



LATROBE COUNCIL

STORMWATER SYSTEM MANAGEMENT PLAN

Document Endorsement	
Responsibility:	It is the responsibility of the Manager Infrastructure & Assets to implement this plan and review its content with Council.
Minute Reference:	Item Number 16160
Council Meeting Date:	20 January 2020
Strategic Plan Reference:	Section 1.2 Stormwater. Objective: To develop and improve system for stormwater reticulation and disposal.
Previous Plan Replaced:	Nil.
Date of Commencement:	21 January 2020.
Publication of Plan:	This plan is publicly available on Council's website (www.latrobe.tas.gov.au).

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1. EXECUTIVE SUMMARY

Within the Municipality of Latrobe there are two locations that can be considered “Urban Areas” for the purposes of the *Urban Drainage Act 2013*. These are the Latrobe and greater Port Sorell townships. Smaller rural communities with a negligible network of formalised stormwater drainage, such as Wesley Vale and Sassafras, are not included in this plan.

Under this legislation Council has an obligation to provide and manage an appropriate stormwater reticulation system and to manage potential risks associated with stormwater drainage.

This Council has mature operational and asset management systems in place to effectively operate the reticulation network. There are however opportunities to continue to mitigate community risk, improve system operation and support improved environmental outcomes associated with stormwater.

From a global urban area perspective there are a range of risks that require some form of management or awareness in respect to the natural environment including climate change, sea level rise, fire and landslip that impact on waterways. There are measures, systems and processes in place and at various levels of maturity to consider/provide for such risks.

Of more significance to our local community are risks that can have a direct impact on residents, their property or business and community infrastructure. Such risks can be assessed on a specific catchment basis and generally relate to:

- Localised flooding impacting on persons, property and infrastructure;
- Overland flows;
- Stream flooding; and
- Riverine flooding.

The purpose of this Stormwater System Management Plan is to provide a high level understanding of how Council manages its existing stormwater reticulation, opportunities to improve system management and planning for the future, document risks associated with stormwater and our plans to addresses potential risks to the community.

The plan is framed around stormwater management objectives:

- Document infrastructure performance requirements and standards for stormwater assets and communicate to key stakeholders;
- Fund the maintenance and operation of the stormwater reticulation in accordance with Councils stormwater service level;
- Develop the reticulation within the urban areas, to meet user needs for appropriate and safe stormwater disposal;
- To understand systems deficiencies and flooding (localised and broader catchment) risks, and possible mitigation measures;
- Identify priorities for improvement and mitigation activities;
- Develop a plan to progressively improve waterway environment and water quality in the natural systems impacted by stormwater systems; and
- Communicate the plan.

This Stormwater System Management Plan has been developed through a review of existing council records and reports, officer knowledge of the systems operation, reference to contemporary stormwater management practices and legislation, and flood studies previously carried out. The output is an action plan that sets stormwater system management priorities over the next four (4) years.

Key actions are:

- Completion of Latrobe township flood mitigation project;
- Work with the State Government and State Emergency Services Flood Policy Unit in regard to updated flood modelling for the Mersey River;
- Overland flow path modelling and minimum floor level above ground assessments for new development;
- Complete and refine DRAINS modelling for Latrobe and Port Sorell;
- Consolidated flood mapping to support future development controls;
- Systems and process improvement; and
- Refine forward works programs.

Implementation of the actions will require adequate resources to be allocated.

A future focus of the Stormwater System Management Plan will be waterway management activities.

2. BACKGROUND

Latrobe Council manages an extensive urban stormwater reticulation, within Latrobe itself and within the Port Sorell /Shearwater/Hawley township.

The systems comprise:

- Open waterways (forming the urban stormwater system);
- Piped systems;
- Pits for the capture and conveyance of stormwater;
- Ocean and stream outfalls;
- Detention systems; and
- Pollutions traps and other such devices.

Outside of the urban area, Council's role in stormwater management relates primarily to roadside drainage and providing a passage for natural stream and overland flows, where roads intercept.

What is stormwater and why is it important to manage?

The *Urban drainage Act 2013* (the Act), defines stormwater:

stormwater means run-off water that has been concentrated by means of a drain, surface channel, subsoil drain or formed surface;

The broad reasons why a Council has an interest in stormwater management relate to:

- Council facilitates and plans the development of communities. Development can have impacts on the normal water cycle: water courses are diverted, ground water recharge areas are paved over, the quantity and speed of flows to waters ways can increase or reduce and the receiving environment can be impacted. Appropriate management of stormwater can assist in mitigating some of these negative impacts on the natural systems.
- Infrastructure concentrates and collects rain and overland flows to point discharges. This concentration, if not managed, can present a risk through localised and a broader flooding risk, resulting in damage to public or private property and injury to persons. Understanding the nature and performance of stormwater infrastructure, ensuring consistent approaches

to design, construction and maintenance, identify risks and establishing plans to address risks aids in protecting community infrastructure and the residents of the community.

- Pollutants (oils, litter, chemicals) and the like accumulate in the urban environment and are washed into stormwater systems. Works in the catchments can result in silt and sediment mobilisation. Ultimately these materials find their way into receiving waters. These materials impact on water quality and the eco system. Opportunities existing to mitigate the impacts of such materials.

In urban environments stormwater systems have developed over time in response to community needs.

The current legislative framework for urban stormwater management is the *Urban Drainage Act 2013*.

Under the Act, Council is a **stormwater service provider** (a council or an agent engaged to act on behalf of the council that operates and maintains the public stormwater system within a municipal area). As such Council has responsibility for meeting its obligations under the Act.

The Objectives of the Act are noted below and reflect the discussion above as to why a Council has an interest in managing stormwater:

- a) to protect people and property by ensuring that stormwater services, infrastructure and planning are provided so as to minimise the risk of urban flooding due to stormwater flows; and
- b) to provide for the safe, environmentally responsible, efficient and sustainable provision of stormwater services in accordance with the objectives of the resource management and planning system of Tasmania, as set out in [Schedule 1](#) of the Act.

A specific requirement of the Act is for a Council to develop a Stormwater System Management Plan.

