

The Central Victorian Uplands Bioregion Valley Grassy Forest

Scientific Name	Common Name	Life Form	Confidence	Reveg Suitability	Restricted Species	Specialist
<u>Austrodanthonia setacea</u> var. <u>setacea</u>	<u>Bristly Wallaby-grass</u>	Medium to Small Tufted Graminoid (Grass-like plant)	High	3	No	No
<u>Austrostipa mollis</u>	<u>Supple Spear-grass</u>	Large Tufted Graminoid (Grass-like plant)	High	3	No	No
<u>Austrostipa rudis</u>	<u>Veined Spear-grass</u>	Large Tufted Graminoid (Grass-like plant)	High	3	No	No
<u>Austrostipa rudis</u> subsp. <u>rudis</u>	<u>Veined Spear-grass</u>	Large Tufted Graminoid (Grass-like plant)	High	4	No	No
<u>Banksia marginata</u>	<u>Silver Banksia</u>	Tree, Medium Shrub	High	3	No	No
<u>Billardiera scandens</u> s.l.	<u>Common Apple-berry</u>	Scrambler or Climber	High	2	No	No
<u>Bossiaea prostrata</u>	<u>Creeping Bossiaea</u>	Prostrate Shrub	Very High	2	No	No
<u>Brunonia australis</u>	<u>Blue Pincushion</u>	Medium Herb	High	2	No	No
<u>Bulbine bulbosa</u>	<u>Bulbine Lily</u>	Medium Herb	High	2	No	No
<u>Burchardia umbellata</u>	<u>Milkmaids</u>	Medium Herb	Very High	2	No	No
<u>Bursaria spinosa</u> subsp. <u>spinosa</u>	<u>Sweet Bursaria</u>	Medium Shrub	High	3	No	No
<u>Caladenia carnea</u> s.s.	<u>Pink Fingers</u>	Medium Herb	High	1	No	No
<u>Caladenia carnea</u> sensu Willis (1970)	<u>Pink Fingers</u>	Medium Herb	High	1	No	No
<u>Cardamine gunnii</u> s.l.	<u>Common Bitter-cress</u>	Medium Herb	High	1	No	No
<u>Carex appressa</u>	<u>Tall Sedge</u>	Large Tufted Graminoid (Grass-like plant)	High	3	No	Yes
<u>Carex breviculmis</u>	<u>Common Grass-sedge</u>	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	Yes
<u>Carex inversa</u>	<u>Knob Sedge</u>	Medium to Small Tufted Graminoid (Grass-like plant)	High	3	No	No
<u>Cassinia aculeata</u>	<u>Common Cassinia</u>	Medium Shrub	High	3	No	No
<u>Cassinia arcuata</u>	<u>Drooping Cassinia</u>	Medium Shrub	High	4	No	No
<u>Cassinia longifolia</u>	<u>Shiny Cassinia</u>	Medium Shrub	High	3	No	No
<u>Centella cordifolia</u>	<u>Centella</u>	Medium Herb	High	2	No	Yes
<u>Chamaescilla corymbosa</u> var. <u>corymbosa</u>	<u>Blue Stars</u>	Medium Herb	High	2	No	No

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<u>Cheilanthes austrotenuifolia</u>	<u>Green Rock-fern</u>	Ground Fern	High	2	No	No
<u>Clematis microphylla s.l.</u>	<u>Small-leaved Clematis</u>	Scrambler or Climber	High	2	No	No
<u>Comesperma volubile</u>	<u>Love Creeper</u>	Scrambler or Climber	High	1	No	No
<u>Coprosma quadrifida</u>	<u>Prickly Currant-bush</u>	Medium Shrub	High	2	No	No
<u>Cotula australis</u>	<u>Common Cotula</u>	Medium Herb	High	2	No	No
<u>Craspedia variabilis</u>	<u>Variable Billy-buttons</u>	Medium Herb	High	2	No	No
<u>Crassula colorata</u>	<u>Dense Crassula</u>	Medium Herb	High	1	No	No
<u>Crassula sieberiana s.l.</u>	<u>Sieber Crassula</u>	Small or Prostrate Herb	High	1	No	No
<u>Crassula sieberiana s.s.</u>	<u>Sieber Crassula</u>	Medium Herb	High	1	No	No
<u>Cymbonotus preissianus</u>	<u>Austral Bear's-ear</u>	Small or Prostrate Herb	High	2	No	No
<u>Daucus glochidiatus</u>	<u>Australian Carrot</u>	Medium Herb	High	1	No	No
<u>Daviesia leptophylla</u>	<u>Narrow-leaf Bitter-pea</u>	Medium Shrub	High	3	No	No
<u>Desmodium varians</u>	<u>Slender Tick-trefoil</u>	Small or Prostrate Herb	High	2	No	No
<u>Deyeuxia quadriseta</u>	<u>Reed Bent-grass</u>	Large Tufted Graminoid (Grass-like plant)	Very High	2	No	No
<u>Dianella admixta</u>	<u>Black-anther Flax-lily</u>		High	2	No	No
<u>Dianella revoluta s.l.</u>	<u>Black-anther Flax-lily</u>	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
<u>Dichondra repens</u>	<u>Kidney-weed</u>	Small or Prostrate Herb	High	2	No	No
<u>Dillwynia cinerascens s.l.</u>	<u>Grey Parrot-pea</u>	Small Shrub	Very High	2	No	No
<u>Dillwynia ramosissima</u>	<u>Bushy Parrot-pea</u>	Small Shrub	High	2	No	No
<u>Diuris sulphurea</u>	<u>Tiger Orchid</u>	Medium Herb	High	1	No	No
<u>Drosera peltata subsp. auriculata</u>	<u>Tall Sundew</u>	Medium Herb	Very High	1	No	No
<u>Drosera whittakeri subsp. aberrans</u>	<u>Scented Sundew</u>	Small or Prostrate Herb	High	2	No	No
<u>Elymus scaber var. scaber</u>	<u>Common Wheat-grass</u>	Medium to Small Tufted Graminoid (Grass-like plant)	High	3	No	No
<u>Epacris impressa</u>	<u>Common Heath</u>	Medium Shrub	High	1	No	No
<u>Eucalyptus globulus subsp. bicostata</u>	<u>Eurabbie</u>	Tree, Small Tree or Large Shrub	High	4	Yes	No

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Scientific Name	Common Name	Life Form	Confidence	Reveg Suitability	Restricted Species	Specialist
Eucalyptus goniocalyx s.l.	Bundy	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus goniocalyx s.s.	Bundy	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus macrorhyncha	Red Stringybark	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus melliodora	Yellow Box	Tree, Small Tree or Large Shrub	Very High	4	No	No
Eucalyptus obliqua	Messmate Stringybark	Tree, Small Tree or Large Shrub	Very High	4	No	No
Eucalyptus ovata	Swamp Gum	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus polyanthemus	Red Box	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus polyanthemus subsp. vestita	Red Box	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus radiata	Narrow-leaf Peppermint	Tree, Small Tree or Large Shrub	Very High	4	No	No
Eucalyptus radiata subsp. radiata	Narrow-leaf Peppermint	Tree, Small Tree or Large Shrub	High	4	No	No
Eucalyptus rubida	Candlebark	Tree, Small Tree or Large Shrub	Very High	4	No	No
Eucalyptus viminalis subsp. viminalis	Manna Gum	Tree, Small Tree or Large Shrub	High	4	No	No
Euchiton collinus s.l.	Clustered/Creeping Cudweed	Medium Herb	High	2	No	No
Euchiton collinus s.s.	Creeping Cudweed	Medium Herb	High	3	No	No
Exocarpos cupressiformis	Cherry Ballart	Tree, Small Tree or Large Shrub	High	2	No	No
Gahnia radula	Thatch Saw-sedge	Large Tufted Graminoid (Grass-like plant)	High	1	No	No
Galium gaudichaudii	Rough Bedstraw	Medium Herb	High	2	No	No
Geranium sp. 2	Variable Crane's-bill	Medium Herb	High	1	No	No
Glossodia major	Wax-lip Orchid	Medium Herb	High	1	No	No
Glycine clandestina	Twining Glycine	Scrambler or Climber	High	2	No	No
Glycine latrobeana	Clover Glycine	Small or Prostrate Herb	High	2	No	No
Gonocarpus tetragynus	Common Raspwort	Medium Herb	Very High	2	No	No
Goodenia geniculata	Bent Goodenia	Medium Herb	High	1	No	No
Goodenia lanata	Trailing Goodenia	Small or Prostrate Herb	Very High	1	No	No
Haloragis heterophylla	Varied Raspwort	Medium Herb	High	2	No	No

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Hardenbergia violacea	Purple Coral-pea	Scrambler or Climber	Very High	2	No	No
Helichrysum scorpioides	Button Everlasting	Medium Herb	High	2	No	No
Hemarthria uncinata var. uncinata	Mat Grass	Medium to Tiny Non-Tufted Graminoid (Grass-like pl	High	2	No	No
Hibbertia obtusifolia	Grey Guinea-flower	Small Shrub	High	2	Yes	No
Hovea heterophylla	Common Hovea	Small Shrub	Very High	2	No	No
Hydrocotyle hirta	Hairy Pennywort	Medium Herb	High	1	No	No
Hydrocotyle laxiflora	Stinking Pennywort	Small or Prostrate Herb	High	2	No	No
Hypericum gramineum	Small St John's Wort	Medium Herb	High	2	No	No
Hypoxis glabella var. glabella	Tiny Star	Medium Herb	High	1	No	No
Isotoma fluviatilis subsp. australis	Swamp Isotome	Small or Prostrate Herb	High	2	No	Yes
Joycea pallida	Silvertop Wallaby-grass	Large Tufted Graminoid (Grass-like plant)	High	2	No	No
Juncus pallidus	Pale Rush	Large Tufted Graminoid (Grass-like plant)	High	3	No	No
Juncus subsecundus	Finger Rush	Medium to Small Tufted Graminoid (Grass-like plant)	High	3	No	No
Kennedia prostrata	Running Postman	Small or Prostrate Herb	High	2	No	No
Kunzea ericoides spp. agg.	Burgan	Medium Shrub	High	3	No	No
Lagenophora stipitata	Common Bottle-daisy	Medium Herb	High	2	No	No
Lepidosperma laterale	Variable Sword-sedge	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Leptorhynchus squamatus	Scaly Buttons	Medium Herb	High	2	No	No
Leptospermum continentale	Prickly Tea-tree	Medium Shrub	High	3	No	No
Levenhookia dubia	Hairy Stylewort	Medium Herb	High	1	No	No
Lobelia pratioides	Poison Lobelia	Small or Prostrate Herb	High	2	No	No
Lomandra filiformis	Wattle Mat-rush	Medium to Small Tufted Graminoid (Grass-like plant)	Very High	2	No	No

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Lomandra filiformis subsp. coriacea	Wattle Mat-rush	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Lomandra filiformis subsp. filiformis	Wattle Mat-rush	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Lomandra longifolia	Spiny-headed Mat-rush	Large Tufted Graminoid (Grass-like plant)	High	3	No	No
Luzula meridionalis	Common Woodrush	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Luzula meridionalis var. densiflora	Common Woodrush	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Luzula meridionalis var. flaccida	Common Woodrush	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Luzula meridionalis var. meridionalis	Common Woodrush	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Microlaena stipoides var. stipoides	Weeping Grass	Medium to Tiny Non-Tufted Graminoid (Grass-like pl)	Very High	3	No	No
Microseris scapigera spp. agg.	Yam Daisy	Medium Herb	High	2	No	No
Microseris sp. 3	Yam Daisy	Large Herb	High	2	No	No
Microtis unifolia	Common Onion-orchid	Large Herb	High	1	No	No
Opercularia varia	Variable Stinkweed	Small or Prostrate Herb	Very High	2	No	No
Oreomyrrhis eriopoda	Australian Caraway	Medium Herb	High	2	No	No
Oxalis corniculata s.l.	Yellow Wood-sorrel	Small or Prostrate Herb	High	1	No	No
Oxalis exilis	Shady Wood-sorrel	Small or Prostrate Herb	High	1	No	No
Oxalis perennans	Grassland Wood-sorrel	Medium Herb	High	2	No	No
Pelargonium rodneyanum	Magenta Stork's-bill	Medium Herb	High	2	No	No
Pentapogon quadrifidus var. quadrifidus	Five-awned Spear-grass	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Pimelea humilis	Common Rice-flower	Small Shrub	Very High	2	No	No

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Scientific Name	Common Name	Life Form	Confidence	Reveg Suitability	Restricted Species	Specialist
Plantago varia	Variable Plantain	Medium Herb	High	2	No	No
Poa labillardierei	Common Tussock-grass	Medium to Small Tufted Graminoid (Grass-like plant)	Very High	3	No	No
Poa labillardierei var. labillardierei	Common Tussock-grass	Medium to Small Tufted Graminoid (Grass-like plant)	High	3	No	No
Poa morrisii	Soft Tussock-grass	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Poa sieberiana	Grey Tussock-grass	Medium to Small Tufted Graminoid (Grass-like plant)	Very High	3	No	No
Poa sieberiana var. sieberiana	Grey Tussock-grass	Medium to Small Tufted Graminoid (Grass-like plant)	High	3	No	No
Poa tenera	Slender Tussock-grass	Medium to Tiny Non-Tufted Graminoid (Grass-like pl)	High	2	No	No
Poranthera microphylla s.l.	Small Poranthera	Medium Herb	High	1	No	No
Pteridium esculentum	Austral Bracken	Ground Fern	Very High	2	No	No
Pterostylis curta	Blunt Greenhood	Medium Herb	High	1	No	No
Pterostylis nutans	Nodding Greenhood	Medium Herb	High	2	No	No
Ranunculus sessiliflorus	Annual Buttercup	Medium Herb	High	1	No	No
Rubus parvifolius	Small-leaf Bramble	Scrambler or Climber	High	3	No	No
Rumex brownii	Slender Dock	Medium Herb	High	3	No	No
Schoenus apogon	Common Bog-sedge	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
Senecio hispidulus s.l.	Rough Fireweed	Large Herb	High	1	No	No
Senecio minimus	Shrubby Fireweed	Large Herb	High	1	No	No
Senecio quadridentatus	Cotton Fireweed	Large Herb	Very High	3	No	No
Senecio tenuiflorus spp. agg.	Slender Fireweed	Large Herb	Very High	2	No	No
Solenogyne dominii	Smooth Solenogyne	Small or Prostrate Herb	High	2	No	No
Stellaria pungens	Prickly Starwort	Medium Herb	High	2	No	No
Stuartina muelleri	Spoon Cudweed	Medium Herb	High	2	No	No
Tetratheca ciliata	Pink-bells	Small Shrub	High	2	Yes	No

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<u>Thelymitra pauciflora</u> s.l.	<u>Slender Sun-orchid</u>	Medium Herb	High	1	No	No
<u>Themeda triandra</u>	<u>Kangaroo Grass</u>	Medium to Small Tufted Graminoid (Grass-like plant)	High	2	No	No
<u>Thysanotus patersonii</u>	<u>Twining Fringe-lily</u>	Scrambler or Climber	High	2	No	No
<u>Thysanotus tuberosus</u>	<u>Common Fringe-lily</u>	Medium Herb	High	2	No	No
<u>Tricoryne elatior</u>	<u>Yellow Rush-lily</u>	Large Herb	High	2	No	No
<u>Triptilodiscus pygmaeus</u>	<u>Common Sunray</u>	Medium Herb	High	1	No	No
<u>Veronica calycina</u>	<u>Hairy Speedwell</u>	Medium Herb	High	2	No	No
<u>Veronica gracilis</u>	<u>Slender Speedwell</u>	Large Herb	High	2	No	No
<u>Veronica plebeia</u>	<u>Trailing Speedwell</u>	Medium Herb	High	2	No	No
<u>Viola betonicifolia</u>	<u>Showy Violet</u>	Medium Herb	High	2	No	No
<u>Viola hederacea</u> sensu Entwisle (1996)	<u>Ivy-leaf Violet</u>	Medium Herb	High	2	No	No
<u>Viola hederacea</u> sensu Willis (1972)	<u>Ivy-leaf Violet</u>	Medium Herb	High	2	No	No
<u>Viola sieberiana</u> spp. agg.	<u>Tiny Violet</u>	Medium Herb	High	2	No	No
<u>Wahlenbergia gracilenta</u> s.l.	<u>Annual Bluebell</u>	Medium Herb	High	2	No	No
<u>Wahlenbergia gracilis</u>	<u>Sprawling Bluebell</u>	Large Herb	High	2	No	No
<u>Wahlenbergia stricta</u> subsp. stricta	<u>Tall Bluebell</u>	Large Herb	High	2	No	No
<u>Wurmbea dioica</u>	<u>Common Early Nancy</u>	Medium Herb	High	2	No	No

**86 Moores Road, Flowerdale VIC
'Carric Hill'
June 2020**

DESCRIPTION

Carric Hill is a 30-hectare organic farm in the hills outside the township of Flowerdale that accommodates visitors, primarily international, seeking an experience of a working organic farm and learning alternative wholistic farming and living experiences from their surrounds. The farm has six cabins and a communal facility where guests can dine and interact to create a sense of community which part of the experience.

