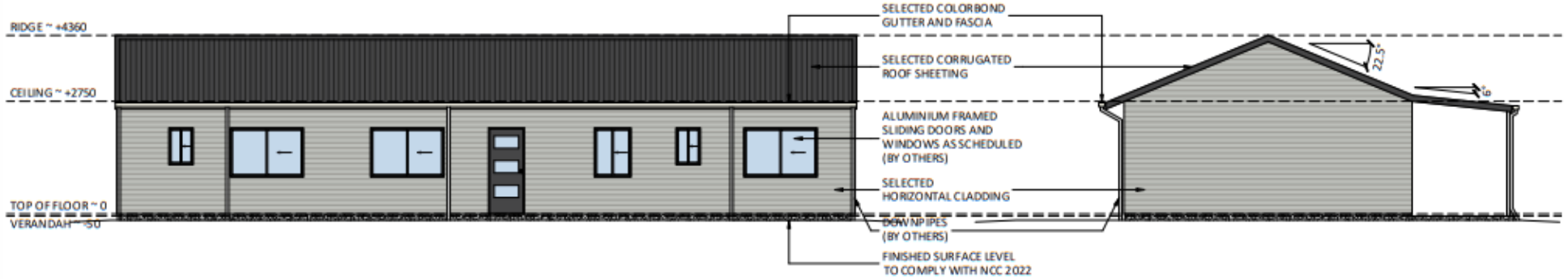
ELEVATION- PROPOSED DWELLING

DATE: 18/02/2024



ELEVATION 1

ELEVATION 2



ELEVATION 3

ELEVATION 4

3.0 ELEVATIONS

Bushfire Management Statement

PATHWAY 2 APPLICATION (Clause 53.02-4)

- ✓ Construction of a dwelling (including an extension or alteration to a dwelling)
- ☐ Small second dwelling
- ☐ Industry
- ☐ Office
- ☐ Retail Premises
- ☐ Service Station
- ☐ Warehouse

Property Address: 410 O'Grady's Road, Kinglake Central 3757

Applicant/Owner Name: Chantal Daniels & Samuel Lowe

Date: 18/02/2024

Prepared by:

Name: Chantal Daniels

Address: [redacted]

Telephone:

Email:

Contents

Introduction

This Bushfire Management Statement has been prepared in response to the requirements of Clause 44.06 – Bushfire Management Overlay, and in accordance with the application requirements of Clause 53.02 – Bushfire Planning.

The statement contains three components:

1. A **bushfire hazard landscape assessment** including a plan that describes the bushfire hazard of the general locality more than 150 metres from the site. Photographs or other techniques may be used to assist in describing the bushfire hazard.
2. A **bushfire hazard site assessment** including a plan that describes the bushfire hazard within 150 metres of the proposed development. The description of the hazard must be prepared in accordance with Section 2.2.3 to 2.2.5 of AS3959:2018 Construction of buildings in bushfire prone areas (Standards Australia) excluding paragraph (a) of section 2.2.3.2. Photographs or other techniques maybe used to assist in describing the bushfire hazard.
3. A **bushfire management statement** describing how the proposed development responds to the requirements of Clause 44.06 and 53.02.

Application Details

Municipality:	Murrindindi Shire
Title description:	Lot 3 LP094810
Overlays:	BMO, ESO, ESO1
Zoning:	Farming Zone (FZ)

Site Description

Site shape:	Rectangle
Site Dimensions:	2071 m
Site Area	195940 sq. m (19.5 ha)
Existing use and siting of buildings and works on and near the land:	Property is used for Agriculatural reasons to grow Australian protea flowers and hay. It is a farming zone. Two edges of the property has thin bushland and other edges maintained low cut grass. Three sheds located near the proposed dwelling is the manufracting of alcholoic spirits, and farm storage. One shed at front of property is the Whisky tasting room.
Existing vehicle arrangements:	Driveway to proposed dwelling already exists.
Location of nearest fire hydrant:	N/A
Any other features of the site relevant to bushfire considerations:	Large spring-feed dam is located on property with road access on both ends. Metal 10,000L tank located next to bonded storage shed for CFA only.

Bushfire Landscape Assessment

Refer to Planning Permit Applications Bushfire Management Overlay Technical Guide for details to assist in developing a Bushfire Hazard Landscape Assessment.

Which landscape scenario represents the site? (Refer to Technical Guide for descriptions)

The landscape scenario that represents this is Landscape Scenario 3.

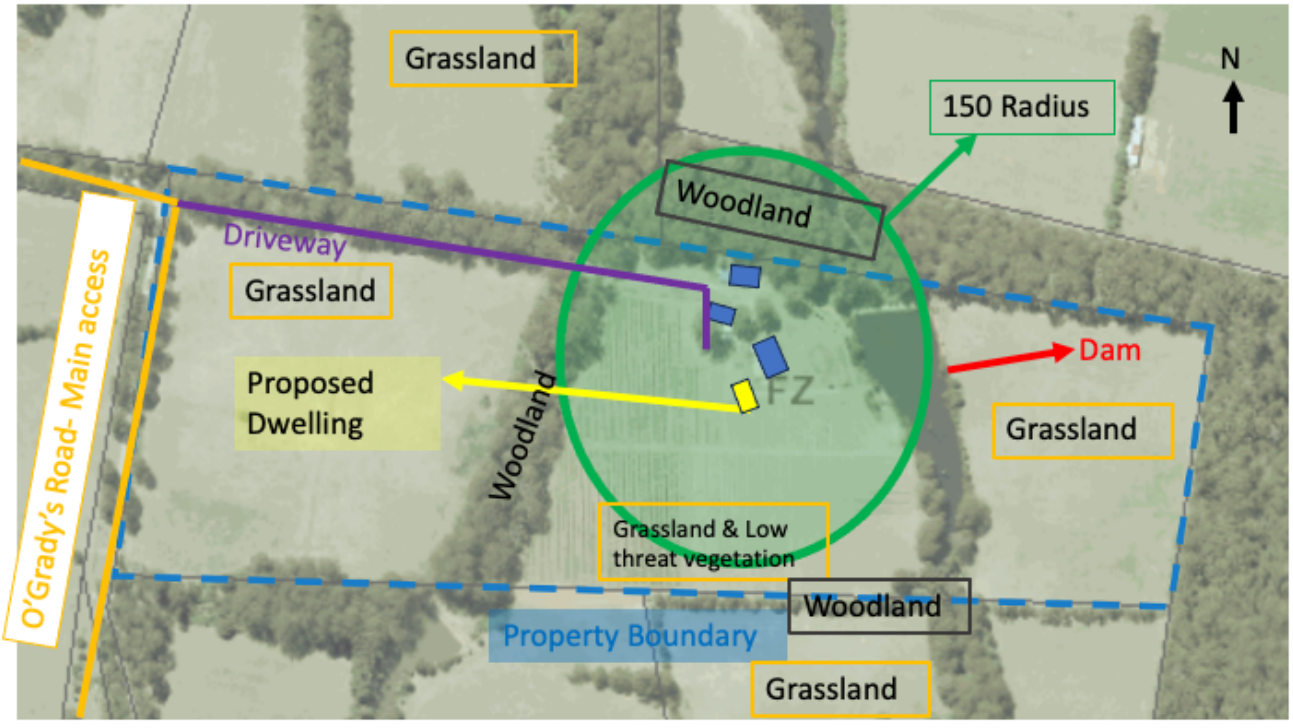
What is the likely fire behaviour impacting the site?

The site is located on 52 arces of grassland in a farming zone. .
North and East boarders of the property have vegetation type Grassland & Woodland. The vegetated areas has fire breaks on all sides being grassland. Kinglake National Park is located 2-3km in East direction from site.
It is likely that the ignition is grassfire or National Park. The National Park fire would develop rapidly and grow to a significant size. The site could be impacted from a Southwest wind direction that is typical of the Victorian fire weather pattern. A wind change Southeast would maintain the fire within the National Park alond with an afternoon cold front change in weather. This scenario would put the site at high risk of ember attack and the neighbouring farms and residedual properties. .

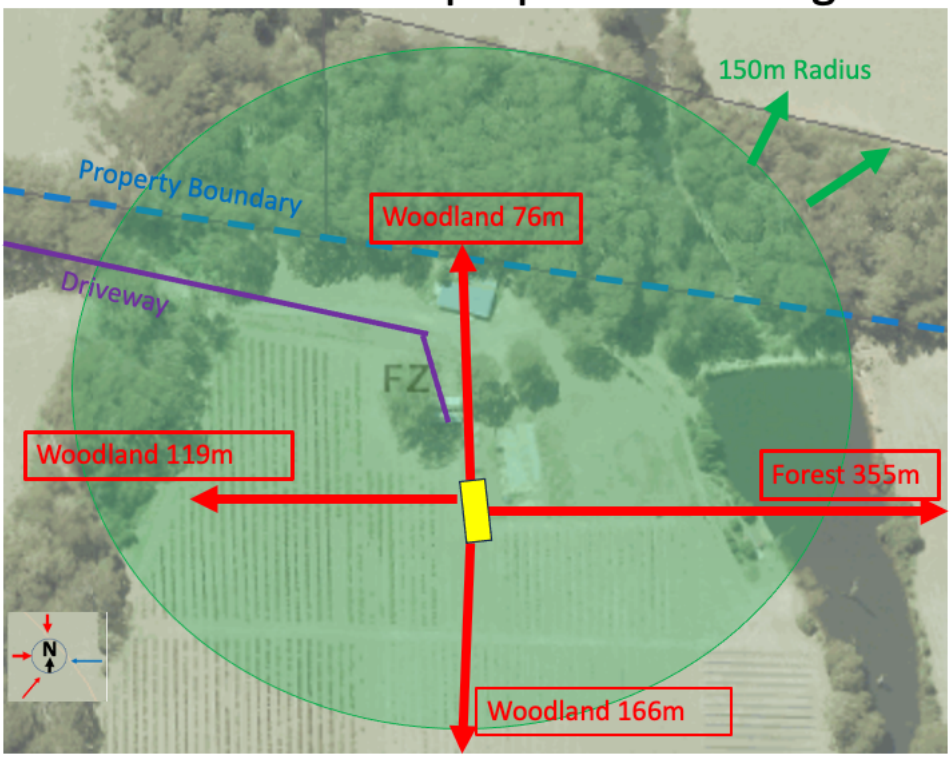
Bushfire Landscape Assessment Plan

Zoom Out view of landscape:

