

## ROADS & STORMWATER DEPARTMENT

Catchment, Stormwater and River  
Management Branch

# Floodplain and River Corridor Management Policy

Balancing flood risk, ecological and  
socio-economic considerations in  
developments near watercourses and  
wetlands

Version 2.1

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(Previously entitled: Floodplain Management Guidelines)



CITY OF CAPE TOWN | ISIXEKO SASEKAPA | STAD KAAPSTAD

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# 1 Preamble

There is a developing worldwide view in many cities that watercourses and wetlands, whether natural or constructed, form an integral component of urban stormwater management systems, are important for sustaining the aquatic ecology of the city, and are an essential element in restoring the urban fabric of the city by providing both recreational and socio-economic opportunities to all citizens.

A well managed watercourse / wetland is a valuable resource for improving the quality of life and aesthetic nature of an urban area and provides benefits for public health, recreation and economic growth. This is particularly important in the context of changing weather patterns and the associated local, national and international strategies targeting sustainability issues.

This policy document is an enhancement of the former Floodplain Management Guidelines (Version 1.0) published in September 2003. Various improvements have been effected to align the policy principles to corporate strategic objectives. It outlines the procedure for managing development adjacent to watercourses and wetlands taking cognisance of the flood regime, aquatic and riparian ecology as well as socio-economic factors.

# 2 Definitions

In this policy, unless inconsistent with the context:–

**"Council"** means the City of Cape Town;

**"development"** means any man-made change to property, including but not limited to construction or upgrading of buildings or other structures, filling, paving, municipal services, or the associated preparation of land;

**"ecological buffer"** means a strip of land adjacent to a watercourse, wetland or vlei required for the protection and enhancement of these ecosystems;

**"fill"** means the placement of fill material such as natural sands, dirt, soil or rock and may include concrete, cement or other waste materials at a specified location to bring the ground surface up to a desired elevation;

**"floodlines"** mean lines on a map or drawing depicting water levels likely to be reached by a flood having a specified recurrence interval;

**"floodplain"** means the land adjoining a watercourse which is susceptible to inundation by floods up to the one hundred year recurrence interval;

**"floor"** means the inner, lower surface of a room, garage or basement to which the occupants of a building have access;

**"recurrence interval"** means the average interval between rainfall or flood events equaling or exceeding a specified severity;

**"river corridor"** means a mixed-use corridor comprising a watercourse and/or associated wetlands, the floodplain, the ecological buffer and the area required for specific aesthetic, recreational and/or socio-economic needs. This combined area must be managed in an integrated manner which balances the flooding, environmental, social and economic issues;

**“stormwater”** means water resulting from natural precipitation and/or the accumulation thereof and includes groundwater and spring water ordinarily conveyed by the stormwater system, as well as sea water within estuaries, but excludes water in a drinking water or waste water reticulation system;

**“stormwater system”** means both the constructed and natural facilities, including pipes, culverts, watercourses and their associated floodplains, whether over or under public or privately owned land, used or required for the management, collection, conveyance, temporary storage, control, monitoring, treatment, use and disposal of stormwater;

**“structure”** means any man-made feature affixed to the ground or attached to something located on the ground, including but not limited to fences, walls, berms, levees, fill, storage tanks, shelters or buildings;

**“top of bank”** of a watercourse means a position identifiable by scour lines, vegetation limits, changes in bed and bank materials, the presence of flood deposited silt, or abrupt changes in slope;

**“water sensitive urban design”** is an approach which seeks to ensure that development in urban areas is holistically planned, designed, constructed and maintained so as to reduce negative impacts on the natural water cycle and protect aquatic ecosystems.

**“watercourse”** means a river, stream, channel, canal, vlei, wetland, dam or lake in or into which water flows regularly or intermittently. Reference to a watercourse includes, where relevant, its bed and banks;

**“wetland”** means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil. This definition thus includes, but is not necessarily limited to, water bodies such as lakes, salt marshes, coastal lakes, estuaries, marshes, swamps, vleis, pools, ponds, pans and artificial impoundments;

**“wetland delineation”** means the determination and marking of the boundary of a wetland using nationally accepted guidelines / methodologies.

### 3 Introduction

Watercourses and wetlands are integral to the stormwater management system, are an important component of the City’s biodiversity network, and represent an essential element in restoring the urban fabric of the City by providing both recreational and economic opportunities.

This policy supports the Roads and Stormwater Department objectives incorporated in the Integrated Development Plan for the City of Cape Town, namely to;

- Reduce the impact of flooding on community livelihoods and regional economies
- Safeguard human health, protect natural aquatic environments, and improve and maintain recreational water quality

The management of land use, development or activity adjacent to watercourses and wetlands is important for the following reasons:

- It is far more cost effective, in the long term, to develop in areas where the threat of flooding is infrequent and the severity of flooding is minimal as opposed to the retrospective

implementation of flood mitigation works which would generally be extremely costly and sometimes prone to catastrophic failure when flood flows exceed the design capacity of infrastructure

- Climate change predictions indicate greater variability in the intensity and magnitude of storm events coupled with accelerated sea level rise. These uncertainties pose significant challenges for the management of major drainage systems.
- Encroachments result in ecological degradation, often reducing water quality and precipitating loss of ecological resources irreversibly.
- Since modifications to natural systems may disrupt natural aquatic and geomorphological processes they require a long term maintenance commitment. Therefore urban activity must be managed in such a way that maintenance activities can be adequately conducted.
- To promote a sense of place and recreational enjoyment for communities.

This policy describes a merit based approach for dealing with land use, development or activity proposals near watercourses and wetlands.

