

Northern Midlands Council

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# Stormwater System Management Plan



January 2023



NORTHERN  
MIDLANDS  
COUNCIL

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# 1. Executive Summary

The *Urban Drainage Act 2013* requires Northern Midlands Council (NMC) to provide and manage appropriate stormwater systems within its municipality. This requires NMC to identify and manage potential risks associated stormwater conveyance in its urban areas.

The municipality of NMC contains urban areas within the following townships:

- Avoca
- CampbellTown
- Cressy
- Evandale
- Longford
- Perth
- Ross
- Western Junction/Translink

In order to comply with the *Act* NMC must provide adequate public stormwater systems that are necessary to effectively drain its urban areas. This requires NMC to understand its stormwater systems, identify the risks associated with them, and plan for the provision and maintenance of such services.

The potential risks impacting on these urban areas may affect the people and infrastructure within them in different ways. In general, these risks can be categorised as coming from the following sources:

- Localised flooding directly from public stormwater networks, including pipes, pits and roadways;
- Overland flows resulting from stormwater runoff; and
- Riverine flooding.

There are a variety of risks, issues and opportunities that are common across all of the urban areas, or relate to responsibilities of NMC associated with the management of stormwater. These are registered in Appendix A – Municipality Wide Urban Stormwater System Actions.

Stormwater System Flood and Risk Studies (SSFRSs) were prepared for each specific urban area in order to determine the performance of the urban public stormwater networks. These studies were based on detailed flood modelling and resulted in the identification of risks to people, vehicles and buildings from localised flooding and runoff. These studies determined actions which are presented collated in Appendix B – Specific Urban Stormwater Actions.

In addition to the stormwater SSFRSs additional studies have been undertaken to assess the risk of riverine flooding on urban catchments and to generate flood maps. Riverine flooding is not directly related to urban stormwater systems as it is the result of runoff from very large rural catchments. Therefore, this urban Stormwater System Management Plan (SSMP) and associated SSFRSs consider local rainfall, runoff and flooding, rather than that from rivers over which NMC has no responsibility for management.

This urban Stormwater System management Plan (SSMP) is a living document that is to be updated as new studies are undertaken, as knowledge of the system improves, and as risks are identified and mitigated. It provides an overview of issues identified at the time of writing.

# 2. Legislation and context

The current legislative framework for urban stormwater management is the *Urban Drainage Act 2013*. Under the *Act* NMC is a stormwater service provider who operates and maintains the public stormwater system in the municipal area.

The objectives of the *Act* are as follows:

- 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
- to provide for the safe, environmentally responsible, efficient and sustainable provision of stormwater services in accordance with the objectives of the resource management and planning system of Tasmania, as set out in Schedule 1 of the *Act*.

The following legislation, policies, guidelines and plans are also relevant to stormwater system management at NMC and within Tasmania more broadly:

- *Urban Drainage Act 2013*
- *Tasmanian Planning Scheme & Northern Midlands Local Provisions Schedule*
- *Local Government Act 1993*
- *Land Use Planning and Approvals Act 1993*
- *Northern Tasmania Regional Land Use Strategy 2018*
- *Local Government (Building and Miscellaneous Provisions) Act 1993*
- *Environmental Management & Pollution Control Act 1994*
- Plumbing Regulations 2014
- *Weed Management Act 1999*
- Building Regulations 2016
- State Policy on Water Quality Management 1997
- Tasmanian Subdivision Guidelines (LGAT, 2013)
- State Stormwater Strategy (DPIPWE, 2010)
- Stormwater System Management Planning; A Guide for Local Government in Tasmania (IPWEA, 2016)
- Australian Rainfall and Runoff Guidelines 2019
- Waterways and Wetlands Works Manual (DPIWE, 2003)
- Weed Action Plan (NRM,2006)
- Australian Disaster Resilience Handbook Collection Handbook 7, Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (AIDR, 2017)
- Australian Building Codes Board Standard: Construction of buildings in flood hazard areas (ABCB, 2019)
- Climate Action 21: Tasmania's Climate Change Action Plan 2017 - 2021 (State of Tasmania, 2017)
- Tasmanian Stormwater Policy Guidance and Standards for Development (Derwent Estuary Program, 2021)
- Australian Standards

### 3. Core principles

The primary aim of an urban stormwater management system is to minimise economic, environmental and social impacts of flooding and water quality degradation caused by stormwater runoff in our communities (IPWEA, 2016). *Stormwater System Management Planning; A Guide for Local Government in Tasmania* (IPWEA, 2016) provides a template for developing SSMPs with consideration given to following core principles:

- Understand the level of risk in its public stormwater system within the urban area
- Apply a risk management framework for flood mitigation and stormwater renewal works based on analysis of defined flood events
- Ensure stormwater systems are planned, designed and built with appropriate consideration of stormwater management principles by making better use of the statutory development and planning system
- Build resilience and consider climate change impacts to address future demands on the urban stormwater system
- Integrate stormwater management into the urban water cycle to achieve the goals of social, environmental and economic sustainability
- Enhance community awareness of, and participation in, the appropriate management of stormwater.

The approach taken by NMC in creating this first iteration of the SSMP generally follows that suggested in the IPWEA framework for the first two principles listed above. Flood studies for each urban area were undertaken in order to understand the public stormwater system in each of those areas, and the level of risk associated with them. A risk management framework was applied to determine an action plan which feeds into (CAPEX) renewals and replacements, and maintenance (OPEX) plans and budgets to address the risks identified in the studies.

Water quality, environmental and sustainability issues are touched upon in this plan, however the current understanding of these issues within the urban catchments remains limited. Work needs to be undertaken in order to understand how NMCs stormwater system impacts upon water quality within the municipality's natural systems in order to identify risks and future actions.

### 4. Overview of plan context

Stormwater System Management Plans are to contain the following (IPWEA, 2016):

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

While this current document addresses the key essentials, it is acknowledged in some areas that ongoing progress needed to build upon the foundations that this existing plan has laid.



## 5. Urban area

The *Urban Drainage Act 2013* specifies that each Council must develop a SSMP for the urban areas within the municipality, however no definition of 'urban' is specified within the Act. The areas nominated by NMC as urban are the following townships which generally consist of land zoned 'general residential', 'low-density residential', 'industrial' and 'commercial'. The areas immediately surrounding these townships is often zoned 'rural use' and has often been included in the SSFRSs as these are likely areas of future growth and/or are areas from which immediate runoff may affect infrastructure:

- Avoca
- CampbellTown
- Cressy
- Evandale
- Longford
- Perth
- Ross
- Western Junction/Translink

## 6. Urban stormwater systems

A summary of the stormwater system's assets in the 8 urban areas are as follows:

<b>Asset Category</b>	<b>Dimension</b>
Pipelines	95.4km
Stormwater nodes (manholes, side-entry pits, gully pits, etc)	2575
Stormwater Detention Basins	5
Maintained drains and urban waterways	Unknown
Gross-pollutant traps	2



## 7. Stormwater management

NMC manage stormwater assets through the Stormwater Asset Management Plan (adopted by Council 16 May 2022 (min. ref. 22/164). Its procedures integrate proactive operational maintenance, renewals and capital upgrades, as well as reactive responses to customer enquiries or unforeseen issues. Risks and opportunities identified in the flood studies are being incorporated into these programs.

The maintenance programs incorporate the following activities:

- Stormwater side-entry and gully pit cleaning
- GPT cleaning and maintenance
- Stormwater detention basin inspections and maintenance
- Waterway and open drain clearing and maintenance
- Reactive investigations and maintenance resulting from issues identified by Council staff or reported by customers.

Maintenance response levels of services are presented in Appendix A of the Stormwater Asset Management Plan.

Capital works are either asset renewals/replacements, upgrades or new projects. Section 6 of the Stormwater Asset Management Plan shows that stormwater asset renewal rates are currently appropriate and sustainable.



## 8. Identification of risks, issues and opportunities

There are a variety of risks, issues and opportunities that are common across all of the urban areas, or relate to responsibilities of NMC associated with the management of stormwater. These are registered in Appendix A – Municipality Wide Stormwater System Actions.

