



Stormwater, Waterway and Floodplain Strategy 2018

*PLANNING FOR OUR PEOPLE
OUR PLACE OUR FUTURE*

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1.1 Background

The Cessnock City Council LGA encompasses approximately 1,950 square kilometres within the Lower Hunter Region of New South Wales. The population of the LGA is approximately 56,500 people, the majority of whom reside in a thin urban belt between the townships of Cessnock and Kurri Kurri. The LGA contains three main urban areas, being the Branxton, Cessnock and Kurri Kurri districts or subregions. The general location of the main urban areas is shown in Figure 1.

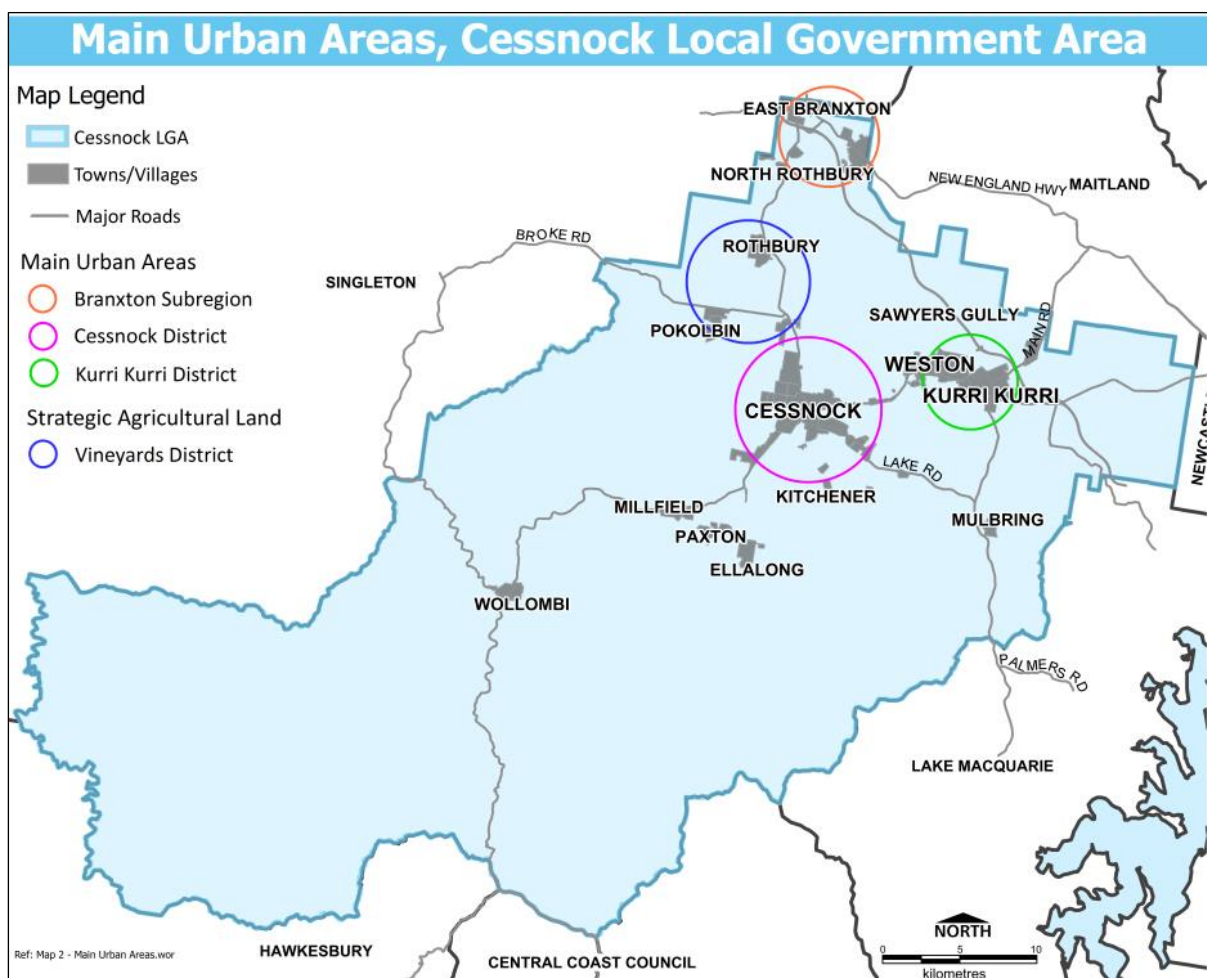


Figure 1 - Main Urban Areas, Cessnock Local Government Area

The LGA's main urban areas are expected to grow significantly in the coming years, primarily as a result of greater housing affordability and in response to major infrastructure projects, such as the Hunter Expressway, which have made the LGA more accessible to employment centres, tourism and community services and facilities in the Upper and Lower Hunter. As a result, the LGA is expecting significant urban and economic growth and a shift from primary and secondary industries, such as mining and rural industries, to an increased range of service industries. The LGA also contains significant areas of rural land, state forest

and national parks, supporting wineries and agricultural activities and a large expanses of untouched natural environment.

In anticipation of significant urban and economic growth, in conjunction with the rural and natural environment within the LGA, it is essential for Council to set clear direction for the management of its stormwater infrastructure, floodplains and waterways. The provision of a water management function is considered a key role of Council as it strives to provide a safe, sustainable and functional environment for its community.

1.2. Purpose

The purpose of the Strategy is to provide direction for the sustainable management of stormwater, waterways and floodplains across the Cessnock LGA, to address the environmental, social and economic impacts and guide civic leadership associated with a growing urban and rural community. The Strategy will set guiding principles and directions as well as proposing implementation actions in order to:

- Incorporate best practice water management planning and development requirements as part of urban and rural development outcomes;
- Integrate asset management principles and best practice stormwater engineering design and construction methods into the management and maintenance of existing and new stormwater infrastructure;
- Manage the impact of stormwater flows and stormwater pollution on receiving waterways;
- Define and manage the mainstream floodplains and local overland flowpaths with the LGA; and
- Define the waterways within the urban and rural areas and manage those waterways within Council owned and operated land.

1.3 Trends and Forecasts

The Hunter Regional Plan 2036 foreshadows that a considerable proportion of the dwellings and jobs required in Greater Newcastle by 2036 will be accommodated through the renewal, diversification and connection of the Region's strategic centres. The Cessnock City LGA has a current population over 56,000 and a projected population in 2036 of 69,320. To accommodate this population, an additional 6,350 dwellings will be required. These dwellings will be delivered through a combination of infill and greenfield development. Further, with the Hunter Expressway improving the accessibility of the LGA to key regional centres for recreation and employment, as well as housing affordability, is likely to accelerate the demand for housing.

The increasing trend in recent years of demolishing older homes and reconstructing new dwellings that take up a higher portion of the block along with intensifying the density of urban development is increasing the impervious portion of the catchment. This trend in general, increases runoff and flooding issues and adversely impacts on natural watercourses downstream of urban development.

The approach to stormwater management in Australia has changed from one focused on conveying and discharging storm and flood water through the catchment and along creeks as rapidly as possible, to one where consideration is not only given to safe and effective floodplain management but also to water quality and quantity management in a more holistic sense.

Previously little consideration was given to the waterway and receiving water environments. Today's best practice has regard to the environmental and social benefits of reducing pollutant entering waterways,

improving water and environmental quality, providing opportunities for reuse and incorporating water management elements into the landscape through integrated water management techniques and multiple use activities.

New development in the LGA, such as in Huntlee, is incorporating an integrated water management approach to maximise social, environmental and economic outcomes. Stormwater is seen as a valuable resource that can enhance the liveability of urban areas.

1.4 Strategic Context

Council has functional responsibilities for constructed stormwater assets, floodplains and natural waterways within the LGA, along with obligations under various State Government legislation and policy. Core activities for management include:

- Stormwater planning;
- Stormwater system management;
- Floodplain management; and
- Natural and modified waterways.

Within the framework of Commonwealth and State legislation and standards, Council also has the responsibility to manage portions of the water cycle within its area. While Hunter Water Corporation manages the water supply and some of the stormwater trunk drainage network in the area, Council manages water functions in relation to waterways and systems, riparian land, floodplains and sustainable stormwater management, treatment and re-use.