150m Radius around site



150m Radius around proposed dwelling



Bushfire Hazard Assessment

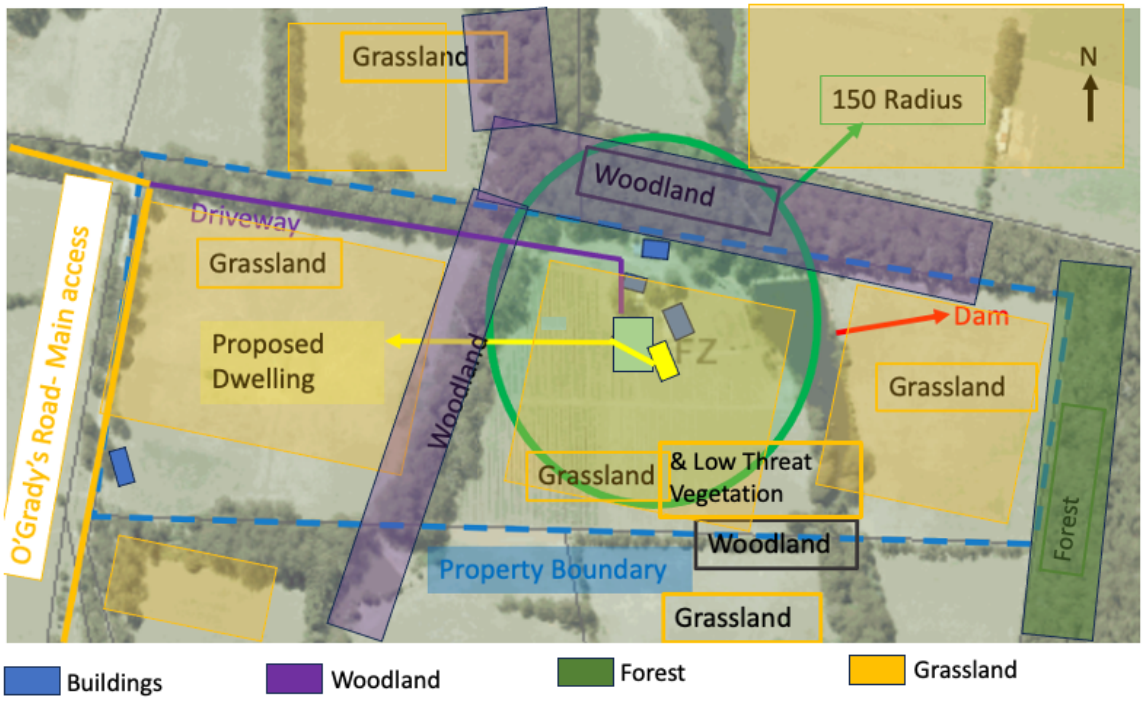
Classify the vegetation within 150 metres of the proposed development in accordance with AS3959:2009 Construction of buildings in bushfire prone areas.

	Direction (Aspect)			
	Northern	**Southern**	**Eastern**	**Western**
Vegetation (within 150 metres of proposed building / works)	Excludable / Low Threat ☐ Modified ☐ Forest ✓ Woodland ☐ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ☐	Excludable / Low Threat ✓ Modified ☐ Forest ☐ Woodland ☐ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ✓	Excludable / Low Threat ☐ Modified ☐ Forest ☐ Woodland ☐ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ✓	Excludable / Low Threat ✓ Modified ☐ Forest ☐ Woodland ✓ Scrub (tall) ☐ Shrubland (short) ☐ Mallee ☐ Rainforest ☐ Grassland ☐
Effective Slope (under the classifiable vegetation within 150 metres)	Upslope / Flat ✓ **DOWNSLOPE** >0 to 5 ° ☐ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐	Upslope / Flat ✓ **DOWNSLOPE** >0 to 5 ° ☐ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐	Upslope / Flat ✓ **DOWNSLOPE** >0 to 5 ° ☐ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐	Upslope / Flat ☐ **DOWNSLOPE** >0 to 5 ° ✓ >5 to 10° ☐ >10° to 15° ☐ >15 to 20° ☐ >20° ☐
Distance (m) to Classifiable Vegetation	83.5m Woodland	166m Woodland	355m Forest	119m Woodland

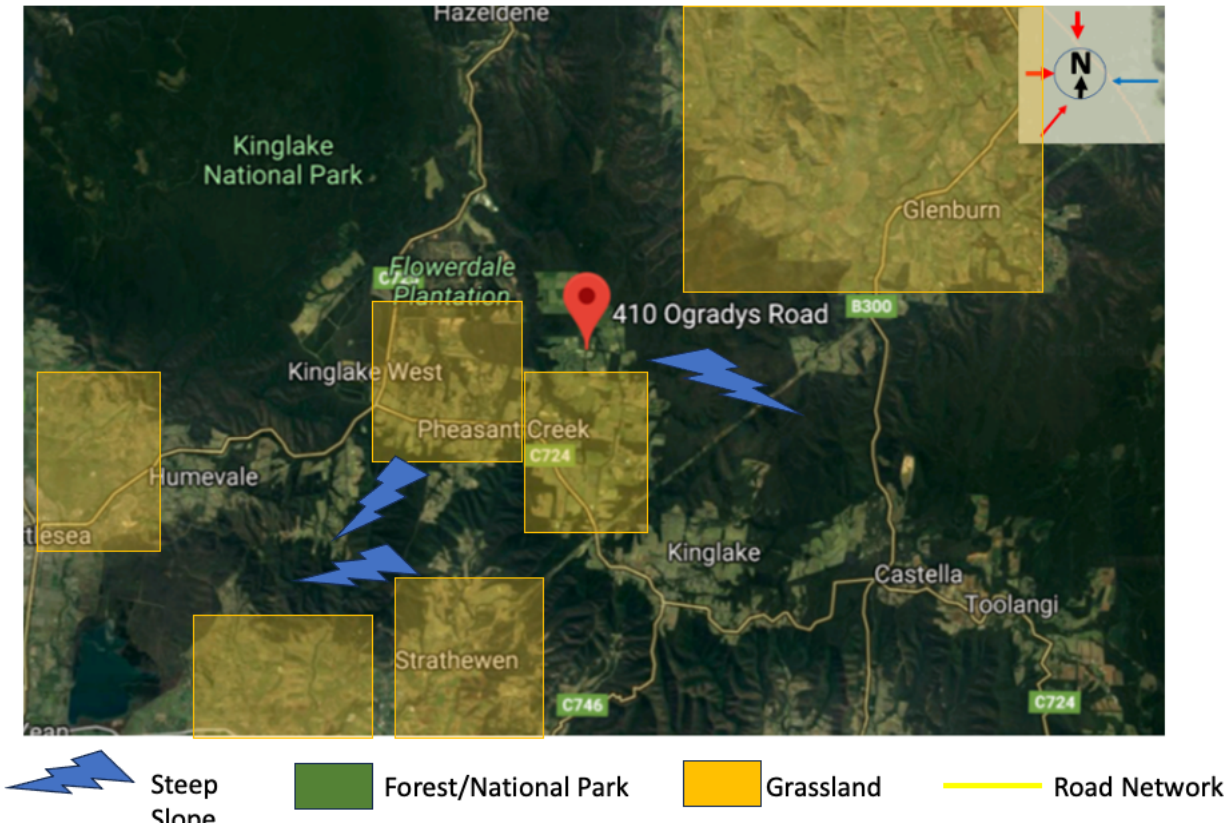
A scaled plan that shows the following is required:

- 150 metre assessment around the location of proposed buildings and around reasonable siting options for proposed buildings (if they are available)
- Property boundaries
- Orientation
- Contours
- Classifiable vegetation within the assessment area
- Excludable vegetation within the assessment area
- Distance between the classifiable vegetation and the proposed buildings
- Slope under the classifiable vegetation (slope is based on the slope under the classifiable vegetation and not the slope between the vegetation and the building)

Bushfire Site Hazard Plan



Landscape Hazard:



Bushfire Management Statement

53.02-4.1 Landscape, Siting and design objectives

- Development is appropriate having regard to the nature of the bushfire risk arising from the surrounding landscape.
- Development is sited to minimise the risk from bushfire.
- Development is sited to provide safe access for vehicles, including emergency vehicles.
- Building design minimises vulnerability to bushfire attack.

Approved Measure (AM) 2.1 - Landscape

Requirement

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

The landscape beyond the site directly is grassland/farming but beyond that land is National Park on North, West, and East side is National Park & Flowerdale Plantation/National Park.
The building has been sited to ensure the relavent bushfire safety mitigations can be implemented. The dwelling is sited with clear 'grassland' and 'low threat vegetation 2.2.3.2 (f)' around and canopy of isolated tree 23m from proposed dwelling.

Has Approved Measure (AM) 2.1 been met? **Yes** ✓ **No** ☐

Approved Measure (AM) 2.2 - Siting

Requirement

A building is sited to ensure the site best achieves the following:

- **The maximum separation distance between the building and the bushfire hazard**

The site is located 83.5meters from closest classifiable vegetation, Woodland.

NORTH- Closest hazard is 'Woodland' that is 83.4m from site, that is the North boarder of property.

SOUTH- 'Grassland' and 'Low Threat Vegetation 2.2.3.2 (f)' with a strip of 'Woodland' along boarder of property (166m).

EAST- There is a shed 10 metres from the proposed dwelling and beyond that is 'Grassland' until boarder of property with classification 'forest' at 355m.

WEST- Closest hazard is 'Woodland' 119m from proposed dwelling site. There is 'Low Threat Vegetation 2.2.3.2 (f)' between the dwelling and Woodland classification.