This Bushfire Emergency Plan is for the purpose of the development as Flowerdale is within a Bushfire prone region and a minor part of the property is bushfire prone. This plan details the following:

GENERAL

All guests will be given a copy of this emergency plan when arrival and a copy will also be in each accommodation. Maps of evacuation area will be posted in the community facility.

OPERATIONS OF DAYS OF 'TOTAL FIRE BAN'

- On days designated 'Total Fire Ban' notification to all guests that all laws relating to total fire ban are required to adhered too
- Areas on the property marked on MAP 1 as '*fireprone area*' will be prohibited to enter
- Guests will be unable to visit nearby high fire risk areas (Kinglelake National Park).
- Nominated Emergency Contact will monitor social media, radio and news for updates on any fire activity in the area
- Guest will be instructed to come via the northern route if possible that has lower fire risk (via Seymour)

OPERATIONS ON DAYS OF FIRE DANGER RATING OF 'CODE RED**'**

- Nominated Emergency Contact will monitor social media, radio and news for updates on any fire activity in the area as well as contacting local emergency services for recommendations if possible.
- No new guests will be accepted and will be immediately contacted to postpone their stay till the fire danger minimises.
- Notification of closure of the accommodation for the period will be listed on appropriate social media and messaging for the farm.
- Remaining guests within the farm will be requested to evacuate using the safest route as soon as possible. If no fire is currently within the region, the northern route will be recommended to return to Melbourne (via Seymour) for the extent of the code red period to avoid high fire risk areas.
- Areas shown as '*fireprone area*' on MAP 1 will be monitored for spot fires and increased fire activity by the Emergency Contact throughout the period of the Code

Red rating unless whole property is vacant. If areas of activity are noted, emergency services will be contacted.

EVACUATION PROCEDURES IN CASE OF FIRE OR **CODE RED**

- If a fire is occurring on-site or in the region all guests and residents are required to move to evacuation area marked on MAP 1 to be debriefed and directed by nominated Emergency Contact of evacuation procedures
- All guests will be instructed of safest route to return to Melbourne if deemed safe to do so (either recommended by emergency services or fire is not within vicinity – within 20km)
- Information will also be given on the off-site emergency evacuation centres in Yea or Seymour
- If it is deemed not safe to leave the property, then it is recommended that all guests and residents stay on-site in the designated shelter-in-place (marked in MAP 1)

NOMINATION OF EMERGENCY CONTACT

- An Emergency Contact will be nominated each year starting 1 July for the property from a resident or employee of the property.
- The Emergency Contact will be educated on this emergency plan, evacuation procedures as well as encouraged to attend any local information sessions, training or education of fire preparedness each year.
- It is the responsibility of the Emergency Contact to take leadership on actions as designated within this plan.
- Emergency Contacts name, phone number and length of residency will be sent to the local fire authority when nominated.
- If nominated emergency contact no longer resides or works at the property a new emergency contact must be nominated
- In the absence of a Emergency Contact on-site in case of an emergency, the local fire authorities will be contacted immediately with the person contacting the fire authority the temporary Emergency Contact.
- If Emergency Contact cannot be reached, emergency services can contact the property owner as listed in emergency contacts.

EMERGENCY CONTACTS

Nominated Emergency Contact for the property (period ____ _to ____ _)

Name: Ph: Other:

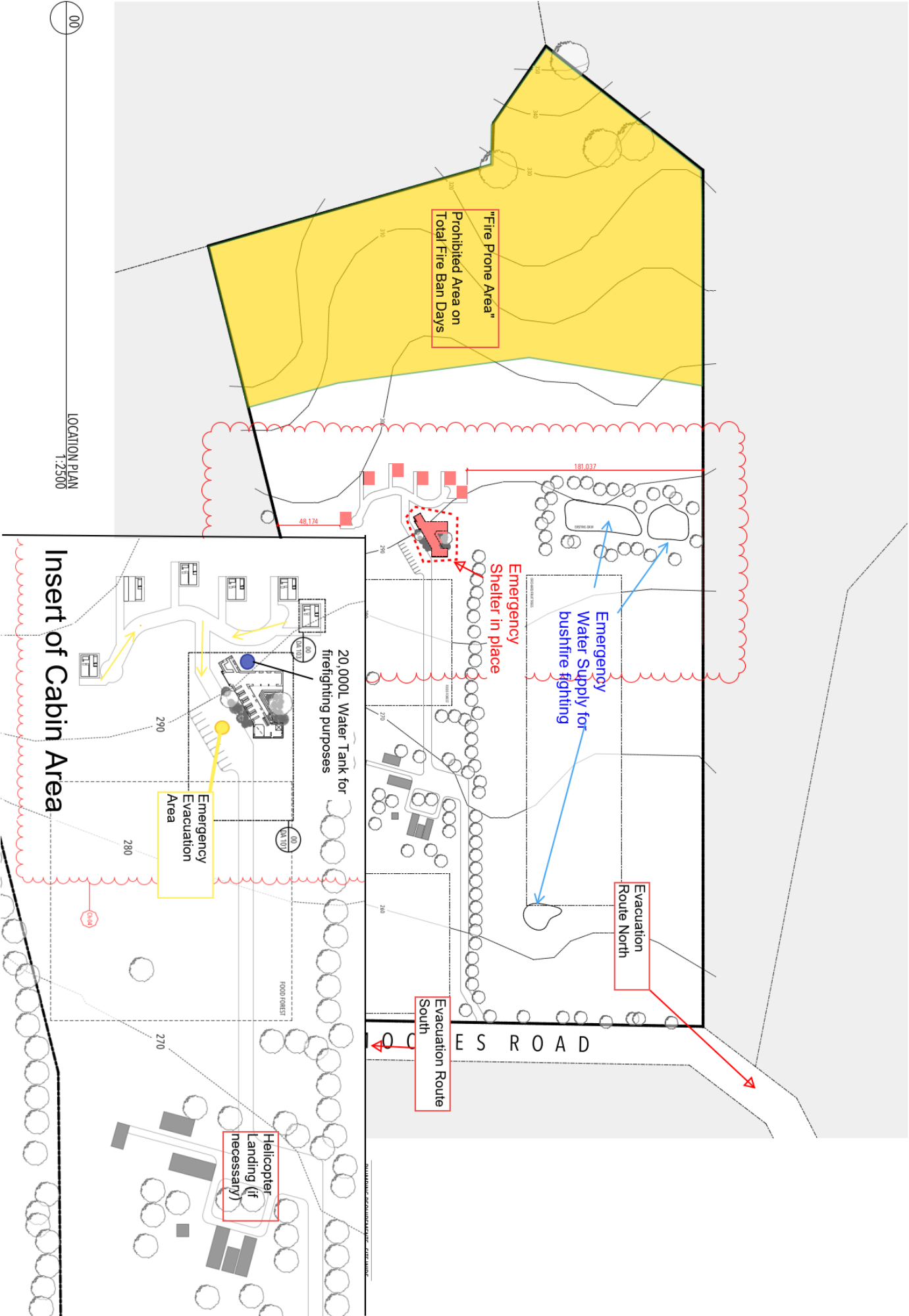
Owner of property

Name: Ph: Other:

REVIEW OF BUSHFIRE EMERGENCY PLAN

This plan shall be reviewed yearly with the nomination of an Emergency Contact of July 1 of each year.

MAP 1: BUSHFIRE EMERGENCY PLAN 86 MOORES ROAD



SHANE SYLVANSRING

**LAND CAPABILITY ASSESSMENT
FOR
ON-SITE WASTEWATER MANAGEMENT
AT
86 MOORES ROAD, FLOWERDALE**

REPORT No. A190803

OCTOBER 2019

By

Paul Williams, B.App.Sc.
Paul Williams & Associates Pty Ltd
CONSULTANTS IN THE EARTH SCIENCES

IMPORTANT NOTE

The land capability assessment report consists of this cover sheet, two written sections, three drawings and four appendices.

The report elements are not to be read or interpreted in isolation.

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**Results of Permeability Testing
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Soil profile Photographs**

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Management Plan

(ii)

ASSESSOR’S ACADEMIC & PROFESSIONAL QUALIFICATIONS

Paul Williams is the Director and principal earth scientist at Paul Williams & Associates Pty Ltd. He has a Bachelors Degree in Applied Science (Geology and Land Use) (awarded in 1978) and has since specialised in vadose zone hydrology, soil science and engineering geology.

He is a member of the Foundation and Footings Society (Vic) Inc. and is a Registered Building Practitioner (EC1486)

All fieldwork and analyses are undertaken by, or directly supervised by Paul Williams.

ASSESSOR’S PROFESSIONAL INDEMNITY INSURANCE

Policy Number:	RSM0000001
Period of Cover:	14/2/2019 – 14/2/2020
Geographical Coverage:	Worldwide (excluding U.S.A. & Canada)
Retro-active Date:	Unlimited
Limit of Indemnity:	\$4,000,000
Underwriting Company:	Lloyds of London (About Underwriting)

(iii)

EXECUTIVE SUMMARY

The proposed development at 86 Moores Road, Flowerdale, is suitable for sustainable on-site effluent disposal.

It is proposed to construct a group accommodation facility including six cabins, an administration centre and communal building, as shown in Drawing 2.

An existing residence is located as shown in Drawing 2. This residence is serviced by a septic tank and trench disposal system.

The site is in the Farming zone and is not in a Special Water Supply Catchment.

The site is not sewerred. For design purposes, mains water (equivalent) is assumed.

Table 1
Description of Development

Parameter	Site specific element
SPI Number	3\PS306336
Property Address	86 Moores Road, Flowerdale
Owner	Zhi Huang
Contact	
Locality	Flowerdale
Zoning and Overlays	Farming zone
Area	21.3 hectares.
Usable Lot Area	At least double proposed land application area.
Soil Texture	Type 4 (loam) over Type 5 (light clay).
Soil Depth	1.2m to 1.5m
Soil Structure	Poorly-structured.
Soil Constraints	Moderate ksat, (Type 5 soils).
Permeability	0.05m/day after renovation.
Slope	Slopes range from less than 10% to 18%.
Distance to Surface Waters	30m (minimum) to dam.
Water Supply	Mains equivalent (assumed for design purposes).
Wastewater Load	1,120 litres (load-balanced).
Availability of Sewer	Not available

The assessment has been made in the context of prioritising public and environmental health with a design compromise between rational wastewater reuse and sustainable wastewater disposal.

Our field testing which included soil profile logging and sampling, laboratory testing, permeability testing and subsequent reporting including water and nutrient balance modelling and risk assessment has revealed that on-site effluent disposal is rational and sustainable.

Effluent shall be treated to at least the 20/30 standard and distributed by subsurface irrigation utilising the processes of evapotranspiration and deep seepage.

The irrigation area has been determined for the mean wet year and satisfies the requirements of *SEPPs (Waters of Victoria)* in that the effluent irrigation system cannot have any detrimental impact on the beneficial use of surface waters or groundwater.

For the proposed development increases in design daily (load-balanced) effluent volume above 1,120 litres are possible.

With regard to density of development and cumulative risk the assessment has considered risk associated with subsurface flows and surface flows.

In regard to subsurface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained the risk to surface and ground waters is negligible. Once the

effluent is placed underground, the extraordinary long travel times via ground water to surface waters ensures adequate nutrient attenuation.

In regard to surface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained, the risk to surface and ground waters is no greater than for a sewered development.

The results of the land capability assessment and risk analysis indicate that primary effluent and trench systems are not appropriate for this site.

Where risk is defined as the product of consequences and frequency, the risk can be reduced to negligible levels if effluent is treated to a secondary level and disposed via pressure compensated subsurface irrigation, as described in Section 2, below.

The LCA supports a conservative, scientifically based, well founded wastewater management system with inherent multiple barriers of safety.

Cumulative risk from the development is extremely low. The risk of serious or irreversible damage is extremely low.

All requirements of *SEPP (Waters of Victoria)* can be met.

Paul Williams & Associates Pty. Ltd.

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LAND CAPABILITY ASSESSMENT LAND USE MAPPING TERRAIN MODELLING HYDROGEOLOGY GEOLOGY HYDROLOGY SOIL SCIENCE LAND-SOIL RISK ASSESSMENT

A190803 – OCTOBER 2019

SHANE SYLVANSRING

LAND CAPABILITY ASSESSMENT FOR ON-SITE WASTEWATER MANAGEMENT AT 86 MOORES ROAD, FLOWERDALE

SECTION 1. SITE INVESTIGATION

1.1 INTRODUCTION

On instruction from Shane Sylvansring, an investigation was undertaken to assess land capability for on-site effluent disposal at 86 Moores Road, Flowerdale.

It is proposed to construct a group accommodation facility including six cabins, an administration centre and communal centre, as shown in Drawing 2.

An existing residence is located as shown in Drawing 2. This residence is serviced by a septic tank and trench disposal system.

The site is in the Farming zone and is not in a Special Water Supply Catchment.

The site is not sewered. For design purposes, mains water (equivalent) is assumed.

The assessment has been made in the context of prioritising public and environmental health with a design compromise between rational wastewater reuse and sustainable wastewater disposal.

1.2 INVESTIGATION METHOD

The reconnaissance site investigation was carried out in accordance with *SEPPs (Waters of Victoria) and related documents. This report is in accordance with current SEPPs (Waters of Victoria) and Code of Practice - Onsite Wastewater Management, E.P.A. Publication 891.4, July 2016. Guidance has been sought from Approaches for Risk Analysis of Development with On-site Wastewater Disposal in Open, Potable Water Catchments, Dr Robert Edis, April 2014. AS/NZS 1547:2012, Guidelines for Wastewater Irrigation, E.P.A. Publication 168, April 1991, Wastewater Subsurface Drip Distribution, Tennessee Valley Authority, March, 2004, AS 2223, AS 1726, AS 1289, AS 2870 and Australian Laboratory Handbook of Soil and Water Chemical Methods.*

Our capability assessment involved the mapping of unique land-soil unit(s) which were defined in terms of significant attributes including; climate, slope, aspect, vegetation, soil profile characteristics (including colloid stability, soil reaction trend and electrical conductivity), depth to rock, proximity to surface waters and escarpments, transient soil moisture characteristics and hydraulic conductivity.

Exploratory boreholes were augered and existing exposures were viewed. The soil profile was logged and representative soil samples were taken for laboratory testing.

Water and nutrient balance analyses were based on the mean annual rainfall for Strath Creek and mean evaporation data for Lake Eildon (G-M Water) and were undertaken in accordance with *Guidelines for Wastewater Irrigation, E.P.A. Publication 168, April 1991 (Part), AS/NZS 1547:2012* and in-house methods.

Redistribution of monthly rainfall was adjusted in proportion to the deviation of means from the minimum mean (see Appendix C, part 2). The rainfall and evaporation data were obtained from the National Climate Centre, Bureau of Meteorology. The data was subsequently analysed and applied to our water and nutrient balance analyses.

The results of the investigation and *in situ* and laboratory testing are given in Section 1.3, below, and in Appendix A, to this report.

1.3 CAPABILITY ASSESSMENT

We have used the attributes determined by the investigation to define one (1) land-soil unit, as follows:-

1.3.1 Land-Soil Unit A. This land-soil unit consists of moderately to steeply sloping terrain, as shown in Drawing 2 and Figure 1.

1.3.1.1 Climate. The general area receives a mean annual rainfall of 686mm, a 9th decile annual rainfall of 875mm and a mean annual evaporation of 1157mm. Mean evaporation matches or exceeds the mean rainfall in October through April.

Rainfall and evaporation data are presented in Appendix B, to this report.

1.3.1.2 Slope and Aspect. The ground surface slopes from 10% to 18% to the east and south-east, as shown in Drawing 2.

The unit is exposed to the prevailing winds and is subject to full winter sunshine.

1.3.1.3 Vegetation and Land Use. The unit is vegetated with dense pasture grasses, as shown in Figures 1 and 2.

1.3.1.4. Slope Stability. For the encountered subsurface conditions, slope degree and geometry and for the proposed range of hydraulic loadings, the stability of the ground slopes within the disposal areas are unlikely to be compromised.

1.3.1.5 Subsurface Profile. The unit is underlain by metasedimentary rocks of Devonian Age.

The general subsurface profile consists of:-

- A topsoil (A₁-horizon) layer of brown, moist to wet, medium dense silty sand (loam), with a soil reaction trend of 5.7 to 5.9 pH and electrical conductivity of 0.17 to 0.21 dS/m, containing coarse gravel and a root mat and root zone, to depths of 0.2 to 0.25m, overlying,
- A residual soil (B₁-horizon) layer of orange-brown, wet, moderately-structured sandy clay of low plasticity (light clay), with a soil reaction trend of 5.8 to 5.9 pH, electrical conductivity of 0.14 to 0.16 dS/m and free swell of 15%, to depths of 0.5 to 0.6m, overlying,
- An extremely weathered (B₂-horizon) layer of light orange-yellow-brown, moist and wet, moderately-structured sandy clay of low plasticity (light clay), with a soil reaction trend of 5.7 to 6.1 pH, electrical conductivity of 0.11 to 0.12 dS/m and free swell of 40%, to depths of 1.1 to 1.4m, overlying,
- Extremely to highly and less weathered, highly fractured sandstone rock.

