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Latrobe City Domestic Wastewater Management Plan

Prepared for Latrobe City Council

Latrobe City
a new energy

1/11/2019

DOCUMENT CONTROL SHEET

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1 Introduction

Latrobe City Council ('Council') are responsible for the approval and on-going oversight of on-site wastewater management systems (traditionally described as 'Septic Tanks' and more recently described as 'On-site Systems') within the municipality. On-site systems are the traditional method for managing sewage and other forms of wastewater on properties that are not connected to a Gippsland Water reticulated (or town) sewerage system. They are also the preferred method of wastewater management for new developments in Low Density Residential (4,000 m^2), Rural Living and Rural land use zonings.

When designed, constructed and operated correctly, on-site systems can provide a safe, cost effective and sustainable wastewater management service. Unfortunately, not all on-site systems meet community expectations in this regard. This can occur due to a variety of factors including;

- Topography, soil and climate constraints (land capability constraints);
- Small lot size associated with older subdivisions;
- Older septic systems that discharge sewage off-site; and
- A lack of management and maintenance.
- Septic systems incorrectly installed; and
- Wastewater load exceeding septic system capacity.

In some circumstances the impact of failing on-site systems can be significant, particularly with regards to risk to human health. Under the State Environment Protection Policy (Waters of Victoria or 'WoV') Council are required to prepare and implement a Domestic Wastewater Management Plan (DWMP). The SEPP (WoV) requires a DWMP to identify and prioritise wastewater risks in a municipality and develop actions to manage those risks.

1.1 Purpose

This is the second revision of the Latrobe City DWMP which coincides with a recent update of the EPA *Code of Practice: On-site Wastewater Management* (2016) and a current review of the SEPP (WoV). In the thirteen years since the initial DWMP, there have also been a range of new technologies and approaches to on-site wastewater management.

The primary purpose of this DWMP is to:

- identify, assess and manage cumulative risks of onsite domestic wastewater systems discharging waste beyond allotment boundaries;
- engage with the EPA and Gippsland Water to identify existing unsewered allotments which do not retain wastewater on site or are not capable of preventing the discharge of wastewater beyond

allotment boundaries, or preventing impacts on groundwater beneficial uses for inclusion in the domestic wastewater management plan; and

- identify, cost, prioritise and evaluate options to —
    - provide solutions to prevent discharge of wastewater beyond allotment boundaries; and
    - provide for the compliance assessment and enforcement of on-site domestic wastewater systems in accordance with the plan; and
    - where applicable have regard to the Guidelines for Planning Permit Applications in Open, Potable Water Supply Catchments and any relevant guidelines authorised by the EPA.

2 What do Residents need to know about this Plan?

- Council are required to prepare a Domestic Wastewater Management Plan (DWMP) under the State Environment Protection Policy (Waters of Victoria). This DWMP must assess domestic wastewater (often referred to as on-site wastewater or septic tank) risks in the municipality and develop prioritised actions to address potential impacts.
- Specifically, Council are required to identify properties where wastewater is discharging off-site and develop actions to prevent this discharge from occurring.
- This DWMP includes on-site wastewater hazard mapping that identifies the risk associated with on-site wastewater management on each property based on land capability and lot size.
- Investigations have also involved an evaluation of existing septic tanks and other on-site systems to identify high risk townships and areas.
- Tyers and Traralgon South are the two main areas identified as in need of improved or potentially alternative wastewater management strategies.
- There are a small number of additional isolated lots that may also pose a risk of off-site discharge and should be investigated to confirm.
- The majority of unsewered areas in Latrobe are moderately well suited to on-site wastewater management subject to meeting the requirements of the EPA Code of Practice for On-site Wastewater Management.
- Domestic Wastewater Management Planning has included an evaluation of existing and potential future lot sizes in unsewered residential areas in conjunction with the broader (draft) Rural Land Use Strategy.
- The outcomes suggest that the proposed Rural Living Zone changes contained in the Draft Rural Land Use Strategy are appropriate in the context of domestic wastewater management provided some site specific investigations are completed for any potential future Rural Living zoned land.
- It is recommended that higher levels of scrutiny are applied to proposed unsewered developments proposing new allotments that are less than one hectare in size. The presence of constraints such as slope, gullies and watercourses can increase risk and limit options on lots below this size.
- The DWMP proposes a set of "Minimum Standards" for Land Capability Assessment and design information that needs to be submitted with Septic Tank or Planning Permits in unsewered areas classified as high risk.
- The DWMP also recommends that consideration be given to potential funding mechanisms for increased on-going oversight of on-site wastewater management system compliance.

3 Background

Council is responsible under the *Environment Protection Act (1970)* for the approval of on-site wastewater management systems ('septic systems'). This includes the approval of alterations to existing systems and consideration of wastewater management risks associated with new unsewered development. The *Latrobe Planning Scheme* and *Victorian Planning Provisions* include reference to the relevant provisions of the *Environment Protection Act* and require consideration of the capability to contain wastewater within property boundaries when approving new development.

Council are also required to ensure existing on-site systems to not adversely impact on human health or the environment under the *Health and Wellbeing Act (2008)* and *State Environment Protection Policy (Waters of Victoria)*. This has historically proven to be a challenging outcome for local councils to achieve due to constraints in the ability to resource oversight and enforce upgrades to failing or inappropriate systems.

3.1 Victorian Context

The following legislation is relevant to Domestic Wastewater Management in Victoria and has been considered in the development of this plan.

- Local Government Act 1989;
- Environment Protection Act 1970;
- Water Act 1989;
- Safe Drinking Water Act 2003 and Regulation 2005;
- Planning and Environment Act 1987;
- Public Health and Wellbeing Act 2008;
- State Environmental Protection Policy (Waters);
- Catchment and Land Protection Act 1994; and
- Victorian Building Regulations 2006.

The State Environment Planning Policy (SEPP) *Waters of Victoria* has recently undergone a review and has recently been gazetted (now known as SEPP – Waters). Therefore there is a need to review the domestic wastewater management elements of the SEPP in relation to Latrobe municipality. This review involves a consolidation of the current SEPP (Waters of Victoria) and SEPP (Groundwaters of Victoria).

The design, operation and management of on-site systems are supported by a number of standards and guidelines. Namely:

- EPA Code of Practice – Onsite Wastewater Management, Publication 891.4 (2016);

- MAV Land Capability Assessment Framework (2014) – replacing EPA Publication 746.1;
- AS/NZS 1547:2012 Onsite Domestic Wastewater Management (updated since last DWMP);
- AS/NZS 3500:2003 Plumbing and Drainage; and
- Guidelines – Planning Permit Applications in Open, Potable Water Supply Catchment Areas (DSE, 2012) – released since last DWMP.

Note: Since July 2016 EPA no longer award a Certificate of Approval to individual on-site wastewater systems. EPA now approves four system types in line with Australian Standards;

- AS/NZS 1546.1 Septic tanks
- AS/NZS 1546.2 Waterless composting toilets
- AS/NZS 1546.3 Aerated wastewater treatment systems
- AS/NZS 1546.4 Domestic greywater treatment systems (draft)

Council Officers can only approve the installation of an on-site wastewater system that is certified to comply with the relevant Australian Standard by an accredited conformity assessment body (CAB). As part of a permit application to council, the applicant will need to include a copy of the certificate of conformity from a CAB.

3.1.1 VAGO Audit of Domestic Wastewater Management

In September 2018 the Victorian Auditor General's Office (VAGO) released the report titled *Managing the Environmental Impact of Domestic Wastewater*. This audit focused on two metropolitan councils and water authorities as case studies. However, many of the outcomes are relevant state wide and specifically to Latrobe City Council. Key outcomes included.

- an overly complex, onerous and duplicative regulatory framework
- a continued lack of clarity around roles and responsibilities
- regulatory barriers and gaps in governance and approval processes are hindering the timely imple mentation of alternative management approaches to sewer.
- regulatory tools that do not adequately drive property owners' compliance with planning permits and legislation
- significant information gaps across a whole range of important on-site wastewater management strategies
- lack of a consistent, robust and transparent risk assessment process.
- Lack of systematic inspection / oversight program
- councils not being held to account for their role in domestic wastewater management.

These outcomes coincided with the changes to the SEPP requiring councils to address some of these issues. The DWMP Risk Assessment and developed Action plan have been described and incorporated into the documents.

3.2 Status of Domestic Wastewater Management in Latrobe City

Council's Environmental Health Coordinator is responsible for the regulatory oversight of Domestic Wastewater within Latrobe City. This includes working with Council's Planning Department to ensure wastewater risks are adequately considered during land use planning and approval processes.

Consideration has been given to the following LCC plans and policies during this DWMP review.

- Latrobe 2026: The Community Vision for Latrobe Valley
- Latrobe City Council Plan 2017-2021
- Strategic Resource Plan 2018 – 2022
- Living Well Latrobe – Municipal Public Health and Wellbeing Plan (2017-2021).

How Are On-site Wastewater Systems Currently Managed in Southern Grampians?

3.2.1 Approval of New Unsewered Development / On-site Systems

Currently, on-site systems that manage or are designed to manage flow rates of more than 5,000 litres per day are typically regulated by EPA through works approvals and, in some cases, operating licences. However there are a number of larger systems (>5,000 L/day) that are the responsibility of Council and are managed through Council's compliance program.

Systems with flow rates less than 5,000 litres a day are the responsibility of Council which issue permits for the construction, installation, and alteration of on-site systems. Council may refuse a permit if the site of the proposed system or proposed effluent land application is considered unsuitable and must refuse if the type of system is not approved by EPA.

Land use planning context is discussed below.

3.2.2 Management of Existing On-site Systems

Council are to enforce action for any system in which a permit was not obtained or if the conditions of the permit have been breached.

Council collect data and information on existing on-site systems across the Shire to help identify issues (particularly in higher risk areas) that require action. These include;

- Septic Permit status and on-site system type information (refer Section 5.3)
- Complaints from residents (system failures)

3.3 Land Use Planning Context

The Latrobe Planning Scheme is currently under a broadscale review as part of the Live Work Latrobe Planning Scheme Amendment (C105).

Live Work Latrobe strategy is a land use policy aimed at creating greater employment and investment opportunities and ensuring sufficient housing and development for the future of Latrobe. It consists of the following strategies;

- Rural Land Use Strategy
- Housing Strategy
- Industrial and Employment Strategy

Live Work Latrobe strategy is a key strategic planning document which aims to identify where growth will be targeted into the future. This includes growth and development within Rural Living Zone (RLZ) which is key planning zone across Latrobe municipality. LCC are currently in the processing of consolidating the RLZ subdivision minimum lot areas which currently consist of the following;

- Schedule 1 – 4,000m^2
- Schedule 2 – 1 hectare
- Schedule 3 – 2 hectare
- Schedule 4 – 4 hectare
- Schedule 5 – 5 hectare
- Schedule 6 – 8 hectare

The current intention is to reduce to only three minimum lot sizes (consolidated to Schedules 3, 4, 6) starting at 2 hectare minimum lot area. Schedule 2 (1 hectare) will be incorporated into the Low Density Residential Zone (LDRZ).

Bushfire Management Overlay (BMO) is a constraint across a large proportion of Latrobe municipality, which has potential impacts for on-site wastewater management systems on unsewered properties. The land capability hazard mapping (discussed in Section 5.2) provides an indication of overall constraints to on-site wastewater management and therefore provide supporting information to be considered in combination with BMO. There is not an Erosion Management Overlay (EMO) for Latrobe municipality, however slope and landslip risk (assessed on a site specific basis) is also a recognised constraint to development that can have a significant influence on the ability to contain on-site. This has been included in the onsite hazard mapping.

3.4 Integrated Water Management

Integrated Water Management (IWM) aims to provide a holistic and forward thinking approach to all elements of the water cycle (movement of water through its various phases) including wastewater in addition to stormwater, potable / non-potable water supply and local watercourses. The intention is for this approach to be adaptive to temporal changes over the long-term and designed in conjunction with end users (community) with a place based element to design.

The recently developed IWM Framework (DELWP, 2017) is aimed at assisting government agencies and the community in planning and implementation of these IWM concepts / options in the future. This includes the establishment of a number of new Victorian IWM Forums of which Latrobe municipality is part of (Gippsland region).

4 Review of 2006 Domestic Wastewater Management Plan

The 2006 DWMP was a more generalised management plan for wastewater management that was developed during early implementation of the SEPP (WoV) provisions requiring Councils to prepare Domestic Wastewater Management Plans. Furthermore, there have been significant changes in the following areas in the ensuing 13 years. On-site and decentralised wastewater management technologies and management approaches.

- Victorian and national guidelines and standards pertaining to on-site wastewater management.
- Victorian and national policy and research into Integrated Water Management and Water Sensitive development.
- The availability of funding through the Victorian Country Towns Water Supply and Sewerage Program has since ceased.

As a result, Council has decided that a wholesale review of the DWMP is warranted. The following table contains a summary of progress in implementation of the Action Plan from the 2006 DWMP.

Table 1 Implementation Progress for the 2006 DWMP

Action	Status	Reason
1a Tyers – "Investigate Innovative Waste Disposal Strategies"	Preferred option identified. On hold since 2008	No viable business case or delivery and management model could be identified at the time.
1b Tyers – Community Information and Education Strategy	Completed in 2008-2010	
1c Tyers – Obtain Funding for continued septic tank and environmental monitoring program.	Not pursued further.	Unable to identify a suitable funding source.
2 Development of a septic tank monitoring program for council owned properties	Partially completed.	
3. Review Domestic Wastewater Information Management System	Partially completed. Permit data now imported into system.	Still underway and on-going.
4 Development and review of operational policies and procedures	Partially completed	
5 Development of a septic tank monitoring program for Traralgon South and other priority localities	Not completed	Unable to identify a suitable funding source.
6 Review of Action Plan	Being undertaken as part of DWMP.	
7 Development of a compliance auditing regime	Not completed	Unable to identify a suitable funding source.
8 Evaluation of DWMP	Underway	

5 Revised Wastewater Management Risk Assessment

The risk assessment completed in 2006 was a largely qualitative evaluation based on limited available data. Best practice DWMP risk assessment involves a number of more quantitative methods to identify the presence, likelihood and magnitude of any risk factors associated with on-site wastewater management. Council have recently been actively working to review and collate Septic Tank Permit data into their Environmental Health and property databases which has improved issues around data availability.

In addition, the availability of more comprehensive Geographical Information System (GIS) data has also created opportunity for a spatial risk assessment to be undertaken. This includes consideration of cumulative impacts from both existing on-site wastewater systems and potential unsewered subdivisions.

There are two components to the DWMP Risk Assessment. The assessment has been completed using an On-site Hazard / Containment Framework developed by DWC in conjunction with Yarra Valley Water that applied the legislative and EPA Code of Practice definition and principles for on-site containment in a spatial (GIS) framework. The Framework has been modified in the context the Latrobe DWMP.

The first component is the preparation of a land capability hazard or risk map;

- to ensure future development is sustainable;
- to recognise where past development practices prevent safe and sustainable DWM; and
- to identify areas where the environment may be sensitive to DWM impacts and requires special protection.

The second component is an infrastructure based assessment (looking at existing on-site systems);

- to identify risks associated with older, inappropriate DWM technologies or approaches (such as direct off-site discharge);
- to geographically identify areas where there are a high number of off-site discharge or failing systems.

There are some areas in the municipality where both land capability constraints (such as slope, poor soils or proximity to waterways) and the presence of older off-site discharge systems combine to create significant immediate risks and place limits on the feasibility of achieving adequate levels of health and environmental protection with on-site systems. An example is the Tyers township.

The DWM risk assessment process has identified these high risk areas and developed recommended strategies for alternative wastewater management. This can range from traditional reticulated sewerage to improved / managed DWM programs.

5.1 Review of Available Data and Information

Data were sourced from both Latrobe City Council and the Victorian Government online data portal for undertaking the onsite hazard mapping for the Latrobe municipality. These data are summarised in the following table.

Table 2 Summary of Available Data and Sources

Data	Description	Source
Topographic / Elevation Data	Contours (1 and 2m) and Digital Elevation Model (DEM) points were available for sections of the LGA (no complete coverage available). Contours and slope grid were created within QGIS based on the Vicmap 10m Digital Terrain Model (DTM) which provides consistent coverage across the entire LGA.	Victorian Government / LCC
Ortho-photography	High resolution ortho-photography tiles for the entire LCC LGA (from Feb 2017).	Latrobe City Council
Soil type (landscape) data	Soil landscape mapping for the Gippsland region (1:100,000 scale). General soil landscape data also provided by client.	Department of Economic Development, Jobs, Transport and Resources (previously DEPI) LCC
Watercourses (All)	State-wide watercourse (hydroline) layer – 1:25,000 scale trimmed to LGA. Used to define both partially vegetated / rehabilitated intermittent drainage lines and permanent watercourses.	Latrobe City Council
Hydroareas (waterbodies)	State-wide waterbodies layer trimmed to LGA. Used to define farm dams and other larger waterbodies.	
Groundwater bores	Groundwater bore locations and available data (potable / non-potable).	BoM Australian Groundwater Explorer online mapping (http://www.bom.gov.au/water/groundwater/explorer/map.shtml)
Planning Overlay	Planning overlay used to isolate Environmental Significant Overlay (ESO), Floodways / Land Subject to Inundation and Bushfire Management Overlay (BMO).	Latrobe City Council
Bio Region Conservation Areas	Bio-conservation vegetation layer used to define environmentally significant vegetation (in combination with ESO layer). *Native Vegetation - Modelled 2005 Ecological Vegetation Classes (with Bioregional Conservation Status)* - NV2005_EVCBCS layer utilised.	Victorian Government (online data portal)

Data	Description	Source
PROPERTY_PRIMARY_APPROVED	Cadastral boundaries for current properties across Latrobe LGA.	Latrobe City Council
Stormwater Drainage	Stormwater pipes and pits for LGA.	Latrobe City Council
Potable Water Supply Catchments	Potable Water Supply Catchments layer (PWSC100) was used to identify properties within designated drinking water catchments.	Victorian Government data portal
Erosion Management Overlay (EMO)	Erosion Management Overlay which identifies areas in which a geotechnical assessment is required to ensure landslip is not a risk. There is no EMO for the municipality and landslip is assessed on a site specific basis.	Latrobe City Council
Sewer alignment	Sewerage infrastructure layers utilised to determine sewered / unsewered lots (as best as possible based on data available).	Gippsland Water

Key guidelines and sources of criteria for the mapping are summarised in Table 3.

Table 3 Guidelines / Standards: On-site Wastewater Risk Framework

Organisation	Resource	Purpose
Victorian government	SEPP (WoV)	Overarching regulatory performance objectives relating to protection of surface waters. Regulatory performance objectives with respect to protection of groundwater beneficial uses.
EPA Victoria	EPA Code of Practice (CoP) – On-site Wastewater Management (2016)	Sets out specific means of compliance recognised as "deemed to comply" with the SEPP. Setback distances adopted for risk classification Framework.
MAV	Victorian Land Capability Framework (2014)	Documents the state government endorsed land capability hazard framework for on-site wastewater management in Victoria. Used as the basis for the land capability elements of the risk classification.
Standards Australia	ASNZS1547:2012 On-site domestic wastewater management	Provides additional design, siting and operational guidance that has been applied within the risk classification Framework.