- **The building is in close proximity to a public road**

  The proposed dwelling is located 440m from O'Grady's Road via driveway.

- **Access can be provided to the building for emergency service vehicles**

  Access point to site in all weather conditions and capable of accommodating

  a vehicle of 15 tonnes for a trafficable width.

Any other comments

Has Approved Measure (AM) 2.2 been met?	**Yes** ✓	**No** ☐

Approved Measure (AM) 2.3 – Building Design

Requirement

A building is designed to be responsive to the landscape risk and reduce the impact of bushfire on the building.

Risk is considered moderate with increasing levels of ember attack and burning debris ignited by wind borne embers; increasing likelihood of exposure to radiant heat. Nominated a minmum Bushfire Attack level of BAL -19 that the building will be designated and constructed.

-Avoid Building design that allows for embers to lodge in re-entrant corners, complex roof lines, gaps between building materials and unenclosed underfloor spaces.

• Construct a concrete slab or fully enclose under floor spaces

• For BAL 12.5 and 19 decks, eaves and fascia should be constructed to comply with BAL 29

• Fire induced winds should be considered. This means constructing to lower cyclone levels

• External materials attached to the building should be non-combustible. This includes decks and other structures

• Building should be of simple design with minimal re-entrant corners and basic roof lines

- A compliant private bushfire shelter might also be considered.

Has Approved Measure (AM) 2.3 been met?	Yes ✓	No ☐

53.02-4.2 – Defendable Space and Construction Objective

- Defendable space and building construction mitigate the effect of flame contact, radiant heat and embers on the building.

Approved Measure (AM) 3.1 – Bushfire Construction and Defendable Space

Requirement:

A building used for a dwelling (including an extension or alteration to a dwelling), a small second dwelling, industry, office, retail premises, service station or warehouse provides the defendable space in accordance with Column A, B, C of Table 2 to Clause 53.02-5 and is managed in accordance with Table 6 to Clause 53.02-5 wholly within the title boundaries of the land.

The building will be provided with defendable space in accordance with Table 2 to clause 53.02-5 Column B.

The defendable space distance required is in accordance with Table 2 to Clause 53.02-5 29 metres.

Table 6 of Clause 53.02-5 - Vegetation management requirement:

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

Are there significant siting constraints that would allow Column D of Table 2 to Clause 53.02-5?

Yes ☐ **No** ☐ **Not Applicable** ✓

A defendable space of 29 metres around the proposed building where vegetation (and other flammable materials) will be modified and managed in accordance with the following requirements:

Grass will be short cropped and maintained the declared fire danger period.

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

Within 10 metres of building, Flammable objects must not be located close to the

vulnerable parts of the building.

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

Shrubs must not located under the canopy of trees.

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

Trees must not overhang or touch any elements of the building. The canopy of trees must be separated by at least 5 metres.

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

A building is constructed to the bushfire attack level:

- That corresponds to the defendable space provided in accordance with Table 2 to Clause 53.02-5. The building will be constructed to The Bushfire attack level in accordance with Table 2 to Clause 53.02-5 of BAL 29.

Is the defendable space wholly contained within the boundaries of your property?

Yes ✓ **No** ☐ if no, see Alternative Measure 3.3

Any other comments

The defendable space is 29 metres.

This defendable space radius contains maintained low cut grass in all directions, 'low Thread vegetation 2.2.3.2 (f)' to the South and West and a shed located to the East side of proposed dwelling. The vegetation classifications will be continued to be maintained for the purposes of providing space for this dwelling.

Slope	Vegetation Type	Defendable space distance from building facade (metres)				
		Column A	Column B	Column C	Column D	Column E
All upslopes and flat land (0 degrees)	Forest	48	35	25	19	< 19
	Woodland	33	24			
	Scrub	27	19	13	10	< 10
	Shrubland	19	13	9	7	< 7
	Mallee/ Mulga	17	12	8	6	< 6
	Rainforest	23	16	11	8	< 8
	Grassland	19	13			< 6
Downslope >0 to 5 degrees	Forest	57	43	32	24	< 24
	Woodland	41	29	21	15	< 15
	Scrub	31	22	15	11	< 11
	Shrubland	22	15	10	7	< 7
	Mallee/ Mulga	20	13	9	7	< 7
	Rainforest	29	20	14	10	< 10
	Grassland	22	15			< 7
Downslope >5 to 10 degrees	Forest	69	53	39	31	< 31
	Woodland	50	37	26	20	< 20
	Scrub	35	24	17	12	< 12
	Shrubland	25	17	11	8	< 8
	Mallee/ Mulga	23	15	10	7	< 7
	Rainforest	36	26	18	13	< 13
	Grassland	25	17	11	8	< 8

Has Approved Measure (AM) 3.1 been met? **Yes** ✓ **No** ☐

Alternative Measures

Alternative Measure (AltM) 3.3 – Defendable Space on adjoining land

Requirement:

Adjoining land may be included as defendable space where there is reasonable assurance that the land will remain or continue to be managed in that condition as part of the defendable space.

Has Alternative Measure (AltM) 3.3 been met? Yes ☐ No ☐ N/A ✓

Alternative Measure (AltM) 3.4 – Calculate defendable space using Method 2 of AS3959-2009

Requirement:

Defendable space and the bushfire attack level is determined using Method 2 of AS3959:2009 Construction of buildings in bushfire prone areas (Standards Australia) subject to any guidance published by the relevant fire authority.

Has Alternative Measure (AltM) 3.4 been met? Yes ☐ No ☐ N/A ✓

Alternative Measure (AltM) 3.5 – Dwellings subject to direct flame contact

Requirement:

A building used for a dwelling (including an extension or alteration to a dwelling) may provide defendable space to the property boundary where it can be demonstrated that:

- The lot has access to urban, township or other areas where:
  - Protection can be provided from the impact of extreme bushfire behaviour
  - Fuel is managed in a minimum fuel condition
  - There is sufficient distance or shielding to protect people from direct flame contact or harmful levels of radiant heat
- Less defendable space and higher construction standard is appropriate having regard to the bushfire hazard landscape assessment
- The dwelling is constructed to a bushfire attack level of BAL-FZ

This alternative measure only applies where the requirements of Approved Measure 3.1 cannot be met.

Has Alternative Measure (AltM) 3.5 been met? Yes ☐ No ☐ N/A ✓

Other Unspecified Alternative Measures

53.02-4.3 – Water Supply and Access Objectives

- A static water supply is provided to assist in protecting property.
- Vehicle access is designed and constructed to enhance safety in the event of a bushfire.

Approved Measure (AM) 4.1 – Water Supply and Access

Water Supply Requirement

A building used for a dwelling (including an extension or alteration to a dwelling), a small second dwelling, industry, office, retail premises service station or warehouse is provided with a static water supply for fire fighting and property protection purposes as specified in Table 4 to Clause 53.02-5.

The water supply may be in the same tank as other water supplies provided that a separate outlet is reserved for fire fighting water supplies.

Lot Size (m^2)	Hydrant Available	Capacity (litres)	Fire Authority Fittings & Access Required	Select Response
Less than 500	Not Applicable	2,500	No	☐
500 – 1000	Yes	5,000	No	☐
500 – 1000	No	10,000	Yes	☐
1001 and above	Not Applicable	10,000	Yes	✓
Note: a hydrant is available if it is located within 120 metres of the rear of the building				

Confirm Static Water Supply meets the following requirements	✓ Is stored in an above ground water tank constructed of concrete or metal ✓ All fixed above ground water pipes and fittings for fire fighting purposes must be made of corrosive resistant metal. ✓ Include a separate outlet for occupant use **The following additional requirements apply when 10,000 litres of static water is required:** ✓ Be readily identifiable from the building or appropriate identification signage to the satisfaction of CFA must be provided. ✓ Be located within 60 metres of the outer edge of the approved building. ✓ The outlet/s of the water tank must by within 4 metres of the accessway and unobstructed

	✓	Incorporate a ball or gate valve (British Standard Pipe (BSP 65mm) and coupling (64mm CFA 3 thread per inch male fitting)
	✓	Any pipework and fittings must be a minimum of 65mm (excluding the CFA coupling)

Additional Information:

Unless otherwise agreed in writing by the relevant fire authority, the water supply must:

• Be stored in an above ground water tank constructed of concrete or metal.

• Have all fixed above ground water pipes and fittings required for firefighting purposes made of corrosive resistant metal.

• Be provided with an outlet for occupant use.

The water supply must also:

• Be readily identifiable from the building or appropriate identification signage to the satisfaction of the CFA.

• Be located within 60 metres of the outer edge of the approved building.

• The outlet/s of the water tank must be within 4 metres of the accessway and unobstructed.

• Incorporate a separate ball or gate valve (British Standard Pipe (BSP 65mm) and coupling (64mm CFA 3 thread per inch male fitting).

• Any pipework and fittings must be a minimum of 65mm (excluding the CFA coupling).

Has Approved Measure (AM) 4.1 (Water Supply) been met? **Yes** ✓ **No** ☐

Access Requirement

A building used for a dwelling (including an extension or alteration to a dwelling), a small second dwelling, industry, office, retail premises, service station or warehouse is provided with vehicle access designed and constructed as specified in Table 5 to Clause 53.02-5.

Column A	Column B
Length of access is less than 30 metres	☐ There are no design and construction requirements if fire authority access to water supply is not required under AM 4.1
Length of access is less than 30 metres	✓ Where fire authority access to the water supply is required under AM 4.1 fire authority vehicles must be able to get within 4 metres of the water supply outlet Within 4 metres of water supple outlet.
Length of access is greater than 30 metres	The following design and construction requirements apply: ✓ All weather construction ✓ A load limit of at least 15 tonnes ✓ Provide a minimum trafficable width of 3.5 metres ✓ Be clear of encroachments for at least 0.5 metres on each side and at least 4 metres vertically ✓ Curves must have a minimum inner radius of 10 metres ✓ The average grade must be no more than 1 in 7 (14.4%)(8.1°) with a maximum grade of no more than 1 in 5 (20%)(11.3°) for no more than 50 metres ✓ Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.
Length of access is greater than 100 metres	A turning area for fire fighting vehicles must be provided close to the building by one of the following: ✓ A turning circle with a minimum radius of eight metres ✓ A driveway encircling the dwelling ✓ The provision of other vehicle turning heads such as a T head or Y Head – which meet the specification of Austroad Design for an 8.8 metre service vehicle.
Length of access is greater than 200 metres	✓ Passing bays must be provided at least every 200 metres. ✓ Passing bays must be a minimum of 20 metres long with a minimum trafficable width of six metres.

