TASMANIAN STORMWATER POLICY GUIDANCE AND STANDARDS FOR DEVELOPMENT

Version 1 November 2021

Derwent Estuary Program

ILGAT
Local Government Association Tasmania

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1.1 Version 1 November 2021

This document has been authored by the Stormwater in Development Working Group.

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This does not imply or state that they have endorsed the document as Council policy.

City of LAUNCESTON
Brighton Council
LGAT Local Government Association Tasmania
TEER Healthy waterways together
Clarence... a brighter place
City of HOBART
Derwent Estuary Program

The Derwent Estuary Program pays respect to the traditional and original owners of this land and acknowledges today's Tasmanian Aboriginal people as the continuing custodians.

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The Derwent Estuary Program

The Derwent Estuary Program (DEP) is a regional not-for-profit partnership between local governments, the Tasmanian state government, businesses, scientists and the community to share science for the benefit of our estuary. The DEP was established in 1999 and has been nationally recognised for excellence in coordinating initiatives to reduce water pollution, conserve habitats and species, monitor river health and promote greater use and enjoyment of the foreshore. Our major sponsors include: Brighton, Clarence, Derwent Valley, Glenorchy, Hobart and Kingborough councils, the Tasmanian State Government, TasWater, Tasmanian Ports Corporation, Norske Skog Boyer, Hydro Tasmania and Nyrstar Hobart. We also work collaboratively on projects with the CSIRO Marine and Atmospheric Research, University of Tasmania, Institute of Marine and Antarctic Studies, Derwent Catchment Project and NRM South.

All photos are by DEP, except where acknowledged.

The Local Government Association of Tasmania

The Local Government Association of Tasmania (LGAT) is the peak body for local government in Tasmania. Our role is to support, promote, advocate for, and represent the local government sector, so our members are in the best possible position to serve their communities. We work collaboratively with all 29 Tasmanian council members to support them and the communities they serve and represent.

Contents

Tables

Figures

Introduction

Appropriate stormwater management in urban areas, including water quality treatment, volume and quantity management and considered development design is valuable to communities. Urban development relies on a network of stormwater infrastructure to manage the stormwater runoff impacts on neighbouring development, communities and the environment. To be effective stormwater considerations must be addressed at the earliest stages of development design.

This policy guidance document will inform and assist Councils acting as a Planning Authority to regulate development under the Landuse Planning and Approvals Act (LUPAA) and the Tasmanian Planning Scheme (TPS), and also their position as Stormwater Service Providers (SSP's) under the UDA.

This document will assist in providing a consistent, open, and transparent way of informing the general public how the terms of a condition are framed and the science and engineering to support those conditions.

It will be used by Council's, developers, and consultants as a guidance document for stormwater management in development in Tasmania.

The document presented in two separate and standalone parts. they can be summarised as the *why* and the *how* of stormwater management.

Part 1 Stormwater Management in Tasmania defines the legislation and heads of power governing stormwater management in Tasmania. It considers the background of why stormwater management is of significance and outlines Councils responsibilities under the legislation. It provides background on the different areas of stormwater management and the ways that Councils manage these responsibilities.

The purpose of this section is to ensure that users of the document are provided with full details of the stormwater situation in Tasmania to apply the implementation section of the document. It also provides the justification for applying stormwater planning conditions under the Tasmanian Planning Scheme.

Part 2 Stormwater Management in Development is for use by Councils, Stormwater Service Providers, Developers and Consultants to define stormwater management requirements in accordance with the legislation and requirements outlined in Section 1.

It clearly defines the requirements and expectations of stormwater management and how it is implemented in regard to stormwater quality, stormwater conveyance, quantity and development design.

It includes what should be done at the planning stage to ensure good design and development and provides guidance on how to implement it in design.

It covers the following areas:

- Background summary of why to stormwater apply conditions to development
- How Councils can implement stormwater requirements
- What stormwater requirements are required
- What inputs are required from developers to meet these requirements.

The **Tasmanian Policy Guidance and Standards for Development Supporting Resources** document contains supporting works for this document. It is separated from this work as it is a living document that is updated with further supporting resources as they become available. It includes policy templates and standard conditions as well as further supporting resources.

Issue Summary

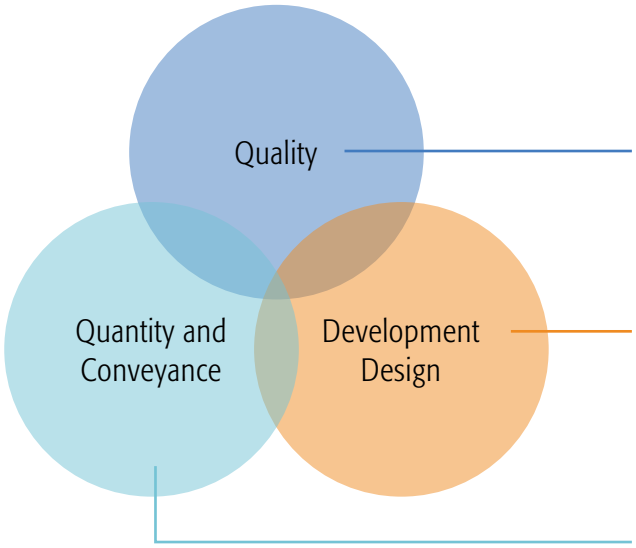
Effective water quality treatment benefits the whole community by improving water quality entering receiving environments and minimising the harm to waterways, estuaries and ocean environments. Minimising this environmental harm from untreated stormwater provides safe beaches and swimming areas, clean and safe freshwater and sea produce, and pleasant residential amenity and recreational areas.

Appropriate consideration of stormwater quantity and conveyance and development design ensures that developments and communities are designed to minimise the risk and consequences of flooding, and that new infrastructure is appropriate to a site and considered in the scheme of the larger catchment network.

Managing stormwater to achieve these outcomes encompasses many different design and treatment options and can be applied at the level of a single lot, or throughout a catchment. To ensure that these outcomes are realised stormwater design should be considered at the earliest stages of a development proposal.

New development creates stormwater infrastructure, impacts overland flow paths and introduces new stormwater runoff and pollutants into the environment. It is part of the role of Local Government to ensure that the stormwater impacts associated with new developments are managed in a way that protects and enhances water quality while allowing for sustainable development and managing risk. Designing development appropriately for stormwater management is key to obtaining these outcomes. This document provides the support and advice for stormwater providers to manage stormwater in accordance with their responsibilities.

There are three key aspects to stormwater management in urban areas covered by this document that are interrelated and often reliant on each other. These are shown below:

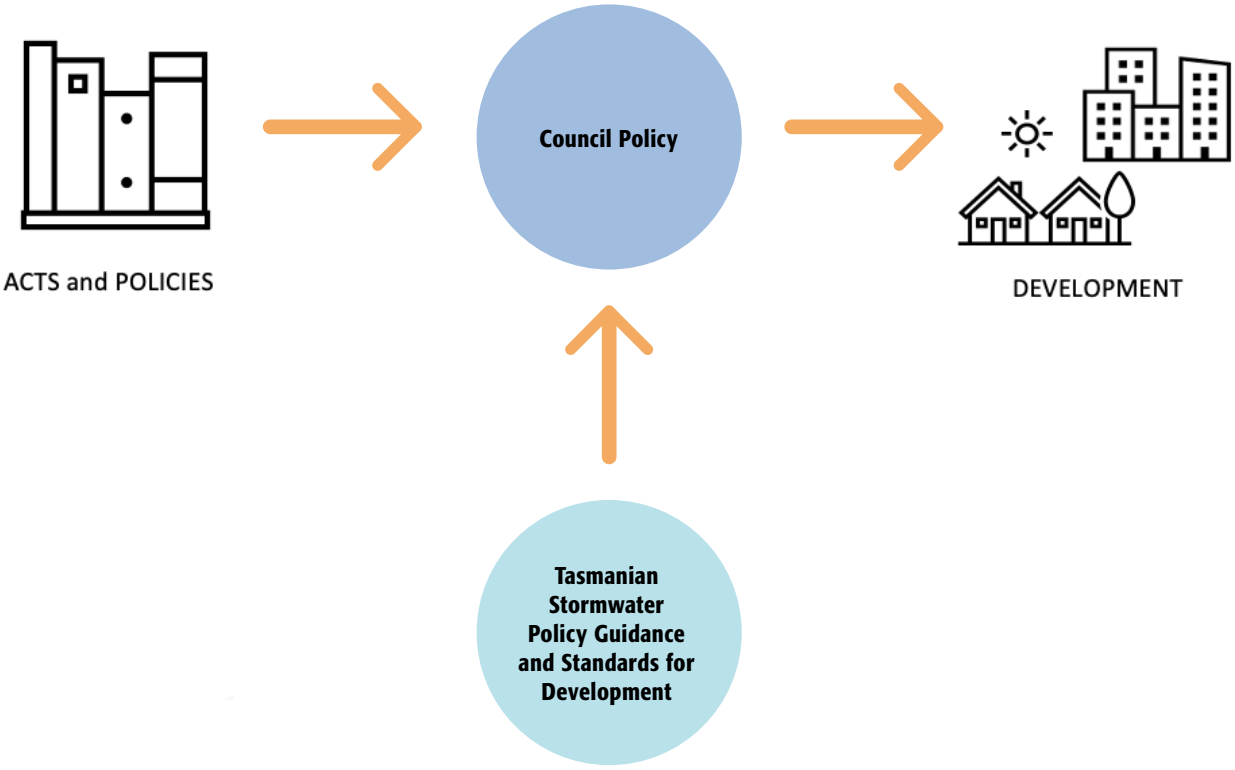


Quality – stormwater quality refers to the quality of the runoff from a development and whether pollutants generated by the development will impact the ecological function of receiving waters.

Development Design – the design of developments refers to how a developments location and layout will impact on the risk to the new development and assess if the development increases the risk in other locations from stormwater or flood impacts.

Quantity and Conveyance– stormwater quantity and conveyance refers to the amount of stormwater generated by, or running through a development. It is managed by the minor (pits and pipes) network and by the major (overland flow path) network.

Figure 1 Stormwater management actions and interactions



Document Context

This work exists fill a gap between state and national policy and legislation and how the requirements of those policies are enacted in development through Council policy or the Tasmanian Planning Scheme. This document is a guide for councils in developing their own policy on how stormwater requirements in development will be regulated. It does not create its own policy nor does it create its own legislative instrument or requirements.

The recommendations in this document are based on legislation, policy, and Acts and specifically based on scientifically backed best practice, engineering and scientific advice and practices.

The context of this document is as a single resource that brings together stormwater requirements and best practice as applied to the Tasmanian context. It is not a technical document and does not supersede technical documents such as Australian Rainfall and Runoff or the Tasmanian Standard Drawings.

The main act regarding stormwater in urban areas in Tasmania is the Urban Drainage Act 2013 (UDA). Councils meet their stormwater requirements under the UDA by maintaining a functioning stormwater asset system, by maintaining maps of the stormwater asset system and maps or records of the flood risk in the urban areas, by creating a stormwater system management plan and by ensuring that development meets the requirements of managing stormwater appropriately under the UDA. This document provides a transparent and consistent framework for Councils to adopt to ensure that development meets the requirements of managing stormwater appropriately under the UDA and in accordance with other relevant policies.

Document Intent

This document has been created to inform the design, construction and management of appropriate stormwater quantity and quality infrastructure and guides development design in response to stormwater hazards.

The purpose of this document is to provide a standardised approach to stormwater management in Tasmania. It has been identified that there is a lack of information and consistency around stormwater management, this work has been created to fill this gap and provide Councils and developers with clear guidance and support around decision making for stormwater in new developments.

The intent is that the approach outlined in this document is adopted by Councils to standardise the stormwater approach in Tasmania. This will provide clear guidelines for developers and improve outcomes for communities and the environment.

There is scope within this document for Councils that have fewer resources to implement stormwater management requirements in a staged manner and scope for areas of greater significance to be addressed at a higher level.

This policy may be applied by Councils in different manners to support their stormwater decision making but the intent is that by providing this work a space is created for stormwater management in new developments that is common to all areas, widely available and streamlines the processes for stormwater providers, consultants and developers.

The document is intended to be reviewed regularly to ensure that it continues to reflect best stormwater management practices and is valuable to its users.

Document Objectives

The objectives of this document are to:

- fulfil the requirements of the relevant policies, strategies and Acts in relation to stormwater management;
- ensure that buildings, works, subdivisions and stormwater drainage systems generate stormwater of a quantity that enables protection of natural assets, infrastructure and property;
- ensure that buildings, works, subdivisions and stormwater drainage systems are designed and located to minimise risk to people and property;
- ensure pollutant types and/or loadings are managed appropriately to protect natural values, infrastructure and property; and
- provide clarity and direct stormwater operators and developers to easy to follow resources on how stormwater quality permit requirements can be fulfilled.

Document Review and Update Cycle

Initial Review: 12 – 18 months.

This review will allow ongoing feedback to be incorporated into the document and include an assessment of the effectiveness of the document and approaches.

After the initial review the policy is to be reviewed every 5 years, and minor alterations as required.

Future iterations of this document should consider the state of stormwater management in Tasmania and assess how this document supports these arrangements.

PART 1

Stormwater Management in Tasmania

1.1 Purpose of this section

The background section of this document defines the legislation and heads of power governing stormwater management in Tasmania. It considers the background of why stormwater management is of significance and outlines Councils responsibilities under the legislation. It provides background on the areas of stormwater management. It then covers the ways that Councils manage the different stormwater responsibilities required.

The purpose of this section is to ensure that everyone using the document is cognisant of the stormwater situation in Tasmania and has sufficient background knowledge to apply the implementation section of the document.

A second yet equally important purpose of this section is to demonstrate that the imposing planning conditions to provide for stormwater management meets the legal requirements for imposing a planning condition. This section outlines that stormwater management as it relates to stormwater quality, quantity and location of assets;

1. has a legal basis
2. is reasonable – the development creates a need / issue that needs to be managed
3. relevance – that stormwater management – for the reasons outlined in this section – is relevant to all developments.

This section contains:

1.2 Policies, Legislation and heads of Power

1.3. Stormwater management

1.4. Contributions for stormwater infrastructure

1.2 Policies, Legislation and Heads of Power

1.2.1 Introduction

Governance of water resources in Australia is the responsibility of state and territory governments, with local government generally responsible for stormwater management. In Tasmania, local governments are expected to protect and enhance water resources, while allowing for sustainable development (Tasmanian Government, 2013) (Resource Planning and Development Commission, 2003).

The purpose of this document is to provide clear direction for implementing stormwater management responsibilities as required under the following legislation and policies.

Stormwater management is administered by several key legislative and policy instruments as follows:

- The Resource Management and Planning System (RMPS)
- Urban Drainage Act 2013;
- Tasmanian Planning Scheme;
- Regional Land Use Strategies.
- Local Government (Building and Miscellaneous Provisions) Act 1993
- Tasmanian State Policy on Water Quality Management 1997;
- Protected Environmental Values;
- Tasmanian State Stormwater Strategy 2010; and
- Environmental Management and Pollution Control Act 1994.

The following sections detail legislative and policy instruments framework in Tasmania and outlines how the 'Tasmanian Stormwater Policy Guidance and Standards for Developments' will be implemented within this framework.

1.2.2 The Resource Management and Planning System

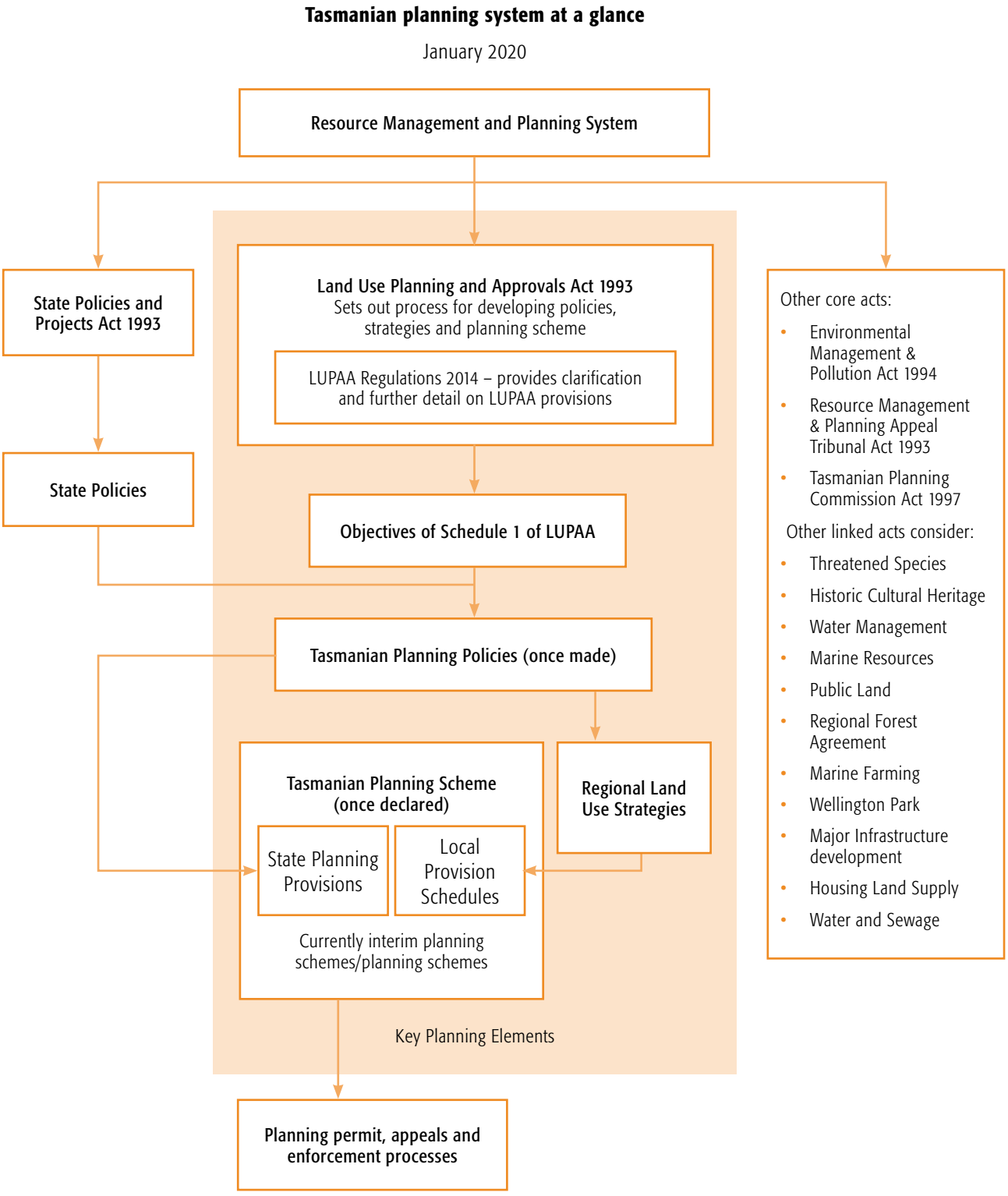
The Resource Management and Planning System (RMPS) of Tasmania was established in 1994 to achieve sustainable outcomes from the use and development of natural and physical resources (Resource Planning and Development Commission, 2003). The RMPS framework includes several key pieces of legislation as well as a suite of State Policies. State Planning Provisions fall under the RMPS. All elements of the RMPS are linked through a set of common objectives.

1. The objectives of the resource management and planning system of Tasmania are:
   a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity; and
   b) to provide for the fair, orderly and sustainable use and development of air, land and water; and
   c) to encourage public involvement in resource management and planning; and
   d) to facilitate economic development in accordance with the objectives set out in paragraphs (a), (b) and (c); and
   e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.
2. In clause 1 (a), sustainable development means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural well-being and for their health and safety while –
   a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and
   b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and
   c) avoiding, remedying or mitigating any adverse effects of activities on the environment.

(The State of Tasmania (The Department of Premier and Cabinet), 2021).

For a diagrammatic overview of the RMPS see Figure 5 Overview of the RMPS sourced from the Tasmanian planning reform website (https://planningreform.tas.gov.au/__data/assets/pdf_file/0010/556633/Tasmanian-Planning-System-at-a-glance.pdf).

Figure 2 Tasmanian planning system at a glance



(Sourced from planningreform.tas.gov.au/planning/tasmanian-planning-scheme-at-a-glance)

1.2.3 Urban Drainage Act 2013

The Urban Drainage Act 2013 (Tasmanian Government, 2013) is the Act which provides for *the management of urban drainage and stormwater systems and infrastructure.* The requirements of this Act to do not extend outside the urban area. The statutory power to condition and control stormwater exist for Councils acting as a Stormwater Service Provider (SSP) under the UDA as well as under LUPAA and the Tasmanian planning scheme as a Planning Authority. Either may be adopted for use by Council to implement stormwater standards and requirements.

The Objectives of the Act are to

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*.

Under this Act Councils have a responsibility to provide for such public stormwater systems as may be necessary to effectively drain the urban area of the Councils municipal area.

