Onsite Wastewater Management Plan

Operational Document
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Document Control Sheet

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Author:	Connor Morton
Project Manager:	Mark Saunders
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Synopsis:	This Operational Plan, together with the accompanying OWMP Technical Document, forms the Onsite Wastewater Management Plan (OWMP) for the Baw Baw Local Government Area. The plan identifies Onsite Wastewater Management (OWM) issues within the Shire and recommends management actions to ensure potential risks are appropriately managed. A key component of the OWMP is an OWM risk assessment and management framework that has been developed for the Shire. This assessment identifies prioritised areas that are in need of improved OWM practices. A framework for the regulation of OWM system (OWMS) performance is also provided.
Client Details	
Client:	Baw Baw Shire Council
Primary Contact:	Tahlia Grandin Coordinator Pubic Health Telephone (03) 5625 0261

Document Distribution

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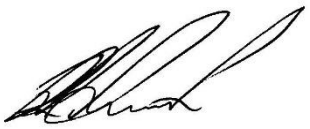
Checked by: Mark Saunders 	***Issued by:*** Connor Morton 

Disclaimer

The information contained in this document is based on independent research undertaken by Whitehead & Associates Environmental Consultants Pty Ltd (W&A). To our knowledge, it does not contain any false, misleading or incomplete information. Recommendations are based on an appraisal of site-specific environmental conditions, subject to the limited scope and resources available for this project, and follow relevant industry standards.

The work performed by W&A included a desktop review, and the conclusions made in this report are based on the information gained and the assumptions as outlined. Under no circumstances, can it be considered that these results represent the actual conditions throughout the entire Shire due to the regional scale of this study.

Copyright Note

Document Certification

This Onsite Wastewater Management Plan (OWMP) has been prepared, and conforms with, standards and guidelines as set out in the following documents, where applicable:

- Department of Energy, Environment and Climate Action (2024), *Planning Permit Applications in Special Water Supply Catchment Areas* (DEECA, 2024);
- Department of Environment, Land, Water and Planning (2022), *Risk Assessment Guidance Report* (DELWP, 2022);
- EPA Victoria (2024), *Guideline for Onsite Wastewater Effluent Dispersal and Recycling Systems* (EDRS, 2024);
- EPA Victoria (2024), *Guideline for Onsite Wastewater Management* (GOWM, 2024);
- Municipal Association of Victoria & Department of Sustainability and Environment (2014), *Victoria Land Capability Assessment Framework, 2nd Ed* (MAV & DSE, 2014);
- Standards Australia / Standards New Zealand (2012), *On-site Domestic Wastewater Management (AS/NZS 1547:2012)*; and
- Victoria Audit General's Office (2018), *Managing the Environmental Impacts of Domestic Wastewater* (VAGO, 2018).

Acknowledgement of Country

Baw Baw Shire Council acknowledges the First Nations people of Australia, including leaders past, present and emerging as the Traditional Owners of the skies, land, waters and sea country across our municipality.

We acknowledge their care and custodianship for more than 60,000 years, which continues today. We walk with them as we respectfully care for and tread lightly on these lands. We also extend that respect to all First Nations people who are part of the community.

Executive Summary

The *Environment Protection Act 2017* (*EP Act 2017*) has established a new framework for environmental protection in Victoria. Under the *EP Act 2017*, an Order for the 'Obligations for Managers of Land or Infrastructure' (OMLI) has been adopted, requiring all Victorian councils to develop a municipal Onsite Wastewater Management Plan (OWMP).

Baw Baw Shire Council (BBSC) has updated the 2016-2021 Domestic Wastewater Management Plan (DWMP) to reflect new risk-based assessment approaches in the development of OWM policy, including recent guideline revisions and risk assessment guidance.

Council is committed to the management of onsite wastewater management (OWM) systems within the Shire. The 2025-2030 OWMP will assist with the efficient and effective management of wastewater within the Shire in a way which will minimise the potential risk posed by effluent upon public health and the environment.

The OWMP has been prepared to recognise, respond to, and link with Council policies and plans, current legislation, regulations, guidelines and the relevant directions of State Regulatory Authorities.

Specifically, the 2025-2030 OWMP has been updated to include:

- Legislative and policy changes relating to OWM;
- Update of the Risk Assessment Framework (RAF) procedure to align with recent OWM guideline revisions;
- Recent planning and development changes (since 2016);
- Update of the final OWM Risk mapping;
- Incorporation of revised Council priorities and projects;
- Review of Council OWM procedures and processing, including the evaluation of OWM system (OWMS) trends in the Shire;
- Incorporating new technical data or recent advances in OWM technology and management practices;
- Review and update of Locality / Township reports; and
- Update the Action Plan for the forward planning period.

The OWMP describes the current situation relating to OWM in the Shire and identifies a range of action items Council seeks to implement over the plan period (2025-2030).

The OWMP contains legislative controls that Council will adopt for the management of OWM in the Shire, as well as details regarding the derivation of methodology for the constraint mapping, risk analysis, locality reports and Cumulative Risk Assessment (CRA).

Identified OWM considerations within the Baw Baw Shire are summarised as follows:

- The ongoing protection of sensitive catchment areas within the Shire and their importance for the supply of potable water, maintenance of public health and the environment;
- Restrictions to development within Special Water Supply Catchment (SWSC) areas to 1 dwelling per 40 hectares and assisting Water Corporation/s (WC/s) to appropriately review this restriction and assess development at a higher density on a case-by-case basis;
- Failing OWMS have the potential to pollute the environment. The identification, monitoring and rectification of these system risks forms an important part of a sustainable risk management approach;

- There are a number of significant constraints (e.g. challenging soils, proximity to water bodies and small lot sizes) which may limit the effectiveness of OWMS in parts of the Shire. To enable improvements to be made in areas where existing OWMS have historically proved problematic, Council needs to develop strategies to assist OWMS owners to upgrade or replace systems where appropriate;
- Environmental characteristics (including climate patterns) may limit the effectiveness of OWMS within the Shire and therefore many systems may require a high-level of design and management to ensure ongoing sustainability;
- To ensure that OWMS associated with new development operate sustainably, a high-level of design and management is required and Council, with WCs and key stakeholders, must develop policies and procedures to allow development to proceed in a manner which appropriately protects public health and the environment;
- Council resourcing to manage OWM monitoring and compliance is limited;
- Rate capping within Victoria will place further pressures on Local Government as to where funds are directed;
- Increasing community expectations relating to appropriate wastewater treatment and disposal (e.g. greywater discharges); and
- Continuing pressure to develop small town sewer schemes, while Local Government may lack the expertise and capacity to manage such systems.

This OWMP presents a framework and clear guidance for mitigating and addressing OWM issues within the Shire, based on the outcomes of a procedural risk assessment process (RAF) developed by the Victorian state government. The RAF process, analysis and outcomes are presented in Section 4 of this Operational Plan and Sections 5 and 6 of the OWMP Technical Document.

Importantly, the revised 2025-2030 OWMP now includes Cumulative Risk Assessment (CRA) for select Areas of Interest (AOI) within the Shire. The CRA adopts the recommended procedure outlined in the ‘Risk Assessment Guidance’ report (DELWP, 2022) to identify potential risks associated with existing or proposed development in unsewered areas, and provides a means of quantifying risks within selected catchment areas or locations.

It is intended the CRA will be used to support future unsewered development and planning considerations within the Shire and will assist Council and WCs in the review of unsewered development or future planning proposals within SWSC areas.

List of Acronyms

Term	Definition
AO	Authorised Officer, under *Environment Protection Act 2017*
AOI	Area/s of Interest
BBSC	Baw Baw Shire Council
AWTP	Aerated Wastewater Treatment Plant
CMA	Catchment Management Authority
CRA	Cumulative Risk Assessment
DEECA	Department of Energy, Environment and Climate Action (formerly DELWP)
DEM	Digital Elevation Model
DELWP	Department of Environment, Land, Water and Planning (now DEECA)
DIR	Design Irrigation Rate
DLR	Design Loading Rate
DSE	Department of Sustainability and the Environment (former)
DWMP	Domestic Wastewater Management Plan (now OWMP)
EDS	Effluent Dispersal System
EPA	Environment Protection Authority
GED	General Environmental Duty
GIS	Geographic Information System
HPO	Health Protection Officer
LCA	Land Capability Assessment
LGA	Local Government Area
MAV	Municipal Association of Victoria
OMLI	Obligations for Managers of Land or Infrastructure
OWM	Onsite Wastewater Management
OWMP	Onsite Wastewater Management Plan
OWMS	Onsite Wastewater Management System
PIC	Plumbing Industry Commission
RAF	Risk Assessment Framework
SWG	Stakeholder Working Group
SWSC	Special Water Supply Catchment/s
VCAT	Victorian Civil and Administrative Tribunal
WC	Water Corporation

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1 Introduction

1.1 Overview and Objectives

Baw Baw Shire Council (BBSC, the Shire or Council) comprises an area of approximately 4,025km^2, with a population of approximately 57,626 in 2021 (ABS, 2021). Council records indicate approximately 4,522 OWM systems are operating in the Shire, along with many unsewered commercial (non-domestic) developments regulated by the EPA and / or Council, such as cafes, tourist accommodation, pubs and farms. The Shire is characterised by several larger towns, townships and settlements, rural development, farming (including forestry), National Parks and State Forests. A substantial area (~44%) of the Shire is located within declared SWSC areas. The protection of public health and the environment are requirements of the *EP Act 2017*.

There are approximately 36,371 developable lots within the Shire as of publishing the 2025-2030 OWMP. Reticulated sewer connection is available to approximately 22,770, resulting in approximately 13,601 unsewered developable lots within the Shire (refer Figure 1).

This Operational Plan forms the major component of the 2025-2030 OWMP and outlines how BBSC will manage OWMS and work with system designers, installers, owners and maintainers to minimise risk to public health and the environment. This Plan is supported by the OWMP Technical Document that provides detail on the regulatory framework for OWM and the methodology used to develop a risk assessment framework (RAF) and corresponding cumulative risk analysis (CRA) for the Shire, including individual Locality reports.

The key objectives of the 2025-2030 OWMP are to:

- Quantify the risk of harm to public health and the environment from unsewered allotments within the Shire;
- Identify and assess the risks of harm to public health and the environment associated with existing and future OWMS in the Shire;
- Identify actions, with implementation timeframes, to minimise the risk associated with OWMS and prevent discharge of wastewater beyond allotment boundaries (Action Plan);
- Provide strategic direction for the development and management of wastewater throughout the Shire;
- Develop and implement a monitoring program for OWMS within the Shire;
- Provide guidance for the preparation of Land Capability Assessment (LCA) within the Shire;
- Develop a risk-based decision tool to provide guidance on the development potential of unsewered areas, with regards to public health and environmental risks from OWMS;
- Provide greater certainty for landowners about the development potential of their land;
- Provide guidance on appropriate maintenance, management and upgrade solutions for non-compliant OWMS throughout the Shire;
- Provide guidance on the appropriateness of wastewater treatment and effluent dispersal system types across the Shire;
- Provide guidance on appropriate education for OWMS owners and residents of unsewered properties; and
- Provide clear direction for the assessment of new and modified OWMS applications and their ongoing compliance with legislative requirements and standards.

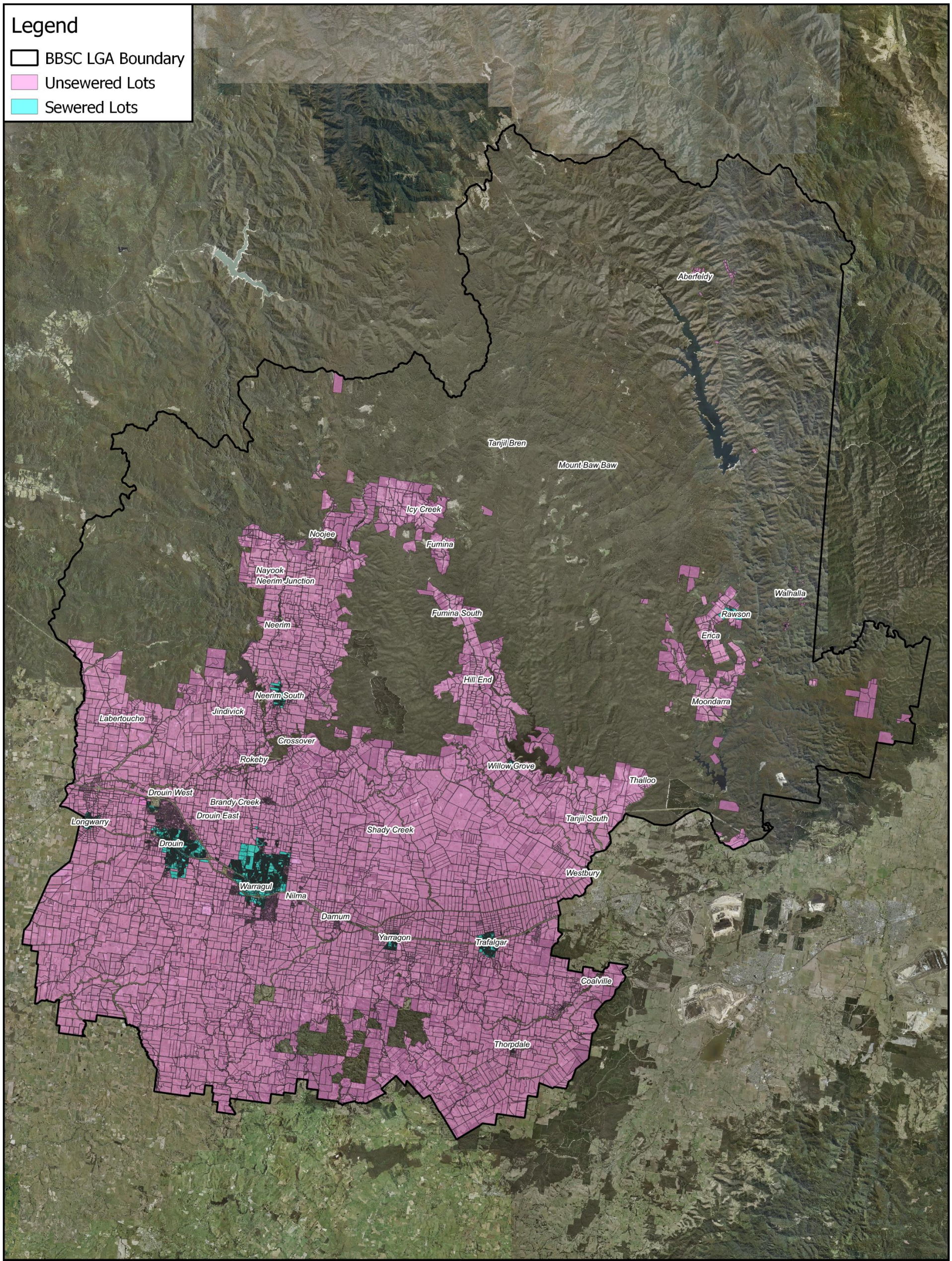


Figure 1: Sewered / Unsewered Lots - Shire

Baw Baw Shire Council OWMP

N

Whitehead & Associates
Environmental Consultants

0 6 12 18 24 30 36 km

(Approx Scale)

Revision	001
Drawn	CM
Approved	MS

1.2 Development of the OWMP

An OWMP is a planning and management document that provides a mechanism for the development, implementation and review of programs to protect public health, the local environment and local amenity. Councils within Victoria are required to prepare a municipal OWMP under the *EP Act 2017* (OMLI), as follows:

1. A council in a municipal district with OWMS must develop and publish on its website an OWMP that so far as reasonably practicable:
    a. Identifies risks of harm to human health and the environment from unsewered allotments in its municipal district;
    b. Identifies and assesses the risks of harm to human health and the environment associated with existing and future on-site wastewater management systems in its municipal district, including but not limited to:
        i. The cumulative risks of existing on-site wastewater management systems that are discharging, or may in the future discharge, wastewater beyond allotment boundaries; and
        ii. The risks of on-site wastewater management systems that are impacting, or may in the future impact, on groundwater or surface water;
    c. Identifies actions with implementation timeframes to:
        i. Minimise the risks identified in paragraphs 1(a) and (b); and
        ii. Prevent discharge of wastewater beyond allotment boundaries; and
2. Sets out the council's approach to compliance and enforcement.

The OWMP establishes Council's policy on, and commitment to, sustainable wastewater management; includes processes to ensure early and comprehensive consideration of OWM in the planning cycle and outlines Council's responsibility for the monitoring and compliance of permitted OWM systems. This 2025-2030 OWMP replaces the 2016-2021 Domestic Wastewater Management Plan (DWMP).

A Stakeholder Working Group (SWG), comprising officers from Council and the relevant WCs (Gippsland Water and South East Water), directed the development of the 2016-2021 DWMP. The 2025-2030 OWMP was updated under the direction of Council staff, and in keeping with goals and objectives of the SWG. A draft copy of the 2025 OWMP was provided to EPA Victoria and stakeholder WCs, who were invited to comment on the document prior to publishing.