1.5 Legislation Policies and Guidelines

Council considers the following list of key legislation, policies and guidelines in carrying out its functional responsibilities for stormwater, waterway and floodplain management within the LGA. A summary can be found in **Appendix A**

Water Management Act 2000

Conveyancing Act 1919 and Right to Discharge Water

Local Government Act 1993

Protection of the Environment Operations Act 1997

Roads Act 1993

Dams Safety Act 2015

Conveyancing Act 1919 (Easements in Gross)

Fisheries Management Act 1994 (Key Fish Habitats)

BASIX 2004

NSW Flood Prone Land Policy and Floodplain Development Manual 2005

Statewide Mutual Guidance Notes – Stormwater Infrastructure (2015)

Australian Rainfall and Runoff 2016 (ARR2016)

ANZECC Guidelines 2000

Managing Urban Stormwater – Harvesting and Reuse 2006

Managing Urban Stormwater – Soils and Construction 2004 (The Blue Book)

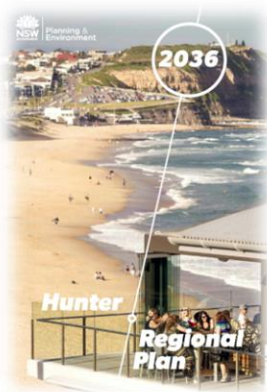
Australian Runoff Quality

Adoption Guidelines for Stormwater Biofiltration Systems

A Rehabilitation Manual for Urban Streams

1.6. Council Plans, Policies and Guidelines

Hunter Regional Plan 2036



The Hunter Regional Plan 2036 supersedes the Lower Hunter Regional Strategy 2006 and provides the overarching framework to guide the NSW Government's land use planning priorities and decisions to 2036.

It is anticipated that a considerable proportion of the dwellings and jobs required in Greater Newcastle by 2036 will be accommodated through the renewal, diversification and connection of the Region's strategic centres.

This projected growth will be delivered through a combination of infill and greenfield development as well as a small portion of rural residential development.

Cessnock 2027 Community Strategic Plan

The Community Strategic Plan is the highest level plan that a council will prepare. The purpose of the plan is to identify the community's main priorities and aspirations for the future and to identify strategies for achieving these goals.

The Cessnock 2027 Community Strategic Plan outlines what the community would like to see by the year 2027 and the direction council should take.

Development of the Community Strategic Plan involved extensive community engagement and together residents, visitors, property owners, business owners, community organisations and government committed to the desired outcomes and strategic directions of the Plan.



The Stormwater, Waterways and Floodplain and Strategy addresses the following objectives in the Strategic Plan:

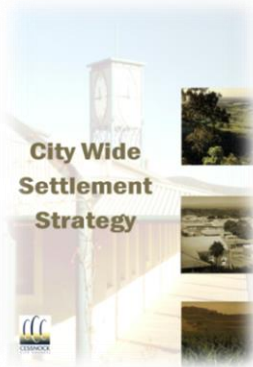
- Objective 1.3 – Promoting safe communities
- Objective 3.1 – Protecting and enhancing the natural environment and rural character of the area.

-
- Objective 4.2 – Improving the road network

The Community Strategic Plan establishes the following vision for the future of the Cessnock LGA.

Cessnock will be a cohesive and welcoming community living in an attractive and sustainable rural environment with a diversity of business and employment opportunities supported by accessible infrastructure and services which effectively meet community needs.

City Wide Settlement Strategy 2010



The City Wide Settlement Strategy 2010 sets out strategic directions that were used to inform the preparation of the Cessnock Local Environmental Plan 2011 and implement a number of the outcomes and actions arising from the Lower Hunter Regional Strategy 2006. A fundamental action of the City Wide Settlement Strategy is the need to contain the urban footprint of the Cessnock LGA to that identified in the Lower Hunter Regional Strategy 2006.

The City Wide Settlement Strategy will be replaced by a new planning strategy to address and manage the growth as outlined in the adopted Hunter Regional Plan 2016.

Cessnock Local Environmental Plan 2011

The Cessnock Local Environmental Plan 2011 (LEP 2011) came into effect on Friday 23 December 2011.

The Cessnock LEP 2011 was prepared in accordance with the NSW State Government's Standard Instrument (Local Environmental Plans) Order 2006, which required local Council's to implement a Standard Instrument LEP. The State Government has created the Standard Instrument LEP to assist in streamlining the NSW Planning system.

Cessnock Development Control Plan 2010

A Development Control Plan (DCP) provides detailed planning and design guidelines to support the planning controls in the Local Environmental Plan (LEP). The Cessnock Development Control Plan 2010 (DCP 2010) commenced on the 23 December 2011, the DCP came into effect upon gazettal of the Cessnock Local Environmental Plan 2011. The Cessnock DCP 2010 is applicable to the entire Local Government Area.

Within the different Parts of DCP 2010 there are various controls and requirements that relate to stormwater, waterways and floodplain management.

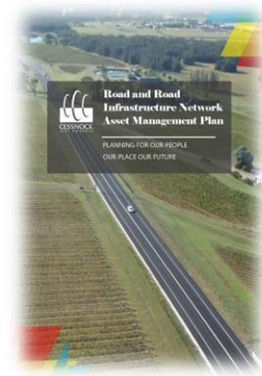
Cessnock City Council Asset Management Policy 2011

Council's Asset Management Policy guides the strategic management of Council's assets in order to deliver Council's strategic objectives as stated in the Community Strategic Plan and to guide the development of the Asset Management Strategy and Plans. Specifically related to this Strategy is the Stormwater Network Asset Management Plan 2017.

Stormwater Asset Management Plan 2017

The stormwater infrastructure network is assessed and managed through the adopted Stormwater Network Asset Management Plan.

An Asset Management Plan is required to demonstrate responsive management of assets (and services provided from assets), compliance with regulatory requirements, and to communicate funding needed to provide the required levels of service over a 20 year planning period.



Cessnock Engineering Requirements for Development 1994

This guideline and its referenced documents provide the minimum requirements for the design and construction of civil works associated with development. The Engineering Requirements for Development 1994 are currently under review. The new guidelines will include, amongst others, requirements and standards for best practice design and construction in stormwater, floodplain, water sensitive urban design, and waterway rehabilitation.

Cessnock City Council Flood Risk Management Policy 2017

The objectives of this policy are:

- Ensure that flood risk is considered as early as possible in the planning and development process.
- Ensure that planning and development decisions affecting flood prone land take into account the most up to date and accurate flood information.
- Ensure that the Council exercises its functions relating to flood risk management with reasonable care and diligence.
- Facilitate the ongoing collection of flood information, and the timely provision of such information to the community.
- Ensure that a framework and relevant procedures are developed for Council's management of all flood related activities and decisions.
- Ensure that the use and development of flood prone land:
 - Has risk consequences that are acceptable to the community;
 - Takes into account the full spectrum of flood risks across all risk dimensions;
 - Recognises the social, economic and environmental values of flood prone land; and
 - Is consistent with the principles contained in the NSW Floodplain Development Manual.
- Reduce the organisational risk to Cessnock City Council for the management of flood prone land. These risks can include:
 - Reputation
 - Financial
 - Environmental

Through the direction of this Policy, Council pursues its floodplain risk management responsibilities by means of the implementation and development of flood studies and floodplain risk management studies and plans and the application of the;

- Cessnock City Council Voluntary House Raising Policy 2017; and
- Cessnock Flood Development Control Plan 2017 (Chapter 9 of the Cessnock Development Control Plan 2010).

Generic Plan of Management General Community Use – Drainage

This Plan of Management, dealing specifically with drainage land, was adopted by Council on Drainage on 7 February 2018.

The Plan states:

“The primary use of drainage reserves or land used for drainage purposes is to drain off storm water runoff and therefore it is critical that the land is developed and managed to facilitate efficient drainage processes. A risk to the efficiency of drainage reserves is the encroachment of private land owners. Private construction such as fences or buildings can inhibit maintenance activities and overland flow. The effective management of drainage should also include broader maintenance activities such as street sweeping and pit cleaning to avoid leaf litter and debris settling in reserves and reducing its capacity to drain water.”

Policy No. S40.6 – Subdivisions – Natural Watercourses

The purpose of this Policy is to ensure that the dedication and preservation of all major watercourses as drainage reserves occurs within development areas. The Policy was originally adopted by Council in 1974, with its latest update in 2005.

Section 2

Built & Natural Assets

2.1. Overview

Council has the responsibility to manage portions of the water cycle within its area. While Hunter Water Corporation manages the water supply and some of the stormwater trunk drainage network in the area, Council manages water functions in relation to waterways and systems, riparian land, floodplains and sustainable stormwater management, treatment and re-use.

Council has functional responsibilities for constructed stormwater assets, floodplains and natural waterways within the areas of:

- Stormwater planning;
- Stormwater system management;
- Floodplain management; and
- Natural waterways.