1.3.1.6 Soil Permeability. The *in-situ* permeability tests were attempted on 3rd October 2019.

The occurrence of transient and seasonally occurring free water in the soil materials prevented the acquisition of sufficient hydraulic data for determination of the geometric mean of saturated hydraulic conductivity.

Note: The relatively high soil moisture content at the time of testing was due to residual seepage from the topsoil into the test holes and high moisture content from recent heavy and persistent rainfalls.

This transient high soil moisture impacts on the test method only and does not reflect in any way on the suitability of the site for the sustainable onsite attenuation of waste water – see AS/NZS1547:2012, Appendix G.

A conservative estimate of permeability has been deduced as follows (see Code 3.6.1):-

Profile analysis in accordance with AS/NZS 1547:2012 and our laboratory analyses shows the residual (B-horizon) materials to be moderately well-drained sandy clay of low plasticity (light clay).

These materials are the limiting layer, controlling vertical permeability.

Constant head permeameter testing from similar formations has realised B-horizon hydraulic conductivity ranging from 0.04 to 0.20m/day.

For the limiting moderately well-structured B-horizon clay soils, we have adopted an estimated saturated hydraulic conductivity of 0.05m/day.

Peak deep seepage is conservatively estimated at 4mm/day.

1.3.1.7 Basement Rock Permeability. From the literature and from examination of rock profiles and rock mass defect character in the vicinity, the hydraulic conductivity of the basement rocks would be in excess of 0.06m/day (adopt 1m/day for buffer design).

1.3.1.8 Colloid Stability. The results of the Emerson Crumb Tests, Dispersion Index tests and observations of any discolouration of water in the boreholes indicate that all encountered materials are non-dispersive.

The Emerson Class was 5 while the Dispersion Index was zero.

The electrical conductivity was determined for all horizons using a 1:5 soil/water extract and converted to EC (saturation extract).

The determined electrical conductivity (EC_{se}) ranged from 0.11 dS/m 0.20 dS/m.

Soil reaction trend ranged from 5.7 pH to 6.0 pH (at depth) which is in tolerable levels for pasture grass.

1.3.1.9 AS1547:2012 Soil Classification. In accordance with AS/NZS1547:2012 the clayey materials can be classified as Type 5 soils (light clays).

1.3.1.10 Surface Drainage. The proposed effluent area slopes to the east and south-east. The proposed effluent areas drain to surface waters located at least 30m distant.

1.3.1.11 Groundwater. Slight to moderate seepage was encountered in the boreholes. This seepage is the result of recent heavy and prolonged rainfall and lateral surface flow and seepage from upslope.

There are no groundwater bores within a significant distance of the proposed land application areas (see Drawing 2).

The Victorian groundwater data base indicates groundwater is deeper than 20 metres of the surface.

Regionally the groundwater is contained in the underlying metasediments. The yield is moderate yield and moderate quality (1000 to 3500 mg/litre TDS) with beneficial use including most stock.

1.3.1.12 Nutrient Attenuation. Clayey soils (as found on this site) can fix large amounts of phosphorous. Phosphate-rich effluent seeping through these soils will lose most of the phosphorous within a few metres.

The limiting nutrient for this site is nitrogen. No phosphorous balance is required.

Nitrogen, contained in organic compounds and ammonia, forms nitrate-N and small amounts of nitrite-N when processed in an aerated treatment plant. Several processes affect nitrogen levels within soil after irrigation. Alternate periods of wetting and drying with the presence of organic matter promote reduction to nitrogen gas (denitrification). Plant roots absorb nitrates at varying rates depending on the plant species (see Appendix B), however nitrate is highly

mobile, readily leached, and can enter groundwater via deep seepage and surface waters via overland flow and near-surface lateral flow.

Based on the water and nutrient balance (see Appendix B), and assuming 30mg/litre N in the effluent (general case) and 20mg/litre P, a denitrification rate of 20%, with N uptake of 220 kg/ha/year for the an appropriate grass cover equivalent to a rye/clover mix) and sequential zoned dosing of the irrigation area, a conservative estimate can be made of the nitrogen content in the deep seepage and lateral flow.

For the general case, and without considering further expected denitrification below the root zone and in the groundwater (reported to be in the vicinity of 80%), denitrification in the lateral flow (external to the irrigation areas but within the curtilage of the allotment) and plant uptake in the lateral flow, the irrigation area would need to be 450m² for 1,120 litres/day of effluent for complete attenuation.

The hydraulic component of the water and nutrient balance have shown that an irrigation area of 540m² would be required to limit surface rainwater flows to episodic rain events.

For the development and to satisfactorily attenuate nitrogen on-site and to accommodate the design hydraulic loading, the application rate should not exceed **2.1mm/day**.

1.3.1.13 Existing Effluent Disposal System. An existing 3-bedroom residence is serviced by a septic tank and trench disposal system.

We are advised that the system is operating satisfactorily and there is no surficial evidence to the contrary.

The total length of disposal trenches is unknown.

We recommend that the system be inspected by a Chartered Plumber to ascertain the adequacy and integrity of the system.

Should the recommendations propose trench extensions, there is sufficient available area for this purpose.

1.4 RISK MANAGEMENT & MITIGATION

SEPP (Waters of Victoria) requires that the proposal be assessed on a risk-weighted basis and cumulative effects^a be considered.

Where risk is defined as the product of consequences and frequency, insertion of properly designed, constructed and (reasonably) maintained^b subsurface irrigation systems would reduce the risk to the integrity of the nearby surface waters and groundwater to negligible levels.

A multiple risk reduction approach is used in assessing this development, with components listed below:

1.4.1 Water Usage. With respect to daily effluent production, the systems are oversized. Current best practice allows for a (continuous) daily effluent flows of 1,500 litres as per *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016.

The design flow is unlikely to be continuous and (at least) standard water reduction fixtures are a mandatory requirement for new structures under local building codes.

1.4.2 Secondary Treatment. The LCA recommends AWTs and sand filters. These systems generate a much higher quality of effluent than septic systems.

^a We would contend that there can be no significant cumulative effect if the provisions of *SEPP (Waters of Victoria)* are met (i.e. all wastes contained onsite).

^b Except for gross negligence, rudimentary maintenance would ensure that "failure" would be restricted to transient reductions in quality of effluent which would continue to be transferred to the subsoil. Potentially "dangerous" contaminated surface flow cannot occur (see 1.4.8, below), while amelioration of contaminants (and this is also true for septic effluent) will continue over the extraordinarily large flow paths and travel times controlled by the regional/local hydraulic gradients (see 1.4.11, below).

1.4.3 Large Block Size. Many under-performing effluent fields are placed on blocks where area is limited. Limited area can lead to inadequately sized or inappropriately placed effluent fields and a lack of options should the daily effluent volumes increase.

For the subject site, size is not a constraining factor.

1.4.4 Management Plan. Historically, inadequate maintenance has played a major part in the failure of onsite effluent disposal systems. There is a management plan within the LCA (see Appendix D). This plan gives guidance on the implementation of mandatory operation, maintenance and inspection procedures.

1.4.5 Sizing of Treatment Systems. No specific proprietary treatment plant is recommended, however treatment plants or sand filters must have current JAS/NZS accreditation, which match effluent volumes with plant capacity.

1.4.6 Load Balancing. Surge flows are possible due to transient increases in population, gatherings, etc. Under these conditions the systems may become overwhelmed for a period. This potential problem can be eliminated by installing a plant with a load balancing facility (or equivalent function) which enables short-term storage and sustainable flows to the distribution area over extended time. The load balancing facility also provides temporary storage should the plant fail or if there is a power outage.

1.4.7 Zoned Dosing. The LCA stipulates that the effluent area is (automatically) irrigated sequentially by zones or time to promote the creation of transient aerobic and anaerobic soil conditions.

The effluent field is sized conservatively for nitrogen attenuation, using pasture grass (rye/clover eq mix), which has a nitrogen uptake of 220 kg/ha/year. Zoned dosing will increase the efficiency of the field for removing nitrogen from the soil.

Undersized effluent fields are at risk of becoming anaerobic for long periods, with the risk of microbial build-up. This leads to secretion of microbial polysaccharides, which coat soil particles and restrict the ability of the soil to adsorb nutrients and attenuate pathogens. Polysaccharides can also coat the interior of pipes and block drainage holes if drainage is slow due to the field being overloaded with effluent. This can lead to effluent surcharge from the ends of the drainage pipes, forming preferential flow paths through overlying soil and draining overland to nearby surface waters.

The alternating aerobic and anaerobic conditions created by zoned dosing prevent the build-up of microbial polysaccharides, and ensures efficient renovation of effluent.

1.4.8 Pressure Compensated Subsurface Disposal. Conservatively sized irrigation areas with pressure compensated subsurface disposal and zoned dosing deliver effluent directly into the soil. Under saturated conditions, water flow is downwards in the direction of maximum hydraulic gradient. For a surface flow containing effluent to occur, the effluent would have to rise, *against gravity*, through at least 150mm of soil. Under unsaturated conditions, water flow is multi-directional due to capillary forces and matrix suction. The atmosphere provides a capillary break with capillary forces and matrix suction reducing to zero at the air/soil interface. Gravitational forces outweigh the capillary forces and matrix suction long before the surface is reached. Hence, any surface flow from the effluent area cannot contain any effluent, regardless of the intensity and duration of rain events. Surface flow can only consist of **rainfall** in excess of soil storage capacity and hydraulic conductivity.

Note: For a pressure compensated distribution network to function properly, lines must be placed parallel to contours and/or horizontal for even effluent distribution. This requirement, alone, requires a high level of quality assurance at the design and construction phases.

1.4.9 Oversized Effluent Areas. Design effluent areas are oversized (designed for continuous flows) and are based on conservative estimates of renovation and complete attenuation of nitrogen. The deep seepage rate is lower than the hydraulic conductivity of the limiting layer (<10%).

1.4.10 Reserve Areas. Although reserve areas are not required for subsurface irrigation (*Code of Practice*, 2016), they have been stipulated in the recommendations and constitute an additional barrier of safety. The reserve area is a spare effluent field, which is left undeveloped, but can be commissioned in the case of contingencies through the chain of ownership.

1.4.11 Buffer Distances. Buffer distances are set out in the *Code of Practice* to allow for attenuation of pathogens and nutrients, should an effluent surcharge occur, either overland or subsurface.

All land application areas are located at least 30m from non-potable surface waters (dam, not on a watercourse).

The time taken for groundwater to reach the nearest surface waters can be estimated by using the Darcy equation (which states that velocity is the product of the hydraulic conductivity and the hydraulic gradient). From the literature, the regional gradient is about 0.005.

Flow times can be estimated for groundwater to flow the 30m (minimum) to the nearest surface waters at this site.

For a conservative basement hydraulic conductivity of 1m/day^c (fractured metasediments) with a hydraulic gradient of 0.005, the time taken for groundwater to flow a distance of 30m is over 15 years.

For perched groundwater flows in the topsoil materials (hydraulic conductivity of 0.6m/day) and a hydraulic gradient equivalent to the typical ground slope (10%), the time taken for perched groundwater to flow a distance of 30m is about 15 months and assumes no evapotranspiration during this time.

For a surface effluent discharge on a 18% slope and for the prevailing soil hydraulic characteristics, the estimated maximum travel distance of effluent before reabsorption is about 2m^d.

1.4.12 System Failure. A properly designed and constructed onsite effluent system consisting of the treatment plant and the irrigation area can suffer degrees of failure. Failure can take the form of mechanical (plant), accidental (toilet blockages, damaged irrigation lines, high BOD influent), operational (power outage, overloading) and maintenance (failure to check filters, failure to participate in maintenance programme).

1.4.12.1 Mechanical Breakdown. Mechanical plant breakdown typically involves compressor and pump malfunction causing no aeration and high-water levels, respectively. Both of these situations are alarmed (both audible and visual). The proposed plants will benefit from a service contract providing 24-hour repair cycles. If the alarms were ignored (or malfunctioned) and the household continued to produce waste until the load balancing tank and plant capacities were exceeded (at least 3 days), a mixture of septic and raw effluent would back up to the interior of the units and/or surcharge through the plant hatches. It is difficult to imagine how this outcome could be allowed to manifest. In addition, a plant malfunction with the residents absent could not cause an effluent surcharge because no influent would be produced during this period.

1.4.12.2 Accidents. Toilet blockages and accidentally damaged irrigation lines could allow localised surface surcharge of treated effluent. This is why minimum buffers to surface waters have been maintained. High BOD influent (e.g. dairy or orange juice) can realise a lesser quality than 20/30 standard for some weeks. Provided the high BOD influent is not continuous, the soils will continue to satisfactorily renovate the effluent.

1.4.12.3 Operational Breakdown. Operational failures including power outages and transient hydraulic overloading are accommodated by the load balancing facility, as described in Section 1.4.6, above.

1.4.12.4 Maintenance Breakdown. Maintenance breakdowns such as failure to clean line filters can lead to expensive pump repairs and in extreme cases leakage (of 20/30 standard effluent) from the outlet pipe. This leakage would occur in proximity to the dwellings and would be noticed and acted on.

Refusal to participate in the management programme would be acted on by the responsible authority within one maintenance cycle.

AWTS and pumped systems have mechanical components which can malfunction and will age. The management plan including the maintenance and monitoring programmes are essential to ensure safe onsite effluent disposal.

1.4.13 Risk Summary. With regard to density of development and cumulative risk the assessment has considered risk associated with subsurface flows and surface flows.

^c This is a conservatively high figure to demonstrate maximum possible flow rates. A conservatively low figure was used for calculation of effluent application rates (see recommendations) to demonstrate irrigation sustainability.

^d Source: *Approaches for Risk Analysis of Development with On-site Wastewater Disposal in Open, Potable Water Catchments* (Dr Robert Edis April 2014).

In regard to subsurface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained (see items 1.4.1 through 1.4.12.4), the risk to surface and ground waters is negligible. Once the effluent is placed underground, the extraordinary long travel times via ground water to surface waters ensures adequate nutrient attenuation.

In regard to surface flows, it is clear that provided the on-site system is adequately designed, constructed, operated and maintained (see items 1.4.1 through 1.4.12.4), the risk to surface and ground waters is no greater than for a sewered development. Indeed, it could be considered that the risk is less than for a sewered development because there can be no mains failure (because there is no mains).

The LCA recommends a conservative, scientifically based, well founded wastewater management system with inherent multiple barriers of safety. Cumulative risk from the development is also extremely low. The risk of serious or irreversible damage is extremely low.

All requirements of *SEPP (Waters of Victoria)* have been met.



Figure 1: Land-soil unit A, viewed from west to east.

SECTION 2. RECOMMENDATIONS

2.1 APPLICATION

The following recommendations are based on the results of our assessment, and are made in accordance with *SEPPs (Waters of Victoria)*, the *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016, AS 1726, and AS/NZS 1547:2012.

They are based on the mean saturated hydraulic conductivity of the limiting clay materials and are designed to demonstrate the viability of on-site effluent disposal for a group accommodation facility including 6 cabins, an administration centre and communal building and a load-balanced daily effluent production of up to 1,120 litres and are considered to be conservative.

2.2 SUBSURFACE IRRIGATION

2.2.1 Disposal Strategy. Effluent from six accommodation cabins, one communal centre and an administration building will be treated via new septic tank. Septic tanks will be provided for each individual building or group of buildings as appropriate.

Septic tanks will gravity feed or be pumped to a load-balancing tank. The load-balancing tank is to be sized to accommodate the peak effluent flow (plus ballast for in-ground tanks).

The daily design flow will be passed through an AWTS/sand filter and pressure compensated subsurface irrigation.

Where any pipe crosses a trafficked area, it shall be protected by a galvanised steel sleeve.

Effluent from the existing residence is being treated via septic tank and trench disposal system. We are advised that this system is functioning satisfactorily and there is no surficial evidence to the contrary. However, we recommend that the integrity of all existing effluent treatment/storage infrastructure should be established by Chartered Plumber.

2.2.2 Effluent. Effluent will be generated from six accommodation cabins, one communal centre and an administration building and will include toilets, laundry, kitchen and showers (i.e. all-wastes).

2.2.2.1 Effluent Quality. Effluent shall be treated (by AWTS/sand filter) to a standard that meets or exceeds the water quality requirements of the 20/30 standard for BOD/SS.

2.2.2.2 Effluent Quantity. For the proposed new buildings, the maximum design daily effluent volumes of 2,020 litres (100% occupancy) and 1,120 litres (50% occupancy) have been estimated from *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July, table 4.