1.3 Special Water Supply Catchment Areas

The *Planning Permit Applications in Special Water Supply Catchment Areas* (DEECA, 2024) provides guidelines for development in potable water supply catchment areas. The document applies where a planning permit is required to use land for a dwelling; to subdivide land or to develop land pursuant to a schedule to the Environmental Significance Overlay (ESO) that has a catchment or water quality protection as an object.

Policy 1 requires that the density of dwellings should not exceed one (1) dwelling per 40 hectares, with each lot created in a subdivision to be at least 40 hectares in area. The dwelling density is established by calculating the number of dwellings within a one (1) kilometre radius of the site of the proposed dwelling. Category 4 (Page 7 of DEECA, 2024) of Policy 1 sets out conditions by which the density requirement of Policy 1 may be relaxed.

The updated 2025-2030 OWMP meets the requirements of Policy 1 (DEECA, 2024). Where unsewered development density >1:40ha is proposed, the OWMP will support Council and development proponents in seeking consideration for planning approvals that would result in a higher density of development than would otherwise be permitted by Policy 1.

The preparation, adoption and effective implementation of an OWMP is required for the relaxation of Policy 1. Table 1 outlines how this will be achieved.

For the OWMP to be considered for endorsement by stakeholder WCs, Council is required to demonstrate that suitable resourcing for implementation, including monitoring, enforcement, review and auditing is available.

A working / reference group comprising Council and WC delegates will be formed to discuss OWMS applications, ensure that requests for information remain uniform, and to help ensure the implementation of this plan.

Co-ordination of Council and WCs regarding the effective implementation of the OWMP is included in the Action Plan:

✓ Action Item 13a – Officers from Council and relevant WCs to meet annually to ensure the effective management of planning referral processes under the OWMP.

Table 1: Policy 1 Requirements

OWMP Requirement	Comments / Reference
1. The OWMP satisfies the relevant requirements of the OMLI. Refer to the OMLI for specific requirements	The OWMP has been developed to identify risk of harm to human health and the environment from unsewered allotments, including existing and future OWMS (refer Section 4). The OWMP identifies actions, with implementation timeframes, to minimise the risk of OWM to human health and the environment (refer Section 12). The 2025-2030 has been provided to relevant stakeholders (WCs, CMAs, EPA, and DEECA) for comment. Cumulative risk of OWMS is assessed using the Risk Assessment Guidance report published by DEECA (refer Section 4.2). The OWMP will be reviewed and updated at a frequency of five (5) years, with a report on the implementation of the OWMP published on the Council website (Action Item 13b).
2. Council should be actively implementing the OWMP and be able to provide evidence of this implementation.	Annual progress review of 2025-2030 OWMP, supported by meeting with WCs, to ensure the effective management of OWM within the Shire (Action Item 13a).
3. When implementing the OWMP, the approach to compliance and enforcement should be reflected in the development of an Action Plan and be consistent with the priorities identified in the risk assessment.	Monitoring program carried out for the Shire, as outlined in Section 8.4 of this Operational Plan. Compliance and enforcement targets as outlined (Action Items 6a-c).
4. Implementing the OWMP includes reviewing controls put in place to assess how effective each control has been in reducing risk. For complex sites, an inspection program should be used to monitor risk management and control effectiveness.	The OWMP will be annually reviewed to assess the effectiveness of controls to minimise OWM risk within the Shire (Action Item 13a). A monitoring program will be carried out for the Shire, primarily aimed at areas of identified OWM risk and site constraint (Action Items 6a-c).

The OWMP should not be static as risks from OWM can change rapidly; therefore, it is important that the OWMP is flexible to allow updated risk assessments when required.

✓ Action Item 5a – Train EHOs in accessing and updating the Risk Analysis.

Council is required to review and update the OWMP and publish a report on the implementation of the OWMP on the Council website at an interval no more than five (5) years.

✓ Action Item 13b – Review of 2025-2030 OWMP after five (5) years, with a report on the implementation of the OWMP on Council's website.

1.4 BBSC DWMP (2016-2021) Review

The 2016-2021 DWMP provided a brief evaluation on the status of OWM throughout the Shire, as well as an assessment of the OWM risk profile.

At the time of preparation, the DWMP noted 14,344 lots within the Shire located in proximity to a reticulated sewer system in the townships of Warragul, Drouin, Yarragon, Trafalgar, Neerim South, Willow Grove, and Rawson. Of these lots, it was found that 12,481 were developed. Approximately 16,341 unsewered lots were found not to be located within reasonable distance to a reticulated sewer system, with 11,818 likely developed. Of the unsewered lots, it was estimated that ~3,180 permits were recorded within the BBSC electronic database. Therefore, it was estimated that ~8,600 OWMS may have been operating without a permit.

Due to the limited OWMS records, it was difficult to determine the performance of these systems and the risk they pose to public health and the environment. To fill in this information, it was proposed within the Action Plan that Council was to work with property owners to get a better understanding of the condition and operation of their OWMS.

A brief assessment of the OWM risk within the Shire was provided in the 2016-2021 DWMP, finding that unmaintained septic tanks, greywater discharge and OWM systems within sensitive areas (SWCSs) posed the largest risk within the Shire.

The number of OWM systems within SWSC areas was also estimated based upon an assessment of aerial imagery and it was concluded that a large portion of systems in these areas were constructed without a permit, with no information held within the Council database.

The DWMP Action Plan outlined a number of recommended actions to be undertaken for improved OWM within the Shire. In 2023, BBSC carried out an internal audit of the Action Plan which found that a number of the actions were completed and many are in progress, with some actions requiring review.

Actions yet to be implemented from the 2016-2021 Operational Plan have been reassessed for relevance and, where appropriate, included in the current Operational Plan. Some actions are ongoing and have also been included in the revised Operational Plan as items which require continuing undertakings.

Those actions carried forward from the 2016-2021 DWMP are detailed in Table 2 along with their status and, where relevant, integration into the current OWMP.

Table 2: DWMP (2016-2021) Action Items not completed as of April 2024

Action Item	Description	Status	2025-2030 OWMP
Risk Analysis Mapping	a. Regularly update GIS layer for Risk Ratings as required.	Under review	Risk assessment and constraint

Action Item	Description	Status	2025-2030 OWMP
	b. Develop interactive Risk mapping for residents to identify the Risk of their parcels.		mapping (refer Section 4).
GIS Training	Train EHO in accessing and updating Risk Analysis mapping in order to provide details to residents and ensure that the database remains up to date.	Under review	Action Item 5a.
Compliance Monitoring Program	a. Update OWM system risk rating for older existing systems as well as new OWM systems.	Behind schedule	Updated monitoring program (refer Section 8.4).
	b. System inspections within priority areas		
Commercial Systems	Undertake system audits of all commercial scale systems.	Behind Schedule	Action Item 7a.
Permit Conditions and Compliance	c. Enforce mandatory maintenance of systems as per permit conditions.	Requires review	No longer recommended.
	d. Advocate the inclusion and implementation of local laws to allow for effective management of OWM systems, allow for proportionate enforcement.	Incomplete	No longer recommended.
	e. Investigate off-site greywater discharge to stormwater based risk prioritisation.	Incomplete	Action Item 6d.
Planning	b. Review Town Reports in DWMP and system inspection data to inform planning decisions regarding unsewered towns. Ensure that strategic and statutory planning processes and decisions take into consideration the OWMP and ongoing inspections.	Incomplete	Action Item 9b.
Risk Density	Assess the OWM Risk Density for Areas-of-Concern for prioritisation. Method detailed in Section 5.5 of the Operational Plan for the remainder of Shire (SWSC and unsewered towns / semi-urban areas complete).	Incomplete	Cumulative Risk Assessment (refer Section 4.2). Action Item 10.
Cumulative Impact Assessment	Develop methodology for and undertake a Cumulative Impact Assessment of Areas-of-Concern, to provide guidance on potential risks associated with existing or proposed development in unsewered areas.	Incomplete	
Education	Continue to discuss individual systems with property owners during the permit application process and in response to enquiries from owners. Educate future / potential owners of homes with OWM systems; update educational material; proactively distribute policies and educational materials to the community and service providers; and provide details about permit process on Council's website.	Incomplete	Action Item 11a-d.

Action Item	Description	Status	2025-2030 OWMP
Professional Briefings	Conduct a briefing session and / or potential training with local OWM & LCA consultants, plumbers and system maintenance contractors to inform and educate on the new requirements of the OWMP.	Incomplete	Action Item 12a-b.
Reviews	Annual progress review of DWMP.	Behind schedule	Action Item 13a.

1.5 Implementation and Review

The effectiveness of the 2025-2030 OWMP will depend on the ability of Council to implement the Action Plan.

Relevant staff should be briefed on the OWMP and its impact on internal operations.

✓ Action Item 9a – Brief all Planning and EHO staff on the OWMP.

Staff should be trained in OWM assessment and be familiar with plumbing requirements to ensure compliance with repair and / or upgrade orders that can be made for OWMS.

✓ Action Item 5b – Staff trained to be familiar with OWM and plumbing requirements.

The effectiveness of the OWMP will be measured by regular monitoring and reporting processes. Further to the requirements in the *EP Act 2017*, Council will monitor OWMS and report annually to WCs on a range of performance indicators (permits issued, complaints investigated, monitoring inspections completed and any non-compliance action taken, etc.). This reporting will not only indicate the progress of Operational Plan implementation, but it will also provide an indication of the effectiveness of the action items in improving public health and environmental outcomes with regard to OWM across the Shire.

✓ Action Item 13a – Officers from Council and relevant WCs to meet annually to ensure the effective management of planning referral processes under the OWMP.

Resource funding and time allocation must be made available by Council to undertake this review.

✓ Action Item 2a – Consider sustainable options for ensuring appropriate resources; and

✓ Action Item 2b – Investigate potential staffing requirements for the implementation of the OWMP.

As per the OMLI, the OWMP must be updated every five (5) years to ensure it is being implemented appropriately, with a report on the progress and implementation published on Council's website.

✓ Action Item 13b – Review of 2025-2030 OWMP after five (5) years, with a report on the implementation of the OWMP on Council's website.

2 Wastewater Management Overview

2.1 The Historical Context

Historically, the management of wastewater systems throughout Victoria has been challenging. Local councils are the delegated regulatory authority for OWM (systems ≤5,000L/day) in Victoria; however, they have often been limited by time and financial support in implementing effective OWMPs. Many Councils throughout Victoria (and most Australian states) have previously

provided very limited programs for OWM, focusing on approvals for new OWMS and basic monitoring systems.

2.2 Public Health & Environmental Risks of Wastewater Management

Wastewater can be highly variable in quantity and quality, which can impact on the performance of OWM treatment systems.

Treatment systems rely on the anaerobic (primary) and aerobic (secondary) breakdown of organic matter by microbes and the settling of solids. Shock loads or harmful chemicals in the wastewater stream (i.e. biocides) can impact on the ability of these microbes to treat the wastewater, resulting in poor effluent quality.

OWMS failures are most often a result of poor system design, poor installation practices, inadequate maintenance, and insufficient land area, all of which contribute to potential environmental and public health impacts. The potential risk of poor OWMS performance, typical causes, and potential impacts are outlined in the Table 3.

Table 3: Environmental and Health Risks of OWMS

Risk	Typical Cause	Potential Impacts
Ineffective regulation	Lack of staff / time / training / experience / limitations with information management	Environmental, Health, and Social
Off-site discharge	Failing / poorly managed / damaged / unapproved treatment and / or EDS / previous approved practices for off-site discharges.	Environmental, Health and Social
Disinfection failure	No disinfection (chlorine) / poor upstream treatment.	Health
Failure of treatment system	Lack of maintenance / poor installation / age of system.	Environmental, Health, and Social
Surcharge from EDS	Peak loads / overload of system / failure of EDS / undersized or poorly designed system.	Environmental, Health, and Social
Failure of EDS	Clogging layer in trenches or beds / broken pipes / inappropriate hydraulics.	Environmental, Health, and Social
Human contact with effluent	Poor OH&S in maintenance / inappropriate dispersal methods.	Health and Social
Owner ignorance	Lack of knowledge of system.	Environmental, Health, and Social
Damage to EDS	Access by vehicles or stock / inappropriate boundaries.	Environmental, Health and Social
Odour	Inadequate treatment in systems / mechanical fault.	Social
Groundwater contamination	EDS overloaded (undersized and / or failing).	Environmental, Health, and Social
Surface water contamination	Surface runoff of effluent in area with reduced setback distance buffers / recharge from contaminated groundwater.	Environmental, Health, and Social
Human or animal disease outbreak	Direct or indirect pathogen exposure due to any of above causes.	Health and Social
Degradation of soils	Undersized or failing EDS / usually high strength effluent.	Environmental and Social
Increased algae growth	Excess nitrate and phosphate in surface waters.	Environmental, Health, and Social

Risk	Typical Cause	Potential Impacts
Degradation of native vegetation	Excess nitrate and phosphate in soils and / or surface waters.	Environmental and Social

2.3 What is Wastewater?

Wastewater is water-borne waste material, including sewage or other human-derived (domestic) wastewater, as well as many forms of waste matter generated from other establishments. Domestic wastewater is derived from typical household streams: kitchen; bathroom (basin, bath and shower); laundry; and toilet. Industrial and commercial wastewater is generated from a range of non-domestic activities and varies widely in character, often requiring specialised treatment processes.

Domestic wastewater is commonly described in the following three (3) forms:

- Blackwater – "water grossly contaminated with human excreta" e.g. toilet water, composting toilet leachate;
- Greywater – "water that is contaminated by but does not contain human excreta" e.g. kitchen, bath, and laundry water. Also referred to as 'sullage'; and
- Combined – "a combination of both black and grey water".

Wastewater quality can vary greatly due to the range of materials being discharged to the system from domestic or non-domestic activities. Table 4 outlines typical value ranges for untreated domestic and non-domestic wastewater quality.

Table 4: Domestic and Non-Domestic Wastewater Quality[1]

Parameter	Domestic	Non-Domestic
Biological Oxygen Demand (BOD_5)	150-350 mg/L	300->5,000 mg/L
Total Suspended Solids (TSS)	150-300 mg/L	>350 mg/L
Total Nitrogen (TN)	50-60 mg/L	20-100 mg/L
Total Phosphorus (TP)	10-30 mg/L	Source-specific
Faecal Coliform (FC)	10^5-10^7 cfu/100mL	10^3-10^{10} cfu/100mL
Oil and Grease	<50 mg/L	50-150 mg/L

[1] Information collated from a range of sources including EPA Publication 891.4 (2016), *AS/NZS 1547:2012*, NRMMC (2006) and NSW DLG (1998). Note all concentrations are highly variable depending on source.

2.4 Wastewater Treatment

In urban environments, wastewater is typically managed in a community sewerage system, with treatment at a centralised wastewater treatment plant with effluent dispersal via approved methods including discharge or land application.

In areas where a centralised sewerage system is not provided, wastewater is required to be managed onsite at each individual allotment. Onsite wastewater management is achieved using a variety of treatment processes and system types. A range of commonly available treatment systems and their associated effluent quality expectations are presented in Table 5.

Table 5: Effluent Quality and OWM Treatment Systems

Treatment System	Expected Effluent Quality
Septic Tanks	Primary:

Treatment System	Expected Effluent Quality
Aerobic Biological Filter Systems	BOD_5: 150-250 mg/L TSS: 20-140 mg/L Faecal Coliforms: 10^5-10^7cfu/100mL.
Aerated Wastewater Treatment Plant (AWTP) **Sand and Media Filters** **Membrane Bioreactors**	Secondary: BOD_5: ≤20mg/L TSS: ≤30mg/L Faecal Coliforms: ≤10cfu/100mL (with disinfection).
	Advanced Secondary: BOD_5: ≤10mg/L TSS: ≤10mg/L Faecal Coliforms: ≤10cfu/100mL (with disinfection).

Current best-practice recommends effluent to be treated to a secondary standard or better. Any variation to this must provide detailed evidence and supporting design to demonstrate suitability. Further detail about OWM treatment systems can be found in Section 4.3 of EPA Victoria *Guideline for Onsite Wastewater Management* (GOWM, 2024) and Section 11.3 of the OWMP Technical Document.

2.5 Effluent Dispersal System

Following treatment, effluent is dispersed within the allotment boundaries in a designated land application system, referred to as the effluent dispersal system (EDS). The type of EDS proposed is dependent upon the type of treatment system used and the associated effluent quality. A summary of EDS suitability based on treatment standard is provided in Table 6.

Table 6: Effluent Quality and EDS Suitability

EDS Type	Primary Treatment	Secondary Treatment	Secondary Treatment (with disinfection)	Advanced Secondary Treatment	Advanced Secondary Treatment (with disinfection)
Trenches / Beds	✓	✓	✓	✓	✓
ETA Trenches / Beds	✓	✓	✓	✓	✓
Surface Irrigation	X	X	✓	✓	✓
Subsurface Irrigation	X	✓	✓	✓	✓
Mounds	✓	✓	✓	✓	✓

Further detail on EDS can be found in Section 2 of EPA Victoria *Guideline for Effluent Dispersal and Recycling Systems* (EDRS, 2024) and Section 11.4 of the OWMP Technical Document.

3 Legislation and Policies

The following section lists the various legislation and policy documents which have been included in the OWMP review, which are discussed further within Section 3 of the OWMP Technical Document.