5.2 On-site Containment / Land Capability Hazard Mapping

DWC has previously developed an agreed definition of on-site containment as part of the Park Orchards Trial project (on behalf of Yarra Valley Water). This definition took the legal terminology from the SEPP (WoV) "*containment of effluent within the boundaries of the allotment and protection*

of any beneficial uses of groundwater" and translated that initially into measurable hydraulic, nutrient and pathogen performance targets that can be validated through field monitoring and numerical modelling. This work confirmed that an effluent Land Application Area (LAA) that has been sized to the most limiting of a water, nitrogen or phosphorus balance (as per the MAV Land Capability Assessment Framework – 2014) and meets standard setback distances to sensitive receptors (from the EPA Code of Practice) can be considered capable of on-site containment.

As part of this DWMP, DWC has evaluated a range of on-site LAA design scenarios in addition to typical levels of development on unsewered properties to nominate a series of property size ranges that represent increasing levels of containment on-site (CoS) potential. These on-site containment criteria are proposed as a *conservative benchmark* to ensure on-site systems to not pose a risk to human health and the environment with all wastewater contained on-site. Appendix C outlines previous minimum lot size and cumulative impact data analysis undertaken by DWC which has been utilised to support these lot ranges.

Table 4 On-site Containment Lot Size Criteria

Lot Size Criteria	On-site Containment Capacity
<2,000 m^2	**Generally not capable of on-site containment:** Properties under 2,000 m^2 do not typically have sufficient available area to fit an adequately sized on-site system for a contemporary dwelling (e.g. a 4-5 bedroom house) whilst meeting recommended setback distances to waterways, groundwater bores and other sensitive receiving environments. Partial or full off-site wastewater management is the preferred strategy for these properties (e.g. reticulated sewerage, cluster system or centrally / authority managed on-site systems). Where owner managed on-site systems are the only available option, specialist design will be required along with increased oversight in order to achieve containment.
2,001 m^2 – 3,999 m^2	**Detailed Land Capability Assessment required to confirm ability to contain on-site:** Properties in this size range are likely to have sufficient available area to fit an adequately sized on-site system for a contemporary dwelling (e.g. 4-5 bedroom house). However, this will be highly dependent on-site specific land capability constraints and proximity to sensitive receiving environments. A more detailed LCA and design process is likely to be required to ensure full containment in addition to higher level treatment and greater construction and operational oversight. Where possible these properties should be considered for partial or full of-site wastewater management (e.g. reticulated sewerage, cluster system or centrally / authority managed on-site systems). Where owner managed on-site systems are the only available option, increased regulatory oversight is strongly recommended in order to ensure containment.
≥ 4,000 m^2	**Generally capable of full on-site containment:** Owner managed on-site systems are the appropriate wastewater servicing strategy for most properties of this size (subject to site specific land capability constraints). Cumulative impacts are negligible where EPA setback distances are met.

These definitions relate to the *long-term sustainability* of on-site wastewater management. For properties greater than 2,000 m^2, consideration must also be given to land capability constraints such as soil characteristics, slope, landslip and proximity to creeks, drains and groundwater bores. To

address this, DWC have also completed a GIS based broad scale Land Capability Assessment (LCA) of unsewered properties in the Latrobe municipality.

This LCA is consistent with the EPA CoP (2016) and the MAV Land Capability Assessment Framework (2014) with a detailed methodology provided in Appendix A. A summary of the hazard classes and what they mean is provided in Table 5 below.

Table 5 Land Capability Hazard Map Summary

Classification	CoS?	EPA CoP?	Derivation	Description
Low Risk / Hazard	Likely (Refer Table 4)	Yes	Final Risk Score<1	Few/minor constraints to on-site wastewater management and low risk receiving environment. Periodic (e.g. 3 years) oversight as per current Septic Tank Permit conditions likely to manage risk.
Medium Risk / Hazard			Final Risk Score 1<>2	Individual and/or cumulative hazards slightly elevate the likelihood and/or consequence of on-site system failure. A higher level of design, construction, maintenance and oversight (e.g. annual inspection) input may be necessary to manage risk and meet regulatory objectives for health and ecosystem protection.
High Risk / Hazard	TBC On-site (Refer Table 4)		Final Risk Score >3	Individual and/or cumulative hazards significantly elevate the likelihood and/or consequence of on-site system failure. Best practice design, construction, maintenance and oversight essential to manage risk and meet regulatory objectives for health and ecosystem protection.
Very High Risk / Hazard		Very constrained (MAV, 2014)	Slope >30% (on average) / landslip risks	Significant Land Capability constraints (steep slope / landslip risk) across the majority of suitable land available within the property. On-site containment may be possible subject to advanced engineering and oversight where the provision of an off-site solution is cost prohibitive.
Non CoS	Unlikely (Refer Table 4)	No	Lot size < 2,000m^2	Generally no suitable land available for CoS. Full off-site solution is highly likely to meet the objectives of the SEPP.

After the development of the broad scale land capability hazard map, lot size was utilised to determine likely potential for containment on-site (CoS) for each property as outlined in

Table 4. This resulted in an overall On-site Hazard Class for each lot.

The following logic was applied to all unsewered lots to develop the final On-site Hazard Class.

- Lot size <2,000m^2 = Non CoS Classification (regardless of land capability);

- Lot size 2,001 m^2 – 3,999 m^2 = Greater of High Hazard or land capability hazard (as per mapping);
- ≥ 4,000 m^2 = Land capability hazard used (as per mapping).

The Wastewater Land Capability Hazard Map (including potable water supply catchments) is presented below along with close up maps of key unsewered areas across Latrobe municipality.

Table 6 presents a breakdown of the hazard class for unsewered lots in Latrobe including properties zoned specifically Rural Living. These numbers are approximate as they may include some unsewered lots that are currently vacant / undevelopable. Sewerage alignment data was utilised to isolate properties that are serviced by reticulated sewer. However the odd sewered property may still be present in the hazard mapping of unsewered lots. As can be seen a large proportion are classified Low to Medium Hazard both within the Rural Living Zone and across the Latrobe municipality.

Table 6 Land Capability Hazard Breakdown including Rural Living Zone Only

Hazard Class	Latrobe City Area	Occurrence in Rural Living Zone
Low Hazard	786 (13%)	389 (16%)
Medium Hazard	2,652 (45%)	1,330 (55%)
High Hazard	2,039 (34%)	641 (26%)
Very High Hazard	193 (3%)	47 (2%)
Non CoS	262 (4%)	31 (1%)
Total	**5,932**	**2,438**

It can be seen that the majority of the unsewered properties in Latrobe are capable of achieving on-site containment *subject to design, installation and operation of an on-site wastewater management system that meets the EPA CoP.* Approximately one third of properties are likely to be capable of on-site containment but feature one or more significant constraints that may require more detailed LCA, design, installation and operational input. Approximately 7% of properties are considered highly constrained or highly unlikely to be capable of safe and sustainable on-site wastewater management in the long-term.

An evaluation of the existing Rural Living Zone land suggest that land capability for on-site wastewater management is not a major issue in these zones. Notwithstanding, the majority of RLZ land does feature one or more constraints to on-site containment with ~84% of properties being identified as Medium Hazard to Non-Containment (Non CoS).

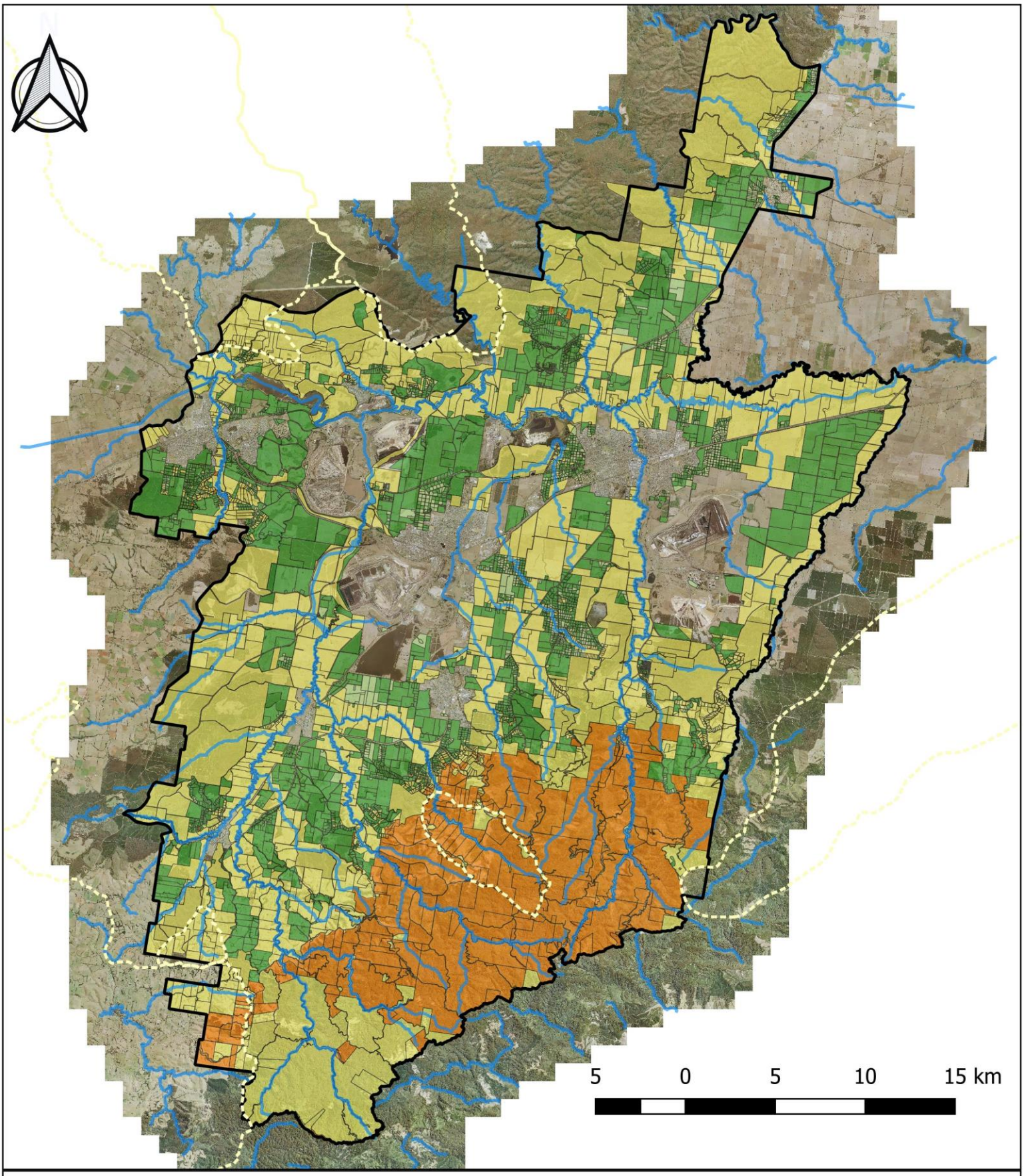

Figure 5-1: Latrobe City Land Capability Hazard Classification Map

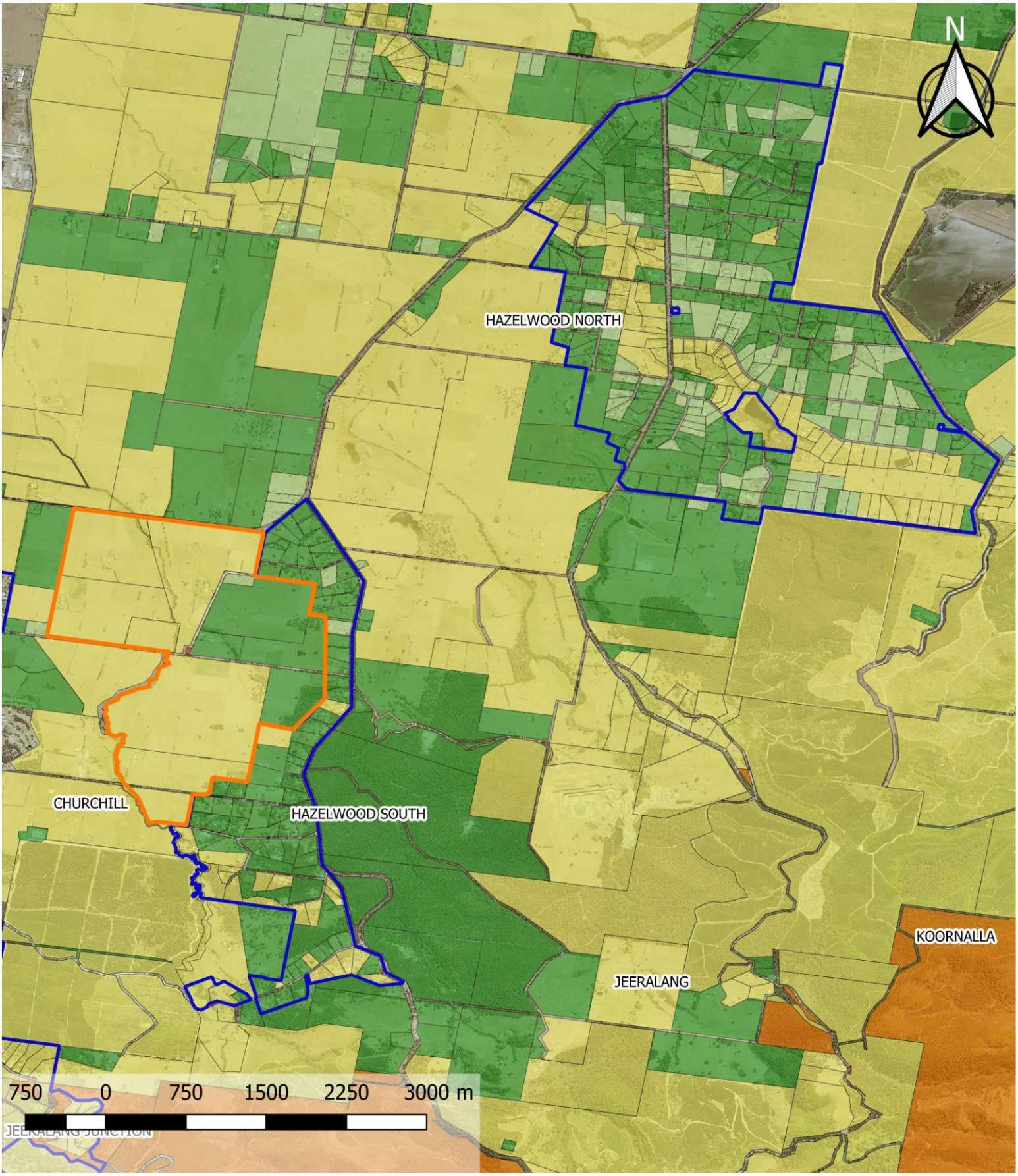

Figure 5-2 Land Capability Hazard Focus Area: Hazelwood / Churchill

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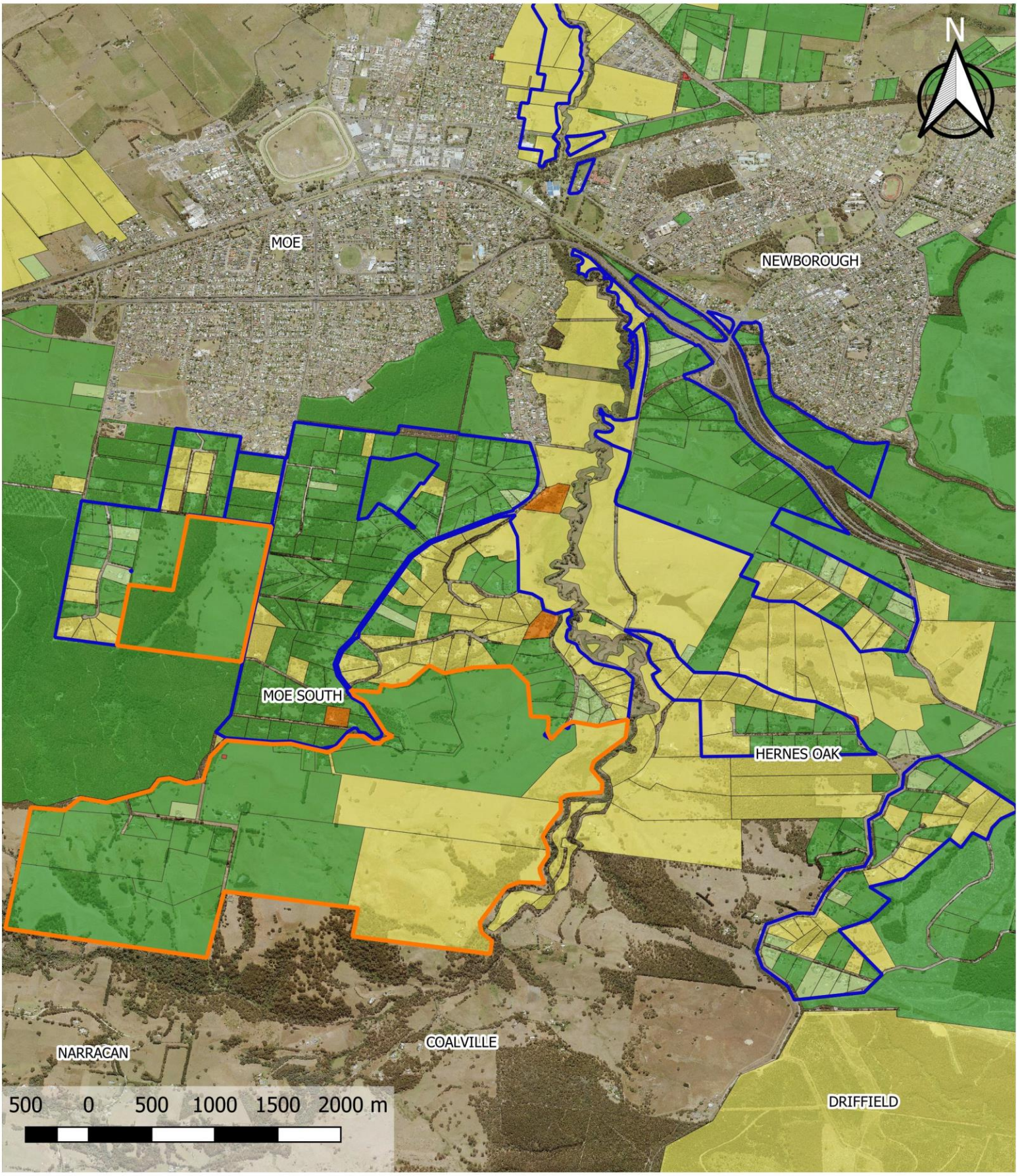