10. Stormwater system management plans

- (1) *A council must develop a stormwater system management plan for the urban area of its municipal area within 6 years after the day on which this Act commences.*
- (2) *A stormwater system management plan is to specify –*
 - (a) plans for the management of any assets used for the delivery of a stormwater service; and*
 - (b) the level of risk from flooding for each urban stormwater catchment in the public stormwater system; and*
 - (c) any other matters prescribed in the regulations or that the council considers appropriate.*

In meeting this obligation, best practice urban stormwater management in Tasmania should aim to develop catchment-based Stormwater System Management Plans with consideration given to the following core principles:

1. Understand the level of risk in its public stormwater system within the urban area.
2. Apply a risk management framework for flood mitigation and stormwater renewal works based on analysis of defined flood events.
3. Ensure stormwater systems are planned, designed and built with appropriate consideration of stormwater management principles by making better use of the statutory development and planning system.
4. Build resilience and consider climate change impacts to address future demands on the urban stormwater system.

5. Integrate stormwater management into the urban water cycle to achieve the goals of social, environmental and economic sustainability.
6. Enhance community awareness of, and participation in, the appropriate management of stormwater.

To provide guidance on the framework for a Stormwater System Management Plan a state-wide working group, convened by the LGAT, developed a template “Stormwater System Management planning- a guide for Local Government in Tasmania.”

The approach taken by Council generally follows the approach suggested in the stormwater framework. It is noted that this is the first iteration of the plan and is developed as a starting point for future improvement.

This plan for Latrobe Council will consider primarily the management of stormwater and how Council is addressing the various risks associated with stormwater. While environmental matters are touched upon in this plan, the setting of specific environmental improvement targets and actions to address the targets; are not areas able to be resourced at this point in time and will be a focus of future iterations of this plan.

In many respects the Stormwater System Management Plan is an aggregation of a range of current Council practices, plans, policies and the like, reflecting the current management arrangements.

3. OVERVIEW OF PLAN CONTENT

The purpose of developing the framework was to support Councils in meeting the general requirements of the Act, at a core level.

The framework identifies key elements of a stormwater system management plan:

- An **identification of objectives and outcomes** for management of stormwater in the designated Urban Area/s.
- A **description of the catchment** to which the plan applies, including a definition of the Urban Area.
- A **description of the existing public stormwater system**, including identification of current condition and ownership of assets where known.
- An **identification of stormwater management problems and opportunities** for achieving outcomes for public and environmental benefit in the Urban Areas/s.
- An **identification of strategies** to meet specified management objectives for the Urban Area/s.
- **Determination of capital and maintenance (including recurring) costs** associated with identified management strategies.
- An **assessment of the benefits to be derived by implementation** of proposed management strategies.
- **Prioritisation** of the strategies and a **timeframe** for implementation.
- **Assignment of responsibilities** for implementing the strategies and meeting any costs.
- A **communication / consultation strategy** for the Plan.

This plan prepared by Council addresses the key elements. It is acknowledged that in some areas, particularly in the water quality space, development is required and will be resourced at a later date.

It is important to note that the development of the framework considered the content of relevant legislation, in addition to the *Urban Drainage Act 2013*, including:

- [Urban Drainage Act 2013](#);
- [Local Government Act 1993](#);
- [Local Government By-Laws](#);
- [Local Government \(Building and Miscellaneous Provisions\) Act 1993](#);
- [Environmental Management & Pollution Control Act 1994](#);
- [Building Act 2000](#);
- [State Policy on Water Quality Management \(1997\)](#);
- [State Stormwater Strategy \(2010\)](#); and
- [Plumbing Regulations 2014](#) and [Building Regulations 2014](#)

4. STORMWATER MANAGEMENT OBJECTIVES

In the background section of this plan the objectives of the *Act* reproduced. The objectives are very broad.

Reviewing the nature of the Latrobe Council, current stormwater management practices and our current level of maturity in the provision and management of stormwater infrastructure, specific objectives (which are our current focus) have been identified, being:

- Document infrastructure performance requirements and standards for stormwater assets and communicate to key stakeholder.
- Fund the maintenance and operation of the stormwater reticulation in accordance with Councils desired stormwater service level.
- Develop the reticulation within the urban areas, to meet user needs for appropriate and safe stormwater disposal.
- To understand systems deficiencies and flooding (localised and broader catchment) risks, and possible mitigation measures.
- Identify priorities for improvement and mitigation activities.
- Develop a plan to progressively improve waterway environment and water quality in the natural systems impacted by stormwater system.
- Communicate the Stormwater System Management Plan.

Achieving these objectives will be a journey that will take some time to complete and it is important that a clear strategy is developed and implemented to guide that journey.

5. DESCRIPTION OF URBAN AREA

The *Urban Drainage Act 2013* specifies that each Council must develop a Stormwater System Management Plan for the urban areas of its municipal area.

There is no definition of 'urban' specified within the Act. The Stormwater Systems Management Plan framework provides some guidance as to potential matters to consider in the establishment of the "Urban Area."

In Latrobe Council's case, a map showing stormwater infrastructure has previously been developed for the Latrobe township and the Port Sorell/Shearwater/Hawley township. It is acknowledged that records of infrastructure installed over many decades is incomplete.

The stormwater infrastructure map could be modified over time to reflect those properties that do, or have the potential to, access stormwater systems maintained by Council and ultimately used to support the potential levying of a stormwater charge.

Appendix A and Appendix B show the urban area and catchments of the Latrobe and Port Sorell areas respectively. These maps overview the stormwater networks in the urban areas and for the purposes of the act this is considered the Urban Area. It must be noted that the location, capture and mapping of all stormwater assets maintainable by Council is an ongoing process as assets have been construct over a very long period with varying degrees of record keeping and data capture.

Also note that whist concrete kerb & channel and not all minor open drains are included on the map, they generally provide legitimate stormwater discharge points for stormwater runoff within the urban area. Some properties are unable to be serviced by existing infrastructure but may be large enough that stormwater runoff does not cause a nuisance, or they have ways and means to capture, retain, discharge or use stormwater runoff on site.

The catchments reflect the major outfalls or stream systems in the urban areas. Council does not have a specific stormwater management role in respect to the Mersey and Rubicon rivers, but does so for smaller creeks, open waterways, rivers and rivulets where they pass through the two urban areas including, for example the Panatana Rivulet, Poyston Creek, Kings Creek and Bonneys Creek. Management rests with the State Government and relevant agencies outside the urban area.