Mains water equivalent with WELS-rated water-reduction fixtures and fittings – minimum 4 Stars for dual-flush toilets, aerator taps, flow/pressure control valves and minimum 3 Stars for all appliances is assumed.

Hydraulic loading calculations for the proposed new buildings are presented in Table 2, below.

Table 2.
Hydraulic loading calculations

Item	No. Items	Persons/day	Rate (litres/day)	Daily loading (100% occupancy)	Daily loading (50% occupancy)
Accommodation Cabins	6	2	150	1,800	900
Admin Centre	1	5	20	100	100
Communal Centre	1	12	10	120	120
Daily hydraulic loading (load-balanced)		-	-	2,020	1,120

The design load-balanced loading (1,120 litres) assumes 50% capacity/occupancy over 52 weeks and is considered conservative.

Biochemical Oxygen Demand (BOD) calculations are presented in Table 3, below.

Table 3
Biochemical Oxygen Demand calculations

Item	No. Items	Persons/day	Rate (g) (BOD/person)	Daily loading (g) (100% occupancy)	Daily loading (g) (50% occupancy)
Accommodation Cabins	6	2	60	7200	360
Admin Centre	1	5	15	75	75
Communal Centre	1	12	15	180	180
Daily organic loading (load-balanced)		-	-	975	615

2.2.2.3 Load Balancing. Transient hydraulic loads in excess of the expected daily peak load may occur. In addition, and in the case of power outages and/or mechanical breakdown, the load balancing tank can act as a temporary storage.

The effluent treatment system must be fitted with a load balancing facility to allow transient high hydraulic loads to be retained and distributed to the land application area during periods of low load.

We recommend that the system be designed to accommodate a 50% occupancy rate.

There is sufficient available land to accommodate a 100% occupancy rate.

The recommended design daily load-balanced flow is 1,120 litres.

The daily peak storage requirement is 2,020 litres.

The 3-day peak storage requirement is 4,060 litres^e plus ballast, allow 5,000 litres plus ballast.

2.2.2.4 BOD Reduction. The effluent treatment system will be required to process up to 975 grams BOD/day (load-balanced for 100% occupancy). The effluent stream will pass through a septic tank(s), load-balancing tank and AWTS/sand filter.

Typically, BOD reduction would be a minimum of 30% in the septic tank ($975 \times 0.7 = 683$ grams) and 30% in the balance tank (assuming ballast or dual tanks simulating a partition) ($683 \times 0.7 = 478$ grams) prior to the AWTS/sand filter. Hence, the AWTS/sand filter will typically need to treat up to 480 grams BOD.

2.2.3 Application Rates and Irrigation Areas. An irrigation area and application rates have been determined from the results of the water and nutrient balance analyses and estimates of occupancy.

2.2.3.1 Hydraulic Loading. To satisfy the requirement for no surface discharge in the mean wet year and as adjusted for slope, effluent shall be applied at an application rate not exceeding 2.1mm/day.

2.2.3.2 Nutrient Loading. The requirements of *SEPPs (Waters of Victoria)* would be satisfied with effluent applied at an application rate not exceeding 2.5mm/day.

2.2.3.3 Design Loading. To satisfy the requirement for no surface discharge in the mean wet year and on-site attenuation of nutrients, the effluent shall be applied at a rate not exceeding **2.1mm/day**.

2.2.4 General Requirements. For subsurface irrigation, it is assumed that the design, construction, operation and maintenance are carried out in accordance with *AS/NZS1547:2012* and a "system specific" JAS/ANZ accreditation, as appropriate.

The irrigation area is to be a dedicated area. To prevent stock and vehicular movements over the area, the effluent area shall be fenced.

^e Two times (two accommodation houses plus one Dad's Shed plus one wellness centre plus three glamping sites plus one annual forum).

2.2.5 Subsurface Distribution System. A distribution network design similar to that shown in *AS/NZS1547:2012, Figure M1* is appropriate.

2.2.5.1 Ground Preparation and Excavations. Preparation of the ground is to include the redistribution of topsoil to form a free draining, smooth surface. Pipe excavations shall only be undertaken in drier periods when soil moisture contents are relatively low and when heavy rainfall and storms are not normally expected.

2.2.5.2 Pump System and Pipe works. Uniform delivery pressure of the effluent throughout the distribution system is essential. Percolation or drip rates shall not vary by more than 10% from the design rate over the whole of the system (i.e. pressure compensated).

The distribution pipes shall be placed coincident with slope contours. The dripper system is to provide an effective even distribution of effluent over the whole of the design area. Line spacing shall be no closer than 1000mm.

2.2.6 Sequential Zoned Irrigation. The efficiency of irrigation effluent disposal systems can be highly variable. We recommend that as part of the daily irrigation process, the effluent area be irrigated sequentially by zones or time to promote the creation of transient aerobic and anaerobic soil conditions.

The inspection regime described in Section 2.2.7, below, is to be strictly adhered to.

2.2.7 Inspections and Monitoring. We recommend that the mandatory testing and reporting as described in the *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016, include an annual (post spring) report on the functioning and integrity of the distribution system and on the functioning and integrity of the cut-off drains and outfall areas.

It is expected that the frequency of inspections and monitoring will intensify as systems age.

2.2.8 Soil Renovation. To maintain stable soil peds, we recommend that gypsum be applied (broadcast) over the proposed land application area, prior to construction of the drip line network, at a rate of 0.25kg/m².

Gypsum should be reapplied (broadcast) at a rate of 0.25kg/m² every three years.

2.2.9 AWTS and Sand Filter. It is assumed that the design, construction, operation and maintenance of all treatment elements are carried out in accordance with *AS/NZS1547:2012* and a current JAS-ANZ accreditation.

The AWTS or sand filter are to be sized to successfully treat a daily hydraulic load of 1,120 litres and a nutrient load of 300 grams BOD (assuming septic tank and balance tank upstream of the AWTS/sand filter).

The sand filter shall have a minimum plan area of 23m² and can be constructed as modules if required. The sand media must comply with the *Code* Appendix G.

The sand media must have less than 5% fines, effective size (D10) between 0.25 and 0.60mm and uniformity coefficient (D60/D10) less than 4mm.

2.3 RESERVE AREA

The expected design life of fifteen years may vary due to construction and maintenance vagaries and possible effluent volume increases through the chain of ownership.

There is sufficient available area on the allotment for extension/duplication of the effluent areas.

2.4 SITE DRAINAGE.

Our recommendations for on-site effluent disposal have allowed for incident rainfall only and are conditional on the installation of a shallow cut-off drain, which shall be placed upslope of the disposal area.

Care shall be taken to ensure that the intercepted and diverted surface waters are discharged well away and down slope of the disposal fields.

Cut-off drain detail is shown in Drawing 3.

The owner shall also ensure that any upslope site works do not divert and/or concentrate surface water flows onto the disposal area.

2.5 BUFFER DISTANCES

The water balance analysis has shown that potential surface (rain water) flows from the effluent area would be restricted to episodic events.

The estimated hydraulic properties of the upper soil materials and hydraulic gradient have been used to evaluate (via Darcy's Law) the buffer distances with respect to subsurface flows.

Our analysis and evaluation have shown that the default setback distances given in *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016, Table 5 and *Approaches for Risk Analysis of Development with On-site Wastewater Disposal in Open, Potable Water Catchments*, Dr Robert Edis, April 2014 are conservative and can be applied without amendment.

For a building located downslope of an effluent field, your engineer shall evaluate the integrity of building foundations with respect to the assigned buffer distance.

2.6 SUMMARY OF RECOMMENDATIONS

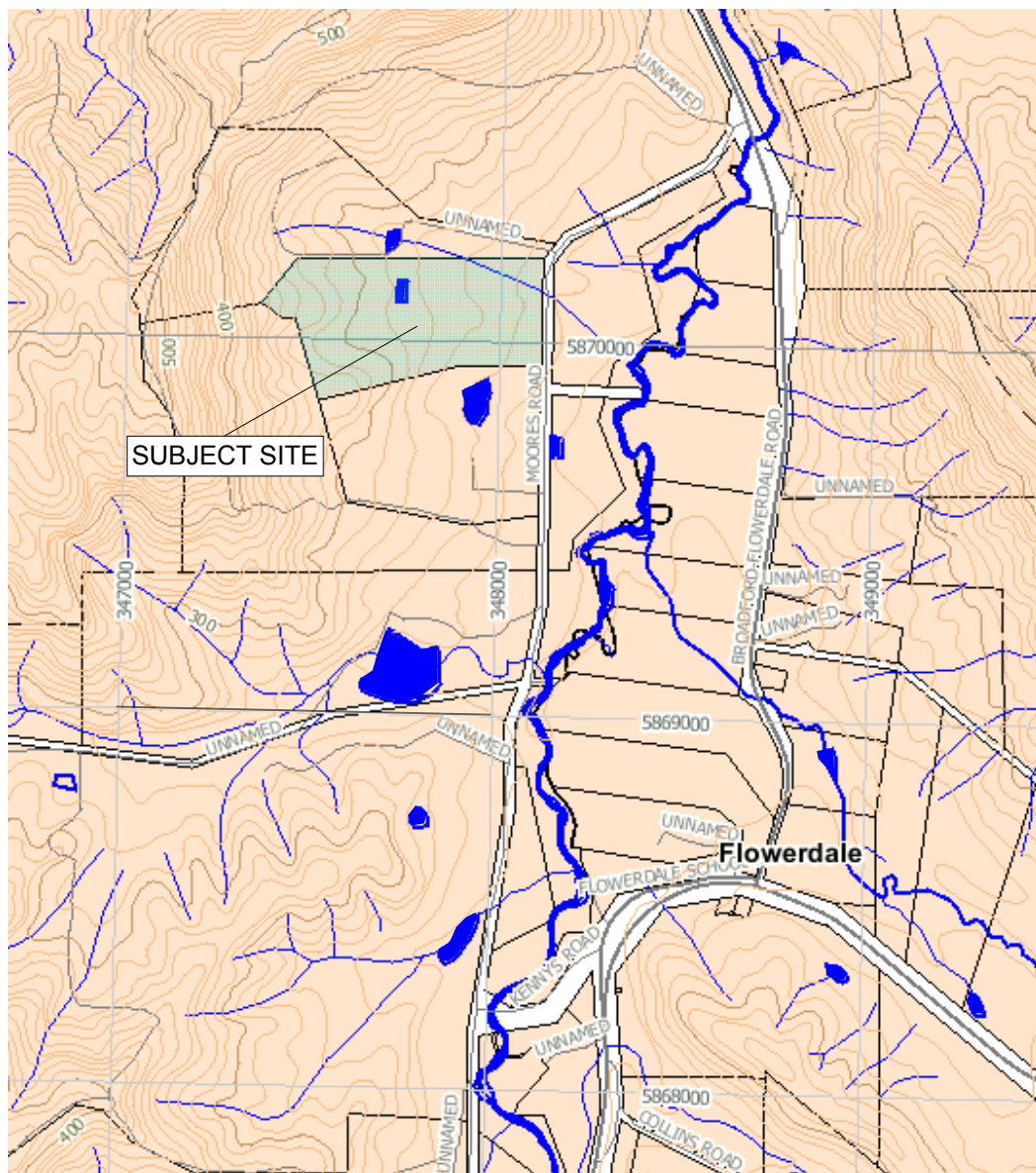
Our capability assessment has shown that at least one rational and sustainable on-site effluent disposal method (20/30 standard subsurface irrigation) is appropriate for the proposed development, subject to specific design criteria, described above.

We recommend that the existing onsite system be inspected by a Chartered Plumber to ascertain the adequacy and integrity of the system.

Should the recommendations propose trench extensions, there is sufficient available area for this purpose.

A management plan is presented in Appendix D, to this report.

Paul R. WILLIAMS B.App.Sc.
PRINCIPAL HYDROGEOLOGIST
Building Practitioner No. EC-1486



LOCATION OF SUBJECT SITE

86 MOORES ROAD, FLOWERDALE

SHANE SYLVANSRING

Scale: 1:20,000

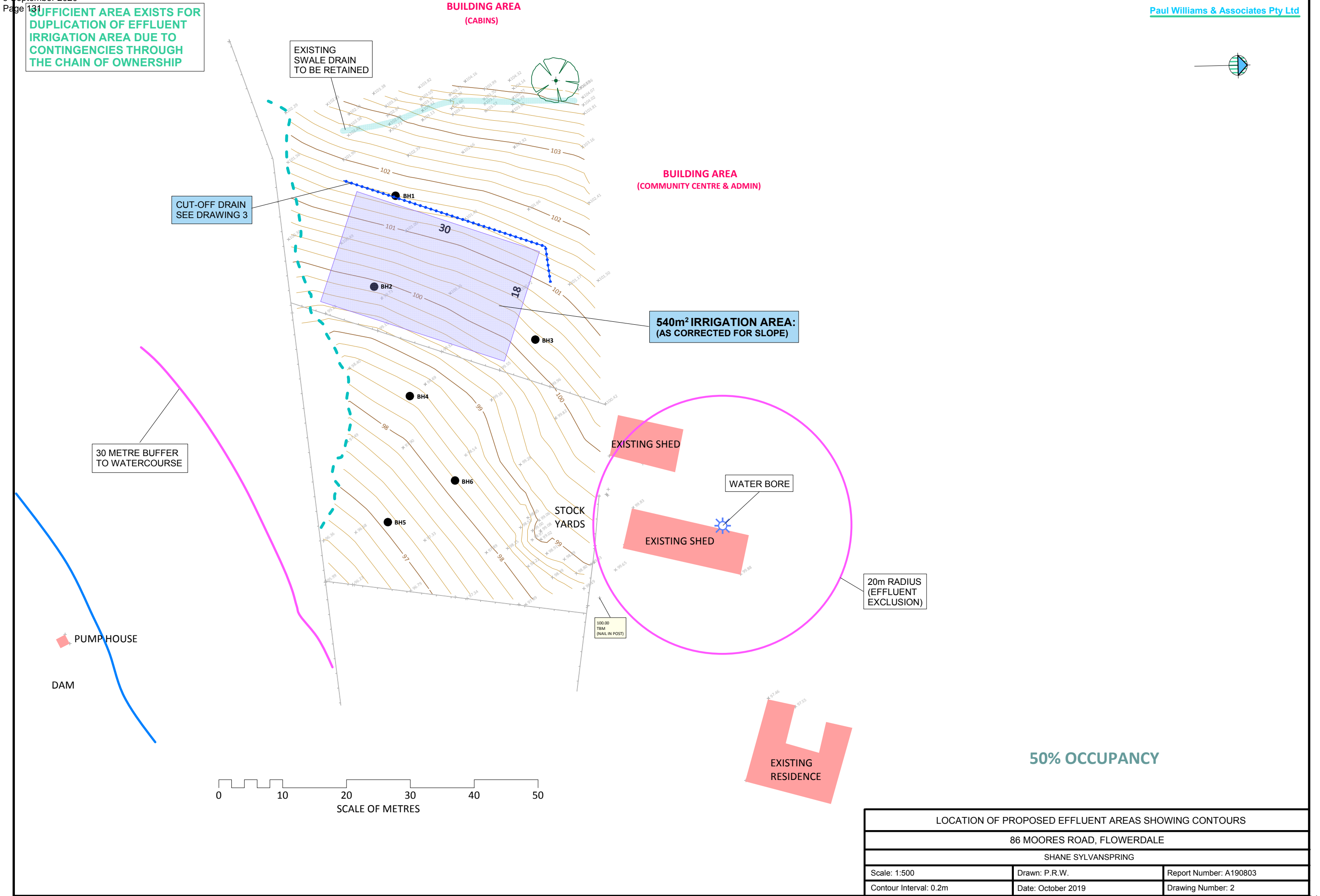
Drawn: P.R.W.