3.1 Council's Plans and Policies

This OWMP has been developed in consideration of other Council Policies and Plans, as follows:

- Council Plan 2021 – 2025;
- Community Vision 2050;
- Settlement Management Plan 2013 – 2017;
- Municipal Health and Wellbeing Plan 2021 – 2025;
- Planning Scheme;
- Growth Management Strategy and subsequent Warragul and Drouin Structure Plans;
- Yarragon Structure Plan 2010; and
- Council Budget.

3.2 Legislation

A summary of the legislation and their stipulated requirements relevant to the regulation of OWM are detailed in the OWMP Technical Document. Those relevant include:

- *Environment Protection Act 2017* and *Regulations 2021*;
- *Safe Drinking Water Act 2003* and *Regulations 2015;*
- *Planning and Environment Act 1987;*
- *Public Health and Wellbeing Act 2008;*
- *Local Government Act 2020;*
- *Water Act 1989;*
- *Catchment and Land Protection Act 1994;* and
- *Victorian Building Regulations 2018.*

3.3 Regulatory and Administrative Responsibility

The management of OWMS requires involvement and input from a number of regulatory agencies and stakeholder organisations:

- Council (Baw Baw Shire Council);
- Environment Protection Authority Victoria (EPA);
- Victorian Building Authority (VBA);
- Plumbing Industry Commission (PIC);
- Municipal Association of Victoria (MAV);
- Water Corporations (Gippsland Water, South Gippsland Water, Southern Rural Water, Melbourne Water; and South East Water);
- Catchment Management Authorities (West Gippsland Catchment Management Authority, Port Phillips and Westernport Catchment Management Authority); and
- Department of Energy, Environment and Climate Action (DEECA).

3.4 Administrative Authorities

VCAT is a tribunal which deals with civil disputes, administrative decisions and appeals that are heard before a Judge or Tribunal member. It provides a dispute resolution service for both government and individuals within Victoria.

In recent cases throughout Victoria, VCAT has questioned the quality of LCAs prepared for OWM, particularly where a site is located within a potable water supply catchment. VCAT has also questioned the rigour of some Council's evaluation of these LCAs and how the minimum development guideline of 1 dwelling per 40 hectares should be applied in the SWSC areas, as per DEECA (2024) *Planning Permit Applications in Special Water Supply Catchment Areas*.

3.5 Standards and Guidelines

The design, operation and management of OWMS in Victoria are supported by a number of standards and guidelines:

- Department of Environment, Land, Water, and Planning (2019), *Guidelines for Development in Flood Affected Areas*;
- Department of Environment, Land, Water, and Planning (2022), *Risk Assessment Guidance Report*;
- Department of Energy, Environment and Climate Action (2024), *Planning Permit Applications in Special Water Supply Catchment Areas*;
- EPA Victoria (2024), *Guideline for Onsite Wastewater Effluent Dispersal and Recycling Systems*;
- EPA Victoria (2024), *Guideline for Onsite Wastewater Management*;
- EPA Victoria (2021), *Regulating Onsite Wastewater Management Systems: Local Government Toolkit*;
- Standards Australia / New Zealand (2012), *AS/NZS 1547:2012 Onsite Domestic Wastewater Management*;
- Municipal Associate of Victoria & Department of Sustainability and Environment (2014), *Victorian Land Capability Assessment Framework*;
- Standards Australia / New Zealand (2008), *AS/NZS 1546.1-2 Onsite Domestic Wastewater Treatment Units (Septic Tanks / Waterless Composting Toilets)*;
- Standards Australia (2016-2017), *AS 1546.3-4 Onsite Domestic Wastewater Treatment Units (Secondary Treatment Systems / Domestic Greywater Treatment Systems)*;
- Standards Australia / New Zealand (2021), *AS/NZS 3500.1-4:2021 Plumbing and Drainage*; and
- Victoria Audit General's Office (2018), *Managing the Environmental Impacts of Domestic Wastewater*.

Where any document is superseded, the 2025-2030 OWMP refers to the most-current guidance.

4 Risk Assessment Framework

Formal risk assessment has proven to be an effective way of supporting decision-making in situations involving considerable complexity and uncertainty. Formal recognition of the value, intent, and application of risk assessment is provided in the international standard for formal risk management and associated guidelines (Standards Australia, 2009 and ISO 31000:2018).

The fundamental purpose of any OWMP is to identify and manage the risk from OWMS to public health and the environment. A means of addressing the OWM challenges raised by unsewered townships is to develop a Risk Assessment Framework (RAF) that identifies possible impacts of OWMS on public health and the environment.

The 2025-2030 OWMP incorporates a comprehensive six (6) stage approach to assist Council in analysing risk and managing OWMS at variable scales. The stages of the methodology are shown in Figures 2a and 2b, and are described as follows:

- Stage 1: Background & Data Collection – Background information, legislation / regulatory / planning controls, data collection and pre-processing;
- Stage 2: GIS Analysis – Development of individual constraint mapping and informative spatial data to examine the degree of OWM risk associated with individual allotments;
- Stage 3: OWM Risk Analysis – Analysis of individual constraint parameters to determine a relative OWM risk profile for all unsewered lots within the Shire, taking into account the inter-relationship between the individual constraints;
- Stage 4: Cumulative Risk Analysis – Semi-quantitative assessment of risk (cumulative impact) in a delineated Area of Interest (AOI); and

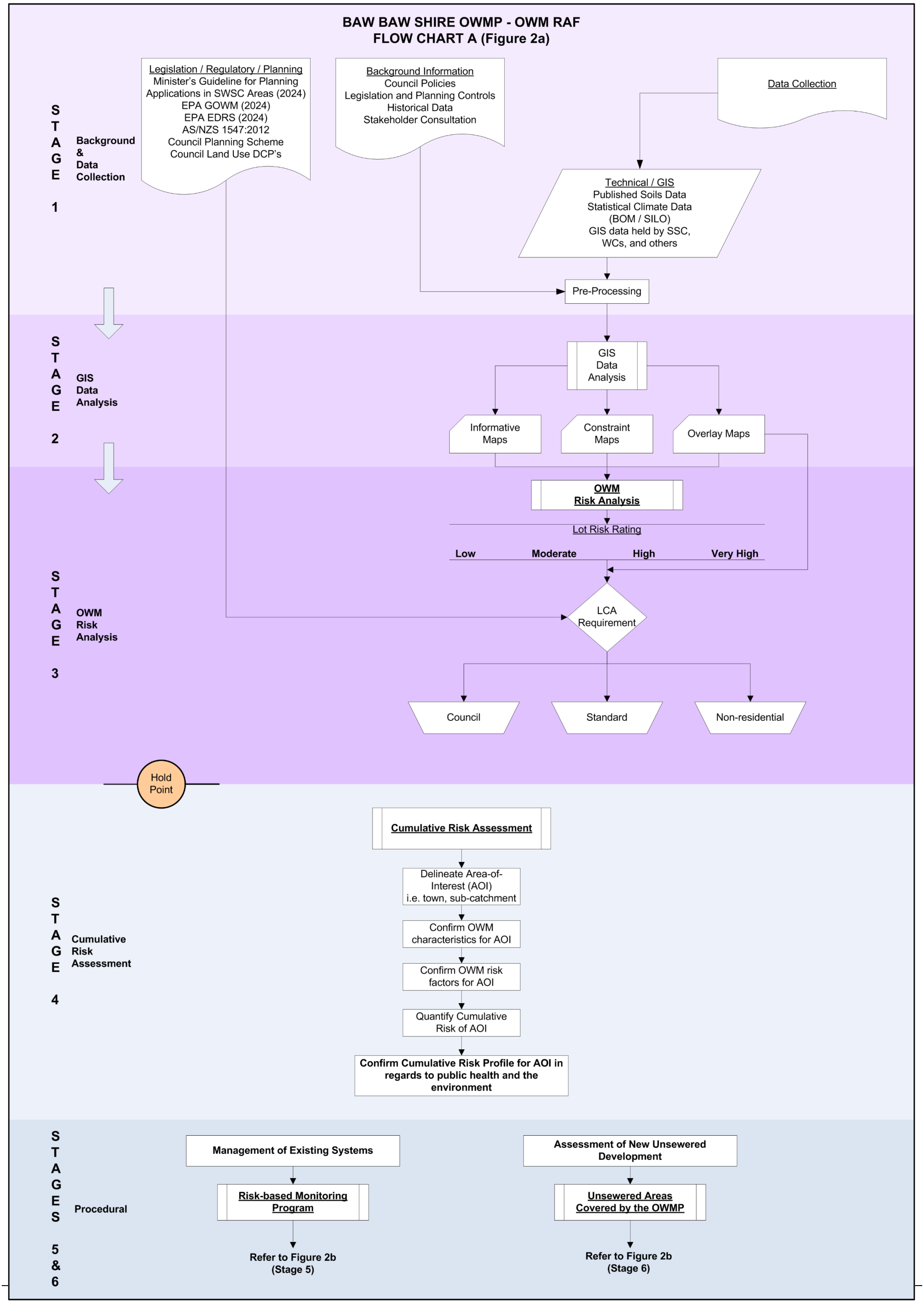
Stages 5 & 6 are ‘procedural’ and outline the review requirements for development assessment under the Planning Scheme, including administrative controls and the management of existing and future OWMS.

The RAF has substantial value as a development assessment tool and provides a defensible identification and justification for prioritisation of existing management issues within the Shire, incorporating tools that assess the bio-geophysical capability for OWM in existing unsewered towns and settlements. It will be primarily used:

- To determine the level of technical investigation required to support an unsewered planning application or OWM permit request (LCA);
- To identify priority unsewered localities and townships that require more detailed investigations to determine needs (i.e. improvement actions or plans);
- To guide development of management and monitoring strategy for existing OWMS; and
- For strategic planning of future unsewered development within the Shire.

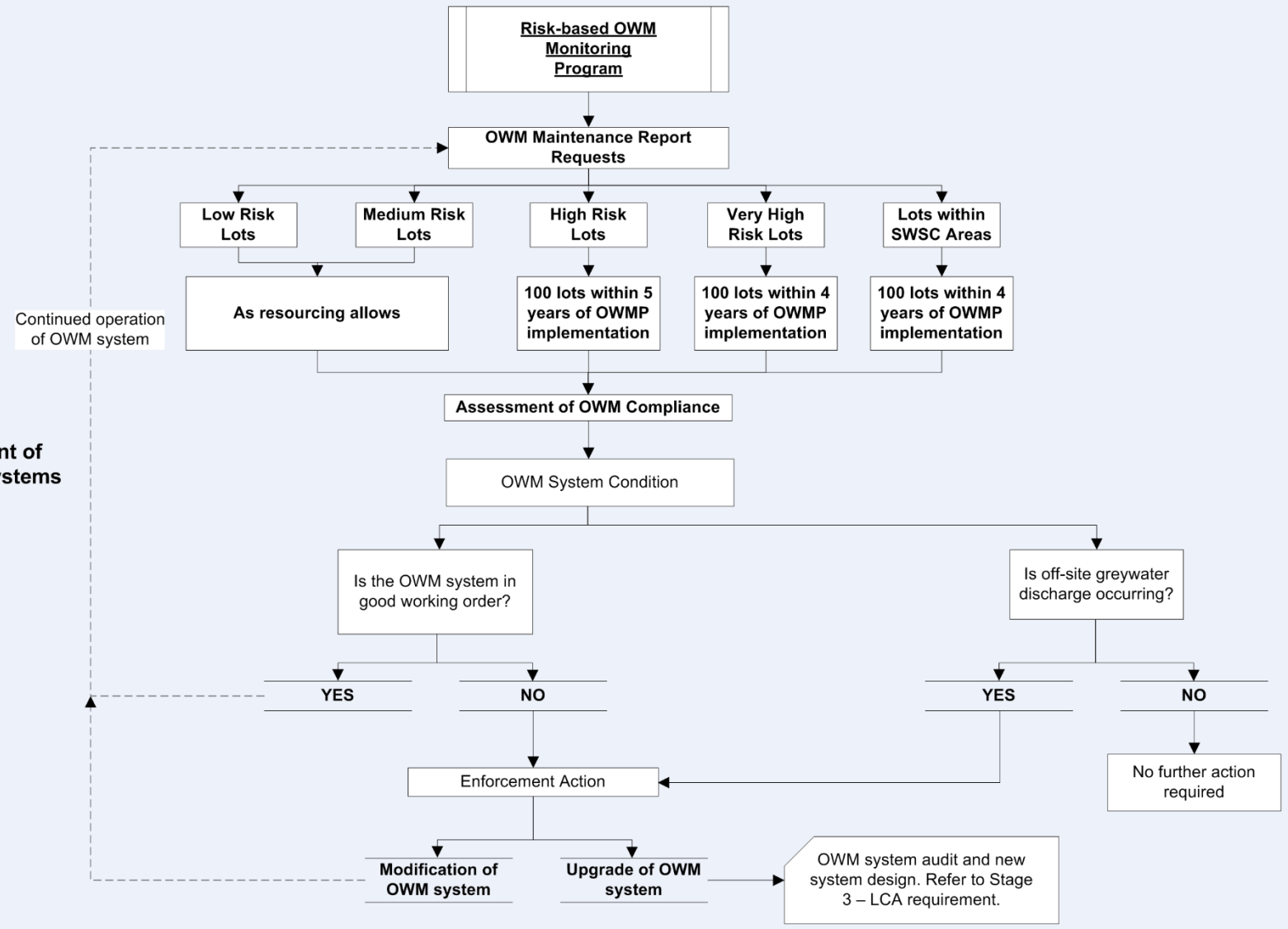
The overall RAF aims to provide Council with a reasoned and justified tool to prioritise future development and to implement processes for improving outcomes within the Shire. Consideration of both individual (allotment) and cumulative (catchment) OWM risk provides a versatile framework for:

- Examining changes from an accepted ‘baseline’ condition (i.e. water quality or environmental indicators);
- Preparing cost / benefit analyses for upgrade / improvement options (i.e. OWM vs. sewerage); and
- Comparing alternate land use / development scenarios (i.e. development lot density).

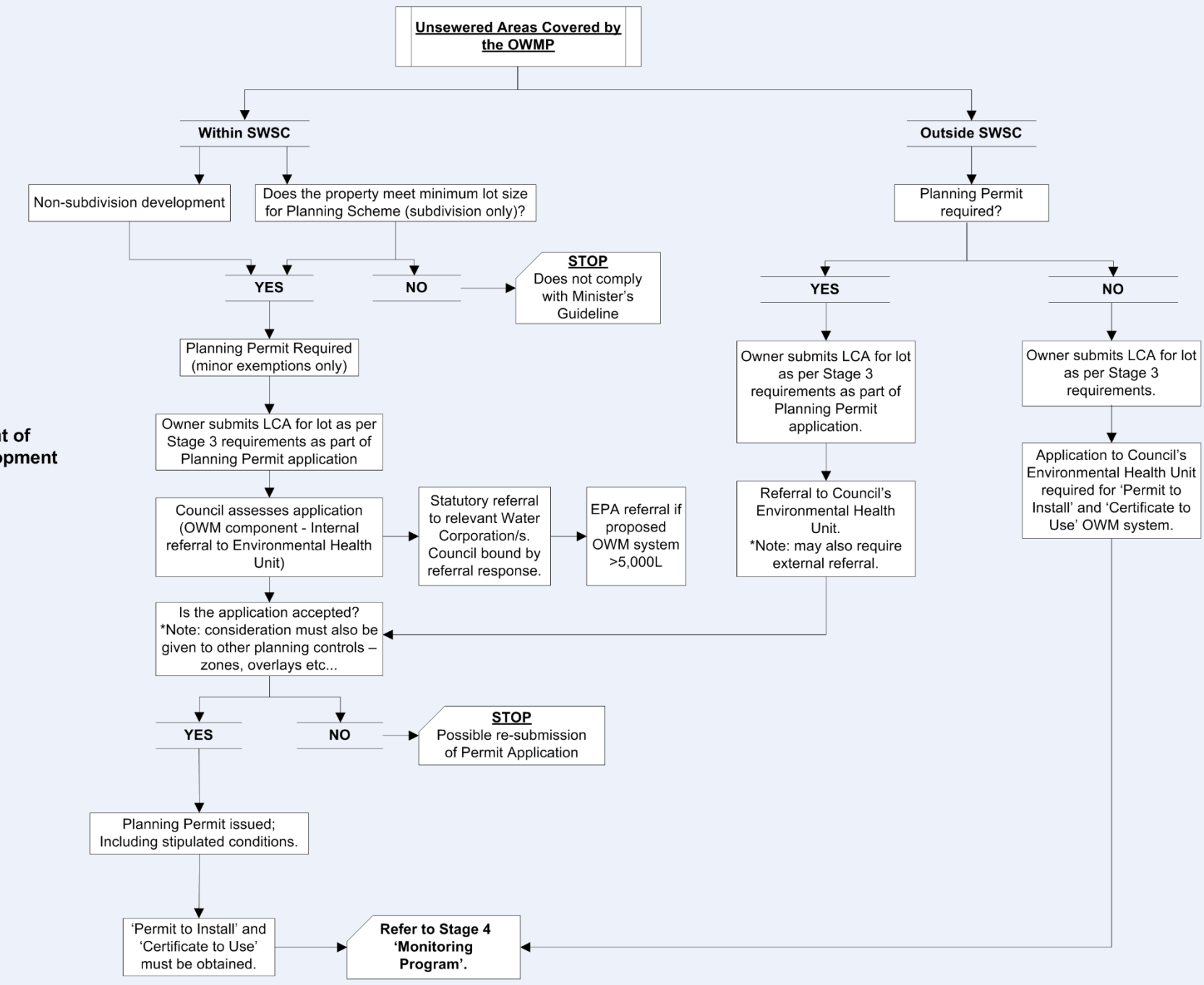

BAW BAW SHIRE OWMP - OWM RAF
FLOW CHART A (Figure 2a)
STAGE 1
Background & Data Collection
Legislation / Regulatory / Planning
Minister's Guideline for Planning Applications in SWSC Areas (2024)
EPA GOWM (2024)
EPA EDRS (2024)
AS/NZS 1547:2012
Council Planning Scheme
Council Land Use DCP's
Background Information
Council Policies
Legislation and Planning Controls
Historical Data
Stakeholder Consultation
Data Collection
Technical / GIS
Published Soils Data
Statistical Climate Data (BOM / SILO)
GIS data held by SSC, WCs, and others
Pre-Processing
STAGE 2
GIS Data Analysis
GIS Data Analysis
Informative Maps
Constraint Maps
Overlay Maps
OWM Risk Analysis
Lot Risk Rating
Low
Moderate
High
Very High
STAGE 3
OWM Risk Analysis
LCA Requirement
Council
Standard
Non-residential
Hold Point
Cumulative Risk Assessment
Delineate Area-of-Interest (AOI) i.e. town, sub-catchment
Confirm OWM characteristics for AOI
Confirm OWM risk factors for AOI
Quantify Cumulative Risk of AOI
Confirm Cumulative Risk Profile for AOI in regards to public health and the environment
STAGE 4
Cumulative Risk Assessment
STAGES 5 & 6
Procedural
Management of Existing Systems
Risk-based Monitoring Program
Refer to Figure 2b (Stage 5)
Assessment of New Unsewered Development
Unsewered Areas Covered by the OWMP
Refer to Figure 2b (Stage 6)