In relation to the Rubicon and Mersey Estuary, there are some stormwater discharges from Council systems, but the receiving water is not considered part of the stormwater infrastructure.

6. DESCRIPTION OF EXISTING STORMWATER ASSETS

The Stormwater Asset Management Plan for Council documents the stormwater assets managed in the urban areas.

In summary the assets are:

Asset Category	Dimension	Replacement Value
Underground mains – pipes of various sizes	84.2 km	\$20,462,000
Manholes	977 items	\$2,646,000
Side entry pits	978 items	\$2,512,000
Grated pits	440 items	\$378,000
Headwalls	41 items	\$29,000

Gross pollutant traps	6 items	\$70,000
Open Channels	TBA	Not valued
TOTAL		\$26,097,000

The stormwater asset information is recorded in Councils asset management register. The same information is presented in graphical format in the GIS system.

Work is required to improve the register, to account for in stream structures such as pond and dams.

The Urban Drainage Act requires that:

12. Council to maintain maps

A council that provides stormwater services must maintain and make publicly available maps showing all public stormwater systems within the urban area of its municipal area, including those portions of waterways that have a primary role in transporting stormwater.

This information is recorded on the Council map, which is available on request for viewing.

Under pinning the Asset Management plan are various reference and support documents including:

- Latrobe Council Infrastructure Assets Policy.
- Stormwater Asset Management Plan.
- Relevant industry standard, guidelines and publications.
- Australian rainfall and runoff.

7. IDENTIFICATION OF RISK, ISSUES AND OPPORTUNITIES

This section of the plan aims to document matters that are relevant to Latrobe in the management of the stormwater system in respect to:

- Risk to the community: current and future impacts.
- System assets and systems management.
- Environment and environmental influences.

Which consequently assists in identifying strategies and actions to consider, with the aim being to more effectively manage risk, address issues or explore opportunities.

As this is a strategy document it is not the intent to undertake a detailed exploration of the matters raised nor is the aim to undertake definitive risk assessments, this will occur as the need arises in respect to specific projects, rather the intent it is to ensure that known and potential future issues are acknowledged, current understanding of such matters is documented and the implications of issues in respect to community safety and level of service are considered.

The exploration will be carried out at two levels:

- System as a whole
- Catchment specific

Level of Service

Council has developed technical and community levels of service for stormwater services within the Asset Management Plan as follows:

Key Performance Measure	Level of Service	Performance Measure Process	Performance Target	Current Performance
COMMUNITY LEVELS OF SERVICE				
Quality	Provide a reliable stormwater drainage system in urban areas that meets community expectations by adequate collection and disposal	Number of customer service requests / complaints	Average <3 per month but limited to the 1 in 5-year recurrence interval.	To be determined
Function	Provide or devise a discharge option or point for all properties in urban areas to discharge stormwater in up to the 1 in 5-year rainfall event	Number of properties where no gravity stormwater discharge point	Maximum of 1 in 100 properties have to pump stormwater from property	To be determined
Safety	Provide stormwater system that is low risk to the community and does not pond for long periods or result in algal blooms	Number of injury / personal damage claims or valid reports of health and safety concerns.	Less than 5 per annum but limited to the 1 in 20-year recurrence storm intervals.	To be determined
TECHNICAL LEVELS OF SERVICE				
Condition	Undertake inspections, routine maintenance tasks and repairs in a timely manner	Frequency of inspections, maintenance or repairs	Inspect every 24 months and repair within 3 months. Monthly cleaning of grates during autumn and flowing rain events.	Not programmed
Accessibility	Ensure adequate stormwater drainage services are available within declared drainage districts	Number of reported property / road inundation events within serviced area following rain greater than 1in10 year event and discharge options exist	Flooding no more than one time in average 10-year period unless an upgrade or improvement program exists, and a connection point or discharge option can be devised	Based on current 10 year forward capital works program and competing projects
Cost Effectiveness	Provide services in a cost-effective manner	Benchmarking against other councils or cost to maintain system per property connected	Validate cost of council compared to contractor undertaking works or cost to maintain system is < or = to that of other municipalities	On a case by case basis. No current benchmarking against other Councils.
Safety	Ensure stormwater infrastructure poses low risk to community and provides physical barriers or signage to identify and protect from hazards. Grates and covers are installed on stormwater entry pits.	Number of injury / damage claims, defect and condition survey results and site-specific risk assessments	Less than 1 claim for compensation per 10 km of network and any high risks identified are addresses within 3 months	No currently measured

The Tasmanian Local Government's Subdivision Guidelines identifies specific design standards based upon the function of the stormwater system element.

From a technical perspective our aim is to work towards achieving 1 in 100 year flood protection for vulnerable uses e.g. residences, key infrastructure and community service providers e.g. hospital, age care facilities and the like, on the basis that protection of people is the key consideration.

Minimising impact on commercial and industrial areas and non-critical infrastructure, is also the aim of Council, however mitigating strategies need first to be targeted to community safety.

The technical standards applied by Council in managing the stormwater systems are noted elsewhere in this document.

System as a Whole

There are a variety of risks, issues and opportunities that are common across all of the catchments within the urban areas under Council's management, or relate to allied responsibilities of Council associated with the management of stormwater and the potential impact of uncontrolled stormwaters on other assets, agencies, the environment and community.

The table below identifies known matters and provides an overview of how such matters are being managed using existing systems, processes, statutory controls and the like, and indicates potential improvement action and strategies for consideration.

The actions and strategies are further explored in section 8.

Risk / Issue / Opportunity	Discussion	Risk Concerns	Responsibility	Mitigation Options	Potential Improvements
Design Standards Subdivision Guidelines	Establish the design criteria: a) ARI pipe capacities. b) Assists with communication to the community. c) Detention requirements / types. Industry accepted design standards and design methodologies are used by Council.	Changes in design standards. Non application of agreed design standards in-house or by third party designers.	LC	Best practice design office process. Professional development. Peer review and audit of external design.	Existing established systems go towards managing this risk.
Resources to Manage Infrastructure	The satisfactory performance of the stormwater systems relies upon appropriate resources being applied to the task and timely intervention.	System performance is impacted by resource or funding gaps.	LC	Asset management plan and Service Level document. Regular inspection of the assets, their condition and forward works programs.	Current level of resourcing sufficient to meet established service levels.