Report Number: A190803

Contour Interval: 10m

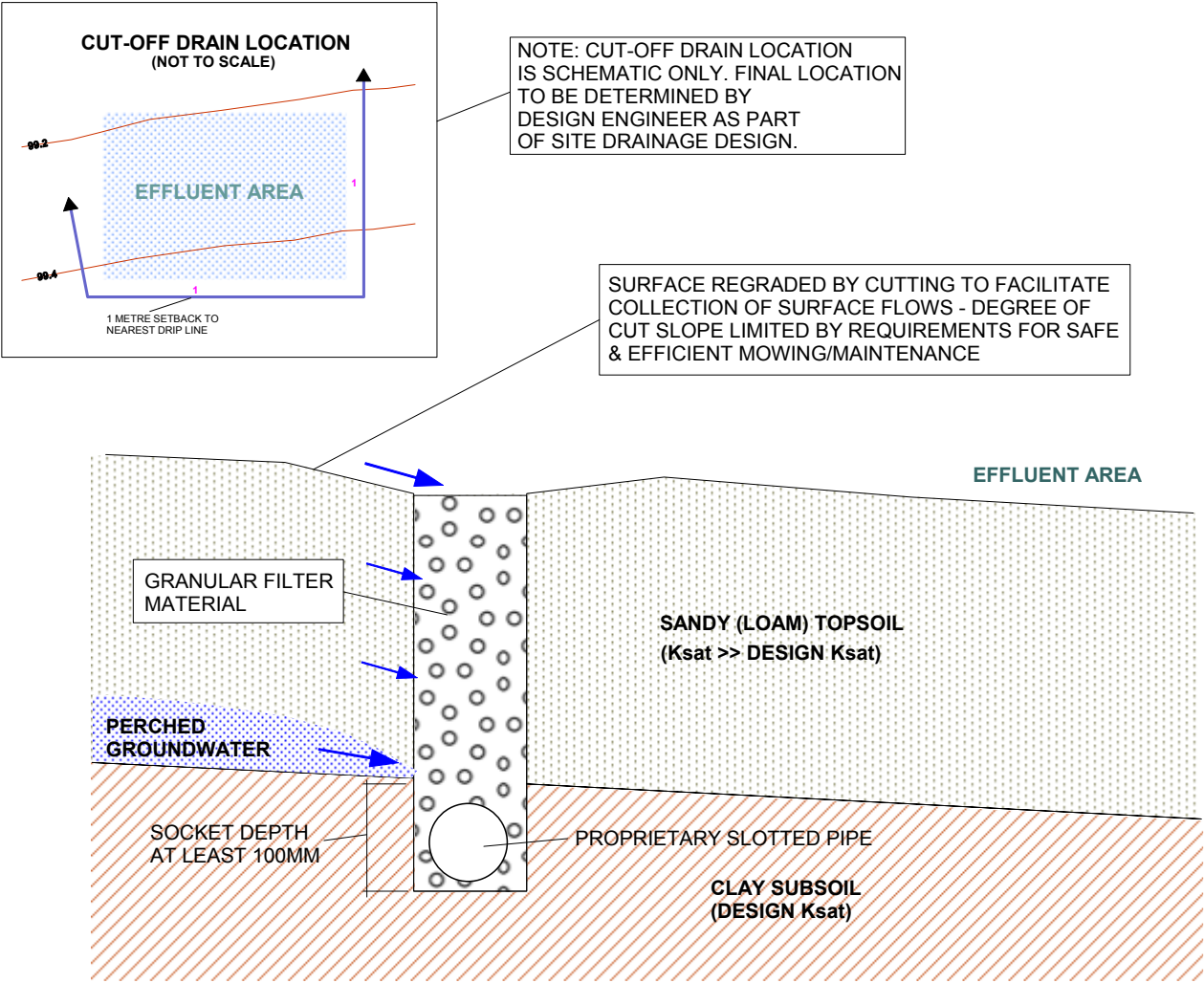
Date: October 2019

Drawing Number: 1



50% OCCUPANCY

LOCATION OF PROPOSED EFFLUENT AREAS SHOWING CONTOURS		
86 MOORES ROAD, FLOWERDALE		
SHANE SYLVANSRING		
Scale: 1:500	Drawn: P.R.W.	Report Number: A190803
Contour Interval: 0.2m	Date: October 2019	Drawing Number: 2



- NOTES:
- 1. DRAIN TO BE DESIGNED, CONSTRUCTED & MAINTAINED TO ENSURE THAT NO SURFACE & PERCHED GROUNDWATER FLOWS ENTER THE IRRIGATION AREA.
 - 2. DRAIN TO BE LOCATED ON ALL UPSLOPE SIDES OF IRRIGATION AREA (NO CLOSER THAN 1m FROM NEAREST SUBSURFACE DISTRIBUTION LINE).
 - 3. DRAIN TO HAVE UNSPECIFIED FALL.
 - 4. MINIMUM SOCKET DEPTH OF 100mm INTO CLAY SUBSOIL (WHERE ENCOUNTERED) OR AT LEAST 400mm DEEP.
 - 5. DRAIN CROSS SECTIONAL AREA RELATED TO DESIGN FLOWS AS DETERMINED BY A SUITABLY QUALIFIED AND EXPERIENCED ENGINEER.
 - 6. OFF-SITE DRAIN OUTFALL TO LEGAL POINT OF DISCHARGE SUBJECT TO LOCAL AUTHORITY REQUIREMENTS.
 - 7. ON-SITE DRAIN OUTFALL TO INCLUDE APPROPRIATE ENERGY DISSIPATION TO AVOID EROSION.
 - 8. ALL DRAINS AND OUTFALL AREAS SUBJECT TO POST-SPRING INSPECTION.

NOTE: DRAWING NOT TO BE USED FOR SET-OUT PURPOSES

CUT-OFF DRAIN DETAIL FOR EFFLUENT IRRIGATION FIELDS		
DUPLEX/GRADATIONAL SOIL PROFILES		
SHANE SYLVANSRING		
Scale: 1:10 (Approximately)	Drawn: P.R.W.	Report Number: SPEC 014
Contour Interval: N/A	Date: October 2019	Drawing Number: 3

APPENDICES

APPENDIX A1 SOIL PERMEABILITY

The *in-situ* permeability tests were attempted on 3rd October 2019.

The occurrence of transient and seasonally occurring free water in the soil materials prevented the acquisition of sufficient hydraulic data for determination of the geometric mean of saturated hydraulic conductivity.

Note: The relatively high soil moisture content at the time of testing was due to residual seepage from the topsoil into the test holes and high moisture content from recent heavy and persistent rainfalls.

This transient high soil moisture impacts on the test method only and does not reflect in any way on the suitability of the site for the sustainable onsite attenuation of waste water – see AS/NZS1547:2012, Appendix G.

A conservative estimate of permeability has been deduced as follows (see Code 3.6.1):-

Profile analysis in accordance with AS/NZS 1547:2012 and our laboratory analyses shows the residual (B-horizon) materials to be moderately well-drained sandy clay of low plasticity (light clay).

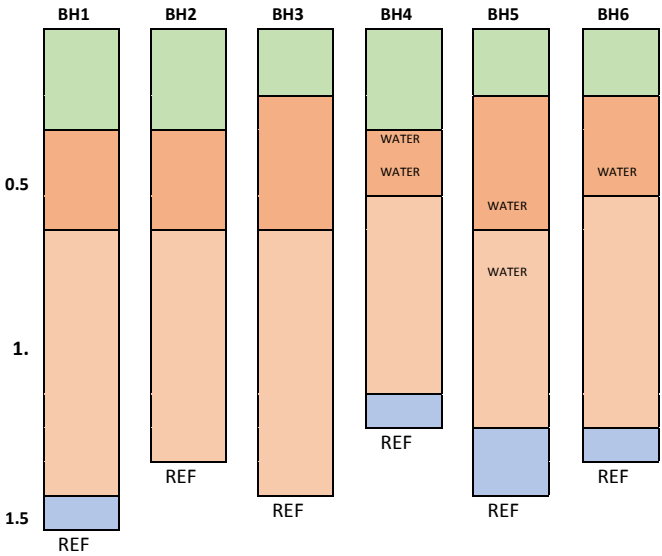
These materials are the limiting layer, controlling vertical permeability.

Constant head permeameter testing from similar formations has realised B-horizon hydraulic conductivity ranging from 0.04 to 0.20m/day.





For the limiting moderately well-structured B-horizon clay soils, we have adopted an estimated saturated hydraulic conductivity of 0.05m/day.

Peak deep seepage is conservatively estimated at 4mm/day.

APPENDIX A2
LOGS OF BOREHOLES



2.

-  Silty SAND; brown, sand fine to coarse, some fine to coarse gravel (**loam**), **TOPSOIL**
-  Sandy CLAY; orange-brown, low plasticity, non-dispersive, containing rock fragments and gravel (**light clay**), **RESIDUAL SOIL**
-  Sandy CLAY; light orange-yellow-brown, low plasticity, non-dispersive, containing rock fragments (**light clay**) **RESIDUAL SOIL**.
-  Extremely to highly weathered sandstone with low plasticity clay matrix (**highly fractured EW/HW sandstone**)

For locations of boreholes refer Drawing 2.
All boreholes terminated at refusal.

**APPENDIX A3
SELECTED SOIL PROFILE PHOTOGRAPHS**



BOREHOLE BH1.



BOREHOLE BH4.



BOREHOLE BH5

APPENDIX B

Paul Williams & Associates Pty Ltd

A190803

WATER/NITROGEN BALANCE (20/30 irrigation): With no wet month storage.

Rainfall Station: Strath Creek/ Evaporation Station: Lake Eildon (G-M Water)

Location: Flowerdale
Date: October, 2019
Client: Shane Sylvanspring

ITEM	UNIT	#	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Days in month:	D	31	28	31	30	31	30	31	31	31	30	31	30	31	365
Evaporation (Mean)	mm	A	173	159	121	76	44	31	33	53	68	105	130	163	1157
Rainfall (Mean)	mm	B1	48	41	39	48	57	69	73	71	69	57	60	53	685.8
Effective rainfall	mm	B2	38	33	31	38	46	55	58	57	55	46	48	42	548
Peak seepage Loss ¹	mm	B3	124	112	124	120	124	120	124	124	120	124	120	124	1460
Evapotranspiration(DKA)	mm	C1	121	111	85	46	22	14	13	24	37	68	91	114	746
Waste Loading(C1+B3-B2)	mm	C2	207	191	177	127	100	79	79	91	102	147	163	196	1659
Net evaporation from lagoons (10(0.8A-B1x)lagoon area(ha)))	L	NL	0	0	0	0	0	0	0	0	0	0	0	0	0
Volume of Wastewater	L	E	34720	31360	34720	33600	34720	33600	34720	34720	33600	34720	33600	34720	408800
Total Irrigation Water(E-NL)/G	mm	F	77	70	77	75	77	75	77	77	75	77	75	77	908
Irrigation Area(E/C2)annual.	m ²	G													450
Surcharge/Storage	mm	H	-130	-121	-100	-53	-23	-4	-2	-14	-27	-70	-88	-119	0
Actual seepage loss	mm	J	-6	-9	24	67	101	116	122	110	93	54	32	5	724
Direct Crop Coefficient:	I	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	0.7	Pasture:
Rainfall Retained:	80 %	K													
Lagoon Area:	0 ha	L													
Wastewater(Irrigation):	1,120 L	M	0.7	0.7	0.7	0.6	0.5	0.45	0.4	0.45	0.55	0.65	0.7	0.7	Pasture:
Seepage Loss (Peak):	4 mm	N	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	Shade:
Irrig'n Area(No storage):	450 m ²	P2	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	Fescue:
Application Rate:	2.5 mm	Q	1	1	1	1	1	1	1	1	1	1	1	1	Woodlot
Nitrogen in Effluent:	30 mg/L	R													
Denitrification Rate:	20 %	S													
Plant Uptake:	220 kg/ha/yr	T													
Average daily seepage:	2.0 mm	U													
Annual N load:	9.81 kg/yr	V													
Area for N uptake:	446 m ²	W													
Application Rate:	2.5 mm	X													
Irrig'n Area adjusted for slope:	540 m ²	Z													
Application Rate:	2.1 mm	Z1													

1. Seepage loss (peak) equals deep seepage plus lateral flow: 4mm (<10% ksat after renovation)

CROP FACTOR

NITROGEN UPTAKE:

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

1.2 x hydraulic area (slopes 10% to 20%)

PART 2

RAINFALL DATA

Station: Strath Creek
Number: 88158
Lat: 37.27° S
Opened: 1982
Lon: 145.28° E
Now: Open
Elevation: 248 m

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	47.9	41.0	39.3	47.8	57.1	68.8	72.5	71.3	69.3	56.9	60.0	52.7	685.8
Lowest	0.0	0.0	4.8	10.4	4.6	15.6	16.8	19.4	16.4	6.0	5.2	2.6	414.2
5th %ile	3.9	1.9	7.7	13.7	13.4	29.1	20.9	24.5	32.0	10.3	16.0	8.7	446.8
10th %ile	18.0	5.3	10.0	15.7	16.5	33.3	27.2	29.6	32.8	15.1	23.5	17.5	473.0
Median	37.4	25.8	37.0	44.1	45.0	65.4	73.8	73.4	62.3	48.1	50.4	37.0	667.8
90th %ile	86.5	98.9	85.3	80.6	104.6	113.8	107.7	111.6	104.0	108.6	120.9	100.8	875.4
95th %ile	112.9	118.2	96.0	86.5	109.4	130.6	129.3	119.9	122.2	130.6	126.8	117.2	918.1
Highest	176.6	171.4	96.8	99.0	128.0	136.0	160.6	129.4	169.2	141.2	150.4	126.4	1197.2

APPENDIX C

LAND CAPABILITY ASSESSMENT TABLE
(Non-potable water supply catchments)

LAND FEATURE	LAND CAPABILITY		RISK RATING		AMELIORATIVE MEASURE & RISK REDUCTION
	LOW	MEDIUM	HIGH	LIMITING	
Available land for LAA	Exceeds LAA and duplicate LAA requirements	Meets LAA and duplicate LAA requirements	Meets LAA and partial duplicate LAA requirements	Insufficient LAA area	Non-limiting for trenches & beds: Full reserve area available. Non-limiting for subsurface irrigation: Full reserve area available
Aspect	North, north-east and north-west	East, west, south-east, south-west	South	South, full shade	East and south-east aspect.
Exposure	Full sun and/or high wind or minimal shading	Dappled light (partial shade)	Limited light, little wind to heavily shaded all day	Perpetual shade	Full winter sunshine.
Slope Form	Convex or divergent side slopes	Straight sided slopes	Concave or convergent side slopes	Locally depressed	Regrade finished LAA surface by smoothing and redistribution of topsoil.
Slope gradient:					
Trenches and beds	<5%	5% to 10%	10% to 15%	>15%	10% to 18%: Limiting for trenches.
Subsurface irrigation	<10%	10% to 30%	30% to 40%	>40%	10% to 18%: Non-limiting for irrigation.
Site drainage: runoff/run-on	LAA backs onto crest or ridge	Moderate likelihood	High likelihood	Cut-off drain not possible	Cut-off drain required upslope.
Landslip ⁶	Potential	Potential	Potential	Existing	Unremarkable
Erosion potential	Low	Moderate	High	No practical amelioration	All runoff to be dispersed without concentrating flows. LAA stabilised with gypsum.
Flood/inundation	Never		<1%AEP	>5% AEP	Unremarkable
Distance to surface waters (m)	Buffer distance complies with Code requirements		Buffer distance does not comply with Code requirements	Reduced buffer distance not acceptable	LAA located at least 30m from dam (see Drawing 2).
Distance to groundwater bores (m)	No bores on site or within a significant distance	Buffer distances comply with Code	Buffer distances do not comply with Code	No suitable treatment method	No bores within a significant distance (40m+).
Vegetation	Plentiful/healthy vegetation	Moderate vegetation	Sparse or no vegetation	Propagation not possible	Existing grasses suitable.
Depth to water table (potentiometric) (m)	>2	2 to 1.5	<1.5	Surface	Water table 20+m.
Depth to water table (seasonal perched) (m)	>1.5	<0.5	0.5 to 1.5	Surface	Perching probable. (Install cut-off drain and design LAA for limiting clay soils)
Rainfall ⁷ (mean) (mm)	<500	500-750	750-1000	>1000	Non-limiting for trench systems. Non-limiting for subsurface irrigation - Design by water balance.
Pan evaporation (mean) (mm)	1250 to 1500	1000 to 1250	750 to 1000	<750	Design by water balance.
SOIL PROFILE CHARACTERISTICS					
Structure	High or moderately structured	Weakly structured	Structureless, massive or hardpan		Maintain structure by gypsum/dolomite application.
Fill materials	Nil or mapped good quality topsoil	Mapped variable depth and quality materials	Variable quality and/or uncontrolled filling	Uncontrolled poor quality/unsuitable filling	No fill present.
Thickness: (m)					
Trenches and beds	>1.4		<1.4	<1.2	High risk to limiting for trench systems.
Subsurface irrigation	1.5+	1.0 to 1.5	0.75 to 1.0	<0.75	Non-limiting for irrigation systems.
Permeability ⁸ (limiting horizon) (m/day)	0.15-0.3	0.03-0.15 0.3-0.6	0.01-0.03 0.6-3.0	>3.0 <0.03	After renovation; design by water balance
Permeability ⁹ (buffer evaluation) (m/day)	<0.3	0.3-3	3 to 5	>5.0	Evaluate flow times via Darcy's Law. (assume 1m/day for fractured metasediments).
Stoniness (%)	<10	10 to 20	>20		Unremarkable
Emerson number	4, 5, 6, 8	7	2, 3	1	Non-dispersive. Apply gypsum to maintain stable peds.
Dispersion Index	0	1-8	8-15	>15	Non-dispersive. Apply gypsum to maintain stable peds.
Reaction trend (pH)	5.5 to 8	4.5 to 5.5	<4.5>8		Unremarkable
E.C. (dS/m)	<0.8	0.8 to 2	2-4	>4.0	Non-limiting for trench systems. Non-limiting for irrigation.
Exchangeable Na (%)	0.5-5	5 to 10	10-15	>15	Estimated: Non-limiting for trenches and irrigation.
Exchangeable Mg (%)	12-17	17 to 25	25-40	40+	Estimated: Non-limiting for trenches and irrigation.
Exchangeable Ca (%)	65-70	40-65	5-40	<5	Estimated: Non-limiting for trenches and irrigation (0.25 kg/m ² gypsum recommended).
Adjusted CEC	15+	10 to 15	5 to 10	<5	Estimated: Non-limiting for trenches and irrigation.
Free swell (%)	<40	40-80	80-120	>120	Low swelling clay fraction.