This Act clearly defines the responsibility of Councils to manage;

stormwater quality for the sustainable and environmentally responsible management of stormwater quality impacts to *avoid or mitigate any adverse effects of activities on the environment*,

stormwater quantity to minimise the risk of urban flooding and protect people and property, and;

development design to minimise the risk of urban flooding and protect people and property.

The Act requires Stormwater Service Providers to develop a Stormwater System Management Plan (SSMP) for the urban area of its municipality, to specify plans for the management of stormwater system assets, and the level of risk from flood, and any other matters considered appropriate. Stormwater quality management has been considered in the SSMP's of some Councils.

This Act has a number of sections that can be used to implement stormwater requirements on developments.

Sections that relate specifically to development include:

> 11. Power of council to adopt stormwater systems
>
> (1) A general manager may agree with a person who has private stormwater systems, or is constructing or proposing to construct private stormwater systems or associated works, that if those works are constructed in accordance with the terms of the agreement, the council will, upon the completion of the work, or at some specified date, or on the happening of some future event, declare the works to be vested in the council.
> ….
>
> (4) Where a person proposes to construct a drain, the general manager may, if the general manager considers that the proposed drain is, or is likely to be, needed to form part of a public stormwater system that it has provided or proposes to provide, require that person to construct the drain in a different way, to a greater hydraulic capacity or with different materials from which the person proposes or could otherwise be required by the council.
> ….
>
> (8) A council that imposes a requirement under *subsection (4)* must pay to the person constructing the drain –
>
> (a) any extra expenses reasonably incurred by the person in complying with the requirement; and
>
> (b) until the drain becomes part of a system, any expenses reasonably incurred by the person, in repairing or maintaining the drain, as may be attributable to that requirement.

The effect of Section 11 of the UDA in a subdivision context, is that if a developer is proposing to construct a stormwater system as part of the subdivision to service the lots it creates, the General Manager may enter into an agreement with that person such that if the works are constructed in accordance with the terms of the agreement, the Council will declare the works to be vested in Council (Street, 2021). Councils therefore have the power under this Act to dictate that developers enter into an agreement with Council and complete the works to the satisfaction of the Council and only on compliance with the terms of the agreement will the new system be vested in the Council.

Section 14 of the Act states that without General Managers consent a person must not build on or near existing stormwater infrastructure:

> 14. Interference with public stormwater systems
>
> (1) A person must not, *without a general manager's consent*, cause or permit –

c) any works to be connected to a public stormwater system; or

d) the alteration or removal of, or interference with, a public stormwater system.

Interference or alteration with/ of a public stormwater systems includes connections to a public stormwater system.

Thus Councils have the power to require a developer to acquire General Managers consent to connect to any public stormwater system and conditions may be placed upon the design and construction of the stormwater arrangements for the minor and major stormwater systems and for stormwater quality. The general manager can also withhold consent to connect until the preconditions are met.

Section 14(2) provides an enforcement mechanism in circumstances where a person breaches section 14(1) via the use of notices requiring removal of the connection, rectification of any damage, or to desist from discharging material into the public stormwater system within 28 days or any longer period as specified by the general manager. This enforcement may be used for an unauthorised connection and also if the conditions to connect are not met.

Infrastructure contributions can be imposed as a condition of a consent granted by the General manager under section 14 of the UDA or as a precondition of the granting of consent under the UDA. They can also be imposed as a term of an agreement under section 11 of the UDA.

Another section relevant to development is section 21:

Section 21. Requirement to Connect is the section of the UDA that requires properties to connect to a public stormwater system. It requires that;

(1) A general manager may, by notice served on the owner of a property, require the owner to connect the property's private stormwater system to a public stormwater system to reduce the flooding risk to the property or to other properties in the stormwater catchment, if the property is located within 30 metres of the public stormwater system.

The UDA is a powerful tool that Councils can use to manage stormwater in their urban areas outside of the planning scheme. To manage stormwater through these powers and functions is a newer process in Tasmania but nonetheless a process and power that exists irrelevant of whether Councils choose to utilise it.

1.2.4 Tasmanian Planning Scheme (TPS) and the Land Use Planning and Approvals Act (LUPAA)

The Tasmanian Planning Scheme (Tasmanian Government, 2021) under the Land Use Planning and Approval Act is the instrument by which new development is approved for construction. The purpose of the Tasmanian Planning Scheme (TPS) is to further the objectives set out under the Land Use Planning and Approvals Act 1993 (LUPAA) (The State of Tasmania (The Department of Premier and Cabinet), 2021) and RMPS (section 1.2.2). The objectives are achieved by providing consistent state-wide planning controls, whilst staying consistent with state policies (e.g. SPWQM) by creating Tasmanian Planning Policies (TPPs).

The TPS is the instrument allowing Planning Authorities to engage with property developers at the planning stage of developments. It allows Councils to place requirements on developments and assess the proposed infrastructure.

Councils and developers are familiar with the planning environment under LUPAA however the TPS is a new statewide planning scheme that is being enacted Council by Council. It has some significant differences to previous local planning schemes particularly in regards to the management of stormwater. These differences and a lack of clarity regarding stormwater requirements has driven the creation of this policy guidance document to enable Councils to have a set of stormwater policy and requirements to condition from.

Under the Land Use Planning and Approvals Act 1993 *the TPPs may relate to the following:*

a) the sustainable use, development, protection or conservation of land;

b) environmental protection;

c) liveability, health and wellbeing of the community;

d) any other matter that may be included in a planning scheme or a regional land use strategy. (The State of Tasmania (The Department of Premier and Cabinet), 2021)

The TPS consists of two parts: State Planning Provisions (SPPs) (state-wide consistent set of planning rules); and Local Provisions Schedule (LPSs), which will apply the SPPs to each municipal area. The TPS will come into effect in each council area once the LPSs for that council area are finalised.

The TPS has three main areas that relate to stormwater quality, quantity and development design. These are:

- Code C12. Flood-Prone Areas Hazard Code
- Clause 6.11.2 (g)
- Clause 6.1.3.(b)

There is a gap that exists in relation to stormwater management for 'exempt' or 'no permit required' development under the TPS as in these cases no permit exists to regulate these developments.

C12.0 Flood Prone Areas Code.

This code relates to risk reduction in regards to the exposure of people and property to flood impacts. It impacts developments that are reasonably expected to be impacted by flood waters and to developments that may contribute to flood impacts on other properties.

C12.1 Code Purpose

The purpose of the Flood-Prone Areas Hazard Code is:

C12.1.1

To ensure that use or development subject to risk from flood is appropriately located and managed, so that:

a) people, property and infrastructure are not exposed to an unacceptable level of risk;

b) future costs associated with options for adaptation, protection, retreat or abandonment of property and infrastructure are minimised; and

c) it does not increase the risk from flood to other land or public infrastructure.

C12.1.2

To preclude development on land that will unreasonably affect flood flow or be affected by permanent or periodic flood.

C12.2 Application of this Code

C12.2.1

This code applies to development of land within a flood-prone hazard area.

C12.2.2

This code applies to use of land within a flood-prone hazard area if for:

a) a change of use that converts a non-habitable building to a habitable building; or

b) a new habitable room within an existing building.

C12.2.3

This code applies to use in a habitable building, or development of land, identified in a report prepared by a suitably qualified person, that is lodged with an application for a permit, or required in response to a request under section 54 of the Act, as subject to risk from flood or that has the potential to cause increased risk from flood.

C12.2.4

The planning authority may only make a request under clause *C12.2.3 where it reasonably believes, based on information in its possession, that the land is subject to risk from flood or has the potential to cause increased risk from flood.*

The planning authority may make a request under this code for a flood hazard report if it has any reasonable reason to believe that a proposed development may be exposed to a flood risk or that a proposed development may contribute to a flood risk.

Clause 6.11.2 (g)

Clause 6.11.2 (g) of the SPP's provides a broad head of power for Councils to apply conditions and restrictions on a permit with regard to *"erosion, and stormwater volume and quality controls."* (Tasmanian Government, 2021). This is the clause that can be used to enact most stormwater conditions.

6.11.2

Conditions and restrictions imposed by the planning authority on a permit may include:

.....

(g) erosion, and stormwater volume and quality controls.

The ability to include suitable stormwater conditions as part of a planning permit results in the TPS being a key instrument for managing stormwater quality and quantity, as specified by the SPWQM.

Clause 6.1.3 (b)

The TPS also includes Clause 6.1.3 (b) which allows Council's to request further information (RFI) regarding the following items relating to stormwater management:

Under clause 6.1.3 b vii of the TPS Councils may require or request further information as pertaining to stormwater design as below.

6.1.3

In addition to the information that is required by clause 6.1.2, a planning authority may, in order to enable it to consider an application, require such further or additional information as the planning authority considers necessary to satisfy it that the proposed use or development will comply with any relevant standards and purpose statements in the zone, codes or a specific area plan, applicable to the use or development including:

.....

(b) a site analysis and site plan at a scale acceptable to the planning authority showing, where applicable:

(i) the existing and proposed use(s) on the site;

(ii) the boundaries and dimensions of the site;

(iii) topography including contours showing AHD levels and major site features;

(iv) natural drainage lines, watercourses and wetlands on or adjacent to the site;

(v) soil type;

(vi) vegetation types and distribution including any known threatened species, and trees and vegetation to be removed;

(vii) the location and capacity and connection point of any existing services and proposed services;

(viii) the location of easements on the site or connected to the site;

(ix) existing pedestrian and vehicle access to the site;

(x) the location of existing and proposed buildings on the site;

(xi) the location of existing adjoining properties, adjacent buildings and their uses;

(xii) any natural hazards that may affect use or development on the site;

(xiii) proposed roads, driveways, parking areas and footpaths within the site;

(xiv) any proposed open space, common space, or facilities on the site; and

(xv) proposed subdivision lot boundaries;

It is considered (but untested given the relative infancy of the TPS) that the ability to impose stormwater conditions under of 6.11.2 must confer the ability to request further information in respect to the quality and volume of stormwater that the development will generate and dispose of, because if it does not have this information, the extent and need for use of the conditioning power would be unknown. (Street, 2021)

The TPS also includes the following code which relates to stormwater management in certain scenarios:

- **Natural Assets Code** – including an overlay for waterway and coastal protection areas. The intention of this Code is to "minimise impacts on water quality, natural assets including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes". The code applies to development of land **immediately adjacent to a watercourse or wetland** and does not consider the impacts on water quality or of increased water volumes from development upstream and spatially removed from the immediate waterway.

1.2.5 Regional Land Use Strategies

Regional Land Use Strategies set out the long term planning goals for the three Tasmanian regions (Cradle Coast, northern and southern.) Planning schemes must be consistent with the land use strategies (Southern Tasmania Regional Planning Project, 2020). Under LUPAA the Minister for Planning may make and amend regional land use strategies. It is the Minister's responsibility to keep each of the strategies under regular review.

New planning schemes and amendments to existing planning schemes must be consistent with the relevant regional land use strategy.

The three regional land use strategies in Tasmania are:

- Southern Tasmania Regional Land Use Strategy 2010-2035 (STRLUS);
- Living on the Coast – The Cradle Coast Regional Land Use Planning Framework (CCRLUPS) (Earle & Sansom, 2010); and
- Northern Tasmania Regional Land Use Strategy (NTRLUS) (Tasmanian Planning Commission, 2021).

Each strategy includes policies and/or goals for water quality management. Each strategy recognises the impact of development on the quantity and quality of runoff, requires the protection of natural assets, and promotes the importance of sustainable design and water sensitive urban design principles for developments. A section of each policy is provided below.

The *Tasmanian Stormwater Policy for New Developments* is consistent with, and supports, each of these Regional Land Use Strategies. Regional Land Use Strategies and additional information is available via the Tasmanian Planning Reform website: https://planningreform.tas.gov.au/the-strategies.

Southern Regional Land Use Strategy:

STRLUS and includes the following policies (Southern Tasmania Regional Planning Project, 2020):

WR 1 - Protect and manage the ecological health, environmental values and water quality of surface and groundwater, including waterways, wetlands and estuaries:

- WR 1.1 – Ensure use and development is undertaken in accordance with the State Policy on Water Quality Management
- WR 1.2 – Incorporate total water cycle management and water sensitive urban design principles in land use and infrastructure planning to minimise stormwater discharge to rivers, (particularly subdivision)

BNV 1 - Maintain and manage the region's biodiversity and ecosystems and their resilience to the impacts of climate change.

Living on the Coast – The Cradle Coast regional Land Use Planning Framework

2.4 Land Use Policies for Water Management

Land use assists the protection, conservation, improvement and restoration of water quality and quantity in natural streams and water bodies and in engineered storages.

Land use planning processes –

a) Use catchments as the ecological and hydrological unit of meaningful scale for planning and land management

b) Identify the surface water and ground water features, hydrological function, and natural features and areas necessary for the ecological and hydrological integrity of catchments

c) Require catchments, natural water courses and water bodies be adequately buffered against likelihood for resource development, economic activity, utilities and settlement to have adverse effect on –

(i) existing and known likely drinking water supplies

(ii) surface water, ground water, and water bodies susceptible to impact due to extraction of water or the addition of nutrients, sediments and pollutants

(iii) hydrological function of water, including its chemical and physical properties, and its biological interaction with the environment

d) Limit modification of natural drainage systems, including change in channel alignment and in the nature of the stream beds and flow rates

e) impact on water quality by runoff from adjacent use or development

d) Promote sustainable water use practices including water harvesting and recycling such as Water Sensitive Urban Design for stormwater and waste water

e) Require retention and rehabilitation of native vegetation within riparian and foreshore areas

f) Require urban and rural land use or development incorporate measures to manage diffuse and point source pollution from storm water and waste water discharge in accordance with the Tasmanian State Policy on Water Quality Management 1997 and the Tasmanian State Stormwater Strategy 2010

Northern Tasmanian Regional Land Use Strategy

C.4.3 Goal 3: Sustainability To promote greater sustainability in new development and develop stronger community

Strategic Direction G3.1 Promote and protect the Region's unique environmental assets and values.

…..

b) Manage the relationship between development and impacts of natural hazards (for example salinity, land instability, acid sulfate soils, bushfire and flood potential, contamination).

….

f) Protect and enhance water quality including significant wetlands and waterways.

….

h) Preserve and protect areas of natural environmental significance, particularly:

- Areas of biodiversity and important flora and fauna communities and threatened species;
- Land and coastal areas sensitive to climate change, tidal and storm surges, rising sea levels and other natural hazards (including acid sulfate soils, bushfire and flooding); and
- Regionally significant open space, scenic landscape amenity areas and outdoor recreation reserves

Strategic Direction G3.2 Establish planning policies to support sustainable development, address the impacts of climate change, improve energy efficiency and reduce environmental emissions and pollutants.

a) Support good building design, reuse and recycling by:

- Increasing the energy efficiency of new development in line with national building design codes, standards and international best practice;
- Providing strategic support and incentives for the reuse of old buildings and other redevelopment in preference to 'Greenfield' development; and
- Identifying known or foreseeable impacts of climate change, such as rising sea levels, flood risk and land instability, and adopting a precautionary approach to the location of new development.

b) Continue improving environmental management (air and water) by:

- Identifying and controlling the emission

of pollutants to sensitive receiving waters and to air to reduce carbon dioxide (CO2) and other greenhouse gas emissions;

- Promoting sustainable water use and conservation measures including innovative water collection practices, and recycling measures; and
- Implementing and securing sustainable urban drainage systems such as water sensitive urban design practices.

E REGIONAL PLANNING POLICIES

CW-P05 Protect and manage the ecological health and environmental values of surface and groundwater.

CW-PO6 Where appropriate, development in new or redevelopment areas is to adopt best practice Water Sensitive Urban Design (WSUD) principles.

CW-PO7 Protect the water quality of the region's waterways and wetlands, including key water supply catchments.

....

CW-A09 Include Water Sensitive Urban Design (WSUD) requirements in planning schemes, where appropriate, to reduce stormwater discharge into waterways and to maximise stormwater quality.

CW-A10 Planning schemes are to be consistent with the Tasmanian State Policy on Water Quality Management 1997 and the Tasmanian State Stormwater Strategy.

1.2.6 Local Government (Building and Miscellaneous Provisions) Act 1993 (LG(BMP))

The Local Government (Building and Miscellaneous Provisions) Act 1993 (State of Tasmania (The Department of Premier and Cabinet), 2021) specifically relates to stormwater specifically **in subdivisions under the following sections:**

85. Refusal of application for subdivision

The council may refuse to approve a plan of subdivision if it is of the opinion –

(a) that the roads will not suit the public convenience, or will not give satisfactory inter-communication to the inhabitants both of the subdivision and the municipal area in which it is; or

(b) that the drainage both of roads and of other land will not be satisfactorily carried off and disposed of; or

Under section 88.(1)(ca) and (1A)(d) final plans are to be lodged with Council which include

(d) works consisting of the provision of a connection to a public stormwater system in accordance with the *Urban Drainage Act 2013* ;

(f) works consisting of arrangements for drainage of stormwater under a State road in accordance with the *Roads and Jetties Act 1935* .

Councils may apply conditions on a planning permit relating to the amount of stormwater and its method of disposal **in a subdivision under this act.**

1.2.7 Tasmanian State Policy on Water Quality Management 1997

The State Policy on Water Quality management was created in 1997 to manage water quality standards for ground and surface waters in Tasmania.

The purpose of the State Policy for Water Quality Management 1997 (SPWQM) (Environment Protection Authority, Tasmania, 1997) is *to achieve the sustainable management of Tasmania's surface water and ground water resources by protecting and enhancing their qualities while allowing for sustainable development*, in accordance with the objectives of the RMPS. The SPWQM underpins the environmental management framework of water resources in Tasmania, the objectives of which are to be met through the planning system.

The SPWQM provides a framework for the management and regulation of water quality, including stormwater. Clauses 31 and 33 of the policy emphasise the need to manage stormwater at the source. These clauses also require stormwater to be managed using best practice environmental management for diffuse sources, and according to stormwater management strategies, *at the construction and development phases of construction*. Key principles and standards for stormwater management are provided in the State Stormwater Strategy 2010 (31). (Environmental Protection Authority, Tasmania, 2010)

Clause 31 states that the provisions outlined in the SPWQM are to be implemented through planning schemes. Clause 33 states that State and Local Governments should develop and maintain strategies to encourage the community to reduce stormwater pollution at the source.

The State Policy on Water Quality Management 1997 is designed to maintain or enhance the quality of Tasmanian surface waters. Principal objectives of the Policy include:

- Move on from reliance on 'end of pipe' controls to take into consideration the number of discharges into a given water body, or the sensitivity or current condition of the water body.

- Ensure that diffuse source and point source pollution does not endanger the achievement of water quality objectives, and that pollutants discharged to waterways are reduced as much as possible by the use of best practice environmental management;
- Facilitate and promote integrated catchment management.
- Focusing on overall water quality management strategies by identifying those water quality values and uses that are considered worthy of protection.

They further state that:

> *The Board and local planning authorities will use these strategies in land use planning and approvals processes, and in ongoing regulation, to ensure that the PEVs for a given water body are maintained or enhanced over time. (Department of Primary Industries, Water and the Environment, 2003)*

The policy required that Protected Environmental Values (PEV's) be set for all public surface waters in Tasmania. PEV's/ Environmental management goals for Tasmanian surface waters were set under this policy and refer to the State Policy on Water Quality Management.

1.2.8 Protected Environmental Values

Protected Environmental Values (PEVs) (also referred to as Environmental Management Goals for Tasmanian Surface Waters) were created under the State Policy on Water Quality management. They identify the current uses and values of the waterways and state that:

A good supply of fresh, clean water is an essential requirement for human life, a healthy environment and a productive economy.

We need water for drinking, for recreational activities like fishing, swimming and boating, to provide the food we eat and export, to generate clean electricity, and to support mining and other industries.

We also expect our rivers and lakes to look healthy, and provide a healthy environment for a wide range of aquatic plants and animals……

River health, and the health of the economies that depend upon them, is clearly linked to the way we use the waters; the degree of regulation we impose; the quantity of water we take out; and the quality of water we return.

There are 22 PEV reports completed that cover all main waterways of Tasmania and link to Default Guideline Values (DGV's) for each classification of waterway. They were established in the early 2000's by a process of significant community consultation.