Risk / Issue / Opportunity	Discussion	Risk Concerns	Responsibility	Mitigation Options	Potential Improvements
Climate Change	Changes in rainfall patterns, intensity and frequency are noticeable. Sea level rise and storm surge becoming more relevant matters for consideration.	Design standards do not reflect prevailing weather patterns. Existing system under stress and new system performance not as desired.	LC	Apply agreed design standard and design methodologies. Peer review. Monitor catchment responses for localised issues.	Document system performance issues as they arise and prioritise improvement work. Review current design ARI's against current rainfall patterns to determine if modification to existing ARI required.
Development within Catchments	Additional development increases system flows. Development may occur on lands subject to stream, riverine flooding or overland flow.	System performance is impacted. Localised flooding. Exposing new group of people, property and infrastructure to flood risk.	LC	Individual catchment modelling to understand impacts of additional development. Review of proposed designs and design criteria. Input into development approvals process which may require incorporation of on-site detention storage. Consider Section 71, Part 5 agreements on relevant titles.	Review how/when detention/retention facilities are provided. Develop a policy position, however each case is different. Inundation maps are not part of planning schemes as yet. Development controls related to inundation (such as minimum floor heights above ground level) may be required to be developed.
Sea Level Rise	Linked to climate change and storm surge. Preparing for impacts associated with sea level rise must occur particularly in regard to new outfall structures, treatment structures and the like.	Catchment hydraulics impacted by sea level rise. Outfall infrastructure performance and asset impacted.	State Government / LC	Council has no ability to control sea level rise but can assist in protection from damage. Tasmanian planning schemes contain "Coastal inundation hazard area" overlays. To guide assessment of the potential risks. Information is reviewed as part of planned stormwater system improvement works. Catchment modelling to allow for sea level rise any storm surge in hydraulic assessments.	Continued awareness of this issue.

Risk / Issue / Opportunity	Discussion	Risk Concerns	Responsibility	Mitigation Options	Potential Improvements
Riverine Flooding	Council has no management responsibility for Estuary and River management outside the urban area. In respect to the "Urban Area" the primary waterways of concern are Kings Creek in Latrobe and Poyston Creek and Marys Creek at Port Sorell.	Riverine flooding will impact on the function and operation of the urban area, particularly in areas abutting rivers.	LC / State Government	Complete identified works to mitigate against flooding of Latrobe from flows in the Mersey River and Kings Creek. LC to capture known information and share (with approval) as part of broader communication / consultation with the community on flood risk.	Continue to better understand river and estuarine flood implications and make information available to the community.
Waterway Management	Open waterways form the majority of the major flow paths through the urban areas.	Challenges exist in managing appropriate waterways hydraulics, against preserving / enhancing the natural values of the waterways. Waterways are degraded in many locations.	LC	Existing management regimes in place to inspect the operation and function of waterways. Planning scheme protects waterways and requires permits for works (other than maintenance) in waterways Work procedures and training to minimize impact on waterways. Review of natural values atlas to identify areas of important natural values that require protection.	Waterways management plans need to be developed to set appropriate natural values outcomes including improvement plans.
Infrastructure Gaps	Within the urban areas infrastructure gaps exist within the reticulation system. Limits the ability of properties to connect and control concentrated or overland storm flows in local areas.	Concentrate water flow on to neighbouring properties. Potential damage to properties.	LC	Forward works program identifies locations where infrastructure gaps exist. Plumbing controls for new works.	System Development (works program) key to prioritising and addressing over time.
Connection to Stormwater Systems	Properties within the urban areas expect to be able to connect to a system even though they are not charged a stormwater removal rate.	Some properties are not able to be connected. Concerns by residents even though they do not pay for or seek a service.	LC	Network expansions noted on forward works program to progressively address such concerns. Project priority based upon identifiable impacts associated with no network provision e.g. uncontrolled overland flows, localised flooding etc.	Introduce a stormwater discharge rate to assist funding new and renewing existing infrastructure.

Risk / Issue / Opportunity	Discussion	Risk Concerns	Responsibility	Mitigation Options	Potential Improvements
Cross Connections	Interconnections exist between the sewer and stormwater reticulation system. These have occurred due to a range of reasons including illegal plumbing works, historical due to lack of stormwater services, emergency overflow provision for the sewerage.	Impacts on sewer reticulation performance and cost. Health risk due to sewerage spills.	LC / TasWater	Council to work with TasWater to resolve cross connection issues and potentially provide SW connection points in areas that are not currently serviced. Plumbing regulations provide legislative framework to address non compliances.	Complete knowledge transfer to Tas Water.
Systems Condition	An assets performance is related to its condition and having in place appropriate regimes to inspect and maintain system performance.	Asset fails to perform. Exposes community to risk progressive failure of assets.	LC	Council has not progressed to undertaking condition assessments of all of its underground assets, as the costs verses the benefits are not demonstrable. Condition information for critical assets is collected and where necessary CCTV is used to diagnose localised issues. The stormwater AMP and associated service level documents detail the management regimes for Council's stormwater assets.	Maintaining the existing regime.
Urban Area Flood Maps	Flood modelling and mapping has not yet commenced for the majority of the urban area. Consolidating information in a GIS layer would enable ease of access to information.	Known issues or hot spots not documented or knowledge transfer has not occurred. Impacts on response measures.	LC	Flood information could be consolidated into a GIS layer. Information can be used for development of inundation mapping associated with the planning scheme hazard mapping.	Flood layer on GIS once reliably developed.