Natural and built water environments can include natural creeks and rivers, rehabilitated channels, constructed wetlands, man-made stormwater systems and detention basins, as well as open water bodies and natural wetlands. Within the urban context waterways are often the link along and between areas of open space as well as supporting urban liveability. Waterways are also an integral part of the rural environment both as a resource and as part of the ecosystem. They are also a source of recreation, providing the community with a “river experience”.

The diversity of Council’s stormwater, floodplain and waterway systems present many challenges for the management of environment, development and leisure spaces. Council’s primary challenge is to balance the needs of the community and the environment, whilst managing development pressures forecasted in a growing Hunter Region.

2.2. Built Assets

Stormwater Infrastructure

Cessnock City Council owns and manages an extensive network of stormwater infrastructure assets. These include:

- 121km of stormwater pipes (mainly reinforced concrete);
- 4,743 stormwater pits;
- 5.5km of culverts;
- 800m of concrete open channels;
- Numerous detention basis and gross pollutant traps (includes Mount View Detention Basin); and
- 360km of street kerb and gutter.

Stormwater infrastructure is often associated with the road network and is most extensive in the more urbanised areas. The constructed stormwater system provides an important function in conveying runoff

from urban (and some rural) areas, generally for storm events ranging up to the 1 in 5 year or 1 in 10 year Average Exceedance Probability (AEP) and occasionally up to the 1 in 100 year AEP.

Stormwater Network Asset Planning

The Stormwater Asset Management Plan was adopted in 2016. Council's goal in managing infrastructure assets is to meet the defined level of service in the most cost effective manner for present and future consumers. The key elements of infrastructure asset management are:

- Providing a defined level of service and monitoring performance;
- Managing the impact of growth through demand management;
- Taking a lifecycle approach to developing cost-effective management strategies for the long-term that meet the defined level of service;
- Identifying, assessing and appropriately controlling risks; and
- Having a long-term financial plan which identifies required, affordable expenditure and how it will be financed.



Water from these basins is used to irrigate the adjacent playing fields.

Stormwater Harvesting and Reuse

Stormwater harvesting and reuse on a regional scale is being encouraged and its application is increasing in NSW. Council has one stormwater water reuse scheme operating in the Mount View Detention Basin with four small stormwater collection ponds located on the western edge of the basin.

Hunter Water Corporation Trunk Drainage

Hunter Water Corporation owns and manages 10.3km of mostly open concrete stormwater channels in the Black Creek catchment in Cessnock. Hunter Water charges land owners in the catchment of its channels an annual charge to maintain its stormwater assets.

Hunter Water Corporation's stormwater assets receive and discharge into water bodies managed by Council. In 2012 Hunter Water and Cessnock City Council signed a Memorandum of Understanding (MoU) that sets out terms for cooperation, defines respective roles and helps each party fulfil their role in stormwater management.



Floodplain Risk Management

Major flood events occurred in the Cessnock LGA in 1949, 1974, 1977, 1990, 2007 and 2015. In 2007 an event with an estimated 1 in 50 to 1 in 100 year AEP was experienced across the LGA and caused significant damage. The 2015 event had an estimated 1 in 20 year AEP in most places within the Black Creek Catchment but rare flooding, greater than a 1 in 200 year AEP was experienced around the Greta Township.

The current floodplain management focus is on the areas effected during the June 2007 flood event. Council has been progressively undertaking flood studies and floodplain risk management plans, in

accordance with the NSW governments Floodplain Development Manual, to identify actions to manage known flooding problems and to ensure new development is compatible with the flood risk.

Recent flood studies that have been adopted by Council include:

- Black Creek Floodplain Risk Management Study and Plan 2016
- Black Creek Stage 2 Flood Study 2015
- Wollombi Flood Study 2014
- Swamp/Fishery Creek Floodplain Risk Management Plan 2013
- Wallis Creek Flood Study 2011
- Hunter River – Branxton to Green Rocks – Flood Study 2010

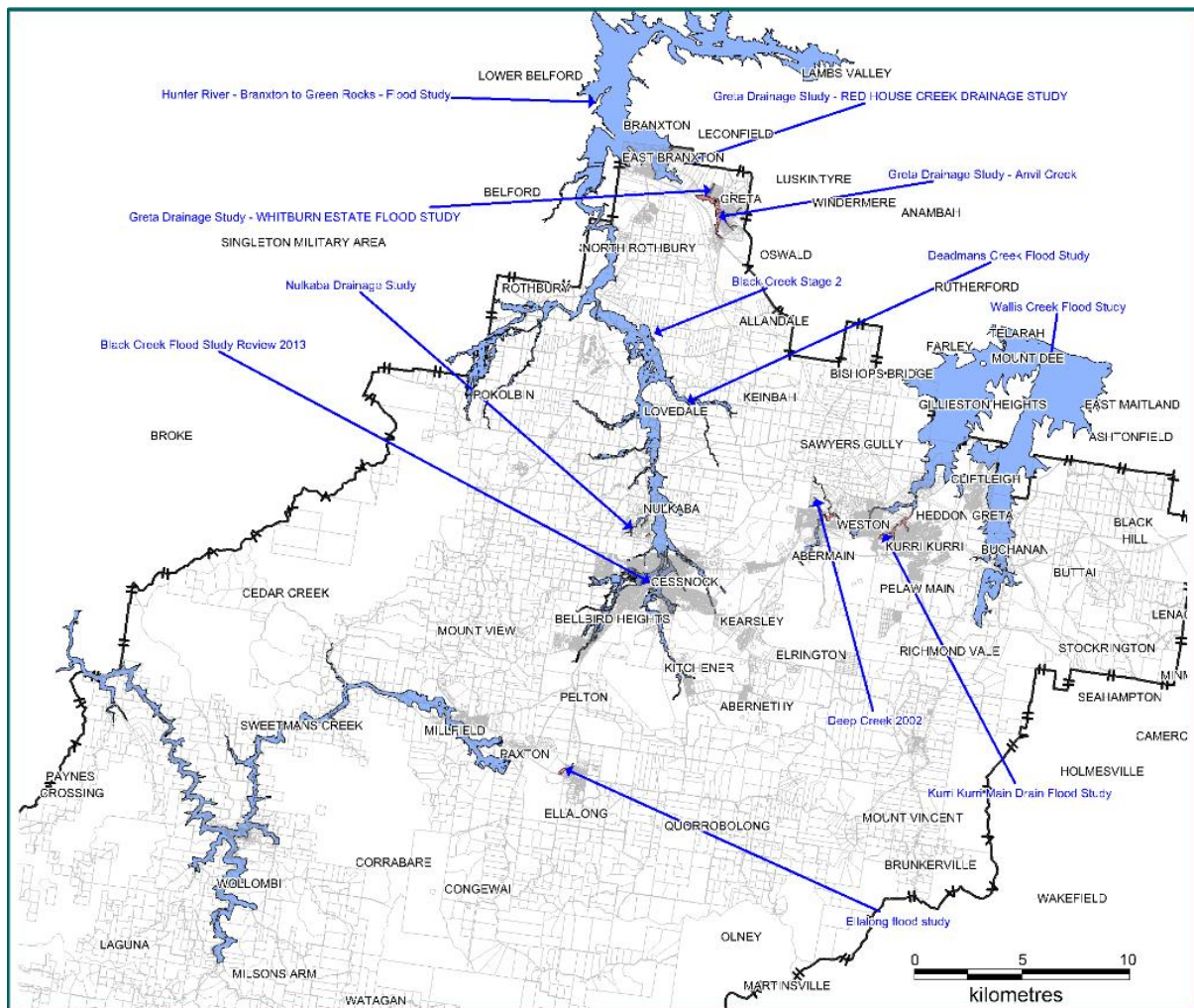


Figure 2: Cessnock City Council Flood Extent Mapping (2016)

The flood studies have identified the following key statistics:

- 1,102 properties flood affected in Black Creek (Cessnock, Bellbird) catchment with 346 experiencing over floor flooding in a 1 in 100 year AEP flood event.
- 41 properties flood affected in Swamp Creek (Abermain, Weston) catchment with 26 experiencing over floor flooding in a 1 in 100 year AEP flood event.
- 18 properties experiencing over floor flooding in 1 in 100 year AEP flood event and many more properties are isolated by flooded roads around Wollombi.

2.3. Natural Assets

Waterways

Within the Cessnock City LGA there is approximately 6,300km of waterways in a natural and modified condition (with reference to the NSW Land and Property Information 1:25,000 GIS mapping available to Council). These include:

- 170km within the urban areas of the LGA;
- 5,900km within the rural areas of the LGA; and
- 300km within Crown Land.