The State Policy on Water Quality Management provides five categories of PEVs:

- Protection of Aquatic Ecosystems
- Recreational Water Quality and Aesthetics
- Raw Water for Drinking Water Supply
- Agricultural Water Uses
- Industrial Water Supply

PEVs provide a strategic framework for water quality management and focus the attention of government, industry and the community on the long-term sustainable use of surface waters. (Environmental Protection Agency Tasmania, 2021)

An example of a PEV taken from the Meander River Catchment document (Department of Primary Industries, Water and the Environment, 2004) is:

Figure 3 Example of a Protected Environmental Value from the Meander River Catchment

For all surface waters within private land (including forest on private land)	A: Protection of Aquatic Ecosystems (ii) Protection of modified (not pristine) ecosystems from which edible fish are harvested B: Recreational Water Quality & Aesthetics* (i) Primary contact water quality (Deloraine, Egmont [Birralee Road], and Bracknell) (ii) Secondary contact water quality (iii) Aesthetic water quality C: Raw Water for Drinking Water Supply (Westbury/Hagley, Exton, Bracknell, and Deloraine) (ii) Subject to coarse screening plus disinfection D: Agricultural Water Uses (i) Irrigation (ii) Stock watering E: Industrial Water Supply (Hydro-Electric Power Generation, Pivot) That is, as a minimum, water quality management strategies should provide water of a physical and chemical nature to support a modified, but healthy aquatic ecosystem from which edible fish may be harvested; that is suitable to supply town drinking water (subject to coarse screening plus disinfection) at Westbury/Hagley, Exton, Bracknell and Deloraine; that is acceptable for irrigation and stock watering purposes; and which will allow people to safely engage in primary and secondary contact recreation activities such as swimming (Deloraine, Egmont and Bracknell), paddling or fishing in aesthetically pleasing waters; and is suitable for use by Pivot and (following impoundment) in the Trevallyn Power Scheme.

1.2.9 Tasmanian State Stormwater Strategy 2010

The State Stormwater Strategy 2010 supports the need to manage stormwater as outlined in the SPWQM (Environmental Protection Authority, Tasmania, 2010). The strategy sets out a range of best management Water Sensitive Urban Design (WSUD) practices, and stormwater quality and quantity targets for private developments based on Integrated Water Management and WSUD principles. The strategy states that:

> *Urban waterways, including rivulets, creeks and natural drainage lines, provide important water quality, ecological and amenity values and should be maintained, enhanced or restored. Piping or lining of natural channels should be seen only as a last resort. It is recommended that buffer zones be established to protect the values of urban waterways, and that any development within these areas be carefully managed. (EPA Division, 2010)*

In alignment with the SPWQM, the strategy emphasises the need to manage stormwater at its source, and identifies the following performance criteria for stormwater discharges from new developments:

- 80% reduction in the average annual load of total suspended solids;
- 45% reduction in the average annual load of total phosphorus;
- 45% reduction in the average annual load of total nitrogen.

To further the objectives of the SPWQM and the State Stormwater Strategy, the 'WSUD: engineering procedures for stormwater management in Tasmania' manual (DEP, 2012) was produced to provide practical implementation advice on the recommendations of the State Stormwater Strategy .

1.2.10 Australian and New Zealand Guidelines for Fresh and Marine Water Quality

The Water Quality Guidelines provide authoritative guidance on the management of water quality for natural and semi-natural water resources in Australia and New Zealand.

The Water Quality Guidelines (Australian Government, 2021) aim to facilitate the productive and sustainable use of water resources while still maintaining the biological communities and ecological processes that the resource supports, consistent with the principles of ecologically sustainable development. They have been developed by the Australian and New Zealand Governments to update the ANZECC & ARMCANZ (2000) guidelines.

The guidelines state that

- Water quality management requires a robust planning process.
- Planning and management of water quality should be coordinated with management of other stressors, such as water quantity and habitat quality (for aquatic ecosystems). This will require close alignment of water quality planning with other planning initiatives that deal with the management of water resources and ecosystem health. The exact nature of the planning requirements will vary from jurisdiction to jurisdiction.
- Management strategies should be developed to account for possible future risks, including climate change. It is preferable to prevent problems from occurring instead of being required to fix the damage.

These guidelines form part of National Water Quality Management Strategy (NWQMS).

1.2.11 Environmental Management and Pollution Control Act 1994

The Environmental Management and Pollution Control Act 1994 (EMPCA) is the Act that covers polluting activities and Councils responsibilities and powers to address these activities. **It may be made applicable to stormwater pollution and to erosion and sediment control on building and construction sites.**

Pollution under EMPCA is defined as **pollutant** includes –

a) a gas, liquid or solid; or

b) an odour; or

c) an organism (whether alive or dead), including a virus; or

d) energy, including noise, radioactivity and electromagnetic radiation; or

e) a combination of pollutants – that may cause environmental harm

Section 5 of the Act defines environmental harm. It is important to note it includes any adverse effect on the environment, material environmental harm is any harm that would cost over the threshold amount ($5000) to prevent or mitigate the environmental harm and make good resulting environmental damage.

Under this Act Council have a duty to prevent or control pollution.

20A. Duty of council to prevent or control pollution

(1) In this section,

prescribed activity means –

(a) an activity that is a level 2 activity; and

(b) an activity that is a level 3 activity in respect of which the council has not, by an order under section 26 of the State Policies and Projects Act 1993 , been made responsible for the enforcement of conditions upon which the activity may proceed.

(2) In relation to activities other than prescribed activities, a council must use its best endeavours to prevent or control acts or omissions which cause or are capable of causing pollution.

This section of the Act demonstrates that Councils must use "their best endeavours ….to prevent acts that are capable of causing pollution.

Under the Act - section 44(2) - Councils may serve environmental protection notices to prevent or manage environmentally relevant activities that are not level 2 or level 3 activities.

Under clause 67 **Environmental Infringement notices** a Council may issue an infringement notice as folllows:

(1) Where an authorized officer or a council officer is satisfied that a person has committed a prescribed offence, the authorized officer or the council officer may serve an environmental infringement notice in respect of that offence on that person or, if the identity of that person cannot be readily ascertained or confirmed, on the occupier or person apparently in charge of the place or vehicle at, in or in relation to which the officer is satisfied such an offence has been committed.

(2) An environmental infringement notice is to be in accordance with section 14 of the Monetary Penalties Enforcement Act 2005

1.2.12 Other Relevant Legislation and Policy

Other key legislation and policy regarding the management of stormwater are as follows:

- Local Government Act 1993;
- Environmental Management and Pollution Control Act 1994;
- Building Act 2016;
- Plumbing Regulations 2014;
- Building Regulations 2014; and
- National Water Quality Management Strategy 2018.

1.3 Stormwater Management

This section provides background on the different aspects of stormwater management including Councils responsibilities and how they are managed, the context of stormwater quality management and stormwater quantity and volume management.

1.3.1 Council Responsibilities

The Acts and legislation previously described demonstrate that Councils have three main areas of responsibility when it comes to management of stormwater.

Figure 4 Summary of Council responsibilities pertaining to stormwater

1. Ensure that the risk of flooding from stormwater is sufficiently identified and planned for through *quantity and conveyance infrastructure management.*
2. Ensure that the risk of flooding from stormwater is sufficiently identified and planned for through *appropriate development design*.
3. Manage the *quality* of stormwater to avoid any adverse affects of stormwater on receiving environments.

Councils meet their stormwater requirements by;

- maintaining a stormwater asset system that functions effectively to drain the urban areas and minimise ecological impacts,
- by ensuring that new developments are compliant with the stormwater requirements,
- by maintaining a map of the stormwater asset system and a map of the flood risk in the urban areas.

Each Council sets up their documentation slightly differently however the following three outlines are an example of the documents that can be used to define Councils actions.

Figure 5 An example of Council SW Management Arrangements

STORMWATER ASSET MANAGEMENT PLAN (SW AMP)	STORMWATER SYSTEM MANAGEMENT PLAN (SSMP)	STORMWATER POLICY FOR DEVELOPMENTS (SPND)
• Financial management plan for the stormwater asset class.	• Identifies risk and opportunities indentified in Council stormwater models • Prioritises works to feed into the asset management planning	• Identifies Councils level of service and infrastructure requirements for infrastructure arising from new development.

1.3.2 Stormwater Quality Control

Appropriate stormwater management, including water quality treatment and volume management, is valuable to communities, particularly in urban areas. Every development relies on a network of stormwater infrastructure to manage the stormwater runoff impacts it has on neighbouring development and to manage stormwater flows that may impact it. Effective water quality treatment benefits the whole community by improving water quality entering receiving environments and minimising the harm to waterways, estuaries and ocean environments. Minimising this environmental harm from untreated stormwater provides safe beaches and swimming areas, clean and safe freshwater and sea produce, and pleasant residential amenity and recreational areas. Managing stormwater to achieve this encompasses many different treatment options and can be applied at the level of a single lot, or throughout a catchment.

Introduction to Water-Sensitive Urban Design (WSUD) and Integrated Water Management (IWM)

The impact of development on receiving water quality has been clearly demonstrated through numerous studies as has the ability of WSUD systems to improve stormwater quality, where plant species have been appropriately selected and systems are well maintained (CSIRO Australia, 1996) (Fox, et al., 2007).

A 2018 review of stormwater science states that urban stormwater that is drained to waterways is identified as the dominant urban pressure on waterways and the key limiting factor to good ecological condition (Fletcher, et al., 2011). Degradation of waterways can occur at very low levels of urbanisation with studies suggesting it takes a very small percentage (about 2%) of directly connected imperviousness (DCI) to cause severe degradation of stream condition (Walsh, et al., 2005; Walsh & Kunapo, 2009; Walsh & Webb, 2016. Ewert, O'Halloran, Lintern, Weber, & McCarthy, 2018).

IWM and WSUD are ways of integrating the water cycle with the built environment through good planning and design. IWM integrates managing all elements of the water cycle and includes managing and protecting waterway health, wastewater management and potable water supplies (Department of Environment, Land, Water and Planning. Victorian State Government, 2021). It is a systems based approach that recognises and incorporates WSUD with provision of water services, flood management and other aspects of the water cycle.

WSUD is defined by the National Water Initiative as the integration of urban planning with the management, protection and conservation of the urban water cycle, that ensures urban water management is sensitive to natural hydrological and ecological processes (Council of Australian Governements (COAG), 2004). It is a way of designing urban areas and stormwater systems that brings components of the water cycle together: supply and demand, mains water, wastewater, rainfall, runoff and groundwater, as well as contributing to local character and aesthetics, environment and community. Using this approach can improve quality of life, while also addressing flooding and pollution. WSUD can be applied at every scale from individual allotments to large subdivisions and commercial and industrial developments.

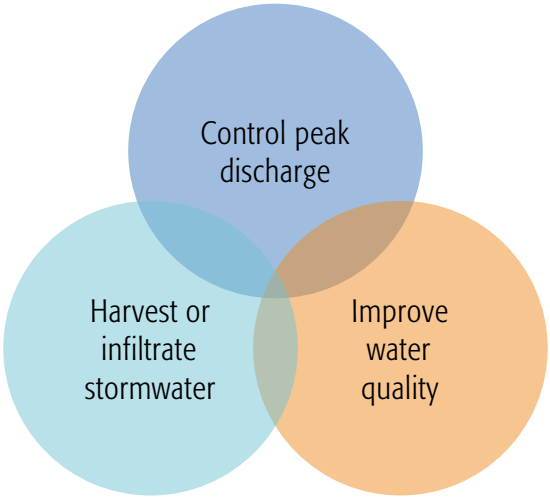
WSUD applies the following principles:

- Preserve natural systems;
- Protect downstream ecosystems;
- Control peak discharge and volumes (reducing flow rates from a site); and
- Improve water quality (reducing stormwater pollutant export).

These principles should be applied in an integrated manner with each principle being complementary to the others.

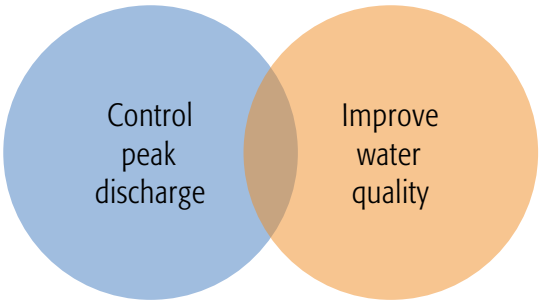
Australian Rainfall and Runoff identifies that water quality objectives can overlap with other aspects of stormwater design as shown in Figure 6 Potential Overlapping Design Objectives ARR (Coombes, Roso, & (Editors), 2019).

Figure 6 Potential Overlapping Design Objectives ARR



While some instances of infiltration and harvesting are undertaken in Tasmania, this approach is typically less common than in mainland Australia. For this reason, the approach generally used in this document is a simplified version of the Australian Rainfall and Runoff approach as shown in Figure 7 – Overlapping stormwater management design objectives (adapted from Australian Rainfall and Runoff, Philips et al, 2019)

Figure 7 Overlapping stormwater management design objectives (adapted from Australian Rainfall and Runoff, Philips et al, 2019)



Nationwide Implementation of WSUD

All Australian jurisdictions (except NSW where it is implemented by LGA's) have state policies that support the implementation of WSUD principles. State planning policies provide a framework for management of stormwater in new developments. A common approach to addressing WSUD principles is by setting water quality targets.

Summary of Australian State Water Quality Targets

Water quality targets enable the protection of environmental values and have been set for all Australian states, however each state has a different model for their setup and enforcement.

In Tasmania, water quality targets are outlined in the State Stormwater Strategy 2010, and in some local government areas are given effect when integrated into interim local planning schemes. Water Quality requirements are applied sporadically to development in Councils that have not had stormwater quality targets in their planning schemes. For additional information please refer to Table 1.

Comparison of stormwater runoff quality targets in Australian jurisdictions. (Tjandraatmadja, 2018) (Cook, Myers, Newland, Pezzanti, & Kemp, 2015) (Choi & Mcilrath, 2017) provides a comparison of WSUD targets across Australian jurisdictions, and a review of how they are implemented within the planning system in each jurisdiction as of 2020. For a thorough review of how WSUD is implemented in the planning system in other Australian jurisdictions see (Tjandraatmadja, 2018), Choi and Mcilrath (2017), and Cook *et al.* (2015).

Tasmanian water quality targets are consistent with those adopted in other Australian mainland states. Notably, Tasmania does not have an official target for gross pollutants.

Table 1 Comparison of stormwater runoff quality targets in Australian jurisdictions. (Tjandraatmadja, 2018) (Cook, Myers, Newland, Pezzanti, & Kemp, 2015) (Choi & Mcilrath, 2017)

State	Approach to pollutant load reduction targets and design objectives	Specified targets
NSW	Can be adopted under Water Quality Improvement Plans which become a relevant consideration for a consent authority under section 79C of the Environmental Planning and Assessment Act, particularly if the council has incorporated in the Development Control Plans. May be given effect in the exercise of discretion.	Varies between councils: TSS 80-85% TP 30-60% TN 30-45%
QLD	Adopted under the State Planning Policy and South East Queensland Regional Plan and given effect when integrated into relevant planning scheme. Also reliant on the following guides: Urban Stormwater Quality Planning Guidelines Queensland Urban Drainage Manual	For SEQ region: TSS 80% TP 45% TN 45% Gross Pollutants 90%
SA	Contained in the Water Sensitive Cities in SA. Generally administered as an engineering condition or as part of a local policy or a Stormwater Management Plan – may be given effect in the exercise of discretion. Policy reform	TSS 80% TP 60% TN 45% Gross Pollutants 90%
Tas	Contained in the State Stormwater Strategy. Given effect when integrated into interim Local Planning Provisions.	TSS 80% TP 45% TN 45%
Vic	Adopted under the State Environment Protection Policy (Waters) and the BPEM Guidelines and given effect under the P&E Act. Water quality targets are mandatory under clause 56.07 and 53.18 of the Victorian Planning Provisions.	TSS 80% TP 60% TN 45% Gross Pollutants 70%
WA	Adopted under Better Urban Water Management and Stormwater Manual for WA which are both non statutory guides. May be used as a policy basis for adoption into planning schemes – may be given effect in the exercise of discretion.	TSS 80% TP 60% TN 45% Gross Pollutants 70%

Link between WSUD water quality targets and environmental need

Water quality targets were set to address pollutants of concern entering receiving environments to address the environmental performance of stormwater systems and assist in protecting the environmental values and beneficial uses of ...waterways and coastal waters (Victoria Stormwater Committee, 1999).

Water quality targets were initially developed in Victoria and linked to local studies of the impacts of pollutants on Port Phillip bay. Other states followed the Victorian lead in creating pollutant targets to manage stormwater inputs into receiving environments.

Best-Practice Environmental Management (BPEM) guidelines (Victoria Stormwater Committee, 1999), which include stormwater quality targets, were developed to manage urban stormwater and are directly linked to environmental need. The BPEM guidelines form the benchmark for stormwater quality treatment targets in Australia and are summarised in Table.2 BPEM targets (CSIRO, 1999). In Victoria the BPEM are supported by the State Environment Protection Policy (SEPP), and are linked to the planning system through Clause 56.07 of the Victoria Planning Provisions (VPPs).

Prior to the 1990s, there were no performance standards for stormwater. The landmark study, the Port Phillip Bay Environmental Study (CSIRO Australia, 1996) in Melbourne, Victoria, enabled practitioners to predict the impact of catchment changes on ecological function. The key outcome from the study was the need to reduce Nitrogen inputs by 1000 tonnes a year from reaching Port Phillip Bay, half of which was to be achieved by in-catchment stormwater works. Numerous other studies on urban stormwater pollutants were done and in 1999 Hugh Duncan examined the studies and provided a statistical overview of stormwater quality data from over 500 Australian and international studies (Duncan, 1999). This furthered the work done in providing an understanding of the 'broad scale' behaviour of urban stormwater quality, and its interactions with land use and other catchment characteristics. These studies provided compelling evidence for the need for the management of stormwater pollutants through relevant performance criteria and formed part of the Best Practice Environmental Management Guidelines.

Since the introduction of BPEM standards, scientific understanding of stormwater quality has come a long way. In 2013/14, Design Flow reviewed the targets based on current science and modelling. The outcome of this analyses was a recommendation for modified BPEM water quality targets for total suspended solids (TSS) (85%), total phosphorus (TP) (50%), and total nitrogen (TN) (50%), however BPEM standards in Victoria currently remain unchanged. In *Review of Stormwater Science*, EPA Victoria (2020) reviewed recent literature which clearly demonstrated that the continued removal of TP, TN, TSS and gross pollutants from urban stormwater is necessary for the ecological protection of receiving waters. In its recommendations, the study identified a need for more evidence (review of data) that current targets sufficiently protect the health of urban waterways (Ewert, O'Halloran, Lintern, Weber, & McCarthy, Review of Stormwater Science, 2018. This report identified that *TSS, TP, TN and gross pollutants are important pollutants to remove from urban stormwater, both for protecting the health of receiving waters, and for protecting public health.* This report goes further to suggest that additional place based targets are an additional inspirational goal for stormwater management in high value waterways dependent on available local data.

Other states have also linked WSUD implementation with environmental need. In South Australia (SA), large-scale studies have provided justification for WSUD implementation and best practice performance targets, based on environmental protection (Cook *et al.*, 2015). The *Adelaide Coastal Waters study* established that suspended sediments primarily from stormwater, and elevated nutrients from wastewater are primarily responsible for the decline in ecological health in the coastal waters off Adelaide (Fox et al. 2007). To improve water quality to a level that would sustain healthy seagrass (populations), the study recommended a 75% reduction in total nitrogen (TN) and a 50% reduction in total suspended solids (TSS) loads from all land-based discharges, based on 2003 levels. Suggested strategies and measures to manage stormwater were further outlined in *Adelaide Coastal Water Quality Improvement Plan* (McDowell and Pfennig, 2013). The methodology for setting of water quality targets in SA is outlined in Myers et al. (2011). SA are currently undergoing significant planning reform which will see the inclusion of performance-based planning provisions for WSUD included in the state-wide planning and design code, further linking water quality targets to environmental need.

Other states have taken a risk-based approach, implementing WSUD in anticipation of environmental and social benefits associated with mitigating urban runoff. For further review of the 'link between WSUD targets' and environmental need, see *Pathways for Implementation of Water Sensitive Urban Design Policy in South Australia* (Cook *et al.*, 2015).

Table 2 BPEM targets (CSIRO, 1999)

Pollutant	Current best practice performance objective
Post construction phase	
Total suspended solids (TSS)	80% retention of typical urban and annual load
Total phosphorus (TP)	45% retention of typical urban and annual load
Total Nitrogen (TN)	45% retention of typical urban and annual load
Litter	70% retention of typical urban and annual load*
Flows	Maintain discharges for the 1.5 year ARI at pre-development levels
Construction phase	
Total suspended solids (TSS)	Effective treatment of 90% of daily run-off events (e.g. < 4 months ARI). Effective treatment equates to a 50%ile TSS concentration of 50 mg/L.
Litter	Prevent litter from entering the stormwater system.
Other pollutants	Limit the application, generation and migration of toxic substances to the maximum extent practicable.

*Litter is defined as anthropogenic material larger than five millimetres

Notes on future directions

The CSRIO BPEM guidelines 1999 are worthwhile but dated. As seen in Table 1 most jurisdictions currently base their water quality requirements off the BPEM guidelines. There is appetite amongst stormwater professionals nationally to update these guidelines with the Victorian Government making commitments to improve stormwater management which includes updating the BPEM guidelines (Ewert, O'Halloran, Lintern, Weber, & McCarthy, Review of stormwater science, 2018).