There are limiting and high-risk factors for primary effluent trench systems (available area, rainfall, slope and profile thickness).

There are no limiting factors for secondary effluent subsurface irrigation.

⁶ Landslip assessment based on proposed hydraulic loading, slope, profile characteristics and past and present land use.

⁷ Mean monthly rainfalls used in water balance analyses.

⁸ Saturated hydraulic conductivity from *insitu* testing and data base.

⁹ Saturated hydraulic conductivity estimated from AS/NZS1547:2012 and data base.

APPENDIX D

MANAGEMENT PLAN

Paul Williams & Associates Pty. Ltd.

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LAND CAPABILITY ASSESSMENT LAND USE MAPPING TERRAIN MODELLING HYDROGEOLOGY HYDROLOGY GEOLOGY SOIL SCIENCE LAND-SOIL RISK ASSESSMENT

A190803-OCTOBER 2019

MANAGEMENT PLAN FOR ON-SITE EFFLUENT DISPOSAL VIA SUBSURFACE IRRIGATION AT 86 MOORES ROAD, FLOWERDALE

1. INTRODUCTION

This document identifies the significant land-soil unit constraints (as identified in A190803) and their management and day-to-day operation and management of the on-site effluent system.

2. SIGNIFICANT LAND-SOIL UNIT CONSTRAINTS

2.1 Allotment Size. The day-to-day operation and management of on-site effluent systems, as described below, is not constrained by lot size or geometry.

Although all requirements of *SEPPs* have been met or exceeded through conservative design, prudence dictates that individual lot owners assiduously follow the management programme given in Section 4, below.

2.2 Nitrogen Attenuation. To reduce nitrates to insignificant levels, the effluent should not contain more than 30mg/litre total nitrogen.

Provided the irrigation areas are at least as large as those required to satisfy the nitrogen loading, as described in A190803 Sections 1.3.1.13, 1.3.2.13 and 2.2.3.2, and that the (specified) grass is cut and (periodically) harvested, nitrogen will be attenuated on-site.

2.3 Hydraulic Conductivity. The limiting soils of this site are non-dispersive, low-swelling clays with a low to moderate hydraulic conductivity. The hydraulic conductivity is significantly influenced by soil structure, soil colloid stability and swell characteristics. Breakdown or reduction of these soil parameters over time may manifest as reduced performance of the irrigation system. The monitoring and inspection regime detailed in Section 4.7.2, below, should be adhered to.

2.4 Site Drainage. Our recommendations for on-site effluent disposal have allowed for incident rainfall (not surface flow or lateral subsurface flow) and are conditional on the installation of a cut-off drain, which should be placed upslope of the disposal area. Care should be taken to ensure that the intercepted and diverted surface waters and any perched groundwater is discharged well away and down slope of the disposal field (see Drawings 2 and 3).

The owner should also ensure that any upslope works do not divert and/or concentrate surface water flows onto the disposal area.

2.5 Vegetation. The effluent disposal areas have been sized via water balance analyses utilising crop factors for pasture (rye/clover mix – the current pasture).

3. THE ONSITE EFFLUENT SYSTEM

The onsite effluent system consists of the influent (toilets, kitchens, bathrooms, laundry), a septic tank(s), load balancing tank, the treatment plant/sand filter (a device to treat the effluent to at least the 20/30 standard), the irrigation area including effluent distribution system (delivery pipes and drippers), prescribed irrigation area vegetation, associated infrastructure (cut-off drains, outfall areas, fencing), a service and maintenance programme and on-going management.

4. MANAGEMENT

The owner is required to understand (and ensure that users understand) that sustainable operation of the onsite effluent system is not automatic. Sustainable operation requires on-going management, as outlined below.

4.1 Effluent. Effluent will be generated from a group accommodation facility including six cabins, an administration centre and communal centre and will include black and grey water (all wastes).

4.1.2 Effluent Quality. Effluent should be treated to a standard that meets or exceeds the water quality requirements of the 20/30 standard.

4.1.3 Effluent Quantity. The daily effluent volume of 1,120 litres has been calculated from *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016, Table 4 and assumes mains water supply (equivalent) and WELS-rated water-reduction fixtures and fittings – minimum 4 Stars for dual-flush toilets, shower-flow restrictors, aerator taps, flow/pressure control valves and minimum 3 Stars for all appliances.

4.2 Treatment Plant. For subsurface irrigation, it is assumed that the design, construction, operation and maintenance are carried out in accordance with *AS/NZS1547:2012* and a current JAS-ANZ accreditation.

4.3 Irrigation Area. The irrigation area has been determined from the results of the water and nutrient balance analyses and *AS/NZS 1547:2012, Appendix M*.

4.3.1 Effluent Area Requirement. For a daily effluent flow of 1,120 litres and to satisfy the requirement for no surface rainwater flow in the 9th decile wet year and on-site attenuation of nutrients, the effluent should be applied to an irrigation area of 540m².

Effluent distribution is as detailed in Section 4.3.2, below.

In case of an increase in effluent production through the chain of ownership, there is sufficient area available for duplicating the irrigation areas.

Any landscaping and/or planting proposals require endorsement from the Murrindindi Shire.

4.3.2 Distribution System. The distribution system must achieve controlled and uniform dosing over the irrigation area. A small volume of treated effluent should be dosed at predetermined time intervals throughout the day via a pressurised piping network that achieves uniform distribution over the entire irrigation area.

Uniform delivery pressure of the effluent throughout the distribution system is essential. Drip rates should not vary by more than 10% from the design rate over the whole of the system.

To minimise uneven post-dripper seepage, the distribution pipes must be placed parallel with slope contours.

Line spacing shall be not closer than 1000mm under any circumstances.

To facilitate the creation of transient aerobic and anaerobic soil conditions we recommend that as part of the daily irrigation process, the effluent area be irrigated sequentially by zones or time.

4.3.3 Soil Renovation. To improve the subsoil permeability and to maintain stable soil peds, the exchangeable Calcium needs to be increased.

To achieve a suitable cation balance gypsum needs to be added to the soil.

Application rates are related to water (irrigation and mean rainfall) available to dissolve or distribute to depth the required ameliorants.

In this instance, where irrigation water is expected to be constant, available water is sourced from mean rainfall plus irrigation minus evapotranspiration.

A suitable amelioration technique is broadcast gypsum over the surface of the proposed land application area at a rate of 0.25kg/m². The irrigation network can be constructed and the topsoil smoothed to form a uniformly sloping surface.

Gypsum should be reapplied (broadcast) over the land application area every three years at a rate of 0.25kg/m².

4.3.4 Buffer Distances. The water balance analysis has shown that potential surface rainwater flows from the effluent area would be restricted to episodic events.

The estimated hydraulic properties of the upper soil materials and hydraulic gradient (equivalent to the ground slope and regional gradients) have been used to evaluate (via Darcy's Law) the buffer distances with respect to subsurface flows.

Our analysis and evaluation have shown that the default setback distances given in *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016, Table 5 are conservative and can be applied without amendment.

For a building located downslope of an effluent field, your engineer should evaluate the integrity of building foundations with respect to the assigned buffer distance.

Buffer distances are to be applied exclusive of the irrigation area.

4.3.5 Buffer Planting. All downslope (Title inclusive) buffers may be required to filter and renovate abnormal surface discharges. Hence, they are to be maintained with existing or equivalent groundcover vegetation.

4.3.6 Buffer Trafficking. On all allotments, buffer trafficking should be minimised to avoid damage to vegetation and/or rutting of the surface soils.

Traffic should be restricted to 'turf' wheeled mowing equipment and to maintenance, monitoring and inspections by pedestrians, where possible.

4.4 Vegetation. The system design for on-site disposal includes the planting and maintenance of suitable vegetation, as specified in A190803 and/or similar documents.

Specifically, this irrigation area has been sized (in part) utilising crop factors and annual nitrogen uptake for a rye/clover eq mix.

The grass needs to be harvested (mown and periodically removed from the irrigation area).

Where a variation to recommended grass species is proposed, it must be demonstrated that the nitrogen uptake and crop factors (as specified in A190803 Appendix B – water balance) are met or exceeded.

4.5 Verification. The Council is to be satisfied that the effluent system has been constructed as designed.

4.6 Associated Infrastructure. The following items are an integral part of the onsite effluent system.

4.6.1 Cut-off drains. Cut-off drains are designed to prevent surface and near-surface water flows from entering the effluent area. They should be constructed and placed around the effluent area, as detailed in Drawing 5.

4.6.2 Outfall areas. All pipe outfalls should be at grade and designed to eliminate scour and erosion.

A grassed outfall would normally be adequate. However, should monitoring and inspections reveal rill or scour formation, the outfall will need to be constructed so that energy is satisfactorily dissipated.

Should this situation occur, professional advice is to be sought.

4.6.3 Fencing. The disposal area is to be a dedicated area. Adequate fencing must be provided to prevent stock, excessive pedestrian and vehicular movements over the area.

4.7 Service and Maintenance Programme. The minimum requirements for servicing and maintenance are set out in the relevant JAS-ANZ accreditation and the manufacturer's recommendations.

4.7.1 Treatment Plant. Aerated treatment plants and sand filters should be serviced at least one time per year (or as recommended in the JAS-ANZ accreditation and the effluent should be sampled and analysed as required by the JAS-ANZ accreditation. The local authority is to ensure compliance.

The manufacturer's recommendations are to be followed. Generally, low phosphorous and low sodium (liquid) detergents should be used. Plastics and other non-degradable items should not be placed into the tanks. Paints, hydrocarbons, poisons etc should not be disposed of in sinks or toilets. Advice from a plumber should be obtained prior to using drain cleaners, chemicals and conditioners. It is important to ensure that grease does not accumulate in the tanks or pipes. Grease and similar products should be disposed of by methods other than via the on-site effluent system.

4.7.2 Monitoring and Inspections. We recommend that the mandatory testing and reporting as described in the *Code of Practice - Onsite Wastewater Management*, E.P.A. Publication 891.4, July 2016, include an annual (post spring) and post periods of heavy and/or prolonged rainfall report on the functioning and integrity of the distribution system and on the functioning and integrity of the cut-off drains, outfall areas and soil media.

The effluent areas should be regularly inspected for excessively wet areas and vegetation integrity.

The inspection regime described in A190803, Section 2.2.7, should be strictly adhered to.

Paul R. WILLIAMS B.App.Sc.
PRINCIPAL HYDROGEOLOGIST
Registered Building Practitioner EC1486



NOTICE OF AN APPLICATION FOR PLANNING PERMIT

<i>The land affected by the application is located at:</i>	265 Whittlesea-Kinglake Road KINGLAKE CENTRAL, (C/A: 2022)
<i>The application is for a permit to:</i>	Use and development of the land for the purpose of a cemetery, associated signage, car parking to the satisfaction of the Responsible Authority and alteration to access to a road in a Road Zone - Category 1
<i>The applicant for the permit is:</i>	Maureen Jackson Planning
<i>The application reference number is:</i>	2020/97
<i>You may look at the application and any documents that support the application by visiting our website via the following web address:</i>	www.murrindindi.vic.gov.au/PlanningComment

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.

<i>The responsible authority will not decide on the application before:</i>	31/07/2020
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If you object, the responsible authority will tell you its decision.

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



Planning Enquiries
Phone: (03) 5772 0317
Email: planning@murrindindi.vic.gov.au
Web: www.murrindindi.vic.gov.au

Clear Form

Office Use Only

VicSmart? ☐ YES ☐ NO

Specify class of VicSmart application:

Application No.: _____ Date Lodged: ____ / ____ / ____

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.

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: _____ 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.: _____ St. Name: _____

Suburb/Locality: _____ Postcode: _____

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.: _____ ☐ Lodged Plan ☐ Title Plan ☐ Plan of Subdivision No.: _____


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? ***

 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 \$


 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.


 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 restrictive covenant, section 173 agreement or other obligation such as an easement or building envelope?

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

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

Applicant and Owner Details

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

Applicant *

The person who wants the permit.

Please provide at least one contact phone number *

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

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.

Name:

Title:

First Name:

Surname:

Organisation (if applicable):

Postal Address:

Unit No.:

St. No.:

St. Name:

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

Suburb/Locality:

State:

Postcode:

Business phone:

Email:

Mobile phone:

Fax:

Contact person's details*

Same as applicant

Name:

Title:

First Name:

Surname:

Organisation (if applicable):

Postal Address:

Unit No.:

St. No.:

St. Name:

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

Suburb/Locality:

State:

Postcode:

Same as applicant

Name:

Title:

First Name:

Surname:

Organisation (if applicable):

Postal Address:

Unit No.:

St. No.:

St. Name:

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

Suburb/Locality:

State:

Postcode:

Owner's Signature (Optional):

Date:

day / month / year

Information requirements

Is the required information provided?


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

☐ 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.

Date:


day / month / year


Checklist

Have you:

☐ Filled in the form completely?

☐ Paid or included the application fee?

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



Provided all necessary supporting information and documents?

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

☐ A plan of existing conditions.

☐ Plans showing the layout and details of the proposal.

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

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

☐ 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.

MORE INFORMATION

The Land

Planning permits relate to the use and development of the land. It is important that accurate, clear and concise details of the land are provided with the application.

How is land identified?

Land is commonly identified by a street address, but sometimes this alone does not provide an accurate identification of the relevant parcel of land relating to an application. Make sure you also provide the formal land description - the lot and plan number or the crown, section and parish/township details (as applicable) for the subject site. This information is shown on the title.

See **Example 1**.

The Proposal

Why is it important to describe the proposal correctly?

The application requires a description of what you want to do with the land. You must describe how the land will be used or developed as a result of the proposal. It is important that you understand the reasons why you need a permit in order to suitably describe the proposal. By providing an accurate description of the proposal, you will avoid unnecessary delays associated with amending the description at a later date.

▲ Planning schemes use specific definitions for different types of use and development. Contact the Council planning office at an early stage in preparing your application to ensure that you use the appropriate terminology and provide the required details.

How do planning schemes affect proposals?

A planning scheme sets out policies and requirements for the use, development and protection of land. There is a planning scheme for every municipality in Victoria. Development of land includes the construction of a building, carrying out works, subdividing land or buildings and displaying signs.

Proposals must comply with the planning scheme provisions in accordance with Clause 61.05 of the planning scheme. Provisions may relate to the State Planning Policy Framework, the Local Planning Policy Framework, zones, overlays, particular and general provisions. You can access the planning scheme by either contacting Council's planning department or by visiting the Planning Schemes Online section of the department's website <http://planning-schemes.delwp.vic.gov.au>

▲ You can obtain a planning certificate to establish planning scheme details about your property. A planning certificate identifies the zones and overlays that apply to the land, but it does not identify all of the provisions of the planning scheme that may be relevant to your application. Planning certificates for land in metropolitan areas and most rural areas can be obtained by visiting www.landata.vic.gov.au. Contact your local Council to obtain a planning certificate in Central Goldfields, Corangamite, Macedon Ranges and Greater Geelong. You can also use the free Planning Property Report to obtain the same information.

See **Example 2**.

Estimated cost of development

In most instances an application fee will be required. This fee must be paid when you lodge the application. The fee is set down by government regulations.

To help Council calculate the application fee, you must provide an accurate cost estimate of the proposed development. This cost does not include the costs of development that you could undertake without a permit or that are separate from the permit process. Development costs should be calculated at a normal industry rate for the type of construction you propose.

Council may ask you to justify your cost estimates. Costs are required solely to allow Council to calculate the permit application fee. Fees are exempt from GST.

▲ Costs for different types of development can be obtained from specialist publications such as Cordell Housing: Building Cost Guide or Rawlinsons: Australian Construction Handbook.

▲ Contact the Council to determine the appropriate fee. Go to www.planning.vic.gov.au to view a summary of fees in the Planning and Environment (Fees) Regulations.

Metropolitan Planning Levy refer Division 5A of Part 4 of the *Planning and Environment Act 1987* (the Act). A planning permit application under section 47 or 96A of the Act for a development of land in metropolitan Melbourne as defined in section 3 of the Act may be a leviable application. If the cost of the development exceeds the threshold of \$1 million (adjusted annually by consumer price index) a levy certificate must be obtained from the State Revenue Office after payment of the levy. A valid levy certificate must be submitted to the responsible planning authority (usually council) with a leviable planning permit application. Refer to the State Revenue Office website at www.sro.vic.gov.au for more information. A leviable application submitted without a levy certificate is void.