Waterways lengths according to LEP zoning includes:

- 26km within Public Recreation;
- 35km within SP2 Infrastructure land;
- 1,600km within National Parks and Nature Reserves;
- 760km within Forestry (State Forest);
- 3,600km within other land zones

Council does not undertake water quality monitoring but it is considered likely that the water quality conditions have not improved over time.

Urban stormwater runoff can have significant impacts on the health of natural waterways through:

- Increased peak runoff affecting stream erosivity and impacting the waterways geomorphic regimes;
- Lower base flows due to lower infiltration because of high impervious areas;
- Sediment laden runoff leading to sedimentation of waterways;
- Pollutants, such as rubbish, animal faeces, chemicals and fertilisers that adversely affect aquatic environments.

Traditionally stormwater infrastructure focused on quantity issues. Within the current review of Council's Engineering Guidelines for Development, Water Sensitive Urban Design (WSUD) principles are to be incorporated. It is expected that the health of natural waterways downstream of new developments that have incorporated WSUD principles in stormwater management practices will be in healthier condition than the waterways downstream of existing urban areas.

2.4. Wellbeing and Amenity

Cessnock is unique in its settlement patterns and the City Wide Settlement Strategy advocates a residential (density) hierarchy through land use zones and associated land use to differentiate between various forms of permissible housing types.

The heritage conservation areas of Wollombi and Sawyers Gully (incorporating the culverts associated with the Great North Road) and the proposed heritage conservation areas in Branxton and Greta, each have their own unique characteristics. The collective existence of buildings, individual heritage items, trees, open spaces, views and landmarks, and smaller details such as sandstone kerb and gutters all contribute to the areas historic value.

In addition, there are heritage listed sandstone kerbs and gutters that are a significant part of the heritage in Abermain, Branxton, Greta, Kurri Kurri, Neath and Weston.

Historically fishing and swimming occurred in the major urban creeks such as Swamp Creek. These activities are no longer common place due to siltation, weed growth and stormwater pollution in these creeks.

Reserves dedicated for drainage offer potential recreation opportunities. Incorporating permanent water features such as constructed wetlands, open space and public recreation into development stormwater management plans can enhance the subdivision amenity. Multiple objective planning is encouraged to provide a “river experience” in an urban context.

The Strategy

3.1. The Aim of the Strategy

The aim of this Strategy is to provide a framework for the planning and management of stormwater infrastructure, waterway environments and floodplain areas which establishes guiding principles to deliver natural and built assets that are fit for purpose and meet the community's service level expectations.

3.2. Guiding Principles

- Improve public safety and mitigate risk
- Protect waterway health and improve water quality
- Value stormwater as a resource that enhances community wellbeing and amenity
- Promote total water cycle management
- Be financially sustainable

3.3. Strategic Direction

To support the Guiding Principles of the Strategy, the following Strategic Directions have been identified:

Effective Stormwater Planning

Strategy

1. Water is considered a material planning consideration.
2. Apply a holistic and multi-disciplinary approach to water planning.
3. Maximise partnership opportunities in stormwater management and planning.

Water is vital to environmental functionality and urban sustainability, and is a valuable asset and resource. Council has a stormwater planning responsibility to ensure the safe conveyance of stormwater, minimise stormwater impact on receiving waters and minimise health and safety risks to the community. It is fundamental that water be regarded as a material planning consideration.

Through effective water planning it is envisaged that Council creates a catalyst for change by thinking beyond current 'Best Practice'. Effective water planning will achieve multiple outcomes (social, environmental economic and civic leadership) through a holistic and multi-disciplinary approach that includes stormwater planning for not only current but future generations.

Cessnock City Council will work towards achieving sustainable water management practices that are outcome driven from a single lot to a regional scale. The aim is to be innovative and proactive within new urban release areas and areas of urban renewal and increasing densities, whilst simultaneously improving existing assets in older suburbs. A proactive approach will identify lifecycle characteristics and costs to effectively and efficiently plan for and resource asset maintenance and renewal.

Council's has adopted the Stormwater Network Asset Management Plan and a Natural Waterways Asset Management Plan may be also be considered. Together these plans are envisaged to facilitate the preparation of holistic water asset management planning that will consider all natural and constructed water assets within the LGA. Asset management plans will provide guidance in development of the Delivery Program and the planning of stormwater systems for both current and future generations.

Effectively Manage the Stormwater System

Strategy

1. Water assets are both maintainable and maintained
2. Maximise Water Sensitive Urban Design and water re-use opportunities in the planning and management of water
3. Soil controls and potential impacts are considered during planning and construction
4. Health and safety is addressed in water planning and management

Council has the control and maintenance responsibility over the constructed stormwater assets within public land, except within the Hunter Water Corporation's trunk drainage lands. The Asset Management Plan identified 121km of stormwater pipes, however this is not a complete record.

In order for Council to be able to properly manage the constructed stormwater system, it must have an accurate and up to date register of all the constructed stormwater assets within its area. Council is building on the necessary information to provide a complete record of its stormwater infrastructure to assist in its ongoing management. As assets are upgraded or renewed this information will be recorded in the corporate asset management system, similarly, asset condition assessment information will also be recorded to assist in the effective and efficient planning and management of the constructed stormwater system network.

The constructed stormwater system provides an important function in conveying runoff from urban (and some rural) areas, generally for storm events ranging up to the 1 in 5 year or 1 in 10 year AEP and occasionally up to the 1 in 100 year AEP. However within older urban areas, in some cases the hydrologic level of service is likely to be less that a 1 in 5 year AEP event, being in the order of a 1 in 2 year AEP level of service.

WSUD is also an important component of stormwater and waterway management and provides a suite of techniques used to mitigate the impacts of urban development on the watercycle. These techniques, used in conjunction with each other, can achieve a reduction of flow rates generated from existing and new impervious surfaces, remove pollutants generated from the altered landscape as well as harvest and reuse stormwater to effectively reduce the volume of water runoff at the source.

Council does not currently have a WSUD development control mechanism or technical guideline to apply to new development or Council assets. Council will need to review, update and consolidate requirements in relation to best practice stormwater treatment, WSUD and sustainable water management.

Manage and Plan for Floodplain Risk and Floodplain Use

Strategy

.1. *Reduce the risk and impact of flooding and flood liability*

Local Government in NSW holds the primary responsibility for planning and management of flood prone lands. This is undertaken in accordance with the NSW Government's Flood Prone Land Policy guided by the Floodplain Development Manual (2005), the Section 9.1 (formerly Section 117) Directions and the EP&A Regulations on Flood Prone Land [Circular PS07-003] 2007.

Councils are required to undertake Floodplain Risk Management Studies for all flood prone land within their LGA and adopt and implement Floodplain Risk Management Plans to address existing, future and continuing flood risk.

The principal objectives of floodplain management are to:

- Reduce the social and financial costs from the risk associated with occupying the floodplain;
- Increase the sustainable benefits of using the floodplain;
- Improve or maintain floodplain ecosystems dependent on flood inundation; and
- Determining land use categories which are compatible with the identified flood hazard.

Manage Council's Natural Waterways

Strategy

1. Natural waterways and riparian land is protected, restored and reinstated
2. Holistic and multi-disciplinary approach to natural waterways management
3. Inform and raise awareness amongst the community of Council's management of water
4. Improved waterway health through effective implementation of the Stormwater, Floodplain and Waterways Strategy and Delivery Program

Natural waterways within the LGA drain to one of two iconic river systems namely the Hunter River to the north-east and Hawkesbury River to the south-west. Natural waterways within the LGA include rivers, creeks, wetlands and swamps and do not necessarily have to be continually inundated with water to be classed as a waterway.

The management of natural waterways is much broader than water conveyance and water quality. Natural waterways management is concerned with the protection, restoration and rehabilitation of waterways and adjoining riparian land. Due to the broad influence of water across the environment, a holistic and multi-disciplinary approach to waterway management is essential.

Council's responsibility to manage the LGA's natural waterways is principally concerned with the following:

- Protection and rehabilitation of terrestrial and aquatic ecology within riparian corridors and riparian lands;

-
- Water quality;
 - Stream bed and bank stability;
 - The societal influence of waterways – the return of a ‘River Experience’;
 - Floodplain management;
 - The protection of public and private infrastructure.

The condition of the LGA’s natural waterways is generally unknown. Although it can be presumed that those directly affected by upstream and adjacent urban developments or intensive rural activity would be impacted to a greater degree than those in National Parks or more natural catchments. Council currently relies on waterway mapping provided by NSW Land and Property Information (LPI). However this mapping is limited by scale and age. A program to map and condition assess waterways within its LGA may be considered.