Stormwater System Flood and Risk studies were undertaken in order to identify and document the risks, issues and opportunities within NMC's urban areas. The list of SSFRS's is as follows:

- Avoca Stormwater System Flood and Risk Study
- Breadalbane Stormwater System Flood and Risk Study
- North Campbell Town Stormwater System Flood and Risk Study
- South Campbell Town Stormwater System Flood and Risk Study
- Cressy Stormwater System Flood and Risk Study
- Evandale Stormwater System Flood and Risk Study
- North-West Longford Stormwater System Flood and Risk Study
- North-East Longford Stormwater System Flood and Risk Study
- South-West Longford Stormwater System Flood and Risk Study
- South-East Longford Stormwater System Flood and Risk Study
- West Perth Stormwater System Flood and Risk Study
- East Perth Stormwater System Flood and Risk Study
- Ross Stormwater System Flood and Risk Study

The 10% AEP and 1% AEP flood events were modelled, with the performance of the pipe and pit network considered against the 10% AEP flood, and overland flows considered against the 1% AEP. Flood hazards were assessed in accordance with ARR2019.

The actions derived from the SSFRSs are provided in Appendix B – Specific Urban Stormwater System Actions.

NMCs proposed 10-year stormwater capital works program is provided in Appendix C, current to January 2023.

## 9. Review

This revision SSMP is the first iteration of the document. It has been prepared based on the relevant available documentation at the time of writing.

The planned review cycle for the Stormwater System Management Plan is four years and as such should be completed in 2027.

# APPENDIX A

## Municipality-wide urban stormwater actions

RISK / ISSUE / OPPORTUNITY	DISCUSSION	RISK	RESPONSIBILITY	MITIGATION	PRIORITY
<b>Resources to manage stormwater infrastructure</b>	<ul style="list-style-type: none"> <li>Appropriate resources must be made available so that Council is able to manage its responsibilities under the <i>Urban Drainage Act</i>, and implement the actions identified in this Urban Stormwater System Management Plan</li> </ul>	<ul style="list-style-type: none"> <li>Council not able to meet its legal obligations and unable to meet commitments made in this document</li> </ul>	NMC Works & Infrastructure	Ensure appropriate funding is in place for day to day obligations and seek additional funding or grants to enable to implementation of identified actions	<b>MEDIUM</b>
<b>Design Standards &amp; Guidelines</b>	<ul style="list-style-type: none"> <li>Council's transition from the Interim Planning Scheme to the Tasmanian Planning Scheme is imminent. The TPS does not include a Stormwater Code</li> <li>Council currently uses Tasmanian Subdivision Guidelines and LGAT Standard Drawings</li> </ul>	<ul style="list-style-type: none"> <li>No control or consistency as to how stormwater for developments is dealt with</li> </ul>	NMC Works & Infrastructure	<p>A stormwater working group was set up by a group of stakeholders to address the issue and provide guidance and clarity for Councils. This has resulted in the creation of the <i>State Stormwater Policy Guidance and Standards for Development</i> document, guidance from LGAT regarding developer contributions to stormwater infrastructure, and also a legal opinion of the powers Council has applied appropriate stormwater conditions</p> <p>Council should understand these powers and have all appropriate policies and systems in place prior to the TPS being adopted. This will also provide opportunity to review existing design and subdivision standards</p>	<b>HIGH</b>

**HIGH** (WITHIN 1 YEAR)   **MEDIUM** (1-3 YEARS)   **LOW** (3+ YRS)

RISK / ISSUE / OPPORTUNITY	DISCUSSION	RISK	RESPONSIBILITY	MITIGATION	PRIORITY
<b>Climate change</b>	<ul style="list-style-type: none"> <li>Increase in rainfall intensity and frequency of severe flood events</li> </ul>	<ul style="list-style-type: none"> <li>Existing infrastructure was not designed to accommodate these changes</li> </ul>	NMC Works & Infrastructure, Planning	Review potential climate change in stormwater system catchment studies	<b>MEDIUM</b>
				Consider impacts of climate change against proposed infrastructure, development and zoning/rezoning	<b>MEDIUM</b>
<b>Stormwater Assets</b>	<ul style="list-style-type: none"> <li>Stormwater asset plans/ GIS not current and does not capture all assets (e.g., open drains). Where assets have been captured information is often missing (e.g., manhole invert levels)</li> <li>Condition of assets unknown</li> </ul>	<ul style="list-style-type: none"> <li>A low quality of information upon which to base decisions and provide advice</li> <li>Creates uncertainty about extent and NMC's responsibility and current/future maintenance requirements</li> <li>Assets not contained in Stormwater Asset Management Plan and future liabilities are therefore not considered</li> </ul>	NMC Works & Infrastructure, IT	Update stormwater asset plans/GIS with most recent and complete data. Consider undertaking rolling asset survey/data collection program	<b>HIGH</b>
				Ensure accurate As Built information is received for NMC capital and operational works as well as external developments (subdivisions etc.) and promptly added to the asset plans/GIS	<b>HIGH</b>
				Undertake audit of open drains and waterways to determine extent of assets and NMC responsibility	<b>MEDIUM</b>
				Consider undertaking rolling CCTV program to assess condition and projected life of assets if cost/ benefit is demonstrable	<b>LOW</b>
<b>Development within existing urban areas or expansion of urban areas</b>	<ul style="list-style-type: none"> <li>Additional and infill development increases runoff and impacts the stormwater system</li> <li>Expansion of urban areas may require stormwater system connectivity through the older areas</li> </ul>	<ul style="list-style-type: none"> <li>Systems designed on the basis of less density or lower levels of service are impacted</li> <li>Development may occur in areas subject to stream flooding or in overland flow paths</li> <li>Overland flow paths not allowed for within new development</li> <li>Piping of overland flow paths, causing flooding of encroaching infrastructure when pipe capacity is exceeded</li> </ul>	NMC Works & Infrastructure, Planning	Ensure the impacts of proposed developments on the stormwater system are considered	<b>HIGH</b>
				Refer to the relevant Stormwater System and Flood Risk studies and flood maps or undertake new studies to understand the impacts of additional development	<b>HIGH</b>
				Review proposed designs and design criteria (e.g., detention requirements) and input into the development approvals process	<b>HIGH</b>
				Develop flood prone area/ inundation maps	<b>HIGH</b>
				Develop policies	<b>MEDIUM</b>

**HIGH** (WITHIN 1 YEAR)    **MEDIUM** (1-3 YEARS)    **LOW** (3+ YRS)



RISK / ISSUE / OPPORTUNITY	DISCUSSION	RISK	RESPONSIBILITY	MITIGATION	PRIORITY
<b>Riverine flooding</b>	<ul style="list-style-type: none"> <li>Council has no direct control or responsibility for river management although flooding from them can impact on urban areas</li> <li>In particular the South Esk River, the Macquarie River and Back Creek at Longford, and the Elizabeth River at Campbell Town, and Sheepwash Creek at Perth have historically flooded urban areas</li> </ul>	<ul style="list-style-type: none"> <li>Riverine flooding has the potential to flood properties and roads, and loss of life</li> <li>Development may occur in areas subject to riverine flooding</li> <li>Bridges, roads and culverts provide barriers to flows and some of these waterways have been piped to allow development in close-proximity to the historical flow path</li> <li>Challenges exist in balancing reduced flooding through improved hydraulics against improving their natural values and water sensitivity of the waterways</li> <li>Waterways are degraded in many locations and prone to weeds</li> </ul>	NMC Works & Infrastructure	Review emergency management procedures and work with the State Government to help develop and maintain flood protection	<b>MEDIUM</b>
				Develop flood awareness, education and community resilience	<b>MEDIUM</b>
				Consider providing prospective property owners with information on flood risk areas in the 337-certificate process	<b>MEDIUM</b>
				The Interim Planning Scheme and the Drainage Act protects waterways and requires permits for works (other than maintenance) in waterways	
				For locations that are frequently affected by flood water, and flood water poses a risk to pedestrians or vehicles consider the installation of flood warning signs. These locations could include overland flow paths, roadways, and detention basins	
<b>Infrastructure gaps</b>	<ul style="list-style-type: none"> <li>Infrastructure gaps exist within the stormwater system, particularly in once rural townships which have become or are becoming increasingly urbanised</li> </ul>	<ul style="list-style-type: none"> <li>Limited ability of properties zoned residential to connect to the system. This results stormwater which discharges to ground or to streets which have limited connectivity to the piped network</li> <li>This results in concentrated flow being passed to neighbouring properties, or roads becoming the primary drainage asset</li> <li>Onsite disposal of stormwater within urban areas (e.g., via soakage trenches) is problematic</li> <li>Potential flooding of properties and roads. Inadequate roadside drainage</li> </ul>	NMC Works & Infrastructure, Plumbing	Audit existing and future urban/development areas to document where infrastructure gaps exist. Cross reference against System Flood and Risk Studies to determine projects for inclusion in future works programs identifies locations where infrastructure gaps exist	<b>MEDIUM</b>
				Plumbing controls for new works	<b>HIGH</b>

