DOMESTIC WASTEWATER MANAGEMENT PLAN 2019-2024

CITY OF BALLARAT

Contents

Executive Summary

This plan articulates the strategic approach to be undertaken by Council in managing domestic wastewater within the Ballarat municipal district. As of 01 July 2018, our municipality had 3,146 septic tank systems, with 390 of these septics located within potable (drinking) water supply catchments. Therefore, there is a legislative requirement by Council to develop and implement a domestic wastewater management plan (DWMP), in accordance with the *State Environment Protection Policy (Waters) 2018* and the *Minister's Guidelines for Planning Permit Applications in Open, Potable Water Supply Catchment Areas 2012*.

This plan replaces Council's previous DWMP which spanned the period 2013-2018. The previous DWMP was endorsed by Central Highlands Water (CHW) on 13 February 2017, largely because it included a funded inspection program of all septics within the potable water supply catchments. This endorsement had and continues to have, significant benefits to those land owners wishing to develop their properties within the potable water catchment.

This plan outlines the priorities and steps necessary to minimise the impact of domestic wastewater on human health and the environment. To date, 655 of the septics in Ballarat have been inspected and mapped by Council, largely during the inspection program associated with the previous DWMP, over the period 2016-18. This represents 21% of the total number of septics.

The recommended strategies for Council to implement are summarised as follows:

1. Use existing rate base to internally resource the implementation of this plan.
2. Maintain CHW endorsement by implementing an inspection program of high-risk septics within the potable catchments.
3. Complete the inspection and mapping of septics in the Declared Sewerage District.
4. Establish an accurate and comprehensive data register for all septic systems in the municipality.
5. Educate septic tank owners on responsible management of their systems.
6. Review Ballarat's domestic wastewater management process with the aim of reducing the cost of installing and operating a septic tank system.

Introduction

Ballarat is a large inland city with a population numbering 101,588. Ballarat sits within the Central Highlands of the Great Dividing Range and is at the head of several catchments which drain to reservoirs used for potable (drinking) water.

The population of Ballarat is distributed as follows:

Urban	69%
Rural residential	18%
Rural	13%

All Councils have a legislative responsibility to protect the health of residents, visitors and those working in the municipality; this is recognised in the Council Plan. The Department of Environment, Land, Water and Planning (DELWP) as well as the Environment Protection Authority (EPA) play a lead role in the strategic management of domestic wastewater in Victoria. On-site domestic wastewater needs to be managed to prevent impacts on the beneficial uses of surface and groundwater. Some of the most recent statements by DELWP and EPA regarding domestic wastewater may be found in Appendix A and B of the recently released report by the Victorian Auditor General: *Managing the Environmental Impacts of Domestic Wastewater (19 September 2018).*

https://www.audit.vic.gov.au/sites/default/files/2018-09/20180919-Managing-the-Environmental-Impacts-of-Domestic-Wastewater.pdf

Clause 29 of the *State Environmental Protection Policy (Waters) 2018* ("*SEPP Waters*") stipulates the following:

> 29. Councils to develop a domestic wastewater management plan
>
> (1) A council in a municipal district with onsite domestic wastewater management systems must develop and implement a domestic wastewater management plan that –
>
> (a) identifies the public health and environmental risks associated with the onsite domestic wastewater management systems; and
>
> (b) sets out strategies to minimise those risks.

(2) The council must consult with the Authority [EPA], water corporations, the community and other stakeholders when developing, revising or implementing a domestic wastewater management plan and, in particular, must –

(a) identify, assess and manage the cumulative risks of onsite domestic wastewater management systems that are, or may in the future, be discharging sewage beyond allotment boundaries or impacting on groundwater; and

(b) engage with the Authority and relevant water corporations to identify existing unsewered allotments for inclusion in the domestic wastewater management plan, that –

(i) do not retain sewage on site; or

(ii) are not capable of preventing the discharge of sewage beyond allotment boundaries, or preventing risks to beneficial uses of groundwater or impacts on groundwater, as demonstrated by a land capability assessment in accordance with Victorian Land Capability Assessment Framework; and

(c) identify, cost, prioritise and evaluate options to provide –

(i) solutions to prevent discharge of sewage beyond allotment boundaries and minimise impacts on groundwater; and

(ii) for the compliance assessment and enforcement of onsite domestic wastewater management systems in accordance with the plan; and

(d) if applicable, have regard to the Guidelines for planning permit applications in open, potable water supply catchment areas and any relevant guidelines authorised by the Authority.

(3) The council must review and update its domestic wastewater management plan at intervals of no more than five years.

(4) The council must conduct an internal audit to assess progress and report on progress of the implementation of the domestic wastewater management plan every three years and publish the report on its website.