BAW BAW SHIRE OWMP - OWM RAF
FLOW CHART B (Figure 2b)

STAGE 5 — **Management of Existing Systems**



STAGE 6 — **Assessment of New Development**



4.1 OWM Risk Analysis (Stage 3)

4.1.1 Methodology and Rationale

The primary objective of the OWMP is to assess all 'unsewered' and 'developable' lots within the Shire to determine their suitability to contain wastewater within the allotment boundaries and comply with legislative and regulatory requirements. The relationship of a wide range of individual constraints and variables affect the specific land capability for sustainable OWM, forming the basis of the Risk Analysis.

The Risk Analysis involved assessing the combined effect of the constraint parameters outlined in Section 6.2 of the OWMP Technical Document for all of unsewered developable lots within the Shire. Each lot was assigned a risk rating for each constraint parameter, which was then used to assign an overall risk value (number) via an algorithm developed with the 2016-2021 DWMP.

Constraint parameter 'risk' bandings from the 2016-2021 DWMP have been updated to reflect the value ranges presented within the Risk Assessment Guidance report (DELWP, 2022). Further details on the individual constraints are outlined in Section 6.2 of the OWMP Technical Document.

The algorithm used to determine the final risk value is as follows.

((Soil Suitability + Slope) x ((2 x Useable Lot Area) + Climate)) / 10

The final risk value derived from the algorithm for each assessable lot is then used to assign each lot to an appropriate Risk Rating class. The following outlines the respective ranges and associated final Risk Rating classes, which remain unchanged from the 2016-2021 DWMP.

- Very High: > 5.3;
- High: 3.9 ≥ x ≤ 5.3;
- Moderate: 1.9 ≥ x < 3.9; and
- Low: < 1.9.

To account for the inherent development sensitivity within SWSC areas, all lots determined to be a Low Risk were automatically increased to a Moderate Risk via the algorithm to ensure that an LCA is required. This is to ensure compliance with Policy 1 of Planning Permit Applications in Special Water Supply Catchment Areas (DEECA, 2024).

The final Risk Ratings for individual lots give guidance towards the OWM requirements as stipulated by Council. For existing OWMS, the level of risk will commonly reflect the level of challenge that has been experienced in managing the system. This information will help guide system owners and Council in the ongoing management of existing OWMS.

Table 7 provides a rationale for the assumptions used to derive the final Risk Ratings.

Table 7: Risk Rating Descriptions

Risk Rating	Description
Very High	Constraints are present at a very high level and this significantly restricts opportunities for sustainable OWM. Traditional primary treatment systems (i.e. septic tanks and trenches) are not appropriate and a detailed land capability assessment would be required to determine if OWM is achievable at all. If achievable, specialised, advanced treatment and EDS may be required to overcome the identified constraints.
High	Constraints are present at a high level and this substantially restricts opportunities for sustainable OWM. Traditional primary treatment systems are

Risk Rating	Description
	not likely appropriate and a detailed land capability assessment would be required to determine if they are supported. Otherwise, advanced treatment and EDS may be required to overcome the identified constraints.
Moderate	Constraints are present at a moderate level and this limits the range of OWM system options that are appropriate for the lot. A land capability assessment may be required to identify the most appropriate OWMS solution, along with any mitigation measures to be employed.
Low	Constraints are present at a low level and are unlikely to substantially limit opportunities for OWM. In most cases appropriately designed and managed traditional systems will be accepted.

4.1.2 Risk Analysis Results

The final Risk Ratings relate to the underlying level of risk posed by OWM on an assessable allotment. They are used to direct management (planning) decisions and subsequently, the level or intensity of site-specific investigation (LCA) required to support planning or permit applications. A summary of the final Risk Ratings for all unsewered developable lots within the Shire is provided in Table 8, and is presented graphically in Figure 3.

It was found that there are approximately 13,601 unsewered developable lots within the Shire. Targeted localities were highlighted as priority regions of investigation by Council. The localities considered in this OWMP are: Buln Buln; Darnum; Erica; Neerim Junction; Nilma; Noojee; Thorpdale and Walhalla. These localities were selected due to current development pressures, OWM issues and existing controls in place to minimise OWM impacts.

Table 8: Final Risk Rating Summary

Locality	Total Unsewered Developable Lots	Total Number in Final Risk Rating			
		Very High	High	Moderate	Low
Shire (Overall)	13,601	2,588	4,968	5,640	405
Buln Buln	259	91	78	90	0
Darnum	417	8	195	168	46
Erica	181	94	55	32	0
Neerim Junction	116	9	41	63	3
Nilma	182	64	84	34	0
Noojee	352	124	169	58	1
Thorpdale	553	171	193	189	0
Walhalla	154	0	145	9	0

The final Risk Ratings and final maps for each of the targeted localities and associated townships are detailed in the respective Locality Reports in Appendix B of the OWMP Technical Document.

Council maintains a database of the calculated Risk Ratings for all unsewered properties within the Shire. An owner can contact Council to obtain the data for the final Risk Rating of their allotment if interested.

Council staff will be trained in accessing and updating the Risk Analysis to ensure the database is up to date. The individual lot Risk Rating mapping layer will be updated regularly by staff to ensure it presents an accurate depiction of OWM risk within the Shire.

- ✓ Action Item 4 – Regularly update GIS layer for Risk Ratings are required; and
- ✓ Action Item 5a – Train EHO in accessing and updating the Risk Analysis.

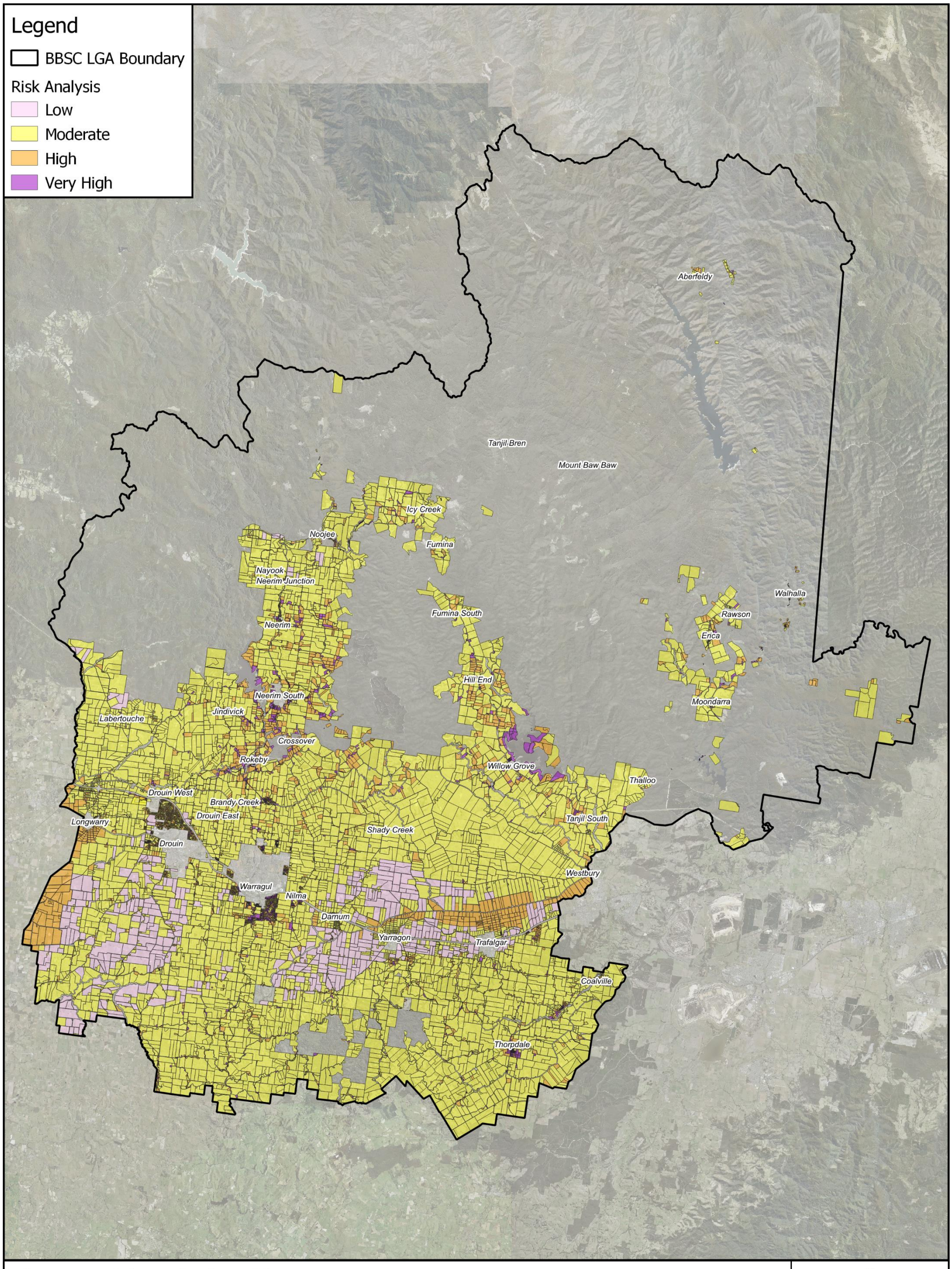


Figure 3: Risk Analysis - Shire

Baw Baw Shire Council OWMP

N

Whitehead & Associates
Environmental Consultants

0 6 12 18 24 30 36 km

(Approx Scale)

Revision	001
Drawn	CM
Approved	MS

4.1.3 Evaluation of OWM Risk

Application of the RAF methodology resulted in a majority of lots within the Shire being assigned a Moderate Risk Rating (~41%). The Risk Analysis found that a combination of two (2) individual constraint parameters (i.e. soil type and useable lot area) influenced the final Risk Rating of a lot.

The Risk Analysis identifies:

- ~3% of lots with a Low Risk Rating;
- ~41% of lots with a Moderate Risk Rating;
- ~37% of lots with a High Risk Rating; and
- ~19% of lots with a Very High Risk Rating.

The spatial distribution OWM risk appears to be distinctly influenced by topographical features, such as the alpine ranges. The central region along the Princes Highway corridor appears to pose a lower risk to sustainable OWM; whereas, the northern and southern regions of the Shire associated with the Great Dividing Range and Strzelecki Ranges (respectively) generally pose a higher risk to sustainable OWM.

Based on the individual constraint mapping (Section 6.2 of OWMP Technical Document), the parameters contributing the greatest limitation to OWM within the Shire are useable lot area, with particular regard to proximity to surface water features; soil suitability and localised impacts from the other constraints.

Climate is most limiting in the higher altitudes around Mount Baw Baw and the Strzelecki Ranges. Useable lot area is most-constraining around towns, as well as rural residential and farming allotments to the south of Longwarry and north of Trafalgar and Yarragon.

There is a high percentage of surface water coverage throughout the Shire, particularly either side of the development corridor along the Princes Highway, consistent with the locations of the SWSC areas, which occupy ~44% of the Shire.

Groundwater bores are concentrated around the central development corridor, with considerable regions of flood prone land in close proximity to the towns to the southwest of Tanjil South; north of Trafalgar and Yarragon; northwest of Nilma and around Longwarry. Regions of increased slope are evident Shire-wide, with particular focus in the northern and southern regions either side of the main development corridor along the Princes Highway (consistent with the Baw Baw alpine region and Strzelecki Ranges). Soil suitability is consistently poor throughout the Shire, with regions of less-constraining soil are found around Thorpdale, Warragul, Nilma, Drouin, Erica and Hill End.

It is essential that the limitations of the data used to undertake the Risk Analysis is recognised. Whilst individual lots have been assigned a Risk Rating, sufficient detail is not inferred to allow determination of individual system performance or land capability for OWM. An allotment classed as Very High Risk will not necessarily be categorically unsuitable for OWM, or shown to currently be experiencing poor system performance or system failure; however, it is likely to contain a number of significant limitations to the safe operation of OWMS when assessed at a very broad scale.

Furthermore, the degree of risk depends on the type of EDS and generated effluent quality (e.g. subsurface irrigation can be installed on slopes up to 15% – 20% in some cases, but this would be impractical for trenches). This relationship is detailed further in Section 6.2 of the OWMP Technical Document.

Physical constraints can often be overcome or substantially mitigated by a range of measures (such as terracing, importing topsoil fill, installing stormwater diversions, removing vegetation or planting nutrient tolerant vegetation), thereby increasing the 'suitability' of the available area.

Risk Ratings should be used to guide the requirement for more detailed individual lot LCAs; rigorous assessment of planning proposals and permit applications and to target investment in the inspection and management of existing OWMS, rather than to define system performance or land capability.

4.1.4 Potential Reticulated Sewered Connection

The Risk Analysis indicates that the townships of Buln Buln; Darnum; Erica; Neerim Junction; Nilma; Noojee; Thorpdale and Walhalla present the highest risk to public health and the environment in regards to OWM. It is recommended that further consideration is given to the investigation, prioritisation and feasibility for these townships to be connected to the reticulated sewerage network.

The 'Walhalla Wastewater Management Feasibility and Crown Land Sales' study was carried out in 2018 by BBSC and DELWP. The study found that there is no public health issues or risk requiring action or investment in the township, with the capital investment in a reticulated scheme was not warranted at the time.

4.2 Cumulative Risk Assessment (Stage 4)

A Cumulative Risk Assessment (CRA) is an indicative risk assessment tool used to identify potential risks associated with existing or proposed development in unsewered areas, and provides a means of quantifying risks within a specific Area of Interest (AOI).

A CRA looks at existing OWMS within an AOI, such as a sub catchment or township area, determining the risk posed from OWM to environmental and health contamination endpoints. It also has potential to be used to assess the impact of increased development and number of OWMS within a particular AOI.

The CRA within the OWMP has been carried out in-line with the DELWP 'Risk Assessment Guidance' report (DELWP Report, 2022), with OWM details and catchment characteristics input into the DELWP 'Risk Calculation' spreadsheet tool (DELWP Tool, 2022).

The CRA is based on the 'likelihood' and 'consequence' of OWM failure within study catchments. Likelihood is defined as the possibility of wastewater transfer off-site towards a defined endpoint, with consequence defined as the contaminant load once wastewater has reached the endpoint.

The areas of Buln Buln, Darnum, Noojee, Nilma, and Walhalla were defined as AOIs and have been evaluated in the CRA. These areas were selected by Council due to current development pressures, OWM issues and complaints, existing controls in place to minimise OWM impacts and location within / proximity to sensitive areas (SWSC areas). Study catchments are presented as Figures 5 – 9 of the OWMP Technical Document. Section 6.4 of the OWMP Technical Document outlines the methodology, process, and results of the CRA.

4.2.1 Evaluation of Cumulative Risk Assessment

The CRA indicates that a majority of the study catchments exhibit a Low to Moderate Risk in regards to public health and the environment. Noojee presents a High Risk to human health in regards to surface and potable water endpoints due to a higher proportion of primary treatment systems (septic tanks) when compared to other catchments, resulting in a higher contaminant load.