Figure 5-3 Land Capability Hazard Focus Area: Moe / Hernes Oak

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

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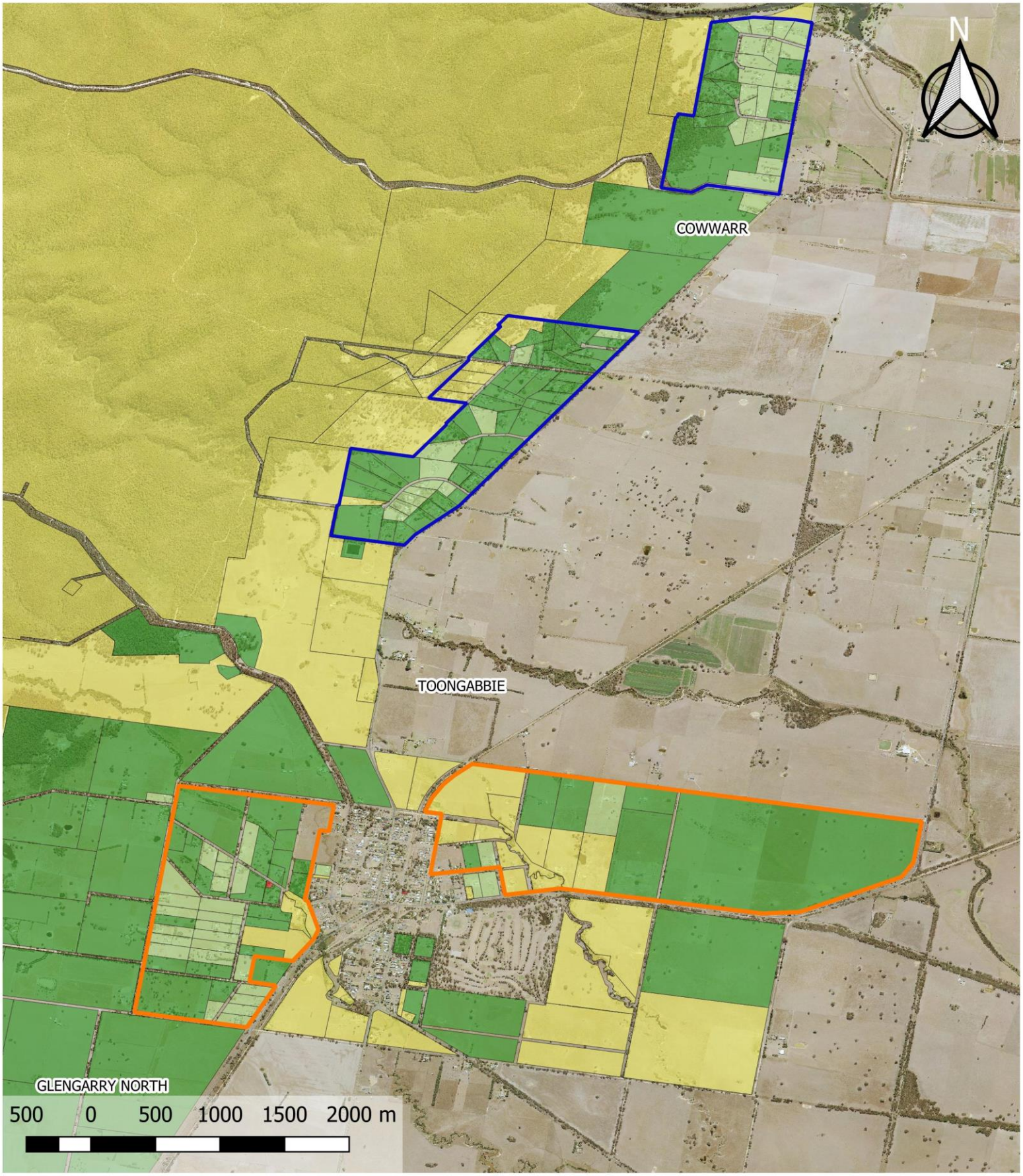