Additional Information:

Access:

- Must be constructed so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable width.
- Have a minimum trafficable width of 3.5m of all- weather construction.
- Be clear of encroachments for at least 0.5m on each side and 4m above the access way.
- Curves must have a minimum inner radius of 10m.
- The average grade must be no more than 1 in 7 (14.4 per cent) (8.1 degrees) with a maximum of no more than 1 in 5 (20 per cent) (11.3 degrees) for no more than 50m.
- Dips must have no more than a 1 in 8 (12.5 per cent) (7.1 degrees) entry and exit angle.
- Incorporate a turning area for fire fighting vehicles close to the building
- Incorporate passing bays at least every 200m which must be at least 20m long and have a minimum trafficable width of 6m.

Has Approved Measure (AM) 4.1 (Access) been met?	**Yes** ✓	**No** ☐

Attachment 1 – Site Photos

Bushfire Management Plan – 410 O'Grady's Road, Kinglake Central VIC 3757

Legend:

- Access
- Dwelling footprint
- Water tank
- Weeper system
- Incomplete Structure
- Tree
- Shed
- Defendable Space

Prepared by: Chantal Daniels | Version: 1 | Date: 14/02/2024

Bushfire Protection Measures

Mandatory Condition

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

a) Defendable Space

Defendable space is provided for a distance of 30 metres around the dwelling or to the property boundary whichever is the lesser and managed in accordance with the following:

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

b) Construction Standard

The dwelling must comply to a minimum Bushfire Attack Level of BAL – 29

c) Water Supply

The following requirements apply:

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

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

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

d) Access

Access Required: No ☐ Yes ☑ The following design and construction requirements apply:

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

Length of access is greater 100 metres: Yes ☑ Nin ☐

Where length of access is greater than 100 metres the following design and construction requirements apply:

- A turning circle with a minimum radius of eight metres, or
- A driveway encircling the building, or
- The provision of other vehicle turning heads - such as a T or Y Head - which meet the specification of Austroad Design for an 8.8 metre Service Vehicle.

Length of driveway is greater than 200 metres: Yes ☑ No ☐

Where length of access is greater than 200 metres the following design and construction requirement applies:

- Passing bays are required at least every 200 metres that are a minimum 20 metres long and a minimum trafficable width of 6 metres.

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GroundScience

LAND CAPABILITY ASSESSMENT

FOR ONSITE WASTEWATER MANAGEMENT

410 O'GRADYS ROAD, KINGLAKE CENTRAL, VICTORIA

PREPARED FOR CHANTAL DANIELS

Report Reference: E2562.1 AA

Date: 15 June 2017

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PROJECT DETAILS

Project Reference	E2562.1	Rev	AA
Project Title	Land Capability Assessment		
Project Location	410 O'Gradys Road, Kinglake Central	State	VIC
Date	15 June 2017		

CLIENT DETAILS

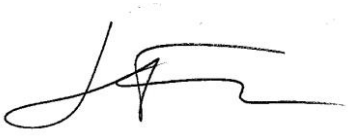
Prepared for (Client)	Chantal Daniels		
Client Address	[redacted]	State	VIC

DISTRIBUTION

Original Held by	Ground Science Pty Ltd
One (1) Electronic Copy	Chantal Daniels

This document presents the results of the land capability assessment conducted for the above project and is detailed for the sole use of the intended recipient and Council. Should you have any questions related to this report please do not hesitate to contact the undersigned.

PREPARED BY:



Jordan Fraser, MIEAust
Environmental Engineer

TABLES

FIGURES

APPENDICES

1. INTRODUCTION

Ground Science Pty Ltd (Ground Science) has prepared this report to present the findings of a land capability assessment (LCA) undertaken for the proposed development at 410 O'Gradys Road, Kinglake Central (herein referred to as 'the site').

Ground Science was engaged by the Owner to conduct the LCA in general accordance with the Ground Science proposal GSPE2017083 AA dated 17 May 2017. All Ground Science personnel involved in the preparation of this LCA are suitably qualified and experienced. Should Council require verification, curricula vitae and relevant insurances can be made available.

2. BACKGROUND

We understand that a Planning Permit Application has been lodged for use of the existing shed at the site for a distillery and associated 'cellar door' style café. A septic tank currently manages wastewater from the existing toilet facilities.

As no reticulated sewer exists and the wastewater loading may increase for the proposed development, Council have requested an assessment to ensure wastewater can be suitably managed onsite.

3. OBJECTIVES

The general objectives of the LCA are to:

- Gather geographical and social information relevant to the site;
- Determine high risk and sensitive areas within allotments and identify relevant site conditions;
- Assess the capability of the site to sustainably manage wastewater within the allotment boundaries; and
- Formulate a sustainable management plan (if possible).

4. REGULATORY GUIDELINES

This assessment was performed in general accordance with the State Environment Protection Policy (SEPP), 2003 - *Waters of Victoria*. The SEPP requires onsite domestic wastewater to be managed to prevent the transport of nutrients, pathogens and other pollutants to surface waters and to prevent any impacts on groundwater beneficial uses. To enable this, guidance has been sought from to following standards and documents:

- EPA Publication 891.4 *Code of Practice (Onsite Wastewater Management*) (2016 – recently amended);
- Municipal Association of Victoria *Victorian Land Capability Assessment Framework* (2014);
- AS/NZS: 1547:2012 *On-site Domestic Wastewater Management.*

4.1 LCA METHODOLOGY

In accordance with EPA 891.4 (2016) the assessment should follow the conservative and 'best practice' LCA report procedures for carrying out land and soil assessments and hydrological calculations for designing land application areas. The framework for LCA aims to direct the assessor to consider both quantitative and qualitative methodologies and identify constraints presented by the site and soil characteristics.

5. SITE DETAILS

The information presented in Table 1 describes the site. A site locality plan is also provided in Figure 1.

Table 1: Summary of Site Details

Site Address	410 OGradys Road, Kinglake Central
Lot and Plan	Lot 3 LP94810
Council area	Murrindindi Shire Council
Surface area	Approx. 52 acres
Domestic water supply	Surface water dam with treatment
Availability of sewer	None
Planning zone	Farming Zone (RCZ3)
Planning overlays	Environmental Significance Overlay (ESO1)

5.1 REGULATORY REQUIREMENTS

Under the provisions of the SEPP, Council requires that any properties not serviced by sewer must treat and contain all domestic wastewater within the boundaries of the property. An approval must be obtained prior to the installation or alteration of any wastewater management system, which is further detailed in the Murrindindi Shire Council *Information Sheet for Septic Tank Applications or Alterations* (2016).

5.2 PROPOSED DEVELOPMENT

Information presented by the Owner indicates the development will consist of a distillery operation within the existing shed, which will have a refurbished kitchen area to supply a café during limited, weekend trading hours.

Considerations for wastewater loading and design purposes include:

- A maximum capacity of 20 visitors per afternoon. Based on the EPA 891.4 (2016) typical wastewater flow allowance for cafes (10L/person), an anticipated maximum loading of 400L/day is estimated;
- Mobile toilet facilities will be used for large events;
- Wastewater produced during pre-washing bottles (300/week estimated) and general surface cleaning is estimated at significantly less than 400L/day and will be limited to weekdays; and
- Spent distillery wash-down liquid will be contained within stormwater system for reuse as irrigation.

As such, a maximum daily wastewater loading of 400L is considered sufficient to cover distillery operations on weekdays and café function on weekends. An associated organic loading of 400g BOD/day has also been considered.

6. DESKTOP STUDY

6.1 SPECIAL WATER SUPPLY CATCHMENT

A review of the Victorian Government Land and Water Management online resources identified the site existing outside all Declared Water Supply Catchments (DWSC), however the onsite dam is to be used for production of potable water for the development. As such this feature must be protected as a sensitive water resource.

6.2 GEOLOGY

The Geological Survey of Victoria map of *Kinglake*, (1977) describes the local geology as consisting of Devonian aged Humevale Formation deposits. The Humevale Formation unit at the site is a siltstone with minor sandstone and is expected to produce fine grained soils through weathering.

6.3 TOPOGRAPHY

The site is located in an elevated region northeast of metropolitan Melbourne, at approximately 570m Australian Height Datum (AHD) at the eastern and western boundaries. Across the site extent, the landform dips and rises, with the development area located at 560m AHD.

6.4 EXPOSURE

The site has moderate tree cover, which is dense across the northern boundary but relatively open within the development area. Standard crop factors will be assumed for the water balance.

6.5 CLIMATE

The climate station closest to the site with suitable rainfall data is the Kinglake West (Wallaby Creek) Climate Station. In accordance with EPA Publication 168, the 90th percentile annual rainfall should be considered for water balance calculation. The monthly summation of 70th percentile data will be used as it provides more accurate monthly rainfall figures and an annual figure of 1,414mm/year, which closely represents the annual 90th percentile rainfall.

Monthly evaporation is calculated by multiplying the mean daily evaporation by the number of days in the month. The closest climate station to record representative pan evaporation is the Toolangi (Mount St Leonard DPI) Climate Station, which reports an annual evaporation of 1,016mm/year.

6.6 HYDROGEOLOGY

A search of the Visualising Victoria's Groundwater (VVG) groundwater database identified 7 registered bores within 500m of the site, with none located onsite. Based on a review of the available information, groundwater is anticipated to be encountered at depths greater than 10m below ground level (mbgl), and is unlikely to be affected by direct application of effluent.