Risk / Issue / Opportunity	Discussion	Risk Concerns	Responsibility	Mitigation Options	Potential Improvements
Extent of Serviced Areas	Council officers have identified the stormwater networks on maps. The maps have potential to be developed into serviced area maps and used as a basis to rate properties that either connect or are able to connect.	The stormwater network may not align with the "Urban Area" resulting in confusion.	LC	Review the various stormwater infrastructure maps and look to prioritise the 'infill' of un-serviced areas.	GIS layer assessment and look for uncaptured infrastructure.
Water Quality Management	The stormwater system uses a network of existing natural waterways as the trunk drainage system, conveying water to Bass Strait via the Rubicon or Mersey River estuaries. The natural waterways have been modified over time and include sections of remnant vegetation, modified and degraded natural systems and constructed infrastructure. The quality of the water in the systems is variable as is the quality of stormwater discharged to the systems. Water quality impacts on the health of the natural systems, including at outfall.	Poor water quality impacts/degrades the natural systems. Loss of flora and fauna. Potential impacts on human health. Impacts on potential uses of the systems for recreation, irrigation and the like. Litter and contaminants in the systems.	LC / State Government	Council has undertaken some work in the past to restore sections of degraded waterways. Pollutant traps have been installed in larger subdivision developments. Flood studies have considered the existing condition of the natural systems but have focused predominately on flow management imperatives. The State Stormwater Policy focuses on water quality and over time it is believed, there will be a concerted effort to encourage Local Government to implement appropriate strategies to address water quality improvement.	Audit of the natural system to understand the existing situation. Water quality monitoring program. Develop a program to stabilise / improve water quality in the natural systems, while maintaining the desired stormwater management function.
Network Hydraulic Model	Developing a hydraulic model for the overall network aids in future planning and supports decision making processes for new or changes in development.	A full suite of information is not available to support decision making.	LC	Flooding modelling and assessment of the trunk drainage lines has commenced to inform decision making. Minor lines are assessed as required to support development assessments or understand localised flooding issues.	No current immediate need, but a desire exists to develop a whole of system network model. The work to date, and future planned works will address information needs.

Catchments

Within the urban area there are a number of discrete catchments that can be identified from a stormwater management perspective.

In essence each of the catchments are self-contained stormwater systems with varying network area and network capacity, that can be defined by geographic features, generally ridge lines and valleys. As noted in Section 5 and illustrated on the plan attached as **Appendix A and B**.

For the purposes of this section only larger catchments have been identified, however over time sub-catchments could be explored and expanded on. In this section we discuss more fully how the risk of flooding is managed or proposed to be managed in each of the catchments, and actions required to be progressed to mitigate flood risk.

Flood in the context of the catchment will consider:

- Stream flooding: individual catchments.
- Overland flows.
- Localised flooding.

Catchment	Description	Flood Model	Flood Issues	Infrastructure and Infrastructure Limitations	Potential Improvements for management plan
Mersey River and Estuary, Latrobe	Includes outlets to the floodplain	Entura flood reports specific the Mersey River overall and Latrobe township following 2016 flooding.	0.3% AEP flood in 2016 instigated investigation and protection project.	Being addressed following 2016 flooding of Latrobe. Sea level and storm surge have a relatively minor effect on levels upstream of Miles Ford Bridge.	See through Latrobe flood mitigation project
Kings Creek, Latrobe	Modified Creek. Main watercourse through Latrobe with many inlets of varying diameter.	Local network modelling 75% complete. 100 year ARI creek model complete by Entura and works incorporated into Latrobe flood mitigation proposal.	Back water effects during large floods in Mersey river. Flooding in Kings Park.	Bass Highway detention basin constructed for 1% flood at the time (c2005). Commence program of inspection with flood mitigation project.	Break into sub-catchments commencing with largest outfall initially after prioritising any emergent hot-spots.

Catchment	Description	Flood Model	Flood Issues	Infrastructure and Infrastructure Limitations	Potential Improvements for management plan
Latrobe Creek (sub catchment of Kings Creek) north of Hawkins St, Latrobe	Modified Creek	No detail modelling. Most of catchment is rural other than from opposite hospital.	Flooding over Bass Highway known to occur in large events.	Has potential to be developed with a detention basin just upstream of Hawkins St.	Break into sub-catchments commencing with largest outfall initially after prioritising any emergent hot-spots.
Cotton St drain, outlet at Cotton St / Victor St, Latrobe	Piped drain	Modelling 75% complete. Data input complete but model needs to be run and made good including network verification.	TasWater sewer known to overflow to SW.	No current known issues. Catchment is effectively fully build out, but infill and impervious areas may increase.	Break into sub-catchments commencing with largest outfall initially after prioritising any emergent hot-spots.
Thomas St drain, outlet west of Hamilton St, Latrobe	Combination of natural and formalised open earth drains, concrete channels, box culverts and pipes.	Modelling 75% complete. Data input complete but model needs to be run and made good including network verification.	Localised flooding of roads is known.	Bosworth Park piped drain was duplicated in recent years and a small detention basin constructed south of Cotton Street. Catchment continues up past the rear of the Council depot and into Maxwell Drive area.	Break into sub-catchments commencing with largest outfall initially after prioritising any emergent hot-spots.
Reibey St drain, outlet into Thomas St drain at Laura St	Combination of natural and formalised open earth drains, concrete channels, box culverts and pipes.	This is the western input at the Laura St split. Needs to be modelled for current development and assessed for residual capacity.	Catchment starts up behind cherry hill cool store. Catchment likely to be developed as residential over the coming 10 years.	Network nearing capacity and continual efforts to reduce peak flow rates from development to that from the existing site or developed at 30% impervious. Some initial investigations to send the water south to Bonney Creek.	Break into sub-catchments commencing with largest outfall initially after prioritising any emergent hot-spots.

Catchment	Description	Flood Model	Flood Issues	Infrastructure and Infrastructure Limitations	Potential Improvements for management plan
Calthorpe St pipe discharge to Mersey River flood plain	Piped drains	Recent works and modelled by developer.	No know issues.	No overland flow path so outlet from low area is sized for 1% AEP event.	Likely to be low in priority to develop a model for this area.
Rubicon River Estuary including Panatana Rivulet, Port Sorell, Shearwater and Hawley	Numerous outlets of varying size (for example includes sometimes buried infrastructure near Caravan park, Anderson St and along Freers Beach).	Modelling by CSE Tasmania using drains and subsequent report is complete.	Minor potential issues identified in report. Priorities already addressed.	Strong growth, infill and upper catchment development still occurring. Detention storage often warranted as piped networks through existing residential areas and outfalls exist already.	Break into sub-catchments commencing with largest outfall initially after prioritising any emergent hot-spots.
Marys Creek, Port Sorell	Highly modified and generally piped until Darling Street.	Developer used Pitt and Sherry and established storage volumes and the like for a detention basin for periods of high tide / storm surge etc.	Existing development is very low. Port Sorell recreation ground remains waterlogged with a high water table late into the Spring period.	Sea level rise, storm surge, Briggs development including sea wall barrage. Very low and flat infrastructure. Pitt and Sherry work as part of Tasmanian Coastal Climate Adaptation Pathways Project of July 2012.	See through the recommendations and development of the Briggs land located between Wilmot / Archer and Darling Streets.
Freers Beach	Outfalls of varying size including Poyston Creek, Freer Street, Anderson Street, Shearwater Park (north and south) and surf club.	Modelling by CSE Tasmania using drains and subsequent report is complete.	Golf course subject to flooding and loss of play time.	Sea level rise, storm surge, sand build up across faces of outfalls are known issues. Poyston Creek outfall onto Freers Beach duplicated in 2018/19 financial year. High levels of sand may require reworking and / or flap valves. Poyston Creek crossing of Pitcairn St to be monitored.	Break into sub-catchments and adjacent smaller outfalls. Commencing with largest outfall initially after prioritising any emergent hot-spots.