**HIGH** (WITHIN 1 YEAR)   **MEDIUM** (1-3 YEARS)   **LOW** (3+ YRS)

RISK / ISSUE / OPPORTUNITY	DISCUSSION	RISK	RESPONSIBILITY	MITIGATION	PRIORITY
<b>Cross-connections</b>	<ul style="list-style-type: none"> <li>Interconnections between the sewer and stormwater systems</li> <li>These have occurred through illegal plumbing works, lack of stormwater or sewer services, and from emergency overflows from the sewage network (e.g., pump stations)</li> </ul>	<ul style="list-style-type: none"> <li>Inflow of sewage into the stormwater network creates health and environmental risks</li> </ul>	NMC Works & Infrastructure, Plumbing, TasWater	Discuss with NMC Plumbing and TasWater. Consider undertaking an investigation program to identify illegal connections	<b>LOW</b>
				Plumbing regulations provide legislative framework to address no compliances	<b>HIGH</b>
<b>Flood maps</b>	<ul style="list-style-type: none"> <li>Flood maps have been generated through modelling undertaken in the Stormwater System Flood and Risk Studies and through other flood studies</li> </ul>	<ul style="list-style-type: none"> <li>Flood maps/layers not transferred to NMC GIS or planning systems/layers, meaning knowledge transfer has not occurred between departments</li> </ul>	NMC Works & Infrastructure, Planning, IT	Consolidate flooding mapping into to a GIS flood prone area layer. Information can be used for assessment of developments in accordance with the Planning Scheme Flood Prone Areas Code	<b>MEDIUM</b>
		<ul style="list-style-type: none"> <li>Developments may be allowed to occur without consideration to flooding or the appropriate controls being implemented</li> <li>Existing and future development may be flooded</li> </ul>		Identify riverine catchments for which additional flood studies are needed. Seek grant and funding opportunities to produce them	<b>MEDIUM</b>
<b>Water Sensitive Urban Design (WSUD), water quality management, and soil and water management</b>	<ul style="list-style-type: none"> <li>Water quality from existing and proposed urban stormwater systems have the potential to impact the receiving environment</li> <li>Natural waterways have been modified and degraded</li> <li>Waterways may have inputs resulting from insufficiently treated onsite wastewater disposal and from illegal sewer connections, due to poor soil and water management practices at developments</li> <li>The quality of the water in the systems remains largely unknown</li> </ul>	<ul style="list-style-type: none"> <li>Poor water quality impacts the health of natural systems</li> </ul>	NMC Works & Infrastructure, NRM	Consider adopting the water quality elements contained in the <i>State Stormwater Policy Guidance and Standards for Development</i>	<b>MEDIUM</b>
		<ul style="list-style-type: none"> <li>Pollution degrades the natural environment, reduces human enjoyment, and impacts health and safety</li> </ul>		Liaise with NRM to assess waterway health Determine key values from which to determine specific actions to improve water quality in the natural systems. Include in this SSMP and forward budgets	<b>MEDIUM</b>
		<ul style="list-style-type: none"> <li>Loss of flora and fauna</li> <li>Potential impacts on human health and potential uses of the systems (e.g., irrigation, recreation etc.)</li> </ul>		Audit of the natural system to understand the existing state of these waterways including a review of the <u>natural values atlas</u> to identify areas of important natural values that require protection	<b>MEDIUM</b>
		<ul style="list-style-type: none"> <li>Bulk unsightly litter and contaminants entering the systems from commercial, residential and developing areas</li> </ul>		Seek grant and funding opportunities to reduce pollutants entering waterways from existing areas to identify areas of important natural values that require protection	<b>MEDIUM</b>
				Ensure permit conditions state soil and water management requirements and ensure compliance	<b>HIGH</b>

**HIGH** (WITHIN 1 YEAR)   **MEDIUM** (1-3 YEARS)   **LOW** (3+ YRS)

# APPENDIX B

## Specific urban stormwater actions

### Avoca

#### FALMOUTH STREET

ACTIONS	PRIORITY	ID
Confirm whether flooding near the war memorial and no. 2 St Pauls Place has occurred (check with operations staff and nearby residents). Consider additional SEPs and/or raising nature strips to the backside of kerbs	LOW	A01
Inspect and consider upgrading road pits in sag locations in St Pauls Place and Blenheim Street to LGAT standard SEPs	MEDIUM	A02
The potential flooding of no. 2 St Pauls Place needs to be considered if a proposal for development on the property is submitted to Council	LOW	A03

#### CHURCHILL STREET

Consider installing additional pits and/or pipe capacity for the system at the intersection of Falmouth Street and Churchill Street	LOW	A04
Consider raising the nature strip at the back of kerb on Churchill Street, near the intersection	LOW	A05

#### ST. PAULS PLACE

Formalise flow paths and/or extend pipework through nos. 12a St Pauls Place and 2352 Esk Main Road	LOW	A06
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### Breadalbane

#### TRANSLINK AVENUE (NORTH)

Consider undertaking model calibration to better align modelled results with real-world measurements and observations. Such improvements will give confidence in the model and surety that proposed upgrades to the stormwater system are well targeted and provide value for money	MEDIUM	B01
Construct an open drain between the northern corner of Statewide to Evandale Road in order to control flows and remove flooding on the Evandale Road industrial lots. Ensure driveways and driveway culverts off Evandale Road are suitably designed to prevent flooding from the Evandale Road drain pushing back into the private properties. Refer to drawing 2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2 (SAS/HDNA 14/07/2015) and drawing TRANSLINK-1 rev A (HDNA, 25/09/2016)	LOW	B02
Undertake additional model runs to determine whether spilling of the basin occurs during the 5% and 2% AEPs. Reconstruct detention basin lip and spillway to prevent spilling during the 1% AEP. Refer to drawing 2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2 (SAS/HDNA 14/07/2015)	LOW	B03
Discuss the flooding of Evandale Road with State Growth to determine potential solutions. Consider upgrading culvert and constructing associated pipework on Evandale Road and Translink Avenue as per drawing 2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2 (SAS/HDNA 14/07/2015) and drawing TRANSLINK-1 rev A (HDNA, 25/09/2016)	LOW	B04

## Breadalbane (continued)

ACTIONS	PRIORITY	ID
<b>RICHARD STREET</b>		
Consider removing the kerb and/or upgrading the side entry pit (SEP) and/or shaping the flow path between the road and open drain at the northern end of Richard Street	LOW	B05
Review and update model as vacant land is developed to ensure service levels remain adequate and consider upgrading network if necessary	LOW	B06
<b>JOHNS STREET</b>		
Consider undertaking model calibration to better align modelled results with real-world measurements and observations. Such improvements will give confidence in the model and surety that proposed upgrades to the stormwater system are well targeted and provide value for money	MEDIUM	B07
Undertake additional model runs to determine whether spilling of the basin occurs during the 5% and 2% AEPs	LOW	B08
Update the model to include LGAT SEPs and pipework in the vicinity of the crossover to no.16 Johns Street. Rerun the model to determine the impact of these pit additions	LOW	B09
Check the levels of the crossover and driveway to no. 16 Johns Street. Consider raising the crossover/driveway to provide freeboard above the Johns Street channel	LOW	B10
Consider diverting the upper stormwater network from Translink Avenue to a new detention basin south-west of the upper end of Boral Road. Refer to drawing <i>2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2</i> (SAS/HDNA 14/07/2015) and drawing <i>TRANSLINK-6 rev A</i> (HDNA, 25/09/2016)	LOW	B11
Consider making the Johns Street basin redundant and piping flows north-east to a new culvert under Evandale Road. Refer to drawing <i>2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2</i> (SAS/HDNA 14/07/2015) and drawings <i>TRANSLINK-1 to 5 rev A</i> (HDNA, 25/09/2016)	LOW	B12
Consider upgrading pipework and pits in the sag of Boral Road approximately 50m west of Evandale Road and/or adjust levels from the sag to the intersection and open drain. This may reduce potential flooding in Boral Road to a low risk	LOW	B13
<b>BORAL ROAD</b>		
Consider construction of a new detention basin south-west of the upper end of Boral Road. This can control rural runoff, and the future adjacent expansion of the industrial precinct between Translink Avenue north and Munroe Street. It could also accept flows diverted from the upper Johns Street catchment as discussed in Section 8.3.3 of this document. Refer to drawing <i>2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2</i> (SAS/HDNA 14/07/2015) and drawings <i>TRANSLINK-5 and 6 rev A</i> (HDNA, 25/09/2016)	MEDIUM	B14
Inspect the cut-off drain above no. 23 Boral Road. Determine Council ownership/liabilities	MEDIUM	B15
Update the model to include private network at no. 11 Boral Road (Haywards) and/or to confirm with owners whether predicted flooding has occurred	MEDIUM	B16
Check levels of the crossover and driveway to no. 11 Boral Road. Consider raising the crossover to provide freeboard above the Boral Road channel	MEDIUM	B17
It may be possible to better enable flows to be passed from Boral Road to Evandale Road. Results show some shallow flooding is passed to Evandale Road. Adjusting the transition between Boral Road and the shallow drain on Evandale Road may reduce flooding of Boral Road and the carpark at no. 11. Evandale Road and its drainage is the responsibility of State Growth. As such, negotiation with State Growth may be necessary to make such changes	LOW	B18