Wastewater within a majority of the study catchments are managed within primary treatment systems (septic tanks) and absorption systems (trenches / beds), with secondary treatment

(AWTP / sand filter) and subsurface irrigation being the second most common OWMS. Even though these types of systems are considered a High Risk, it is noted that the risk factors associated with the systems (i.e. proximity to sensitive features) trend towards Low Risk.

Soil type was the most common constraint across all catchments, with a majority containing Category 6 soils presenting a High Risk to surface water features. A majority of the study catchments had a relatively low OWM system density, with most <0.5 OWMS per hectare, with the sub catchments of Buln Buln 1, Darnum 3, and Noojee 1 exceeding this value.

The outcomes of the CRA will be used as a 'baseline' assessment for the selected study catchments within the Shire, and can be used as a basis for the assessment of risk for future development within the associated catchments.

✓ Action Item 10 – Undertake CRA of AOIs to provide guidance on potential risk associated with existing or proposed development in unsewered areas.

4.3 Limitations of the Risk Assessment Framework

There are several limitations inherent in the methodology adopted to assess the variation in onsite wastewater related risk throughout the Shire. Briefly, these are due to:

- The use of broad-scale mapping and desktop analysis;
- A lack of digital data in some areas;
- The present level of scientific understanding and uncertainties relating to the physical and chemical processes and their implications for sustainable OWM;
    - Current best practice derived from wide experience in Australia, New Zealand and the United States was used in this assessment;
- The limited availability, quality, and accuracy of attribute data;
- Limitations in the method of assessing the inter-relationship and cumulative effect of individual attributes and constraints; and
- Inability to assess off-site discharge of greywater within the CRA procedure.

The recognised limitations emphasise that the Risk Analysis should only be used as a preliminary attempt to distinguish regions within the Shire with relatively higher levels of risk to public health and / or the environment with the objective of determining preliminary priority for future wastewater servicing.

5 Existing OWM Systems (Stage 5)

5.1 Existing OWM Trends in Baw Baw Shire

There are approximately 40,523 lots within the Shire as of publishing the 2025-2030 OWMP. The towns which are currently sewered are Warragul, Drouin, Trafalgar, Yarragon, Longwarry, Neerim South, Rawson and Willow Grove, resulting in approximately 22,770 sewered lots. There are approximately 4,152 lots within the Shire that are not suitable for development (i.e. Crown Land, National Park, State Forests, waterways, and roads), and will (generally) not include an OWMS. Therefore, there are approximately 13,601 unsewered developable lots within the Shire.

Of these lots, there are approximately 4,522 OWMS registered on Council's permit management system. It is expected that there are a number of lots within the Shire which have OWMS that are unknown to BBSC, with these OWMS either constructed without a permit / before permits were required or where continuity of records were interrupted with amalgamation of the Shire in 1994. It is noted that some records are held as paper copies only and are yet to be digitised. Electronic records will be updated as these properties apply for permits or when property owners request copies of plans from Council.

A majority of the older OWMS consist of septic tanks with conventional absorption trenches or beds. These can operate effectively; however, require regular maintenance (i.e. desludging). Common practice in Victoria is to bury the septic tank underground, making the septic tanks difficult to locate, resulting in inadequate maintenance of the tank. It is noted that Council now require all tanks to be fitted with saddles or risers to improve access for ongoing maintenance. A number of older OWMS managed blackwater and greywater separately, with greywater discharging off-site to street drainage as per their original permit conditions. It is unclear which, and how many, properties continue to operate using this method.

✓ Action Item 6d – Investigate discharge of greywater to street drainage.

Newer systems installed in the Shire tend to provide higher levels of treatment through the use of AWTPs, sand filters, or greywater treatment systems. These systems provide secondary treatment of the wastewater before dispersal via irrigation systems. These systems require more maintenance septic tanks and servicing every three (3) months is a requirement for EPA approval.

5.2 Management of Existing OWM Systems

Stage 5 of the RAF (refer Figure 2b) outlines the procedural framework under which BBSC will prioritise monitoring and (if necessary) require / enforce management of OWMS in the Shire. Existing OWMS in the Shire will be managed through the risk-based monitoring program as described in Section 8.4 of this Operational Plan.

✓ Action Items 6a-c – Introduce a monitoring program of OWMS.

Under the *EP Act 2017*, the General Environmental Duty (GED) was introduced, requiring any owners or occupiers of the land managing or controlling an OWMS to take reasonable steps to maintain the OWMS in good working order, keep maintenance records (service reports / pump-out reports), respond to any problems that arise, and notify Council of a failure and rectification steps.

The *EP Act 2017* and *Regulations 2021* also provide Councils with the power to enforce compliance. Council can issue infringement penalties (*EP Regulation 2021*, Schedule 10), improvement notices (*EP Regulation 2021*, Section 271), order maintenance (*EP Regulation 2021*, Regulation 163), and prohibition notices (*EP Regulation 2021*, Section 272), if they have reasonable belief that any of the grounds listed in the relevant sections of the *EP Act 2017* or *EP Regulation 2021* are satisfied.

To ensure compliance with the *EP Act 2017*, owners or occupiers of the land are to maintain their OWMS in good working order. Supporting information for the OWM maintenance and rectification of issues can found in the following sections.

5.3 Maintenance of Existing OWM Systems

Maintenance actions should be undertaken by the owner or occupier of the land, or a qualified service agent in order to minimise the risk of system failure and contravening the *EP Act 2017*. Potential actions are outlined in the following:

- Regular desludging of septic tank (or primary tank in secondary system);
- Checking of all system chambers and other checks as required by system manufacturers;
- Addition of chlorine for disinfection where chlorination is used;
- Ensuring occupants do not discharge chemicals used within the dwelling to the system (i.e. bleaches, antibacterial cleaning products, paints, dyes etc.);
- Ensuring that secondary treatment systems are not turned off at any time;
- Responding to system alarms as this usually indicates a system failure or problem;
- Monitoring of secondary treatment system effluent quality for commercial systems (as required); and
- Ensuring EDS, sprinklers or irrigation area is maintained.

5.4 Non-compliant OWM Systems

It is recognised that there are many older OWMS located on lots with unsuitable characteristics for OWM. These systems may be undersized or have direct greywater discharge off-lot, resulting in a non-compliant OWMS.

Sections 5.5 and 5.6 of this Operational Plan outline the range of options available to improve OWM performance of non-compliant OWMS. Section 8.4 of this Operation Plan outlines the procedure for identifying and managing existing OWMS in the Shire through a risk-based monitoring program.

5.5 Modifications for Existing OWM Systems

In some cases, it is not necessary to replace all OWMS components to rectify issues. Risks from non-compliant systems may be appropriately managed by modifying a system. Potential modifications include, but are not limited to:

- Minor repairs (crack repair, replace components, etc.);
- Outlet filters for septic tanks; and
- Access risers for septic tanks.

Required modifications should be determined on a case-by-case basis, and discussed with Council prior to implementation. Septic tanks that are to be modified or repaired must be structurally sound and adequately sized. Further information on the modification of existing systems can be found in Section 9.1 of the OWMP Technical Document.

5.6 Replacement / Upgrade of Existing OWM Systems

Where an existing system is shown to be operating effectively but does not comply with the current Standards or EPA Guidelines, the system is not required to be upgraded but should be

monitored. In the event that failure occurs, effluent is discharging off-site due to OWMS failure, or development alterations increasing wastewater generation are proposed (i.e. addition of bedrooms), the OWMS must be replaced or upgraded. Where a new system or upgrade works are required, the system must comply with the current Standards and EPA Guidelines.

Potential upgrade and replacement options include, but are not limited to:

- Septic tank replacement or upgrade to secondary treatment system;
- Absorption system rejuvenation;
- Absorption system replacement, replication, or expansion;
- Soil amelioration; and
- Alternative absorption system design.

Replacement of systems and components should be carried out according to the site-specific conditions and requirements of the lot, and by an appropriately qualified and experienced person. Further information on the replacement of existing systems can be found in Section 9.2 of the OWMP Technical Document. A permit will be required to replace or upgrade an OWMS, and will only be issued to properties that are unable to be serviced by reticulated sewerage.

5.7 Subdivision of Developed Land

During the process of subdivision of land that is currently developed, it is common that the OWMS servicing the existing development will be impacted, resulting in the OWMS becoming non-compliant (i.e. OWMS located in newly created lot). In the case that this occurs, the OWMS must be upgraded to be in line with the current Standards and EPA Guidelines. OWMS requirements can be inferred from the LCA provided for the subdivision, assuming the site and soil conditions are relevant to the existing development.

6 Future OWM Systems (Stage 6)

Stage 6 of the RAF (refer Figure 2b) outlines Council's 'procedural' steps for determining the management requirements for future unsewered development.

6.1 Future Development in Unsewered Localities

Victoria in Future (EPA, 2019) has projected the population of the Shire to increase to 79,920 (~34% increase) by 2036, with the number of unsewered allotments requiring OWMS also anticipated to increase in line with the population.

The Baw Baw Shire *Settlement Management Plan* (2013) previously assessed growth throughout the Shire. The largest predicted growth towns identified were Warragul, Drouin, Trafalgar, Yarragon, Longwarry, Neerim South, Rawson, Darnum, Willow Grove, Nilma and Thorpdale. As per the BBSC Planning Scheme, towns with the highest growth are Warragul and Drouin. Moderate growth is identified for the towns of Trafalgar, Yarragon, Longwarry and Neerim South.

6.1.1 Comparison with Risk Analysis Results

Future development within Thorpdale is considered unlikely due to there being no provision for sewer and limited land area available for OWM. Noojee, Tanjil Bren and Walhalla are also predicted to have limited growth potential due to land area and topographic constraints. Willow Grove and Rawson are identified to have a moderate growth potential; however, there is limited infrastructure in these towns which are located in a SWSC area. Gippsland Water have indicated that the expansion of reticulated sewerage in Willow Grove is not supported, with all new developments to remain serviced by OWMS.

6.2 Assessment of Future OWM Systems

Proposals for development exempt from planning permit requirements (e.g. dwelling in Township Zone that is not covered by any overlays) will proceed directly to the preparation of an LCA as per the requirements set out in Section 6.3 of this Operational Plan.

Development and planning proposals for lots located within SWSC areas must comply with the minimum lot size specified for the current land zoning per the Planning Scheme (subdivision only), as outlined in Table 9. Further information can be found at the following. If a lot does not achieve the minimum area, then it is deemed as non-compliant with DEECA (2024).

Baw Baw Planning Scheme - Ordinance

Table 9: Minimum Lot Size for Planning Scheme

Land Zoning		Minimum Lot Size (ha)
Farming Zone		40.0
Rural Living	**Schedule 1**	4.0
	Schedule 2	8.0
	Schedule 3 (Lots 1-6)	0.43
	Schedule 3 (Lot 7)	3
	Schedule 4	0.4
	Schedule 5	1.0

Council's procedures for assessing OWM proposals are detailed in Section 7 of this Operational Plan. All OWM proposals must be submitted to Council with a 'Permit to Install' application form for the proposed treatment system and EDS.

The requirements for LCA based on the Risk Analysis in Section 4.1 of this Operational Plan are to be followed when applying for a Permit to Install. Any OWM works within SWSC areas require a Planning Permit, with WCs referred through the planning process.

The Action Item 1 of the Action Plan includes a review and finalisation of Council procedures for the assessment of OWM proposals.

✓ Action Item 1 – Prepare and document BBSC policies / procedures to ensure they are in line with this Operational Plan and current legislation, standards, and guidelines.

Records of development and rezoning applications in unsewered localities provide useful data about development pressures across the Shire and can be used to inform strategic land use and development planning decisions in the unsewered townships and their surrounds. It is important to ensure that the broader planning processes and decisions take into consideration the OWMP and ongoing inspections; therefore, all the Planning Officers and EHO should be briefed on the requirements.

✓ Action Item 9a – Brief all Planning and EHO staff on the OWMP.

6.3 Land Capability Assessment Requirements

The level of detail required by the LCA is to be inferred by the Risk Analysis provided in Section 4.1 of this Operational Plan. Council maintains a database of the calculated Risk Ratings for all the unsewered lots within the Shire. An owner can contact Council to obtain the data for the final Risk Rating of their land.

Copies of the minimum requirements for assessment and reporting for each level of LCA are provided in Appendix B of this Operational Plan. The specific LCA requirements are detailed in the following sections.

The LCA must be conducted in accordance with the standards outlined in Section 3.4 of GOWM (2024), and should be guided by the Victorian Model LCA Framework (MAV & DSE, 2014) (as amended).

With regards to OWMS selection and sizing, the permeability and corresponding ‘design’ loading rate for the most limiting soil horizon within 600mm from the base of the EDS must be used to ensure the loading of wastewater on the soil can be supported for the entire soil profile.

6.3.1 Requirements for Low Risk Lots

It is envisaged that a LCA will generally not be necessary for Low Risk lots, unless deemed so by Council staff. Application for low Risk lots can be assessed using the Risk Pro-forma Checklist (Table 11 and Appendix B) and / or the ‘Site Information Sheet’ template in Appendix D of *AS/NZS 1547:2012* to confirm and record the site and soil characteristics.

The proposed treatment and EDS combination may be selected from the System Selection (Table 4 of this Operational Plan) and Sizing Tables (Town Reports in Appendix B of the OWMP Technical Document).

Council will conduct a site visit to confirm site and soil details are as per the Pro-forma detail and that the proposed OWMS is appropriate for the site. If a Low Risk Rating lot is located within a region of increased OWM risk or constraint, Council staff may require (at their discretion) a Standard LCA Assessment and Report to be completed (refer Table B1, Appendix B). This may include lots that are located in areas prone to landslip, high groundwater regions, or Groundwater Management Areas.

6.3.2 Requirements for Moderate Risk Lots

A Standard LCA is recommended for Moderate Risk lots (refer Table B1, Appendix B) which includes Site Inspection and Field Investigations. However, where appropriate and available, system design can be determined using the System Selection (Table 4 of this Operational Plan) and Sizing Tables (Town Reports in Appendix B of the OWMP Technical Document). For Moderate Risk Rating lots located outside of a SWSC, Council may at its discretion not require an LCA to be completed and the procedure as per Low Rating lots to be followed.

6.3.3 Requirements for High and Very High Risk Lots

A Standard LCA is required for High Risk lots (refer Table B1, Appendix B) which requires information in addition to the Standard LCA. The main requirement of a Detailed LCA is to undertake a monthly water and annual nutrient balance for sizing the OWMS. More comprehensive soil testing is also required to assist with appropriate system selection and ensuring any necessary mitigation measures are implemented into the site management plan.

System Selection and Sizing Tables are not available for High Risk Rating lots.

6.3.4 Non-residential LCA Requirements

Non-residential developments (i.e. cafes, pubs, restaurants, etc.) present a higher risk to OWM when compared to residential developments as they are complex due to variability in wastewater generation and wastewater composition. Therefore, a high degree of assessment should be carried out.

A Non-residential LCA is required for all non-residential developments (refer Table B2, Appendix B), which requires a higher level of assessment and reporting due to the inherent constraints and risks associated with generated wastewater. The LCA requires in-situ permeability testing, soil chemical analysis, conservative monthly or daily water balance, an annual nutrient balance, and a detailed site-specific hydraulic design in addition to the standard LCA requirements.

All non-residential developments are to install a flow meter to aid in monitoring water usage and flow rates from the development. As per GOWM (2024), EDRS (2024), and *AS/NZS 1547:2012*, flow meter data may be used in place of standard flow rates for existing developments as this representative of the development, and can avoid under / over design of an OWMS'.

If the development contains a commercial kitchen, it is required that an adequately sized grease trap be installed on the greywater waste stream to ensure excess fats, oils, and greases are not discharged to the treatment system. The grease trap must be sized by the seating capacity or fixture allowance method, and have a minimum volume of 600L (whichever value is larger). Further information can be found in Food and Oil Interceptor (FOI) Sizing Criteria (South East Water, 2012).

6.3.5 Generic LCA Requirements - Overlays

As detailed in Stage 1 of each LCA procedure (Appendix B), confirmation of any relevant risk overlays with Council is required. If any risk is identified, this needs to be specifically addressed within the LCA. Discussion with Council is required to determine the necessary requirements to be met. If the site is located within an identified landslip region, then a geotechnical report (OWM relevant) will likely need to be completed.

If the site is located within a known shallow groundwater region, the depth to (permanent and shallow) groundwater will need to be determined and discussed within the LCA report.

It should be noted that an LCA may indicate that it is not be possible to design an appropriate OWMS for a given site and sometimes costs for construction may be prohibitive. However, the onus of justification rests with the LCA assessor who may demonstrate to Council / WC satisfaction that the risk from a proposed OWMS combination has been adequately addressed by design or management measures.

6.3.6 Subdivision LCA Requirements

It is very important that an LCA is performed early in the planning phase of land development before rezoning or subdivision as it achieves a more sustainable result, because areas with higher degrees of limitation can be appropriately zoned and subdivision layouts can make best use of the constraints and opportunities of the land. It is also a requirement under the Planning Scheme to be able to demonstrate that the land is suitable for the development of a dwelling prior to subdivision approval. Chapter 5 of the Victorian LCA Framework (MAV & DSE, 2014) broadly discusses LCAs for subdivisions.