Catchment	Description	Flood Model	Flood Issues	Infrastructure and Infrastructure Limitations	Potential Improvements for management plan
Hawley Beach	Series of discharge points of varying sizes to the Rubicon Estuary.	Modelling by CSE Tasmania using drains and subsequent report is complete.	Overland flow into residential properties from undeveloped rural land has been an issue in vicinity of Meadowsweet Close and to the south. Inlets and catch drains above urban area require periodic attention.	Hawley was an original 'shack' area with little need for formalised drainage networks due to large pervious areas of relatively sparse development. This has changes over the last 20 years with more permanent residents and larger impervious areas creating additional runoff not always meeting owner expectations. Predominantly nuisance overland flows rather than flooding. Kerb and channel to control surface water off roads only exists in parts of Hawley Beach. Some expectation within the community for outfalls to be relocated off sandy beaches and onto rocky outcrops.	Determine priorities for potential kerb and channel work and associated drainage upgrades.

1. Risk Assessment											
Risk Category	Responsible Officer	Risk Issue	Consequence	Inherent Assessment			Treatment	Residual Risk After Treatment			Notes
				Likelihood	Consequence	Risk		Likelihood	Consequence	Risk	
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Management and design processes do not reflect current practice.	Service level expectations not met. Required infrastructure capacity for new and upgrade work not to an appropriate standard.	Possible	Minor	Medium	Staff training , periodic review of design process and policies	Unlikely	Minor	Low	
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Development impacts on existing system performance	System capacity issues. New incidences of local flooding. Damage to infrastructure.	Possible	Minor	Medium	Develop a policy to guide system management for new subdivisions eg detention / retention, upgraded etc.	Unlikely	Minor	Low	
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Development within areas of inundation.	Flood impact on new properties. Insurance claims and claims against council.	Possible	Moderate	High	Development controls and associated flood hazard maps in scheme	Rare	Moderate	Medium	Finalise internal consolidated flood map for LC
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Waterway / flora and fauna health impacts due to use as drainage systems	Eco system is damaged. Poor water quality. Community complaint about the aesthetic of the waterways. Potential impact on use of recreational waters.	Likely	Minor	Medium	Develop waterway management plans	Possible	Minor	Medium	Lower priority project at this point in time. Acknowledgement of the need to develop over time.
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Cross connections between sewer and stormwater create public health issues	Stormwater impacts on operation of the sewerage. Sewage enters waterways and impact on water quality	Likely	Minor	Medium	Work with TasWater on I and I programs. Provide details of past investigations to support TasWater. Infill drainage works as per gap analysis.	Possible	Minor	Medium	Forward work program to address in part over time

1. Risk Assessment											
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Maps showing stormwater infrastructure and ability to connect maps don't reflect infrastructure provided.	Impacts on charging regimes.	Possible	Insignificant	Low	Review network maps and align				Focus is on political and financial risk
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Hot spot management and identification	Inattention to hotspots will result in localised flooding and potential damage to infrastructure	Possible	Minor	Medium	Identify hot spot flooding. Maintenance regimes	Unlikely	Minor	Low	Existing system in operation.
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Mersey River flooding	Results in high backwater in Kings creek and potential loss in hydraulic grade line for river outfalls to discharge thereby resulting in road and property flooding.	Possible	Major	High	Development and Implementation of a project to protect Latrobe from Mersey River and Kings Creek flooding and ensure Kings Creek Detention basin has adequate capacity.	Possible	Major	High	Project is underway to protect Latrobe from flooding of the Mersey River and Kings Creek.
Public Safety / Assets and infrastructure	Manager Infrastructure & Assets	Poyston Creek Catchment	Flooding of golf course and inability for creek to drain to estuary due to high sand levels at outfall.	Possible	Minor	Medium	Rock groyne extension northern side and / or flap vales and / or pipeline extension.	Unlikely	Minor	Low	900mm dia outfall duplicated in 2019.

Risk Assessment

The preceding sections have provided an understanding of what we know about the Latrobe and Port Sorell stormwater systems, identified potential actions and undertakings to address community risk, improve system performance and support improved environmental outcomes.

Broadly actions identified can be grouped under the following headings:

- Operational management and management improvements.
- Environmental management.
- Development impacts.
- Flooding including hotspot management.

A focus of the SSMP is risk management and understanding the relative risk of the issues and impact of the implementation of the proposed action/s will aid in prioritising actions and projects.

A basic risk assessment applying Council's risk management framework was undertaken.

The framework notes ten risk categories. For the purpose of this exercise there is a focus on the assets and infrastructure, and public safety categories but this is not to suggest that the other risk categories are less important or relevant. Generally, there will be alignment across many of the risk categories in respect to risk scoring. The risk assessment has been applied to the matters raised above, which would have apparent risk implications if not managed.

The output from the risk assessment will be included in the corporate risk register, and the risk rating used to assign a priority to projects listed in the action plan.

8. IDENTIFICATION OF STRATEGIES AND OUTCOMES

Within Council there is a well-developed understanding of stormwater asset management, design, construction and operational management. This is supported by appropriate operational resources and funding.

Council in recent years have gained an understanding and undertaken works to address a number of flood incidents that have occurred. Ongoing work is required to identify, detail and program opportunities to mitigate the extent and impact of existing flooding and as the urban areas extend.