1.3.3 Stormwater Quantity / Conveyance

The Urban Drainage Act (UDA) provides for the management of urban drainage and public stormwater systems and infrastructure in Tasmania (Tasmanian Government, 2013). One of the objectives of The Act is 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.*

Stormwater quantity is managed by the infrastructure installed to manage the flow of stormwater through urban areas. In Tasmania flow is managed through a major / minor stormwater approach. Australian Rainfall and Runoff 2019 is the design reference for background information and design of stormwater conveyance systems.

The minor and major systems work together to transport stormwater and should be considered as one interconnected system that includes the piped network, kerb and channel, roads and overland flow paths.

Major Minor Systems

Minor drainage systems are the reticulation infrastructure designed to accommodate more frequent rainfall events having regard to convenience, safety and cost. These consist of the underground stormwater pipe network and the kerb and channel network.

Note that the design and function of the minor network is to manage nuisance and is not a flood mitigation function.

Major drainage systems are the combination of overland flow paths (including roads and watercourses) and the underground reticulation system designed to provide safe conveyance of stormwater runoff and a specific level of flood mitigation.

Major systems must be incorporated into development design to manage flood risk.

Level of service (LOS) is the expected rate of conveyance of each of the above systems. It can be specified by Council area or type of development. An example is the minor system carries the 10% AEP (1 in 10 year ARI) for residential areas, and a 2% AEP event (1 in 50 ARI) for the Central Business District and the major system is required to be designed for the 1% AEP (1 in 100 ARI). Note that this is an example only and expected levels of service will vary between Councils and may vary within individual Councils.

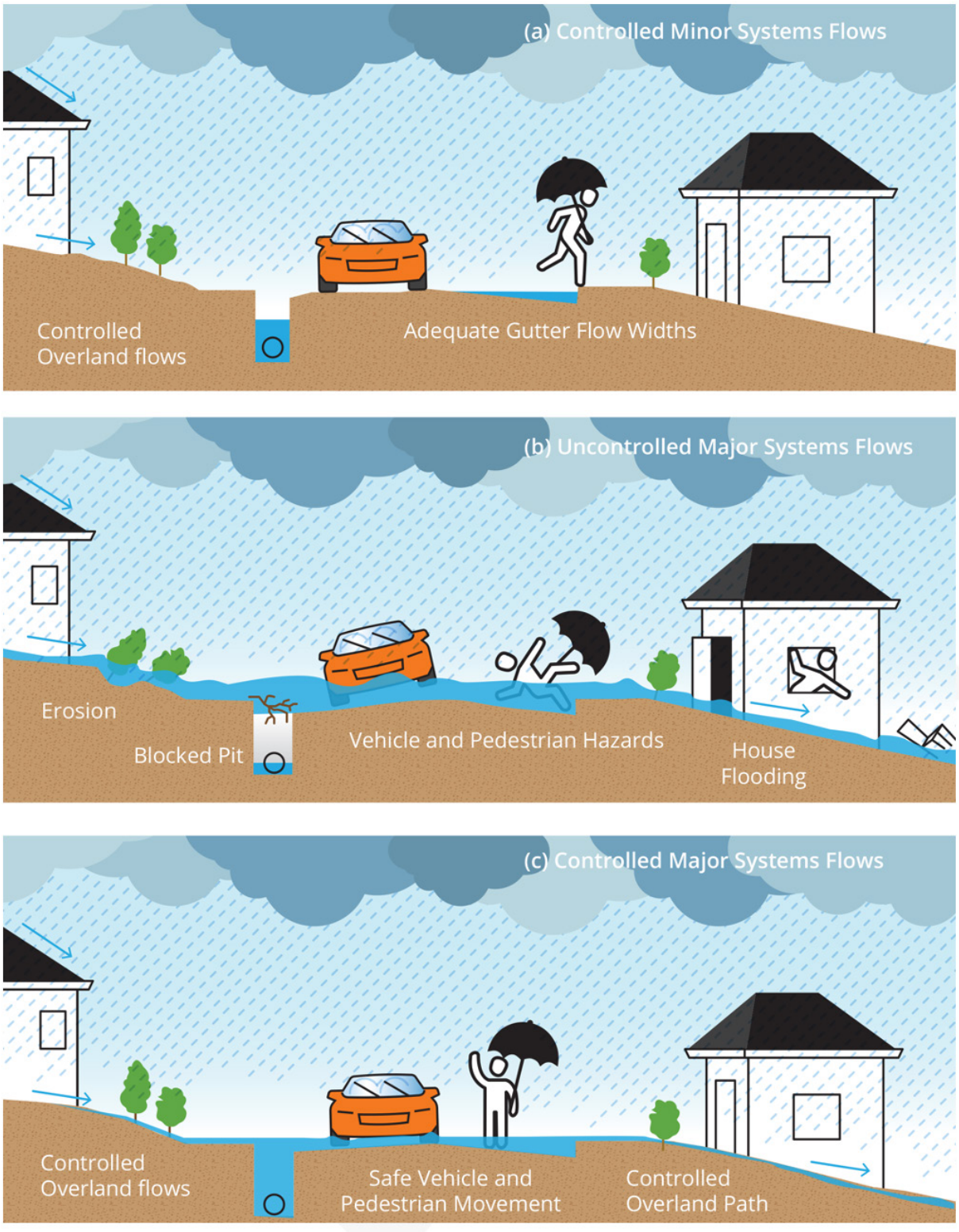
Selecting a level of service for the minor system is not based on any technical requirement, rather it is based on community expectation and a trade off between cost and efficiency. There are a number of varying levels of service for the minor system currently in place in Tasmanian ranging from a 1 in 5 year event to a 1 in 20 year event, or 1 in 50 for industrial areas or CBD's in some Councils. The risk to the community from a lower minor event level of service can be mitigated by a well designed major system.

Designs usually involve minor system capacity criteria for design of conveyance infrastructure and major system assumptions to ensure the urban area can safely cope with larger storm events as shown in the figures below from Australian Rainfall and Runoff 2019 (ARR 2019) (Coombes & Rosso, Book 9, Runoff in Urban Areas in Australian Rainfall and Runoff - A Guide to Flood Estimation, 2019).

Designing appropriate major and minor systems is essential to the effective function of the systems and to keep the people and infrastructure safe during rainfall events. The minor and major stormwater systems must interact so that the major stormwater system - often contained in overland flow paths - acts as a "safe failure" point or as redundancy for the minor stormwater system. To ensure this interaction is designed appropriately it is essential that stormwater design is prioritised during development design. Ideally roads and public land will form the major system and uncontained overland flow in private property will be minimised.

Ensuring that appropriate design of the major flow path takes place will also ensure that there is capacity to deal with increased rainfall due to climate change fluctuations in events. Drainage requirements can be found at the Tasmanian Subdivision Guidelines (Local Government Association of Tasmania, 2013), or are specified by individual Councils and application requirements are covered in section 2.5 *Development Requirements – Quantity and Conveyance.* of this document.

Figure 8 Minor and Major Concepts for Conveyance Networks image from ARR 2019 Chapter 9



Stormwater Detention

Detention can be used to manage the peak discharge condition in a catchment and/or manage the total volume of an event in a catchment.

The amount of stormwater flowing through a drainage system can be affected by the management of the volume of stormwater entering the system. In some cases it is advantageous to manage the increased volume of runoff or manage the peak flow conditions created by urban catchments. Note that there can be a difference between managing the peak discharge condition and management of the total volume of an event as management of the peak discharge aims to reduces peaks in the flow rate however does not reduce the total volume of water in the environment as the flow is released at a different rate. The objectives of detention at a specific site and from a catchment perspective is important to consider.

Detention requirements and objectives will be identified by Council stormwater managers.

Stormwater volume management can be used to manage effects on:

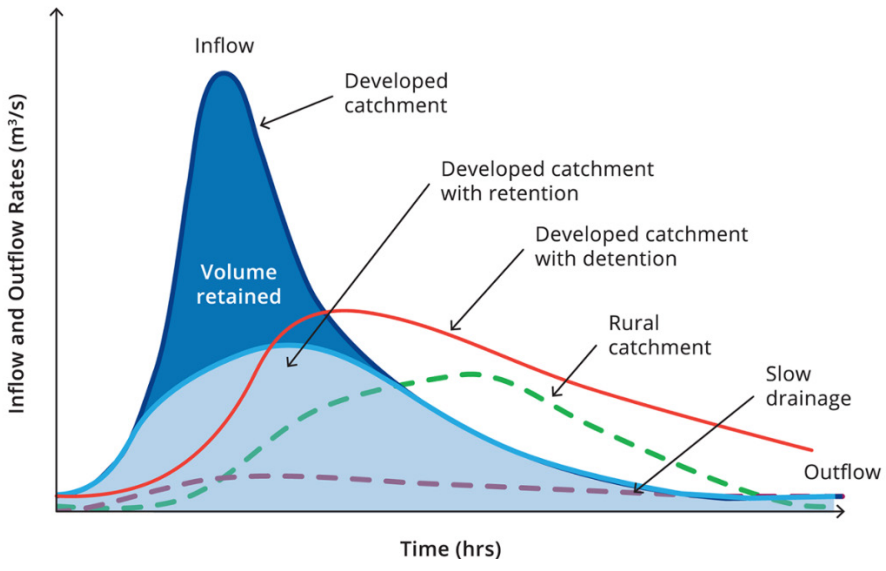
1. **Environment** – increased flow volumes and flow rates can have detrimental effects on receiving environments. Managing the flow regime to be more natural can support ecological systems.
2. **Volume reduction** – managing the amount of water entering the stormwater system can reduce localised flooding events by retaining volume on site. This is useful when storm event impacts are related to water volume in the landscape. To be effective stormwater volume management must retain water rather than distributing the flow over time. Water tanks that retain water for use on site are an example of volume management.
3. **Peak Discharge management** – in many areas new development will be plumbing into existing stormwater networks. These networks may have been established many years ago when the development framework and expectations differed to the current proposal and as such the stormwater infrastructure installed may not have the capacity to accept significantly increased flow without resulting in increased downstream risk or reduction in service levels. In these areas a limit on peak discharge rates may be required. This will be managed through a peak discharge condition that requires that stormwater off a site is limited to a set amount. An example of this is a detention system that includes a low flow outlet and continually drains at a set rate.

Volume management can take place at an at source, neighbourhood or precinct scale (Coombes & Rosso, Book 9, Runoff in Urban Areas in Australian Rainfall and Runoff - A Guide to Flood Estimation, 2019).

Stormwater detention is the tool generally used to manage stormwater volume. As detention can have multiple benefits it is useful to consider the objectives of a detention installation prior to design. Book 9 Chapter 4 - Stormwater Volume Management - of Australian Rainfall and Runoff contains considerable information on stormwater volume management.

The following diagram from ARR Book 9 Chapter 4 shows the changes to a hydrograph under the different retention conditions.

Figure 9 Developed catchment showing Retention as Compared to Detention and Slow Drainage Strategies (Figure 9.4.3 Australian Rainfall and Runoff)



1.3.4 Erosion and Sediment Control

Excess sediment can be damaging to the ecological health of waterways and reduce their environmental, social and cultural values. Mobilised coarse sandy sediment tends to accumulate in areas of slow-flow and may smother bottom-dwelling organisms and their habitats.

Large sediment accumulations can cause upstream flooding, or deflect the flow into the adjacent stream bank or even onto adjacent land, causing further erosion.

Increased fine sediment suspended in the water column (turbidity) reduces the penetration of light and therefore the ability of algae and other aquatic plants to photosynthesize and clogs the gills of fish. Fine sediment and the nutrients it transports are also associated with seasonal blue-green algal blooms. As a consequence, of excess sediment, the abundance and distribution of aquatic plants and animals change, natural food webs are disrupted and aquatic diversity declines.

Once sediment has entered a waterway it is difficult and expensive to remove, requiring engineering solutions and heavy equipment. (Government of Western Australia. Department of Water and Environmental Regulation, 2021)

Building and construction sites generate a range of pollutants. Of these sediment poses the greatest ecological and economic impacts to receiving waters. Per area and duration building and construction sites account for a disproportionate volume of sediment discharge. the building and construction industry is responsible for soil and water management throughout all phases of a development and it is a Council responsibility under EMPCA to ensure that construction sites are managed to prevent pollution through mobilisation of soil and water off construction sites.

Figure 10 Suspended sediment impacting a waterway

Sediment and erosion control should be addressed at the development stage to ensure that developers have plans in place to mitigate this pollutant risk.

1.3.5 Development Design

Siting developments and infrastructure is part of stormwater management as it ensures that infrastructure is located in a way that minimises its exposure to risk of flooding from stormwater. Designing developments so overland flow paths are managed safely through the development, roads are designed as overland flow paths, and buildings are not placed in the path of stormwater flow paths has a large impact on the efficiency of the stormwater system, on the safety of residents and the risk levels of structures. These issues are complex to address after the design phase of a project and expensive to manage after construction is complete so appropriate design and design assessment early is essential.

Siting developments and infrastructure within developments in regards to stormwater can be managed by flood zones and by overland flow paths. Some developments will be large enough to create their own overland flow paths which must be identified and managed appropriately.

Location must be considered early in the design stage and prior to development unsuitable locations must be identified by Councils or developers.

Flood zones occurring from stormwater flow may be difficult to identify as stormwater overland flow paths - particularly in urban areas - are often in minor depressions that do not contain permanent watercourses. These flow paths nonetheless can carry large volumes, depths and velocities of overland flow during significant local events. A dwelling that is flooded due to being placed in an overland flow path will experience similar property damage as a building that is flooded by a riverine flood event.

Figure 11 shows and example of when an overland flow path diverges from the underground piped network. Unless managed by it's own easement this flow path will be easy to miss during development design. Figure 12 shows a development where the overland flow path has been incorporated into open space in the development design. These images highlight the importance of early analysis of stormwater minor and major network paths and how to incorporate these into development design at the earliest stages.

Figure 11 Image showing discrepancies between stormwater pipe infrastructure and overland flow paths

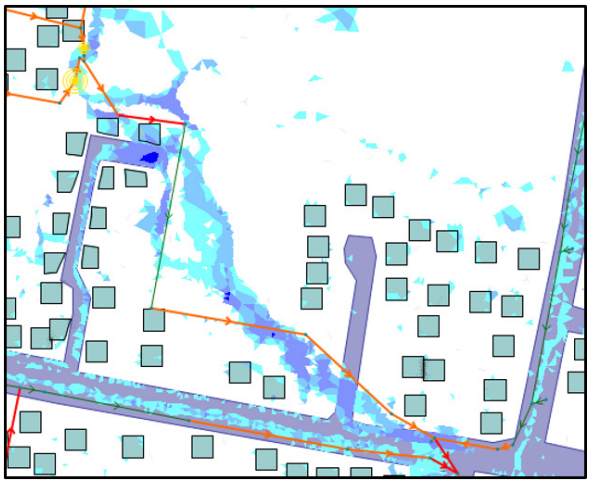
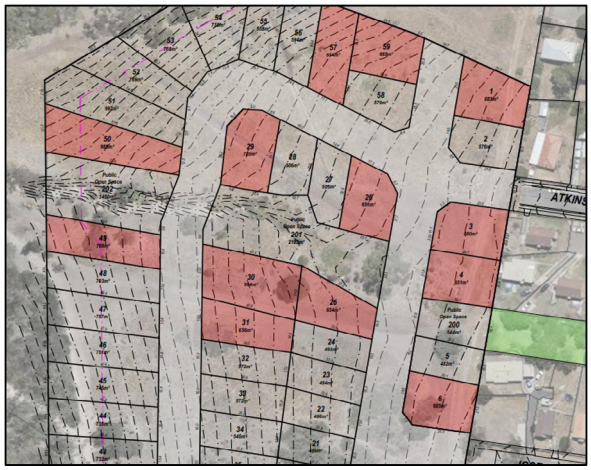


Figure 12 An example of an overland flow path incorporated in initial subdivision design



1.4 Contributions for Stormwater Infrastructure

Appropriate stormwater management, including water quality treatment and volume management, is valuable to communities, particularly in urban areas. Every development relies on a network of stormwater infrastructure to manage the stormwater runoff impacts it has on neighbouring development and to manage stormwater flows that may impact it. Effective water quality treatment benefits the whole community by improving water quality entering receiving environments and minimising the harm to waterways, estuaries and ocean environments. Minimising this environmental harm from untreated stormwater provides safe beaches and swimming areas, clean and safe freshwater and sea produce, and pleasant residential amenity and recreational areas. Managing stormwater to achieve this encompasses many different treatment options and can be applied at the level of a single lot, or throughout a catchment.

Some developments may propose not to meet stormwater management requirements on site, due to insufficient on-site stormwater management or lot size, or a combination of reasons. In these cases, the proposal's stormwater management requirements can often be more effectively or efficiently managed by network infrastructure services outside the development site. Where a development proposes not to meet stormwater requirements with on site measures, that development can be required to contribute to establishing the necessary off site network infrastructure to manage these higher stormwater impacts.

Infrastructure authorities, including councils and stormwater service providers, implement infrastructure contributions to support the delivery of the infrastructure that has been conditioned to meet policy requirements so development can proceed. They can be applied in any case where a development proposal would place higher than planned for demand on infrastructure networks to contribute to the establishment costs of the infrastructure that the development needs. However, contributions are particularly important in cases where the infrastructure demand of a development is greater than planned for or than the current capacity.

In some development scenarios, it may be more effective and/or efficient for the Stormwater Service Providers to install and maintain WSUD measures in areas *outside* the land parcel of a new development. Indeed, contributing to offsite stormwater management in network infrastructure can often enable both the maximum development potential of land and achievement of stormwater

management objectives. In these cases, the Stormwater Service Provider may provide the developer with the option of making a stormwater offset contribution in lieu of the developer providing WSUD on-site.

Infrastructure contributions are a standard and accepted part of development in most Australian states because they benefit both developers and infrastructure authorities. Infrastructure contributions enable infrastructure authorities to get on with the job of delivering infrastructure for development and enable developers to get on with the job of developing. Contribution arrangements can also provide developers with greater flexibility around how to meet their on-site water treatment obligations, and they provide Stormwater Service Providers with a funding source to assist in delivering stormwater management infrastructure to benefit development and communities.

Tasmanian councils have several legislative mechanisms to levy charges found in different Acts. Councils have broad authority under the *Local Government Act 1993* to set various rates, fees and charges. Section 205 in particular allows councils to impose charges for *"the use of any property or facility owned, controlled, managed or maintained by the council"*, as well as *"services supplied…* [and] *carrying out work at a person's request"*. Councils are also empowered under section 19(3) of the *Urban Drainage Act 2013* to *"set an appropriate fee for the cost of providing a stormwater connection point to a property"*.

There are two ways that infrastructure charges may be enacted in regards to stormwater.

The most common and efficient way to implement contributions towards infrastructure is through the development approvals process. For Tasmanian councils, this can be levied as conditions of planning permits under section 51(3A) and (4) of the *Land Use Planning and Approvals Act 1993* (LUPAA). Applying infrastructure charges as conditions of approval is subject to the principles of permit conditions set out by case law and can be challenged through appeal. These principles are a legal test of conditions, typically expressed as:

1. **Planning purpose:** the condition (or charge) must be for a planning purpose and not for an ulterior purpose, usually demonstrated by a head of power or requirement in legislation or planning instrument;
2. **Relevant:** the condition (or charge) must reasonably relate to the approved development and not simply address a general pre-existing need; and
3. **Reasonable:** the condition (or charge) must be certain and reasonable.

(See *Western Australian Planning Commission v Temwood Holdings Pty Ltd [2004] HCA 63*: http://www.austlii.edu.au/cgi-bin/viewdoc/au/cases/cth/HCA/2004/63.html).

To be robust to this legal test, charges applied as planning approval conditions should scale proportionately with the nature, scale, and intensity of the proposed development in a way that relates to a development's demand on the infrastructure network. A straightforward way to demonstrate the relationship between a development's charge and its demand on the network is to apply the objectives of the infrastructure network (e.g. stormwater quality or flow objectives) to the development through development requirements (e.g. stormwater requirements in a planning scheme), then apply a charge for cases where the requirements are not met by a proposed development.

A more advanced way to demonstrate the infrastructure charge-demand relationship is to develop a infrastructure network plan. Such a plan projects the establishment cost of all the new and upgraded network infrastructure required to service all of the development projected for the service area and apportions that cost equitably across all the projected development to be serviced by the infrastructure planned. Although a complex piece of work, such planning can facilitate a more fluid and adaptive charging system, featuring more generalised charges and better revenue flow to support timely delivery of infrastructure. This allows all forms of development to contribute to the network infrastructure that they will benefit from and improves equitability in charging.

PART 2

Stormwater Management in Development

2.1 Purpose of Stormwater Management Section

This section of the document is used by Councils, Stormwater Service Providers, Developers and Consultants to define stormwater management requirements in accordance with the legislation and requirements outlined in Section 1. This section can be read as a stand alone section.

The intent of this section is that it is used by Councils and developers to clearly define the requirements and expectations of stormwater management and how it is implemented in regards to stormwater quality, stormwater conveyance, quantity and development design.