Regardless of the scale of an LCA, the objective is the same, that is, the determination of a sustainable OWM strategy for **each** proposed lot to reduce potential impacts to the local receiving environments. Different management strategies may be required within the same subdivision due to varying constraints identified through the LCA across the site.

Only concept OWMS designs are necessary at this stage to determine the minimum size of the EDS. Options may be left as broad technology types suitable for the lots, with detailed system design required at the individual lot development stage.

The subdivision LCA must provide an assessment based on a minimum of five (5) bedroom dwelling for residential subdivisions to ensure no issues arise at the individual lot stage. Each proposed lot must meet the minimum lot size requirements specified in the relevant Planning Scheme. If no minimum lot size is provided for the Planning Scheme (i.e. TZ), a minimum lot size of 0.4ha (4,000m^2) is to be followed (refer Section 6.4 of this Operational Plan).

The LCA requirements detailed within Section 6.3 of this Operational Plan are applicable to all scales of development planning and assessment. The Risk Rating of the existing lot will direct the level of detail required for an LCA for a subdivision or rezoning of a lot.

6.4 Minimum Lot Size for New Developments

The Risk Analysis mapping will assist Council in planning for future development and determining minimum lot sizes for future subdivisions. The assessment of a site for wastewater management potential is important as it can assist in understanding the site's potential for development.

Historically, wastewater management was overlooked in early planning stages with standards changing over time, resulting in a number of subdivided lots within towns and low density residential areas (i.e. settlements) being significantly undersized.

Due to small lot size, these lots have been given a high risk rating in the risk analysis and generally wastewater management on these lots is constrained and potentially unsustainable. This does not automatically preclude them from development; however, an appropriately detailed LCA and design will be required to the satisfaction of Council and other stakeholders, including the relevant WC (in accordance with the Risk Rating).

Where OWM is not supported on small lots, consolidation with adjacent undeveloped lots (where feasible) is the most likely pathway to allowing development proposals to be considered on the land subject to appropriate zoning of the lots in question, and approval by Council and other relevant stakeholders. Such approval will also take into account other planning controls relating to the land.

Where rezoning of land is being considered or Structure Plans are being developed, Council can use the Risk Analysis to determine suitable development potential and density. The results of the Risk Analysis mapping (and findings in the previous 2016 OWMP) generally support a minimum lot size of 0.4ha (4,000m^2), assuming that there is adequate 'useable' land for OWM, including a sustainable effluent disposal or reuse system contained entirely within the lot boundary. This minimum lot size is a broad guideline only; a more detailed LCAs must be carried out for all subdivision and single-lot developments within all SWSC areas.

Constrained properties, such as those with steep slopes, very shallow soils, or in close proximity to surface waters or groundwater bores, will need to demonstrate that they have adequate available land for the sustainable application of treated effluent. An area of 0.4ha may be too small in such instances; however, innovative building design and lot layout can mitigate constraints on previously undeveloped or redevelopment sites.

6.5 Onsite Wastewater Management Systems Design

6.5.1 Wastewater Generation

Wastewater generation rates for residential dwellings are to be estimated based on the occupancy rate outlined in Section 4.2 of the GOWM (2024), which is based on the number of bedrooms plus one (1). Additional rooms that could potentially serve as a bedroom (i.e. study, office) are to be considered in the assessment. Commercial accommodation units are to be based on an occupancy rate of two (2) persons per bedroom.

Wastewater flow rates are to be based on those outlined in the current Standards and Table 4-2 and 4-4 of the GOWM (2024). It should be noted that flow rates presented in the GOWM (2024) take precedence over those in *AS/NZS 1547:2012*. Further information can be found in Section 8 of the OWMP Technical Document.

6.5.2 Treatment Systems

Due to the higher associated risk with primary treatment systems, all new developments within SWSC areas are required to implement a secondary treatment system to mitigate the risk of OWM to public health and the environment.

For the installation of new proprietary systems, the selected system must have a current certificate of conformity from a conformity assessment body, conforming to the relevant Australian Standard. The appropriate standards for the different types of treatment systems are as follows:

- Septic tanks (and vermiculture systems) – AS/NZS 1546.1:2008, on-site domestic wastewater treatment units, Part 1: Septic tanks.
- Waterless composting toilets – AS/NZS 1546.2:2008, on-site domestic wastewater treatment units, Part 2: Waterless composting toilets.
- Secondary treatment systems – AS 1546.3:2017, on-site domestic wastewater treatment units, Part 3: Secondary treatment systems.
- Domestic greywater system – AS 1546.4:2016, on-site domestic wastewater treatment units, Part 4: Domestic greywater treatment systems.

EPA holds a register of the OWMS with valid Certificates of Conformance within Victoria, which can be found at the following:

Onsite wastewater treatment systems with valid certificates | Environment Protection Authority Victoria (epa.vic.gov.au)

The EPA Guidelines provides useful guidance on factors to consider when selecting an EPA approved OWMS. Site constraints (including for effluent dispersal or reuse) are a major factor when deciding on a treatment system.

6.5.3 Effluent Dispersal System

The key issues that influence the selection and design of EDS' are:

- The level of treatment of the effluent (primary, secondary, or advanced secondary);
- Soil characteristics (texture, structure, depth, dispersibility, and phosphorus adsorption capacity);
- Site characteristics (slope, aspect, and exposure); and
- Proximity to sensitive receiving environments (surface waters and groundwater).

The degree of constraint for sustainable effluent dispersal can be a major factor in selecting a treatment system. The design of the EDS must be carried out consistently with the guidelines cited in this document, as well as the *AS/NZS 1547:2012*. Table 4 of this Operational Plan details the compatibility of treatment systems and EDS options.

6.5.4 Installation

Often system failures will occur as a result of poor installation practices. The installation of OWMS must be undertaken by a licensed plumber or system installer who is familiar with the requirements of Council, the Guidelines and Standards, and has experience in installing OWMS.

For a system to operate and perform as it was designed, the system must be installed in accordance with the manufacturer's requirements. Issues such as poor drainage around tanks and uneven distribution of effluent throughout trenches or irrigation systems can all result in effluent ponding, runoff or impacts on public health and the environment which can easily be avoided. Further detail on OWM installation can be found in Section 5 of the GOWM (2024), and Section 6 of the EDRS (2024).

6.5.5 Maintenance

For a system to operate and perform as it was designed, the system must also be maintained in accordance with the manufacturer's requirements and regular maintenance must be undertaken in accordance with the maintenance procedures outlined in Section 5.3 of this Operational Plan.

As a minimum, it is recommended that all treatment systems are to be inspected and maintained every three (3) years by a suitably qualified service agent, and are pumped out / de-sludged unless deemed unnecessary by the agent. Further, it is recommended that secondary treatment systems are inspected and maintained by a suitably qualified service agent at the prescribed intervals (commonly quarterly).

By undertaking these regular maintenance tasks a system can operate effectively without major problems; however, a lack of care for any one, or all, of these items can result in system failures. Further detail on OWM installation can be found in Section 6 of the GOWM (2024), and Section 7 of the EDRS (2024).

7 OWM System Design, Approval, Installation, & Operation

This section broadly describes the responsibilities across planning, installation and operation of OWMS in unsewered localities of the Shire, with reference to the Risk Analysis described in detail in the OWMP Technical Document. The level of detail required to support a proposal for OWM on an unsewered lot is outlined Section 6.3 of this Operational Plan.

7.1 Council's Responsibilities

Council is responsible for assessing permit applications; issuing permits for new and altered OWMS; monitoring of existing systems; and ensuring compliance with Council, EPA, and policy / legislative requirements (as outlined in Section 3 of this Operational Plan).

Council will utilise the EPA *Regulating Onsite Wastewater Management Systems: Local Government Toolkit* (Publication 1974:2021) to assist regulating OWMS within the Shire and adhering to the *EP Act 2017*. The flowchart for investigating OWM is detailed in Appendix 3 of the toolkit gives an overview of Council's responsibilities in OWM.

Criteria to be considered when assessing a permit application is found in Regulation 26 of the *EP Regulations 2021*, with circumstances for refusal provided. Permits will be issued for a maximum five (5) years. Under Regulation 33 of the *EP Regulations 2021* Council staff may inspect the site of a proposed OWMS during the assessment and installation process prior to issuing a Certificate to Use, as determined on a case-by-case basis.

7.2 Land Owner and Occupier Responsibilities

Persons that own or occupy land with an OWMS are to take all reasonably practicable steps to eliminate or reduce risks of harm to public health and the environment, so far as reasonably practicable by: taking reasonable steps to maintain the OWMS in good working order; providing information to a person in management of an OWMS (i.e. tenant) regarding correct operation and maintenance of the system; keeping maintenance records; responding to problems that arise; and notifying Council of a failure and rectification steps. Further detail can be found in Part 5.7 of the *EP Regulations 2021*.

This requires a proactive approach from owners and occupants, with Table 2 of the EPA Publication 1974:2021 outlining the requirements for the operation and maintenance of an OWMS for both the owner and occupier of the land. Objectives to achieve better OWMS management in the Action Plan include:

- ✓ Action Item 1 – Development of Council policies and procedures;
- ✓ Action Items 6a-c – Development of monitoring program; and
- ✓ Action Items 11a-d – Development of an education program.

7.3 LCA Assessor / System Designer Responsibilities

The GOWM (2024) and Victorian LCA Framework (MAV & DSE, 2014) outline minimum requirements for land capability assessors with regards to qualifications, experience, association, insurances and independence.

The professional engaged to undertake the LCA and the OWMS design has a responsibility to prepare a site-specific OWM design and supporting documentation that demonstrates that the requirements of the *EP Act 2017* will be achievable. The LCA must include sufficient information regarding treatment performance (effluent standard) and EDS (sizing and layout) to allow for an appropriate OWMS design to be provided with an application.

The assessor / designer is required to undertake the level of investigation and reporting appropriate (LCA) to the Risk Rating applied to the lot, as outlined in Sections 6.3 of this Operational Plan. Section 6.5 of this Operational Plan provides general advice on design, installation, and maintenance of OWMS, that applies to all unsewered properties in the Shire.

8 Compliance Monitoring

8.1 Record Keeping

Electronic database records of applications and permits for OWMS in the Shire date back to the early 2000s, with hardcopies to the 1970s. The current record system for OWMS applications and permits is as follows:

- Applications and permits are electronically registered in the Health Manager database. Details of the type of system, the permit conditions, the issue dates and the inspection results are kept on the database. The electronic database is linked to Council's Property and Risk Rating system which allows for the effective integration and recovery of information;
- Hard copy records of plans, permits, and inspection notes are kept on the relevant lot files. It is thought that information should be available for most of the OWMS that have been installed since 1970 (and all since 2000); and
- Hard copies of active files are kept by the Environmental Health Unit.

The Shire receives service reports from the majority of contractors that service secondary treatment systems. The ability to receive and manage these records is fundamental to facilitating monitoring programs that assess the compliance of maintenance of secondary treatment systems.

The Health Manager database should be updated on an ongoing basis as Certificates of Use are issued, service reports are received, and system inspections are completed.

✓ Action Item 3 – Ongoing updates of Council's OWM Health Management database.

8.2 Electronic Records of Inspections

The use of a paper-based records system for field work can be time consuming and requires extra staff to enter the details into the database upon return to the office.

Council currently utilise portable hand-held laptops loaded with software that includes the system inspection pro-form sheet. The device allows for the recording of GPS coordinates of OWMS components (treatment and EDS). It is recommended that the proposed monitoring program outlined in Section 8.4 of this Operational Plan utilised these devices.

In the absence of electronic inspection software, hard-copy inspection checklists have been developed based on existing templates in use by BBSC and current best practice.

8.3 Fees or Charges for OWMS Owners

Permit fees for OWM are set by the *EP Regulations 2021*, as presented in Table 10.

Table 10: Fee Units for OWMS

Permit Application	Fee Units
Amend a permit	10.38
Construct, install or alter an OWMS	48.88
Construct, install or alter an OWMS – Complex Maximum	135.43
Construct, install or alter an OWMS – Complex (per hour)	6.12
Exemption	14.67

Permit Application	Fee Units
Exemption – Complex Maximum	61.41
Exemption – Complex (per hour)	5.94
Minor Alteration to OWMS	37.25
Renew a Permit	8.31
Transfer a Permit	9.93

Many rural and regional Councils with a high proportion of OWMS have introduced an additional annual fee or charge for owners of unsewered properties to help resource monitoring and education programs. Adequate resourcing is a prerequisite to implementing the OWMP and monitoring its effectiveness. It is recommended that BBSC investigate the options for implementing an appropriate fee or charge to fund the Action Items and programs in this OWMP, as well as the staffing requirements require (Action 2).

- ✓ Action Item 2a – Consider sustainable options for ensuring appropriate resources; and
- ✓ Action Item 2b – Investigate potential staffing requirements for the implementation of the OWMP.

8.4 Monitoring Program

8.4.1 Overview

The effective management of OWMS requires a robust and well-resourced monitoring program. However, since the implementation of the *EP Act 2017*, Councils no longer have permission for entry to “residential premises” without consent, unless Council reasonably believes that a person has contravened, is contravening or is about to contravene, the *EP Act 2017* or *EP Regulations 2021*.

Therefore, the following factors may be used to trigger an OWMS inspection:

- A complaint made by a member of the public in relation to a system;
- The owners of a system lodge a planning permit to alter the lot development; and
- For OWMS that have been operating for over three (3) years and a land owner / occupier has failed to provide a maintenance report / maintenance records within 60 days after being requested (Council can reasonably believe that the person in management or control of land on which an OWMS is located has not taken all reasonable steps to ensure that the OWMS is maintained in good working order - Regulation 159(2)).

It is important that information relating to OWMS condition in the form of maintenance reports (secondary treatment system service reports or pump-out records) is requested from the property owner by Council on a consistent basis.

8.4.2 Legislation

There are two (2) pieces of legislation applicable to management of OWM, the *Public Health and Wellbeing Act 2008* and the *EP Act 2017*, which deals with new OWMS, historic systems with permits and the setting of current standards for OWM, and the older legacy systems that were not required to obtain a permit and pose, or may pose, a risk to human health or the environment, or are not, or may not be, in good working order. Each piece of legislation has different, but compatible objectives, and requirements for the exercising of powers by authorised officers and mechanisms that may apply to improvement of OWMS.

8.4.3 Monitoring Program

The monitoring program involves the following features. It is recommended that all records are to be incorporated into the Health Manager database.

1. Permit approval inspections;
2. Unpermitted system detection and capture;
3. Ad-hoc inspection by request or nuisance complaint; and
4. System monitoring.

Permit approval process:

Following the review of the proposed system application, if it is deemed suitable for the site, Council will issue a 'Permit to Install' and stipulate any conditions. Council inspects an OWMS prior to approving it for use and issues a 'Certificate to Use'.

✓ Action Item 8 – Undertake compliance audits of new installations.

Unpermitted system detection and capture:

Identification of improved properties without a record of OWM permit will be undertaken using indicative data. An approach based on a case-by-case basis will be used to ensure these unpermitted systems comply with current legislation.

Ah-hoc inspection by request or complaint:

Inspections can be made in response to nuisance complaints from system owners or the general public or in response to other actions as Council deems appropriate, on a case-by-case basis.

System monitoring:

BBSC will assess the operational condition of OWMS throughout the Shire, ensuring compliance with the *EP Act 2017* and *Regulations 2021*. This will be done by requesting and assessing OWMS maintenance reports (i.e. pump-out receipts, secondary treatment system service reports) from property owners under Regulation 162 of the *EP Regulations 2021*.

✓ Action Items 6a-c – Introduction of an ongoing OWMS monitoring program.

The assessment of the maintenance records will be used to ensure the property owner is taking reasonable steps to ensure the OWM system is maintained in good working order. Provided records indicating poor system maintenance are in breach of the GED and / or Regulation 159(2).

If responding to a complaint investigation and a maintenance report cannot be provided, it will be assumed that the OWMS is not in good working order, and is therefore contravening Regulation 159(2) of the *EP Regulations 2021* (Council can reasonably believe that the person in management or control of land on which an OWMS is located has not taken all reasonable steps to ensure that the OWMS is maintained in good working order).

When the GED and / or Regulation 159(2) is contravened, Council will follow up with an inspection of the OWM system, and will issue a maintenance order or improvement notice for the rectification of any identified issue(s). BBSC may utilise powers of entry to inspect OWM systems under Part 9.3 of the *EP Act 2017*. The property owner will be notified of the inspection date, and will be given the opportunity to contact the Authorised Officer in regards to the inspection details or rescheduling. Monitoring will continue on an ongoing basis throughout the Shire.

Lot Risk Ratings (refer Section 4.1 of this Operational Plan) will be used to prioritise the monitoring program. Action Items 6b-c of the Action Plan detail the projected timeframes for completion and the resources required for the monitoring program. An overview of the monitoring program is provided in the following:

1. Request maintenance reports for 100 lots within SWSC areas, and 100 lots assigned a **Very High Risk Rating** within **four (4)** years of implementation of this OWMP (Action Item 6b);
2. Request maintenance reports for 100 lots assigned a **High Risk Rating** within **five (5)** years of implementation of this OWMP (Action Item 6c); and
3. Request maintenance reports for all lots assigned a Low and Moderate Risk Rating as required.