As noted in the preceding sections, further work is required in this space.

Through the discussion and risk assessments various specific actions were identified related to works implementation, flood studies and the like, with a more strategic focus.

Matters related to improvements to internal processes, information capture and communication were also noted, and in most instances existing administrative arrangements will allow these matters to be addressed over time, as noted in the discussion section.

An Action Plan has been prepared to capture those specific tasks that will require focus and resource.

It is suggested that overall priorities for management of the urban stormwater systems are (in order of perceived importance):

1. Quantifying actual and potential flood risk and in all urban catchments.
2. Identifying and implementing flood mitigations strategies.
3. Communicating / educating the community.
4. Systems and process improvements and knowledge capture management regimes.
5. Waterway environment and water quality.

It is acknowledged that others may consider that waterway environment and water quality are important matters for Council to focus its efforts. However, from a broad community perspective protection of people and property from flood risk, which has the potential to be managed or mitigated, is the priority focus area for Council at this point in time.

Future iterations of this plan will expand on the waterway environment and water quality improvements.

The action plan noted below documents the key matters which Council wishes to address within the life of this plan.

ACTION PLAN

Action / Strategy	Scope	Benefit	Priority High 2 to 5 years Medium 10 Years Low 10 to 20 years	Cost	Funding source	Timeline	Responsibility
Mersey River Flooding, Latrobe	Implement the Latrobe flood mitigation project.	Protects urban residents from events equivalent to the June 2016 0.3% AEP flood.	High	\$4m	Local, State and Federal Governments	2020/21	Latrobe Council with funding from State and Federal
Kings Creek Flooding, Latrobe	Following implementation of the Mersey River flood mitigation project determine any works to increase capacity or reduce flow rates, development controls and detention storage in the Kings Creek catchment. Assess need for ongoing inspection program on the Kings Creek Detention Basin wall.	To ensure that Kings Creek continues to have capacity to drain the town adequately even at times when high backwaters exist in the Mersey River.	High	TBD	LC	2021/22	LC- seek grant funding NDRGP or similar
Communications strategy for flooding and flood risk	Communicate council's current knowledge of flood risk to assist community to manage risk individually. Note that Railton (Kentish Council) is a pilot project with the SES Flood Policy Unit.	Informed and resilient community.	High	\$10,000	LC, SES	2021/22	LC and SES
Dam Safety	Ensure 'farm' dams located in the urban area catchment are managed adequately from a dam safety perspective. Identified in Mersey Leven Emergency Management risk assessment.	Actual and perceived safety.	High	\$20,000	LC initially. Dam owners subsequently.	2020	LC, dam regulator and dam owners.

Action / Strategy	Scope	Benefit	Priority High 2 to 5 years Medium 10 Years Low 10 to 20 years	Cost	Funding source	Timeline	Responsibility
Illegal and cross connections	Knowledge transfer to TasWater as to outcomes of Stormwater infrastructure improvement program.	Facilitate on going improvement programs. Address health risk. Reduced cost to the community.	High	No cost	N/A	2020/21	LC and Taswater
Reibey Street Drain, Latrobe	Investigate options as development of the catchment continues. Potentially on site detention storage, capacity increase and /or diversion to Bonneys Creek (ie south).	Allow ongoing development of the township.	Medium	TBD	LC and subdividers.	2022 on	LC – primary role
Shearwater ocean outfalls	Investigate options to prevent blocking of outfalls with sand. Potentially groynes, flap valves, outfall extensions.	Ensures installed system can function as intended.	Medium	TBD	LC	2022 on	LC and Crown as landowners.
Development controls in known flood inundated area	Develop flood hazard mapping to support application of planning provisions.	Address inundation risks prior to development. Reduced cost to the community.	Medium	TBD	State Government	Post adoption of new state-wide planning scheme	State Government and LC
Inspection regime	Includes for example outfalls, detention basins, dam walls, pollutant traps, grates over inlets / outlet headwalls and grated stormwater entry pits.	Helps to maximise system capacity prior to heavy rainfall events.	Medium	Inspection relatively low cost. Actions may be high.	LC	2021	LC and residents to report.

Specific system and process improvements noted for action are:

Systems and Process	Benefits	Responsibility	Timeline
Review ARI set for storm events against the catchment responses and climate change impacts . Determine if new design criteria are required and if so adopt.	Design of new systems and existing system upgrades cater for expected storm flows. Mitigate over time instances of localised flooding associated with higher intensity storm events.	Infrastructure & Assets	2022/23
Consolidate flood information in one location/map.	Knowledge is available across Council. Support the development of planning scheme hazard maps.	Infrastructure & Assets (and GIS resource)	2022/23
Develop a Stormwater detention / retention policy.	Clear guidance on the use of such infrastructure, maintenance responsibilities and the like.	Infrastructure & Assets	2021/22
Stormwater infrastructure maps: review current ability to service the extent of the urban area and align with current / future ability to service. Consider future SW rate.	Clear linkage between network maps and expansions plans and areas where a stormwater rate could be applied.	Infrastructure & Assets	2021/22
Maintain a register of flooding hot spots, capture new issues as they arise.	Manage localised flooding risk. Identify issue which may require assessment and intervention in forward works programs. GIS map: incorporated into a flood layer. Ready reference for staff.	Infrastructure & Assets with input from Operations Department.	Ongoing
Appropriate management arrangements are in place to guide work in waterways, so as to limit impact. Education and training of staff and contractors.	Preserve the integrity of existing waterway values.	Operations Department	Ongoing
Reticulation “gaps” are noted, prioritised and captured in forward works program as scheduled or unscheduled.	Identified and costed improvement program to guide future works. Progressively address locations within the urban area where there is no ability to drain private or public infrastructure including roads.	Infrastructure & Assets	Ongoing

9. COSTS, BENEFITS AND FUNDING ARRANGEMENTS

The action plan has broadly identified cost, benefit and funding opportunities to address those projects and strategies. Such an approach assists in broadly identify priorities.

For the majority of projects and strategies there is a need to source funding, either via the Council's capital works program, additional ongoing resource within the Infrastructure & Assets Department or externally through grants or other agencies.

In seeking such funding there is generally a need for a more detailed assessment of "Cost and Benefit" to enable a projects viability to be proved up.