In addition, municipalities such as Ballarat, which contain potable water catchments have specific restrictions on development as described in the Minister's Guidelines for *Planning Permit Applications in Open, Potable Water Supply Catchment Areas 2012.* In the absence of an endorsed DWMP, new dwellings within the catchment are restricted to a density of one dwelling per 40 hectares. Until 13 February 2017 when the City of Ballarat's DWMP was endorsed by CHW, some land owners located in

these catchment zones were unable to construct dwellings on their properties. This endorsement requires Council to commit to the ongoing protection of urban water supply catchments into the future – the main method being via an ongoing inspection program of these septics.

The Minister's Guidelines require the DWMP to be independently audited every three years. The City of Ballarat's DWMP was recently audited by Neil Dunbar of Waste Data Management Specialists (WDMS) and his report dated 8 October 2018 provided the following summary of recommendations:

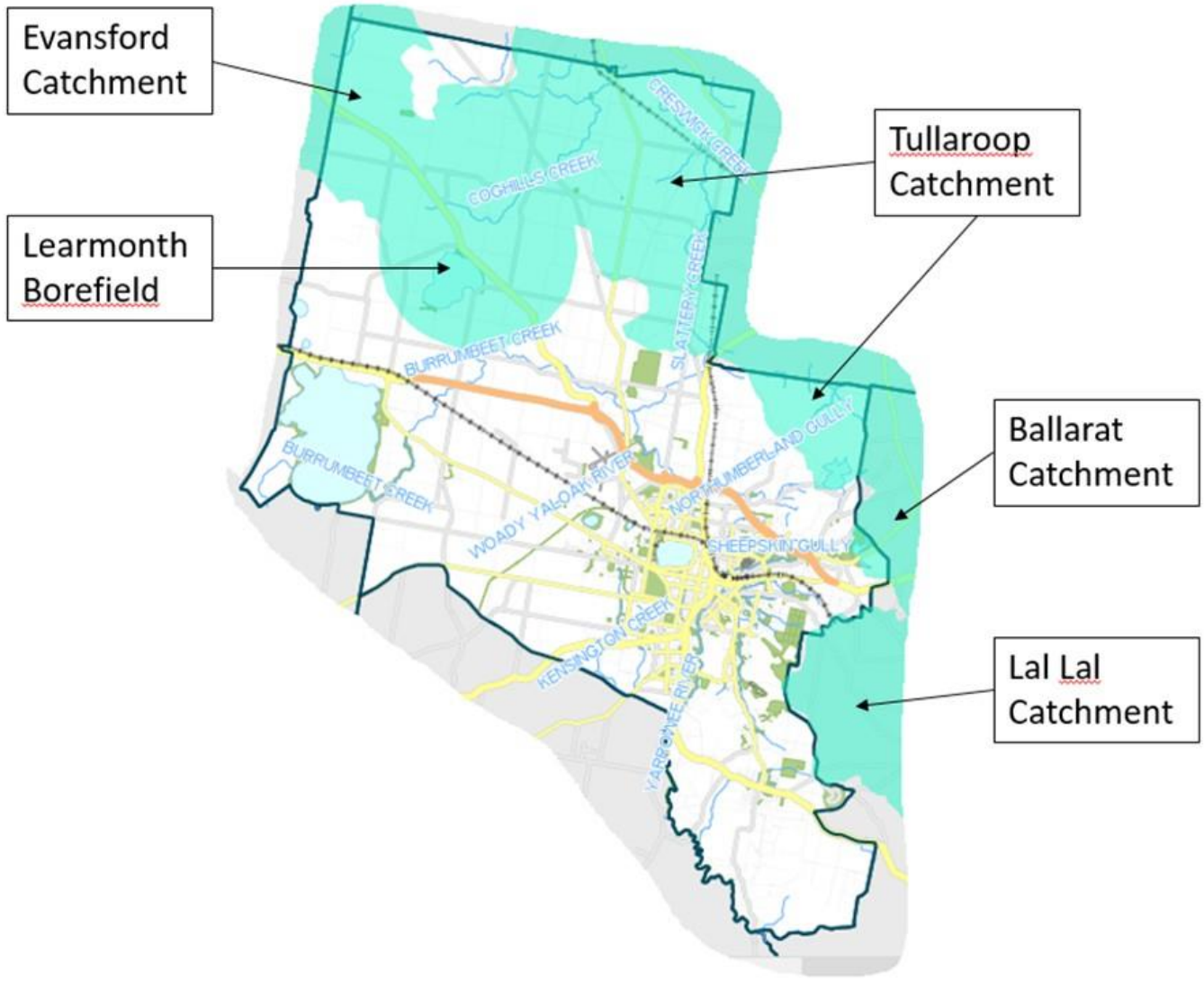
- Establish a comprehensive septic register;
- Complete the septic inspection program in the DSD and potable catchments;
- Resolve outstanding issues with owners of failed and high-risk septic systems;
- Work with CHW and Goulburn Murray Water to establish an evidence base for measuring the impact of domestic wastewater; and
- Introduce a notification system for septic owners at the time of property transfer.