ACTIONS	PRIORITY	ID
<b>HUDSON FYSH DRIVE</b>		
Consider undertaking model calibration to better align modelled results with real-world measurements and observations. Such improvements will give confidence in the model and surety that propose upgrades of stormwater assets in the area re well targeted	<b>MEDIUM</b>	B19
Upgrade cut-off drain above nos. 3 and 5 Gatty Street	<b>LOW</b>	B20
Undertake additional model runs to determine whether spilling of the basin occurs during the 5% and 2% AEPs	<b>LOW</b>	B21
Consider the installation of a detention basin above Gatty Street. Refer to drawing <i>2014016NMC-Translink Concept Stormwater Designs for Grant Application rev 2</i> (SAS/HDNA 14/07/2015), concept drawing <i>TRANSLINK-9 rev A</i> (HDNA, 25/09/2016), and detailed design drawings 0125.008-C01 to C03 (HDNA, 01/2020).	<b>LOW</b>	B22
Consider augmenting the existing detention basin behind no. 7 Hudson Fysh Drive and divert rural flows from the south into it. Refer to drawing <i>2014016 NMC-Translink Concept Stormwater Designs for Grant Application rev 2</i> (SAS/HDNA 14/07/2015), concept drawing <i>TRANSLINK-8 rev A</i> (HDNA, 25/09/2016).	<b>MEDIUM</b>	B23
Consider upgrading the existing road pits to LGAT standards. Consider providing addition pit and pipe capacity and/or raising of nature strips and crossovers to prevent flooding through to private property	<b>LOW</b>	B24

## Campbell Town

### WEST STREET(NORTH)

Update model to include new development in Bond Street. Conduct additional assessment on flood risks. Work to better define the open drain to the rear of these properties may be required	<b>LOW</b>	NCT01
Update the model to include missing culverts in Pedder Street and West Street	<b>LOW</b>	NCT02
Inspect and assess culvert inlets. Consider headwalls to prevent blockages and upgrades to network to reduce flood footprints. Ensure flood footprints are transferred to NMC Intramaps.	<b>HIGH</b>	NCT03

### EAST STREET

Consider the potential for flooding of the high school. Connections to the public network from school buildings may need to be determined and the model updated	<b>LOW</b>	NCT04
Investigate the effectiveness of drainage pipes/pits and the eastern end of Church Street. Ensure the potential for road flooding is limited to <300mm flood depth	<b>MEDIUM</b>	NCT05
Consider the potential for flooding of no. 68 High Street and the adjacent carpark in Church Street. Verify whether flooding has occurred in the past and consider upgrading pipes, pits and/or open drain	<b>LOW</b>	NCT06
Update model to include the rail culvert in the vicinity of East Street to determine impacts on East Street	<b>MEDIUM</b>	NCT07

### WILLIAM STREET

Update model to include William Street and East Street culverts to confirm the risks of flooding to no. 1 William Street	<b>LOW</b>	NCT08
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### KING STREET (EAST)

Consider installing an additional road pit on the northern side of the road at the sag in Queen Street. Remodel the effects to ensure overflows are not passed to Bridge Street private properties	<b>LOW</b>	NCT08
Consider raising driveways of nos. 18 and 20-30 King Street and 140 Bridge Street and installing additional pits in the sag in King Street	<b>LOW</b>	NCT09
Provide additional pits or upgrade existing SEPs on the eastern side of the King and Bridge Street intersections	<b>LOW</b>	NCT10

## Campbell Town (continued)

ACTIONS	PRIORITY	ID
<b>FRANKLIN STREET</b>		
Update model to include culvert under Bedford Street, north of the Franklin Street intersection. Remodel and update this study to reflect results	LOW	SCT01
Confirm the capacity of the culvert under Franklin Street in the vicinity of the rail line is appropriate. Consider upgrading culvert to ensure flooding of No.11 Franklin Street is safe. This will require further modelling and analysis	MEDIUM	SCT02
<b>MONTAGU STREET (EAST)</b>		
Confirm the existence of additional culverts near the intersection of Montagu Street and the rail line. If they do, collect asset data and include in the model. Update this study to include any revised modelling results	MEDIUM	SCT03
Inspect the Bedford Street open drains. Consider upgrades and/or raising of driveway crossings as required	LOW	SCT04
<b>MONTAGU STREET (WEST)</b>		
Inspect the High Street open drains to determine suitability and state of repair. Consider upgrading to add capacity if required	LOW	SCT05
<b>FORSTER STREET</b>		
Inspect the Montagu Street and Forster Street open drains and culverts in order to determine suitability and state of repair. Consider upgrading to add capacity if required	LOW	SCT06
<b>Cressy</b>		
<b>JETSON COURT</b>		
Consider the installation of additional road capacity at the western end of Jetson Court	LOW	CR01
Ensure the unmade road levels north of no. 8 Main Street to ensure overland flooding is directed to the open drain	LOW	CR02
<b>WILLIAM STREET</b>		
Consider providing additional stormwater pipes and pits, particularly at the intersection of William Street and Archer Street. Upgrade existing side-entry pit (SEP) to LGAT standard	LOW	CR03
Consider upgrading open drain in unmade Archer Street and the drain running along the boundaries of nos. 8-10 Main Street and 4-12 William Street to ensure carriage of 1% AEP flows	LOW	CR04
<b>WILSON STREET</b>		
Update the model to include the William Street and East Street culverts to confirm the risks of flooding to no. 1 William Street	LOW	CR05
Consider upgrading road pits to LGAT standard and increasing the capacity of the DN225 pipe downstream of the manhole at the south-west corner of no. 18 Archer Street	LOW	CR06
<b>ARCHER STREET (SOUTH)</b>		
Check the existence and extent of an open drain downstream outlet. Update the model. Define and upgrade open drain if necessary	LOW	CR07
Consider upgrading the SEP to LGAT standards and/or construct additional pits to reduce road flooding, the system has spare capacity to accept additional flows from the road during the 10% AEP	LOW	CR08

## Cressy (continued)

ACTIONS	PRIORITY	ID
<b>KING STREET</b>		
Undertake survey of the stormwater system to asset information. Update model and rerun as required	<b>HIGH</b>	CR09
Consider raising kerb and crossovers in Gatenby Street, Main Street and King Streets to maximise storage capacity of the roadways	<b>LOW</b>	CR10
Consider upgrading the DN600 pipeline through 8a King Street. Consider the installation of an open drain on the southern side of no. 8a King Street to accommodate overland flow	<b>LOW</b>	CR11
Consider upgrading road pits in the sags of Gatenby, Main and King Streets to LGAT standards. Google Street View shows that all of the existing pits are non-standard	<b>LOW</b>	CR12
<b>MURFETT STREET</b>		
Consider the provision of additional pipe and pits to remove road flows and intersections during the major AEP. Consider raising kerbs and crossovers to mitigate flooding of private properties.	<b>LOW</b>	CR13
Consider arrangements for the open drain north of no. 2 Charles Street. Ensure the drain is properly catered for as it is intercepted by Murfett Street. Update the model as required. Consider directing flows from the drain straight through to no. 4 Elphinstone Road, rather than into the Murfett Street kerb and channel	<b>LOW</b>	CR14
Consider extending Church Street pipework from the Charles Street intersection connect to the bubble-up pit on the western side of the Main Street intersection	<b>LOW</b>	CR15
<b>SAUNDRIDGE ROAD</b>		
Consider upgrading road pits at intersection of Saundridge Road and Charles Street to LGAT standard pits. Ensure Saundridge Road roadside drain and culvert inlet are fit for purpose. Consider better defining drain to provide developed depths for the culvert inlet	<b>LOW</b>	CR16
Consider upgrades to the stormwater system and flood path through Cressy District High School to ensure no surcharge from the system during the minor AEP	<b>MEDIUM</b>	CR17
Inspect the DN375 outlet and open drain within High School grounds. Consider improvements and upgrades as required	<b>LOW</b>	CR18
Inspect open drain south of Cressy District High School. Consider adding the culvert crossings to the model. Determine Councils requirements for exiting culverts to be maintained or removed	<b>LOW</b>	CR19
<b>MAIN STREET (SOUTH)</b>		
Consider defining the open drain along the southern side of no. 136 Main Street, or extending outlet pipe to the major drainage channel at the western end of the property	<b>LOW</b>	CR20
Consider upgrading road pits to LGAT standard and/or direct road overflows to shaped drain commencing at the south-east boundary of no. 136 Main Street	<b>MEDIUM</b>	CR21