It includes what should be done at the planning stage to ensure good design and development by third parties and provides guidance on how to implement it in design.

It covers the following areas:

1. Background summary of why to apply stormwater conditions to new developments
2. How Councils can implement stormwater requirements
3. What Stormwater requirements are required
4. What inputs are required from developers to meet these requirements
5. Offset Contributions

Compliance with Industry Standards

This document is intended to provide advice and guidance for stormwater design and management in new developments in Tasmania. It does not replace best practice manuals such as Australian Rainfall and Runoff, and Australian Runoff Quality. Stormwater design in new developments is to be in accordance with the current versions of the industry standard documents Australian Rainfall and Runoff, and Australian Runoff Quality and any other Tasmanian industry standard document.

2.2 Why to apply Stormwater Conditions at the Planning Stage of New Developments

New development creates stormwater infrastructure, impacts overland flow paths and introduces new stormwater runoff into the environment. It is part of the role of Local Government to ensure that the stormwater impacts associated with new developments are managed in a way that **protect and enhances water quality while allowing for sustainable development and managing risk (LUPAA)**. Designing development appropriately for stormwater management is key to obtaining these outcomes. There are three key aspects to stormwater management in urban areas that are addressed by this document. These are:

Quantity and Conveyance – stormwater quantity and conveyance refers to the amount of stormwater generated by, or running through a development. It is managed by the minor (pits and pipes) network and by the major (overland flow path) network.

Quality – stormwater quality refers to the quality of the runoff from a development and whether pollutants generated by the development will impact the ecological function of receiving waters.

Development Design – the design of developments refers to how a developments location and layout, and levels will impact on the risk to the new development and assess if the development increases the risk in other locations from stormwater or flood impacts.

Each of these elements is important to consider at the early planning stages of development as appropriately managing these aspects requires considered development design. Considering stormwater at the start of development design can save money and time for developers and Councils by identifying:

- Overland flow paths for the major flow events that may impact on proposed road or building locations and minimum floor levels (if applicable) for buildings adjacent to those flow paths.
- Minor network pipe levels and grades to ensure that stormwater removal from site is achievable
- Space and grade requirements for stormwater quality treatment are achievable
- Impact of the development on the downstream stormwater network and if detention is required on site

Each of these areas are straightforward to incorporate or consider at the earliest design stage of development but each can be extremely difficult to retrofit into an existing design and often results in sub-optimal outcomes if this approach is taken.

Requiring that these issues be carefully considered at the earliest design phase ensures that ongoing risks to the public, to property and to the environment are addressed and managed and Council responsibilities are met.

The State Policy on Water Quality specifically advises that stormwater quality, erosion and stormwater controls:

> ***are specifically addressed at the design phase of proposals for new developments****, and ensure that best practice environmental management is implemented at development sites in accordance with clause 31 of this Policy. (Section 33.1) .*

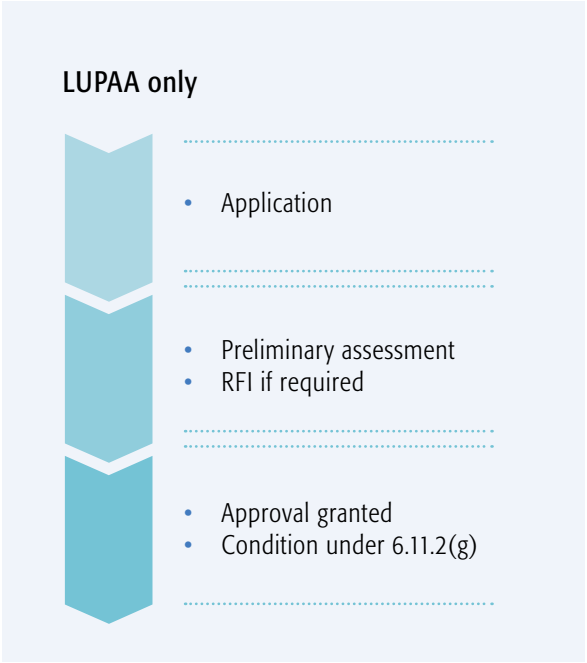
This highlights the significance of addressing these issues at the design stage to ensure best outcomes. Stormwater management is considerably more difficult to address at the end stages of a design and the cost of retrofitting stormwater management if required post construction is excessive.

2.3 How to Implement Stormwater requirements

Councils must ensure that stormwater is managed appropriately at the design stage and ensure that certain requirements are met to manage the stormwater risk to the community and environment. It is essential that Councils are able to assess that stormwater has been appropriately incorporated into development design at the design stage of development. If this is not assessed early it may result in significant cost to developers to have a development redesigned to manage the risk appropriately.

There are two regulatory instruments under which stormwater requirements on development may be implemented, these are the **Tasmanian Planning Scheme (TPS) and the Urban Drainage Act (UDA)**. The instruments may be used individually, separately or in tandem and have similar but slightly differing powers to condition, request further information and refuse applications.

Councils can choose how they are going to implement managing stormwater for development, but it is recommended that Councils have considered their approach and adopted their chosen approach into a Council policy. Under the TPS, UDA or TPS and UDA approach this guidance document can be called in to provide a transparent and standard set of information and conditions to support the Council or Stormwater Service provider. Some options for how stormwater management may look are outlined below, further advice on implementation will be found in the TSPG Supporting Resources.



LUPAA only

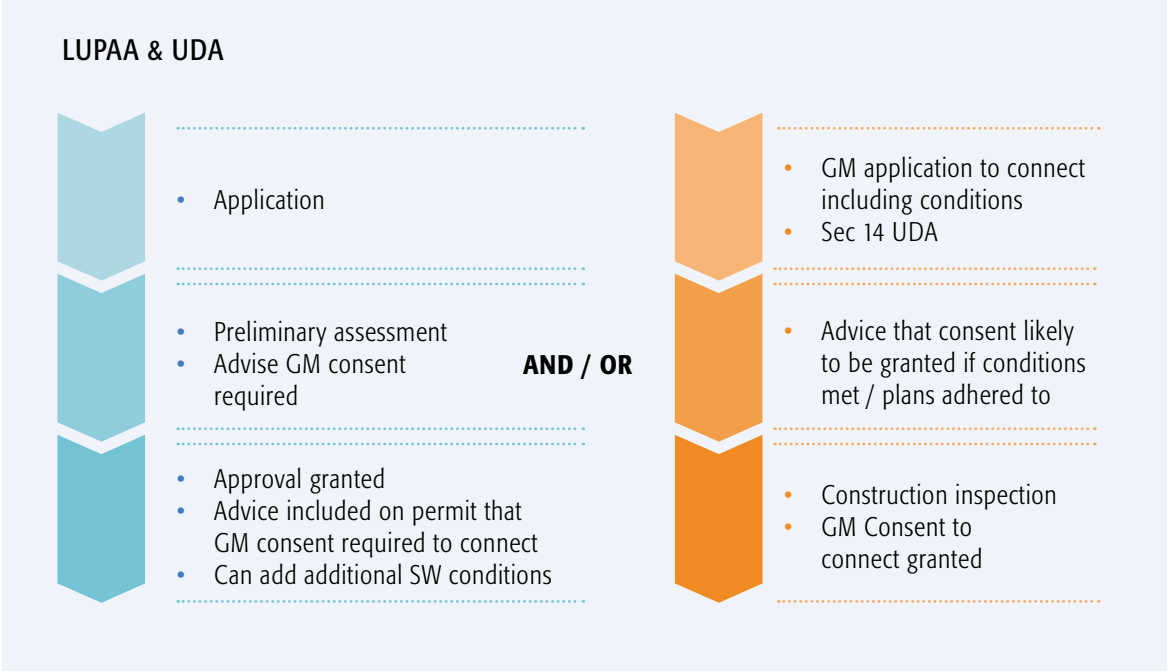
- Utilising the TPS only to assess and condition for SW requirements.

PRO's

- Can clearly condition under 6.11.2 (g)
- Can likely RFI as without this ability scope of the conditioning may not be known.
- Known process already embedded within Councils
- Can be applied to non urban areas.

CON's

- Cannot be applied to exempt or no permit required development
- Ability to RFI may be challenged
- Cannot refuse based on SW.



LUPAA AND THE UDA

- Utilising the TPS and the UDA in parallel to condition for SW requirements.

PRO's

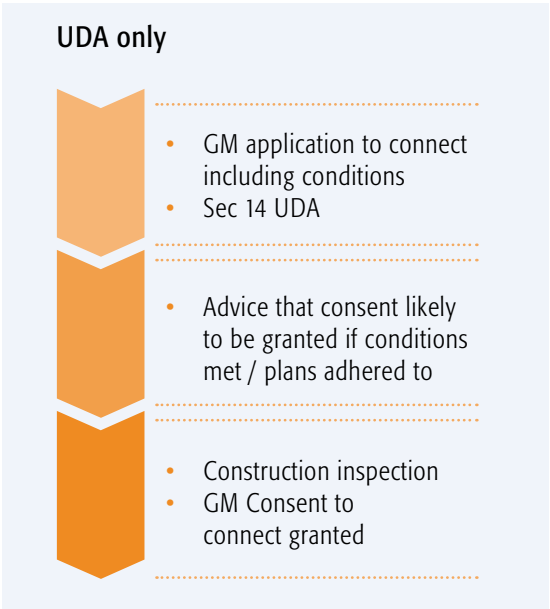
- Difficult for developers to challenge
- Can include conditions
- Can withhold connection if conditions not met
- Includes an enforcement mechanism (UDA section 14.2) as well as withholding consent to connect
- Can condition to contribute
- Utilising the UDA does not remove Councils ability to condition under LUPAA nor vice versa
- Developers are notified of the requirement to get GM consent through a familiar process (the DA)

CON's

- New process to embed within Councils
- UDA cannot be applied to non-urban areas
- More difficult to enforce that the TPS

NOTES

- The UDA exists as a parallel process whether Councils engage with it or not. It is a powerful tool for managing stormwater.



UDA ONLY

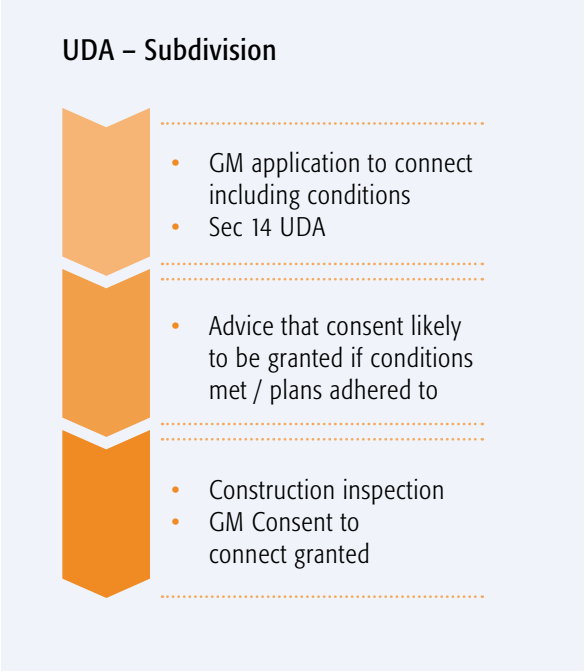
- Utilising the UDA only to assess and condition for SW requirements under Sec 14.

PRO's

- As for LUPAA and UDA (above)
- Will pick up developments not covered by the TPS – exempt and no permit required development.

CON's

- New process to embed within Councils
- Will need a process to pick up exempt and no permit required developments
- UDA cannot be applied to non-urban areas
- More difficult to enforce that the TPS



UDA – Subdivision

- Utilising the UDA Section 11 to condition subdivisions.
- Council and the developer enter into an agreement on the works to be carried out for Council to vest the works at a future date.

OVERVIEW

- Tool for managing subdivision specifically.
- Allows Council to have a standard agreement with standard requirements.
- Advice will be provided in TPSG Supporting Documents.
- If works are not carried out in accordance with the agreement Council can refuse to adopt the works.
- Disincentive to ignore for developers – question under 337 certificate process.

2.3.1 Stormwater and the TPS under LUPAA

The Tasmanian Planning Scheme (TPS) is the instrument by which new development is approved for construction. The purpose of the Tasmanian Planning Scheme is to further the objectives set out under LUPAA and RMPS (The Resource Management and Planning System). The objectives are achieved by providing consistent state-wide planning controls, whilst staying consistent with state policies (e.g. SPWQM).

The TPS is the instrument allowing Planning Authorities to engage with property developers at the planning stage of developments. It allows Councils to place requirements on developments and assess the proposed infrastructure.

To summarise this section:

- Councils can apply stormwater conditions under LUPAA and the TPS
- Councils should be able to request further information (RFI) regarding stormwater
- Councils cannot apply conditions to exempt or no permit required development.
- Councils cannot outright refuse an application based on stormwater under the TPS
- The imposition of a levy or infrastructure contribution by way of a condition on a permit, if properly drafted, can validly be imposed.

Conditioning Under LUPAA and the State Planning Provisions

Clause 6.11.2 under provision 6 of the State Planning Provisions (SPP's) provides a broad head of power for Councils to apply conditions and restrictions on a permit with regard to "***erosion, and stormwater volume and quality controls***".

The ability to include suitable stormwater conditions as part of a planning permit results in the TPS being a key instrument for managing stormwater quality and quantity, as specified by the SPWQM.

> *Provision 6 – Assessment of an Application for Use or Development clause 6.11.2 of the TPS;*
>
> *6.11.2*
>
> *Conditions and restrictions imposed by the planning authority on a permit may include:*
>
> .....
>
> *(g) erosion, and stormwater volume and quality controls.*

Stormwater conditions may be included under this clause in an approved development application **for discretionary and permitted permits**. This

clause cannot be called in to 'exempt' or 'no permit required' development under the TPS.

Note that conditioning under this clause must be used if stormwater conditions are required on a development outside of a residential area. The UDA does not cover non-urban areas so conditioning under LUPAA through the TPS is the only option in these areas.

Conditioning under this clause must fulfill the three planning requirements for a condition:

a) *be for a planning purpose and not any ulterior purpose.* As 6.11.2(g) exists in the scheme conditioning under it is therefore for a proper planning purpose.

b) *One that fairly relates to the development permitted.* This document outlines the policy positions, background and reasons for applying stormwater conditions to development. "identifying the adverse impact which could flow if a condition is not imposed can be as simple as identifying the central problem which the condition is seeking to address. In terms of stormwater quality and volume constraints, this can be the protection of environmental values through quality controls and the protection of public infrastructure and flooding that has the potential to occur if volume and flow of stormwater is not controlled as it enters the public system." (Street, 2021)

c) *Not so unreasonable that no reasonable Planning Authority could have imposed it.* The requirements and advice contained in this document are used in practice in different regions of Australia. There are no requirements contained in this work that are outside of *what a reasonable planning authority could impose.*

Conditioning for Stormwater Quality

Stormwater quality management is addressed under Provision 6 – Assessment of an Application for Use or Development clause 6.11.2 of the TPS;

> *Conditions and restrictions imposed by the planning authority on a permit may include:*
>
> .....
>
> *(g) erosion, and stormwater volume and quality controls.*

To address the requirements of the policies and legislation set out in Part 1 of this document, specifically;

sustainable development means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while –

a) sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations; and

b) safeguarding the life-supporting capacity of air, water, soil and ecosystems; and

c) avoiding, remedying or mitigating any adverse effects of activities on the environment

Councils can use this section of the TPS to apply conditions on development to ensure the stormwater quality from a development does not impact on the sustainability of receiving environments. Section 1.2.4 Tasmanian Planning Scheme of this document outlines the importance of stormwater quality, its impact on receiving environments, and its widespread adoption throughout Australia.

Requesting Further Information

The TPS includes Clause 6.1.3 (b) which allows Council's to request further information (RFI) regarding the following items relating to stormwater management:

- topography including contours showing AHD levels and major site features;
- natural drainage lines, watercourses and wetlands on or adjacent to the site;
- the location and capacity and connection point of any existing services and proposed services;
- the location of easements on the site or connected to the site; and
- any natural hazards that may affect use or development on the site.

However it is considered reasonable to request further information pertaining to stormwater outside of these limitations under section 54(1) of LUPAA *in good faith as it is arguable that for a Planning Authority to determine the extent and specifics of a condition regarding quality and volume of stormwater, the Planning Authority may request further information in respect of the quality and volume of stormwater that the development and dispose of, and how it proposes to do so, because if it does not have this information, the extent and need of the use of the conditioning power would be unknown.* (Street, 2021)

Refusal

Council cannot refuse an application based on stormwater under the TPS, only condition. However, legal advice around this states that:

*"this is not to say that the imposition of conditions on a planning permit, **where such conditions are lawfully imposed**, could not have the effect that the development that is proposed becomes unviable and prohibitively expensive or practically impossible*

if conditions informed by the policy were imposed in respect of stormwater quality and volume."

One interpretation of this is that if a reasonable condition is imposed based on an outcome (i.e meeting quality standards) then the Council is not imposing requirements on how to meet that condition and the developer themselves may decide to address the conditions within the current proposal – which may be difficult or expensive – or the developer may decide to resubmit a different proposal which makes meeting the conditions more achievable.

Other Codes

The TPS also includes the following codes which relate to stormwater management:

- C 12.0 Flood-Prone Areas Hazard code – including an overlay map in the relevant Local Provisions Schedule. The intention of this Code is to manage the risk to development on flood prone land, and the objectives are set around the concept of 'tolerable risk'. This section of the code provides stormwater managers the ability to require that development address the location aspect of stormwater design by ensuring that new development does not increase the risk of flooding to the community by either exacerbating downstream flooding or by placing future development at risk of flooding.
- C 7.0 Natural Assets code - including an overlay for waterway and coastal protection areas. The intention of this Code is to "minimise impacts on water quality, natural assets including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes". The code applies to development of land immediately adjacent to a watercourse or wetland and does not consider the impacts on water quality or of increased water volumes from development upstream and/or spatially removed from the immediate waterway.

2.3.2 Stormwater and the Urban Drainage Act

The Urban Drainage Act (UDA) is the Act covering the roles and responsibilities in relation to stormwater in urban areas. It provides an alternate (albeit untested) option for requiring stormwater standards of development.

In summary:

- The UDA is a powerful tool for managing stormwater
- Councils can require any development obtains GM consent under section 14 prior to connecting into the network
- GM consent can be conditional
- Council can withhold consent to connect if conditions are not met
- Challenging of conditions would be through judicial review before the Supreme Court of Tasmania
- Section 14(2) Contains an enforcement clause
- Councils can require, under section 11, that developers of subdivision can enter into an agreement regarding stormwater works and takeover the infrastructure only if the construction is in accordance with the agreement.
- UDA does not apply to non-urban areas.
- Infrastructure contributions could be imposed as a condition of consent.

The Urban Drainage Act

The objects of the UDA are to

> *4(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 .*

The UDA requires that

> *5(1) A council must, in accordance with the objects of this Act, provide for such public stormwater systems as may be necessary to effectively drain the urban area of the council's municipal area.*

Section 11 of the UDA deals with the adoption by Council of stormwater systems to be part of the public stormwater system. It states:

> *11. Power of council to adopt stormwater systems*
>
> *(1) A general manager may agree with a person who has private stormwater systems, or is constructing or proposing to construct private stormwater systems or associated works, that if those works are constructed in accordance with the terms of the agreement, the council will, upon the completion of the work, or at some specified date, or on the happening of some future event, declare the works to be vested in the council.*

Section 14 of the UDA refers to *Interference with Public stormwater systems*. It requires that:

> *14. Interference with public stormwater systems*
>
> *(1) A person must not, without a general manager's consent, cause or permit –*

(a) any works to be connected to a public stormwater system; or

(b) the alteration or removal of, or interference with, a public stormwater system.

Adding stormwater into a Council stormwater system can be considered interference with the system under the UDA and any development that interferes with the system requires General Managers (GM's) consent to connect. In some Councils GM's consent may be implied in planning consent. If however a Council creates a policy that specifies that GM's consent is not implied then it must be explicitly given to a developer prior to connection into the network. In this case any development that requires connection must gain general manager's consent to connect. The general manager may require conditions be applied to ensure the stormwater and stormwater system connection is of a satisfactory standard to approve connection.

This will require a general managers consent process separated from the TPS (ideally a parallel system). Consent will have to be provided prior to connection. In this case it is in the developers and Councils best interest that stormwater requirements and conditions are provided at the start of the design process and stormwater design is approved to ensure that it will meet the general managers requirements parallel to development approval.

If this avenue is pursued by Council advice should be included on a development permit that the permit itself does not address stormwater requirements and that these will be addressed by the general managers consent.

Section 14 and requiring General Managers (GM) consent to connect

Section 14 is a very important tool that is available to Councils. It provides General Managers with an unfettered discretion to grant consent to cause or permit "any works to be connected to a public stormwater system" or the "alteration or removal of, or interference with, a public stormwater system."

General Managers consent can be conditional and can be withheld if preconditions are not met. These abilities provide a solid foundation through which development can be influenced, regulated and controlled in respect to stormwater management. A person exercising an unfettered discretionary power may impose conditions on those affected by the exercise of power as long as the conditions are not inconsistent with the purpose of which the power is granted.