Existing Conditions

How should land be described?

You need to describe, in general terms, the way the land is used now, including the activities, buildings, structures and works that exist (e.g. single dwelling, 24 dwellings in a three-storey building, medical centre with three practitioners and 8 car parking spaces, vacant building, vacant land, grazing land, bush block).

Please attach to your application a plan of the existing conditions of the land. Check with the local Council for the quantity, scale and level of detail required. It is also helpful to include photographs of the existing conditions.

See **Example 3**.

Title Information

What is an encumbrance?

An 'encumbrance' is a formal obligation on the land, with the most common type being a 'mortgage'. Other common examples of encumbrances include:

- **Restrictive Covenants:** A 'restrictive covenant' is a written agreement between owners of land restricting the use or development of the land for the benefit of others, (eg. a limit of one dwelling or limits on types of building materials to be used).
- **Section 173 Agreements:** A 'section 173 agreement' is a contract between an owner of the land and the Council which sets out limitations on the use or development of the land.
- **Easements:** An 'easement' gives rights to other parties to use the land or provide for services or access on, under or above the surface of the land.
- **Building Envelopes:** A 'building envelope' defines the development boundaries for the land.

Aside from mortgages, the above encumbrances can potentially limit or even prevent certain types of proposals.

What documents should I check to find encumbrances?

Encumbrances are identified on the title (register search statement) under the header 'encumbrances, caveats and notices'. The actual details of an encumbrance are usually provided in a separate document (instrument) associated with the title. Sometimes encumbrances are also marked on the title diagram or plan, such as easements or building envelopes.

What about caveats and notices?

A 'caveat' is a record of a claim from a party to an interest in the land. Caveats are not normally relevant to planning applications as they typically relate to a purchaser, mortgagee or chargee claim, but can sometimes include claims to a covenant or easement on the land. These types of caveats may affect your proposal.

Other less common types of obligations may also be specified on title in the form of 'notices'. These may have an effect on your proposal, such as a notice that the building on the land is listed on the Heritage Register.

What happens if the proposal contravenes an encumbrance on title?

Encumbrances may affect or limit your proposal or prevent it from proceeding. Section 61(4) of the *Planning and Environment Act 1987* for example, prevents a Council from granting a permit if it would result in a breach of a registered restrictive covenant. If the proposal contravenes any encumbrance, contact the Council for advice on how to proceed.

You may be able to modify your proposal to respond to the issue. If not, separate procedures exist to change or remove the various types of encumbrances from the title. The procedures are generally quite involved and if the encumbrance relates to more than the subject property, the process will include notice to the affected party.

▲ You should seek advice from an appropriately qualified person, such as a solicitor, if you need to interpret the effect of an encumbrance or if you seek to amend or remove an encumbrance.

Why is title information required?

Title information confirms the location and dimensions of the land specified in the planning application and any obligations affecting what can be done on or with the land.

As well as describing the land, a full copy of the title will include a diagram or plan of the land and will identify any encumbrances, caveats and notices.

What is a 'full' copy of the title?

The title information accompanying your application must include a 'register search statement' and the title diagram, which together make up the title.

In addition, any relevant associated title documents, known as 'instruments', must also be provided to make up a full copy of the title.

Check the title to see if any of the types of encumbrances, such as a restrictive covenant, section 173 agreement, easement or building envelope, are listed. If so, you must submit a copy of the document (instrument) describing that encumbrance. Mortgages do not need to be provided with planning applications.

▲ Some titles have not yet been converted by Land Registry into an electronic register search statement format. In these earlier types of titles, the diagram and encumbrances are often detailed on the actual title, rather than in separate plans or instruments.

Why is 'current' title information required?

It is important that you attach a current copy of the title for each individual parcel of land forming the subject site. 'Current' title information accurately provides all relevant and up-to-date information.

Some Councils require that title information must have been searched within a specified time frame. Contact the Council for advice on their requirements.

▲ Copies of title documents can be obtained from Land Registry: Level 10, 570 Bourke Street, Melbourne; 03 8636 2010; www.landata.vic.gov.au – go direct to "titles & property certificates".

Applicant and Owner Details

This section provides information about the permit applicant, the owner of the land and the person who should be contacted about any matters concerning the permit application.

The applicant is the person or organisation that wants the permit. The applicant can, but need not, be the contact person.

In order to avoid any confusion, the Council will communicate only with the person who is also responsible for providing further details. The contact may be a professional adviser (e.g. architect or planner) engaged to prepare or manage the application. To ensure prompt communications, contact details should be given.

Check with council how they prefer to communicate with you about the application. If an email address is provided this may be the preferred method of communication between Council and the applicant/contact.

The owner of the land is the person or organisation who owns the land at the time the application is made. Where a parcel of land has been sold and an application made prior to settlement, the owner's details should be identified as those of the vendor. The owner can, but need not, be the contact or the applicant.

See **Example 4**.

Declaration

The declaration should be signed by the person who takes responsibility for the accuracy of all the information that is provided. This declaration is a signed statement that the information included with the application is true and correct at the time of lodgement.

The declaration can be signed by the applicant or owner. If the owner is not the applicant, the owner must either sign the application form or must be notified of the application which is acknowledged in the declaration.

▲ Obtaining or attempting to obtain a permit by wilfully making or causing any false representation or declaration, either orally or in writing, is an offence under the *Planning and Environment Act 1987* and could result in a fine and/or cancellation of the permit.

Checklist

What additional information should you provide to support the proposal?

You should provide sufficient supporting material with the application to describe the proposal in enough detail for the Council to make a decision. It is important that copies of all plans and information submitted with the application are legible.

There may be specific application requirements set out in the planning scheme for the use or development you propose. The application should demonstrate how these have been addressed or met.

The checklist is to help ensure that you have:

- provided all the required information on the form
- included payment of the application fee
- attached all necessary supporting information and documents
- completed the relevant Council planning permit checklist
- signed the declaration on the last page of the application form

▲ The more complete the information you provide with your permit application, the sooner Council will be able to make a decision.

Need help with the Application?

If you have attended a pre-application meeting with a Council planner, fill in the name of the planner and the date, so that the person can be consulted about the application once it has been lodged.

Lodgement

The application must be lodged with the Council responsible for the planning scheme in which the land affected by the application is located. In some cases the Minister for Planning or another body is the responsible authority instead of Council. Ask the Council if in doubt.

Check with Council how they prefer to have the application lodged. For example, they may have an online lodgement system, prefer email or want an electronic and hard copy. Check also how many copies of plans and the size of plans that may be required.

Contact details are listed in the lodgement section on the last page of the form.

▲ Approval from other authorities: In addition to obtaining a planning permit, approvals or exemptions may be required from other authorities or Council departments. Depending on the nature of your proposal, these may include food or health registrations, building permits or approvals from water and other service authorities.

Example 1

The Land

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

Street Address *

Unit No.: 4

St. No.: 26

St. Name: Planmore Avenue

Suburb/Locality: HAWTHORN

Postcode: 3122

Formal Land Description *

Complete either A or B.

A

Lot No.: 2

Lodged Plan

Title Plan

Plan of Subdivision

No.: LP93562

OR

B

Crown Allotment No.:

Section No.:

Parish/Township Name:

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

Example 2

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

Construction of two, double-storey dwellings and construction of two new crossovers.

i 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.

Example 3

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.

Single dwelling.

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

Example 4

Applicant and Owner Details

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

Applicant *

The person who wants the permit.

*Please provide at least one contact phone number **

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

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:

Contact information for applicant OR contact person below

Business phone: Email:

Mobile phone: Fax:

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.

Name: ☒ Same as applicant

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's Signature (Optional): Date:

day / month / year

CROWN FOLIO STATEMENT

Page 1 of 1

VOLUME 11745 FOLIO 686
No Coft exists

Security no : 124083750123L
Produced 16/06/2020 12:21 PM

CROWN FOLIO

LAND DESCRIPTION

Crown Allotment 2023 Parish of Kinglake.
PARENT TITLE Volume 11701 Folio 251
Created by instrument MI124893F 06/08/2016

CROWN LAND ADMINISTRATOR



STATUS, ENCUMBRANCES AND NOTICES

RESERVATION MI124895B 06/08/2016
TEMPORARY
CEMETERY
OP123498

DIAGRAM LOCATION

SEE CD049793T FOR FURTHER DETAILS AND BOUNDARIES

ACTIVITY IN THE LAST 125 DAYS

NIL

-----END OF CROWN FOLIO STATEMENT-----

Additional information: (not part of the Crown Folio Statement)

Street Address: 265 WHITTLESEA-KINGLAKE ROAD KINGLAKE CENTRAL VIC 3757

DOCUMENT END



Imaged Document Cover Sheet

The document following this cover sheet is an imaged document supplied by LANDATA®, Victorian Land Registry Services.

Document Type	Plan
Document Identification	CD049793T
Number of Pages (excluding this cover sheet)	1
Document Assembled	16/06/2020 12:25

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The document is invalid if this cover sheet is removed or altered.

CROWN DIAGRAM		EDITION 1	CD049793T
LOCATION OF LAND PARISH: KINGLAKE (2881) TOWNSHIP: SECTION: CROWN ALLOTMENT: 2023 LAST PLAN REFERENCE: 2021\PP2881 DERIVED FROM: OP123498		NOTATIONS WARNING: NO WARRANTY IS GIVEN AS TO THE ACCURACY OR COMPLETENESS OF THIS PLAN. ANY DERIVED DIMENSIONS ARE APPROXIMATE.	
<div>FOR DIAGRAM INFORMATION RELATED TO CROWN ALLOTMENT 2023 SEE OP123498</div>			THIS PLAN HAS BEEN PREPARED BY LAND VICTORIA FOR CROWN DIAGRAM PURPOSES Checked by: QJ Date: 06/10/2014
LENGTHS ARE IN METRES		Dealing/File Number : Code:	SHEET 1 OF 1



Department of Environment, Land, Water & Planning

Electronic Instrument Statement

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Dealing Number: MI124893F

Rectification Date: 06/08/2016

Rectification Category: Crown Land Data Migration

Status: Registered

RECTIFICATION

Raised By: REGISTRAR OF TITLES
DX 250639 MELBOURNE

Folio Affected	CofT Supplied	Controlling Party
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11745/686	No	
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Details of Rectification

This Crown Land Migration transaction was created as part of the crown land data migration. No instrument is available for this transaction.

Statement End.



Imaged Document Cover Sheet

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NOTATIONS:

Prepared from:
VDP, K109(14), OP122980 and Abstract of Field
Records by N.Bennett L.S.

CAD File: OP123498.dgn

Drawn: N. BENNETT 1/07/2014

Examined: B. CHEE 17/09/2014

File Ref. 2018912

ORIGINAL	
SCALE	SHEET
25 0 25 50 75 100	SIZE
LENGTHS ARE IN METRES	
1:2500	
A3	

PLAN OF CROWN ALLOTMENTS

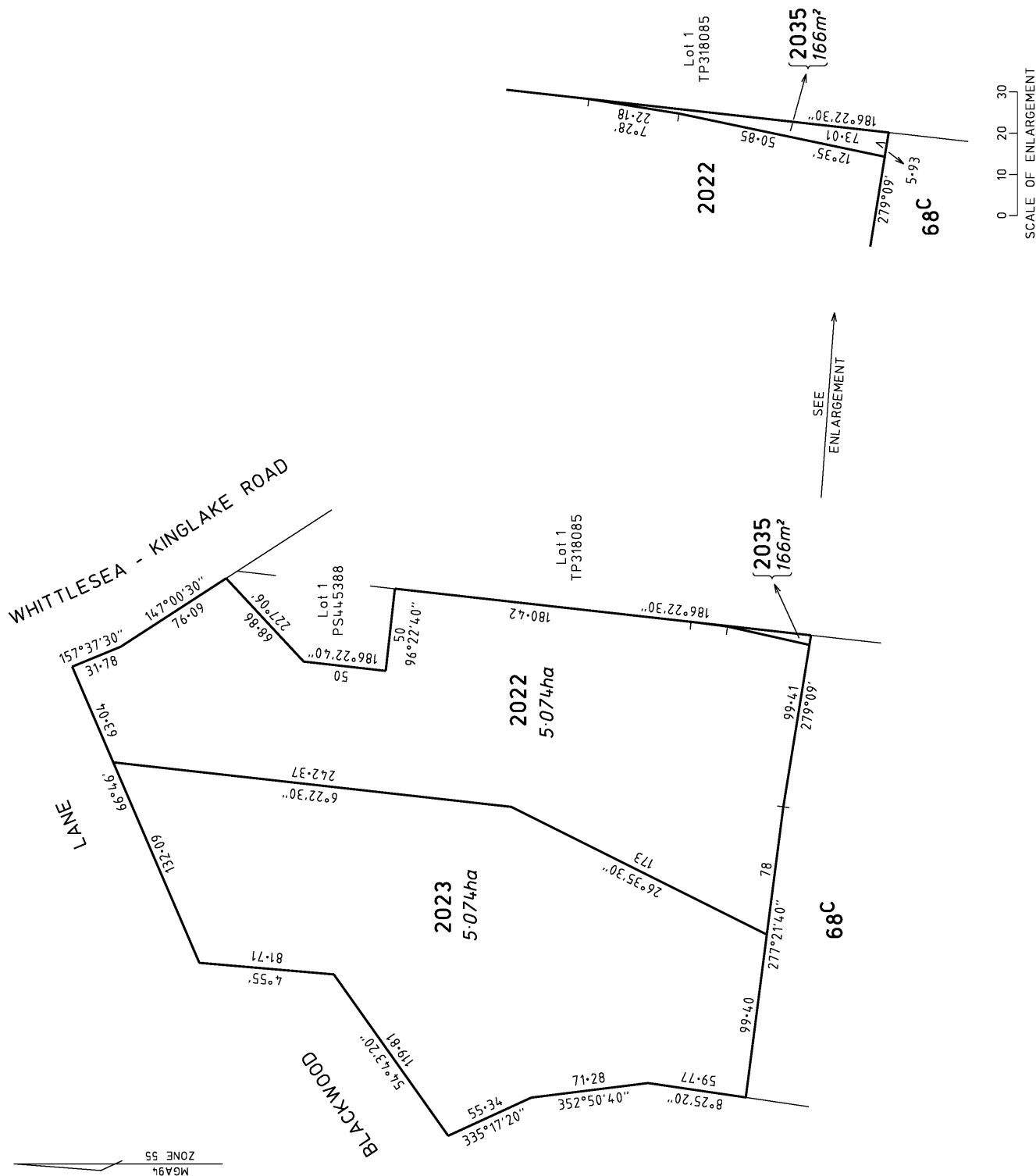
COUNTY OF EVELYN
PARISH OF KINGLAKE
CROWN ALLOTMENTS 2022,
2023 AND 2035

SHEET 1 OF 1 SHEET

OFFICE OF
SURVEYOR-GENERAL VICTORIA
DEPARTMENT OF TRANSPORT,
PLANNING AND LOCAL INFRASTRUCTURE

David Richard Boyle
Acting Surveyor-General, 26/09/2014

OP123498



OP123498

LICENSED SURVEYOR'S REPORT

Surveyor's name: Nevan J Bennett

Firm name and address: Office of Surveyor-General Victoria
 Level 17, 570 Bourke Street
 Melbourne 3000

Surveyor's Reference: MEL-66906-2

File Reference: 2018912

Crown Description: County of Evelyn
 Parish of Kinglake
 Crown Allotments 2022, 2023 & 2035

Municipality: Murrindindi Shire Council

Survey Information used: OP122980

Survey Information Perused: PS445388M, CP163539

Purpose: To create Crown Allotments 2022 and 2023 into two equal areas and create a separate parcel Crown Allotment 2035 for proposed sale to adjoining owner.

Datum Relationships:

Cadastral Datum 'A' – 'B' – 'C' vide OP122980

Datum provided by Kinglake PM 101 'A' and Rod found at 'B', datum confirmed by rod found at 'C'.

<u>'A'-'B'</u>	<i>Bearing</i>	<i>Distance</i>
<i>SURVEY</i>	242°54'11"	383.624
<i>OP122980</i>	242°54'12"	383.624
	+0°00'01"	+0.000

<u>'A'-'C'</u>	<i>Bearing</i>	<i>Distance</i>
<i>SURVEY</i>	262°30'05"	317.660
<i>OP122980</i>	262°30'05"	317.665
	0°00'00"	0.005

- **Survey datum = OP122980**

MGA 94 Zone 55 Grid Connection derived from Kinglake PM 101 and PM 111

	<i>Bearing</i>	<i>Distance</i>
<i>SURVEY</i>	116°50'42"	290.648
<i>SMES</i>	116°50'54"	290.639
	+0°00'12"	+0.009

A small MGA94 Grid Connection datum difference is noted between the derived SMES and OP122980. OP122980 has been adopted for MGA94 bearing datum in preference to that derived from the SMES coordinates of PMs 101 and 111.