3.4. Desired Community Service Level

With reference to the community consultation undertaken to inform the Stormwater Network Asset Management Plan (AMP), the community desired service level for Stormwater Infrastructure is Condition Level 3. Although the bulk of the existing network is Condition Level 3 or better, this analysis does not address the overall effectiveness of the network or the gaps or linkages missing in the network.

3.5. Urban Release Areas

All new Urban Release Areas will be required to have stormwater, floodplain and waterway systems and environments designed in accordance with Council’s Engineer Requirements for Development and best practice water sensitive urban design and waterway management guidelines and techniques.

3.6. Intergenerational Equity

The condition of the stormwater infrastructure network is deteriorating due to long-term limitations in funding and an inconsistency in approach to the management and planning of this asset. Whilst new assets are consistent with Council’s Engineer Requirements for Development, it has been sometime since these guidelines were updated.

These practices are likely to create a significant cost shifting to be borne by future generations. To ensure the cost burden of growth is delivered by property developers, conditions need to be applied at the time when there is uplift in the value of the site. This financial benefit through the uplift in property values resulting from developments such as dual occupancy, multi dwelling housing or subdivision developments will not be shared with the community or ratepayers. Therefore it is unreasonable that the cost of improvements to the stormwater network should become the financial burden of the ratepayers of Cessnock.

The consistent application of this Strategy, updated engineering guidelines and associated development conditions, ought to ensure the burden of intergenerational equity is not exacerbated.

Project Prioritisation

4.1 Strategy Implementation

Implementation of this Strategy is anticipated to occur through:

- Prioritised investigations and projects in Council’s Delivery Program, incorporating;
 - Floodplain Risk Management Program;
 - Stormwater Network Asset Management Plan; and
 - Generic Plan of Management General Community Use – Drainage
- The application of land use planning requirements and development controls; and
- The application of Council’s Engineering Requirements for Development.

For Council’s Delivery Program, risk criteria have been developed to provide a mechanism to prioritise investigations and projects funded through the Drainage Construction and Floodplain Management Programs.

4.2 Criteria for Prioritisation

Council’s Delivery Program will be prioritised using a risk criteria process to objectively prioritise stormwater, floodplain and waterway projects. This will be applied when considering new asset installation, replacement or upgrading of existing assets and waterway restoration and rehabilitation projects. The development of the Delivery Program relies on the assessment of each project against set risk criteria and a significance score. The program needs to remain flexible to allow for the added inclusion of projects which are identified to have a high priority, i.e. after a storm or other unforeseen natural events.

Floodplain management projects will rely on prioritisation within and across the implementation recommendations with the Floodplain Risk Management Plans.

Table 1: Prioritisation Criteria

Criteria	Weight	Score	Weighted Score
Risk to life	3		
Risk to property	2		
Risk to infrastructure	2		
Risk to environment	1		
Known priority area flooding problem	2		
Pipe / structure condition	1		
Known priority erosion hazard	2		
Maintenance hotspot	1		
Customer Request	1		
Priority Score			

Table 2: Criteria Significance Score

Criteria Significance	Significance	Score
Risk Significance		
Significant impact	Immediate attention required	4
Possible Impact	Amelioration and monitoring required	2
Acceptable Impact	Handled through standard operating procedures	1
No impact	No immediate risk	0
Known Flooding Problem		
Yes	Has previous history of flooding	2
May be	Potential flooding problem	1
No	No previous history of flooding	0
Asset Condition Rating		
Excellent	Only planned maintenance required	1
Good	Minor maintenance required plus planned maintenance	2
Average	Significant maintenance required	3
Below Average	Significant renewal/upgrade required	4
Poor	Unserviceable	5
Known Priority Erosion Hazard Risk		
Yes	Is a known erosion hazard	2
May be	Potential erosion hazard	1
No	No previous history of erosion	0
Maintenance Hotspot		
Yes	Is a known maintenance hotspot	2
May be	Potential on-going maintenance requirements	1
No	No previous history maintenance	0
Customer Requests		
Frequent	High incidence of requests, long-term issue, media, Councillor involvement	2
Infrequent	Occasional or one off customer request	1
No	No previous customer request	0
Risk Significance - Further Explanatory Example		
Significant Impact	The likelihood of the event is expected to occur in most circumstances and the consequence is significant and irreparable impact and loss.	
Possible Impact	The likelihood of the event is that it may occur at some time and the consequence is medium environmental or life/property/infrastructure impact, loss of some habitat, some potential criticism of organisation.	
Acceptable Impact	The likelihood of the event is that it could occur at some time but is not anticipated and the consequence is minimal or small environmental or life/property/infrastructure impact, loss of un-listed vegetation, impact easily remedied.	

Section 5

Funding

5.1 Storm Management Service Charge

The *Local Government Act 1993* was amended in 2005 to allow councils the option to apply a stormwater management service charge on eligible urban residential or business rateable land for improved stormwater management. Funding can be used for stormwater infrastructure that reduces flooding, improves the health of urban waterways and provides an alternate water source through stormwater harvesting and reuse.

Under the provisions of Section 496A of the *Local Government Act 1993*, Council may make and levy an annual charge for the provision of stormwater management services for each parcel of rateable land for which the service is available. A stormwater service is a service to manage the quantity or quality, or both, of stormwater that flows off land, and includes a service to manage the re-use of stormwater for any purpose.

In line with the Stormwater Management Guidelines, Council levies a charge calculated at \$25 per 350 square metres (or part thereof) up to a maximum charge of \$500 on business properties located within the defined stormwater area. Residential properties within the defined stormwater area are levied at a fixed charge of \$25 per property in line with the Stormwater Management Guidelines. Residential strata properties are levied a fixed charge of \$12.50 per property in line with the Stormwater Management Guidelines.

Council applies the Stormwater Management Service Charge to eligible properties in the LGA which generates approximately \$500,000 per year.

5.2 Council Borrowings

Council borrows funds each year to provide long-term assets and facilities that are unable to be funded out of recurrent revenues. Council invites quotes for the provision of loan funds from lending institutions. All loans are secured by a mortgage deed taken over Council's general revenue and are normally taken over a ten-year period or for the economic life of the asset acquired, whichever is the shorter.

In 2018-19 Council borrowings for the drainage improvements is \$659,600.

5.3 Grants

Council, thought the implementation of its Floodplain Management Program is eligible for grants subsidies under the NSW Government's Floodplain Management Program. The NSW Government offers 2:1 grant assistance for eligible projects. Council has made several grant applications and is anticipating funding of \$174,000 during 2018/19.

5.4. Development Contributions

Development contributions (Sections 7.11 and 7.12 of the *Environmental Planning and Assessment Act, 1979*) are collected by Council to cater for the provision or improvement of amenities and services resulting from the intensification of land use within the LGA. These contributions must be spent for the specific purpose they are collected and cannot be used to retrospectively provide infrastructure or services to cater for the existing population. Council has prepared several Contribution Plans and levies contributions on development which includes, in some instances, stormwater infrastructure.

Section 6

Implementation Plan

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
Direction 1: Effective Stormwater Planning			
<i>Strategy 1.1: Water is considered a material planning consideration</i>			
1. Include best practice in Council directional plans, policies, development controls and specifications.	a) Finalise the Draft Kerb and Gutter Strategy	The Kerb and Gutter Strategy that provides guiding principles to manage the kerb and gutter and street network within the LGA is currently nearing finalisation. The Kerb and Gutter Strategy is seen as part of the holistic water management strategy guided by this document.	In Progress In house cost
	b) Review, update and establish Council's <ul style="list-style-type: none"> • Engineering design guidelines and technical specifications; • standard drawings; and • development control plans associated with stormwater, floodplain and waterways management. 	Council's current Engineering Requirements for Development is outdated. Council is progressing a review that considers a Hunter Region consistency in the guideline. Guideline and specification should also include water sensitive urban design and sustainable water management principles. Development Controls in relation to WSUD and waterways should also be developed as a follow-on from the Engineering Requirements for Development review.	In Progress In house cost Specialist advice and peer review – \$20,000
	c) Implementation of Australian Rainfall and Runoff 2016 (ARR2016) into Council's engineering design guidelines and specifications.	ARR2016 is seen as the guiding document in stormwater and flood management across Australia. Council has not fully taken up the guidelines and maybe at risk if it is not utilising	1 year In house cost Specialist advice and staff training -