The more detailed assessment may include:

- Preliminary design and project costing.
- Cost benefit analysis.
- Risk assessment.

And the like.

10. PRIORITIES AND TIMEFRAMES

Project priorities are noted on the action plan but are subject to change. The priority has been assigned generally through consideration of Risk exposure either to Council or more directly to the community, at a local or broader level.

Timeframes will adjust over time depending upon budget allocations and review of project priorities and in respond to unforeseen circumstances.

11. RESPONSIBILITIES

Council has primary responsibility for managing stormwater in the urban area.

The broader river environments and coastal beach strip are inactively managed by the State Government or are held under lease to by the Latrobe Council. Works in those environments, related to stormwater assets, requires consultation and potentially approval from the respective Government Agencies.

Understanding the impacts of riverine flooding is a joint responsibility of the State Government and Council, however the role for Council is understanding the extent of risk and working with stakeholders to mitigate the risk or ensuring persons at risk are aware of the potential for inundation.

Communication and Consultation.

The purpose of this plan is to provide the community and Council staff with an understanding of the Urban stormwater system, how it is managed, current issues and risks which may need to be addressed and a plan of action to address such issues and risks, on a priority basis.

The plan informs decisions in regard to the allocation of resources within Council and supports potential applications for external funding to address identified issues.

Planned communication and consultation actions include:

Action	Responsibility	Timeline
Provide information to the impacted community on the extent of flood impacts, advice on flood preparedness and plan mitigation actions.	Manager Infrastructure & Assets	2020/21
Develop a page on the Council web site to provide information on stormwater management, flooding and flood preparedness and water quality issues. Include a linkage to planning scheme hazard mapping and consolidated flood map.	Manager Infrastructure & Assets	2020
Publish the Stormwater System management plan on Council website.	Manager Infrastructure & Assets	Adoption of SSMP

These actions will be captured as part of the development of a broader communications strategy, associated with this storm water system management plan.

12. REVIEW OF THE STORMWATER SYSTEM MANAGEMENT PLANS

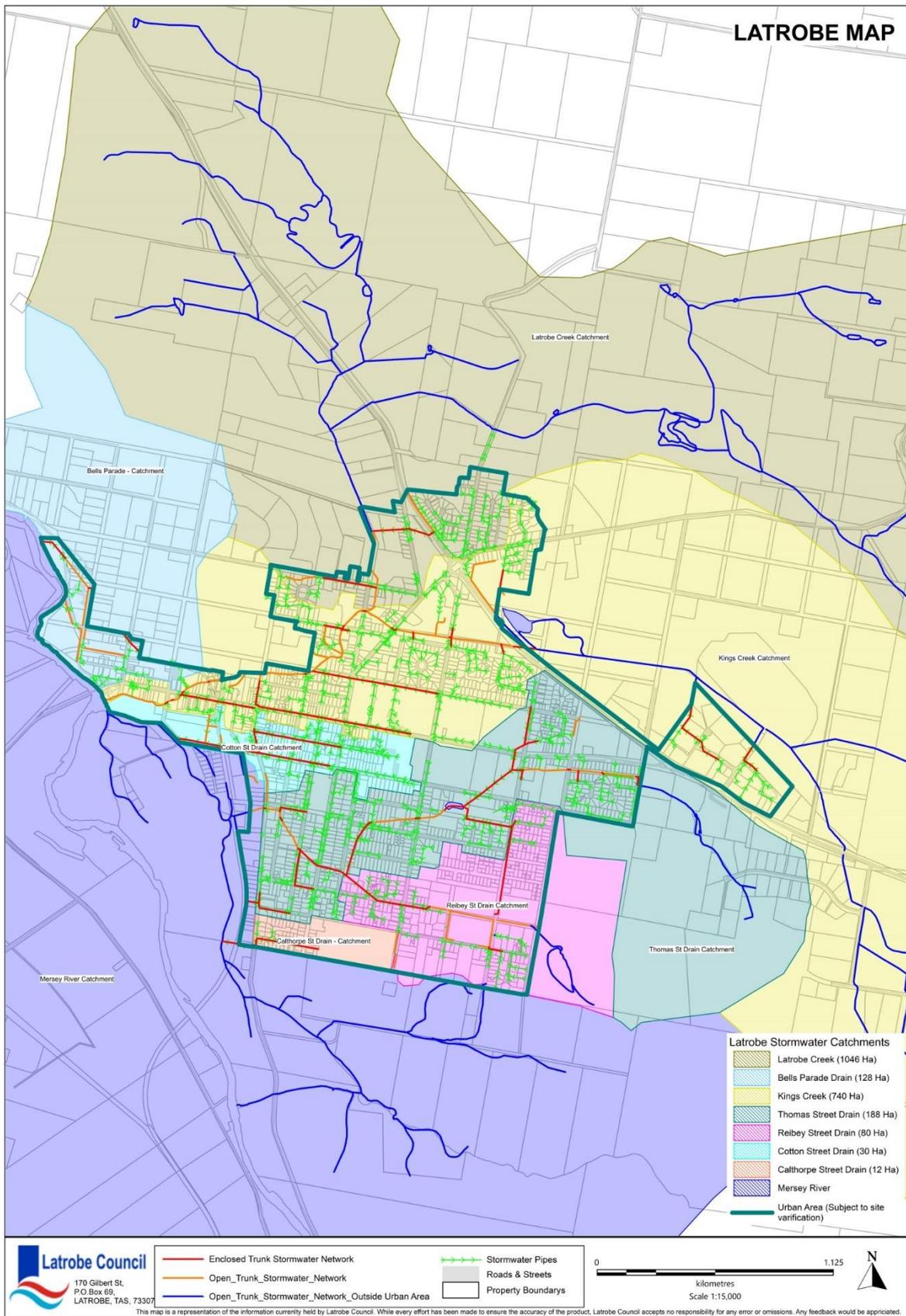
This initial Stormwater System Management plan is the first iteration of such a document.

The plan is underpinned by a range of other documents as noted throughout this document.

To implement the actions noted within the plan will require a number of budget cycles.

The planed review cycle for this plan is 4 years.

APPENDIX A: LATROBE - URBAN AREA & CATCHMENT



APPENDIX B: PORT SORELL – URBAN AREA & CATCHMENT