✓ Action Items 6b-c – Ongoing monitoring targets.

8.4.4 Inspection Protocol

Appendix C provides an example system inspection pro-forma covering virtually all possible attributes that may be used to record details and observations in the field, for entering into Council's Health Manager database. In summary, the inspection should record key OWMS information, including (but not limited to):

- Exact location and GPS coordinates of system components;
- Type of treatment system and EDS; and
- Performance and compliance of systems (e.g. if there are any maintenance issues which need to be addressed, and their urgency).

The results of inspections are highly valuable for improving and refining the risk assessment tools and for providing a rationale for the rectification or replacement of poorly functioning OWMS.

9 Commercial Wastewater Management Systems

9.1 Overview

Schedule 1 of the *EP Regulations 2021* defines which activities require EPA prescribed permission under the *EP Act 2017*. Wastewater treatment systems with a design or actual flow rate of >5,000L/day on any day require an A03 development and operating licence from the EPA.

An A03 development and operating licence are statutory documents which allow scheduled works to be constructed and operated, subject to conditions set by the EPA during the assessment process. As part of the approval process, the EPA assesses any potential environmental impacts from the proposal, mitigation for any impacts, compliance with policy requirements (including protection of beneficial uses), and comments from referral agencies and the general public.

The EPA licences set acceptable waste discharge and management criteria. They are publicly available documents that can be viewed at the following:

Permissioning decisions register | Environment Protection Authority Victoria (epa.vic.gov.au)

In some cases, the EPA may approve an exemption from the need to obtain licences.

The EPA periodically inspects all licenced sites, with the frequency informed by a range of factors related to the degree of public health and environmental risk posed by the site. Targeted inspections can also be made based on intelligence and pollution report information.

Licenced sites are required to submit an Annual Performance Statement detailing their performance against the licence conditions. These are also public documents that can be searched on the above link. The EPA conducts a combination of targeted and random assessments of Annual Performance Statements.

There are other types of industrial activity (not wastewater treatment) that are not directly regulated under the *EP Regulations 2021* that still have potential to impact on water quality. Examples include dairy farm effluent management and stormwater from commercial and light industrial operations, particularly in unsewered areas. The EPA has a role in pollution prevention and response in these activities. The EPA's approach to these issues is outlined in the Compliance and Enforcement Policy, Publication 1388. The Compliance and Enforcement Policy articulates the EPA's approach, method and priorities for ensuring compliance with the relevant Acts and statutory documents and carrying out the EPA's compliance and enforcement powers.

Council is responsible for the regulation of all OWMS <5,000L/day, which includes some commercial systems. It is important to note that commercial enterprises, such as small factories and cafes operating in unsewered areas, often generate <2,000L/day and therefore are regarded from an operational perspective as domestic systems. The characteristics of the wastewater will differ from a typical residential dwelling, but the wastewater is expected to contain the same broad ranges of contaminants. This is unless the commercial enterprise is producing high strength or unusual wastes, such as small-scale food, alcohol, or chemical processing, in which case it should be regarded as a commercial development. Commercial enterprises generating up to 5,000L/day in the Shire include restaurants, pubs, and tourist accommodation.

Without proactive enforcement from the regulator, system maintenance, monitoring, and record-keeping can become lax over time, with system performance suffering as a result. Generally speaking, older commercial systems are often non-compliant with current expectations and standards. However, they continue operating until improvements are triggered, typically by the identification of problems, the redevelopment of the premises, or proactive intervention by regulators (local government or other agencies).

9.2 Risks Associated with Commercial Systems

The most common causes of failure or underperformance of commercial wastewater treatment systems include the following:

- Surge loads, e.g. peak holiday seasons or production cycles in factories;
- Irregular and / or ineffective maintenance and upgrades;
- Inadequate desludging; and
- AWTPs and other aerobic systems being switched off for long periods of time, leading to die-off of aerobic microorganisms and delayed start-up and poor performance when switched back on.

The most common causes of failure or underperformance of commercial effluent dispersal or reuse systems include the following:

- Inappropriate design, including undersized effluent dispersal system for peak loads without appropriate load buffering;
- Inadequate setback distances from sensitive receptors, such as watercourses, which no longer meet the minimum setbacks in the current EPA Guidelines;
- Poor or inappropriate installation;
- Inadequate maintenance, including regular back-flushing of irrigation systems with clean water to prevent solids build-up and delays to repairs (e.g. broken sections of pipe); and
- 'Creeping failure' of trench and bed systems as soils and media become blocked with suspended solids from poorly designed and/or poorly maintained treatment systems.

9.3 Management Strategies for Commercial Systems

9.3.1 Wastewater Treatment Systems

All commercial wastewater treatment systems should have an up-to-date Operation and Maintenance (O&M) Plan or Manual which includes a diagram of the system and provides instructions for all maintenance schedules required for the system, and details of who is responsible for the management and maintenance of the system.

Commercial systems <5,000L/day should be serviced and maintained in accordance with the system manufacturer's requirements. Secondary treatment systems will require servicing quarterly; however, some commercial systems will require daily monitoring by an onsite system operator. Results of system servicing should be submitted to Council on a quarterly basis or in accordance with the approved conditions. Where system maintenance records are not supplied to Council as required, follow up action should be taken by Council to ensure the system is serviced appropriately.

Council is responsible for monitoring commercial systems <5,000L/day. These systems should be included in a Council monitoring program and, where problems or complaints are received, Council should assess and regulate the system in a similar fashion to a domestic system and also inform the EPA of the investigation, where relevant. The priority of the monitoring is to be based on the Risk Analysis presented in Section 4.1 of this Operational Plan.

✓ Action Item 7a – Undertake audits of all commercial scale systems on a risk based priority.

Commercial OWM systems >5,000L/day require regular maintenance by appropriately trained staff and / or contractors. Details on commercial systems are held by the EPA, and can be accessed by Council upon request.

✓ Action Item 7b – Regularly update details on EPA licenses for all commercial systems in the Shire, as well as their associated O&M plans.

The EPA is responsible for carrying out additional investigations at its own discretion, including in response to complaints about a system from Council or members of the public. Council is required to maintain a database of all commercial systems within the Shire, which should also include a list of EPA licensed sites. The database will be maintained and updated annually and include any maintenance records of the premises (2,000-5,000L/day) under Council control.

9.3.2 Effluent Dispersal Systems

The issues surrounding selection, design, installation, and maintenance of commercial-scale EDS' are largely the same as for domestic systems. However, potential problems associated with scale and flow-balancing are introduced with large and / or irregular effluent flows. For seasonal developments, part of the EDS may need to be switched off, or alternatively the off-season (reduced) effluent load can be distributed throughout the entire area over longer time periods using a flow sequencing control system.

EDS' require regular maintenance and should be closely monitored to ensure effective operation and even distribution of effluent. An O&M Plan or Manual should be developed, as for the treatment system. EDS' that are turfed will require regular mowing, with lawn clippings removed from the area. Other vegetation types should be pruned and maintained as necessary to ensure nutrients are being removed by plant uptake.

10 Community Education Program

The BBSC website has a section dedicated to OWM in the Shire, which explains how owners and occupants of unsewered properties can best manage their systems in order to protect public health and the environment.

Is your septic system healthy? (bawbawshire.vic.gov.au)

Wastewater Information (bawbawshire.vic.gov.au)

This online content is distributed digitally via email to property owners and residences prior to the issuance of a Certificate to Use, and will be updated to ensure compliance with recently released legislation and guidelines.

- ✓ Action Item 11b – Update educational material; and
- ✓ Action Item 11c – Distribution of policies and educational material to the community.

Details on the permit application process for OWMS installation or alteration can also be found on the BBSC website.

Getting a System (bawbawshire.vic.gov.au)

- ✓ Action Item 11d – Provide details about permit process on Councils website.

11 Risk Mitigation in OWM Design and Installation

The OWM risks identified across unsewered areas in the OWMP are based on the predominance of standard (primary) septic tanks with conventional absorption trenches throughout the Shire (as confirmed by Council records). Table 11 outlines some possible ways these risks can be mitigated.

Table 11: Risk Mitigation for Various Constraints

Risk Category	Issue	Possible solutions	Methods	Benefits
Soils	Poor soils make it difficult for the site to effectively disperse effluent.	Enhanced treatment of effluent.	Secondary treatment (20/30/30).	Higher standard of treatment suitable for subsurface EDS' in poorer soils.
			Advanced secondary treatment (10/10/10).	Disinfection stage decreases public health risk. Higher standard of treatment suitable for subsurface EDS' in poorer soils.
		Remediate soils.	Addition of gypsum / lime as per LCA recommendation.	Can assist in improving effluent adsorption capabilities of dispersive soil.
		Import better quality soils.	Sandy loams, loams, and clay loams with <10% gravel content.	Soils can be selected for suitable characteristics (e.g. permeability) and also increase profile depth.
Slope	Steep slopes can be destabilised by effluent, and it is difficult to contain effluent onsite.	Terracing.	Reduce slopes by creating flatter areas, ensure soil depth is adequate if using cut and fill.	Ease of access and maintenance (e.g. mowing) and other controls (e.g. erosion).
		Pressure dosing	Apply effluent evenly across the EDS via pressure doing.	Reduces the risk of effluent breakout / surface surcharge as effluent doesn't accumulate at a single point in the EDS.
Lot size	The smaller the lot the less area is	Reduce dwelling size (number of bedrooms).	To be done at the planning and design stage.	If a dwelling is smaller with fewer occupants, it will generate less wastewater

Risk Category	Issue	Possible solutions	Methods	Benefits
	available for effluent management.	Reduce footprint of dwelling and other improvements.	To be done at the planning and design stage.	To ensure there is enough area to use for effluent dispersal, reduce the space occupied by the dwelling, shed, driveway etc.
		Consider mound system as effluent dispersal option.		Permits highest effluent loading rate per square metre.
		Consider secondary treatment to absorption systems.		
Water-courses/ Groundwater Bores	Setback distances from watercourses and groundwater bores.	Ensure entire system (including dwelling) is located outside of setbacks and consider treatment options.	Increase wastewater treatment standard.	Setbacks can be reduced when higher treatment standards (e.g. advanced secondary with disinfection) are used.
Flood Prone Land	Flood prone land.	Ensure entire system (including dwelling) is located away from flood prone land.	To be done at the planning and design stage.	Waters are protected from contamination, and the system is protected from inundation of water which eliminates the potential need for costly system replacement or repair.

12 Action Plan & Implementation Timeline

This Action Plan Timeline outlines the management strategies and action items to address priorities. The Environmental Health Unit will have the primary responsibility for the coordination and implementation of the recommendations. Council's Planning, Environment, Infrastructure, Building and GIS staff will assist them. All actions will be completed as a part of Council's operational budget.

Table 12: Action Plan

Action Number	Action	Description	Term	Due Date	Responsibility
1	**Preparation of policies and procedures**	Prepare (or revise / finalise) and document the following to ensure they are in line with this OWMP: • OWMS inspection procedure and program; • Non-compliant with inspection procedure; • Complaint inspection procedure; • Rectification / upgrade works procedure; • Issuing of fines / notice procedure; • Permit to Install procedure; • Certificate to Use procedure; and • Compliance and Enforcement Policy.	Short Term	December 2025	Coordinator Public Health
2a	**Fees and Charges**	Consider sustainable options for ensuring appropriate resources to implement the OWMP.	Short Term	December 2025	Coordinator Public Health
2b		Investigate potential staffing requirements for the implementation of the OWMP	Short Term	December 2025	Coordinator Public Health
3	**Database management**	Ensure that Council's OWM Health Manager Database is updated on an ongoing basis to record all property and system details	Ongoing	Ongoing	Coordinator Public Health
4	**Risk Analysis Mapping**	Regularly update GIS layer for Risk Ratings as required.	Ongoing	Ongoing	GIS Office
5a	**Staff Training**	Train EHO in accessing and updating the Risk Analysis mapping in order to provide details to residents and ensure that the database remains up to date.	Ongoing	Ongoing	Coordinator Public Health
5b		Staff trained to be familiar with OWM and plumbing requirements.	Ongoing	Ongoing	Coordinator Public Health

Action Number	Action	Description	Term	Due Date	Responsibility
6a	**Monitoring Program**	Introduce a monitoring program of OWMS. This monitoring program should involve the following: • Request maintenance reports from properties serviced by OWMS. • Inspect properties that indicate the *EP Act 2017* has been contravened. • Enforce action (maintenance / modification) indicated with inspected OWMS. Provide monitoring results to stakeholders.	Medium – Ongoing	September 2025	Coordinator Public Health
6b		Request the maintenance reports for 100 OWMS within SWSC areas, and 100 Very High Risk lots.	Medium Term	September 2028	Coordinator Public Health
6c		Request the maintenance reports for 100 OWMS within High Risk lots.	Long Term	September 2029	Coordinator Public Health
6d		Investigate discharge of greywater to street drainage.	Ongoing		Coordinator Public Health
6e		Update the OWMS risk rating for older existing systems as well as new OWMS.	Ongoing		GIS Office
7a	**Commercial Systems**	Undertake system audits of all commercial scale systems (>2,000 - ≤5,000L/day) on a risk basis priority.	Ongoing		Coordinator Public Health
7b		Regularly updating details of EPA licenses for all commercial systems (>5,000L/day) in the Shire, including provision of O&M plans where applicable.	Ongoing		Coordinator Public Health
8	**Permit Conditions and Compliance**	Undertake compliance audits of new installations.	Ongoing		Coordinator Public Health
9a	**Planning**	Brief all Planning and EHO staff on the OWMP.	Short Term	June 2025	Coordinator Public Health
9b		Review Town Reports (Appendix B of the OWMP Technical Document) in OWMP and system inspection data to inform planning decisions regarding unsewered towns. Ensure that broader planning processes and decisions take into consideration the OWMP and ongoing inspections.	Long Term	As plans are amended	Coordinator Public Health
10	**Cumulative Risk Assessment**	Undertake CRA of AOIs, to provide guidance on potential risks associated with existing or proposed development in unsewered areas.	Completed		Coordinator Public Health

Action Number	Action	Description	Term	Due Date	Responsibility
11a	**Education Program**	Continue to discuss individual systems with property owners during the permit application process and in response to enquiries from owners. Educate future / potential owners of homes with OWMS.	Ongoing		Coordinator Public Health
11b		Update educational material.	Short Term	December 2025	Coordinator Public Health
11c		Proactively distribute policies and educational materials to the community and service providers.	Medium Term	December 2025	Coordinator Public Health
11d		Provide details about permit process on Council's website.	Medium Term	December 2025	Coordinator Public Health
12a	**OWM Professionals Briefing**	Conduct a briefing session and / or potential training with local OWM & LCA consultants, plumbers and system maintenance contractors to inform and educate on the new requirements of the OWMP.	Ongoing		Coordinator Public Health
12b		Development of "self-service" GIS information for plumbers and LCA assessors.	Ongoing		Coordinator Public Health
13a	**Reviews and Reporting**	Annual progress review of 2025 OWMP and meeting with the WCs to ensure the effective management of planning referral process under the OWMP. Review to include an assessment of the effectiveness of controls put in place to minimise OWM risk within the Shire.	Ongoing		Coordinator Public Health
13b		Review of 2025 OWMP after five (5) years, with a report on the implementation of the OWMP on Council's website.	Long Term	September 2029	Coordinator Public Health

13 Glossary of Terms

Term	Definition
Aerobic treatment	Biological treatment processes that occur in the presence of oxygen (i.e. aerobic bacteria digest wastewater contaminants). Aerobic bacteria are organisms that require oxygen to survive and grow.
Anaerobic treatment	Biological treatment processes that occur in the absence of oxygen.
Blackwater	Wastewater from toilets.
Desludging	Removal of the semi solid waste from a tank.
Effluent	Liquid that flows out of a wastewater treatment plant following treatment.
Evapotranspiration	Transfer of water from the soil to the atmosphere through evaporation and plant transpiration.
Organic Matter	Material that comes from the tissues of organisms (plants, animals, or microorganisms) that are currently or were once living.
Greywater	Wastewater from showers, baths, hand basins, washing machines, laundry troughs and kitchens.
Hardpan	A hardened, compacted and/or cemented horizon.
Locality	The broader locality surrounding a town (place name within mapped boundaries).
Non-Potable	Water not suitable for human consumption.
Parcel	The smallest unit of land able to be transferred within Victoria's cadastral system, usually having one proprietor or owner (land.vic.gov.au). For the purposes of this OWMP, parcel and lot are given to have the same meaning.
Peds	An aggregate of soil particles.
Permeability	The ability of the soil to allow water to pass through.
P-sorb	Phosphorus adsorption capacity of soil.
Property	Land under common occupation (land.vic.gov.au). May include multiple lots.
Risk	The 'likely' consequence of off-site (OWM) impacts based on the cumulative effect of individual lot constraints (soil suitability, slope, useable lot area, climate and location) and variables affecting the specific land capability and associated limitations of the lot to sustainably manage wastewater in compliance with *EP Act 2017* objectives.
Settlement	An area of residential development within the Rural Living Zone or Rural Conservation Zone.
Sewage	Wastewater containing any of human excreta, urine and toilet flush water and includes greywater (which is also called sullage and may include water from the shower, bath, basins, washing machine, laundry trough and kitchen) (*EP Regulation 2021*).
Sewerage	A system of sewers.
Town	The town servicing a locality, which is predominantly zoned Township Zone. It contains both residential and commercial development.