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
		the latest and most up to date information available in it stormwater and floodplain analysis. With the update of Council's Engineering Requirements for Development progressing it is timely that ARR2016 be incorporated.	\$10,000
2. Council staff, stakeholders and government agencies are informed and aware of Council guidelines and controls in relation to the planning and management of stormwater assets.	a) Establish consultation mechanisms with internal and external stakeholders for the collaborative planning and management of stormwater assets.	To establish ownership and 'buy in' of new processes and requirements by the community, developers, consultants and staff. Appropriate information dissemination and consultation programs should be implemented.	Ongoing In house cost
<i>Strategy 1.2: Apply a holistic and multi-disciplinary approach to water planning.</i>			
1. Regional and catchment-wide planning of water at all stages of development.	a) Develop waterway and WSUD technical guidelines, planning requirements and development controls.	Consider all environmental parameters at all stages of development, from concept design through to construction and maintenance at a site specific, local and regional scale. Parameters and guidelines to be included provided as part the review and update of Council's Engineering Requirements for Development and related Development Control Plans.	In Progress with Action 1.1.1.a
	b) Collaborate internally as well as with District and Regional stakeholders to ensure a regional and catchment wide approach to water planning is established and maintained.	To establish ownership and 'buy in' of new processes and requirements by the community, developers, consultants and staff. Appropriate information dissemination and consultation programs should be implemented.	Ongoing In house cost
2. Apply a long term outcome approach to stormwater planning.	a) Water planning processes will consider future development, land use, community and asset requirements.	The mechanism for consideration is through the review of the Engineering Requirements for Development, new and updated policies, strategies and DCPs that incorporate best practice water planning principles.	In Progress with Action 1.1.1.a
	b) Update and/or prepare Asset Management Plans, mapping and condition assessment for stormwater, detention basins, kerb and	Stormwater Network Assessment Management Plan is complete. Establish the condition of the stormwater network through CCTV investigation and	2 – 5 years Asset condition assessment-

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
	gutter and natural waterway assets which will aid the development of a works program.	incorporate into an asset renewal and upgrade program. Consideration should be given to developing specific asset management plans for other stormwater and waterway assets.	\$50,000/year for 5 years Specific asset management planning – In house cost
	c) Update the 2012 Stormwater Management Memorandum of Understanding between Hunter Water corporation and Council.	In 2012 Hunter Water Corporation and Council signed a Memorandum of Understanding (MoU) that sets out terms for cooperation, defines respective roles and helps each party fulfil their role in stormwater management.	1 year In house cost
3. Council departments/teams understand the importance of holistic water planning.	a) Establish internal consultation mechanisms with internal stakeholders to ensure cross departmental collaboration on outcomes.	To establish ownership and 'buy in' of new processes and requirements by internal staff appropriate information dissemination and consultation programs should be considered.	On-going In house cost
<i>Strategy 1.3 Maximise partnership opportunities in stormwater management and planning</i>			
1. Develop and maintain communications and partnerships with government agencies, education institutions and business in stormwater management and planning.	a) Develop contacts and partnerships to work collaboratively in stormwater planning and water management projects within the LGA.	Through networking, contacting potential key partners, attending conferences/workshops, develop contacts and partnerships to work collaboratively in stormwater planning and water management projects within the LGA, to expand the scope, share knowledge and resources and improve access to funding.	Ongoing Cost In house staff time Conference and training costs - \$5,000/year

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
Direction 2. Effectively Manage the Stormwater System			
<i>Strategy 2.1: Water assets are both maintainable and maintained</i>			
1. Maintenance requirements for natural and constructed stormwater and waterway assets are considered during the feasibility and concept design stages of development.	a) Lifecycle asset maintenance is considered in the development and design of new assets.	Maintenance requirements and resources necessary for both natural and constructed water assets are identified, and consideration is given to the capacity of the relevant Council team responsible to include required maintenance within their schedule of works over the lifetime of the asset.	1 year In-house cost
2. Required maintenance of water assets is undertaken.	a) Establish a scheduled maintenance program for stormwater and waterway assets	Provide the necessary asset management information to the appropriate Council team(s) when the stormwater or waterway asset is approved, prior to construction. For incorporation into a scheduled maintenance planning system and maintenance costing can be projected for the asset.	2 years In house cost
	b) Define asset renewals	Monitor stormwater or waterway asset maintenance performance, requirements. Review and amend as necessary within the asset management program. Ensure that the procedures and processes are delivering a functional system that meets community expectations.	2 years In house cost
	c) Regularly monitor ageing infrastructure and identify assets that required maintenance and upgrade.	Condition of the asset is critical. Monitoring will enable assessment of replacement timing for inclusion in a future works program.	1 year In house cost
3. Minimise environmental impacts from construction and maintenance work practices.	a) Define the appropriate equipment utilised and devices installed.	To establish cost effective and efficient service provision.	With Action 2.1.1.a
	b) Scheduled maintenance program developed and reactive asset maintenance is undertaken as required.	Within a successful program of scheduled maintenance the incidence of reactive maintenance should decrease overtime. This may have cost and resource benefits overtime.	With Action 2.1.1.a

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
	c) Monitoring of construction sites is undertaken for compliance with required environmental impact mitigation measures.	Ensuring construction sites are installing and maintaining their soil and water management plans effectively prevents unwanted sediment and pollutants from entering the stormwater and waterway systems. Once in the stormwater system, the cost to remove and maintain is borne by Council.	In progress In house cost, offset by infringement notices
<i>Strategy 2.2: Maximise Water Sensitive Urban Design and water re-use opportunities in the planning and management of water</i>			
1. Apply the principles of the Stormwater, Floodplain and Waterways Strategy.	a) Relevant principles and objectives are incorporated into Council's DCP and engineering guidelines with associated standard conditions and development checklists to assist the development application process.	To apply a consistent and rational approach across Council's development and operational activities that is regionally inclusive of surrounding jurisdiction's approaches.	1 year In house cost
	b) The principles and actions within Council's Generic Plan of Management General Community Use – Drainage are incorporated and applied into this Strategy.	Council adopted the Plan of Management in February 2018. It directs and sets targets for the management of Council's Drainage Land. The actions within this Plan should be considered with the implementation of this strategy.	1 year Cost varies depending on project
2. Maximise opportunities to design and/or retrofit Council buildings, car parks and public domain.	a) Develop a program to install WSUD elements to reduce pollution runoff and improve stormwater flows	Council should endeavour to lead by example in its approach to sustainable water management in the LGA. Opportunities should be investigated to retrofit and install appropriate water management elements as part of renewal, upgrade and new projects.	2 years Cost varies depending on project
	b) Include technical guidelines in the revision of Council's Engineering Requirements for Development.	To inform the concept, design and construction of water management elements on Council facilities appropriate technical guidelines should be provided in Council's revision of its Engineering Requirements for Development.	In Progress with Action 1.1.1.a
<i>Strategy 2.3: Soil controls and potential impacts are considered during planning and construction</i>			

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
1. Reduce and minimise the impact of erosive forces on channel form.	a) Any development is to maintain flows below erosion threshold limits or apply appropriate techniques to minimise erosive impact on channel form.	Utilising research and investigations specific to the region, define an implement qualitative guidelines to facilitate appropriate development activities.	3 years \$10,000
1. Minimise the amount of sediment, beyond that of natural process, which could potentially enter waterways.	a) Improve compliance with sediment and erosion control requirements applied during all stages of construction and site establishment, through education and enforcement programs.	Poorly controlled erosion and sediment on building sites can lead to impacts on council's stormwater and waterways systems.	On going In house cost
<i>Strategy 2.4: Health and safety is addressed in water planning and management</i>			
2. Minimise risk to health and safety of the public (including maintenance staff).	a) Identify health and safety risks and implement solutions to mitigate those risks.	In the creation of new assets and the management of existing assets the safety of the public who utilise and are affected by these assets is important. These are such things as governing the depth of detention basins, fencing high drops from headwalls and to ensuring batter slopes are adequate for maintenance. Council has begun a risk assessment in this regard and best practice guidelines should be incorporate into the revision of Council's Engineering Requirements for Development.	In progress In house cost

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
Direction 3. Manage and Plan for Floodplain Risk and Floodplain Use			
<i>Strategy 3.1: Reduce the risk and impact of flooding and flood liability</i>			
1. Identify land that is subject to flooding within the LGA.	a) Undertake an overland flow flood study and management plan for the urban areas within the LGA.	Define the risk and impact associated with local overland flow within the urban areas of the LGA in order to define flood controlled land, facilitate appropriate development, mitigate risk to people and property and assist in defining flash flood response. Any overland flow study should link to Council Floodplain Risk Management Program and prioritise known overland flow affected areas.	1 year Cost \$150,000 to \$200,000
	b) Define the hydrologic capacity of the existing trunk drainage and stormwater network and prioritise a plan of upgrades.	Council's trunk drainage and stormwater network is overwhelmed during intense storm events with private property flooded and people at risk. In conjunction with an overland flow study determine the associated capacity of the trunk stormwater drainage and stormwater network, analyse the risk associated with the existing system and determine a prioritised program of capital works for design and construction of infrastructure upgrades.	1 year In conjunction with Action 3.1.1.a Capital works to be determined
	c) Continue the implementation of the Council's Floodplain Risk Management Program.	Council has already established a Floodplain Risk Management Program. This Program should continue and prioritise known flood affected areas with implementation across property, response and flood modification measures to manage flood risk and reduce flood losses.	In progress Cost >\$500,000
	d) Continue to implementation of the Cessnock City Council Voluntary House Raising Policy.	This Policy was last reviewed in June 2017. its ongoing implementation should also be in line with Council's Development Control Plan Chapter 9: Development on Flood Prone Land and the Floodplain Risk Management Program.	In progress In house cost No project cost to Council