By imposing conditions that impose controls in respect of stormwater quality and volume on a consent to connect to the public stormwater system, the General manager would be exercising the statutory power in a way that seeks to provide for the *safe, environmentally responsible, efficient and sustainable* disposal of stormwater consistent with the object of the UDA under section 4.

Under this ability to impose conditions Councils can define and set standards for stormwater volume and quality that is discharged into the public stormwater system.

This policy guidance can be used to inform and be the basis upon which the conditions of consent, or equally as the basis for refusal of consent for a connection.

Developers would need to challenge conditions through the judicial review before the Supreme Court of Tasmania.

Conditions can be imposed upon new lots and connections, and upon already developed lots if it will impact on or upgrade the internal private system and that system will connect to the public stormwater system.

Section 14(2) provides and enforcement mechanism in circumstances where a person breaches section 14(1) of the UDA. It provides a GM with the ability to serve a written notice requiring the person to remove a connection, rectify any damage or desist from discharging any material into the public system within 28 days or any longer period the GM allows. This mechanism can also be used where there is a failure to comply with any conditions imposed on granting of consent.

Infrastructure contributions may be imposed as a condition of consent or as a preconditioning of consent if not used as an unreasonable exercise of discretionary power.

In order to determine whether a connection should be permitted, the GM is entitled to require the provision of further information to determine whether a connection should be allowed. The GM is entitled to withhold consent until the information they deem necessary has been provided.

Subdivisions under Section 11

The effect of section 11 in a subdivision context, is that if a developer is proposing to construct a stormwater system as part of the subdivision to service the lots it creates, the GM of the Council may enter into an agreement with that person such that if the works are constructed in accordance with the terms of the agreement, the Council will, upon completion of the works or some other event, declare the works to be vested in Council. Effectively, if a developer does not enter into an agreement with Council it will not vest the works and the stormwater will remain a private system.

Much like a Part V agreement Council cannot be forced to enter into the agreement and the

developer must negotiate with Council the terms and conditions of that agreement.

It is recommended that a Council policy utilising this section include a prescription that Council will only adopt or allow a system to vest in it if an agreement under section 11 of the UDA is entered into.

This document (the TSPG) and supporting resources provide guidance around conditions that may be required for these agreements.

2.4 Development Requirements – Quality

Stormwater quality requirements are addressed at the development stage to identify what level of stormwater quality management is required, if stormwater quality requirements can be met on site and if the development can appropriately incorporate those requirements. Quality targets ensure the ongoing impacts of development on stormwater quality and associated impacts on receiving waters are addressed.

2.4.1 Stormwater Quality Targets

This document sets a base level of stormwater quality management targets that have been accepted throughout Australia. This document outlines the standard stormwater quality targets, entry level targets and addresses site specific level targets.

Standard stormwater quality targets are recommended for new developments state-wide. These stormwater targets are consistent with State Stormwater Strategy 2010, as well as being in broad alignment with other states and jurisdictions, as discussed in 1.3.2 Stormwater Quality Control.

Minimum stormwater targets are not considered best practice, nor are they in accordance with the State Stormwater Strategy 2010. These have been included as an entry level to target for Stormwater Service Providers to adopt as an interim measure whilst local capacity is developed.

Table 3 Water Quality Treatement Targets

Target Level	Water Quality Treatment Target
1. Site Specific Stormwater Treatment Requirements	Site specific requirements at discretion of the Stormwater Service Provider (for example sites with, or draining to, areas with environmental values, potentially contaminating activities etc).
2. Standard Stormwater Treatment Requirements	90% reduction in the average annual load of litter/gross pollutants based on typical urban stormwater concentrations; AND 80% reduction in the average annual load of total suspended solids (TSS) based on typical urban stormwater TSS concentrations; AND 45% reduction in the average annual load of total phosphorus (TP) based on typical urban stormwater TP concentrations; AND 45% reduction in the average annual load of total nitrogen (TN) based on typical urban stormwater TN concentrations
3. Minimum Stormwater Treatment Requirements	90% reduction in the average annual load of litter/gross pollutants 80% reduction in the average annual load of total suspended solids (TSS)

a) Stormwater quality treatment may be offset via a cash contribution at the discretion of Council.

b) If a staged development occurs within a 5-year period, treatment will be required for the total development prior to proceeding with more than 50% of the total development.

c) For staged developments, the developer shall maintain all the WSUD treatment train elements until the completion and sealing of the survey diagram for the final stage of the subdivision. Prior to Council taking over all the WSUD treatment train elements, the developer is required to demonstrate to Council by providing evidence or documentation, to the satisfaction of Council's Development Engineer, that all the WSUD treatment train elements are in a working condition as designed.

d) Design of the water quality treatment system must consider the fully developed site.

Note: Target Level 3. Minimum Stormwater Treatment Targets may be adopted by Council areas where Councils are not mature enough in their systems and asset management to support the adoption of the standard quality targets.

Target Level 1 will apply where the receiving environment has been identified as being at greater risk than standard areas or differing in a way that has been identified by the manager of the receiving environment. Site specific conditions may be placed upon developments impacting those areas. Some examples of these may be;

- Sites discharging to areas of greater environmental value,
- Sites on which potentially contaminating industries occur,[1]
- New service stations
- Sites on which chemical storage occurs which requires new bunding and spill management[2]
- Long-term industrial vehicle storage; or
- Sites on which sediment, fertiliser, gravel, soil or mulch is stockpiled for commercial storage, except if in the Rural Living Zone, Rural Zone, Agricultural Zone, or Landscape Conservation Zone.

Target Level 2 requirements are the standard stormwater quality targets that are considered nationally as the base level targets required to achieve environmental outcomes.

Target level 3 will be adopted by Councils where there is no history of stormwater quality management and the Council is not mature enough in their systems and asset management to support the adoption of the standard quality targets. In this case the minimum targets will provide some environmental protection however the standard targets are the best placed to meet Councils responsibilities under State legislation and policy so Councils should have these as aspirational targets. Council may adopt the Target Level 3 minimum interim targets to ensure that the most pressing environmental issues are addressed.

1 'Potentially contaminating activities, industries and land uses' are listed by the Tasmanian EPA at: http://epa.tas.gov.au/regulation/potentially-contaminating-activities

2 Tasmanian EPA 'Bunding and Spill Management Guidelines', Note: Section 4. describes assessment considerations for bunding at: http://epa.tas.gov.au/documents/bunding_and_spill_management_guidelines_dec_2015.pdf

Notes on Hydrocarbons and Oils

Hydrocarbons are runoff generally created by fuel sources such as car fuels. It is estimated that urban and industrial uses account for 30% of oils and petroleum hydrocarbons entering the marine environment annually.

Oil is less dense than water and is biodegradable. As it floats on the surface of water, a major effect of oil on the environment results from shoreline smothering, unless it is first physically or chemically dispersed. In confined environments (e.g. small freshwater streams or lakes) biodegradation will result in reduction in dissolved oxygen while there can be a localised build-up of toxic fractions (Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 2000).

Runoff from developments such as roads, carparks, service stations, industrial developments etc can collect hydrocarbons and discharge these pollutants into the stormwater network.

Model for Urban Stormwater Improvement Conceptualisation (MUSIC) does not currently consider hydrocarbon removal, therefore specifying a target for hydrocarbon treatment or demonstrating compliance is difficult.

A practical specification may be that runoff from developments must be 'visually free' of hydrocarbons. As hydrocarbons are visible at very low concentrations this is considered a possible approach.

There are several propriety devices which have been designed to remove hydrocarbons from stormwater. Stormwater Service Providers may require particular developments include a proprietary hydrocarbon removal system as part of Target Level 1 treatment (see Table 3 Water Quality Treatment Targets).

Stormwater Australia are currently undertaking a process of independently reviewing proprietary devices to assess their performance. This is known as the Stormwater Quality Improvement Device Evaluation Process (SQIDEP). As the list of reviewed devices increases, this may help Stormwater Service Providers select and approve suitable proprietary devices. Visit the Stormwater Australia website for more details https://www.stormwater.asn.au/sqidep/about-sqidep.

Future revisions of stormwater standards for Tasmania should consider including hydrocarbon treatment levels.

https://www.waterquality.gov.au/anz-guidelines/guideline-values/default/water-quality-toxicants/toxicants/oils-petroleum-hydrocarbons-2000

2.4.2 Applying Quality Targets to Development

Stormwater quality target requirements can be applied under clause 6.11.2 (g) of the Tasmanian Planning Scheme or under the Urban Drainage Act section 14 and in accordance with the Objects of the Act (section 4).

> *6.11.2*
>
> *Conditions and restrictions imposed by the planning authority on a permit may include:*
>
> .....
>
> *(g) erosion, and stormwater volume and quality controls.*

Stormwater quality targets are to be selected by Councils and may be applied in line with following:

Table 4 Stormwater Quality Treatment Application

Stormwater Quality Treatment Requirements		
Exempt development: i) A single dwelling on a single lot that will be connected to the existing public stormwater system; ii) Development creating new impervious area less than 500m^2; iii) A subdivision creating new lots greater than 5000m^2 in area, and with new roads and footpaths less than 500m^2 in area; iv) Subdivisions which are solely for the purpose of creating road reserve, public open space, public infrastructure, littoral or riparian reserve or minor boundary adjustments. Note – if a staged development occurs within a 5-year period, treatment requirements will be assessed on the size of the total final development and will be required for the total final development		
C1. Stormwater from the developed site must meet the Stormwater Treatment Target set by the Stormwater Service Provider (Refer to Table 3 Water Quality Treatment Targets). AND / OR C2. Stormwater quality treatment may be offset via a cost contribution.	C1 Conditions/standards: 1. Proposed treatment is designed by a Suitably Qualified Person, and is suitable for the site, AND 2. Ongoing maintenance burden (including site access) is acceptable to the Stormwater Service Provider. OR C2 Conditions/standards: 1. C2 must be approved by the Stormwater Service provider, AND 2. Cost contribution received must be in line with the Developer Contribution Scheme adopted by the Stormwater Service Provider for stormwater treatment.	C1 or C2 option available at discretion of the Stormwater Service Provider

Small Development – Less than 2500m^2 for Residential, less than 5000m^2 for Non-Residential

Designers of stormwater systems for small developments may use the guidelines and tools listed below to meet design requirements, or adhere to the requirements for Large Developments:

- The design of the water quality treatment system must consider the fully developed site.
- Water Sensitive Urban Design: Engineering procedures for stormwater management in Tasmania 2012 provides a range of simple design options for water quality systems in smaller developments and can be accessed online: https://epa.tas.gov.au/epa/water/stormwater/water-sensitive-urban-design;
- An online stormwater quality calculator may be used to test the efficacy of stormwater treatment systems in small developments

Alternatively, at the discretion of the Stormwater Service Provider, designers of stormwater systems for Small Developments may be given the option of providing a voluntary stormwater offset contribution in lieu of or in combination with the on-site provision of a water quality treatment system.

Large Development – Greater than 2500m^2 for Residential, Greater than 5000m^2 for Non-Residential

The design of a water quality treatment system for a large development must:

- Consider the fully developed site;
- Be in accordance with the requirements of ARR (Engineers Australia, 2019), Australian Runoff Quality (Engineers Australia, 2006) and this document; and
- Be carried out by a Suitably Qualified Person.

A MUSIC model or report by a suitably qualified professional is required for developments in this category to simulate the proposed stormwater quality treatment train in order to demonstrate compliance target requirements.

Rainfall information is to be used from the closest available rainfall station, or as otherwise specified by the Stormwater Service Provider. Default values for the treatment systems are to be used unless supporting information is provided to justify amendment of the default values.

Alternatively, at the discretion of the Stormwater Service Provider, designers of stormwater systems for Large Developments may be given the option of providing a voluntary stormwater offset contribution in lieu of, or in combination with, the on-site provision of a water quality treatment system.

Water Quality Design Requirements for Development Approval

The following requirements must be submitted with a design application for any development required to meet stormwater quality treatment requirements.

Table 5 Stormwater Quality Requirements for Development Application Submissions

Stormwater Quality Requirements for Development Application Submission
• Indication of design approach taken to fulfill water quality targets. • Proposed location of infrastructure and easements • Design details indicating available fall through proposed system and into outlet. • STORM UPDATED report or MUSIC model or other work demonstrating that proposal will meet quality targets. • Details of bypass system • Details of maintenance requirements

2.4.3 Voluntary Stormwater Quality Offset Contributions

There may be cases where the above requirements for stormwater quality or volume management are more effectively met, or partially met, outside the proposed development land parcel. If the stormwater service provider believes this to be the case a developer contribution option may be implemented to ensure that the impacts on the community and environment from the development can still be mitigated whilst allowing development to proceed.

Appropriate stormwater management, including water quality treatment and volume management, is valuable in urban areas. Effective water quality treatment benefits the whole community by improving water quality entering receiving environments and minimising the harm to waterways, estuaries and ocean environments. WSUD encompasses many different treatment options and can be applied at the level of a single lot, or throughout a catchment.

In some development scenarios, it may be more effective and/or efficient for the Stormwater Service Providers to install and maintain WSUD measures in areas outside the land parcel of a new development. In these cases, the Stormwater Service Provider may provide the developer with the option of making a stormwater offset contribution in lieu of the developer providing WSUD on-site.

Stormwater offset contributions are beneficial for both the developers and Stormwater Service Providers. They provide developers with greater flexibility around on-site water treatment obligations, and they provide Stormwater Service Providers with a funding source to assist in delivering stormwater management infrastructure to benefit communities.

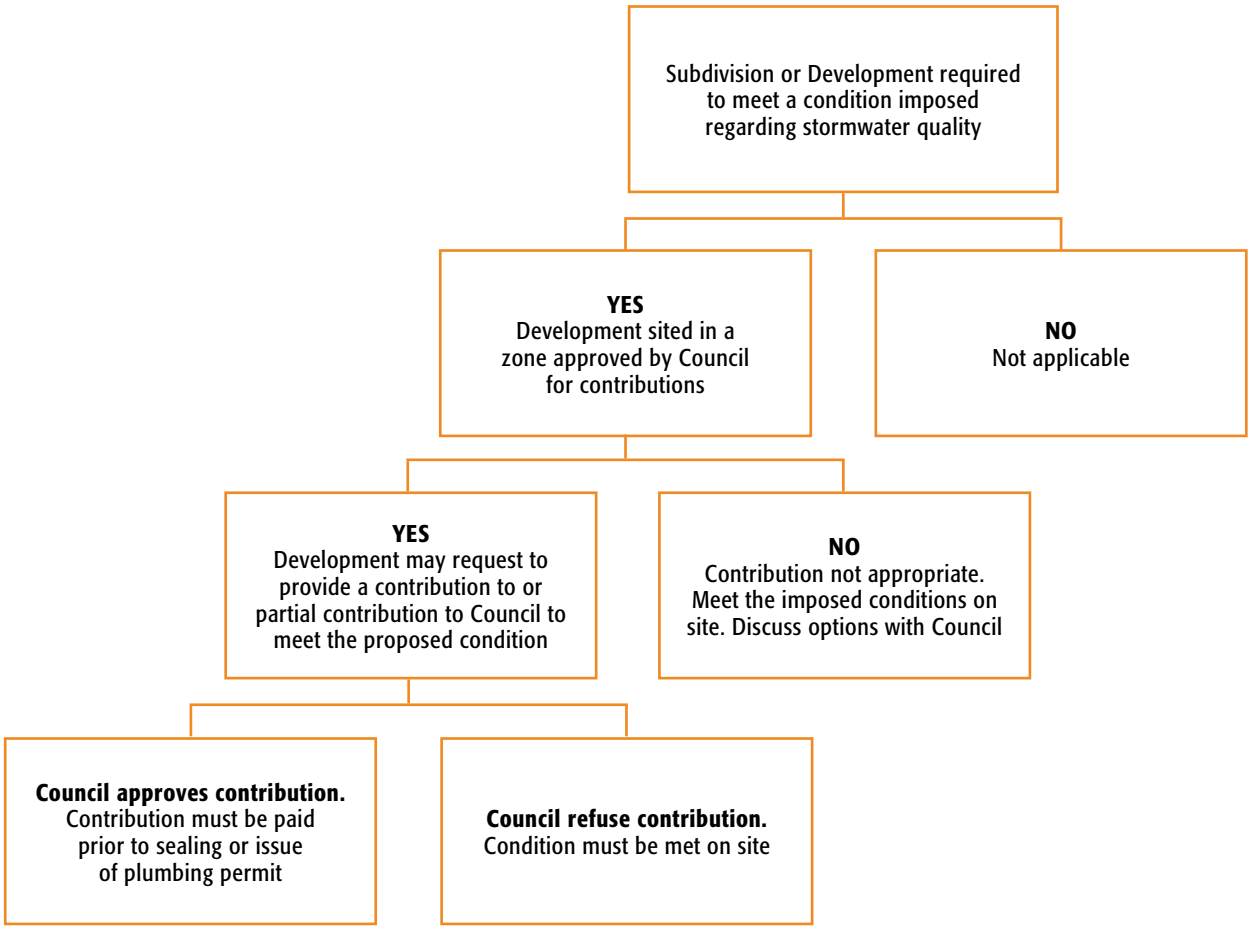
Offset contributions will be a voluntary option and must be agreed to by both the developer and the assessing Council. If this option is to be considered the recommended process is:

Table 6 Premises of the voluntary contribution scheme

Voluntary Contribution Conditions and Premises	
Premise	**Requisite**
1. Voluntary	The process outlined following will be used to determine if a contribution in lieu of providing on site stormwater quality control is appropriate. A water quality contribution will be voluntary and meeting the condition on site will be the alternate option.
2. Defined amount	Contribution amounts are to be set by Councils in their Fees and Charges Schedules. Subdivisions are required to pay the applicable fee as determined in Councils Fees and Charges schedule each year *per lot*. Developments are required to pay the applicable fee as determined in Councils Fees and Charges schedule each year *per additional dwelling*. This amount may be varied by catchment if defined by Council.
3. Requested	Any development in any zone that is required to meet a condition imposed by the Council under 6.11.2.(g) or under the UDA GM's consent process in regards to stormwater quality control may request that a contribution be considered. The development will be required to meet the condition requirements however it may be negotiated with Council to provide a contribution to Council to go towards adopting stormwater quality management throughout the urban area. It is recommended the voluntary developer contribution scheme is considered by the developer prior to processing plans with the Stormwater Service Provider, as incorporating appropriate WSUD into the site will likely impact site design.
4. Applies to and fulfills SW Quality conditions	If the contribution is approved by the Stormwater Service Provider, and the suitable contributions provided, the development will be considered to have met the requirements for water quality treatment of this policy. This policy does not apply to conditions imposed under 6.11.2.(g) or the UDA regarding stormwater quantity controls. Detention required to meet a stormwater quantity control condition does not qualify to request a contribution under this contribution scheme. If on site detention is not feasible on a site other options may be discussed with Council.
5. Councils Right to Refuse or vary	Contribution applications must be referred to Councils asset services department and must be approved by Council. If Council deems that the stormwater quality control requirement can be effectively met on site, or that meeting the control requirement on site will result in improved environmental outcomes Council may refuse a request for contribution. This will be at Councils discretion. Council may require or request a variation to the request i.e. request a partial contribution if it believes that will benefit the catchment.
6. Partial Contribution Option	A request may be made to make a partial contribution if it can be proven that the development will partially meet the WSUD principles of 45% reduction in total nitrogen and total phosphorous and 80% reduction in total suspended solids. The contribution will be based on the percentage reduction demonstrated that will be achieved by WSUD treatment options proposed to be installed.

Voluntary Contribution Conditions and Premises	
7. Payment prior to installation	Subdivision Application contributions will be required to be paid prior to sealing the plan of survey. Development Application contributions will be required to be paid prior to issue of a plumbing permit.
8. Recorded	The Stormwater Service Provider will keep a record of all contributions and expenses related to water quality works under this scheme.
9. Not catchment specific	Contributions may be used for the design and installation of water quality improvements within the Council area. Improvements in water quality benefits all residents, so – unless specified by a specific catchment plan or policy – there is not requirement on the Council to utilise the contributed funds in the catchment of the development.

Figure 13 Stormwater offset contribution suitability flow chart



2.4.4 Deemed to Comply Solutions

Deemed to comply solutions are water quality design solutions that have been deemed to meet adequate treatment requirements if included in the design and installed as designed.

Councils may develop their own deemed to comply solutions and this is an area that more work may be done to expand these options.

Currently the deemed to comply process utilises the STORM updated tool which has been set up for Tasmanian conditions.

This tool allows a developer to choose from a limited number of treatment options to simply identify appropriate treatment solutions. The tool then assesses the pollutant reduction loading achieved for the site. The background calculations have been taken from MUSIC software so a small developer would not have to engage a stormwater engineer to identify and calculate stormwater treatment solutions. In this case the following options are available.