6.7 SURFACE WATER

A review of the DELWP Victorian Water Resources online mapping database identified Chyser Creek and an associated dam approximately 80m east of the development area. An unnamed creek exists approximately 100m to the west, which is expected to drain towards Chyser Creek to the north.

6.8 FLOOD POTENTIAL

Information obtained from the Victorian Water Resources online mapping system indicates that the site is not within the 1 in 100 year flood overlay.

7. SITE INSPECTION

Ground Science personnel conducted a site inspection on 29 May 2017, with site photographs presented in Appendix A. Observations made during the inspection included:

- The site is a large farming property bound by similar farmland and is used to produce native flowers;
- A shed exists at the site with limited bathroom facilities;
- Two surface water creeks and a large dam exist on the site. The dam is proposed for potable water supply;
- The site slopes down from the development area toward the west and east. Slope across the proposed development area is estimated at approximately 10% and becomes slightly steeper closer to the surface water features; and
- The existing wastewater management system was not able to be located but is believed to consist of a septic tank with absorption trench. The existing system is proposed to be decommissioned and replaced as part of the development.

7.1 SETBACK DISTANCES

Buffer setbacks dependent on effluent type are to be observed for all sensitive features to the distances specified in Table 5 of EPA 891.4. The most relevant setback distances are outlined in Table 2, with the complete table provided in Appendix B.

Table 2: Applicable Setback Distances

Landscape feature or structure	Setback Distance (m)	
	Primary treated effluent	Secondary treated effluent
Waterways and dams (non-potable)*	60	30
Wastewater field down-slope of building/adjacent lot	3	1.5
Wastewater field up-slope of building/adjacent lot	6	3

* Setbacks to surface waters for potable water supply have not been considered as the dam/creeks do not provide public potable water supply as per Note 12 of Table 5 in EPA 891.4 (2016)

7.2 AREA AVAILABLE FOR LAND APPLICATION

The land application area (LAA) is the area into which treated effluent is applied via the chosen land application method. The site is expected to have sufficient area, however a suitable setback distance to the dam should be ensured.

7.3 RESERVE AREA

A reserve area is a duplicate land area of equal size to the designated LAA which may be used as the LAA if the original area fails, is inadequate or needs to be rested. It is noted that a reserve area can be reduced or removed at Council's discretion if it is satisfied that based on local knowledge and/or evidence from a comprehensive LCA that there is a low risk of negative impact on the environment and human health.

In accordance with EPA Guidelines, a reserve area is not required for sub-surface drip irrigation systems where the size of the system has been calculated and designed using the recommended design irrigation rates (DIR).

8. SOIL ASSESSMENT

A preliminary soil assessment was conducted at the time of the site inspection. The assessment included drilling at 3 borehole locations (shown in Figure 1) to a maximum terminated depth of 1.3mbgl using hand auger techniques.

Detailed soil borehole logs are presented in Appendix C.

8.1 SOIL PROFILE

A shallow layer of silty clay topsoil was observed at each of the boreholes to a maximum depth of 0.1mbg. This A horizon was noted to be brown, of low plasticity, soft and damp. The A horizon graded into a silty clay, which was noted to be brown with black and red mottling, low to medium plasticity, stiff, dry and contained weathered gravels at depth. Refusal on rock was not encountered during the assessment.

8.2 LIMITING SOIL HORIZON

The B Horizon silty clay was identified as the most limiting soil layer, which must be considered for the long-term absorption of effluent. The soil displays the properties of a light clay when manipulated into a moist bolus with reference to its plasticity and silt content in line with McDonald (1990).

8.3 SOIL PERMEABILITY

Soil permeability is the rate which soil transmits water and air. EPA 891.4 (2016) outlines two procedures for estimating soil permeability; in-situ constant head permeability testing or indicative rates based on key soil properties (such as texture, structure, depth, colour and mottling). The indicative permeability rates for a light clay are <0.06-0.5m/d (soil categories: 5a-5c).

The *Talsma Constant Head Soil Permeability Measurement* as outlined in AS/NZS 1547:2012 was used to measure in-situ the permeability of the limiting layer at BH1. The average permeability rate was calculated at 0.02m/day. This permeability is representative of a weakly structured light clay which will be considered for water balance calculations.

Detailed results of the constant head permeability testing can be found in Appendix D.

8.4 SOIL SAMPLING

Soil sampling was conducted at selected borehole locations. Samples of all discrete soil layers were collected for subsequent laboratory analysis of pH, electrical conductivity (EC) and modified Emerson Aggregate test. A soil analysis summary is outlined in Table 3.

Table 3: Soil Analysis Summary

Sample no.	Borehole	Depth (m)	pH	EC (dS/m)	EAC
1	BH1/1	0.1	5.5	0.07	Slake 2
2	BH1/2	0.6	5.7	0.03	Slake 2
3	BH2/1	0.7	5.4	0.03	Slake 2

8.4.1 Soil Reaction

The soil reaction (pH) of 1:5 soil/water suspensions were measured using a hand-held pH/EC meter. The soil reaction reported an average pH of 5.5, indicating an acceptable range to support plant growth.

8.4.2 Soil Salinity

The soil salinity was assessed in the laboratory using a 1:5 soil/water suspension using a hand-held pH/EC meter. The soil salinity and indicative electrical conductivity was measured at between 0.03-0.07dSm^{-1} for each sample. For a light clay this is considered non-saline and should not affect plant growth.

8.4.3 Soil Aggregate Stability

The EAC test is used to determine the soil stability for effluent stability and identify any susceptibility to erosion, with results indicating minor slaking. Soil renovation is recommended as is outlined in Section 10.8 to improve soil structure.

9. RISK ASSESSMENT

Based on the site and soil characteristics, an overall risk assessment has been developed for the identified constraints. Where moderate and major constraints are identified, the management system must adequately mitigate these constraints to ensure the protection of human health and the environment.

Table 4: Site Constraints & Mitigation Measures

Characteristic	Description	Level of constraint	Mitigation measure / comments
Climate	Rainfall > evaporation	Major	• Consider deeper effluent application method • Control stormwater run-on
Surface waters	Dam used for potable use (onsite only)	Major	• LAA placed on western side of development to inhibit runoff toward the dam • Potable water will be treated prior to use
Indicative permeability	Category 5c soils identified	Major	• Prepare receiving soil by deep ripping • Treat with gypsum • Dose the LAA more than once per day • Promote vegetation growth in application area
Emerson aggregate class	Slaking soils identified	Moderate	• Soil renovation prior to application method installation and periodically
Slope	Slopes of >15% identified close to surface waters	Moderate	• Selective placement of LAA away from steepest sloping areas • Conservative loading rates may be required

One or more of the mitigation measures recommended above are considered feasible to implement for development of a sustainable wastewater management system. Conservative loading rates and selective placement of the LAA must be ensured.

10. MANAGEMENT PROGRAM

10.1 TREATMENT SYSTEM

Untreated domestic wastewater typically has values of 200-300mg/L biochemical oxygen demand (BOD_5) and 200-300mg/L total suspended solids (TSS). Primary treated effluent ranges from 100-140mg/L BOD and 20-55mg/L TSS with an outlet filter, while indicative target effluent quality for secondary treatment systems are < 20mg/L BOD_5, < 30mg/L TSS and <10cfu/100mL E. Coli.

A range of treatment systems options are available for typical domestic wastewater management, which provide primary and secondary effluent treatment. Primary treatment systems typically exist as septic tanks, with secondary treatment options including aerated wastewater treatment systems (AWTS), combinations of primary treatment with sand/media filters, or alternative treatments (vermiculture or composting) with secondary clarification of residual effluent. Further information regarding treatment systems is presented in Appendix E.

With consideration of the low loading and relatively low risk presented by site conditions and surrounding features, treatment to primary effluent quality is considered a suitable management target.

10.2 LAND APPLICATION

A range of possible land application systems have been considered, such as absorption trenches/beds, evapotranspiration/absorption (ETA) beds, mound systems and sub-surface irrigation. AS1547:2012 outlines factors affecting the construction and operation of common land application systems, with further assessment of land application systems presented in Appendix E.

Due to the low loading, climate conditions and primary effluent quality target, ETA beds, sub-surface irrigation and mound systems are not considered suitable application methods. As such, suitably sized absorption trenches are considered the most suitable application method.

Construction of absorption trenches provide the most traditional method for land application of treated effluent. A conventional trench system comprises an effluent distribution line within a maximum 0.4m depth of 20-40mm aggregate. The trench dimensions should be designed with a width and depth of 0.6m, with a flat base ensured across the entire trench. Additional installation details include 0.2m of quality topsoil (suitably sourced onsite) overlying a geofabric membrane to provide a growing medium while preventing soil incursion into the aggregate.

10.3 WATER BALANCE MODELLING

In accordance with Note 3 of Table L1 in AS1547:2012, water balance modelling has been undertaken to calculate the minimum size of the LAA for absorption trenches. The water balance considers climate data and is designed so that the land application area is based upon a depth of saturated soil that meets the upper limits of acceptance.

The parameters and results of the water balance are outlined in Table 5 and further detailed in in Appendix F.

Table 5: Water Balance

Treatment system	Application system	Hydraulic Loading (L/day)	DLR (mm/day)	Max storage depth (mm)	Trench length (m)	Minimum area (m^2)	Reserve (m^2)
Primary septic tank	Absorption trenches	400	5	300	195	297[a]	297

(a) Based on a configuration of 13 x (15m long x 0.6m wide) trenches with 1m spacing

10.4 NUTRIENT BALANCE

The site is predominantly underlain by silty clay soils which fix large amounts of phosphorus, prior to presenting any significant risk to runoff or groundwater. No phosphorus balance has been undertaken.

A nutrient balance has been undertaken to assess the area required for assimilation of nitrogen by soil and vegetation (presented in Appendix G). The nitrogen balance is based upon the method used in the MAV Land Capability Assessment Framework (2014) and assumes a nitrogen concentration in wastewater of 35mg/L, which is expected to be representative of primary treated effluent (limited kitchen wastewater).