The City of Ballarat has five discrete potable (drinking) water supply catchments within its land area. These are areas of land from which the surface water drains to reservoirs used for supplying drinking water, although in the case of Learmonth, the catchment relates to a water supply bore located on Bankin Hill in the township. The number of septics within the potable catchments are shown in Table 1 and the location of the catchments is mapped in Figure 1 below. Potable catchments are treated with the highest degree of caution when planning for onsite wastewater treatment. This is due to the potential for human pathogens to be transmitted via the system effluent into the drinking water supply.

Table 1: Breakdown of the number of septics within the different potable catchments in Ballarat

Potable Catchment	Number of septic tanks
Tullaroop	236
Learmonth Borefield	82
Lal Lal	34
Evansford	32
Ballarat	6
Total	390

Figure 1: Map showing the location of the five potable water catchments which overlap on the City of Ballarat.



Risks associated with domestic wastewater

Domestic wastewater is typically high in nutrients and human pathogens. A summary of the risks associated with these is presented below:

Type of risk	Risk
Public health	Drinking water sources polluted with bacteria, nitrates and phosphorous, resulting in stomach upsets, diarrhoea and more serious illnesses
	Recreational waterways and other water bodies polluted, thus placing at risk people who come into contact with polluted water through recreational pursuits
Environmental	Prolific weed growth and destruction of indigenous vegetation
	Polluted surface waters (such as creeks, waterways and drains)
	Polluted groundwater
	Harm to aquatic fauna (such as fish and macroinvertebrates)
Amenity	Smell, unsightly discharges and seepage leading to reduced amenity and reduction in property values

Source: Victorian Auditor-General's Office.

Figure 2: Summary of risks posed by domestic wastewater (from p.37 Victorian Auditor-General's Office report: "Protecting our environment and community from failing septic tanks" 2006)

Legislation and standards relevant to this DWMP

Environment Protection Act 1970

This Act provides for Councils to issue permits for septic tank systems and outlines the requirements for such applications.

State Environment Protection Policy (Waters) 2018

This policy directs Councils to develop a DWMP and work with other authorities in the management of domestic wastewater. This is achieved by reference to supporting documents such as the *Victorian Land Capability Assessment Framework January 2014* and the *EPA Code of Practice for Onsite Wastewater Management (EPA Publication 891.4 July 2016)*.

Public Health and Wellbeing Act 2008

The objective of the *Public Health and Wellbeing Act 2008* is to impose a duty on Councils to achieve the highest attainable standard of public health and wellbeing by investigating and remedying conditions that are liable to be dangerous to health or offensive, by:

- Protecting public health and preventing disease, illness, injury, disability or premature death
- Promoting conditions in which persons can be healthy

Building Act 1993

The *Building Act 1993* and *Building Regulations 2006* require the report and consent of the relevant Council must be obtained to an application for a building permit that requires the installation or alteration of a septic tank system.

Planning and Environment Act 1987

The key legislation relating to land development in Victoria is the *Planning and Environment Act 1987* (*" P & E Act"*). The two objectives of the planning framework under the *P & E Act* are:

- To enable land use development and planning policy to easily integrate with environmental conservation and resource management policies
- To ensure that the effects on the environment are considered when decisions are made about the use and development of land

The *P & E Act* requires that all land use and development take place in accordance with the planning scheme for the municipal district. Land within the potable catchments is subject to Environmental Significance Overlay 3 (ESO3) of the Ballarat Planning Scheme which has specific requirements for protecting water quality in the catchment.

In addition, Clause 66.02-5 of the Victoria Planning Provisions identifies water supply authorities as a determining referral authority for permit applications within the potable catchments. This applies to permits to use, subdivide, consolidate, construct a building or construct or carry out works, or to demolish a building or works. For Ballarat, this means that CHW can object to a planning permit application and Council must refuse to issue a permit. Alternatively, CHW has the power to impose conditions on the planning permit.

Minister's Guidelines for *Planning Permit Applications in Open, Potable Water Supply Catchment Areas, November 2012*

These direct responsible authorities in their assessment of planning permit applications for development of land within open, potable water supply catchments in Victoria.

Density provisions may be relaxed subject to a suitable DWMP being in place that manages the risk to the catchment posed by septic tank systems. The suitability of a DWMP includes:

- The effective monitoring of the condition and management of onsite systems
- Acting where non-compliances are identified
- The implementation of the DWMP is suitably resourced including monitoring and enforcement

The risk-based inspection program implemented in the previous plan achieved CHW endorsement on 13 February 2017.