Table 7 Deemed to comply options

Option	Description	Requirements to Provide	Council Response
1.Overall STORM rating 100% or greater	Treatment options are identified in the STORMupdated software as having an overall STORM option equal to or greater than 100% reduction in pollutant loading.	1. STORMupdated report 2. Treatment options shown on plans including invert levels.	Accept that the development application meets the water quality treatment requirements. Further information may be required at detailed design stage.
2. Overall STORM rating less than 100%	Treatment options are unable to meet 100% reduction targets. In this case a contribution may be requested to be made to Council in line with their Voluntary Stormwater Quality Offset Contribution Scheme. A contribution covering the remaining percentage of treatment may be acceptable to Council	1. STORMupdated report 2. Treatment options shown on plans including invert levels. 3. Request to contribute the remaining percentage of treatment.	Accept or deny the contribution request. If accepted – Accept that the development application meets the water quality treatment requirements. Further information may be required at detailed design stage If denied – Require that full treatment must be met on site.

2.4.5 WSUD System Protection During Construction

WSUD elements require additional managing and protection during construction and require ongoing maintenance to ensure they continue to maintain their functional outcomes.

Bioretention systems, bioretention swales and some proprietary systems are particularly sensitive to materials that may clog, or cause a crust to form over the top of filter mediums. The protection of these systems during construction phase is therefore critical.

Building controls mitigate some risk, however additional measures are required to protect WSUD systems and may include:

- Silt fences and/or straw bales;
- Fences/bollards around WSUD treatment systems;
- Sacrificial layers in treatment systems (for example in bio retention systems);
- Temporary planting during construction for sediment control (e.g. with turf), which can then be removed and the area planted out with long term vegetation;
- Temporary sedimentation basins;
- Temporary diversions of stormwater around WSUD asset during construction;
- Diversion of high flow events around WSUD assets during construction.

In some cases a multi-phase approach may be required for the construction of WSUD assets. For example, in a development that is being constructed over several years the design and construction of WSUD assets may also need to be staged to match the overall development. Consideration of asset protection and ensuring the design requirements are achieved with each construction phase (e.g. enough runoff is provided for raingardens), is important in such developments.

WSUD systems to be transferred to the Stormwater Service Provider are to be cleaned/maintained to the satisfaction of the Stormwater Service Provider prior to hand over. Checklists for the final inspection of these assets are included in the *WSUD: Engineering procedures for stormwater management in Tasmania* document available on the Derwent Estuary website.

2.4.6 Maintenance of Private WSUD Systems and On-Site Detention

Regular maintenance of private WSUD and detention systems is required to ensure ongoing water quality treatment and stormwater quantity control.

The Building Regulations 2016 Section 73 (2) states that 'as part of notifiable work, or permit work, performed under the Act, permit authorities may place additional requirements in respect of the maintenance of premises where the work was performed or in respect of any system or installation installed as part of the work'.

Using this head of power, it is recommended that Stormwater Service Providers use Plumbing Permits to condition for maintenance for any developments including WSUD or on-site detention systems via a Form 46.

An example Form 46, including a Schedule of Maintenance – Prescribed Essential Building Services (Plumbing Installations) is included in the TSPG supporting documents.

It is recommended that Stormwater Service Providers establish a database of private WSUD assets within their Local Government Area, including information such as year of installation, last service reported to the Stormwater Service Provider, any complaints etc.

2.5 Development Requirements – Quantity and Conveyance

Stormwater quantity is managed by the infrastructure installed to manage the flow of stormwater through urban areas. In Tasmania flow is managed through a major / minor stormwater approach. Australian Rainfall and Runoff 2019 is the design reference for background information and design of stormwater conveyance systems.

Design and calculations must be carried out by a Suitably Qualified Person.

The minor and major systems work together to transport stormwater and should be considered as one interconnected system that includes the piped network, kerb and channel, roads and overland flow paths.

Stormwater drainage systems should be designed in accordance with the following:

- Australian Rainfall and Runoff (ARR) (Engineers Australia, 2019) (www.arr.ga.gov.au);
- Tasmanian Municipal Standard – Specifications (https://www.lgat.tas.gov.au/member-services/engineering-local-government-standards-and-guidelines);
- Tasmanian Municipal Standard – Drawings (https://www.lgat.tas.gov.au/member-services/engineering-local-government-standards-and-guidelines);
- Tasmanian Subdivision Guidelines (https://www.lgat.tas.gov.au/member-services/engineering-local-government-standards-and-guidelines); for Councils that endorse these guidelines.
- AS/NZ 3500.3:2003-Plumbing and Drainage – Part 3: Stormwater Drainage;
- Building Code of Australia, and;
- Tasmanian Planning Scheme - Flood-Prone Areas Hazard Code.

Stormwater quantity and conveyance requirements are outlined in this section and include:

- Stormwater Disposal Requirements
- Major Drainage System
- Minor Drainage System
- Detention
- Design Rainfall
- Climate Change
- Fraction Impervious
- Minimum Finished Floor Levels and construction requirements
- Geotechnical Concerns
- Erosion and Sediment Control

2.5.1 Stormwater Disposal Requirements

Each Council may specify stormwater disposal and connection requirements.

Standard requirements are:

1. Stormwater must be disposed of by gravity to the Council stormwater system where practicable. This is the default position in urban areas.
2. Where a Council stormwater system is unavailable stormwater may be disposed of on site to the satisfaction of Council.
3. New stormwater outfalls into river streams or other water bodies must follow the requirements of the C7.0 Natural Assets Code section P3 of the TPS.
4. Each lot will typically have one property connection only.

2.5.2 Major Drainage System

Overland conveyance of stormwater from large events is potentially hazardous due to the velocity and depth of flows, and must be safely contained within a defined corridor of major system flows (Coombes, Roso, & (Editors), Runoff in Urban Areas, Book 9, Australian Rainfall and Runoff - A Guide to Flood Estimation, 2019.

The major drainage system is primarily intended to mitigate disaster. The major system typically includes overland flow paths on roads and through open space, and trunk conveyance infrastructure. This system conveys additional stormwater runoff produced during larger, less probable storm events with the intent of mitigating the potential for flood disaster. Low points in the landscape will pick up surface flow from surrounding areas and form an overland flow path even if no piped stormwater is actively directed into these gully depressions. If these overland flow paths are not recognised, the unmanaged flow may create a risk to people and property. Consideration of major flow paths in the early stages of development design is essential.

This document provides guidelines in regard to localised surface flooding through urban areas. It does not address or provide guidance on major riverine or coastal flooding controls.

For additional information on the major drainage system refer to Australian Rainfall and Runoff.

Major Drainage System Design Requirements for Development Approval

The following design information must be included in development design and included in a development application. .

Table 8 Major drainage system design requirements for submission with development application

Major Drainage System Design Requirements for Submission with Development Application
• 1% storm event drainage path locations, direction and widths indicated on plans for depth greater than 50mm with consideration for the following: » The major drainage system must be designed to allow for the safe conveyance of the 1% AEP storm event with an allowance for climate change. The allowance for climate change included is to be in accordance with the current version of ARR, or as specified by the Stormwater Service Provider and recommended as the RCP 8.5 2100 scenario » Watercourses, open drains and overland flow paths are to be aligned such that they are free-flowing and free of obstructions. They should be located on a public road, open space, drainage reserve or easement wherever possible. » Consideration must be given to continuity of the overland flow path and where, for example, a roadway acting as an overland flow path, discharges stormwater to a pathway, park or stormwater reserve. Any fencing crossing the overland flow path must be permeable and designed to prevent blockages to allow water to flow freely. » Velocity x depth must be calculated for overland flow paths and compared to the ARR flood hazard classification curves included in Figure 18 Australian Rainfall and Runoff flood hazard classification curves. » New trunk pipe, box section or lined channel drainage outfalls must be designed to control the discharge velocity and spread the concentrated discharge to avoid erosion of the receiving streams bed and banks. » Wherever practical, vegetated swales or drainage channels must be provided downstream from the trunk drainage outlet. » If there is likely to be significant sheet flow from upstream unmanaged slopes management of this issue should be considered in design.

Major Drainage System Calculation Requirements

Calculations are to include as appropriate:

- Calculations of flow widths and flows across road junctions;
- Calculation of flow depth and velocity or hazard classification in any in any surface drainage flow path drainage pathway.
- Calculations of road flow capacity and overland flow path capacity (if any) based on full road cross section;
- Demonstrate that the inlet system for the minor drainage network can continue to operate under appropriate levels of blockage, otherwise appropriate adjustments must be made to the design of the major drainage system to account for potential malfunctions of blockages in the minor system. Refer to ARR Book 9, Chapter 5 and/or ARR Revision Project 11 Blockage of Hydraulic Structures for further guidance;
- Any other requirements set by the Stormwater Service Provider.

For additional guidance on design requirements see Australian Rainfall and Runoff (Engineers Australia, 2019).

2.5.3 Minor Drainage System

The minor drainage system manages nuisance, maintains safety, and minimises damage to property for regular rainfall occurrences. The infrastructure is also provided to avoid potential maintenance problems, for example, ponding and saturation of designated areas. The minor system also includes volume management measures that aim to hold water within urban landscapes and sub-catchments, for example rainwater tanks or detention basins. These solutions may include ponding of stormwater within a defined area.

For additional information on the minor drainage system refer to Australian Rainfall and Runoff, Book 9 Chapter 3.5.

The Level of Service for the minor drainage system is to be specified by the Stormwater Service Provider. Stormwater Service Providers may specify different levels of service within different areas of the municipality. If a level of service for the minor system has not been set for a development area assume a 5% storm event with climate change as per ARR 2019 scenario 8.5 at 2100.

Note that traditionally Tasmanian Councils have set a range of minor network levels of service that have varied throughout the state and include the following.

Figure 14 Australian Rainfall and Runoff flood hazard classification curves.

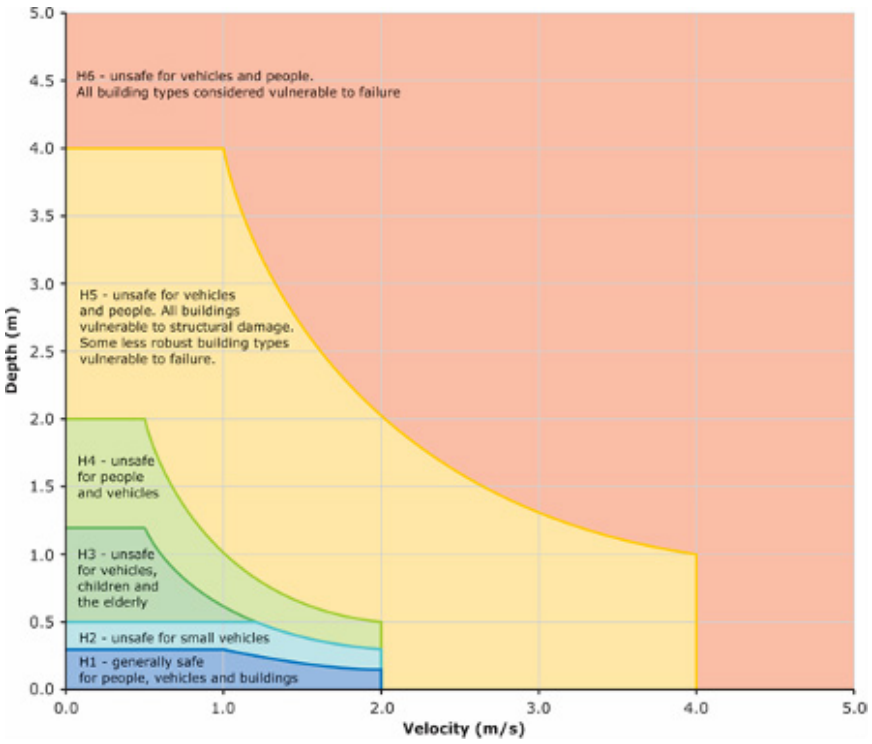


Table 9 Minor system levels of service in use in Tasmania

ARI Minor – Residential	AEP	ARI Minor Rural & Residential >2ha	AEP	ARI Minor – CBD	AEP	ARI Minor – Business, Commercial and Industrial	AEP
1 in 5	20%	1 in 2	50%	1 in 50	2%	1 in 20	5%
1 in 10	10%	1 in 5	20%	1 in 20	5%	1 in 50 - Industrial	2%
1 in 20	5%	1 in 20	5%				

Setting the minor service level should be a risk based assessment. When considering what level to set a minor network level of service a Council should consider the definition and capacity of the major network and its ability to capture exceedance from the minor system. If the major system can capture the exceedance safely and transport it through the catchment there is a reduction in risk if the minor system is exceeded.

Councils, when implementing a stormwater policy, should specify their level of service expectations.

Note that, unless specified, this document refers to Annual Exceedance Probability (AEP), which is defined as the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year, which is in line with current industry practice.

Table 10 Australian Rainfall and Runoff Thresholds – preferred terminology coloured

Frequency Descriptor	Exceedances per Year	Annual Exceedance Probability (%)	Annual Exceedance Probability (1 in x)	ARI	Uses in Engineering Design
Very Frequent	12				Water Sensitive Urban Design
	6	99.75	1.002	0.17	
	4	98.17	1.02	0.25	
	3	95.02	1.05	0.33	
	2	86.47	1.16	0.50	
	1	63.1	1.58	1	
Frequent	0.69	50.0	2	1.44	Minor System pit and pipe design – design standard to be specified by the Stormwater Service Provider
	0.5	39.35	2.54	2	
	0.22	20.00	5	4.48	
	0.2	18.13	5.52	5	
Infrequent	0.11	10.00	10	9.49	
	0.05	5.00	20	20	
	0.02	2.00	50	50	Floodplain management and waterway design
	0.01	1.00	100	100	
Rare	0.005	0.50	200	200	
	0.002	0.20	500	500	
	0.001	0.10	1000	1000	
	0.0005	0.05	2000	2000	
Extremely Rare	0.0002	0.02	5000	5000	Design of high–consequence infrastructure (e.g. major dams)
Extreme			Probably Maximum Precipitation (PMP)		

Minor Drainage System Design Requirements for Development Approval

The following requirements should be included with a development application:

Table 11 Major drainage system plan requirements for submission with development application

Minor drainage system plan requirements for submission with Development Application
• Locations and sizes of pipes and easements. • Design calculations justifying pipe sizes that include a climate change factor as specified by Council (recommended as with climate change as per ARR 2019 scenario RCP 8.5 at 2100) • Invert levels for pipes and manholes. • Location of outfalls and outfall management details if applicable. • Maximum flow rate at connection point for the specified event and associated calculation details.

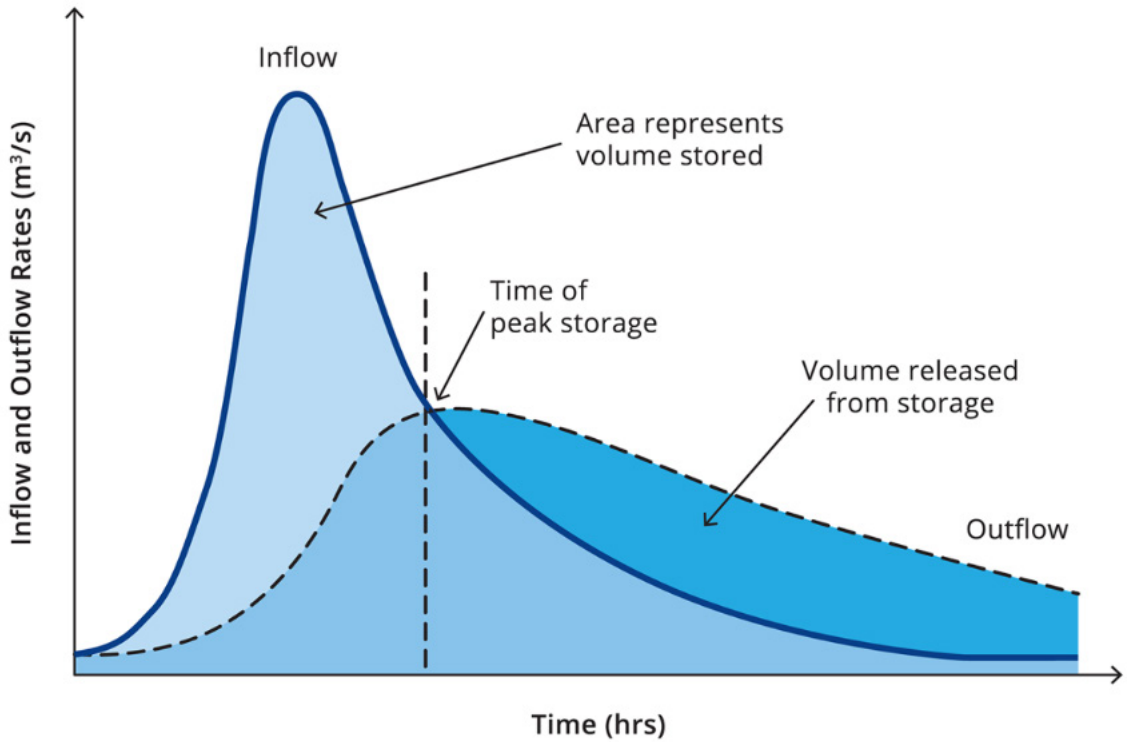
2.5.4 Detention

Detention systems provide temporary storage of stormwater runoff from developments and

restricts discharge from the site to a rate which the existing public drainage system is more capable of accommodating. Detention of expected increased flows from a development assists with minimising risks and nuisance to the public and to property by ensuring that the extra load placed on the stormwater network is managed in a manner appropriate to the downstream network.

Detention is useful in areas where downstream stormwater infrastructure was not sized to accommodate proposed development levels, and where urban areas have densified over time.

Figure 15 Typical Hydrograph change generated by a temporary storage (without harvesting) ARR Book 9 Chapter 4 (Coombes, Roso, & (Editors), Runoff in Urban Areas, Book 9, Australian Rainfall and Runoff – A Guide to Flood Estimation, 2019)



Detention limits peak flood flows during storm events from developments, providing the following benefits:

- Reducing property flood damage;
- Reducing personal safety risks due to flood;
- Reducing infrastructure damage; and
- Reducing upgrade requirements for Stormwater Service Provider infrastructure.

On-site detention is to be designed in accordance with Australian Rainfall and Runoff.

The Stormwater Service Provider is responsible for applying conditions on the peak discharge level required from a development. The capacity of the existing drainage system should not be exceeded.

Detention Requirements for Development Approvals

Any of the following discharge conditions may be applied by Councils. It is recommended developers discuss detention or permissible site discharge arrangements with a Council stormwater or development engineer prior to the submission of a development application.

Table 12 Peak discharge conditions

Possible Peak Discharge Requirements	
Level	**Peak Discharge Condition**
1	No peak discharge condition applied. Runoff from new impervious surfaces within the development is disposed of by a gravity system to the public stormwater infrastructure, which has adequate capacity for runoff from the new development. Adequate downstream overland flow paths are also available. If this is not possible, it may be disposed of on-site with soakage devices (having regard to the planning zoning of the site, site suitability, the system design and water sensitive urban design principles), collected for re-use, or disposed of to the public stormwater infrastructure via a pump system which is designed, maintained and managed to minimise the risk of failure to the satisfaction of the Stormwater Service Provider
2A	Detention is required to limit peak discharge and can be incorporated on site. On-site detention must be designed in accordance with this document. Outflow from the on-site detention system is disposed of by gravity to the public stormwater infrastructure. If this is not possible, outflow may be disposed of on-site with soakage devices (having regard to the planning zoning of the site, the site suitability, the system design and water sensitive urban design principles), collected for re-use, or disposed of to the public stormwater infrastructure via a pump system which is designed, maintained and managed to minimise the risk of failure to the satisfaction of the Stormwater Service Provider.
2B	Detention is required but can not be incorporated on site. *** If approved by the Stormwater Service Provider, the developer is to pay a cost contribution to the Stormwater Service Provider for the purpose of the Stormwater Service Provider constructing detention elsewhere within the catchment in accordance with the Stormwater Service Provider's Stormwater System Management Plan, or other document. Runoff from new impervious surfaces within the development is then disposed of by a gravity system to the public stormwater infrastructure. If this is not possible, it may be disposed of on-site with soakage devices (having regard to the planning zoning of the site, the site suitability, the system design and water sensitive urban design principles), collected for re-use, or disposed of to the public stormwater infrastructure via a pump system which is designed, maintained and managed to minimise the risk of failure to the satisfaction of the Stormwater Service Provider.

*** Council may only accept this option if it is willing to hold the risk of having a higher load on the network until the detention elsewhere is constructed. It will be Councils responsibility to consider and manage this risk.