Figure 5-4 Land Capability Hazard Focus Area: Toongabbie / Cowwarr

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

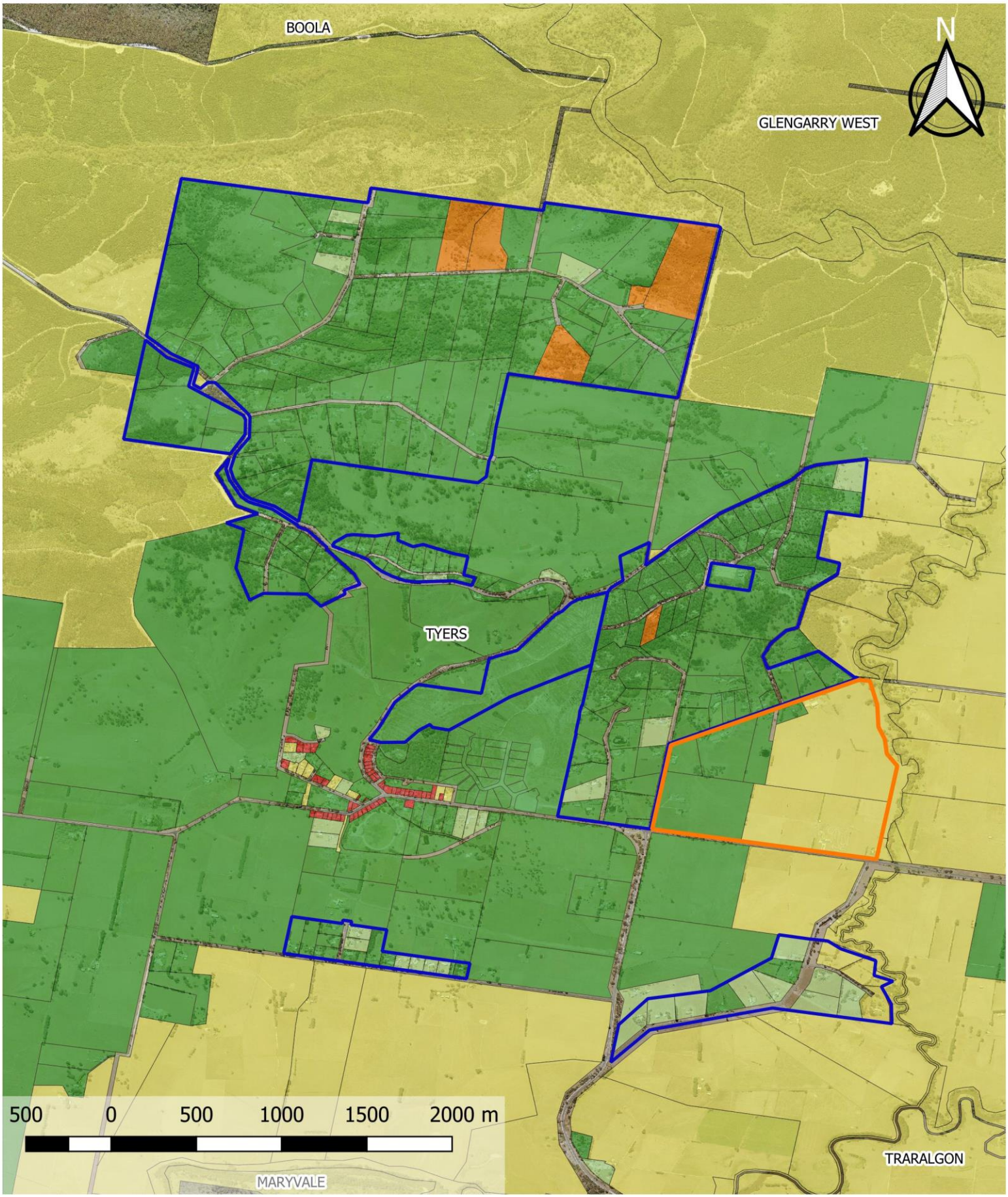

Figure 5-5 Land Capability Hazard Focus Area: Tyers

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

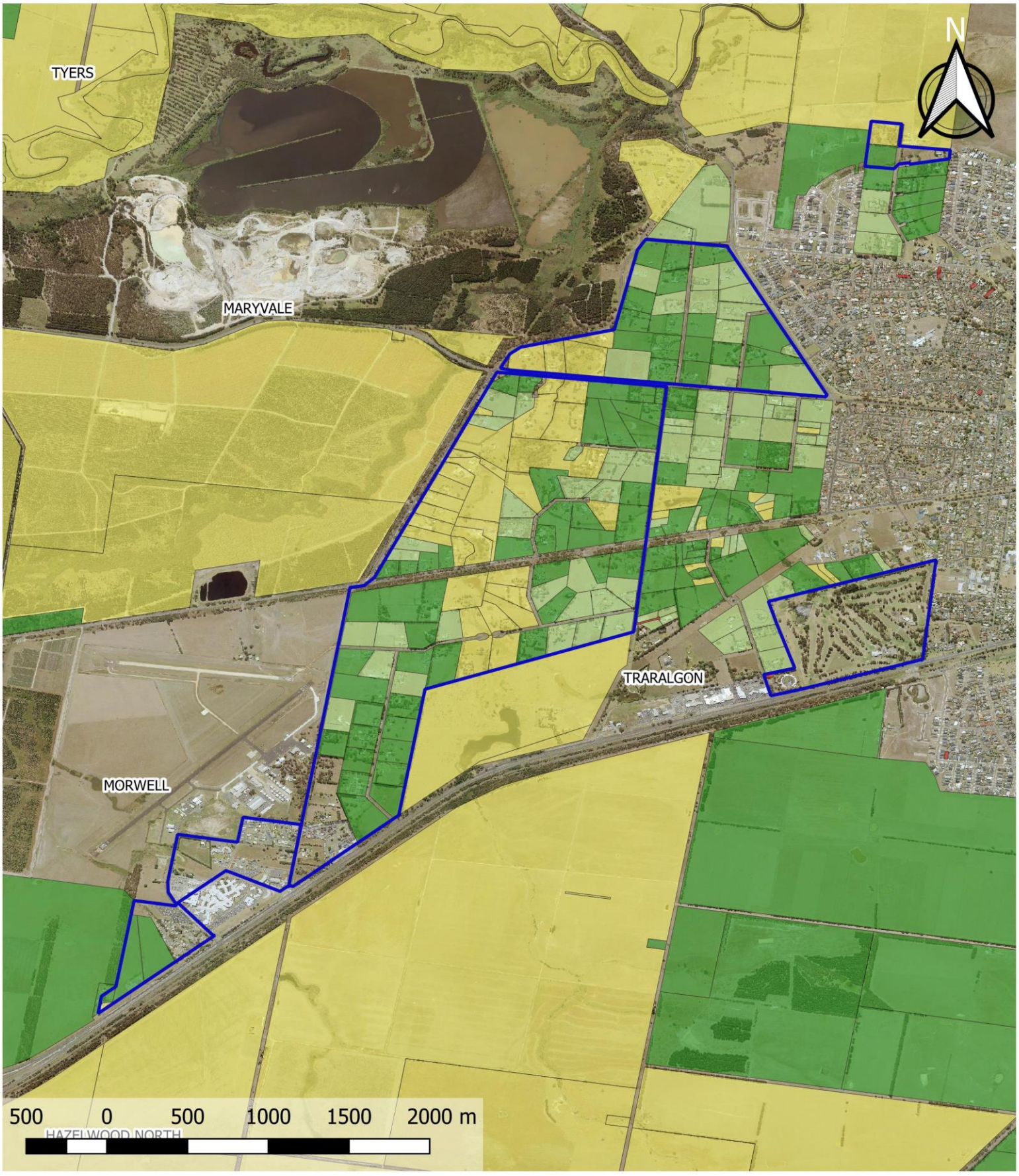

Figure 5-6 Land Capability Hazard Focus Area: Traralgon

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

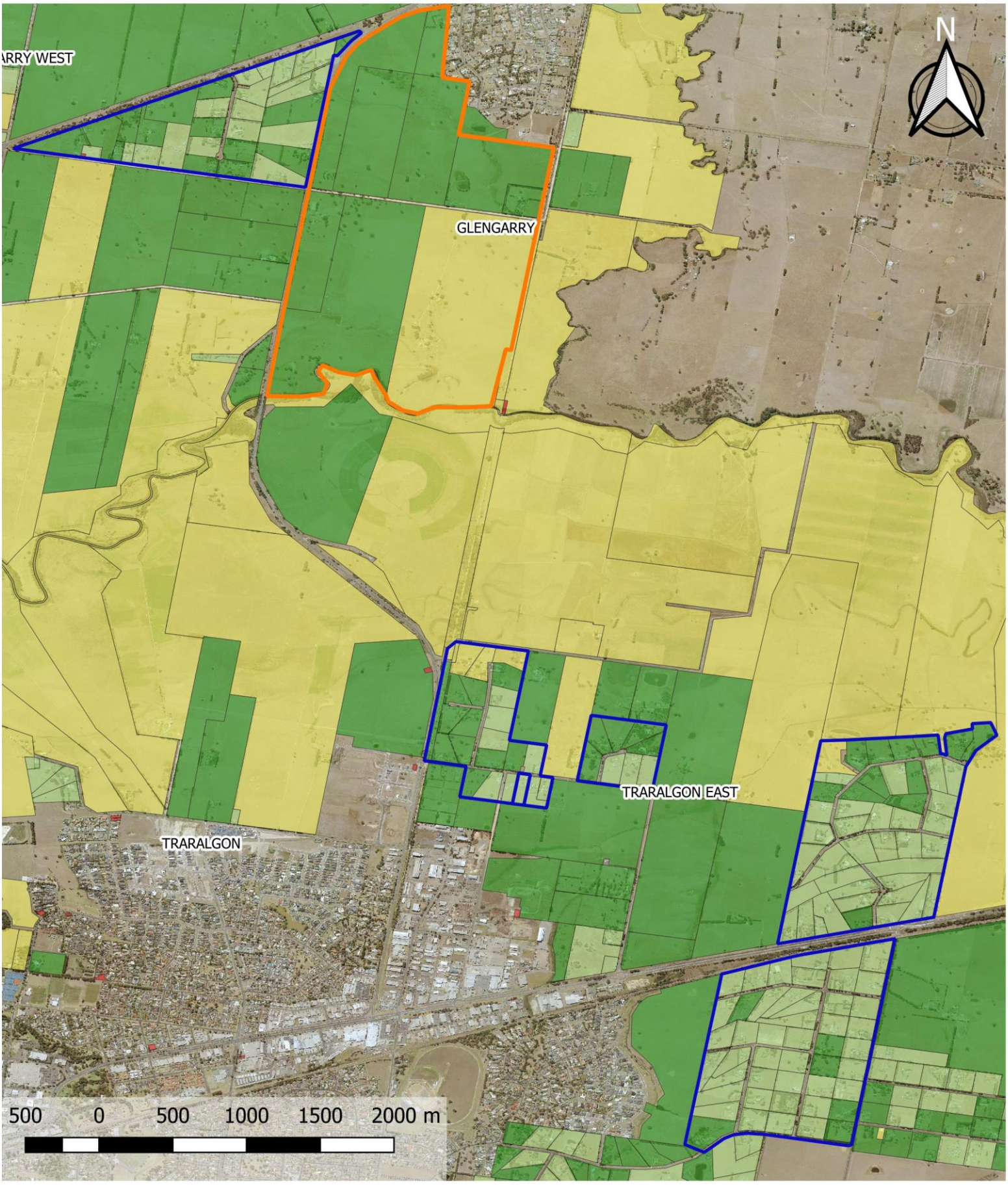

Figure 5-7 Land Capability Hazard Area: Traralgon East / Glengarry

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

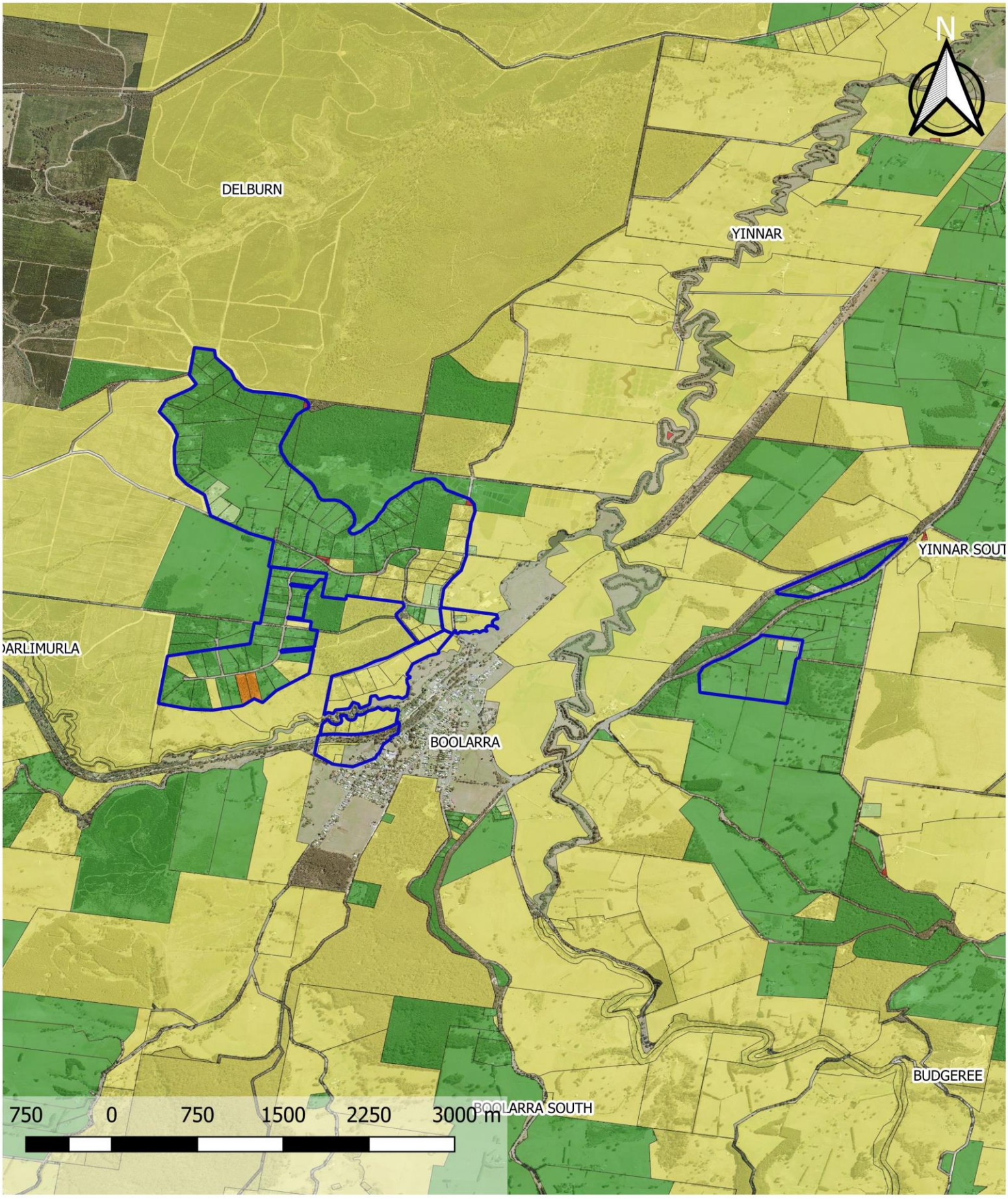

Figure 5-8 Land Capability Hazard Focus Area: Boolarra

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

Figure 5-9 Land Capability Hazard Focus Area, Traralgon South

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

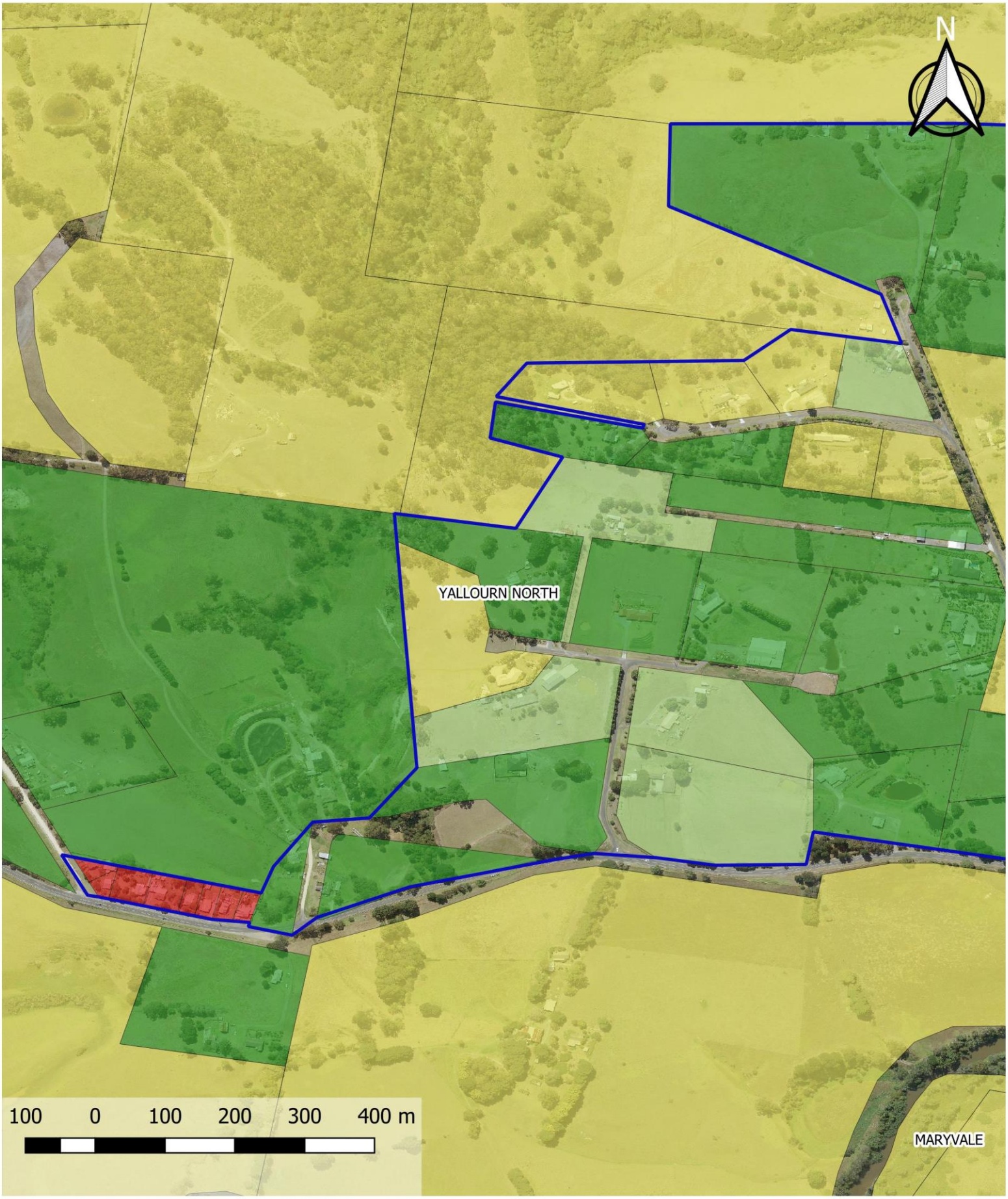

Figure 5-10 Land Capability Hazard Focus Area: Yallourn North

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

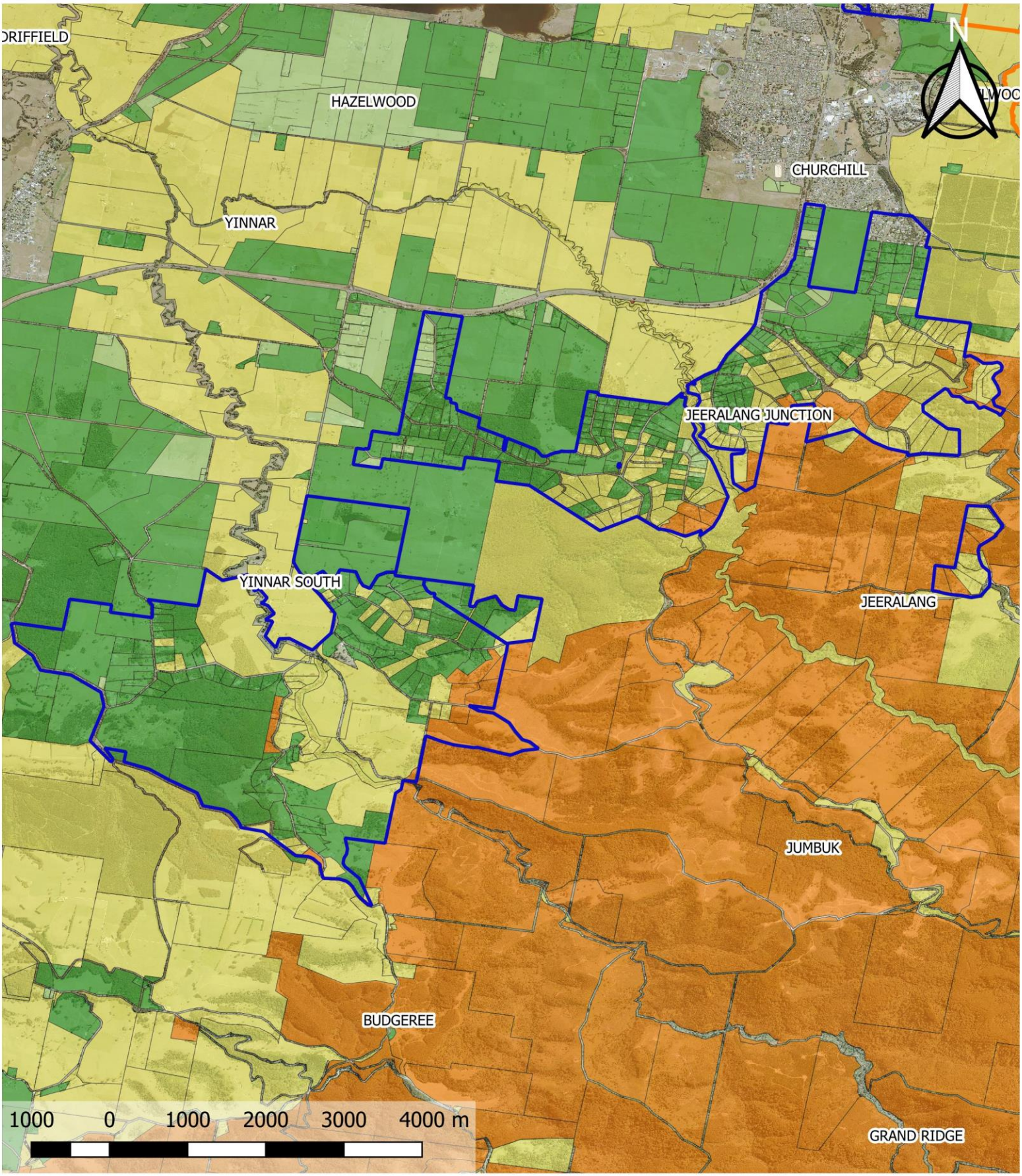

Figure 5-11 Land Capability Hazard Focus Area: Yinnar South / Jeeralang Junction

LC Hazard Mapping Classification
- Non CoS
- Very High Hazard
- High Hazard
- Medium Hazard
- Low Hazard

- Existing Rural Living Zone
- Future Rural Living Zone Investigation Area

DECENTRALISED WATER CONSULTING

5.3 On-site Wastewater System (Management) Hazards

DWC are currently undertaking analysis of available data on the type, age and spatial distribution of the various types of on-site wastewater management systems in the Latrobe municipality. Given Council are still in the process of importing permit data into their health and property data management systems, the analysis being undertaken as part of the DWMP process is preliminary only. The DWMP includes a recommend actions relating to both on-going data collection and incorporation into the quantitative domestic wastewater risk assessment.

Of primary interest is the location and number of systems that incorporate some form of off-site discharge. This typically occurs with older 'split' systems where greywater is directed to stormwater drains or older sand filter systems where treated sewage was permitted under EPA guidelines to discharge off-site on properties considered unsuitable for full on-site containment predominantly in the 1980's. Off-site discharge systems should form the focus of Council actions and efforts to understand and manage wastewater risks.

Based on best available data at the time of this DWMP preparation, there are approximately 5,000 on-site systems in the Latrobe Municipality. Table 7 summarises the breakdown of on-site system types in Latrobe. Table 8 and Table 9 summarise on-site system types for some of the key unsewered townships and localities. Council are continuing to import Septic Tank Permit data into the Health Manager system which will improve the accuracy and detail of these data.

Table 7 Summary of Existing On-site Wastewater Management Systems in Latrobe

System Types	Number	Percentage
Composting System	19	0.4%
Primary Treatment - Trenches/Beds	2,197	43.5%
Primary Treatment - Unknown	6	0.1%
Sand Filter – Subsurface Irrigation	198	3.9%
Sand Filter - Trenches/Beds	40	0.8%
Sand Filter - Unknown	3	0.1%
Secondary Treatment – Subsurface Irrigation	53	1.0%
Secondary Treatment – Surface Irrigation	29	0.6%
Secondary Treatment - Trenches/Beds	4	0.1%
Secondary Treatment - Unknown	19	0.4%
Split System	308	6.1%
Unknown	2,179	43.1%
Total	**5,055**	

Table 8 On-site Wastewater Management System Types for Localities

Suburb / Locality	Composting System	Primary Treatment - Trenches/ Beds	Primary Treatment - Unknown	Sand Filter - Subsurface	Sand Filter - Trenches/ Beds	Sand Filter - Unknown	Secondary Treatment - Subsurface	Secondary Treatment - Surface	Secondary Treatment - Trenches/ Beds	Secondary Treatment - Unknown	Split System	Unknown	Total
Boolarra	4	114	1	8	1	0	1	2	0	2	31	187	**351**
Budgeree	1	18	0	0	0	0	1	0	0	0	7	43	**70**
Callignee	1	117	0	7	3	0	1	1	0	2	2	42	**176**
Churchill	0	21	0	1	2	0	1	0	0	0	22	62	**109**
Cowwarr	0	10	0	2	1	0	0	0	0	0	0	15	**28**
Darlimurla	0	1	0	0	0	0	0	0	0	0	0	4	**5**
Driffield	0	15	1	1	1	0	1	0	0	0	1	41	**61**
Flynn	0	28	0	2	0	0	1	0	0	1	1	22	**55**
Glengarry	1	53	0	4	0	0	1	0	0	2	1	155	**217**
Grand Ridge	0	3	0	0	1	0	0	0	0	0	0	11	**15**
Hazelwood	0	534	1	31	5	0	12	4	0	3	13	216	**819**
Hernes Oak	0	53	1	1	1	0	1	1	0	1	21	64	**144**
Jeeralang	0	74	0	9	2	1	1	0	0	0	62	128	**277**
Jumbuk	0	6	0	0	0	0	0	0	0	0	4	14	**24**
Koornalla	0	26	0	3	3	0	3	2	0	0	0	8	**45**
Loy Yang	0	3	0	0	0	0	0	0	0	0	0	8	**11**
Maryvale	0	4	0	0	0	0	0	0	0	0	0	26	**30**
Mirboo	1	6	0	1	0	0	0	1	0	0	3	30	**42**
Moe	0	97	0	5	0	0	0	3	0	1	1	200	**307**

Suburb / Locality	Composting System	Primary Treatment - Trenches/ Beds	Primary Treatment - Unknown	Sand Filter - Subsurface	Sand Filter - Trenches/ Beds	Sand Filter - Unknown	Secondary Treatment - Subsurface	Secondary Treatment - Surface	Secondary Treatment - Trenches/ Beds	Secondary Treatment - Unknown	Split System	Unknown	Total
Morwell	0	35	0	9	1	0	5	1	1	1	4	84	**141**
Mount Tassie	0	0	0	0	0	0	0	0	0	0	0	3	**3**
Narracan	0	0	0	0	0	0	0	0	0	0	0	1	**1**
Newborough	1	35	0	5	1	0	2	1	0	0	0	88	**133**
Tanjil South	2	23	0	1	2	0	0	1	0	0	1	66	**96**
Toongabbie	0	69	0	10	3	0	1	1	0	0	1	112	**197**
Traralgon	4	164	0	34	2	2	9	1	1	2	14	83	**316**
Traralgon East	2	148	1	11	0	0	3	3	0	0	7	34	**209**
Traralgon South	0	159	0	10	4	0	5	2	0	0	0	17	**197**
Tyers	0	231	0	24	2	0	1	1	1	1	4	66	**331**
Yallourn	0	53	1	11	2	0	1	2	0	1	26	114	**211**
Yinnar	2	93	0	8	3	0	2	2	1	2	82	230	**425**
Unknown	0	4	0	0	0	0	0	0	0	0	0	5	**9**

Table 9 Percentages of On-site System Type by Locality

Suburb	Composting System	Primary Treatment - Trenches/Beds	Primary Treatment - Unknown	Sand Filter - Subsurface	Sand Filter - Trenches/Beds	Sand Filter - Unknown	Secondary Treatment - Subsurface	Secondary Treatment - Surface	Secondary Treatment - Trenches/Beds	Secondary Treatment - Unknown	Split System	Unknown	% of Total Systems
Boolarra	1%	32%	0%	2%	0%	0%	0%	1%	0%	1%	9%	53%	7%
Budgeree	1%	26%	0%	0%	0%	0%	1%	0%	0%	0%	10%	61%	1%
Callignee	1%	66%	0%	4%	2%	0%	1%	1%	0%	1%	1%	24%	3%
Churchill	0%	19%	0%	1%	2%	0%	1%	0%	0%	0%	20%	57%	2%
Cowwarr	0%	36%	0%	7%	4%	0%	0%	0%	0%	0%	0%	54%	1%
Darlimurla	0%	20%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%
Driffield	0%	25%	2%	2%	2%	0%	2%	0%	0%	0%	2%	67%	1%
Flynn	0%	51%	0%	4%	0%	0%	2%	0%	0%	2%	2%	40%	1%
Glengarry	0%	24%	0%	2%	0%	0%	0%	0%	0%	1%	0%	71%	4%
Grand Ridge	0%	20%	0%	0%	7%	0%	0%	0%	0%	0%	0%	73%	0%
Hazelwood	0%	65%	0%	4%	1%	0%	1%	0%	0%	0%	2%	26%	16%
Hernes Oak	0%	37%	1%	1%	1%	0%	1%	1%	0%	1%	15%	44%	3%
Jeeralang	0%	27%	0%	3%	1%	0%	0%	0%	0%	0%	22%	46%	5%
Jumbuk	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	17%	58%	0%
Koornalla	0%	58%	0%	7%	7%	0%	7%	4%	0%	0%	0%	18%	1%
Loy Yang	0%	27%	0%	0%	0%	0%	0%	0%	0%	0%	0%	73%	0%
Maryvale	0%	13%	0%	0%	0%	0%	0%	0%	0%	0%	0%	87%	1%
Mirboo	2%	14%	0%	2%	0%	0%	0%	2%	0%	0%	7%	71%	1%
Moe	0%	32%	0%	2%	0%	0%	0%	1%	0%	0%	0%	65%	6%
Morwell	0%	25%	0%	6%	1%	0%	4%	1%	1%	1%	3%	60%	3%

Suburb	Composting System	Primary Treatment - Trenches/Beds	Primary Treatment - Unknown	Sand Filter - Subsurface	Sand Filter - Trenches/Beds	Sand Filter - Unknown	Secondary Treatment - Subsurface	Secondary Treatment - Surface	Secondary Treatment - Trenches/Beds	Secondary Treatment - Unknown	Split System	Unknown	% of Total Systems
Mount Tassie	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Narracan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
Newborough	1%	26%	0%	4%	1%	0%	2%	1%	0%	0%	0%	66%	3%
Tanjil South	2%	24%	0%	1%	2%	0%	0%	1%	0%	0%	1%	69%	2%
Toongabbie	0%	35%	0%	5%	2%	0%	1%	1%	0%	0%	1%	57%	4%
Traralgon	1%	52%	0%	11%	1%	1%	3%	0%	0%	1%	4%	26%	6%
Traralgon East	1%	71%	0%	5%	0%	0%	1%	1%	0%	0%	3%	16%	4%
Traralgon South	0%	81%	0%	5%	2%	0%	3%	1%	0%	0%	0%	9%	4%
Tyers	0%	70%	0%	7%	1%	0%	0%	0%	0%	0%	1%	20%	7%
Yallourn	0%	25%	0%	5%	1%	0%	0%	1%	0%	0%	12%	54%	4%
Yinnar	0%	22%	0%	2%	1%	0%	0%	0%	0%	0%	19%	54%	8%
Unknown	0%	44%	0%	0%	0%	0%	0%	0%	0%	0%	0%	56%	0%

It can be seen that the majority of systems are traditional septic tank and absorption trench systems. More recently new Approval to Installs have included a higher proportion of secondary treatment systems and sand filters. Based on advice from Council, it is understood that a large proportion of Permits entered into the database did not contain sufficient information to classify the type of system (currently classified "Unknown"). These are typically older septic tank systems (mostly more than 30 years old) and are expected to include a reasonable number of split systems with some level of direct off-site discharge.

Existing on-site systems that typically pose a significant risk to human health and the environment are in higher proportions in Tyers, Yinnar and Jeeralang and moderate numbers in Yallourn, Herne's Oak, Churchill and Boolara. The majority are older (i.e. more than 30 years) "split" systems where greywater is typically piped off site via stormwater and only the blackwater is treated by septic tank and applied to land. These systems (especially when located in an area with small allotment sizes) have been shown to pose a significant risk to human health and water quality (BMT WBM, 2016). Implementation of alternative wastewater management solutions should be a priority for these sites.

While more traditional septic tank to absorption trench / bed systems can be a reliable and effective on-site wastewater management option, land capability characteristics in a number of unsewered areas in Latrobe do not favour this approach. Specifically, the combined impact of low permeability soils, climate, topography and presence of intermittent watercourses combine to make both the constructability and operational reliability of septic tank to trench / bed system limited. Comprehensive Land Capability Assessment (LCA) and on-going oversight are therefore critical to their effective performance.