## Evandale

### CAMBOCK LANE WEST

ACTIONS	PRIORITY	ID
Ensure the stormwater system is catered for during the upcoming development of No. 43 Cambock Lane East	LOW	EV01

### CAMBOCK LANE EAST

Consider the provision of additional SEPs on High Street as necessary. The downstream system to the outlet has capacity to accept additional inflow	LOW	EV02
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### COLLINS STREET

Undertake survey of pits and pipelines from Collins Street to the northern extent of Murray Street. Update model and GIS data as necessary. Add missing SEP located near the Murray Street and Rodgers Lane intersection. Rerun the model and update this document	LOW	EV03
Consider upgrading the pipe network to ensure it does not flood during the 10% AEP, and reduces flooding during the 1% AEP. This will require additional modelling and analysis	LOW	EV04

### LOGAN ROAD

Consider upgrading the stormwater system between Coachmans Road and Stockmans Road to prevent surcharge from it during the minor event, and to allow capacity for intensification of the area's development	LOW	EV05
Upgrade the inlets and system downstream of Saddlers Reserve to ensure the overland flows produced during the major AEP are contained and not passed through private property. Consider the installation of a detention basin within Saddlers Reserve	LOW	EV06
Provide additional capacity to pipes and inlets within Drovers Court and Stockmans Road. Upgrade existing pits within the system, particularly in Drovers Court and Stockmans Road, to LGAT standard SEPs	MEDIUM	EV07

## Longford

### GAY STREET

Determine the best way to prevent flooding within Nos. 9 and 11 Gay Street. This may include:

- Extend open drain to the kerb, and allow overtopping of roadway via a new crossover arrangement
- Raising the kerb and/or easement
- Improving the capacity of inlet pits and downstream pipework
- Increase the capacity of the rail culvert

LOW NWL01

Currently the open drain is acting as part of NMC's stormwater system. If water is prevented from entering it could be decommissioned

### HAY STREET

Determine whether upgrades to the network should be considered to prevent surcharging from the system	LOW	NWL02
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### HIGH STREET (WEST)

Verify whether flooding of No. 31 Smith Street and the Longford Recreation Ground is an issue and consider upgrading the system. The pipes downstream of the recreation ground have capacity available to accept additional flows from upstream	LOW	NWL03
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## Longford (continued)

ACTIONS	PRIORITY	ID
<b>PATON STREET</b>		
Consider upgrading road pipes and pits in Davis Crescent to LGAT standards	<b>MEDIUM</b>	NWL04
<b>HOBHOUSE STREET (WEST)</b>		
Undertake survey of pipes and pits and verify capacity of DN150 pipeline behind Nos. 104 and 110 Marlborough Street. Consider whether an upgrade is necessary. Aerial imagery shows Nos. 102 and 104 as vacant land which, once developed will increase the likelihood of flooding.	<b>LOW</b>	NWL05
Consider upgrades to in the sags of Hobhouse Street, Marlborough Street and Catherine Street.	<b>LOW</b>	NWL06
<b>BULWER STREET</b>		
Ensure road pits in Lach Dar Court are LGAT standard side entry pits (SEPs)	<b>LOW</b>	SWL01
<b>LEWIS STREET (WEST)</b>		
Ensure the roadside drain on the western side of Catherine Street has sufficient capacity to pass flows to the headwall and the intersection of Lewis Street West	<b>LOW</b>	SWL02
Ensure the roadside drain on the western side of Cressy Road has sufficient capacity to pass flows to the inlet adjacent No. 1 Cressy Road	<b>LOW</b>	SWL03
<b>CRACROFT STREET(WEST)</b>		
Update the model to include road pits in Equus Court and Mews Court. Rerun the model and revise the risk assessment and action plan as required	<b>MEDIUM</b>	SWL04
<b>CATHERINE STREET (SOUTH)</b>		
Ensure overland flow paths between Anstey Street and Catherine Street are maintained and considered in any development in the surrounding land	<b>MEDIUM</b>	SWL05
Consider upgrading culvert crossings	<b>MEDIUM</b>	SWL06
Consider the overall stormwater system requirements and layout as development occurs in the area. The roadside drains appear to hold water	<b>LOW</b>	SWL07
<b>UNION STREET</b>		
Consider upgrades to the stormwater network at the intersection of Union and Wellington Streets. Given the location of the intersection near a busy shopping precinct a higher priority may be appropriate for this work.	<b>LOW</b>	NEL01
Consider improvements to the roadside drainage and inlet to alleviate flooding within No. 5 Union Street	<b>LOW</b>	NEL02
Confirm the levels and functionality of the stormwater network linking the land adjacent to Union Street and No. 3 Union Street with the open drain in No. 7 Wellington Street. Confirm the functionality of the open drain in No. 7. Update the model and consider improvements as necessary	<b>LOW</b>	NEL03
<b>SMITH STREET</b>		
Confirm the diameter and levels of the cross connections in Smith Street and Latour Street. Update the model, risk assessment and action plan as required	<b>MEDIUM</b>	NEL04
Confirm whether there is real-world evidence of surcharging (popping of manhole lids) occurring in Smith Street, between Wellington and George Streets. These manholes are within the westbound carriageway and could pose a danger to traffic if the lids are forced off	<b>LOW</b>	NEL05

## Longford (continued)

ACTIONS	PRIORITY	ID
<b>LYTTLETON STREET</b>		
Confirm ownership which assets within No. 8a Lyttleton Street (TasWater) and No. 73 Wellington Street are private and which are public. Remove private assets from the database or provide notation and that they are private	LOW	NEL06
Confirm levels and functionality of cross-connection and ensure the network and swale in the vicinity of No. 17 Latour Street are fit for purpose	LOW	NEL07
<b>SWAN AVENUE</b>		
Consider upgrading the Gosling Grove sag pit inlet capacity and downstream pipework	MEDIUM	SEL01
<b>LONGFORD CLOSE</b>		
Confirm whether flooding of No.13 Country Field Court has occurred and consider upgrading the SEPS to LGAT standard pits if required. Consider increasing driveway freeboard to No. 13 and increasing pipe capacity as needed	LOW	SEL02
Install raised grates on the Cracraft Street open drain pits to help prevent blockage and ensure functionality is maintained	LOW	SEL03
Investigate the Longford Racecourse private pump station. Incorporate information relative to the racecourse drainage into the Longford model and liaise with racecourse management if corrective action is required	MEDIUM	SEL04
<b>WELLINGTON STREET (SOUTH)</b>		
Consider upgrading existing road pit adjacent the south-western corner of No. 2 Bulwer Street to LGAT standards. Check channel levels and if necessary, install and new pit in the low point. Consider increasing kerb and/or nature strip freeboard levels and the capacity of the downstream as required	LOW	SEL05
Install raised grates on Cracraft Street open drain pits to help prevent blockage and maintain functionality	LOW	SEL06
Approach the operators of the Longford Racecourse to obtain information about their stormwater drainage, pumps/wet-well and procedures. Failure of the racecourse to control their concentrated flows needs to be addressed. Incorporate information relative to the racecourse drainage into the hydraulic model	LOW	SEL07
Inspect open drain and headwall within No. 3 Lewis Street. Ensure the inlet is well maintained and clear of blockages. Consider upgrading inlet headwall if required	LOW	SEL08