Relevant Victorian Civil and Administrative Tribunal (VCAT) decisions

***Rozen v Macedon Ranges Shire Council & Anor* (2010) VSC 583 ("*Rozen v Macedon*")**

The application sought permission for four dwellings within the Campaspe River Special Water Supply Catchment Areas. It was initially heard by VCAT in 2007, who granted a permit for four dwellings on four lots. This decision was overturned by the Victorian Supreme Court (VSC) on that basis that VCAT had failed to properly apply the precautionary principle in relation to the issue of cumulative risk of water contamination. In the end, a permit for one dwelling was granted. *Rozen v Macedon* is highly significant as it set a precedent that planning authorities had to consider the cumulative impact of all septics within a catchment, not just the one for which a permit is being sought. The risk to water quality was deemed to be more from the failure of septics, rather than when they are properly functioning.

***Kapiris v Macedon Ranges SC* (2012) VCAT 1969**

Macedon Ranges SC refused the permit for a dwelling on 16 hectares located in the Rosslyne Reservoir Catchment. VCAT found that the dwelling density significantly exceeded the 1 in 40 hectare threshold. In addition, although Macedon Ranges SC had adopted a DWMP, it did not meet the requirements of the 2012 Catchment Guidelines and was therefore not endorsed by the water authorities. It was acknowledged that community tolerance of contamination of drinking water supplies is very low and requires a very strong precautionary approach. This meant that acceptance of the increased risk posed by this development, even though very low, was deemed as unsatisfactory.

VCAT therefore confirmed the decision of Macedon Ranges SC that no permit be issued.

***Simpson v Ballarat CC* (2012) VCAT 133**

Ballarat City Council refused a planning permit for a dwelling in Bald Hills, located in the Tullaroop catchment. The refusal was made following objections from CHW. Key amongst the reasons was that the proposal exceeded the 1 in 40-hectare density requirement and that Council did not have an implemented DWMP for the potable catchments. This was appealed to VCAT by Simpson where the permit application was again refused. Following the endorsement of Council's DWMP by CHW, a permit was re-applied for and approved on that occasion.

***McDonald v Hepburn SC* (2013) VCAT 1538**

Hepburn SC, Coliban Water and Goulburn Murray Water supported the issue of a planning permit for a dwelling despite the dwelling density exceeding the 1 in 40 hectare threshold. McDonald was a resident who owned an adjacent property and took the council to VCAT in opposition to the permit. VCAT found

that because a DWMP had not been prepared or implemented there was not sufficient evidence, using the precautionary principle, that the Minister's Guidelines had been met in addressing the risk to the Eppalock catchment. Hence, the permit application was not granted.

Water Act 1989 ("Water Act")

Section 180 of the *Water Act* requires Council to refer any applications for a permit to install a septic tank to a water corporation if the application is within a sewerage district, if the water corporation has issued a standing written request. CHW has issued such a request to Ballarat City Council and therefore septic tank applications received by Council for the sewerage district are referred to CHW.

Section 147 of the *Water Act* empowers water corporations to require the owner of a serviced property to connect into the sewerage system. This process is particularly relevant where site constraints mean that sewer is the most viable option to a failing septic. Council can declare that the septic represents a risk to public health or the environment and then instruct CHW to enforce connection to reticulated sewerage, if it is available.

Australian Standards

Australian Standards have relevance to the construction and design of septic tank systems. The EPA requires that systems meet these standards as part of its approval process. The primary standard with respect to septic tank system design is:

- AS/NZS 1547:2012 – On-site Domestic Wastewater Management

Further relevant standards include:

- AS/NZS 1546.1 – On-site Domestic Wastewater Treatment Units – Septic Tanks
- AS/NZS 1546.2 – On-site domestic wastewater treatment units - Waterless composting toilets
- AS/NZS 1546.3 – On-site Domestic Wastewater Treatment Units – Secondary treatment systems
- AS/NZS 1546.4 – On-site domestic wastewater treatment units – Domestic greywater treatment systems
- AS/NZS 3500 – National Plumbing and Drainage – Domestic Installations

DWMP stakeholder engagement

Council will produce a draft DWMP (2019-2024) for dissemination amongst stakeholders who will be invited to provide feedback during an eight-week consultation process.

The key stakeholder is CHW who are responsible for the protection of the potable water catchments and management of sewerage infrastructure.

Other stakeholders include:

1. Owners or users of septics
2. Corangamite Catchment Management Authority
3. North Central Catchment Management Authority
4. Glenelg Hopkins Catchment Management Authority
5. Environment Protection Authority
6. Goulburn Murray Water

DWMP implementation

Implementation will be undertaken by Council's Environmental Health Unit in accordance with the level of resourcing available. Without resourcing, the DWMP will be a strategic document outlining Council's intentions.