OP123498

Alignments and Boundaries adopted:

Crown Allotments 2022 & 2023

The south-east corner of Lot 1 on PS445388M has been fixed vide OP122980 connection from Kinglake PM 101 to the peg found under the fence. OP122980 dimensions were maintained and projected south to the peg found at the south eastern corner of the subject land. OP122980 external southern boundary dimensions were maintained to the new derived corner between Crown Allotments 2022 and 2023.

The common Crown Allotments 2022 and 2023 boundaries were derived by maintaining equal areas for both allotments. The derived boundaries were intersected with the southern boundary of the LU.S and the southern alignment of Blackwood Lane. OP122980 dimensions were maintained from the derived corner along Blackwood Lane to the commencement point at the south-east corner of Lot 1 on PS445388M.

Crown Allotments 2035

OP122980 bearings has been maintained for the east and south boundaries. The old post and wire fence was adopted as the western boundary for dimensions 192°35' 50.85. From the part at the northern end of this boundary, a bearing of 7°28' was adopted to intersect with the eastern boundary of Crown Allotment 2022.

Marking of Boundaries:

The boundaries have been marked where appropriate as required by *Regulation 9 of the Surveying (Cadastral Surveys) Regulations 2005*.

Proclaimed survey area:

The land is not within a Proclaimed Survey Area.

Connection to Marks:

The survey has connected to the required number of PMs and PCMs as required by *Regulation 11(3) Surveying (Cadastral Surveys) Regulations 2005*.

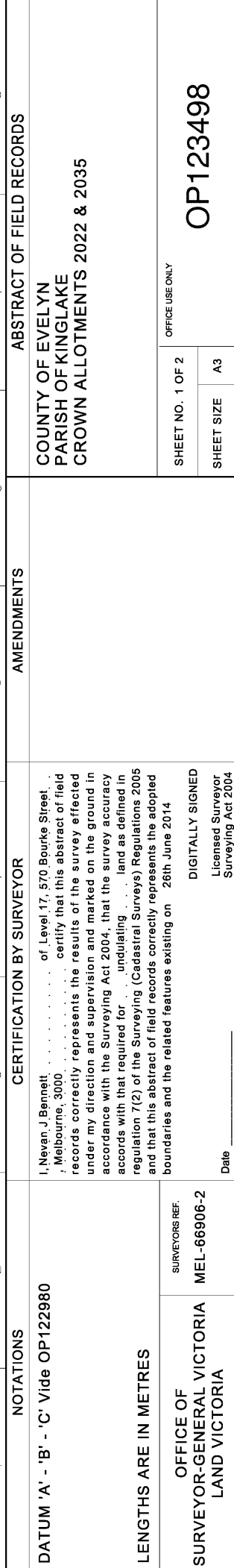
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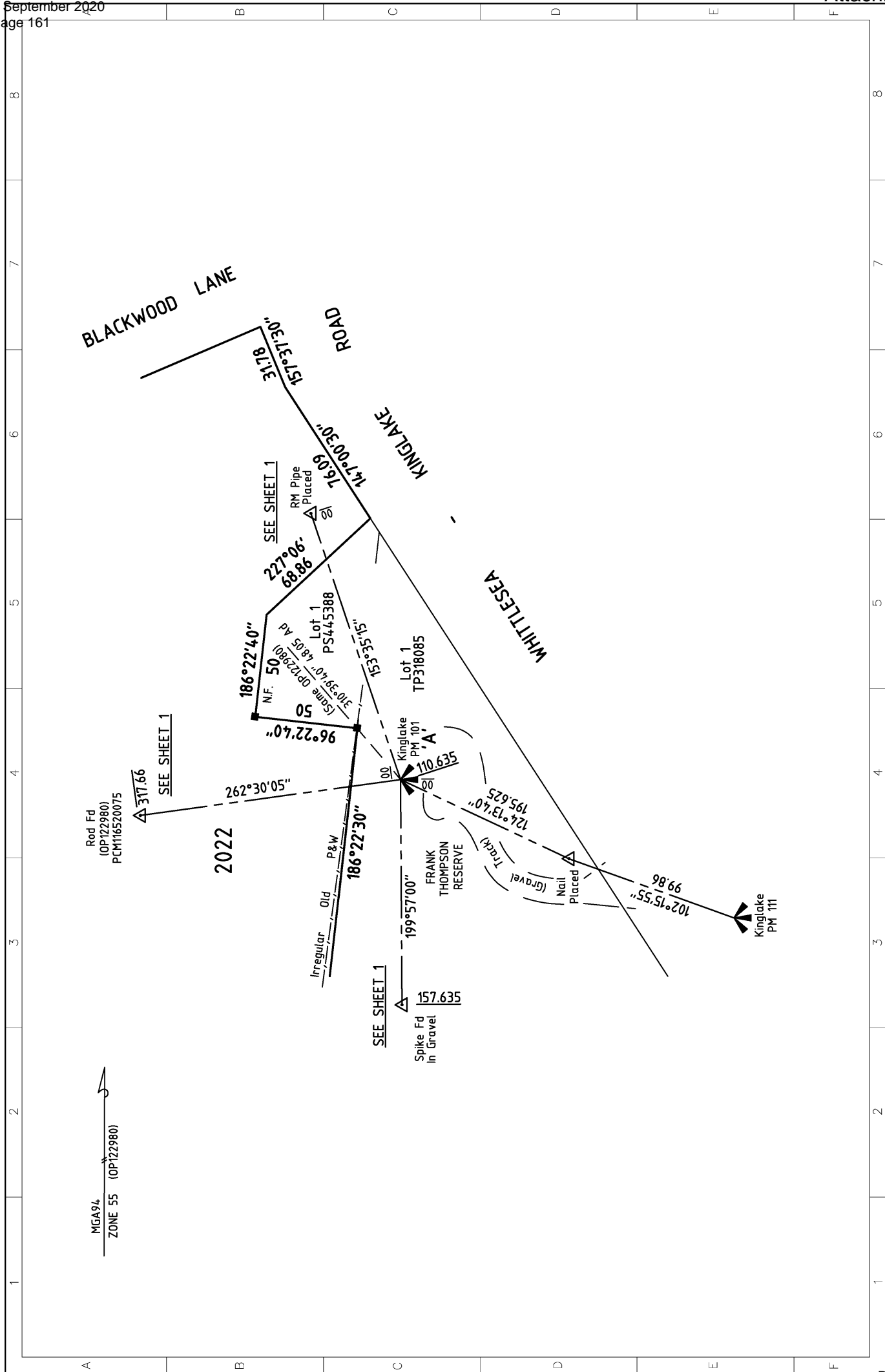
Leica TCR1103
Serial #2626189
Last Calibrated at
Mitcham on 17 April 2014

Other Relevant Particulars:

Unchecked radiations shown on Abstract of Field Records were checked in the field by observing independent angles and distances.

DIGITALLY SIGNED
.....
LICENSED SURVEYOR





OFFICE OF SURVEYOR-GENERAL VICTORIA LAND VICTORIA		SURVEYORS REF. MEL-66906-2	DIGITALLY SIGNED SURVEYOR		DATE		ABSTRACT OF FIELD RECORDS COUNTY OF EVELYN PARISH OF KINGLAKE CROWN ALLOTMENTS 2022 & 2035		SHEET NO. 2/2 SHEET SIZE A3		OFFICE USE ONLY OP123498	
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Maureen Jackson Planning



**PROPOSED USE AND DEVELOPMENT AS A CEMETERY,
ASSOCIATED SIGNAGE, CARPARKING TO THE
SATISFACTION OF THE RESPONSIBLE AUTHORITY AND
ALTERATION TO ACCESS TO A MAIN ROAD**

AT 265 WHITTLESEA-KINGLAKE RD, KINGLAKE CENTRAL.

Prepared for:
Kinglake Ranges Cemetery Trust

Prepared by:
Maureen Jackson Planning Pty Ltd
June 2020



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4 OVERVIEW OF THE PROPOSAL	5
5 GENERAL PLANNING POLICY AND PLANNING SCHEME PROVISIONS	6
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Appendices

Plans by Peddle Thorp Architects

Landscape Plan by Simon Ellis Landscape Architects

Traffic Impact Assessment Report by One Mile Grid.

Survey Plan by M.J.Parsons and Associates.

This report is compiled on the basis of the available amount of access and time permitted to investigate its components. In areas where access could not readily be available, assumptions may have been made to aid the client. These assumptions are identified within the body of the report. This report is for the exclusive use of the client and cannot be used for any other purposes without prior permission from Maureen Jackson Planning Pty Ltd. The report is valid only in its entire form.



1 BACKGROUND

On 4th November 2010, Amendment C33 to the Murrindindi Planning Scheme was gazetted to rezone land at 265 Whittlesea – Kinglake Road from Farming to Public Use 7- Other. The land was purchased by the State Government in 2010 for the purpose of providing a site to enable the replacement of the Kinglake National Park Office and Depot, and the development of the Kinglake Ranges Cultural and Community Facility.

No development of the land has occurred since the approval of the amendment.

The eastern portion of this land (identified as Lot 2022) of approximately 5 hectares was gifted to the Kinglake Ranges Foundation to establish a Multi Purpose Facility.

Based on advice from the Parliamentary Secretary for the Environment the land identified as Lot 2023 (western section) has been reserved in accordance with the Crown Land (Reserves) Act 1978 for cemetery purposes and declared a public cemetery by the Governor in Council under the Cemeteries and Crematoria Act 2003, to be managed by the Kinglake Ranges Cemetery Trust by Order in Council on 10th March 2016.

Therefore the land is zoned or public use with the underlying reservation specifically to enable the land to be developed as a cemetery.

At no time has a crematorium been contemplated and would be subject to planning approval.

The reservation of the subject site is considered appropriate for a number of reasons including :

- the lack of vegetation on site allowing for the development of the cemetery as existing bushland to the rear of the site will be left to form a backdrop to the cemetery; only one dead tree will be removed from the site;
- proximity to the townships and relative ease of access, and
- high degree of difficulty of developing the land previously designated for cemetery purposes. A 4.0 hectare parcel of land at 825 Whittlesea-Kinglake Road was previously reserved for the purpose of a cemetery for many years however this reservation has now been removed. This site is heavily vegetated and would require extensive clearing and the purchase of vegetation offsets for significant loss of vegetation amongst other major challenges for development.

The land that is the subject of this application is predominantly cleared of trees, as well as being close to townships, hence appropriate for the intended use as a cemetery, servicing Kinglake and surrounding neighbourhoods within the municipality.

Previous amendment proposals to rezone the land from Public Use 5-Other to Public Use 7 - Cemetery and Crematorium have been refused by Council despite supporting officer recommendations for proceeding with the rezoning process.

The public land managers for the site are the Kinglake Ranges Cemetery Trust who are the applicants for this proposal.

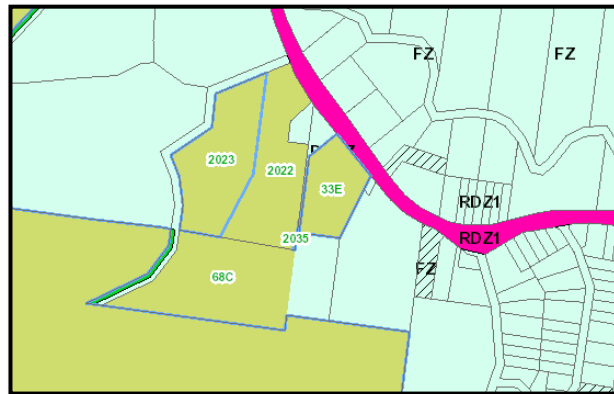


FIGURE 1. ZONING MAP SHOWING LOTS 2022 AND 2023, MURRINDINDI PLANNING SCHEME, DELWP, JUNE 2020

2 THIS REPORT

This report has been prepared in support of obtaining planning approval for use and development of a cemetery, signage, carparking to the satisfaction of the Responsible Authority and alteration of access to a main road at 265 Whittlesea-Kinglake Rd, Kinglake Central.

The following sections of this report provide:

- An overview of the site and surrounds;
- A description of the proposal; and,
- An assessment of the proposal against the planning controls impacting the site.

3 SITE DESCRIPTION

The overall site is an irregularly shaped parcel of land with an area of 10.3 hectares. It is bound at the north-east corner by the Whittlesea-Kinglake Rd which is a Category 1 Road zone. Leading from the Whittlesea-Kinglake Rd is Blackwood Lane, forming the northern and north-western border. The southwestern boundary is fronted by a single residential development, on land zoned as Farming (FZ). Directly abutting the southeastern boundary is a public recreation zone known as the Frank Thompson Reserve, while all other boundaries abut cleared agricultural land.

The land is divided into two lots and the subject of this proposal is identified as Lot 2023, approximately 5.07 hectares in area, and forms the western portion of the land.

The main township of Kinglake is located to the southeast, while further to the southwest is an extensive area of uncleared, heavily wooded bush reserves.

The subject site is mostly cleared of vegetation with bushland located at the rear of the site and one dead tree which will be removed.



4 OVERVIEW OF THE PROPOSAL

This application relates to the use and development as a cemetery, associated signage, carparking to the satisfaction of the responsible authority and alteration to access to a main road at 265 Whittlesea-Kinglake Road, Kinglake Central.

The design ethos is one based on creating a bush cemetery with minimal buildings and works on site. Planting will also be based on drought resistant species that are suited to the climatic conditions at Kinglake. The planting species have been carefully chosen by our landscape architect in consultation with the Upper Goulburn Landcare Group.

The cemetery will be developed in stages based on community demand and determined by the Kinglake Ranges Cemetery Trust.

The development includes:

- minimal intrusion into the landscape and protection of viewlines from the site;
- provision of a lawn cemetery, Children's Memorial, Pioneer's Memorial Garden (Memorial Blackwood Grove), Veterans Memorial Garden (Lone Pine Memorial Garden);
- up to 5350 cremated remains, lawn beams and wall plaques;
- landscaping to provide a series of stepped levels for burial and cremation sites; the low walls would serve the two functions of seating and repository for memorialising ashes;
- access via an internal road with a carriageway width of 6 metres, an approximate length of 700 metres and used in a clockwise direction. It is proposed to provide 46 indented 90-degree parking spaces along the internal road. In addition, parallel parking will be permitted along the length of the internal roadway, outside the areas of the 90-degrees spaces, allowing for approximately 90 parking spaces. Therefore, a total of 136 spaces will be provided for the cemetery.
- stone entry and exit portals (1.8 – 2.4 m height) onto Blackwood Lane, and a timber paling fence with stone posts (1.2 to 1.3 m height) along Blackwood Lane;
- selective drought resistant planting including groundcovers, small shrubs and trees;
- a proposed right turning lane added to Whittlesea-Kinglake Rd onto Blackwood Lane based on previous consultation and requirements set by VicRoads;
- regrading of Blackwood Lane to 7.0m width;
- construction of small open shed at southwestern corner (less than 100 square metres) to store garden equipment;
- the southwestern boundary to be fenced with post and wire fencing and include shed access point, and
- ***no crematorium on the site.***



5 GENERAL PLANNING POLICY AND PLANNING SCHEME PROVISIONS

The Murrindindi Planning Scheme requires consideration of the following key planning provisions:

Planning Scheme	Murrindindi
SPPF	Clause 01 Purposes Clause 11 Settlement Clause 12 Environmental and Landscape Values Clause 12.01-2S Native vegetation management Clause 13.02 Bushfire Clause 13.02-1S Bushfire planning Clause 13.02-1L Bushfire Planning (Local Planning Policy) Clause 18.02-4S Car parking Clause 19 Infrastructure
LPPF and MSS	Clause 21.01 Municipal Strategic Statement Clause 21.01-3 Key Issues and Influences Clause 21.02 The Planning Vision Clause 21.02-1 Vision Clause 21.03 Economic Development Clause 21.03-1 Business and Industry Clause 21.03-2 Agriculture Clause 21.05 Environment Clause 21.05-1 Environmental Values Clause 21.06 Transport and Infrastructure Clause 21.06-4 Community Development:
Zoning	Clause 36.01 Public Use Zone – Other (PUZ7) Clause 36.01-7 Signs
Overlays	Clause 42.01 Environmental Significance Overlay, Schedule 1, ES01 SCHEDULE 1 TO THE ENVIRONMENTAL SIGNIFICANCE OVERLAY, ES01 HIGH QUALITY AGRICULTURAL LAND Clause 44.06 BUSHFIRE MANAGEMENT OVERLAY
Other	Aboriginal Cultural Heritage Sensitivity
Particular Provisions	Clause 52.06 Car Parking Clause 52.17 Native Vegetation Clause 52.25 Crematorium Clause 52.34 Bicycle Facilities Clause 52.29 LAND ADJACENT TO A ROAD ZONE, CATEGORY 1, OR A PUBLIC ACQUISITION OVERLAY FOR A CATEGORY 1 ROAD
General Provisions	Clause 65 Decision Guidelines
Planning permit triggers	Section 72 of the Planning and Environment Act 1987