## Perth

<b>GEORGE STREET</b>		
Ensure the subdivision of No. 96-102 Fairtlough Street and changes to the stormwater system are updated in the model. Ensure any new inlets and flowpaths, constructed within and upstream of the new subdivision, are well maintained. Remodel the determine impacts of the subdivision on predicted flooding and hazards at Seccombe Street, and within the overland flow path between Seccombe Street and Arthur Street. Update this the flood study, risk assessment and action plan as required	MEDIUM	EP01
Consider upgrading the road pit and pipework from Onyx Court, or reducing the depth required for spilling to occur to the adjacent overflow path	LOW	EP02
Consider the implication high hazard flows within the overland flow path between Seccombe Street and Arthur Street. Review modelled roughness of this zone	MEDIUM	EP03
Consider upgrading the overland flow path adjacent Nos. 50 and 52 Arthur Street. Consider the installation of a plinth wall to ensure flooding is contained within the flow path	LOW	EP04

## Longford (continued)

ACTIONS	PRIORITY	ID
Consider the creation of an overland flow path linking Arthur Street to the western rail line and culvert. An upgrade of the pipes and pits may be needed – if additional stormwater can be directed to the rail easement No. 41-43 Arthur Street may be protected. An additional rail culvert may also help, although additional flow to the southern side of the line may adversely impact properties downstream of that point	<b>MEDIUM</b>	EP05
Ensure the open drain and potential wider flow path within No. 48 George Street is protected. This includes ensuring the DN900 culvert inlet adjacent to Fairtloug	<b>MEDIUM</b>	EP06
Consider the construction of a detention basin within No. 48 George Street. The property may have sufficient size to hold a detention basin. A basin could reduce downstream overland flows and provide a buffer for the future intensification of development likely within the catchment	<b>MEDIUM</b>	EP07
Inspect the road pit adjacent to No. 143 Fairtlough Street. Blockage of this pit could contribute to private property flooding between Fairtlough Street and Clarence Street. Consider upgrading the stormwater main within No. 143 from DN750 to DN900 or DN1050	<b>LOW</b>	EP08
Consider conversion of the manholes within Nos. 24A and 24B George Street to grated inlets in order to capture flooding within the natural gully	<b>LOW</b>	EP09
Inspect the pits in the sag of Clarence Street. Consider upgrading the pits and downstream pipework as necessary	<b>LOW</b>	EP10
Inspect open drain within No. 1-3 George Street. Consider the acquisition of a formal easement, remove barriers as necessary, and undertake regular maintenance	<b>HIGH</b>	EP11
Consider the provision of additional pit/pipe capacity in Fairtlough Street, adjacent Perth Football Club	<b>LOW</b>	EP12
When As-Constructed data is available include the subdivision opposite No. 18 Clarence Street in the model. Ensure the designed overland flow path allows road flows to pass through the subdivision and into the open drain with No. 1-3 George Street	<b>LOW</b>	EP13
<b>ARTHUR STREET</b>		
Consider linking the stormwater system at the intersection of Clarence Street and Arthur Street either to the eastern end of Arthur Street, or southwards to the sag pits adjacent No. 16 George Street in Clarence Street. Consider linking the stormwater system at the intersection of Clarence Street and Arthur Street either to the eastern end of Arthur Street, or southwards to the sag pits adjacent No. 16 George Street in Clarence Street	<b>LOW</b>	EP14
Consider upgrading the Samclay Court sag pit to an LGAT standard grated SEP. Consider providing additional pits and raising the highpoint of the driveway of No. 8 if necessary	<b>LOW</b>	EP15
<b>OLD BRIDGE ROAD</b>		
Confirm the size of the pipeline in front of Nos. 17 and 19 Old Bridge Road. Update the asset data and remodel if necessary	<b>LOW</b>	EP16
Consider upgrading the ungrated side-entry pit (SEP) at the southern end of Old Bridge Road with an LGAT standard grated SEP	<b>LOW</b>	EP17
<b>SECCOMBE STREET WEST</b>		
Obtain As-Built drawings and/or undertake survey to determine any changes to the stormwater system as a result of highway works. Update Council asset and GIS data and the model as required. Update the ground model and 2D mesh when new LiDAR is available. Rerun the model and updated this report in due course	<b>LOW</b>	WP01
Update model to include the Muirton Way 2D components, and Seccombe Street kerb and channel. Review the potential for flooding between No. 82 Seccombe Street and No. 4 Muirton Way. Rerun the model and updated the report as necessary	<b>MEDIUM</b>	WP02

## Longford (continued)

ACTIONS	PRIORITY	ID
<b>YOUL ROAD</b>		
Check pipe and pit levels at the intersection of Main Road and Arthur Street and update model if necessary	LOW	WP03
Consider the upgrade of the Cootamundra Drive and Acacia Court road pits to LGAT standard grated SEPs. Also consider upgrading the DN300 pipeline behind Nos. 58 to 82 Arthur Street	LOW	WP04
<b>PHILLIP STREET (WEST)</b>		
Confirm the existence of a gully pit adjacent to No. 5 Napoleon Street and add data to the GIS and the model. Re-run the model and review impacts to Napoleon Street and private properties	LOW	WP05
<b>NAPOLEON STREET</b>		
Inspect the headwalls on the western side of Napoleon Street. Ensure they are effective and well maintained. Consider upgrades to these inlets (e.g., installation of headwalls to LGAT standards) and ensure open drains are maintained	LOW	WP06
Consider the effects of increase stormwater on the downstream system from any proposed development on the western side of Napoleon Street	MEDIUM	WP07
<b>EDWARD STREET</b>		
Consider upgrades to pipe network on the northern side of Edward Street in conjunction with any infill development. It may be possible to link this network to the pipeline on the southern side of the road to provide relief	LOW	WP08
<b>CROMWELL STREET</b>		
Undertake programmed capital works to replace the Cromwell Street culverts with a box culvert. Realignment of the drain upstream of the new culvert will improve efficiency	LOW	WP09
Ensure any development of No. 1-13 Cromwell Street considers potential breakout from the dam and the interaction between Sheepwash Creek flows, and the flows from the direction of Cromwell Street	MEDIUM	WP10
<b>EFFRA COURT</b>		
Consider upgrades to the DN150 which collects the western side of Effra Court	LOW	WP11
<b>NORFOLK STREET</b>		
Consider upgrades to the Fredrick Street gully pits to standard LGAT SEPs. Currently the road pits are gully pits only with capacity for side-entry. Consider adding addition pits in the sag in Norfolk Street adjacent to no. 69 Frederick Street and upgrading the pipework as required	LOW	WP12
Consider directing kerb connections in Frederick Street directly to the adjacent pipelines where possible	LOW	WP13
<b>DRUMMOND CRESCENT</b>		
Consider upsizing the pipe network on the eastern side of Drummond Crescent. It is noted that the topography in this area is very flat and the outfall is restricted by the depth of the open drain on the southern side of Drummond Street	LOW	WP14
Undertake an investigation to determine options, if any, to alleviate the internal flood of the properties at No. 58 Drummond Street. This may include the installation of additional kerb and channel, better collection and diversion of flows from the Drummond Crescent intersection, and upsizing and lowering the DN225 culvert	LOW	WP15
Provide new SEPs between Scone Street and Drummond Crescent with links to the roadside drain on the southern side of Drummond Street	MEDIUM	WP16

# APPENDIX C

## 10 Year Capital Works Program (Current January 2023)

FY BEGINNING	TOTAL
2023	950,000
2024	1,085,000
2025	720,000
2026	562,000
2027	555,000
2028	685,000
2029	530,000
2030	670,000
2031	615,000
2032	535,000
	6,907,000

### REV. 3 NOVEMBER 2022

This program provides a preliminary list of potential projects derived from various sources:

1. Urban stormwater system flood and risk studies
2. Large projects based on other studies (e.g. Sheepwash Creek flood mapping)
3. Water quality (WSUD) projects targeting the removal of litter from waterways with installation of gross pollutant traps (GPTs) on networks which collect stormwater from commercial or industrial areas
4. Projects identified by the Works and General Managers

Council's understanding of the condition of its assets is very limited. Nominal items have been added to undertake rolling CCTV program which will help form the basis of condition-based renewal program.

The current costs associated with each line item are currently preliminary only. As the scope of each item is improved through further investigation and design, the program will be updated with improved estimates.

Future costs have not been discounted.

The west Perth (Sheepwash Creek) culvert projects for Drummond Street, the rail line, Youl Road, Edwards Street and for Phillip Street are high cost items for which we are seeking grant funding opportunities to help progress. Grants will be sought for other projects as appropriate.

Some 'placeholder' investigation items have been listed for 2023/2024. These may be done in-house or by consultants. These are strategic investigations which may lead to additional projects added to the program.