DWMP audit and review

The implementation of the DWMP will include progress reports. The key stakeholder, CHW, will receive a copy of these progress reports. In accordance with Clause 29 (6) of the *SEPP*, Council will conduct an audit to assess progress of the DWMP at least every three years and publish the report on its website. Council will review this DWMP at least every five years per the requirements of Clause 29 (5) of the *SEPP*.

Findings and outcomes from the 2013-18 DWMP

The current situation with domestic wastewater in Ballarat is summarised below.

Table 2: Inspections outcomes associated with the DWMP 2013-2018

<table>
<tr><td>3,146 total septic records in the City of Ballarat</td><td>➔ 655 (21% of total)

Those septic systems inspected and mapped</td><td>➔ 2,491 (79% of total)

Septic systems not inspected and mapped</td></tr>
<tr><td colspan="3">➔ 390

Septic systems in the potable catchments

100% of septics in the potable catchment have been inspected and mapped

Failure rate of septics was 11%, reduced to 6% following intervention. The highest risk systems were preferentially targeted. High risk factors include proximity to waterways or off-site discharge.</td></tr>
<tr><td colspan="3">➔ 550

Septic records in the Declared Sewer District

153 (28%) of septics in the DSD have been inspected and mapped</td></tr>
</table>

As of June 2018, there are 3,146 operational septic systems in the municipality and 655 (21%) have been inspected and mapped by Council. 2,491 septics (79%) have not been inspected or mapped. The number of new septic tank systems being installed is expected to remain constant at an average rate of 55 applications per year.

There are 390 inspected and mapped septics located in the potable water catchments. Of the 550 septics in the Declared Sewerage District (DSD), 153 (28%) have been inspected and mapped. The failure rate for systems was approximately 10% in the catchment and on average between 10-20% in the DSD. Septic failure is defined as a system that discharges effluent above ground causing saturation of the soil surface. Interventions taken by Council during the previous DWMP, such as working with property owners to upgrade their systems, have resulted in the failure rate being reduced in the catchment. As of June 2018, the septic failure rate in the catchment is 6%. The highest risk systems were preferentially targeted, where risk factors included proximity to waterways and whether the discharge was flowing off- site. Remedying these failing septics is active and ongoing with the Environmental Health team.

Within the DSD, it was noted that many of the failed septics occurred in geographically discrete clusters. There were nine clusters identified with the largest cluster containing eight failing septics on the same street. These cause localised risks to public health and amenity. The most feasible solution has been identified as the provision of reticulated sewerage to the relevant properties. This is because most of the properties have small land areas which means that there is insufficient land to absorb the wastewater.

Sewerage planning must take into account the existing stock of septic systems, particularly within and on the boundary of towns and regional cities. These zones often contain higher population densities and small block sizes which amplify health risks from the septic systems. With foresight and adequate information, the development of reticulated sewer can take into account both the resolution of failing or aged septic systems and connection for new dwellings. It would appear that the most effective approach is the development of shared data systems between Council and CHW which communicates the locations and status of septic systems and the existing reticulated sewer network. This requires an effective inspection and mapping program within the DSD by Council, which currently does not have a feasible funding model.

Anecdotal evidence suggests that a key barrier to building sewer infrastructure is distributing the capital cost obligations in an equitable manner. It is usually impossible to broker voluntary agreements between the mix of existing households with septic systems of varying levels of performance and the property developer who typically is seeking to minimise construction costs. What has been observed in practice is that each party act in their own economic interest and often will seek to avoid making payment if able to do so, even when they gain benefit from the group provision of sewer. The other parties then understandably do not wish or are simply not able to pay for entire sewer scheme and the proposal does not progress any further.

What is required is leadership from CHW to develop funded solutions for reticulated sewerage and to act as a broker between the various parties. The most equitable approach is requiring all parties who benefit from the scheme being required to contribute to it. Given that contributory costs can easily exceed $20,000 per property for many schemes, paying the cost up-front is financially prohibitive for many

households and not feasible. The most sensible and equitable approach is having a payment-over-time approach. This is catered for under the *Water Industry Act 1994* which specifically references a 20-year payment period for the provision of reticulated sewerage services[1]. This brings the cost of the service down to a feasible amount.

[1] See 7-9.2 of Minister's Statement of Obligations 20 December 2015

Strategy 1: Develop a funding model to resource the implementation of this plan

The income derived from statutory fees and charges for septic system management does not provide full cost recovery to resource the DWMP inspection program, however, the commitment to the implementation of the plan will be funded internally with existing resources.

It may be noted that Council made a significant investment in the 2013-18 DWMP, employing a full-time project officer for approximately two and a half years, at a total cost in excess of $200,000. This funding came from general revenue. The DWMP provided benefit to those landowners within the potable catchments when the DWMP was endorsed by CHW on 13 February 2017, enabling the development of suitable lots which had previously been restricted. The broader community also benefited from the reduced risk of pollution of potable water resources when defective systems were rectified.