The number and proportion of secondary treatment systems (including sand filters) will continue to grow in Latrobe as existing on-site systems are replaced and new unsewered development occurs. While these technologies are necessary on many sites to meet EPA Code of Practice requirements and overcome land capability constraints, they do inevitably require higher levels of maintenance to ensure effective operation. Scheduled maintenance and three yearly inspections are a condition of approval for secondary treatment systems.

It is recommended that on-site wastewater management system (on-site system) data continue to be refined and developed to enable Council to maintain an active register of higher risk existing on-site systems. Ideally, this should be linked with a spatial (GIS) mapping layer that enables Council to clearly identify hotspot areas that may warrant higher levels of operational oversight. As inspection data for existing systems grow, it can also be incorporated into this database.

This work will also enable operational risk to be overlayed with land capability risk to highlight the areas where the two types of hazard have the potential to create very high risk conditions. The most significant of these areas based on this DWMP Risk Assessment is Tyers with an alternative wastewater management solution essential to meeting regulatory requirements. Traralgon South has

also been identified as facing a combination of land capability and operational (on-site system) risks that require further investigation.

5.4 Unsewered Development and Septic Tank Permit Approvals

DWC have been consulting with Council's Strategic Planning staff to ensure the DWMP adequately aligns with current Planning Scheme and the Live Work Latrobe Strategy. This Strategy includes a number of Rural Living land use zones that are currently proposed as unsewered areas and therefore would depend on owner managed on-site systems for wastewater management.

The DWMP work discussed in Sections 5.2 and 5.3 will inform the development of recommended minimum standards for both subdivision and future Septic Tank Permit applications in relation to;

- Land Capability Assessment (LCA) standards;
- Cumulative impacts in constrained and/or sensitive areas; and
- Potential for deemed to comply rules that could be applied to these Rural Living developments.

DWC have also flagged some areas earmarked for unsewered development where land capability constraints may warrant further investigation prior to any rezoning. The DWMP contains Minimum Standards in Appendix B for LCAs and Septic Tank Permit applications that are risk based and applicable to the on-site wastewater risk classification assigned to each unsewered property in Latrobe. This will provide Council with a consistent framework and clear expectations for applicants to follow when preparing Permit applications for both unsewered subdivision or individual systems.

5.4.1 Property Size

Statistics were developed for property size across Latrobe municipality and these are summarised below in Table 10. As can be seen the typical lot size across Latrobe City area is large to very large, which is consistent with the low to moderate land capability hazard class identified for a large proportion of properties. DWC consolidated comprehensive minimum lot data (for sustainable on-site system installation) from previous projects undertaken for areas similar to Latrobe (large rural properties). Details of the data are provided in Appendix C.

The extensive data collated / analysed consistently indicates that lot sizes greater than 4,000 m^2 are likely to be capable of fitting a sustainable on-site sewage management system within the property assuming aspects such as native vegetation protection can be managed through site specific design and communication between relevant Council staff. This equates to the 10%ile lot size across Latrobe municipality and aligns with the low to moderate land capability hazard observed overall as there is typically sufficient useable land to manage these constrained and setbacks (if present).

Table 10 Latrobe Unsewered Property Size Statistics

Statistics	Approximate Lot Size (hectares)
10%ile	0.45
Median	2.2
Mean	20.1
90%ile	41.7

5.5 Key Outcomes of Risk Assessment

5.5.1 Land Capability Hazards

- Land Capability in Latrobe is generally moderately constrained with respect to safe and sustainable on-site wastewater management. However climate, low permeability soils, steep slopes and incised watercourses do pose a greater constraint in specific locations.
- Constraints can typically be managed through;
    - adequate minimum lot size (2ha is a recommended benchmark with 0.4 and 1ha by exception and with consideration of cumulative impacts);
    - increased Land Capability Assessment (LCA) and design detail on constrained properties to support Septic Tank and Planning Permit applications;
    - provision of secondary treatment to enable a wider array of land application options on more constrained lots with respect to soil, slope and watercourses; and
    - adequate maintenance and performance auditing (currently constrained by resources and regulatory powers).

5.5.2 Existing On-site Wastewater Management System Risks

There are approximately 5,000 existing On-site Wastewater Management Systems in the municipality. An initial compilation and cleaning of historical Septic Tank Permit data has been undertaken that identifies some gaps in understanding of the nature and condition of systems in Latrobe. Council are continuing to improve the accuracy and completeness of these data and the outcomes will be incorporated into the final DWMP.

Understandably, limited information is currently available on older systems which are anecdotally known to include a higher proportion of "split" systems that discharge wastewater off-site. It is recommended that Council undertake investigations to confirm the number and location of all off-site discharge systems in the municipality as a matter of priority. This will ensure resources are directed to the areas of highest risk.

The majority of existing systems in Latrobe are more traditional septic tank (primary treatment) systems that drain to an absorption or Evapo-transpiration / absorption (ETA) trench or bed. This approach remains to reliable option for larger properties (indicatively greater than 1ha) due to the lack of moving parts and reduced reliance on maintenance. However, many of the soils and climate in Latrobe pose challenges to the design and construction of trench / bed systems in accordance with the EPA Code of Practice and *AS1547:2012*. It is recommended that Council consider the development of a clear and consistent set of minimum standards for the design and construction of primary treatment to trench / bed systems to ensure that good quality outcomes are achieved for

Council and the property owner. This should include clear guidance on when septic tank to trench / bed systems will be considered and when they are not considered an acceptable long-term solution.

Notwithstanding, the primary risk factor associated with existing on-site systems is consistently the level of management and oversight applied to them on an on-going basis. Almost any on-site system will fail to meet community standards in the absence of an on-going operation, maintenance and monitoring program. Under current legislation, responsibility for operation and maintenance rests with the property owner whilst regulatory oversight rests with Council (for systems <5,000 L/day).

Under the impending revision of the SEPP (WoV), a DWMP is to "provide for the compliance assessment and enforcement of on-site domestic wastewater systems in accordance with the plan." It is recommended that Council investigate opportunities and funding mechanisms and potential legal options for establishment of a more comprehensive operational oversight program for on-site systems.

5.5.3 New Unsewered Developments

There have recently been approximately 25-35 new unsewered allotments created per annum in Latrobe which is a relatively modest number compared to other jurisdictions. The Rural Land Use Strategy (Planisphere, 2017) has identified the limited remaining Rural Living Zone land available for further subdivision to be a constraint to new unsewered dwellings.

There are also specific Rural Living Zone areas where slope / land stability and bushfire constraints limit or prevent the ability to meet the EPA Code of Practice with respect to on-site system approval. Land capability hazard mapping indicates that existing Rural Living Zones are moderately suited to unsewered development and diligent LCA and consideration of cumulative impacts is considered important to ensure both land use planning and environmental objectives can be met.

The evaluation of sustainable lot sizes for on-site wastewater management conducted as part of this DWMP support the recommended consolidation and refinement of Rural Living Zone Schedules in the Planning Scheme. While sustainable on-site wastewater management is achievable on lots that are 0.4 - 1ha in size, past experience in Latrobe and other jurisdictions has shown that site specific constraints and a greater reliance on diligent owner management can increase the risk of human health and environmental impact. As such, planning permit applications for new unsewered development proposing lot sizes less than 1 ha should be subject to a higher degree of scrutiny with respect to Land Capability Assessment and potential for cumulative / off-site impacts. They may also warrant a higher level of operational accountability.

DWC have previously applied the concept of "Useable Land" to provide a basis for increased levels of scrutiny and assessment for unsewered development. Useable Land can be defined as:

total allotment area excluding dams, intermittent and permanent watercourses, wetlands or waterbodies and open stormwater drains and pits in addition to the relevant buffer distances prescribed in the EPA Code of Practice for On-site Wastewater Management.

Where a proposed allotment can demonstrate 4,000 m^2 of Useable Land, Council can be comfortable that the objectives of the SEPP (WoV) will be achieved subject to typical on-site system design, construction and operational practices. Where this cannot be demonstrated, a higher level of assessment detail and Council scrutiny may be warranted. When used in conjunction with the Land Capability Risk Class, Useable Land enables constrained sites in close proximity to receiving environments to be targeted for this higher level of assessment including cases where site constraints render large portions of an allotment unavailable for effluent management.

DWC has also reviewed the Future Rural Living Zone Investigation Zones identified in the Rural Land Use Strategy using the Land Capability Risk Mapping developed as part of the DWMP (refer to Section 5.2 for details - in particular Figures 5-1 to 5-11). It is recommended that the Risk Mapping be used to inform further investigations into land capability and minimum lot sizes for these areas. The Toongabbie, Tyers and Glengarry Investigation Areas are considered to be well suited to future Rural Living development (subject to refinement of the RLZ Schedules as proposed). The Churchill Investigation Area is moderately suited and requires consideration of the presence of intermittent and permanent waterways to confirm an appropriate and sustainable minimum lot size. The Moe South Investigation Area features moderate to high constraints to on-site wastewater management. More detailed investigation is recommended should rezoning be progressed.

5.5.4 Risk Based Prioritisation

The limited availability of data confirming the type, age and condition of on-site systems in Latrobe limits the ability to incorporate Management Hazard into a quantitative prioritisation process. It is recommended that this be completed as data availability and accuracy improves. DWC have provided Council with a tool for calculating this order of priority as information is gathered during DWMP implementation (Appendix D). As an initial prioritisation process, land capability (using the proportion of Non-CoS and High/Very High on-site wastewater hazard class to set thresholds) has been used in conjunction with available Septic Tank Permit data and field inspections to group localities into "bands" of priority for inspection and development of alternative wastewater management solutions.

Table 11 Initial Prioritisation of Domestic Wastewater Risk Management Actions

Priority Band	Localities	Key Actions in this DWMP Period
Very High	Tyers, Traralgon South	Inspection ASAP to confirm existing system type and condition. Investigate alternative solutions or pursue rectification. Potential water quality monitoring of impact zones.
High	Isolated Non-containment (Non-CoS) properties and properties <4,000m^2. Yallourn North Jeeralang / Jeeralang Junction Boolarra	Inspection to confirm existing system type and condition. Seek rectification of failures to maximise containment. Implement finalised Minimum Standards in Appendix B for new Permits.
Medium	Moe South Yinnar South Traralgon (west) Hernes Oak Strzelecki Hills localities	Inspection to confirm existing system type and condition. Implement finalised Minimum Standards in Appendix B for new Permits.
Low	All other localities	Inspect if resources permit. Implement finalised Minimum Standards in Appendix B for new Permits.

These priority bands are considered an indicative guide to risk priority which can be strongly influenced by the age, type and condition of the existing system. A Priority Action has been put forward in Section 6 to investigate options for resourcing an on-going risk based inspection program. As part of this, it is recommended that the quantitative risk prioritisation tool be used to prioritise inspections based on site specific property characteristics.

The outcomes of the Domestic Wastewater risk assessment (as documented in Section 5) have identified two clear priorities in terms of managing off-site wastewater impact risks in the form of

Tyers and Traralgon South. In addition there are some more isolated non containment properties dispersed throughout other areas that should be inspected as a priority to confirm actual on-site system performance. It is estimated that approximately 10-15% of unsewered properties in Latrobe would be failing to contain wastewater on-site or pose a high risk of non-containment. Relative to other council areas, this is a modest number and likely to be strongly influenced by the much lower amount of Low Density Residential Zone (LDRZ) land in the municipality.

The remaining 85-90% of unsewered properties are able to contain on-site subject to adequate on-going management and consideration of site specific land capability constraints. It is recommended that a risk based on-site system inspection program and Minimum Standards are developed for Septic Tank and Planning Permit applications (initial examples of Minimum Standards are provided in Appendix B) to address this.

6 Domestic Wastewater Management Action Plan

The revised risk assessment documented in Section 5 has been used to identify priority areas and properties for improved wastewater management. Where high proportions of properties are at risk of not containing wastewater on-site, priority actions focus on progressing strategies, potential management frameworks and funding models for some form of managed wastewater service. For medium and lower risk areas / properties, actions focus on resourcing and implementing improved levels of oversight for on-site system operation and management.

6.1 Priority Actions

The following Actions are the 'highlight' or priority actions that have been identified through the DWMP process.

6.1.1 Review / Re-align an Alternative Wastewater Management Strategy for Tyers

Risks to human health and the environment from off-site discharges in Tyers remain very high and should be considered unacceptable. It remains the highest priority issue with respect to domestic wastewater management in Latrobe. It is understood that previous investigations and initiatives (some of which were completed by DWC's Director when employed by others) were progressed as far as possible with both the EPA and Gippsland Water.

It is recommended that the previous investigations be reviewed and updated to reflect the current state of legislation, technology and potential funding sources. Based on previous engagement with Gippsland Water, a revised business case may be warranted that considers alternative governance structures given the health and environmental risks associated with on-site systems in Tyers are significant and on-going. Appendix E contains an outline of potential alternative wastewater management strategies and management models that may warrant further investigation as part of DWMP implementation.

6.1.2 Traralgon South Wastewater Investigation

The risk assessment documented in Section 5 has identified Traralgon South as another area where the risk of off-site discharge would likely be elevated. This is the result of slightly smaller lot sizes combined with land capability constraints. Given the isolated nature of the community, the viability of connection to the Gippsland Water sewerage network is likely to be low. Initial desktop evaluation as part of the DWMP by DWC indicates that Traralgon South is likely to be well suited to a decentralised solution that may involve partial management on site with excess recycled water managed as a communal facility. Alternatively, more active management and oversight of exiting on-site systems may be adequate to manage risk.

It is recommended that investigations be undertaken in relation to Traralgon South to;

- better understand and quantify the risk posed by existing on-site systems and the sustainability of owner managed on-site systems;
- engage with residents to understand the extent of concern over wastewater management and willingness to participate in a community wastewater solution;
- investigate options for improved wastewater management in Traralgon South and develop a business case for potential access to external funding assistance.

6.1.3 Develop and Implement an On-site Wastewater Oversight Program

Of primary importance throughout most of Latrobe's unsewered areas is the need for on-going compliance oversight of on-site systems. The intention would be for a grading of inspection frequency and degree of enforcement action based on the broader priority bands presented in this DWMP (Table 11). It is recognised that this oversight regime would need to focus on higher risk properties as per the On-site Wastewater Risk Class developed from the land capability mapping layer and existing on-site inspection data (where available).

It is recommended that an initial inspection of all properties (excluding those already inspected) is completed in order of risk priority (see Table 11) for the following purpose.

- To obtain accurate data on type, age, condition, location and size of each system; and
- (Where possible) to engage with the resident on the importance of managing their system, guidance on the 'do's and don'ts' and why Council are conducting inspections.

Once this initial inspection has been completed, Table 12 summarises a recommended inspection / oversight program for Latrobe.

Table 12 Proposed On-site Wastewater Oversight Program

Inspection Frequency	Priority Band (See Table 11)	Follow Up on Required Works
Annual	Very High (excluding Non-containment properties[1]). Any property identified as having a major non-compliance requiring rectification[2].	Follow up within 3 months to ensure completion of required works.
Two-yearly	High Risk (excluding Non-containment properties[1]).	Follow up within 6 months to ensure completion of required works (minor non-compliances only).
Three-yearly	Medium Risk Any system with Permit condition requiring a 3-yearly inspection.	Follow up within 12 months to ensure completion of required works (minor non-compliances only).
Five-yearly	Low Risk[3]	

1. *Non-containment properties will be considered as part of development of any whole town solution or mitigation strategy.*
2. *Major non-compliances typically involve the failure of land application areas and off-site discharge of wastewater that was not originally approved or major structural / operational failure.*
3. *Where a new system is approved and installed on a Low Risk property, it may be adequate to rely on a 3-5 yearly check by a licenced plumber or drainlayer.*

The biggest challenge for all Victorian council's is the establishment of a long-term funding mechanism for this oversight and enforcement capability. This DWMP includes a small number of potential options for resourcing of the oversight program that will require further examination to confirm feasibility and acceptability to Council and the community.

It is recommended that Council prepare a business case for increased Domestic Wastewater Management oversight that strikes a balance between cost burden on the community, management of risk and fulfilment of Council's legislative obligations. This should include community engagement on both the risks / impacts of on-site systems and seeking feedback on community willingness to pay for improved oversight.

While this business case may not progress to implementation, as a minimum it enables Council to demonstrate it has actively sought to meet its domestic wastewater management obligations under the SEPP (WoV).

Three potential DWMP funding models are currently being considered for Latrobe City (noting these are to be finalised as part of DWMP implementation).

- Utilise general Council revenue based on the human health and environment protection benefits to the community.

- Increase in Septic Tank Permit fees to allow for oversight of Permit condition compliance.
- Potential establishment of a Local Law to enable a levy to be charged.

There are other, external funding mechanisms that may also be available such as application of a charge associated with septic tank desludging and disposal. Additionally, systems approved since (approximately) 1999 typically have a condition on their Permit requiring three yearly checks by a licenced drainlayer. For these systems, the cost of this inspection would be borne by the property owner. This approach does not always provide the community with the best value for money and can be challenging to enforce and oversee (resulting in higher costs also).

6.1.4 DWM Information Collection and Management

Council have been steadily progressing an information audit of Septic Tank Permit data and importation into both Environmental Health and Property Management Systems. This process is critical to improved management of Domestic Wastewater Management (DWM) risks. The DWMP also puts forward some additional options to streamline information collection and management for DWM as new Permit Applications are submitted of system inspection undertaken.

The DWM Hazard Mapping can potentially form the basis for an Area wide information management system for DWM systems. As information is input into Health Manager, it could be also directly updated in a mapping layer on intranet mapping.

6.1.5 Ensuring Future Unsewered Development is Safe and Sustainable

There are a number of other localities where on-site containment can be achieved subject to management of constraints. Some examples include Yallourn North, Glengarry North, Moe South, Hernes Creek and other areas. Constraints include soil, incised watercourses and soils with poor suitability for effluent land application. In addition to this, the Live, Work, Latrobe Strategy (draft) currently identifies a number of areas for potential Rural Living zoning through a Plan Change.

Section 5.4 and 5.5.3 of this DWMP utilised the DWM Hazard Mapping prepared as part of risk assessment activities to set risk based Minimum Standards for the following (but not limited to) elements of DWM. Indicative examples of these Minimum Standards are provided in Appendix B and will be refined and finalised as part of DWMP implementation.

- Investigation, design and impact assessment requirements for unsewered Planning Permit and Septic Tank Permit applications.
- Triggers for completion of Cumulative Impact Assessments for new unsewered development that considers the impact of land capability of the amount of "useable land" on a site for DWM (as discussed and defined in Section 5.5.3).
- Additional requirements for non-residential DWM systems approved under the Septic Tank Permit system (<5,000 L/day).

- Policy positions for common challenges / constraints that impact on the ability to contain wastewater on-site (e.g. water supply catchments, land stability, bushfire management, flood risk, vegetation protection overlays)
- Risk based Septic Tank Permit conditions for on-going operational compliance requirements.
- Risk based requirements for designer certification of new DWM systems.