Without considering further expected denitrification below the root zone, the nutrient balance requires a minimum of approximately 186m^2. This area is sufficiently covered by the recommended minimum LAA.

10.5 DESIGNATED AREA

Any LAA must be constructed in a designated area (only used for effluent application) to enhance evapotranspiration and must have no effluent run-off beyond the LAA.

The recommended location of the LAA is detailed in Figure 1 and provides no potential for runoff toward the water supply dam. The recommended LAA also maintains other necessary setback distances and will allow for effluent distribution utilising gravity.

10.6 RESERVE AREA

A reserve field of equal size to the recommended LAA must be maintained at the site and developed for effluent application in the event of system failure.

10.7 SOIL RENOVATION

Due to the slaking potential of soils, we recommend that gypsum be applied over the base of the LAA by shallow ripping or a rotary hoe to improve structure and permeability. This renovation method should also manage potential dispersion of soils caused by salt loading within treated effluent and must be repeated with gypsum applied to the LAA surface every 4 years.

10.8 SITE DRAINAGE

Trenches should be reinstated with slight mounding to enhance surface runoff of rainfall, minimising direct infiltration. Adequate stormwater drainage systems must be installed upslope of the LAA to inhibit stormwater run-on.

10.9 CONSTRUCTION, OPERATION AND MAINTENANCE

All works should be carried out in accordance with the Council permit and relevant Australian Standards to ensure effective long-term operation of the treatment and land application systems. Further detail regarding specific system requirements and general recommendations are presented in Appendix H.

11. CONCLUSIONS

This LCA was conducted for the management of wastewater to be generated by a small distillery and 'cellar door' style café with limited trading hours. We consider primary treatment of wastewater followed by the application of effluent via absorption trenches to be the most suitable management option for the current planning proposal.

The cumulative risk to human health and the environment will be low based on implementation of the following recommendations and conditions:

- Wastewater must be treated to a primary effluent standard as a minimum;
- The septic tank should provide a 3-day retention time (capacity >1,200L), with a 3,200L septic tank (with baffle) recommended to reduce pump-out requirements;
- Design, construction, operation and maintenance of the treatment system (including inspection and pump-out) must be carried out in accordance with the relevant Australian Standard and permit requirements;
- Absorption trenches must be constructed by a suitably licensed contractor based on the minimum trench length of 195m and the recommended configuration, with a flat base ensured across each trench;
- All setback distances are to be maintained in accordance with EPA 891.4 and the LAA must not be located up-gradient of the onsite dam. Additionally, the LAA should not be used for parking or other activities that may compromise its effectiveness;
- A reserve area of 297m^2 must be maintained in an alternative area of the site;
- Low permeability soils within the LAA should be ripped and treated with gypsum to improve absorption;
- Following construction, suitable vegetation should be planted around the LAA to promote evapotranspiration; and
- The existing wastewater management system should be decommissioned as part of the proposed upgrade works.

Ground Science notes that should a future increase to trading hours or distillery operations be proposed, the wastewater management system must be reviewed. Installation of a commercial-style kitchen would likely require upgrade to secondary treatment of wastewater.

12. LIMITATIONS

Ground Science has prepared this document in accordance with proposal GSPE2017083 AA dated 17 May 2017 and this report.

The advice given in this report is based on the assumption that the test results are representative of the overall soil conditions. However, it should be noted that actual conditions in some parts of the site might differ from those found. If further sampling reveals soil conditions significantly different from those shown in our findings, Ground Science must be consulted.

It is recognised that the passage of time affects the information and assessment provided in this document. Ground Science's assessment is based on information that existed at the time of the preparation of this document. It is understood that the services provided allowed Ground Science to form no more than an opinion of the actual site conditions observed and cannot be used to assess the effects of any subsequent changes in the quality of the site, or its surroundings, or any laws or regulations.

Where data has been supplied by the client or a third party, it is assumed that the information is correct unless otherwise stated. No responsibility is accepted by Ground Science for incomplete or inaccurate data supplied by others.

Any drawings or figures presented in this report should be considered only as pictorial evidence of our work. Therefore, unless otherwise stated, any dimensions should not be used for accurate calculations or dimensioning.

It is noted that the Murrindindi Shire Council may include provisions of this LCA as conditions on the planning permit for the site.

13. REFERENCES

- Bureau of Meteorology http://www.bom.gov.au
- Department of Primary Industries http://www.dpi.vic.gov.au
- Environmental Protection Authority Publication 168 *Guidelines for Wastewater Irrigation* (1991)
- Environmental Protection Authority Publication 891.4 *Code of Practice - Onsite Wastewater Management* (2016)
- Geological Survey of Victoria, *Mapsheet Kinglake* (Scale 1:63,360) (1997)
- McDonald, R.C., Isbell, R.F., Spreight, J.G., Walker, J and Hopkins, M.S. *Australian Soil and Land Survey: Field Handbook*. Second Edition (1990)
- Municipal Association of Victoria, Department of Environment and Sustainability and EPA Victoria *Victorian Land Capability Assessment Framework* (2014)
- Murrindindi Shire Council *Information Sheet for Septic Tank Applications or Alterations* (2016)
- Nearmap Imagery *http://nearmap.com* (2017)
- Shelly, Liz & Asquith, Ben *Model Land Capability Assessment prepared for Municipal Association of Victoria* (2005)
- Standards Australia / Standards New Zealand *AS/NZS: 1547:2012 On-site Domestic-wastewater Management* (2012)
- State Environment Protection Policy *(Waters of Victoria)* (2003)
- Victorian Water resources http://www.dse.vic.gov.au/waterdata/
- Visualising Victoria's Groundwater http://www.vvg.org.au/

FIGURES

410 O'GRADYS ROAD
KINGLAKE CENTRAL

SAMPLING AND SYSTEM DETAILS

FIGURE 1

LEGEND

- APPROXIMATE SITE BOUNDARY
- BOREHOLE LOCATION
- RECOMMENDED LAA – 835m²
- POTENTIAL TREATMENT SYSTEM LOCATION
- MINIMUM SETBACK

JOB NO: E2562.1
DATE: 15 JUNE 2017
DRAWN: JF
SCALE: NOT TO SCALE

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APPENDIX A – SITE PHOTOGRAPHS

Development area – facing west

Site conditions facing east

Surface water dam to the east

Approximate area of existing wastewater system

Soil profile from a nearby cut face

Top end of area recommended for septic and trench system

APPENDIX B – SETBACK DISTANCES

Landscape Feature/Structure	Setback (m)		
	Primary effluent	Secondary effluent	Advanced secondary effluent
Building			
Wastewater field upslope of building	6	3	3
Wastewater field down slope of building	3	1.5	1.5
Allotment boundary			
Wastewater field upslope of adjacent lot	6	3	1
Wastewater field down slope of adjacent lot	3	1.5	0.5
Services			
Water supply pipe	3	1.5	1.5
Potable supply channel (wastewater field upslope)	300	150	150
Potable supply channel (wastewater down slope)	20	10	10
Gas supply pipe	3	1.5	1.5
Underground water tank	15	4	3
Stormwater drain	6	3	2
In-ground swimming pool	6	3	2
Cutting / escarpment (wastewater field upslope)	15	15	15
Surface waters (upslope from)			
Dam, lake, reservoir (potable, including food production)*	300	150	150
Waterways (potable water supply)	100	100	50
Dam, lake, reservoir (stock & non potable)	60	30	30
Waterways, wetlands, ocean beach (continuous or ephemeral, non-potable, includes high-tide mark ocean)	60	30	30
Groundwater bore			
Category 1 to 2a soils	NA	50	20
Category 2b to 6 soils	20	20	20
Water table			
Vertical depth from base of trench to ground water table	1.5	1.5	1.5
Vertical depth from irrigation pipes to ground water table	NA	1.5	1.5

APPENDIX C – BOREHOLE LOGS

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BOREHOLE LOG

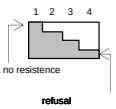
BOREHOLE No: BH1

JOB No : E2562.1

CLIENT:	CHANTAL DANIELS	**TEST DATE:**	29-May-17
PROJECT:	410 O'GRADYS ROAD	**LOGGED BY:**	JF
LOCATION:	KINGLAKE CENTRAL	**CHECKED BY:**	JF
TEST LOCATION:	REFER TO FIGURE 1		
DRILL METHOD:	HAND AUGER	**EASTING:**	**INCLINATION:** 90°
HOLE DIAMETER:	100mm	**NORTHING:**	**SURFACE RL:** ND

DRILLING				SAMPLING		FIELD MATERIAL DESCRIPTION							
PENETRATION RESISTANCE 1 2 3 4	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	PID (ppm)	CONTAMINATION RANKING	ADDITIONAL OBSERVATIONS
		0.0		BH1/1	E		ML	silty CLAY, low plasticity, brown	S	Dp	0	0	TOPSOIL
			0.10				CI	silty CLAY, low to medium plasticity, brown with black and red mottling	F				
				PERC 1	E						0	0	
		0.5	0.50						St	D			
			0.60					Borehole Terminated @ 0.6m					
		1.0											
		1.5											
		2.0											
		2.5											
		3.0											
		3.5											

PENETRATION



CONSISTENCY		DENSITY		MOISTURE		TEST NOTES	
Vs	very soft	Fb	friable	D	dry	U50	undisturbed sample 50mm dia
S	soft	VL	very loose	Dp	damp	U63	undisturbed sample 63mm dia
St	stiff	L	loose	M	moist	D	disturbed sample
VSt	very stiff	MD	medium dense	W	wet	Bs	bulk sample
H	hard	D	dense	S	saturated	E	environmental sample