The 2013-18 DWMP provided the underpinning for the identification of the clusters of failing septics within the DSD. CHW is now at the stage where it may implement a sewerage infrastructure program. The details of this are yet to be fully established however this development would certainly have not eventuated without the foundational work of the DWMP. Such a program will improve the amenity and environment for Ballarat, as well as reducing the risks to public health.

Strategy 2: Maintain CHW endorsement by implementing a risk-based inspection program of septics within the potable catchments

The previous DWMP included the inspection of all 390 septics located within the potable catchments and the rectification of the highest risk failures, such as those which discharged effluent near waterways. There remain approximately 25 septics, of lower risk, which require further work or upgrades to bring them to acceptable standards. These will continue to be managed for the duration of the DWMP. In addition, a base level of inspections will be conducted on those systems which are of elevated risk – these are generally those systems which are in closer proximity to watercourses which drain to the catchment reservoirs. It is estimated that there are approximately 50 such systems.

Strategy 3: Complete the inspection and mapping of septics in the Declared Sewerage District

As residential development in Ballarat continues to expand in geographic size and population, property development on the outskirts of the city has been problematic, especially when the existence and condition of septics is unknown. The Environmental Health team has experienced numerous instances where development has led to unsewered properties being isolated from the newly installed sewer. There are instances of septic systems being damaged by new housing construction that has led to both economic and health impacts caused by the discharge of effluent into densely populated community (see Figure 3 below).

The public health and amenity impacts caused by septic effluent in these areas are often greater than those experienced by rural communities. Effluent continues to be discharged onto public land or waterways within the City of Ballarat. The most cost effective and sustainable solution typically requires the provision of reticulated sewer. A comprehensive assessment of septics in the DSD will establish the basis for a coherent, efficient and cost-effective approach to planning for the provision of sewer infrastructure for a 21st century growing city.

For these reasons, the risk assessment has been adjusted and those septics located within the DSD have been allocated a high priority. There are 550 active septic records in the DSD. 153 (28%) have been inspected and mapped, leaving 397 (72%) remaining to be done.

Figure 3: Example of septic effluent emerging in the backyard of a newly constructed house in Bonshaw, July 2016. Both houses were in the Declared Sewer District. The effluent originated from the septic of a house located 70m away which had not been inspected or mapped. Emergency sewer works had to be completed at considerable time and expense for City of Ballarat and CHW.

Strategy 4: Establish a comprehensive data register for all septic systems in the municipality

Major improvements were realised during the previous DWMP in the creation and utilisation of septic data. This data has enabled detailed mapping of septic tanks and improved data interrogation options which assist management and planning decisions. A comprehensive septic dataset will create local expertise which has the potential to reduce the cost and complexity for septic installations. The focus for this DWMP is to maintain the database and progressively update the approximate 2,491 septic records which have not been inspected or mapped. The ultimate aim is to have all 3,146 septics accurately mapped with a known status logged in the database.

Strategy 5: Educate septic tank owners on responsible management of their systems

During the inspection process of the previous DWMP it was found that many septic owners were not regularly carrying out basic maintenance to their systems, often due to ignorance. Meeting the owners and explaining the current regulations and expectations for maintenance was identified to be a powerful way of educating the community. As the database of septic systems becomes more accurate and refined, relevant messaging will become easier and more effective to deliver to septic owners. Prior to 2013, the database was so compromised and the data so incomplete that it was not practicable for mass mail-outs to be done. Pleasingly, the recent DWMP community consultation in 2019 has shown that owners are more engaged with high response levels to the review process.

Septic system owners must have access to suitable information to fulfil their responsibilities. Community education initiatives underpin this DWMP and have been developed from a range of sources.

This DWMP will continue the following:

1. Owners of newly installed septics will receive a copy of the Ballarat-specific booklet: “Your Septic Tank Operation & Maintenance Manual” (see Figure 4 below)

2. Opportunistic education, including the provision of septic tank information during council interactions

3. Building community knowledge through access to information on operations and responsibilities through the City of Ballarat website

4. Mass communication via post or email, such as when seeking feedback on the draft DWMP. This communication can also include messaging on maintenance and why Council has a DWMP in the first place.