6.2 Full Action Plan

At present, resourcing for Domestic Wastewater Management (DWM) obligations is limited primarily to Septic Tank Permit application assessment, response to complaints and addressing high risk on-site system failures that pose an immediate health risk. The following Action Plan has been developed with a view to balancing cost of implementation against Council's DWMP obligations under the SEPP (WoV) and the outcomes of the DWM Risk Assessment documented in Section 5. Implementation of the Action Plan will require resourcing beyond the existing situation. Consequently, investigations into potential long-term funding models is identified as a High Priority Action under the DWMP.

The wastewater management strategy for Tyers township (Action 1) has been initially costed based on the previous report prepared by Whiteheads and Associates (2008) with adjustment for inflation. This costing is indicative only to provide an initial cost range for further consideration and would require a formal costing process to be undertaken.

Table 13 Latrobe Domestic Wastewater Management Action Plan

Action	Action Steps	Responsibility	Resourcing	Timing
Action 1 **Very High Priority** Review and progress an alternative wastewater management strategy for the Tyers township.	1. Review and refresh previous investigation and business case. 2. Engage with Council, Victorian Agency and Community Stakeholders to identify potential funding and management opportunities. 3. Seek approval for a preferred governance and business case. 4. Develop and implement or mitigate impacts.	LCC Environmental Health LCC, EPA, Gippsland Water, DELWP LCC Environmental Health	TBC ($10k-$15k) Approx. $1.5-1.8M (adjusted for inflation)[1]	DWMP Year 1 DWMP Year 1 DWMP Year 1-2 DWMP Year 3-5?
Action 2 **High Priority** Develop Funding Models for On-site Wastewater Oversight / Compliance Program and Implement	1. Evaluate potential funding models and make recommendation to LCC. 2. Seek approval for funding model. 3. Implementation (prioritised based on Permit Data analysis and risk)	LCC Environmental Health	No additional Approx. 1 FTE staff + vehicle (approx. $120k p.a. including overheads)	DWMP Year 1 DWMP Year 1 DWMP Year 2
Action 3 **High Priority** Investigate the need for an alternative wastewater servicing strategy for Traralgon South.	1. Conduct a town specific on-site containment risk assessment that builds on DWMP. 2. Engage with the Traralgon South community to determine interest in alternative strategies. 3. Complete an options study in consultation with Gippsland Water and the EPA to confirm a preferred long-term strategy. 4. Prepare Business Case if alternative solution is identified as preferred.	LCC Environmental Health LCC Environmental Health LCC Environmental Health, Gippsland Water, EPA LCC Environmental Health	TBC ($15k-$20k)	DWMP Year 2 DWMP Year 2 DWMP Year 3 DWMP Year 4-5
Action 4 **High Priority** DWM Information Collection and Management	1. Complete importation and review of existing Septic Tank Permit data. 2. Create a baseline Septic Tank Permit mapping layer.	LCC Environmental Health LCC Environmental Health / IT	No additional	DWMP Year 1

Action	Action Steps	Responsibility	Resourcing	Timing
	3. Establish procedure for direct input of all new Permits' data as they are approved.			
Action 5 **Moderate Priority** Establish Minimum Standards for Septic Tank and Planning Permit Applications	1. Refine and finalise Minimum Standards Tables in Appendix B. 2. Conduct Consultant and Installer Information Sessions 3. Implement and Update as Required	DWC LCC Environmental Health	As part of DWMP Existing budget	DWMP Finalisation DWMP Year 1 DWMP Year 1
Action 6 **Moderate Priority** Ensure DWMP Risk Assessment Outcomes are incorporated into Live Work Latrobe Strategy	1. Finalise DWM Risk Profiling of current and potential future RLZ areas. 2. Undertake cumulative impact / minimum lot size assessments to confirm requirements for final proposed RLZ areas. 3. Confirm any specific assessment requirements.	DWC LCC Environmental Health LCC Environmental Health	As part of DWMP TBC ($5k-$10k)	DWMP Finalisation As per Live Work Latrobe timing
Action 7 **Low Priority** DWM Impact Monitoring Program	1. Evaluate potential for an on-going water quality monitoring program in high risk areas.	LCC Environmental Health	TBC (monitoring program indicatively $10k-$40k p.a.)	DWMP Year 3
Action 8 **Low Priority** DWMP Action Plan Review	1. On-going evaluation against Action Plan 2. Adapt DWMP Actions as required based on available funding and previous action outcomes. 3. Full DWMP Review	LCC Environmental Health	Existing	Annually Annually DWMP Year 5
Indicative Budget Estimate for DWMP Action Plan Implementation	**$140k-$170k p.a. over five years** (excludes implementation of solution for Tyers or Traralgon South)			

Note 1: Based on previous investigations by Whitehead & Associates (2008).

6.3 Community and Stakeholder Engagement

DWC has assisted Council in conducting community and Victoria agency engagement during the preparation of this draft version of the Domestic Wastewater Management Plan (DWMP). Engagement activities included the following.

- Internal Council and Victoria agency workshop (November 2018).
- Completion of two sets of community information and engagement sessions in November 2018 and January 2019.
- Notification of the opportunity to make submissions on the DWMP development via mail-outs, social media and the LCC website.
- Opportunity to submit via the Council "Your Say" website or in writing up until the end of February 2019.

Appendix F contains the outcomes of consultation and engagement to date including the current actions and/or response in relation to any concerns raised. Submissions were received from 4 community members, one Land Capability Consultant and Gippsland Water. Key feedback from community engagement sessions has also been included.

A number of the proposed adjustments to the DWMP have already been made with the remaining changes to be completed following public exhibition of the Plan.

7 References

BMT WBM (2012) *Assessment of On-site Containment: Park Orchards Case Study*. Yarra Valley Water.

BMT WBM (2015a) *Park Orchards Trial Project: Preliminary Design Package Volume 1*. Yarra Valley Water.

BMT WBM (2015b) *Integrated Water Cycle Planning for Community Sewerage Areas Case Study – Monbulk*. Yarra Valley Water.

BMT WBM (2016) *Park Orchards Trial Project: Baseline Monitoring Program Technical Review*. Yarra Valley Water.

DELWP (2017) Integrated Water Management Framework for Victoria.

EPA Victoria (2016) *Code of Practice for Onsite Wastewater Management*. Publication 891.4.

Infocus Management Group (2006) *Municipal Domestic Wastewater Management Plan*. Latrobe City Council.

Municipal Association of Victoria (2014) Victorian Land Capability Assessment Framework.

Planisphere (2017) Rural Land Use Strategy – Live Work Latrobe. Latrobe City Council.

Standards Australia (2012) *AS/NZS1547:2012 On-site domestic wastewater management.* Standards Australia.

Victorian Auditor-General's Office (2018) *Managing the Environmental Impacts of Domestic Wastewater.*

Whitehead & Associates Environmental Consultants Pty Ltd (2008) *Options for an Innovative Wastewater Management Scheme for Tyers*. Latrobe City Council.

Appendix A On-site Containment and Land Capability Risk Assessment Methodology

A1 Weighted Hazard Score for On-site Containment

Properties with potential for containment on-site (CoS) were classified based on the potential risks and impacts associated with on-going on-site wastewater management. A detailed description of the weighted hazard scoring system is provided in the following tables. There are three Head Criteria used to calculate the CoS Hazard Score. These scores are determined through direct GIS queries and analysis with the land capability hazard calculated using four sub-criteria.

A1.1 Primary On-site Containment Hazard Criteria and Risk Framework

*CoS Hazard = (Land capability hazard*0.5) +(Receiving Environment: Proximity*0.25)+(Receiving Environment: Sensitivity*0.25)*

Head Criteria	Classification	Hazard	Score	Weight	Description
Land capability hazard	Hazard score <0.95 in Land Capability hazard score	Low	0	50%	Few / minor land capability constraints to on-site wastewater management.
	Hazard score >=0.95 and <2 in Land Capability hazard	Medium	1		Some moderate land capability constraints to on-site sewage with potential to increase failure rates
	Hazard score >=2 in Land Capability hazard score	High	2		Significant land capability constraints which have a high potential to increase failure rates
Receiving Environment: Proximity	Property outside of setback area	Low	0	25%	Limited to no proximity risk
	Receiving environment setback intersects boundary	Medium	2		Risk may be elevated, particularly where other constraints exist or COS is marginal
	Receiving environment itself intersects boundary	High	3		High risk - careful design and oversight required as likelihood of impact high in failure event
Receiving Environment: Sensitivity	None present / >setback distance	Low	0	25%	Self-explanatory – acceptable risk
	Stormwater drain				Typical swale drains on street or piped system
	Degraded or cleared intermittent drainage line.				Gully lines with predominantly grass cover and some scattered trees and shrubs.
	Dam / small waterbody (Upslope)	Medium	2		Farm dams possibly used for irrigation of edible crops or watering livestock
	Partially vegetated / rehabilitated ephemeral waterways				Some ecosystem value, seeking to not degrade further.
	Open stormwater drains in public places				Adjacent to and within parks, reserves, schools, shops.
	ESO vegetation communities (non-riparian)				Non-riparian ESO (or bioregion) polygons
	Non-potable groundwater bore				Domestic stock and irrigation bores from available data
	Potable water supply catchment	High	3		Protection of human health (priority)
	Potable groundwater bore				Protection of human health (priority)
	Permanent watercourse / waterbody (Upslope)				Perennial or near perennial streams and rivers, or large lakes and reservoirs.
	ESO (high value) aquatic ecosystems				Riparian polygons of ESOs and bioregions

ESO = Environmental Significance Overlay; *LAA=Land Application Area*

A1.2 Land Capability Hazard Sub-criteria

Land capability hazard score equation is as follows.

*(Slope hazard*0.4)+(Soil hazard*0.3)+(Drainage Hazard*0.1)+(Climate*0.2)*

Criteria	Value	Hazard	Score	Weight	Notes
Slope (area weighted average)	<10%	Low	0	40%	No impact on design or function
	10-15%	Medium	2		Some constraints to land application, breakout risks
	15-30%	High	3		High risk of design failure or effluent breakout
	>30%	Prohibitive	Prohibitive		Land application prone to failure regardless of management (Very High Hazard)
Soil	<1.5	Low	0	30%	Soil hazard was assessed and calculated as per BMT WBM (2012, 2015a & 2015b).
	1.5-2.5	Medium	2		
	>2.5	High	3		
Climate	≤3 months where RF > PET	Low	0	20%	Monthly average rainfall exceeds potential evapotranspiration only for a small number of months.
	4 to 5 months where RF > PET	Medium	1		Rainfall exceeds potential evapotranspiration for close to half of the year.
	≥6 months where RF > PET	High	2		Rainfall exceeds potential evapotranspiration for half or greater of the year (soils expected to be consistently moist).
Drainage Class	>Mod. well	Low	0	10%	Free draining soils, ridges, upper and mid slopes
	Imperfect	Medium	1		Imperfectly drained soil profiles, lower slopes (footslopes)
	<Poor	High	2		Poorly drained landscapes, depressions, water accumulation, swamps, floodplains

A1.3 Red flags

The need for a number of "red flags" was identified during groundtruthing and development of the Framework. Red flags represent more significant or extreme conditions associated with a specific criterion that have a significant and in some cases prohibitive impact on the ability to CoS.

Table 14 Land Capability Hazard Red Flags

Occurrence	Outcome	Purpose
Land capability = High	CoS Hazard Class = High automatically assigned.	Avoid significant and extreme (e.g. steep slopes and shallow soils) constraints on large lots that are not close to sensitive environments from being diluted.
Lot size <4,000m^2 = High		These sites will be highly dependent on site specific land capability constraints and proximity to sensitive receiving environments. A more detailed LCA and design process is likely to be required to ensure full containment in addition to higher level treatment and greater construction and operational oversight.
Receiving environment proximity = High		Capturing otherwise unconstrained lots that either contain or are immediately adjacent to sensitive receiving environments (i.e. if failure occurred there is limited assimilative capacity).
Receiving environment sensitivity = High		As above but capturing the need for greater vigilance where an on-site system is close to a high value or highly sensitive receiving environment (e.g. potable water supply catchment).

A2 Receiving Environment Analysis

Receiving Environment hazards were assigned the relevant Sensitivity hazard (as defined in 0 above) and applied to each of the unsewered properties within the LGA which contained the individual hazard. A Receiving Environment Proximity hazard of 3 (high) was applied to each property in which the relevant hazard polygon or line intersected the property boundary. If the Receiving Environment (RE) hazard buffer (setback) area intersected the property boundary, a RE Proximity hazard of 2 (medium) was assigned. The flooding and ESO hazard layers were not buffered and therefore were assigned a uniform RE Proximity hazard of 2 (medium). Details of each of the specific RE constraints which were considered are discussed below.

A2.1 Watercourses

The watercourse layer ('Hydroline') was found to correlate quite well with intermittent waterways and drainage lines across the LGA. Therefore, these were buffered by 30 metres (EPA CoP setback distance) and given the appropriate Receiving Environment Sensitivity hazard (Medium). The watercourse layer also correlated well with permanent waterways within the LGA and this was buffered by 60 metres and given an increased RE Sensitivity hazard (High). For properties ≥4,000m^2 in which a watercourse intersects the property boundary a Medium RE Proximity hazard was assigned to capture the improved ability for a land application area to be located on larger lots with sufficient setback to this constraint. High RE Proximity hazard was assigned if the property was <4,000m^2.

A2.2 Waterbodies

Dams and other waterbodies were mapped within the 'Hydroarea' layer provided by Council. Small waterbodies (e.g. farm dams) was buffered by 30 metres and assigned a Medium RE Sensitivity hazard whilst larger waterbodies were buffered by 60 metres and assigned a High RE Sensitivity hazard. For properties ≥4,000m^2 in which a small waterbody (farm dam) is located within the property boundary a Medium RE Proximity hazard was assigned (as discussed above for watercourses). High RE Proximity hazard was assigned if the property was <4,000m^2.

A2.3 Groundwater

Groundwater bore locations were sourced from the Victorian Government online data portal ('NGIS_Bores'). All bores known to be potable water sources were buffered by 100 metres and assigned with a High RE Sensitivity hazard. There is some uncertainty around currency, accurateness and completeness of groundwater bore data and therefore bores assigned as non-potable or unknown were not included (given the board-scale nature of the mapping).

A2.4 Environmentally Significant Vegetation

The Council planning overlay was used to extract areas classified specifically as part of the 'Environmental Significant Overlay' (ESO). This was combined with the 'Native Vegetation – Bioregional Conservation' layer obtained from Vic Gov data portal. No buffer was applied to this combined ESO / Bio-conservation region and therefore it is assigned a uniform RE Proximity hazard of 2 (medium).

In order to identify high value (Riparian) ESO / Bio-conservation areas, permanent watercourses (with 30m buffer applied) was used to identify these areas and assign a High (3) RE Sensitivity hazard to any properties within this region. All other ESO / Bio-conservation areas were assigned a Medium (2) RE Sensitivity hazard.

A2.5 Flooding

Flood risk areas were identified via the Council planning overlay to determine properties within the 'Floodway' or 'Land subject to inundation' planning regions. Properties that were within these areas were assigned a medium RE Proximity hazard (and therefore minimum Medium Hazard classification) to flag this potential land capability constraint for installation of a suitably sized on-site wastewater management system.

A2.6 Stormwater

Stormwater drainage infrastructure data was provided by Council and was predominantly located within areas serviced by reticulated sewer. Open stormwater drainage was not a key hazard concern in public places such as parks and reserves, and sufficient setbacks to open roadside swale drains were typically able to be achieved.

A3 Soil Hazard

Soil hazards relevant to on-site wastewater management have been evaluated using the parameters / system documented in the tables below. Initial classification has been based on best available broad scale soil landscape mapping and data. Groundtruthing field verification includes completion of soil investigations across Latrobe at a number of representative locations. The focus was on the key / dominant soil landscapes and areas where there was uncertainty around soil characteristics and/or soil hazard was important for the overall Hazard Class. This also included collection of soil samples for laboratory analysis for a number of key soil landscapes.

Table 15 Parameters for Soil Hazard Derivation

Hazard Type	Parameter	Hazard Class	Description	
Depth Hazard	Profile Depth	Low	Greater than 1.5 metres profile depth	Greater depths of unsaturated soil provide increased treatment of effluent and reduced potential for lateral water movement.
		Medium	0.8 – 1.5 metres profile depth	
		High	Less than 0.8 metre profile depth	
Hydraulic Hazard	Texture	Low	Pedal loam to clay loam soils with mid-range permeability and moderate to free drainage.	
	Structure	Medium	Generally imperfectly drained, weakly structured clay loams and light clays or deep, rapidly drained sands (e.g. sand hills).	
	Indicative Permeability	High	Generally, shallow, structureless clays and sands in either very rapidly or very poorly drained landscapes.	
	Drainage			
Pollution Hazard	Nutrient Retention	Low	Generally, soils with high cation exchange (CEC) and / or phosphorus sorption capacity, no sodicity potential and good organic content in topsoil.	
	Sodicity	Medium	Generally, soils with moderate CEC, phosphorus sorption capacity, minor sodicity potential and moderate organic content in topsoil.	
	Organic Content	High	Generally, soils with low CEC, phosphorus sorption capacity, sodicity potential and/or limited organic content.	

Table 16 Weighted Average Logic for Soil Hazard Class

Hazard Score	Hazard Type	Weighting	Calculation
Low=1	Depth	1.5	**Final Hazard Class** = [(Depth HS x w) + (Hydraulic HS x w) + (Pollution HS x w)] / 3 **Weighted average hazard classes** 1 – 1.5 = Low Soil Hazard 1.5 – 2.5 = Medium Soil Hazard 2.5 – 3 = High Soil Hazard
Medium=2	Hydraulic	1	
High=3	Pollution	0.5	

A4 Slope and Drainage Hazard

Elevation contours (1 and 2 metre) and DEM data points were available for sections of the LGA but no complete data was available from LCC. Therefore contours and slope grid were created within QGIS based on the Vicmap 10m Digital Terrain Model (DTM) available for the entire LGA. This assisted with evaluation of topographical, hydrologic and landscape constraints. The slope grid created from the DTM provided a broad desktop assessment of variability in slope, from which assumptions were evaluated and verified during groundtruthing.

The drainage hazard was inferred from the general soil atlas data layer (provided by LCC) based on identifying board areas in which poor drainage was likely to be a constrain to effluent management. The High Drainage Hazard areas predominately consisted of low-lying floodplains with incised watercourses present.

A5 Climate Hazard

A general climate analysis across the LGA was undertaken to provide an assessment of the degree to which climate limits or enhances opportunities for the land application of effluent. The Climate Hazard analysis classifies the Latrobe LGA based on the number of average climate months where rainfall exceeds potential evapo-transpiration (PET).

This provides a general spatial representation of periods where enhanced deep drainage or surface surcharging of effluent is more likely to occur because evapo-transpiration is providing limited or no assistance in assimilating wastewater. Conversely areas (grid cells) with limited or no average months where PET is greater than rainfall generally represent sites with good evapo-transpiration capacity available for effluent assimilation.