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
2. Increase knowledge and access to information regarding flood prone land within the LGA.	a) Map all flood prone land within the LGA and make available to the community.	As flood prone land mapping and information is made available to Council it should be disclosed via appropriate media and through the flood certificate process.	In progress In house cost

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
Direction 4. Manage Council's Natural Waterways			
<i>Strategy 4.1: Natural waterways and riparian land is protected, restored and reinstated</i>			
1. Identify and categorise natural waterways and riparian land.	a) Undertake waterways mapping and condition assessment.	Define the waterways under Council's care and control and determine their condition in order to develop a program of rehabilitation to meet community expectation and environmental standards.	2 years Cost \$50,000
2. Implement findings of the Waterways Mapping and Condition Assessment.	a) Define and prioritise relevant waterways projects for inclusion in the works program and review the prioritised schedule annually.	Following waterway mapping and condition assessment, Council will have an understanding of the issues surround its waterways and will be able to develop a program to monitor and improve the waterway environments. This can prioritise projects for funding within the works program.	3 years In house cost
3. Undertake monitoring and works to improve water quality, quantity and riparian corridor ecology.	a) Carry out relevant projects as prioritised the works program that address increased flows, pollutant control and capture, weed control and removal and waterway corridor enhancement.	Carry out prioritised waterways projects and water quality and environmental monitoring to determine background conditions and improvements as a result of new work.	3 years Cost varies according to project scope and available funding
4. Reinstatement natural flows and watercourses.	a) Identification and feasibility studies for watercourse reinstatement. Feasible projects assessed for inclusion in the capital works program.	Where a Waterways Mapping and Condition Assessment has identified issues associated with waterways carry out necessary investigations and design to inform future works.	3 years Cost varies according to project scope and available funding
<i>Strategy 4.2: Holistic and multi-disciplinary approach to natural waterways management</i>			
1. To manage water holistically by considering catchment wide conditions and processes and multiple environmental parameters.	a) Review and revise Policy No. S40.6 – Subdivisions – Natural Watercourses.	The Policy was last reviewed in 2005. A revision of the policy should be undertake to bring it in line with the current contemporary approach to waterway management in order to facilitate appropriate development.	Undertake with Action 1.1.1.a
	b) Waterway projects are to consider multiple environmental parameters and their	Waterway management requires a multi-disciplined approach that considers physical, chemical, environmental and human influences	Undertake with Action 1.1.1.a

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
	relationships at a site specific, local and regional scale.	at site and within the catchment in order to an effective and sustainable outcome.	
2. Long term outcome approach to natural waterways management.	a) Water projects are to consider future development, land use, community and asset requirements.	Likely changes and trends over time should be considered to inform a robust project design and provide sustainable lifecycle management of the project outcome.	Undertake with Action 1.1.1.a
<i>Strategy 4.3: Inform and raise awareness amongst the community of Council's management of water</i>			
1. Enhance awareness of local waterways and encourage participation.	a) In project identification, planning and/or concept design identify any key locations suitable for public participation activities, placement of informative signage and suitable public access with the goal to provide a "river experience" in urban waterways.	Waterways within the urban environment should be design and upgraded to provide a community experience and link to the open space and water environment. In a generally constructed environment a waterway can add a positive passive connection to open space and improve a community's well-being.	Implement as part of project future planning
	b) Incorporate waterway management activities into community group activities and initiatives.	Support and facilitate community groups and actions to improve the quality of waterways in the LGA.	3 years In house cost
<i>Strategy 4.4: Improved waterway health through effective implementation of the Stormwater Floodplain and Waterways Strategy and works program</i>			
1. Review the implementation of the Stormwater Floodplain and Waterways Strategy.	a) The Stormwater, Floodplain and Waterway Strategy is to undergo review after every 12 months and five year periods.	Monitor success for the Strategy implementation and revise and update as new knowledge and better practice emerges.	1 year In house
	b) Recommendations from the review of the Stormwater Floodplain and Waterways Strategy are adopted.	Following the Strategy review it is re-exhibited and adopted by Council for implementation.	1 year In house
2. Assess the effectiveness of the works program.	a) Carry out individual project evaluations to assess project strengths and weaknesses and site improvements.	Determine the "lessons learnt" from the development, implementation and outcomes of projects in order to refine the planning, design and construction processes for efficiencies in delivery and funding.	1 year In house cost
	b) Monitor catchment health to record any changes in condition (water quality, stream and riparian condition, and biodiversity).	In defining the success of the any program monitoring of baseline conditions against any changes as result of project implementation can	2 years \$25,000

Direction and Strategy	Actions	Rationale	Commencement Timing and Estimate Cost
		measure success and assist in defining future activity and justify funding.	
<i>Strategy 4.5: European and Aboriginal Heritage is incorporated into the management of water</i>			
1. Identify and acknowledge European and Aboriginal heritage items and values.	a) Utilise Council's LEP heritage listing and carry out desktop research, studies and site investigations during the project planning.	Identification of European and Aboriginal heritage is an important part of project planning and design. Where possible it should be incorporated into the project outcome.	As part of project concept planning In house cost
	b) Investigate suitable sites to acknowledge heritage items and values in the landscape through the application of art, signage and creative landscape design.	Identification of European and Aboriginal heritage is an important part of project planning and design. Where possible it should be incorporated into the project outcome.	As part of project concept planning In house cost

APPENDIX A

Key Legislation, Policies and Guidelines

Water Management Act 2000

Section 5 sets out general principles in drainage and floodplain management.

In relation to drainage management:

- (a) Drainage activities should avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, acidity, waterlogging, decline of native vegetation or, where appropriate, salinity and, where possible, land should be rehabilitated, and
- (b) The impacts of drainage activities on other water users should be avoided or minimised.

In relation to floodplain management:

Floodplain management must avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, acidity, waterlogging, decline of native vegetation or, where appropriate, salinity and, where possible, land must be rehabilitated.

The NSW Office of Water administers the regulation of the Water Management Act as it relates to Controlled Activity. The NSW Office of Water produces guidelines for controlled activities undertaken within and adjacent to water courses. These guidelines include:

- In stream works
- Laying pipes and cables in water courses
- Outlet structures
- Riparian Corridors
- Vegetation Management Plans
- Watercourse Crossings

Under the Water Management Act 2000 (WM Act) an approval is required to undertake controlled activities on waterfront land, unless that activity is otherwise exempt (section 91E).

Controlled activities include the carrying out of building work, such as erecting buildings and other structures, and the installation of infrastructure. They also include excavating or depositing material.

Waterfront land is the bed of any river, lake or estuary and any land within 40 metres of the highest bank of the river, the lake shore or the mean high water mark of the estuary.

Further information on exemptions can be found in the fact sheet:

http://www.water.nsw.gov.au/_data/assets/pdf_file/0010/547048/licensing_approvals_controlled_activities_exemptions_factsheet.pdf

In general Council and contractors undertaking work on behalf of Council are exempt from seeking controlled activity approval from the NSW Office of Water. Council, however, is expected to comply with the guidelines for controlled activities.

Key considerations for Council are outlined in Controlled Activities on Waterfront Land - Guidelines for Riparian Corridors on Waterfront Land:

- Development should in general be prohibited within the riparian corridor. Some encroachment of the outer riparian zone is allowed when appropriate offsets are provided.
- The width of riparian corridor increases as the water course stream order increases up to 80m.
- Stream realignment should be limited to 1st order streams.
- Road crossings should consist of culverts or bridges for 3rd order streams and above

Conveyancing Act 1919 and Right to Discharge

Schedule 4A Easements in gross

Part 3 Easement to drain water

Part 7 Easement for drainage of water

Land owners have the right to discharge stormwater, known as the legal point of discharge, into either:

- An appropriate public drainage system
- A natural waterway
- A private drainage system that drains into an appropriate public drainage system or a natural waterway if the landowner creates or has an agreement to discharge stormwater.