Note on Detention and Retention

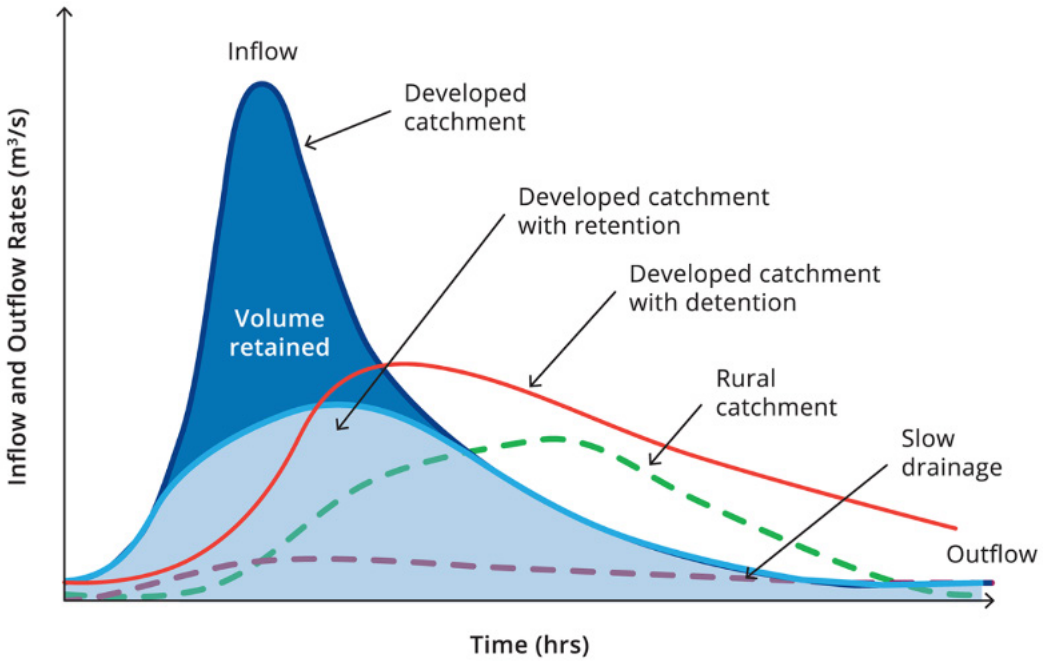
Detention holds a volume of flow and releases it into the system at a reduced rate. The full volume of water is still released into the stormwater system. In some catchments with a peak flow rate that differs to the one managed by the detention of a development, releasing flows may exacerbate down stream flooding issues.

This should be considered by the stormwater service provider.

Retention retains a volume of water for use or infiltrates it into the ground. In some cases this will be a preferable outcome and should be considered.

Some systems may have a combination of both retention and detention.

Figure 16 Developed catchment showing Retention as Compared to Detention and Slow Drainage Strategies (Figure 9.4.3 Australian Rainfall and Runoff)



Developer Contributions for Off-Site Detention

Stormwater Service Providers may consider developer contributions in lieu of the provision of on-site detention. This must be in accordance with the Stormwater Service Providers Stormwater System Management Plan, or other similar document.

It is noted that there are limited examples of authorities accepting developer contributions for stormwater peak flows. It is recommended that Stormwater Service Providers considering this option refer to the guidance provided in Australian Rainfall and Runoff, Book 9, Chapter 3, Section 3.7 for further information and key principles to consider in making the decision to accept developer contributions for off-site detention.

The value of the contribution in lieu of on-site detention is to be determined by the Stormwater Service Provider.

The Stormwater Service Provider must manage the risk, and any potential liability, associated with acceptance of contributions in lieu of on-site detention.

2.5.5 Climate Change

The expected life span of developments and consequences of development decisions are long. Stormwater assets in particular are likely to be in place for possibly 100 years. Due to the life span of these assets and long term consequences of development decisions it is prudent risk management to consider climate change effects and include the best available predictions in development design.

Australian Rainfall and Runoff Book 2 – Rainfall Estimation (Babister & Retallick, 2019) states that:

> *Statistically significant increases in rainfall intensity have been detected in Australia for short duration rainfall events and are likely to become more evident towards the end of the 21st century.*

As short duration rainfall events are particularly likely to impact urban stormwater infrastructure it is essential that climate change effects are designed into stormwater infrastructure.

Stormwater Service Providers should have additional requirements for the design and construction of stormwater systems to incorporate current or future effects from climate change.

Climate change factors can be taken from the ARR data hub which holds interim climate change factors for RCP (Representative Concentration Pathways) 4.5, 6 and 8.5 It is recommended that Councils use the RCP 8.5 pathway as applicable at 2100. If other data is available a Council may specify a different approach or climate change factor.

2.5.6 Fraction Impervious

Design of the stormwater system for subdivisions must include consideration of the full design area. This includes requirements for stormwater treatment and on-site detention as required.

The Stormwater Service Provider may specify the required fraction impervious for use in calculations. If the Stormwater Service Provider does not specify the required fraction impervious, designers should determine the actual fraction impervious of the fully developed upstream catchment and site, based on road width, allotment size, house size etc. Indicative fraction impervious values are included in Table 13 Indicative fraction impervious values for development categories (from Queensland Urban Drainage Manual) (Institue of Public Works Engineering Australasia, Queensland Division, 2016). Note that this table is for subdivision only where developers have no bearing on the ultimate development of the land. If a development has known impervious area make ups the Effective Impervious Area (EIA) approach may be used for calculations as per ARR guidelines.

Table 13 Indicative fraction impervious values for development categories (from Queensland Urban Drainage Manual)

Fraction Imperviousness Values for Design and Modelling	
Development	**Fraction Impervious**
Central business district	1.0
Commercial, local business, neighbouring facilities, service industry, general industry, home industry	0.9
Significant paved areas eg roads and carparks	0.9
Townhouse type development	0.7
Multi-unit dwellings (20 or more units per hectare)	0.85
Urban residential – high density (20 or more dwellings per hectare)	0.7 – 0.9
Urban residential – low density (5–20 dwellings per hectare, including roads)	0.45 – 0.85
Urban residential – low density (5–20 dwellings per hectare, excluding roads)	0.40 – 0.75
Rural residential	0.1 – 0.2
Open space and parks etc	0

2.5.7 Minimum Finished Floor Levels and construction requirements

The National Construction Code sets up building requirements in flood hazard areas (Commonwealth of Australia and States and Territories, 2019) and provides requirements for building in flood hazard area. The Standard states that:

> *"It must also be emphasised that the Standard is not a stand-alone solution to mitigating life safety risk due to flooding. Mitigating risk to life in flooding requires a comprehensive set of measures that consider flood hazard and aim to reduce residual flood risk to a manageable level."*

Flood hazard level (FHL): the flood level used to determine the minimum height of floors in a building and represents the defined flood level (DFL) **plus the freeboard. Freeboard is given as 300mm above the defined flood level under the Directors determination – Riverine Inundation Hazard Areas.** (Graham, 2020)

Freeboard: the height above the defined flood level (DFL) as determined by the appropriate authority, typically used to compensate for effects such as wave action and localised hydraulic behaviour.

This set of measures generally involves a combination of effective land use planning considering flood hazard, flood mitigation measures, emergency response strategies for flooding, and building standards.

Minimum floor levels will be considered in areas identified by the Council or the flood modeller as areas of inundation within the flood hazard level. Finished floor levels are to be in accordance with Building Act and Planning Scheme requirements. In most cases, this will mean the finished flood level of habitable rooms must be at least 300mm above the defined flood event (generally the 1% AEP event).

In the absence of local flood information, the Stormwater Service Provider may specify a minimum finished floor level. This is at the discretion of the Stormwater Service Provider, however it is recommended that all new developments have finished floor levels a minimum of 300mm above the natural surface at the building footprint/site.

Where possible paved areas and driveways should grade away from the buildings to provide an overland flow path and to reduce the risk of the property flooding.

https://www.cbos.tas.gov.au/__data/assets/pdf_file/0011/550838/Directors-Determination-Riverine-inundation-hazard-areas.pdf

2.5.8 Geotechnical Concerns

Geotechnical and soil issues such as dispersive soils, slaking soils, acid sulphate soils etc create different and additional issues and hazards to standard stormwater design. Appropriate design is crucial to minimising hazards from stormwater in these areas stormwater management including driveway runoff should be design by a suitably qualified specialist.

Stormwater management in regards to specific geotechnical concerns should be site specific and identified on a construction plan.

Stormwater Service Providers may have additional requirements for the design and construction of stormwater systems in areas geotechnical issues or in areas with certain soil types. It is best to consult with Council or a geotechnical engineer in these instances.

2.5.9 Erosion and Sediment Control

Erosion and sediment loading from construction sites poses a significant environmental hazard and nuisance to the stormwater systems. Councils are required to manage the environmental risk through EMPCA (Tasmanian Government, 2021) and it is prudent asset management to manage the stormwater system asset risk.

A consistent approach to the management of soil and water on building sites is required to institutionalise improved soil and water management practices. Consistency also allows contractors, who work across municipal boundaries, to know what is expected of them wherever they are working.

It is recommended that Stormwater Service Providers adopt standard conditions for soil and erosion protection for building permits and development applications.

Erosion and sediment control plans should be submitted with the detailed designs for a site. These plans will ensure that the management of these risks are considered in the construction planning.

The recommended process for managing erosion and sediment control is:

Table 14 Erosion and Sediment Control Management Process

Erosion and Sediment Control Management Process		
Stage	**Requirement**	**Council Response**
Development Application	Identify overland flow paths and surrounding water ways on DA plans.	Condition the DA for a Soil and Water Management Plan (SWMP)
Detailed Design Submission	Include a detailed soil and management plan for the site considering: • Diversion of clean water around open construction areas • Management of contaminated flow through site • Stockpile management • Early roof drainage connections • Protection of stormwater pits • Plans for sediment removal from water prior to entering receiving environments • Minimisation of open site area • Staging - stages may require a separate SWMP plan for each construction stage.	Council to conditionally endorse the SWMP. Council to NOT stamp SWMP as accepted or endorsed as there are likely to be changes during construction that require variations to the plans. Erosion and management control is a constant variable throughout construction.
Construction	Implement SWMP on site. Continually assess erosion and sediment control effectiveness and adjust responses as required.	Inspect construction sites. Serve an Environmental Infringement Notice under clause 67 of EMPCA or an Environmental Protection Notice under section 44(2) if soil and water management is releasing pollutants into the surrounding landscape that would cost greater than $5000 to remove. This notice must specify remediation actions to be carried out within a specified timeframe.

Advice can be obtained for preparing soil and water management plans or appropriate control measures for development from the following sources:

- Derwent Estuary Program: https://www.derwentestuary.org.au/stormwater/; and
- International Erosion Control Association: http://www.austieca.com.au/publications/best-practice-erosion-and-sediment-control-bpesc-document

These sources are considered to provide advice on best practice soil and water management techniques that complies with the SPWQM (Division 3, Clauses 31 & 33).

2.6 Stormwater Design Requirements and Stormwater Reports

2.6.1 Development Application Drawing Requirements

Drawings submitted for the stormwater assessment of a **Development Application** must include, as a minimum, the following:

Table 15 Stormwater Design Development Application Submission Requirements

Development Application Submission Requirements
• All above and below ground existing and proposed features on the site including any existing overland flow paths and proposed easements and drainage reserves; • Soil type • Topography including 1 metre contours showing AHD levels and major site features • Natural drainage lines, watercourses and wetlands on or adjacent to the site • Stormwater connection points • Contours and/or spot levels for proposed finished surface levels • Overland flow paths through, or created by, the development • The location of existing and proposed buildings on the site • Proposed subdivision lot boundaries if applicable. • Proposed roads, driveways, parking areas, and footpaths within the site • Proposed open space, communal space, or facilities on the site • All existing public service infrastructure (trees, footpaths, streetlights, stormwater etc); and • All proposed stormwater management devices (pipes, drains, grates, culverts, detention systems, pumps, water quality treatment systems etc) including: » Location and size; » Proof of concept of detention and water quality treatment systems.

Drawings submitted for **Detailed Design** must include all details required at the Development Application stage plus, as a minimum, the following:

Table 16 Stormwater Design Detailed Design Submission Requirements

Detailed Design Submission Requirements
• Proposed building finished floor levels and footprints; • All minor network design including » Pipe size and material and location » Pipe upstream and downstream invert depth » Hydraulic grade lines » Peak flow entering connection point » Pit location » Pit type » Pit invert level » Lot connections if applicable • Details on detention systems including » Size, location and topography » Overflow and bypass conditions » Maintenance requirements » All relevant invert levels » Landscaping if applicable • Details on water quality treatment systems including » Type and capacity of system » Location of system and associated catchment areas » Any catchment areas not diverted through treatment » Treatment efficiency via MUSIC model, STORM updated output or other. » All relevant invert levels » Design storm treatment level » Bypass conditions » Maintenance requirements • Overland flow path / major system details including » location » width and depth of flow » hazard classification category » climate change factor used in design » associated easements

- Soil and Water Management Plan
  - Diversion of clean water around open construction areas
  - Management of contaminated flow through site
  - Stockpile management
  - Early roof drainage connections
  - Protection of stormwater pits
  - Plans for sediment removal from water prior to entering receiving environments
  - Minimisation of open site area
  - Staging - stages may require a separate SWMP plan for each construction stage.

Stormwater Service Providers may request additional information at either the Development Application or Detailed Design stage such as:

- Detailed flood studies;
- Water velocities within pipes;
- Additional details on proposed detention systems;
- Additional details on proposed water quality treatment systems; and
- Other items as deemed necessary by the Stormwater Service Provider.

2.6.2 Stormwater Management Reports

A Stormwater Management Report written by a Suitably Qualified Person must accompany all developments with a total development area greater than 2500m2 for residential and greater than 5000m2 for non-residential, and include details of the following:

Table 17 Stormwater Management Report Requirements

Stormwater Management Report Requirements
• Site discharge and/or on-site detention; • Stormwater infiltration systems; • Stormwater pump systems, if applicable; • Water Sensitive Urban Design systems; and • Major flow paths.

A Stormwater Management Report for other developments may be requested at the discretion of the Stormwater Service Provider.

It is recommended that stormwater reports include the following as these details will be required by the Council to adequately assess the development application.

Table 18 Stormwater Management Report Recommended Layout and Inclusions

Stormwater Management Report Recommended Layout and Inclusions
• Introduction - brief description of the site and the proposed development. • Existing Development: » Description of the existing development and a plan (figure/drawing) showing the site boundary, existing pervious and impervious catchment areas on the site; » The plan must show any external catchments that will contribute stormwater runoff to the site or will be diverted around the site, and watercourses in close proximity to the site that may have an impact due to flood extents; » Description of existing stormwater assets and any drainage easements or reserves. • Proposed Stormwater Management Strategy: » Description of the proposed development and a plan showing the proposed pervious and impervious catchment areas; » A dot point summary of the Stormwater Service Provider's key design criteria/ requirements relevant to the particular development; » A description of the proposed stormwater management strategy; » A plan showing the proposed stormwater management strategy, including proposed pits, pipes, detention and stormwater quality improvement measures, overland flow paths and proposed design levels (spot levels or concept design contours). • Analysis of the Stormwater Management Strategy: » A summary of the hydrologic and hydraulic modelling input data and assumptions, including a table showing the existing and proposed development catchment areas and percentages of impervious areas; » Summary of the existing and proposed development peak flow rates and hazards for the minor and major storm events. If modelling software has been used, details and screen shots of model results are to be shown in an appendix; » Commentary on the hydrologic and hydraulic modelling results. • Commentary on any specific details of the proposed system including requirements for orifice plates, orifice diameter, plant species, weir levels/overflow levels, details on filtration media etc; » Detention calculations including details on overflows, and including evidence that no nuisance is being created; » A summary of the stormwater quality modelling input data and assumptions; » An image showing the MUSIC(X) model catchments and treatment train with the treatment train effectiveness summary table to demonstrate full or partial compliance (if relevant); » Commentary on the stormwater quality modelling results (if relevant). • Construction: » Details as to how the existing environment (including vegetation, waterways, existing infrastructure etc) and WSUD assets are to be protected during construction. • Maintenance: » A table with a general asset description (pits, GPT, swales etc.) and the required frequency of inspection and maintenance; » Operational, inspection and maintenance manual for basins, on-site detention, pumps and WSUD elements (note checklists are included in the *WSUD: Engineering procedures for stormwater management in Tasmania 2012* document for WSUD components); » A schedule of design life expectations for all components. • Certification: » The stormwater design and the Stormwater Management Report must be certified by a Suitably Qualified Person (as defined in Appendix A – Definitions). • Conclusion - summary of the proposed development, stormwater strategy and results.

Additional information may be requested by the Stormwater Service Provider, including but not limited to modelling software files, MUSIC(X) model soft copy etc.

2.7 Development Requirements for Buildings and Works

Table 20 includes a summary of requirements for new developments. Please note, this table is included for reference; it does not include all requirements of the Tasmanian Stormwater Policy Guidance and Standards for Development.

This must be read in conjunction with the full Tasmanian Stormwater Policy Guidance and Standards for Development document along with the Tasmanian Planning Scheme, and other relevant documents.

Table 20 **Development requirements for Buildings and works, subdivision and development**

A. Stormwater System Design Requirements	
Exempt development None.	
A1. Any new stormwater infrastructure must be designed to the satisfaction of the Stormwater Service Provider for the minor and major design event.	A1 Conditions/standards: 1. A new minor stormwater drainage system must be sized in accordance with the requirements of the Stormwater Service Provider; AND 2. A new major stormwater drainage system must be designed to accommodate a 1% AEP storm event (including climate change as specified by the Stormwater Service Provider), or to a higher level of service as specified by the Stormwater Service Provider in the case of a vulnerable use or critical use development (as defined in the Planning Scheme).

B. Stormwater Disposal Method Requirements		
Exempt development: None.		
B1. Stormwater must be disposed of by gravity to a public stormwater system	B1 Conditions/standards: 1. Stormwater disposal must be in accordance with the requirements of the Tasmanian Planning Scheme, the Tasmanian Subdivision Guidelines, and any Stormwater Service Provider by-laws.	
If B1 is not achievable, B2. Stormwater may be disposed of onsite	B2 Conditions/standards: 1. Onsite disposal must be consistent with the current disposal method AND the site must be within the Rural Living or Low Density Residential zone. OR: 2. A report by a Suitably Qualified Person demonstrates that the site is suitable, and that the onsite disposal system is designed, and will be maintained and managed, to minimise the risk of failure to the satisfaction of the Stormwater Service Provider	B2 is only acceptable if B1 is not achievable

If neither B1 OR B2 are not achievable, B3. Stormwater may be disposed of via a pump system	B3 Conditions/standards: 1. B3 must be approved by the Stormwater Service provider AND 2. Pump systems must be designed by a Suitably Qualified Person and must be maintained and managed to minimise the risk of failure to the satisfaction of Stormwater Service Provider. A Form 46 is recommended to ensure ongoing maintenance.	B3 is only acceptable if neither B1 or B2 are achievable

C. Stormwater Quality Treatment Requirements

Exempt development:

i) A single dwelling on a single lot that will be connected to the existing public stormwater system;

ii) Development creating new impervious area less than 500m^2;

iii) A subdivision creating new lots greater than 5000m^2 in area, and with new roads and footpaths less than 500m^2 in area;

iv) Subdivisions which are solely for the purpose of creating road reserve, public open space, public infrastructure, littoral or riparian reserve or minor boundary adjustments.

Note – if a staged development occurs within a 5-year period, treatment will be required for the total final development

C1. Stormwater from the developed site must meet the Stormwater Treatment Target set by the Stormwater Service Provider (Refer to Table 3) OR C2. Stormwater quality treatment may be offset via a cost contribution.	C1 Conditions/standards: 1. Proposed treatment is designed by a Suitably Qualified Person, and is suitable for the site, AND 2. Ongoing maintenance burden (including site access) is considered reasonable and/or acceptable. OR C2 Conditions/standards: 1. C2 must be approved by the Stormwater Service provider, AND 2. Cost contribution received must be in line with the Developer Contribution Scheme adopted by the Stormwater Service Provider for stormwater treatment.	C1 or C2 option available at discretion of the Stormwater Service Provider

D. Stormwater Quantity Controls		
Exempt development: Development that results in no increase in the proportion of total impervious areas to pervious area for the whole site, and no change of use of the site; AND where the downstream public stormwater system is known to have sufficient capacity to cater for the fully developed catchment.		
D1. The quantity and conveyance of stormwater is compliant with stormwater drainage system requirements of the Stormwater Service Provider. AND/OR D2. The impact of the stormwater quantity from the site may be offset via a cost contribution	D1 Conditions/standards: 1. Any increase in stormwater runoff must be accommodated within an existing public stormwater system to the satisfaction of the Stormwater Service Provider OR 2. Public infrastructure upgraded by the developer as part of the development proposal to the satisfaction of the Stormwater Service Provider OR 3. On-site detention is designed to offset the increase in stormwater runoff caused by the development, to the satisfaction of the Stormwater Service Provider OR D2 Conditions/standards: 1. D2 must be approved by the Stormwater Service provider AND 2. A cost contribution is received for a future improvement of the public stormwater system for infrastructure upgrades that are linked to an Urban Drainage Plan (or similar) created or accepted by the Stormwater Service Provider.	D1 or D2 option available at discretion of the Stormwater Service Provider

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