The baseline data layers used include;

- 2.5 km^2 grid of mean monthly rainfall (Bureau of Meteorology Climate Atlas) www.bom.gov.au/climate/averages/climatology/gridded-data-info/metadata/md_ave_rain_1961-90.shtml
- 10 km^2 grid of mean monthly areal Potential Evapo-transpiration (BoM Climate Atlas)

http://www.bom.gov.au/climate/averages/climatology/gridded-data-info/metadata/md_ave_et_1961-90.shtml

The rainfall and evapotranspiration data for each month were converted from lat/long co-ordinates to an MGA projection and then converted to a 40m grid cell size for consistency.

The final output of the RF minus PET monthly grid analysis was an approximation of excess rainfall for each month of an average statistical year. The results of this were used to determine an appropriate spatial climate hazard level across the LGA.

The climate hazard layer was created through classification of grid cells in accordance with the following conditions.

Low hazard: ≤3 months where RF > PET

Medium hazard: 4 to 5 months where RF > PET

High hazard: ≥6 months where RF > PET

A6 Groundtruthing

DWC conducted field groundtruthing of the land capability hazard mapping in August 2018. Twenty five sites were assessed based on the risk / hazard classification Framework detailed above. Sites were selected to maximise benefits of field checking by;

- concentrating on locations where land capability inputs (i.e. the inputs subject to the most uncertainty) had the potential to influence the final Land Capability Hazard Class (e.g. soil landscapes which covered a large proportion of the Latrobe municipality);
- identifying sites where there was observed uncertainty in the individual parameters used to assign a hazard class (e.g. near a soil landscape boundary or area of variable slope); and
- concentrating on areas with higher densities of on-site systems or known performance issues.

Groundtruthing involved visual checking of each site against the tables in Section A1 above. It also involved some checking of soil hazard class against key criteria set out in Section A3. Hazard mapping was then checked via a laptop and GPS at each site with results recorded with supporting photography.

The results found no significant discrepancies in the Land Capability Hazard Class for the groundtruthing sites. General comments / limitations were as follows.

- Slope Hazard is based on the best available and most consistent data across the municipality, however as it is based on 10m DTM grids it will not necessarily pick up subtle changes across sites. It is appropriate for broad-scale mapping such as this.
- The Native Vegetation (Bioregional Conservation) data utilised as part of the ESO vegetation hazard has variable accuracy regarding actual vegetation location, however is it sufficient given the broad-scale nature of the mapping and is the best data available.

Appendix B Minimum Standards – Septic Tank Permits & Subdivision

Domestic Septic Tank Permit

The flow chart below outlines the pathway for assessing a septic tank permit for a new domestic system or alternation to an existing system. The Minimum Standards for assessment and design are dependent on the On-site Hazard Class (discussed in Section 5) for the specific unsewered domestic site. An **example** minimum standards checklist is presented below in Table 17 for Low to Medium Hazard sites. The intention is that a consultant can undertake a simple domestic wastewater system design and report provided the Minimum Standards are achieved. In addition, **example** minimum standards for properties classified as High / Very High Hazard and Non CoS (and where Low / Medium minimum standards are not achieved) is presented below in Table 18.

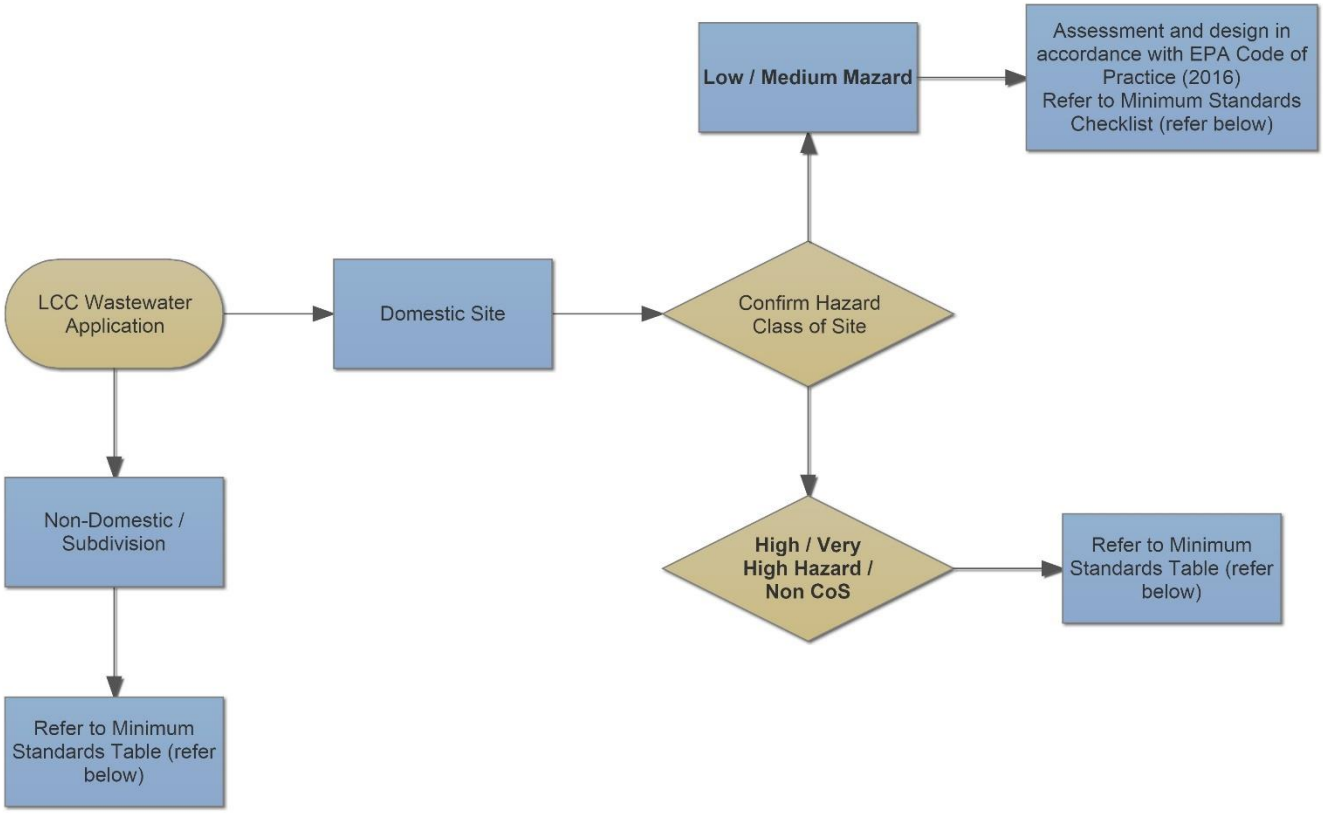

Table 17 Low / Medium Hazard Minimum Standards

1. Site Assessment	Low / Medium Hazard	
	Limit	**Comply (tick or cross)**
Aspect/exposure of disposal area (sun and wind)	**Moderate/High**	
Slope of disposal area	**<20%**	
Flooding – is the property flood prone?	**> 1 in 20 year ARI**	
Depth to bedrock or hardpan? (below point of effluent application)	**> 0.6metres**	
Depth to groundwater? (below point of effluent application)	**> 0.6metres**	
Dam, lake, reservoir or bore (potable water supply catchment) – *Upslope*	**> 300metres**	
Groundwater bore – distance to disposal area?	**> 60 metres**	
Permanent waters (potable water supply) – distance to disposal area?	**> 100 metres**	
Permanent waters (non-potable water supply) – distance to disposal area?	**> 60 metres**	
Dams, drains, intermittent watercourses – distance to disposal area?		
Vegetation - removal for disposal area?	**No**	
Any other health or environmental constraints specific to the property?	**No**	
Soil classification (*AS/NZS 1547:2012)*	**Cat. 1-5**	

Applications must be assessed under the High Hazard Minimum Standards where site specific investigations confirm a failure to meet any of the criteria in this table.

1. Slope may be estimated visually.
2. Subsurface criteria must be assessed through excavation of at least one soil test pit within the proposed land application area(s).
3. Soil classification shall be conducted through textural analysis as described in Appendix E of *ASNZS1547:2012*.
4. Failure to declare obvious property constraints may trigger additional investigation requirements.

Table 18 Minimum Standard for Wastewater Management Reports: High / Very High Hazard and Non CoS Lot

SINGLE ALLOTMENT (Domestic) Minimum Standard for Wastewater Management Reports		
Report Element	**Minimum Standard**	**Nominal Level of Detail**
Introduction and Background	• Name, contact details and qualifications of author(s). • Site location and owner. • Allotment size (m^2 or ha). • Proposed / existing water supply. • Number of bedrooms and occupants. • Availability of sewer.	One page of text and tables.
Site and Soil Assessment	• Broad overview of locality and landscape characteristics. • Details of the date and time of assessment in addition to statements confirming the methods used to complete the assessment. • Site and soil assessment accordance with MAV Land Capability Assessment Framework (2014), *AS/NZS 1547:2012* and EPA Code of Practice 2016 (CoP). • Summary of available published soils information for the site. • Detailed explanation of the implications of observed site and soil features for system design and performance. • Assessment of the existing condition of the receiving environment and sensitivity to on-site system impacts. Setbacks to be met as per EPA CoP.	• Paragraph and locality map. • Paragraph or table • Table(s) • 1-2 paragraphs • Up to 1 page of explanation and recommended design elements to overcome constraints. • Up to one page.
System Selection	• Summarise potential treatment and land application systems considered including advantages and limitations. • Preliminary design calculations for a minimum of 2-4 options. • Brief statement justifying selection of treatment and land application system.	• Table. • Summary table. • Paragraph.

Design	• Site specific calculation of design wastewater generation rates in accordance EPA CoP accompanied by water use / wastewater generation data to support design rates for all existing systems upgrades.
	• Certification details for the selected treatment system.
	• Land Application Area (LAA) sizing in accordance with EPA CoP and MAV (2014);
	  ○ Trench / Bed: most limiting of monthly water balance and annual nutrient balance calculations (EPA CoP).
	  ○ Surface / Subsurface Irrigation: most limiting of hydraulic sizing equation (Eq. L1 *AS/NZS 1547:2012*) and annual nutrient balance calculations (EPA CoP).
	• Hydraulic design calculations for all pressurised pipework (including drip irrigation).
	• Design drawings of all non-certified system components.
		• Tables and paragraph justifying calculations.
		• Attach Certificate
		• Table summarising inputs and assumptions accompanied by a summary table of results.
		• A4 schematic (not to scale).
		• A4 schematic (not to scale).

Site Plan	• Nominated Effluent Management Area (EMA) to be clearly shown to ensure construction does not occur over this area at any time; • Survey plan; • Location of tank(s); • Location of boundaries, buildings, swimming pools, paths, groundwater bores, dams and waterways; • Location of primary and reserve disposal areas; • Location of stormwater diversion drains and earth bunds (if applicable); • Setback (buffer) distances to the above features; • Two metre elevation contours;	• A4 Site Plan (1:500 scale minimum).

	• Location of drainage pipework (centreline).	
Appendices	• Soil bore logs for all test pits (Permeability test results). • Raw laboratory results for soil analysis. • All design calculations and assumptions.	-

Subdivision

The same Minimum Standards will be required for all new subdivision regardless of the specific properties On-site Hazard Class. An example table is presented below.

Table 19 Minimum Standard for Wastewater Management Reports (Subdivision)

INCREASE IN BUILDING ENTITLEMENTS Minimum Standard for Wastewater Management Reports		
Report Element	**Minimum Standard**	**Nominal Level of Detail**
Introduction and Background	• Name, contact details and qualifications of author(s). • Site location and owner. • Allotment size (m^2 or ha). • Proposed / existing water supply. • Number of new building entitlements. • Availability of sewer.	One page of text and tables.
Site and Soil Assessment	• Broad overview of locality and landscape characteristics. • Details of the date and time of assessment in addition to statements confirming the methods used to complete the assessment. • Site and soil assessment accordance with MAV Land Capability Assessment Framework (2014), *AS/NZS 1547:2012* and EPA Code or Practice 2016 (CoP). • Detailed review of available published soils information for the site. • Where multiple soil facets are present the site plan should show the approximate boundary between facets. • Detailed explanation of the implications of observed site and soil features for system design and performance. • Assessment of the existing condition of the receiving environment and sensitivity to on-site system impacts. Confirm setbacks are met as per EPA CoP.	• Paragraph and locality map. • Paragraph or table • Table(s) • 1-2 paragraphs • Minimum 3 soil test pits per soil facet. • Up to 1 page of explanation and recommended design elements to overcome constraints. • Up to one page.
System Selection and Design	• Summarise potential treatment and land application systems considered including advantages and limitations. • Brief statement justifying selection of potential treatment and land application systems. • Sizing of land application systems using the most limiting of monthly soil water and annual nutrient balances (EPA CoP / MAV 2014 and *AS/NZS 1547:2012*).	• Table. • Paragraph. • Table summarising inputs and assumptions accompanied by a summary table of results and paragraph justifying calculations.
Site Plan	• Useable Land to be clearly identified; • Survey plan; • Proposed allotment boundaries, dimensions and area; • Location of existing buildings, swimming pools, paths, groundwater bores, dams and waterways; • Location of exclusion zones (e.g. setback distances and unsuitable site and soil conditions); • Location of EMAs capable of containing LAAs and reserves (where applicable); • Two metre elevation contours; and • Location of existing and proposed drainage pipework (centreline).	• Minimum Site Plan (1:500).
Off-site Impacts (Where required)	• Confirm Useable Land (UL) and if Setbacks are achieved for each new lot (as per EPA CoP). ○ ≥4,000m^2 UL within each new lot and all setbacks achieved – **No further works required**	• Up to 1 page.

	○ <4,000m^2 UL within a new lot or EPA CoP setbacks cannot be achieved – **Site specific Land Capability Assessment required** in accordance with MAV (2014) and EPA CoP. • Methodology documenting the basis and source of input data including reference to site specific data and published information to justify use. • Results demonstrating compliance with local water quality objectives and adequate management of health risk as per EPA CoP. • Brief discussion of long-term risks to health and environment and recommended management measures to address impacts.	• 2-4 pages of tables, figures and text. • 1-2 pages of tables, figures and text. • Up to 1 page.
Appendices	• Soil bore logs for all test pits. • Raw laboratory results for soil analysis. • All design calculations and assumptions including screenshots of off-site impact spreadsheets/models (if required).	-

Non-domestic System

The same Minimum Standards will be required for all non-domestic systems regardless of the specific properties On-site Hazard Class. An example table is presented below.

Table 20 Minimum Standard for Wastewater Management Reports (Non-Domestic System)

NON-DOMESTIC SYSTEMS (ADWF <5 kL/day) Minimum Standard for Wastewater Management Reports		
Report Element	**Minimum Standard**	**Nominal Level of Detail**
Introduction and Background	• Name, contact details and qualifications of author(s). • Site location and owner. • Allotment size (m^2 or ha). • Proposed / existing water supply. • Description of proposed facility (including equivalent persons). • Availability of sewer.	One page of text and tables.
Site and Soil Assessment	• Broad overview of locality and landscape characteristics. • Details of the date and time of assessment in addition to statements confirming the methods used to complete the assessment. • Summary of available published soils information for the site. • Site and soil assessment accordance with MAV Land Capability Assessment Framework (2014), *AS/NZS 1547:2012* and EPA Code or Practice 2016 (CoP). • Brief and clear explanation of the implications of observed site and soil features for system design and performance. • Assessment of the existing condition of the receiving environment and sensitivity to on-site system impacts. Confirm setbacks are met as per EPA CoP.	• Paragraph and locality map. • Paragraph or table • 1-2 paragraphs • Table(s), minimum 3 soil test pits per soil facet. • Bullet point list of recommended design elements to overcome constraints. • 1-2 paragraphs
System Selection	• Summarise potential treatment and land application systems considered including advantages and limitations. • Brief statement justifying selection of potential treatment and land application systems.	• Table. • Paragraph.
Design	• Site specific wastewater characterisation based on best available published or local information including consideration of seasonal / monthly variation. • Establish site specific design criteria based on typical / published performance. • Brief process design outlining rationale, assumed performance and capacity to manage design flows and loads. Process performance should be supported by published data or information that demonstrates the suitability of the process to the site and development. • Sizing of land application systems using the most limiting of monthly soil water and annual nutrient balances (EPA Code and *AS/NZS 1547:2012*). • Off-site impacts assessment **may be required** if setbacks (as per EPA Code and *AS/NZS 1547:2012*) cannot be achieved – at discretion of Latrobe Cite Council. • Preliminary hydraulic design of collection, treatment and land application components.	• Seasonal / monthly time series of flow and loads and 1-2 paragraphs + table justification. • Paragraph and bullet points. • 1-2 pages including supporting tables and figures. • Tables summarising inputs, assumptions and results and paragraph justifying calculations. • Tables and process schematic.

Site Plan	• Location of boundaries, buildings, swimming pools, paths, groundwater bores, dams and waterways; • Location / extent of all system components (including any reserve areas); • Two metre elevation contours; and • Location of existing and proposed drainage pipework (centreline).	• Minimum Site Plan (1:500).
Appendices	• Soil bore logs for all test pits. • Raw laboratory results for soil analysis. • All design calculations and assumptions including screenshots of off-site impact spreadsheets/models (if required).	-

Appendix C Minimum Property Size Analysis

A review was undertaken of sustainable minimum property sizes for on-site sewage management based on collated data for a number of unsewered regions across Victoria and New South Wales, which are similar to Latrobe municipality. Sustainable minimum lot size was previously considered to allow for typical levels of site development (based on applicable land use zoning) in addition to a conservatively sized land application system (using hydraulic and nutrient balances) and provision of adequate separation distances from sensitive receptors.

The intention of these previous assessments was to establish a conservative lot size (or some other measure) that was considered adequate to provide Council with a high degree of confidence that an effective, safe and sustainable on-site sewage management service can be accommodated (with factors of safety).

C1 Methodology

Based on previous studies and experience, a conservative land area requirement for sustainable on-site sewage management has been calculated by the following procedure. The procedure was applied using rainfall from local stations and gridded potential evapo-transpiration data from Bureau of Meteorology (BoM).

- A design occupancy of 6 persons for a 4 bedroom house (using reticulated water) was adopted to represent the typical design residential development scenario.
- A typical system configuration of secondary treatment and subsurface irrigation was assumed. This scenario also allowed for primary dosed trenches and beds (discussed further below).
- Hydraulic and annual nutrient balance was undertaken based on the above occupancy assuming a Design Loading Rate (DLR) of 3 mm/day (Category 5 – light clays). This DLR was selected on the basis that it strikes an appropriate balance between conservatism and realism.

The outcomes of these water and nutrient balance calculations were then used to examine minimum Effluent Management Areas (EMA) required for the majority of typical sites and dwellings likely to be encountered.

An assessment was then undertaken of a sample of properties within unsewered zones of the LGA's. Properties were assessed to determine the capacity to provide available area for sewage management in addition to area occupied by development and separation distances from objects such as;

- building structures;
- driveways and paths;
- swimming pools and other dedicated recreational areas (e.g. tennis courts);

- land occupied by livestock or horses;
- property boundaries; and
- dams, intermittent and permanent watercourses.