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
High Street culvert upgrade	Acquisition	30000	West of 1a Bond Street	Upgrade of culvert and/or inlet and outlet headwalls and adjacent headwalls in order to reduce flood footprint on eastern side of highway	Campbell Town	NCT03	H	No design required?	No	State Growth road?
West Street culvert upgrade	Acquisition	20000	West 12 High Street	Upgrade of culvert and/or inlet and outlet headwalls	Campbell Town	NCT03	H	No design req?	No	
King Street stormwater system strategy	Investigation	20000	King Street stormwater system	Undertake assessment and design of upgrade of stormwater system in King Street catchment. Increase minor system capacity to at least 10% AEP, more if required, ensure existing and future development is properly serviced, and limit 1% CC overland flooding if possible. Include detailed design of Stage 1 of upgrades for construction in 24/25	Cressy	CR09, CR10, CR11, CR12	M	Options	N/A	
Road pit replacement program	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All	A02, CR21, NWL04, EV02	M	No design required?	N/A	Start with higher risk sag locations
Church Street / High Street network upgrade and GPT	Acquisition, Renewal/upgrade	100000	Intersection of Church Street and High Street, and south-west corner of Memorial Ground	Provide duplicate culvert, upgrade pits (if necessary). Install GPT	Campbell Town	NCT05, NCT06	M	Design required	No	
Logan Road stormwater system strategy	Investigation	20000	Saddlers Reserve, Drovers Court, Shepherds Court, Stockmans Road	Undertake assessment for provision of additional capacity to pipes and inlets within Drovers Court and Stockmans Road. Upgrade existing pits within the system, particularly in Drovers Court and Stockmans Road, to LGAT standard SEPs	Evandale	EV07	M	Options	N/A	
Drummond Street bridge	Renewal/upgrade	450000	Sheepwash Creek crossing of Drummond Street	Replacement of existing culverts with bridge. Includes creek realignment and stabilisation works up and downstream from Drummond Street	Perth		M	Design required	Concept	State Growth road? Design and construct, assumes 50% funding from NDRRGP Grant
Carins Street stormwater upgrades	Acquisition	30000	Carins Street, Union Street to end	Install low-flow pipes/s and V-pits, reshape open drains	Longford			Design	No	Design in progress
Arthur Street overland flow path	Acquisition	25000	43 Arthur Street	Construct overland flow path following demolition of building	Perth	EP04, EP05	M	Design required	No	
CCTV Program West Perth	Investigation	60000	West Perth		Perth			N/A	N/A	
Devon Hills urban stormwater modelling	Investigation	25000	Devon Hills	Survey and modelling of Devon Hills public SW system, production of report	Devon Hills			N/A	N/A	
East St (Rail) Table Drain	Renewal	100000	Against rail line, William Street south	Current drain is flat and under capacity, rock	Campbell Town			Design required	No	TasRail issues
Frederick Street open drain upgrade	Renewal	50000	Frederick Street road easement, Cromwell to Napoleon Street	Centralise open drain within road easement, connect to box culvert under Cromwell Street	Perth			Design required	Check	

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All	BR24, CR03, CR06, CR08, EP16, EP17	M	No design required	N/A	Start with higher risk sag locations
<b>Rail and Youl Road box culverts and walkway</b>	Acquisition	400000	Sheepwash Creek crossing Youl Road and the rail line, adjacent to WSUD	Replacement of existing culverts with box culverts Youl Road may be new culvert or abandoned section. Includes creek realignment and transition to new culvert(s)	Perth		M	Design required	Concept	
<b>North Translink GPT</b>	Acquisition	75000	Translink Avenue	New GPT servicing a large section Translink subcatchment	Perth		WSUD	Design required	No	
<b>48 George Street inlet</b>	Renewal/upgrade	10000	48 George Street	Formalise inlet, headwall and transition to DN900	Perth	EP06	M	No design required?	No	Is detention being considered?
<b>Hudson-Fysh Drive basin expansion</b>	Renewal/upgrade	250000	No. 47 Hudson Fysh Dr	Augment detention basin	Translink	B23	M	Design required	Concept	Ties to subdivision works
<b>Cracroft Street</b>	Acquisition	250000	NE of racecourse to Macquarie River. Install raised grates on pits adjacent to racecourse	Collect racecourse pumpstation, Cracroft Street pits, directed to new main down boundary of 245 or 277 Wellington Street then open drain to river	Longford	SEL03, SEL04	L	Design required	No	Help deal with racecourse failing pump station, alleviate Cracroft Street flooding. May allow 245 and 277 rezoning above flood footprint
<b>CCTV Program East Perth</b>	Investigation	60000		Condition investigation	Perth		N/A	N/A	No	
<b>Campbell Town pipeline extensions</b>	Investigation	20000	Campbell Town	Improve drainage for existing, infill and future development	Campbell Town	SCT04, SCT05, SCT06	L	Design required	N	Improve drainage for existing, infill and future development

# 2025/2026

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All	WP03, WP06, WP07	L	No design required	N/A	Start with higher risk sag locations
<b>Edward Street box culvert</b>	Renewal/upgrade	200000	Sheepwash Creek crossing of Edward Street, adjacent to WSUD	Replacement of existing culverts with box culvert. Includes creek realignment and transition to new culvert(s)	Perth		M	Design required	Concept	
<b>Drummond Street/ Scone Street stormwater upgrades</b>	Acquisition	300000	Drummond Street (Drummond Crescent to Scone St), Drummond Street(Scone Street to No. 18 Drummond St)	New stormwater pipe/pits	Perth	WP19	M	Design required	No	
<b>NE Longford GPT</b>	Acquisition	50000	Union Street	New GPT servicing a large section of Wellington Street	Longford		WSUD	Design required	No	
<b>Edward Street main upgrade</b>	Renewal/upgrade	100000	Edward Street (Cromwell Streetto Sheepwash Ck)	Upgrade ex. main or new duplicate main on northern side of Edward Street plus new road crossing	Perth	WP09	M	Design required	No	
<b>CCTV Program NW Longford</b>	Investigation	50000		Condition investigation	Perth			N/A	N/A	



PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All			No design required	N/A	Start with higher risk sag locations
<b>Phillip Street box culvert</b>	Renewal/upgrade	200000	Sheepwash Creek crossing of Phillip Street	Replacement of existing culverts with box culvert. Includes creek realignment and transition to new culvert(s)	Perth			Design required	Concept	
<b>East Perth GPT</b>	Acquisition	50000	George Street	New GPT servicing a large section Perth subcatchment	Perth		WSUD	Design required	No	
<b>Falmouth Street (west) upgrades and extension</b>	Acquisition	200000	Falmouth Street (St Pauls Place to Arthur St)	Upgrade pits, install new pits, pipeline extension	Avoca	A02, A04	L	Design required	No	
<b>Richard Street</b>	Acquisition	2000	Northern end/corner of Richard Street	Construct link from kerb/last SEP to open drain	Translink	B05	L	No design required	No	May be okay, check
<b>CCTV Program NE Longford</b>	Investigation	30000		Condition investigation	Longford			N/A	N/A	
<b>King Street pipe upgrade</b>	Renewal/upgrade	60000	King Street (Western Line to (location to be confirmed))	Upgrade King Street main (western end)	Perth	WP13	M	Modelling/design required	No	

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized graded side-entry pits (G-SEPs)	All		M	No design required	N/A	Start with higher risk sag locations
<b>NW Longford GPT</b>	Acquisition	50000	Intersection of Gay Street and Howick St, or western end of High Street	New GPT servicing a large section of Wellington Street	Longford		WSUD	Design required	No	
<b>No. 16 Johns Street crossover</b>	Renewal/upgrade	5000	No. 16 Johns Street	Reconstruct crossover and driveway to boundary to provide min. 150mm freeboard from channel	Translink	B10	L	No design required	N/A	May be okay, check
<b>Church Street upgrades 1</b>	Renewal/upgrade	200000	Northern end of Charles Street, western end of Church Street to Main Street	Upgrade/new pipes/pits	Cressy	CR13, CR14	L	Design required	N	Consider piping to edge of urban area while maintaining overland flow paths
<b>Collins Street stormwater catchment upgrade 1</b>	Renewal/upgrade	150000	Upgrade/duplicate pipe from outlet in no. 93 Nile Road to Collins Street	Adding capacity to alleviate system issues upstream	Evandale	EV03, EV04	L	Modelling and design required	No	
<b>CCTV Program SW Longford</b>	Investigation	20000		Condition investigation	Longford				N/A	N/A
<b>Fairtlough Street and Arthur Street Pit upgrades</b>	Renewal/upgrade	10000	Outside no. 143 Fairtlough and 24A and B George Street	Upgrade pit outside no. 143 to double grated SEP. Downstream MH lids in 24A and B to grated lids	Perth	EP08, EP09	L	No design required	N	
<b>Frederick Street stormwater upgrades</b>	Renewal/upgrade	100000	Corner Frederick Street to Charles Street	Upgrade non-standard road pits, intersection drainage, connect properties on southern side of the road to pipeline? (currently connected to kerb). Upgrade pipeline	Perth	WP14, WP15	M	Modelling and design required	N/A	