WATER

Ground Science

BOREHOLE LOG

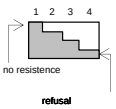
BOREHOLE No: BH2

JOB No : E2562.1

CLIENT:	CHANTAL DANIELS	**TEST DATE:**	29-May-17
PROJECT:	410 O'GRADYS ROAD	**LOGGED BY:**	JF
LOCATION:	KINGLAKE CENTRAL	**CHECKED BY:**	JF
TEST LOCATION:	REFER TO FIGURE 1		
DRILL METHOD:	HAND AUGER	**EASTING:**	**INCLINATION:** 90°
HOLE DIAMETER:	100mm	**NORTHING:**	**SURFACE RL:** ND

DRILLING				SAMPLING		FIELD MATERIAL DESCRIPTION						
PENETRATION RESISTANCE 1 2 3 4	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	PID (ppm)	CONTAMINATION RANKING	ADDITIONAL OBSERVATIONS
		0.0					ML	silty CLAY, low plasticity, brown	S	Dp			TOPSOIL
			0.05				Cl	silty CLAY, low to medium plasticity, brown with black and red mottling	F				
		0.5	0.50	BH2/1	E				St	D	0	0	
		1.0											
			1.30					Borehole Terminated @ 1.3m					
		1.5											
		2.0											
		2.5											
		3.0											
		3.5											

PENETRATION



CONSISTENCY		DENSITY		MOISTURE		TEST NOTES	
Vs	very soft	Fb	friable	D	dry	U50	undisturbed sample 50mm dia
S	soft	VL	very loose	Dp	damp	U63	undisturbed sample 63mm dia
St	stiff	L	loose	M	moist	D	disturbed sample
VSt	very stiff	MD	medium dense	W	wet	Bs	bulk sample
H	hard	D	dense	S	saturated	E	environmental sample

WATER

water level on date shown | wateroutflow | water inflow

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BOREHOLE LOG

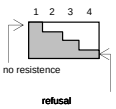
BOREHOLE No: BH3

JOB No : E2562.1

CLIENT:	CHANTAL DANIELS	**TEST DATE:**	29-May-17
PROJECT:	410 O'GRADYS ROAD	**LOGGED BY:**	JF
LOCATION:	KINGLAKE CENTRAL	**CHECKED BY:**	JF
TEST LOCATION:	REFER TO FIGURE 1		
DRILL METHOD:	HAND AUGER	**EASTING:**	**INCLINATION:** 90°
HOLE DIAMETER:	100mm	**NORTHING:**	**SURFACE RL:** ND

DRILLING				SAMPLING		FIELD MATERIAL DESCRIPTION							
PENETRATION RESISTANCE 1 2 3 4	WATER	DEPTH (metres)	DEPTH (RL)	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC SYMBOL	SOIL / ROCK MATERIAL DESCRIPTION	CONSISTENCY DENSITY	MOISTURE	PID (ppm)	CONTAMINATION RANKING	ADDITIONAL OBSERVATIONS
		0.0					ML	silty CLAY, low plasticity, brown	S	Dp			TOPSOIL
			0.10				CI	silty CLAY, low to medium plasticity, brown with black and red mottling	F				
		0.5	0.50						St	D			
		1.0											
			1.30					Borehole Terminated @ 1.3m					
		1.5											
		2.0											
		2.5											
		3.0											
		3.5											

PENETRATION



CONSISTENCY

Vs	very soft
S	soft
St	stiff
VSt	very stiff
H	hard

DENSITY

Fb	friable
VL	very loose
L	loose
MD	medium dense
D	dense

MOISTURE

D	dry
Dp	damp
M	moist
W	wet
S	saturated

TEST NOTES

U50	undisturbed sample 50mm dia
U63	undisturbed sample 63mm dia
D	disturbed sample
Bs	bulk sample
E	environmental sample

WATER

APPENDIX D – PERMEABILITY TESTING

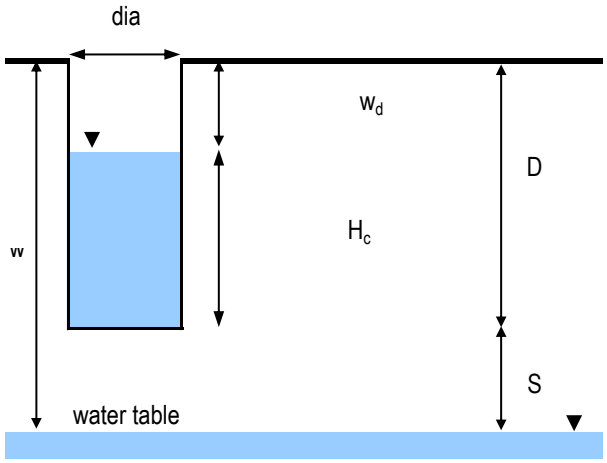
PERMEABILITY TEST REPORT

Client :	**CHANTAL DANIELS**	Job Number :	**E2562.1**
Project :	**410 O'GRADYS ROAD**	Test Date :	**29-May-17**
Location :	**KINGLAKE CENTRAL**	Tested By :	**JF**

Job ref / borehole ref: **BH1**

Test Method : AS /NZS 1547:2012

Applies where S > 2H_c

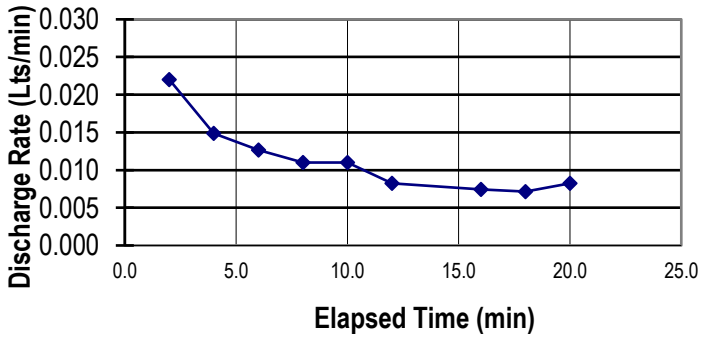


Test Fluid : Potable water

Hole Radius, R :	0.10	m
Hole Depth, D :	0.60	m
Depth to Water, w_d:	0.40	m
Constant Head, H_c :	0.20	m
Depth to Water Table, w (if known) :	NE	m

Reading No.	Elapsed Time t (mins)	Time Interval dt (mins)	Water Added per dt (litres)	Discharge Rate (litres/min)
1	0:02:00	2.00	0.044	0.02200
2	0:04:00	2.00	0.030	0.01485
3	0:06:00	2.00	0.025	0.01265
4	0:08:00	2.00	0.022	0.01100
5	0:10:00	2.00	0.022	0.01100
6	0:12:00	2.00	0.017	0.00825
7	0:16:00	4.00	0.030	0.00743
8	0:18:00	2.00	0.014	0.00715
9	0:20:00	2.00	0.017	0.00825

Discharge Rate versus Time



Discharge Rate Q = **0.0078** litres/min

Site conditions

soil moisture condition :	damp
vegetation cover at test site:	grass
slope:	minor
surface cracks:	none
water logging:	none

Hydraulic Conductivity, K = $\frac{Q\{\sinh^{-1}(H_c/R) - 1\}}{2\pi H_c^2}$

=	**2.3E-07**	**m/sec**
=	**0.0197**	**m/day**

Notes : 1) Test material consists of: 0.0-0.1m: clayey silt; 0.1-0.6m: silty CLAY (refer to borehole log BH1)

APPENDIX E – TREATMENT SYSTEMS

TREATMENT SYSTEMS

Primary Treatment System – Septic Tank

Septic tanks provide preliminary treatment of wastewater by allowing solids to settle out of solution and oils/fats to float to the top, forming a scum layer. Anaerobic bacterial digestion of the settled solids produces sludge, which accumulates in the bottom of the tank. Primary treated effluent flows from the septic tank to a secondary system for further treatment or land application.

Aerated Wastewater Treatment System (AWTS)

AWTS are pre-fabricated treatment systems designed to treat wastewater to secondary effluent standard through the following processes:

- Settling of solids and flotation of scum in an anaerobic primary chamber;
- Oxidation and consumption of organic matter through aerobic biological processes;
- Clarification – secondary settling of solids; and
- Disinfection prior to disposal (in some systems).

Good maintenance of an AWTS (e.g. removal of sludge) is essential to ensure a consistently high level of performance, with quarterly service by an approved maintenance contractor required.

Biological Filters

Biological filters such as wet composting systems are comprised of different filter media which utilise worms and bacteria to breakdown and consume solid residuals and liquid organics within a wastewater load under aerobic conditions. Compost is removed from the humus layer and the residual wastewater that collects at the base of the tank is either pumped or flows by gravity to a land application area. Residual effluent from wet composting systems is generally representative of primary treated effluent only and further treatment may be required to ensure secondary effluent quality.

Sand Filters

Sand filters provide advanced secondary treatment to water that has already undergone primary treatment in a septic tank or similar device. They contain approximately 600mm depth of filter media (usually medium to coarse sand, but other media can be incorporated) within a lined excavation containing an underdrain system. Selection of the filter media is critical and a carefully designed distribution network is necessary. A dosing well and pump is normally used to allow periodic dosing. Depending on the desired level of treatment, sand filters can be single-pass or may incorporate partial recirculation.

Reed Beds

Reed beds are typically a constructed aquatic system using macrophytes (plants) to provide an oxygen source and uptake nutrients and include Rhizopod Systems. Reed beds provide secondary treatment for BOD, TN, TSS and faecal coliforms for wastewater which has already undergone primary treatment in a septic tank or similar device. A reed bed is typically a 0.5m deep polyethylene tub/planter box approximately 8m long that contains various grades of granular fill media and suitable vegetation. An effluent outlet pump is stored in a dosing sump which is then pumped to the LAA. Reed beds are typically low maintenance and relatively inexpensive.