The assessment was undertaken through orthophoto investigations and GIS creation of buffers around the abovementioned objects. Statistics on the area of land and proportion of total lot area occupied by each component (inclusive of buffers) were recorded for analysis. The lots assessed were selected to provide a representative sample of typical development across a variety of unsewered areas. The data also consists of ~800 lots in Monbulk in which site specific available area for effluent management was measured on-property.

Statistics obtained from the assessments were analysed to identify any patterns or relationships between lot size, land use zones and area available for EMA's. Multiple scatter plots of lot size and the average area available for effluent management were created. This was completed for a number of property size ranges to determine relationships for these properties ranges that could be applied region wide. Data were utilised from many previous assessments across Victoria and New South Wales and provided a consistent relationship.

C2 Data Analysis

Based on the outcomes of previous water (checked against annual nutrient balances) balance assessments, an LAA of 650 – 850 m^2 has typically been required. The "design" estimate (outlined in points 1 – 3 above) based on the more conservative climate zone resulted in a minimum land application area of approximately 850 m^2. Allowing for treatment tanks, required zoning of LAAs and other infrastructure required for an on-site system, a typical EMA was found to be **~1,000 m^2**. Primary dosed trenches and beds (which are not always suitable for observed site and soil conditions) occupy approximately half the land area of a secondary dosed irrigation system. However, allowance for a reserve area must be made for primary dosed subsurface systems which results in a comparable land area requirement to that of a secondary dosed irrigation system.

The larger footprint is considered appropriate for planning purposes and allows for situations where issues such as irregular shaped areas and slope limit the proportion of available land that can actually be occupied by a land application system. It is important to note that the outcomes of this minimum property size assessment should not be used in a prescriptive or deterministic fashion. Individual applicants should be able to undertake additional site specific investigations to confirm the appropriateness of Council's general minimum lot size for their site.

The relationship between Lot Size and Available Area for Effluent Management for the various areas assessed was compared based on adoption of an average available area approach which was found to be more applicable and more adaptable to the study areas considered. This involved determining

the relationship between average available area and property size at property size ranges. The figure below contains the results of this consolidated analysis.

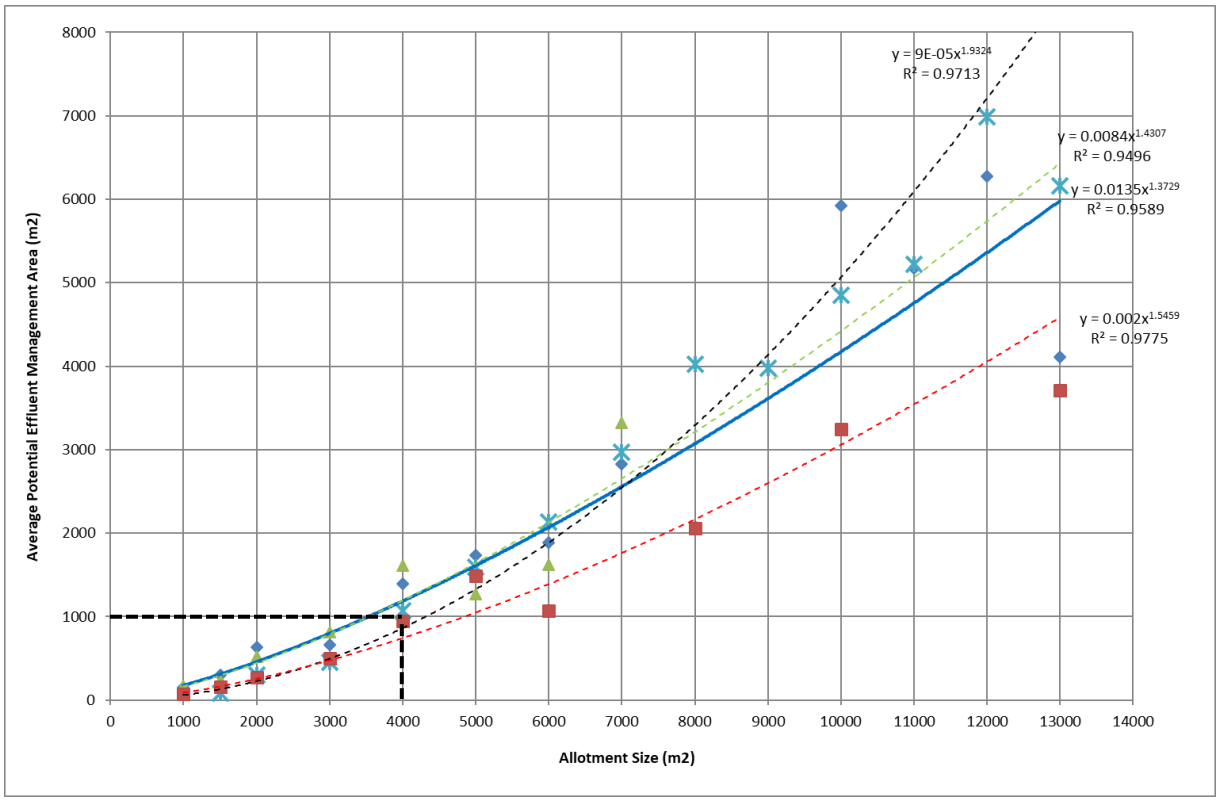

Figure: Average Available Area and Property Size Evaluation

The extensive data collated consistently indicated that lot sizes at or greater than 4,000 m^2 are likely to be capable of fitting a sustainable on-site sewage management system within the property, assuming aspects such as native vegetation protection can be managed through site specific design and communication between relevant Council staff.

Appendix D Potential On-site System Risk and Management Hazard Methodology

This appendix includes details for a potential methodology for developing an onsite system 'Management' Hazard Class and final 'Domestic Wastewater Management' Class for the entire municipality. This is based on combining the Land Capability Hazard mapping class with a separate 'Management' hazard class based on the Existing On-site System (inspection data) for each property. This overall 'Domestic Wastewater Management' (DWM) Hazard Class would ultimately dictate the inspection frequency for each property and the time allowance for ensuring compliance issues (if any) are addressed and rectified.

The potential DWM / Management Risk Class is summarised in the table below for feedback from Council.

The intention would be for Council to develop a consistent, clearly defined set of criteria for what constitutes as minor, moderate, major and critical non-compliance from the on-site system inspection data.

Where on-site system inspection data is not available, some additional criteria may include;

- Systems older than 30 years - automatic major non-compliance until inspected
- Systems 10-30 years old - automatic moderate non-compliance until inspected
- Systems <10 years old - automatic low risk (Management) until inspected

Another aspect for consideration is a potential reduction in the assigned Land Capability Hazard for a property based on inspection information. For example, following an inspection it may be determined that the existing on-site system achieves all minimum setbacks to sensitive environmental receptors and therefore the onsite hazard is being adequately managed.

Domestic Wastewater Management (DWM) Risk Map / Class

Land Capability Hazard + Existing On-site System Hazard = DWM Risk Class

DWM Risk Class	Description	Land Capability Hazard Class	Management Class	Inspection Frequency	Indicative Timeframe for Rectification of Non-compliance
Low	Few or no constraints to sustainable on-site wastewater management. Traditional technology approaches, routine maintenance and 3-5 yearly oversight likely to be adequate to manage risk. No known off-site discharge or major - critical non-compliance.	Low	Low risk or minor non-compliance	5 Yearly	1 Year
		Medium	Low risk		
Medium	There may be some moderate to major constraints to sustainable on-site wastewater management that require consideration in the approval of new systems. Higher levels of treatment and land application may be required in addition to more frequent oversight (2-3 years). No known off-site discharge or major - critical non-compliance.	Low	Moderate non-compliance (no OSD)	3 Yearly	9 Months
		Medium	Low or Minor non-compliance		
		High	Low risk		
High	Property will either a) possess significant constraints to sustainable on-site wastewater management that require specialist land capability assessment and design to mitigate; or b) contain an existing on-site system that has a known non-compliance. No known off-site discharge (critical non-compliance).	Low	Major non-compliance (no OSD)	2 Yearly	6 Months
		Medium	Moderate or major non-compliance (No OSD)		
		High	Minor non-compliance (no OSD)		
Very High	Properties with a known off-site discharge (either a legacy system or discharge due to a critical non-compliance) or too small to be able contain wastewater on-site in the long-term. Rectification of non-compliance and/or provision of an alternative wastewater management service should be a priority.	Non CoS & Very High	All	1 Yearly	3 Months
		Medium	Major non-compliance (no OSD)		
		High	Known off-site discharge (legacy system or due to a critical non-compliance)		

Appendix E Potential Wastewater Management Strategies / Models

Strategy / Model	Description
Managed On-site Wastewater Management Systems	On-site Wastewater management systems upgraded and managed / operated (also potentially owned) by a Responsible Management Entity (RME) such as a Council or private utility, as discussed in Section 3.6 of the VAGO report (2018) based on US EPA governance model.
Decentralised / Cluster Wastewater Management System	System to collect treated effluent from on-property systems for polishing (potentially Class B) and irrigation across community / public open space. Cluster systems are typically set up at a precinct scale to treat wastewater from a group of properties within the vicinity of the nominated community / public open space. Allows opportunities for on-property reuse of treated wastewater to reduce downstream infrastructure / irrigation requirements. To be operated and managed by RME.
Monitoring and Inspection Program	Program for collection of on-site system type and performance data to guide priority of inspection and compliance assessment.
Integrated Water Management	Water management approach that aims to provide a holistic and forward thinking approach to all elements of the water cycle (movement of water through its various phases) including wastewater in addition to stormwater, potable / non-potable water supply and local watercourses. The intention is for this approach to be adaptive to temporal changes over the long-term and designed in conjunction with end users (community) with a place based element to design. Examples include Best Practicable Option upgrades to existing on-site systems with any excess wastewater not able to be contained on-lot sent to upgraded stormwater infrastructure (biofilters / constructed wetlands).
Funded on-site system upgrade grants.	Seek external funding to assist home owners in system upgrades. Operation and management of systems continues to be home owner responsibility.
Reticulated Sewerage (Conventional)	Delivery of low pressure sewer, pump stations and rising main to existing sewerage network or central Water Recycling Plant. To be delivered and managed by Gippsland Water (currently no plans to extend network).

Appendix F Community and Stakeholder Engagement Summary

Domestic Waste Water Management Plan – Synopsis Community Feedback Sessions Matters Raised

Sessions held 15/16 January 2019

1. Cost implications for inspection process

2. Cost implications for repair replacement of systems

3. Inference replacement systems would involvement high end systems i.e. treatment plants/sand filters

4. Cost implications for sewer connection based on Glengarry suggested cost to individual landowners $16000

5. Strong sentiment of not wanting inspector's onsite

6. Lack of understanding of risk mapping in plan; incorrect linkage that same infers all existing systems in area as being high risk

7. Polite communication required as to letters of demand

8. Charge associated with inspection of systems must be reasonable

9. Focus not only on community. Council systems must also be addressed where there are apparent issues i.e. recreational grounds and the like

10. Assumption plan in present form has been adopted by Council

11. Concern with mapping in plan the and scientific validity to support ratings associated with the same i.e. upstream downstream testing what if any undertaken

12. Qualifications of those persons to do testing/onsite assessment of existing systems

13. Tyers if offsite discharge is a consideration for smaller allotment who is to pay for same

14. Water supply implications for Tyers with new subdivision

15. Inconsistency by Council in Tyers area allowing new subdivision to go through

16. Watercourse mapping in document clarity re same

17. Anecdotal monitoring of rivers and waterways to substantiate recommendations what if any undertaken

18. Tyers township 2 part consideration of downhill component questioned

19. Systems originally approved specific to offsite discharge.

20.What funding avenues will be available to landholders

21. Changes in control standards to septic what has evolved and why

22. Plan Council initiated as opposed to Council being required to undertake

23. Clarity re infield assessment feedback and its implications

24. Standardization of inspection/assessment process for existing systems

Key Discussion Themes and Responses

Hazard Mapping and Classification

- The classification is not based on a specific computer model, it is a general mapping process as discussed in the Draft DWMP. The map is broad-scale and is based on collating a range of information freely available to anyone. The map provided a general indication of *land capability* constraints to a property, that being the ability to install an onsite wastewater system in accordance with current standards. It is not claiming that it is a definitive hazard class as is to be updated as potential inspections are undertaken.
- The mapping is not based on existing systems as we do not have that information for the entire municipality. Collection of this data is one of the recommended DWMP actions. The text in the maps have been updated to make clear they are based on land capability only (not performance of existing on-site systems).
- The mapping does not prohibit someone from getting a site specific inspection completed as part of a wastewater system design completed for their property. The mapping informs Council of higher risk areas in which it is actually necessary to confirm site specific details e.g. proximity to sensitive receptors when selecting the location of a new or upgraded system.
- Based on discussions, Medium hazard does not mean Council are necessarily concerned with the site. It merely means that the mapping indicates there may be one hazard (such as a watercourse or dam) on the property which has slightly raised the hazard from Low. The intention of the groundtruthing is to make sure that the mapping is generally correct, which was found to be the case consistently and is based on many areas across Victoria and NSW, including Latrobe. This mapping gives Councils an idea of areas that are considered to have a greater number of higher risk properties and therefore require priority – in particular Traralgon South and Tyers.
- Complaint information will be compiled as part of this DWMP to determine if indeed these higher risk areas are experiencing issues.

Inspection Program / Alternative Wastewater Strategies

- The intention of this DWMP is to develop a potential 'Management' Hazard methodology which will be based on existing system performance. This information would be linked with the Land Capability Hazard mapping to help inform a potential inspection program - which is only proposed at this stage and still needed to be discussed within Council and formally taken forward.
- This DWMP is the preliminary stage of outlining actions that could be undertaken, but these are not currently proposed. There are many steps needed to get to the position of installing an alternative wastewater strategy (e.g. cluster water reuse facility), in particular gaining necessary external funding as it would not be left solely up to the community to pay.

- The DWMP has been updated to make it clear what a potential inspection program what involve in the context of a potential 'Management' Hazard.

Community Consultation

- The community would be consulted throughout all processes as Council need everyone to be on board before any actions are persuaded further. This DWMP is the first step for Council investigating what might be done to better manage wastewater across the Latrobe City region.

Traralgon South community session

Tyers community session

Latrobe DRAFT DWMP - Community Consultation Feedback

Submission	Theme	Comment	Action	Response
1	Tyers	For many years the committee has had the provision of sewerage in Tyers as our top priority objective. From the report it would appear that this is a worthwhile and necessary objective. The majority of the homes within the designated township area of Tyers are less than 2,000 square meters and as such fall into the Very High Hazard classification. The committee therefore urges the Latrobe City Council to endeavour to gain agreement from the responsible entity to provide funds for the installation of a sewerage system.	Noted	
2	Mapping and inspection of systems	Having read the DWMP draft report I am concerned that property classification is based solely on a computer model. The ground truthing of 25 properties was grossly inadequate. Given the apparent premise that the community will pay for future over site; it is imperative that property classification is accurate. I am assuming here that individuals will only pay for their own property based on an actual assessment. I will object strongly if I am levied a rate loading to subsidise poorly drained or managed properties, eg; older Tyers Township properties and one or two other properties in my immediate locality. With respect to my own property I have a tank and sixty metres of trench drainage. My land is gentle sloping sandy loam to 60cm depth with the nearest boundary > 60 metres. I note on the Tyers map we are rated medium risk by your computer model. Based on 14 years experience of my property I dispute this rating as too high. Thankyou for this opportunity to comment.	Updated maps to make clear they are based on land capability only (not existing on-site systems)	Thanks. To clarify: - The classification is not based on a specific computer model, it is a general mapping process as discussed in the Draft DWMP. The map is broad-scale and is based on collating a range of information freely available to anyone. The map give a **general** indication of land capability constraints to a property, that being the ability to install an onsite wastewater system in accordance with current standards. - The mapping is not based on existing systems as we do not have that information for the entire municipality. Collection of this data is one of the recommended DWMP actions. - Based on what you have described your site and system do indeed sound low risk. To clarify, Medium hazard does not mean Council are concerned with the site. It merely means that the mapping indicates there may be one hazard (such as a watercourse or dam) on the property which has slightly raised the hazard to Medium. The intention of the groundtruthing is to make sure that the mapping is generally correct, which was found to be the case and is based on many areas including Latrobe. This gives Councils an idea of areas that are considered to have a greater number of higher risk properties.
3	Potential trial of product	A letter was provided to Council outlining a potential trial project for a product named Blixitt. This is a tablet that aims to return spetic system to an aerobic condition, therefore enhancing the treatment performance.	-	The DWMP is not able to outline an explict trial project such as this. Council are legally required to undertake a formal procument process for adoption of any commercial product, even as a trial project as outlined in the letter provided. The intention of the DWMP is to outline an Action Plan and 'way forward' for domestic wastewater management within the Latrobe region, so that Council can begin developing a business case for potential funding of a particular action. Your letter has been noted by Council.
4	Various	My first point is that to obtain a septic system that all ratepayers followed guidelines to obtain permits at the time of construction ,therefore adhering to council regulations and fees associated.	-	Yes that is what Council currently require and try to enforce.
		That existing systems providing they are working as required are not to be removed ,retrospective action should not be involved .		That is correct, if a system is operating correctly the intention is it is to be left as is.
		If alternative wastewater strategies are recommended I am concerned that ratepayers who have already paid for their systems as per regulations will be put into a position of financial strain , I believe this will cause great hardship to families and elderly /pensioners on fixed incomes .		This DWMP is the preliminary stage of outlining actions that could be undertaken, but are not currently proposed. There are many steps needed to get to the position of installing an alternative wastewate strategy, in particular gaining necessary external funding as it would not be left solely up to the community to pay. The community would be consulted thoughout this process as Council need everyone to be on board.
		There is currently evidence that council owned properties within Traralgon South are discharging and I would expect council to rectify these areas within their responsibility to lead by example to residents before asking for compliance among ratepayers .		Yes this is noted and Council are aware of the system.
		Any new monitoring or assessment of current systems be guided with clear detailed information of what is required by inspection to avoid misunderstanding and anxiety for residents.		Yes there would be consultation with the community at various points if an inspection program was to move forward (it is only currently a recommended action at this stage).
		Possible recommendations for local businesses who can provide inspections or a group program to allow for continuity and bulk discount .		Yes, this is something that could be discussed later if an insepction program was to move forward.
		Decentralised solution for Traralgon South managed as a communal facility ,cost borne by council as part of their rates structure .		Yes this is one of the potential options that Council might consider in the future.
		Firmly oppose the establishment of a local law or levy to be charged and unwilling to pay councils oversight to fulfil their legislative obligations .		Yes and noted.
		Would support Council obtaining funding to fulfil the new guidelines as per the epa.		
		The purpose of the rates we pay go to the whole of Latrobe shire and pays for maintenance and upgrades ,therefore I would expect that Traralgon South be provide with the same equality to this funding that Latrobe City enjoys.		
5	Mapping and overarching process	Provided commentary regarding the mapping process, DWMP development and his experience as a consultant, particularly regarding soil science and drainage. This was discussed at Council during the Agency workshop and DWC were in agreeance with many points raised.	-	Dicussed in workshop - general outcomes dicussed in DWMP Consultation Summary.

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