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Main Street-Jenson upgrade</b>	Renewal/upgrade	40000	No. 8 to No. 15 Main Street	Upgrade pipework in Main Street/Jenson Court intersection. New survey of network undertaken since modelling report was finished	Cressy	CR01, CR02	L	Design required	N	Remodel first
<b>Collins Street stormwater catchment upgrade 2</b>	Renewal/upgrade	120000	Upgrade/duplicate pipe from Collins Street to Russell Street	Adding capacity to alleviate system issues upstream	Evandale	EV03, EV04	L	Modelling and design required	N	
<b>Logan Road stormwater catchment upgrades 1</b>	Renewal/upgrade	120000	Upgrade/duplicate pipe through Saddlers Reserve to Stockmans Road	Adding capacity to alleviate system issues upstream	Evandale	EV05, EV06	L	Modelling and design required	N	
<b>Hobhouse Street (West)</b>	Renewal/upgrade	20000	Pakenham to Marlborough Street	Upgrade road pits	Longford	NWL06	L	No design required	N	
<b>Union Street K&amp;C upgrade</b>	Acquisition	10000	Outside no. 5 Union Street	Extend K&C and add SEP at end of kerb	Longford	NEL02	L	No design required	N	
<b>3 Lewis Street headwall upgrade</b>	Renewal/upgrade	5000	No. 3 Lewis Street	Upgrade headwall	Longford	SEL08	L	No design required	N	
<b>Drummond Street stormwater upgrades</b>	Renewal/upgrade	250000	Drummond Crescent to Drummond Crescent	K&C, lowering/upsizes of DN225 culvert	Perth	WPT7	L	Design required	N	Will help remove flooding issues at 58 Drummond Street
<b>CCTV Program SE Longford</b>	Investigation	50000		Condition investigation	Longford			N/A	N/A	
<b>Campbell Town GPT</b>	Acquisition	70000	High Street (Nth of outfall to Elizabeth River)	New GPT on DN375 main	Campbell Town			Design required	N	

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All		M	No design required	N/A	Start with higher risk sag locations
<b>Collins Street stormwater catchment upgrade 3</b>	Acquisition, Renewal/upgrade	120000	Upgrade/duplicate/realign system between Russell Street and Murray Street	Adding capacity, reducing losses do to layout, pit upgrades etc	Evandale	EV03, EV04	L	Modelling and design required	N	
<b>Logan Road stormwater catchment upgrades 2</b>	Acquisition, Renewal/upgrade	250000	Additional upgrades (detention?) in Saddlers Reserve and/or no. 38 Arthur Street	Adding capacity to alleviate system issues upstream	Evandale	EV05, EV06	L	Modelling and design required	N	
<b>CCTV Program Evandale</b>	Investigation	45000	Evandale	Condition investigation	Evandale			N/A	N/A	
<b>Johns Street basin decommission outlet/orifice resize</b>	Investigation	10000	No's 2 Hughes Court and 17 Johns Street	When upstream diversion is complete and new Boral Road detention constructed, Johns Street basin may be able to be decommissioned, or the outlet adjusted to enable more effective detention	Translink	B12	L	Design required	N	Upstream diversion has to occur first
<b>15 Hobhouse Street pipe upgrade</b>	Renewal/upgrade	75000	No. 15 Hobhouse Street	Upgrade/duplicate pipe in No. 15 through to Hobhouse Street. Add grates to pits in Countryfield Court and/or raise driveway	Longford	SEL03	L	Modelling and design required	N	Verify issues
<b>Corner Bulwer Street and Wellington Street</b>	Renewal/upgrade	10000	Corner to No. 197	Upgrade pipe and pits between intersection of Bulwer and Wellington Streets to No. 197	Longford	SEL05	L	Modelling and design required	N	

PROJECT NAME	TYPE	ESTIMATE	LOCATION	DESCRIPTION	TOWNSHIP	SSMP ACTION CODE	SSMP PRIORITY	STATUS	DESIGNED?	COMMENTS
<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All		M	No design required	N/A	Start with higher risk sag locations
<b>Gay Street upgrades</b>	Renewal/upgrade	100000		Upgrade link to between Gay Street and rail line if possible, maybe downstream	Longford	NWL01	L	Modelling and design required	N	May be difficult as overflows from road sag make way to TasRail culvert
<b>Smith Street pipe upgrade</b>	Renewal/upgrade	100000	Wellington Street to George Street	Plumb in properties to main if road flooding is an issue. Upgrade pipe and add pit on northern side of road if manholes popping	Longford	NEL05	L	Modelling and design required	N	Modelling based on direct connections. Looks like most are kerb adaptors
<b>East Drummond Crescent pipe upgrades</b>	Renewal/upgrade	250000	Northern end to Drummond Street	Ex. DN150 is undersized. May include pipe and pit upgrades and new road crossing to open drain	Perth	WP16	L	Design required	N	Will help remove flooding issues at 58 Drummond Street
<b>Falmouth Street (east) upgrades and extension</b>	Acquisition	200000	Falmouth Street (corner Churchill Street)	Upgrade pits, install new pits, pipeline extension	Avoca	A05	L	Design required	N	Check ex. Network layout, may be wrong)

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<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All		M	No design required	N/A	Start with higher risk sag locations
<b>Bedford Street stormwater main</b>	Acquisition	80000	Bedford Street (No. 24 to Montagu Street)	Extend Montague Street main to Bedford Street to drain low points	Campbell Town	SCT04	L	Design required	N	
<b>Onyx Court upgrade</b>	Renewal/upgrade	5000	Cul-de-sac head to overland flow path	Make sure overland flow path works, reshape kerb/crossover	Perth	EP02	L	No design required	N	
<b>Cressy Road inlet upgrades</b>	Renewal/upgrade	10000	No. 4 Cressy Road to Summerfield Park	Upgrade pits/headwalls servicing open drains	Longford	SWL03	L	No design required	N	
<b>Church Street upgrades 2</b>	Acquisition	200000	Charles Street to Main Street	New pipeline, extend from intersection of Church and Charles to Main Street, collect bubble up pit	Cressy	CR15	L	Design required	N	
<b>Smith Street</b>	Renewal/upgrade	150000	Longford Recreation Ground to Howick Street	Adding capacity to alleviate system issues upstream	Longford	NWL03	L	Modelling and design required	N	
<b>North Cressy open drain works</b>	Renewal/upgrade	150000	No. 8 to No. 15 Main Street	Upgrade open drains	Cressy	CR02, CR04, CR07	L	Design required	N	Consider piping to edge of urban area while maintaining overland flow paths

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<b>Road pit upgrade program</b>	Renewal/upgrade	20000	Review SSFRS for key pits	Upgrade non-standard pits with appropriately sized grated side-entry pits (G-SEPs)	All		M	No design required	N/A	Start with higher risk sag locations
<b>Samclay Court upgrade</b>	Renewal/upgrade	150000	Upgrade Samclay Court line through and sag pit	Upgrade Samclay Court line through to George Street. Trapped low point	Perth	EPT14	L	Modelling and design required	N	Verify issues
<b>Effra Court DNI150 upgrade</b>	Renewal/upgrade	75000	Rear of western Effra Court properties	Could be caused by backup from open drain?	Perth	WPT2	L	No design required	N	Verify issues
<b>Hay Street system upgrades</b>	Renewal/upgrade	100000	Upgrades system north of Longford Rec Ground	Add capacity. Realignment because of oval development?	Longford	NWL02	L	Modelling and design required	N	Surcharging in vicinity of proposed new oval.
<b>Corner Union Street and Wellington Street</b>	Renewal/upgrade	150000	Intersection	Upgrade pipes and pits	Longford	NEL01	L	Modelling and design required	N	
<b>St Pauls Place pipeline (or open drain)</b>	Acquisition	40000	Opp. St Pauls Place	Link St Pauls Place network to river	Avoca	A06	L	Design required	N	









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