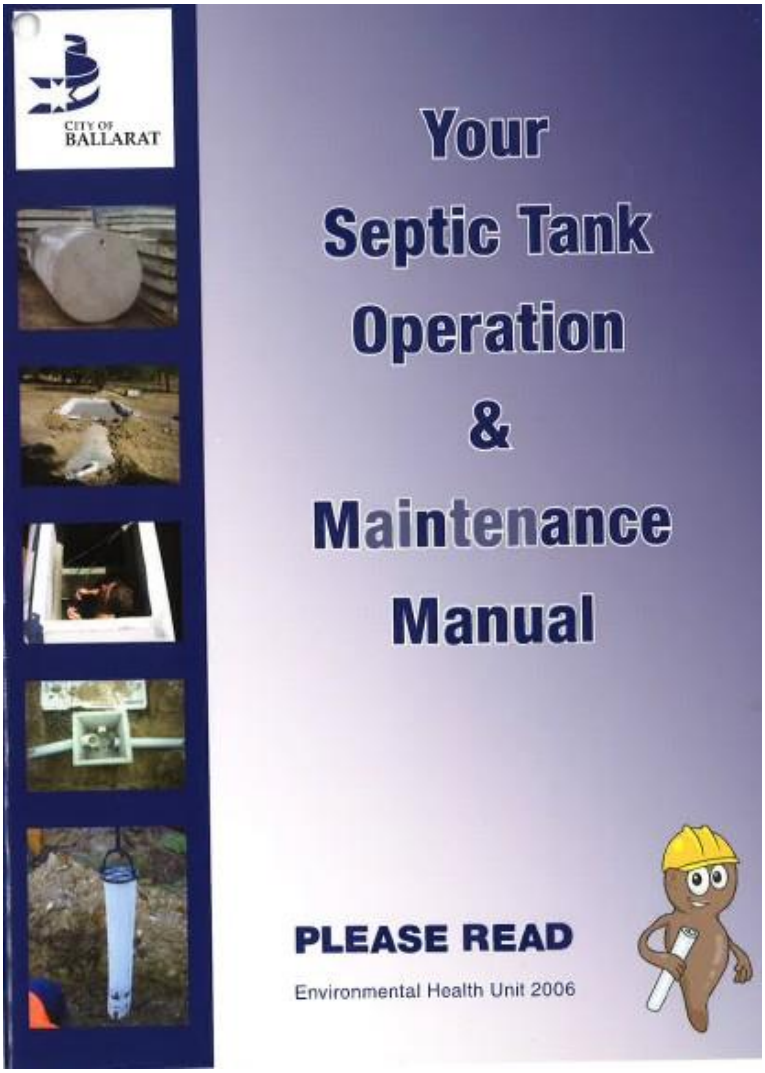


Figure 4: The City of Ballarat septic tank instruction booklet

Strategy 6: Review Ballarat's domestic wastewater management process with the aim of reducing the cost of installing and operating a septic tank system

Land Capability Assessments (LCA), typically cost in the region $1,500-$3,000 and add a significant impost to the cost of developing a property. According to the EPA Code of Practice – Onsite Wastewater Management 891.4 (2016), Section 3.6, Councils have the discretion to not require LCAs for low risk or

well understood sites. The Environmental Health team has over time developed a body of knowledge on what is necessary for the successful operation of septic systems in the municipality, taking into consideration factors such as soil characteristics as well as groundwater and climatic conditions. Some of these findings are included in Appendix B. In many instances, the depth of knowledge within Council is sufficient to provide an appropriate recommendation for a septic without resorting to an independent LCA. Other councils have developed information packs with internal guidelines that circumvent the need for LCAs. This speeds up processing times and significantly reduces the cost of obtaining a septic permit. In instances where the proposed site has identified constraints or other complexities, Council reserves the right to require an independent LCA. Under the *EPA Code of Practice for Wastewater*, LCAs are mandatory for planning permit applications within the potable catchments.

It is proposed that Ballarat Council documents this knowledge and develops an information pack with guidelines to reduce the cost of installing and operating a septic tank system.

Implementation plan

1	Develop a DWMP in consultation with key stakeholders and the community for endorsement by Council; minimum 8-week consultation period.
2	Examine funding models for obtaining the appropriate level of resourcing for DWMP implementation.
3	Select and implement a funding model that supplies the necessary resources to sustain the DWMP whilst balancing this with community expectations and organisational constraints
4	Continue the inspection and mapping program, in particular those septics in the Declared Sewerage District.
5	Apply interventions to those systems that pose a risk to public and environmental health.
6	Engage in public education and capacity building on septic tank use and maintenance, with a view to encouraging voluntary compliance.

7	Establish ongoing risk-based monitoring and compliance program inclusive of periodic inspections of septics, particularly within the potable catchments
8	Develop septic tank information pack
9	Have the DWMP audited every 3 years.
10	Review the DWMP in conjunction with key stakeholders after a period of not more than five years.
11	Develop new DWMP.

Conclusion

The City of Ballarat has greatly improved its management and oversight of domestic wastewater via the implementation of its 2013-18 DWMP. All 390 septics within the potable catchments were inspected and mapped, leading to the endorsement of the DWMP by CHW on 13 February 2017. This endorsement has enabled some property owners to build homes on their land after many years of being held in limbo.