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LAND APPLICATION METHODS

Land application	Description	Limitations & Suitability
Absorption trenches	Trenches are the most common type of land application system and are generally used on lots which are reasonably flat and where water soaks into the soil readily in all weather conditions. Commonly, distribution pipes, self-supporting arch trenching or box trenching are laid in trenches filled with aggregate/rock. Effluent then soaks into the surrounding soil.	• Relies on soil absorption • Not considered suitable where shallow rock exists
ETA beds	ETA beds are shallower and wider forms of traditional absorption trenches. Because ETA systems have smaller sidewall area compared with absorption trenches, the absorption provided by sidewall loading is reduced. ETA systems maximise effluent disposal/reuse through evapotranspiration.	• Utilises soil absorption and evapotranspiration • Not suitable in where shallow rock or steep slopes exist • Not suitable due to climate conditions
Sub-surface irrigation	Sub-surface drip irrigation requires secondary treated effluent dosing lines buried in the topsoil at shallow depth. Irrigation systems operate by both soil absorption and evapotranspiration from plants/trees.	• Primarily utilises evapotranspiration • Requires secondary treatment • Not suitable due to climate conditions
Mound system	A mound system permits the absorption area to be sited in a location where the natural water table or impermeable rock approaches the ground surface. The mound is filled with medium-grade sand to provide suitable filtering before intercepting the natural soils. A pump/siphon dosing system distributes effluent uniformly through a bed of aggregate at the top of the mound.	• Limitations behind sourcing material for construction • Not suitable on steep slopes

APPENDIX F – WATER BALANCE CALCULATIONS

WATER BALANCE & LAND APPLICATION AREA

DISTILLERY AND CAFÉ

GroundScience

CLIENT:	CHANTAL DANIELS	**JOB No:**	E2562.1 AA
SITE ADDRESS:	410 O'GRADYS ROAD	**DATE:**	15 June 2017
LOCATION:	KINGLAKE CENTRAL		

INPUT DATA			
Daily Flow Allowance (per person)	L	10	café per visitor per dining and distillery operations
Daily Wastewater Volume	L	400	20 people per day, 2 potential dinings
Effluent Quality		primary	conservative loading rates apply for primary treated effluent
Effective Rainfall	%	70	Proportion of rainfall retained onsite
Soil Texture		light clay	most limiting soil horizon observed during the field investigation
Soil Structure		weakly structured	
Soil Category		5c	
Indicative Permeability	m/d	<0.06	Ksat
Slope Percentage	%	-	

TRENCHES/BEDS														
DLR	m/d	5												
Porosity	%	40												
Storage Depth	mm	300												
Crop Factor - Standard Pasture	%	*0.85*	*0.85*	*0.85*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.85*	*0.85*	*0.85*	
Crop Factor - Lucene	%	0.95	0.9	0.85	0.8	0.7	0.55	0.55	0.65	0.75	0.85	0.95	1	
Crop Factor - Shade	%	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Crop Factor - Woodlot	%	1	1	1	1	1	1	1	1	1	1	1	1	

Rainfall Data: **Kinglake West (Wallaby Creek) Climate Station**

Evaporation Data: **Toolangi (Mt St Leonard DPI) Climate Station**

Parameter	Unit	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	days	31	28	31	30	31	30	31	31	30	31	30	31	365
Rainfall	mm/month	81.05	68.9	87.16	114.24	124.86	150.8	141.74	155.86	135.88	134.74	107.78	111.29	1414.3
Evaporation	mm/month	145.7	120.4	108.5	69	46.5	33	37.2	49.6	66	96.1	114	130.2	1016.2
OUTPUTS														
Evapotranspiration	mm/month	123.8	102.3	92.2	41.4	27.9	19.8	22.3	29.8	39.6	81.7	96.9	110.7	788.45
Percolation	mm/month	155.0	140.0	155.0	150.0	155.0	150.0	155.0	155.0	150.0	155.0	150.0	155.0	1825
Total Outputs	mm/month	278.8	242.3	247.2	191.4	182.9	169.8	177.3	184.8	189.6	236.7	246.9	265.7	2613.4
INPUTS														
Effective Rainfall	mm/month	5673.5	4823	6101.2	7996.8	8740.2	10556	9921.8	10910	9511.6	9431.8	7544.6	7790.3	99001
Application Rate	mm/month	106.0	95.7	106.0	102.6	106.0	102.6	106.0	106.0	102.6	106.0	102.6	106.0	1247.9
Total Inputs	mm/month	5779.5	4918.7	6207.2	8099.4	8846.2	######	######	######	9614.2	9537.8	7647.2	7896.3	100249
STORAGE CALCULATION														
Waste Loading	mm/month	-5394.7	-4580.7	-5854.0	-7805.4	-8557.3	######	-9744.5	######	-9322.0	-9195.1	-7297.7	-7524.6	
Volume of Wastewater	Litres	12400	11200	12400	12000	12400	12000	12400	12400	12000	12400	12000	12400	
Cumulative Storage	mm/month	0.0	0.0	0.0	0.0	26.2	122.0	191.7	267.5	287.7	196.8	24.6	0.0	
Lineal Meters Required	***lineal meters***													***195***
Width	mm													600
Depth	mm													400

Water Budget compiled in accordance with EPA Publication 168: Guidelines for Wastewater Irrigation (1991) & Lanfax Laboraotries

APPENDIX G – NUTRIENT BALANCE CALCULATIONS

NUTRIENT BALANCE

NITROGEN

GroundScience

CLIENT:	CHANTAL DANIELS	**JOB No:**	E2562.1 AA
SITE ADDRESS:	410 O'GRADYS ROAD	**DATE:**	15 June 2017
LOCATION:	KINGLAKE CENTRAL		

NITROGEN BALANCE

A	HYDRAULIC LOADING	400	L/day	A
B	EFFLUENT N CONCENTRATION	35	mg/L	B
C	DAILY N LOADING	14000	mg/day	A x B
D	ANNUAL N LOADING	5110000	mg/year	C x 365
E	DENTRIFICATOIN LOSS %	20	%	
F	DENTRIFICATION LOSS	4088000	mg/year	D x 80%
G	TOTAL ANNUAL N LOAD	4.088	kg/year	F / 1000000
H	PLANT UPTAKE	220	kgN/ha/year	
I	MINIMUM AREA FOR N UPTAKE	0.01858182	ha	G / H
J	**AREA FOR N UPTAKE**	**185.8**	**m^2**	I x 10,000

APPENDIX I – SYSTEM CONSTRUCTION, OPERATION AND MAINTENANCE

CONSTRUCTION METHODS

Any wastewater system should be installed in compliance with the manufacturer's recommendations, AS/NZS 3500.2:2003 *Plumbing and Drainage* and Council requirements. An EPA Certificate of Approval is no longer required to certify that the installation has been performed in accordance with relevant requirements, however a Council inspection will be undertaken to confirm compliance.

The following excavation techniques shall be observed so as to minimise the risk of damage to the soil:

- Plan to excavate only when the weather is fine;
- Avoid excavation when the soil has a moisture content above the plastic limit;
- All trenching used to install pipes/lines must be backfilled adequately to prevent preferential flow; and
- Irrigation lines must be installed parallel to the contour of the site slope.

OWNERS RESPONSIBILITIES

Owners and occupiers must ensure the onsite wastewater management system is operated, maintained and monitored in accordance with the Council permit and EPA requirements. If a person other than the property owner will be using the system, the property owner must ensure the person is aware of any responsibilities they have in relation to the system, especially the mandatory requirement for ongoing regular servicing. A person who fails to comply with the permit conditions could be subject to Council enforcement action and penalties under sections 53MA and/or 53N of the Act. Property owners may need to review their public liability insurance policy to ensure the onsite wastewater management system is included.

Treatment System:

A suitably qualified maintenance contractor should perform maintenance procedures including but not limited to:

- Checking the structural integrity of the tank/s and lid/s;
- Checking the condition and operation of the, float switches and other components, and replacing or repairing any faulty parts;
- Ensuring adequate air delivery and timing of aeration;
- Ensuring correct operation of sludge return systems and skimmers;
- Checking biomass accumulation on the media (fixed growth systems) or settleability using Imhoff Cone (suspended growth systems);
- Assessing liquid characteristics such as colour, odour, pH, clarity and dissolved oxygen, to measure treatment performance or making adjustments as required to improve effluent quality; and
- Testing of effluent biochemical oxygen demand and suspended solids by a NATA registered laboratory in accordance with the time period set out in the system's EPA Certificate of Approval.

Land Application System:

- Regularly maintain vegetation within the LAA to maximize uptake of water and nutrients;
- Monitor and maintain the system as per the manufacturer's recommendations, including flushing of lines;
- Regularly clean in-line filters;
- Do not erect any structures over the LAA;
- Minimize vehicle access to the LAA, to prevent compaction;
- Ensure that a minimum of two warning signs complying with AS 1319 and AS 1547 regarding the use of

recycled water is posted within the irrigation area; and

- Divert storm water away from the land application area as much as practicable.

Water Conservation and Improving Wastewater Quality

Good water conservation is an important aspect in the overall management of onsite systems. It is important to the ongoing performance of both the treatment and land application systems that they are not overloaded hydraulically, or by particular chemical constituents contained in wastewater.

AAA rated plumbing is recommended for all water fixtures. Using the following water saving devices, the property's water consumption can be reduced substantially:

- AAA rated shower heads to limit flow to 6L/minute;
- AAA rated dishwasher, using not more than 18L/wash; and
- AAA rated washing machine, front loading, limiting water use to 22L/dry kg of clothes or less;
- dual flush 6/3L pan and cistern; and
- AAA rated taps, limiting flow to less than 9L/minute.

Organic matter, oils and fats can enter the waste stream from various sources. These pollutants can be reduced by avoiding disposal of food wastes, oils and fats down the sink. Compost food and other organic wastes where possible and place oils and fats in sealed containers for disposal with the Council waste collection system. Never install "Insinkerator" style garbage disposal units. A grease trap should be installed to capture any grease and oils that make their way into the waste stream.

Bleaches, disinfectants and other cleaning compounds can harm wastewater treatment systems, such as septic tanks, because they kill bacteria that colonize the treatment system and help treat wastewater. Use these products sparingly and always check that they are safe for septic systems.

Avoid placing oil, paint, petrol, acids, degreasers, photography chemicals, cosmetics, lotions, pesticides and herbicides in the wastewater system. Even small amounts of these products can harm the performance of the onsite effluent management system.