14 References

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United States Environmental Protection Agency (2002), Onsite Wastewater Treatment Systems Manual. United States Environmental Protection Agency.

Appendix A

Risk Assessment Checklist

Parameter	Site specific input
PFI Identification Number	
Lot Address	
Locality	
Zoning	
Area (ha)	
Soil Texture	
Soil Depth (m)	
Soil Structure	
Soil Limitations	
Permeability (Ksat) (m/day)	
Slope (%)	
Presence of Surface Waters	
Useable Lot Area (ha)	

Appendix B

Land Capability Assessment Checklists

Table B1: Minimum Requirement for a Standard LCA and Report

Report Element	Standard Requirements	Completed
1. Introduction and Background	Report summary / Executive Summary.	☐
	Acknowledgement of allotment Risk Rating.	☐
	Confirmation of any relevant Risk overlays (e.g. landslip) as per communications with Council.	☐
	Confirmation that lot(s) meets minimum lot size criteria for BBSC Planning Scheme Zone.	☐
	Current land use and development overview (including occupancy); single lot, subdivision, rezoning or non-domestic development.	☐
	Name, contact details, qualifications and insurances of LCA assessor (author).	☐
	Site location (including property address and lot details) and ownership.	☐
	Allotment size.	☐
	Proposed / existing water supply.	☐
	Availability of sewer.	☐
	Locality map showing the site in relation to surrounding region.	☐
2. Site Inspection and Field Investigations	Gather information on relevant Council, Water Corporation, Catchment Management Authority and State Government requirements, including restrictions and caveats on title, and planning / building / bushfire / flood controls, e.g. zones and overlays. *Note Environmental Significant Overlays, potable water supply and SWSCs. Impose this information on a base map (or site plan) which shows their location with respect to title boundaries.*	☐
	Broad overview of locality and landscape characteristics that may pose a constraint to the sustainable application of wastewater on the site and adjacent land, e.g. climatic information, groundwater and bore water information.	☐
	Details of date, time and methodology of site inspection and field investigations.	☐
	Site assessment that considers all of the parameters described in Table 1 of the Victorian LCA Framework (2014). Present detailed explanation of the level of constraint posed by each parameter, with regards to OWM and recommended mitigation measures to overcome these constraints.	☐
	Minimum of two (2) soil test pits or auger holes within the identified available effluent dispersal area(s), with additional test pits required for more than one soil type (multiple soil landscapes or facets).	☐
	Soil assessment that considers the following parameters from Table 2 of the Victorian LCA Framework (2014): • Colour and mottling; • Electrical conductivity; • Emerson Aggregate Class; • Permeability and design loading rate (using soil texture); • pH; • Rock fragments; • Soil depth;	☐

Report Element	Standard Requirements	Completed
	• Soil texture (field textural analysis); and • Depth to watertable (if required). Detailed explanation of the level of constraint with regards to OWM and recommended mitigation measures to overcome these constraints.	
3. Available Area and Setback Distances	Calculation of available effluent dispersal area and location on the Site Plan.	☐
	Discussion regarding the achievability of the applicable setback distances (as per Section 4.5 of GOWM (2024)). Justification required.	☐
4. Cumulative Impacts	Using the desktop and site assessment information for the site, comment on any possible cumulative detrimental impacts that the development may have on beneficial uses of the surrounding land, surface water and groundwater.	☐
5. System Selection and Design	Design maximum wastewater load (generation rates) and organic load for the proposed development, as per Section 4.2 of the GOWM (2024).	☐
	Description of existing OWM system (if applicable).	☐
	Target effluent treatment standard.	☐
	Description and location of applicable OWM treatment system options (refer to relevant Locality Report and EPA website for list of currently approved systems).	☐
	List of EDS options and detailed description of preferred option and location (as per relevant Locality Report). Sizing of EDS as per the system Sizing Tables detailed in the OWMP Technical Document.	☐
6. Mitigation Measures	Detailed discussion of mitigation measures to overcome any site or soil constraints posed to the sustainable treatment and application of wastewater on-site. This may include the following: • Storm water management • Soil amelioration; and • Vegetation establishment and management.	☐
7. Site Management Plan	Description of ways to improve wastewater and OWMS performance for residents' reference.	☐
	Operation and Management Plan.	☐
8. Conclusion	Conclusion summarising all the important design, sizing and mitigation requirements to ensure sustainable OWM.	☐
9. Site Plan Requirements	Site address, including lot number and street number.	☐
	All title boundaries.	☐
	All relevant zones and overlays and / or restrictions (e.g. Council zoning and overlays, including Environmental Significant Overlays and SWSCs).	☐
	Type of catchment (e.g. potable or other special water supply catchment).	☐
	North arrow.	☐
	Location of groundwater bores.	☐
	Contour lines (at maximum 1 in 10m intervals), direction of slope and grade.	☐

Report Element	Standard Requirements	Completed
	Location of soil test pits or auger holes.	☐
	Location of any significant site features e.g. rock outcrops or waterlogged regions.	☐
	Location of intermittent and permanent surface waterways (dams, creeks, reservoirs and springs).	☐
	Location of 1% and 5% Annual Exceedance Probability flood level contours lines (if applicable).	☐
	Location, depth and specified use of groundwater bores on the site and adjacent properties from Water Measurement Information System web database maintained by DELWP http://data.water.vic.gov.au/monitoring.htm Depth to groundwater table in winter (if less than 2.1m deep).	☐
	Vegetation cover (can use aerial image as base map).	☐
	Relevant setback distances as per the current EPA Guidelines	☐
	Location of existing and proposed buildings, sheds, driveways, paths and any other improvements.	☐
	Available effluent management area(s).	☐
	Location of proposed EDS (sized to scale).	☐
	Location of proposed stormwater cut-off drains adjacent to the EDS.	☐
	Location of proposed OWMS (nominal).	☐
	Location of reserve EDS (sized to scale).	☐
10. Appendices	Figures	☐
	Site Plan	☐
	Soil bore logs for all test pits or auger holes	☐
	Certificate of Title(s) for lot (plan)	☐
	Proposed building plans	☐
	Planning Permit application (where applicable)	☐
	Septic Tank Permit application	☐

Table B2: Minimum Requirement for a Non-residential LCA and Report

Report Element	Non-residential Requirements	Completed
1. Introduction and Background	Report summary / executive summary.	☐
	Acknowledgement of allotment Risk Rating.	☐
	Confirmation of any relevant sensitivity overlays (e.g. landslip) as per communications with Council.	☐
	Confirmation that lot(s) meets minimum lot size criteria for BBSC Planning Scheme Zone.	☐
	Current land use and development overview (including occupancy, number of seats, site attendance).	☐
	Name, contact details, qualifications and insurances of LCA assessor (author).	☐
	Site location (including property address and lot details) and ownership.	☐
	Lot area.	☐
	Proposed / existing water supply.	☐
	Availability of sewer.	☐
	Locality map showing the site in relation to surrounding region.	☐
	Site survey plan (2m contours) will need to be conducted by a qualified surveyor, or surveys obtained from current data from government sources (i.e. ELVIS).	☐
2. Site Inspection and Field Investigations	Gather information on relevant Council, Water Corporation, Catchment Management Authority, and State Government requirements, including restrictions and caveats on title, and planning / building / bushfire / flood controls (e.g. zones and overlays). *Note: Environmental Significant Overlays and SWSCs. Impose this information on a base map (or site plan) which shows their location with respect to title boundaries.*	☐
	Broad overview of locality and landscape characteristics that may pose a constraint to the sustainable application of wastewater on the site and adjacent land, e.g. climatic information, groundwater and bore water information.	☐
	Details of date, time, and methodology of site inspection and field investigations.	☐
	Site assessment that considers all of the parameters as per Table 1 of the Victorian LCA Framework (2014). Detailed explanation of the level of constraint with regards to OWM and recommended mitigation measures to overcome these constraints.	☐
	Minimum of two (2) soil test pits or auger holes within the identified available effluent dispersal area with additional test pits required for more than one soil type (multiple soil landscapes or facets).	☐
	Soil assessment that considers all of the parameters in Table 2 of the Victorian LCA Framework (2014): • Colour and mottling; • Electrical conductivity; • Emerson Aggregate Class; • Permeability and design loading rate (using soil texture); • pH; • Rock fragments; • Soil depth; • Soil texture (field textural analysis);	☐

Report Element	Non-residential Requirements	Completed
	• Watertable (depth to); • Cation exchange capacity (CEC); and • Sodicity (Exchangeable Sodium Percentage ESP). Phosphorous Sorption Capacity is also required to be measured for the soil to which the effluent will be applied to. Detailed explanation of the level of constraint with regards to OWM and recommended mitigation measures to overcome these constraints. Soil permeability testing conducted in situ for the soil within the available effluent management area as per constant head well permeameter method (Appendix G of *AS/NZS 1547:2012*) may be undertaken to determine the sustainable daily effluent loading rates.	
	Detailed review of available published soils information for the site. Soil landscapes and different soil facets should be mapped on the Site Plan.	☐
3. Available Area and Setback Distances	Calculation of area available for effluent management and location on Site Plan.	☐
	Discussion regarding the achievability of the applicable setback distances (as per Section 4.5 of GOWM (2024)). Justification required.	☐
4. Cumulative Impacts	Using the desktop and site assessment information for the site, comment on any possible cumulative detrimental impacts that the development may have on beneficial uses of the surrounding land, surface water, and groundwater.	☐
5. System Selection and Design	Discussion about the variability in wastewater load and organic load (i.e. weekend and annual peaks) for the proposed development.	☐
	Design (maximum or balanced) wastewater load (generation rates) and organic load for the proposed development.	☐
	Description of existing system (if applicable).	☐
	Minimum grease trap sizing for commercial kitchen (if applicable).	☐
	Target effluent treatment quality (as per the current EPA Guidelines).	☐
	Description and location of applicable OWM treatment system options (if applicable, refer to EPA website for list of currently approved systems).	☐
	List of EDS options and detailed description of preferred option and location. EDS to be sized on the most limiting balance as detailed below.	☐
	A water balance (refer to Appendix 1 Victorian LCA Framework (2014)) is required to size the preferred effluent dispersal system for the proposed development scenario. All inputs, results and justification to be shown in the report.	☐
	Undertake an annual nutrient modelling (refer to Appendix 2 Victorian LCA Framework (2014)) for the proposed development scenario. All inputs, results and justification to be shown in the report.	☐
	Prepare a site specific detailed hydraulic design for the EDS suitable for supplier quotation and construction.	☐
6. Mitigation Measures	Detailed discussion of mitigation measures to overcome any site or soil constraints posed to the sustainable treatment and application of wastewater on-site. This may include the following:	☐

Report Element	Non-residential Requirements	Completed
	• Storm water management; • Soil amelioration; and • Vegetation establishment and management.	
7. Site Management Plan	Description of ways to improve wastewater and OWMS' performance for residents' reference.	☐
	Operation and Management Plan.	☐
8. Conclusion	Conclusion summarising all the important design, sizing and mitigation requirements to ensure sustainable on-site OWM.	☐
9. Site Plan Requirements	Site address, including lot number and street number.	☐
	All title boundaries.	☐
	All relevant zones and overlays and / or restrictions (e.g. Council zoning and overlays, including Environmental Significant Overlays and SWSCs).	☐
	Type of catchment (e.g. potable or other special water supply catchment).	☐
	North arrow.	☐
	Location of groundwater bores.	☐
	Contour lines (2m intervals from survey plan or Council provided data), direction of slope and grade.	☐
	Location of soil test pits or auger holes.	☐
	Location of other utilities i.e. electricity, gas, telecommunications (which must be located outside the effluent dispersal systems)	☐
	Location of any significant site features e.g. rock outcrops or waterlogged regions.	☐
	Location of intermittent and permanent surface waterways (dams, creeks, reservoirs and springs).	☐
	Location of 1% and 5% Annual Exceedance Probability flood level contours lines (if applicable).	☐
	Location, depth, and specified use of groundwater bores on the site and adjacent properties from the register of the relevant Water Corporation. Depth to groundwater table in winter (if less than 2.1m deep).	☐
	Vegetation cover (can use aerial image as base map).	☐
	Relevant setback distances as per Section 4.5 of GOWM (2024).	☐
	Location of existing and proposed buildings, sheds, driveways, paths, and any other improvements.	☐
	Area available for effluent management.	☐
	Location of proposed EDS (sized to scale).	☐
	Location of proposed stormwater cut-off drains adjacent to the EDS.	☐
	Location of proposed OWMS' (nominal).	☐
	Location of reserve EDS (sized to scale).	☐
10. Appendices	Copy of the water (hydraulic) balance calculations.	☐
	Copy of the nutrient balance calculations.	☐
	Figures.	☐
	Site Plan.	☐
	Soil bore logs for all test pits or auger holes.	☐
	Copy of the Survey Plan.	☐

Report Element	Non-residential Requirements	Completed
	Certificate of Title(s) for lot (plan).	☐
	Proposed building plans.	☐
	Planning Permit application (where applicable).	☐

Appendix C

System Inspection Template (Example)

Date & Time of Inspection		**GPS Coordinates of Effluent Dispersal Area**				
Property Address:		**South**		**East**		**Aspect:**
Property Owners/Contact:		**Owner Present:**				
Inspected By:		Yes			No	
Inspection Protocol						
Risk Rating		**Low (1)**	**Medium (2)**	**High (3)**	**N/A**	**Comments**
Treatment System						
Grease Trap						
Is grease trap adequately sized, maintained and functioning (if applicable)?		Yes	No			
Greywater						
Is greywater directed to street / drain?		No		Yes		
Is greywater diversion device operating correctly (if applicable)?		Yes		No		
Septic Tank						
Is tank(s) accessible for inspection and maintenance?		Yes		No		
Is tank(s) and lid(s) appear structurally sound?		Yes		No		
Is tank(s) adequately sealed?		Yes		No		
Is tank area subject to stormwater or groundwater inundation?		No		Yes		
Is tank(s) require urgent repair or replacement?		No		Yes		
Tank dimensions:						
Type	Plastic Concrete Other:					
Volume (L):						
Baffle?	Yes No Damaged	Yes		No / Damaged		
Outlet height (mm):						
Liquid height (mm):						
Scum Depth (mm):						
Sludge Depth (mm):						
Operation:	Are T-juctions attached and working?	Yes		No		
	Is desludging required?	No		Yes		
	Is adequate anaerobic treatment provided?	Yes		No		
Pump / pump wells / controls						
Is the pumpwell(s) of adequate capacity (e.g. emergency storage)?		Yes		No		
Is the system fitted with a high level alarm?		Yes		No		
Are there any electrical hazards / issues with the system?		No		Yes		
Is there a suitable control system for the pump?		Yes		No		
Is the pump operational and in a satisfactory condition?		Yes		No		
Is pump well in satisfactory condition? (Yes - Low, No - Medium or High)		Yes		No		
AWTS						
Is the AWTS operating satisfactorily? (Yes - Low, No - Medium or High)		Yes		No		
Are the blowers working?		Yes		No		
Is there sludge or scum accumulation in aeration chamber, clarification chamber or irrigation chamber?		No		Yes		
Is the chlorine dispenser filled and functioning?		Yes		No		
Resdiual Chlorine (mg/L)						
Is system regularly serviced by a contractor?		Yes		No		
Effluent Dispersal Area						
Absorption System						
Dimensions (m)	Slope (%) approx.	<6%	6-10%	>10%		
Is the effluent dispersal area of adequate size?		Yes		No		
Is there a suitable vegetation cover over the effluent dispersal area?		Yes	Partial	No		
Is there adequate exposure of the effluent dispersal area?		Yes	Partial	No		
Is the effluent dispersal area wet or boggy?		No		Yes		
Is there evidence of surface ponding or runoff from the effluent dispersal area?		No		Yes		
Is the effluent dispersal area prone to poor drainage, flooding or high groundwater?		No		Yes		
Are there any damaged or collapsed sections of the effluent dispersal area?		No		Yes		
Is there evidence of, or access for vehicle and animal traffic?		No				
Does the effluent dispersal area appear to be level and in line with contours?		Yes		No		
Are buffer distances to effluent dispersal area adequate?		Yes		No		
Surface / Subsurface Irrigation						
Dimensions (m^2):	Approximate slope (%):					
Is the effluent dispersal area wet or boggy?		No	Yes	Yes		
Is there evidence of surface ponding or runoff from the effluent dispersal area?		No	Yes	Yes		
Are buffer distances to effluent dispersal area adequate?		Yes	No	No		
Are all sprinklers working?		Yes	No	No		
Overall Assessment						
Was the whole system located and accessed?		Yes		No		
Was the system discharging effluent to the ground surface in an unsatisfactory manner?		No		Yes		
General Condition of system	Good (Low) Satisfactory (Medium) Unsatisfactory (High)	Good	Satisfactory	Unsatisfactory		
Overall Highest Risk Rating						
Are works required on the system?		**Minor**	**Moderate**	**Major**	**Nil**	
Details of Required Works:						