A public drainage system is a structure built to convey stormwater flows that is owned by a government authority. In the Cessnock LGA the public drainage system is owned by Cessnock City Council, except for 10.3km of concrete channels in the Cessnock Township.

A natural waterway is a stream, creek or river that conveys water permanently, intermittently or ephemerally. It consists of a sediment and soil bed and banks, has a riparian area that contains its floodplain and supports various aquatic and terrestrial flora and fauna.

Under the Conveyancing Act 1919, a drainage easement is a right attached to the property title that grants access by a third party (often a council) to a designated part of the property for the purpose of maintaining drainage. If work is to be done on a property that will affect the natural flow or drainage of water onto another property, a drainage easement is generally required.

Council must consider the quantity and quality of stormwater runoff and its impacts downstream. A landowner may take civil action for nuisance if the stormwater impacts cause damage or affect the enjoyment of a land owner's property. In general, Council's Engineer Requirements for Development require development to limit peak run off to the pre-development peak flows and to manage the quality of stormwater discharged from the site. Council may be liable for damages if it permitted the nuisance to arise by failing to exercise reasonable care. This liability may extend to the adequate maintenance of stormwater infrastructure owned by Council.

Local Government Act 1993

Section 59A Ownership of water supply, sewerage and stormwater drainage works

Section 67 Private works

Section 733 Exemption from liability—flood liable land, land subject to risk of bush fire and land in coastal zone

Roads Act 1993

Section 94 Roads authority may carry out drainage work across land adjoining public road etc

Dams Safety Act 2015

The Dams Safety Committee was formed under the Act to provide guidance on the classification, design and maintenance of prescribed dams. The Dams Safety Committee (DSC) can require owners of prescribed dams to do things to ensure the safety of their dams. Cessnock City Council has one prescribed dam, Mount View Detention Basin, and one potential prescribed dam – South Cessnock Bund Wall. Council is required to undertake regular 5 yearly inspections of the Mount View Detention Basin by an appropriately qualified dam safety engineer.

<http://www.damsafety.nsw.gov.au/>

Statewide Mutual Guidance Notes – Stormwater Infrastructure (2015)

This Guidance Note is provided to assist Councils in minimising their potential for liability from negative outcomes of the stormwater network. This has been done by identifying risks associated with a range of stormwater facilities and suggesting appropriate measures to reduce the potential for adverse outcomes from those risks. Councils should also incorporate a process of evaluating the risks posed by its existing or proposed stormwater management facilities to assist in determining the appropriate risk mitigation measures and their priorities.

This Guidance Note provides:

- The principles to be adopted in relation to risks associated with Council's facilities for the management of urban stormwater runoff quantity, quality and frequent flow management;
- Guidance in the interpretation of those principles;
- Standard procedures for consideration by Council; and
- Statutory references and standards (available at the time of production).

Australian Rainfall and Runoff 2016 (ARR2016)

Australian Rainfall and Runoff (ARR) was first published in 1958, with the 3rd edition, published in 1987. The ARR was last updated in 1997. Since then, our understanding of the complexity of the Australian landscape has grown. Further, many of the practices recommended in the 1987 edition of ARR have become outdated, both in terms of technique and approach to water management.

Recognising the need to update the water management approach, the limited data in previous ARR editions and the series of storms, floods and cyclones that effected parts of Queensland and Victoria in 2010 and 2011, the Australian Government committed to a revision of the Guidelines. The 2016 revision includes

all Australian data, including a national database of extreme flood hazards and 30 years of over 8000 rainfall gauges across the Nation.

ARR 2016 has a national application and is considered necessary for policy decisions and projects in areas as such as:

- Infrastructure such as roads, rail, airports, bridges, dams, stormwater and sewer systems;
- Town planning;
- Mining;
- Developing flood management plans for urban and rural communities;
- Flood warnings and flood emergency management;
- Operation of regulated river systems; and
- Prediction of extreme flood levels.

<http://arr.ga.gov.au/arr-guideline>

ANZECC Guidelines 2000

The Australian and New Zealand Environment Conservation Council (ANZECC) published the revised Australian and New Zealand guidelines for fresh and marine water quality in 2000.

These guidelines provide government and the community, especially regulators, industry, consultants, community groups and catchment and water managers, with a framework for conserving ambient water quality in our rivers, lakes, estuaries and marine waters.

New development and projects that aim to improve water quality in natural watercourses should consider the ANZECC guidelines in the setting of water quality goals. For each catchment in NSW, the State Government has endorsed the community's environmental values for water, known as 'Water Quality Objectives' (WQOs).

The NSW WQOs are the environmental values and long-term goals for consideration when assessing and managing the likely impact of activities on waterways. They are not intended to be applied directly as regulatory criteria, limits or conditions but are one factor to be considered by industry, the community, planning authorities or regulators when making decisions affecting the future of a waterway.

The environmental values expressed as WQOs provide goals that help in the selection of the most appropriate management options. The guiding principles are that:

- Where the environmental values are being achieved in a waterway, they should be protected, and
- Where the environmental values are not being achieved in a waterway, all activities should work towards their achievement over time.

The Hunter River Water Quality and River Flow Objectives apply to the Cessnock LGA.

<http://www.waterquality.gov.au/anz-guidelines/framework>

BASIX 2004

BASIX is a sustainability planning measure that ensures all new residential dwellings are water and energy efficient. Most new dwelling construction now includes rainwater tank installation to comply with BASIX legislation. Rainwater tanks retain stormwater for use in gardens, toilet flushing and in washing machines and reduce runoff volumes.

<https://www.planningportal.nsw.gov.au/planning-tools/basix>

NSW Flood Prone Land Policy and Floodplain Development Manual 2005

The management of flood liable land in NSW is directed through the NSW Governments Flood Prone Land Policy. This Policy sets the primary responsibility for the management of flood prone land with councils. The NSW Floodplain Development Manual (FDM) 2005 supports council's management of flood prone land and provides guidelines for development and management of flood liable land. In utilising the FDM councils are exempt from liability associated with flood events under Section 733 of the Local Government Act 1993.

Council is following the recommended approaches in the Manual to identify and address flooding issues for the major urban waterways within the LGA.

<https://www.environment.nsw.gov.au/topics/water/floodplains/managing-floodplains>

Managing Urban Stormwater – Harvesting and Reuse 2006

Managing Urban Stormwater: Harvesting and Reuse presents an overview of stormwater harvesting and its potential benefits and limitations. It also provides guidance on the planning and design aspects of stormwater harvesting projects, taking into account statutory and regulatory requirements.

Managing Urban Stormwater – Soils and Construction 2004 (The Blue Book)

The Managing urban stormwater: soils and construction publications provide guidance on erosion and sediment control during construction and other land disturbance activities.

Australian Runoff Quality

Australian Runoff Quality is an overview of current best practice in the management of urban stormwater within the context of total urban water cycle management and integration of management practices into the urban built form. As well as the issue of stormwater quality, major Australian urban areas have experienced raw water supply shortages in recent years, and potential synergies between stormwater quantity management/reuse and potable water use minimisation have been identified as a priority.

The manual provides procedures for estimating a range of urban stormwater contaminants, design guidelines for commonly applied stormwater quantity and quality management practices, procedures for estimating performance of these practices and advice on integrated urban water cycle management practices.

Adoption Guidelines for Stormwater Biofiltration Systems

Biofiltration technology can be applied to various catchment sizes and landscape settings, from street trees and private backyards to street-scale applications and car parks, up to larger regional stormwater treatment systems, including those in public parks and forested reserves. Further, biofilter design can be tailored to optimise performance for local conditions and specific treatment objectives.

The purpose of this document is to provide guidance on how to apply the research findings in practice. The target audience includes planners, engineers, landscape architects, developers, constructors, and all other parties involved in urban design.

The guidelines are presented as a series of chapters, each addressing a different aspect of implementation of biofiltration systems. View the list of chapters below.

<https://watersensitivecities.org.au/content/stormwater-biofilter-design/>

A Rehabilitation Manual for Urban Streams

Over the past two hundred years we have physically and biologically degraded many Australian streams. Catchment managers at the end of the millennium face two daunting tasks: how to minimise further damage to rivers and streams, and how to repair the damage that has already occurred.

We can return natural values to our waterways. This manual is designed to help those professional managers who are accepting the challenge of rehabilitating the physical and biological condition of Australian streams. It has four sections covering the following main topics:

- Rehabilitation concepts;
- A planning procedure for rehabilitating streams;
- Typical stream problems; and
- A range of tools that could be useful for rehabilitation.

The concepts provide a firm basis for planning a rehabilitation strategy, while the typical problems and tools provide resources that could be useful to the manager.