Within the Declared Sewerage District, 153 septics were inspected and mapped, leading to the identification of nine clusters of failing septics. These are currently being assessed for reticulated sewerage by CHW. There are approximately 400 remaining septics in the DSD which have been prioritised for inspection.

There are numerous documented instances of costly delays and planning conflicts between new development and properties with existing septics, especially at the urban fringe of the city. Council and CHW must work together to have a transparent, equitable and efficient process to minimise such conflict and plan effectively for the growth of Ballarat.

This plan builds upon the work achieved by the previous DWMP and has six strategies designed to address these issues. These strategies seek to sustainably fund the implementation of the plan over the next five years and focus on inspecting all septics in the Declared Sewerage District.

This DWMP is intended to deliver a coherent approach, in conjunction with CHW, for the provision of sewerage infrastructure and onsite septic systems for Ballarat. This DWMP also proposes to maintain its endorsement in relation to the potable catchments via an inspection program of those elevated risk septics. Finally, this DWMP recommends improving the septic database, educating septic owners and improving the process by which septic permits are issued.

Appendix A: Communications Plan

- The process of communicating the DWMP is referenced in the section on Stakeholder Engagement on page 9.

- The audit report for the 2013-2018 DWMP will be published on Council's website.

- Feedback will be sought from all 3,146 septic owners via post or email. Such extensive consultation was not done with previous DWMPs and it is hoped that it will deliver a better response from the community than was achieved in the past.

- Once the DWMP has been finalised and is endorsed by Council, then it will be published on Council's website, in the same location as the 2018 audit report.

- If an Information Pack is developed in accordance with Strategy 6, this will be published on Council's website.

- If an inspection program commences in the DSD, then the outcomes will be communicated to the key stakeholder, CHW, in separate reports produced at least annually.

Appendix B: Recommendations specific to Ballarat

Reserve land application area	The City of Ballarat supports the principle that all unsewered allotments should have a reserve effluent disposal/land application area set aside for future use. The purpose of having a reserve area is to allow a factor of safety against unforeseen malfunction or failure, perhaps following increased household occupancy or inadvertent misuse of the system. It also makes it possible to increase the size of the house in the future. On newly created allotments a reserve land application area should be nominated at the subdivision stage for all allotments under 1 ha (10,000m^2) in size. The requirement for a reserve land application area is supported in AS/NZS 1547:2012.
Irrigation Systems	AS/NZS 1547:2012 requires irrigation systems to be constructed to avoid the likelihood of blockage. For this reason, the following components should be included in an irrigation system. • In-line filters to minimise the discharge of suspended solids to the land application system • Vacuum breakers to prevent the ingress of soil • Flush valves to allow periodic cleaning/flushing of the system. The installation of an in-line filter however, creates a responsibility for the home owner to ensure that the filter is cleaned regularly. Failure to clean an in-line filter may have a detrimental effect on any pumps installed within the septic tank system.

	Irrigation systems should be constructed using pressure compensating sub-surface irrigation pipe work which evenly distributes effluent throughout the irrigation area. It is important to ensure that any pump used in the distribution of wastewater is designed to suit the irrigation network. For this reason, it may be necessary to increase the size of an irrigation field when proposing to split the irrigation system for alternate dosing.
Water Rotors	Water rotor valves have been found to be unreliable to the extent that many property owners have been found to have undertaken unauthorised alteration to their irrigation systems by removing the water rotor. For this reason, the City of Ballarat does not support the installation of water rotor valves on irrigation systems due to the high likelihood of failure, and the subsequent overloading of sections of an irrigation system.
Absorption trench system	• Minimum capacity 3000L concrete Septic Tank • 100mm sewer pipe from dwelling to Septic tank • 90mm PVC pipe from Septic Tank to Distribution Boxes • Distribution Boxes made from concrete or HDPE • Aggregate in absorption trenches – blue metal or clean Scoria, 20-40mm • Geotextile Cloth or Woven Weedmat over aggregate • Trench capping – loam or site top soil
Sandfilter system	• Minimum capacity 3000L concrete Septic Tank • Welded Canvacon Q liner • Approved filter sand • Distribution pipes – 90mm slotted PVC • Collection pipe – 100mm slotted sewer pipe • Geotextile cloth or Woven Weedmat

	• Pumpwell – 750mm diameter concrete • Visual / Audible Alarm • HDPE fittings
Mound system	• Imported soil or approved sand • Design as per technical drawing or LCA
Aerated Wastewater Treatment System (AWTS)	• Current EPA Certificate of Conformance • Visual / Audible Alarm
Subsurface Irrigation (for Secondary Treated Wastewater Only)	• Pressure Compensating pipework – Toro, Wasteflow, or similar • Inline filter • Vacuum Breaker with a Surface Box • Flush out valve with a Surface Box