## **4 Legislative Context and Legal Mandate**

Land use, development and associated activities influenced by this policy are dealt with in terms of the statutes and planning frameworks highlighted in the following sections.

### **4.1 National**

- National Building Regulations & Building Standards Act, 1997 (Act 103 of 1977)
- Conservation of Agricultural Resources Act (Act 43 of 1983)
- National Water Act (Act 36 of 1998)
- National Environmental Management Act (Act 107 of 1998)
- Disaster Management Act (Act 57 of 2002)
- National Environmental Management: Biodiversity Act (Act 10 of 2004)
- National Environmental Management: Protected Areas Act (Act 57 of 2004)

### **4.2 Provincial**

- Western Cape Planning & Development Act (Act 7 of 1999) (This Act will apply upon its coming into operation).
- Land Use Planning Ordinance, 1985 (Ordinance 15 of 1985)

### **4.3 City of Cape Town**

- Integrated Development Plan (2007/8 to 2011/12)

The Roads and Stormwater Department objectives are incorporated in the Integrated Development Plan for the City of Cape Town:

- Reduce the impact of flooding on community livelihoods and regional economies
  - Safeguard human health, protect natural aquatic environments, and improve and maintain recreational water quality
- By-law relating to Stormwater Management (Promulgated September 2005 – PG 6300) together with which this policy is to be read and interpreted.

The City's By-law relating to Stormwater Management defines the stormwater system to mean "both the constructed and natural facilities, including pipes, culverts, watercourses and their associated floodplains, whether over or under public or privately owned land, used or required for the management, collection, conveyance, temporary storage, control, monitoring, treatment, use and disposal of stormwater".

Clauses 4 and 5 of the By-law deal with the protection of the stormwater system (which includes the natural and built systems and associated floodplain) and the prevention of flood risk.

It is in terms of this By-law therefore that Council may prohibit or conditionally permit development in areas adjacent to watercourses and wetlands.

In addition, a number of other documents have been produced over the years which have referred to the management of development adjacent to watercourses and wetlands, either directly or by implication, and considered how these areas should be managed. Some of the more pertinent are listed below.

- Greening the City: Open Space and Recreation Plan for Cape Town (1982)
- Roads and Stormwater Department: Catchment, Stormwater and River Management Strategy (2002)
- Biodiversity Strategy (2003) and Biodiversity Report (2008)
- Coastal Zone Strategy (2003) and Coastal Zone Management Review and State of the Coast Report Year 3 (2006)
- CMOSS – An Open Space Strategy (2005)
- Planning for Future Cape Town (2006)

## **5 Policy Rationale**

Within the confines of the Cape Town Metropolitan Area the pressure to develop is significant and requires careful management to avoid developing in high flood risk areas, to protect the environmental integrity of aquatic resources and to ensure that permitted development enhances the aesthetics and character of the adjacent watercourses / wetlands.

In order to achieve this, a new approach is required where engineering, environmental and socio-economic elements are assessed and integrated as the vision for a particular watercourse / wetland system.

In this Policy a merit based approach is advocated for dealing with proposals within and adjacent to floodprone areas and environmental buffers. In addition, socio-economic considerations are also introduced whereby any permitted development will take cognizance of the presence of the watercourse / wetland and thereby holistically enhance the urban fabric of the area.

This Policy is important in achieving the service outcomes (refer to Section 3) namely; reducing the impact of flooding on people and properties, and of safeguarding human health, aquatic environments and improving and maintaining recreational water quality.

## **6 Policy Statement**

“In order to ensure sustainable development and associated activities within or adjacent to natural and built stormwater systems, and that there is a balanced consideration of potential flood risk, environmental impacts and socio-economic needs, all developments within these areas shall be planned and designed in accordance with best practice and the requirements and conditions laid down in this policy.”

This policy supports the service outcomes as highlighted in Section 3 above. It furthermore ensures administrative actions with respect to land use planning applications that are lawful, reasonable and procedurally fair.

## **7 Scope and Application**

This policy is applicable to land use, development or building or activity proposals adjacent to watercourses or wetlands. The principles regarding flood management can also be applied to development in the vicinity of formal stormwater management systems.

## **8 Objectives**

The objectives of this policy are to manage development in a manner that;

- Limits or reduces exposure to flood risk by avoiding hazardous, uneconomic or unwise use of floodplains, thereby protecting life, property and community infrastructure.
- Protects the natural flood carrying capacity of watercourses and wetlands.
- Protects and enhances the intrinsic value and the environmental goods and services provided by watercourses, wetlands and associated riparian areas and floodplains.
- Facilitates the beneficial integration of watercourses into the urban landscape by creating an aesthetically pleasing public resource which will ultimately allow for the social and economic up-liftment of communities adjacent to watercourses and wetlands.
- Provides an effective decision making tool for officials, developers and consultants by introducing an element of predictability with regard to applications for development along watercourses / river corridors and adjacent to wetlands.
- Promotes sustainable development from engineering, environmental and socio-economic perspectives.

## **9 Planning, Safety, Environmental and Socio-economic Considerations**

Land use, development or activities near watercourses and wetlands must be appropriate for the anticipated degree of flood risk whilst minimising concomitant environmental impacts and sustaining a sense of place and urban form. The following sections outline the planning, safety, environmental and socio-economic aspects to be considered when evaluating applications as envisaged in Section 7 above.

### **9.1 Plans / Sectoral plans**

Cognisance must be taken of applicable requirements and recommendations contained in various plans / related documents. Various categories of plans that should be consulted where

available are listed below. Sound engineering and environmental judgment should be applied in the absence of these guide plans.

- Roads and Stormwater Department: Catchment, Stormwater and River Management Strategy 2002 – 2007
- Catchment & River Management Plan
- Stormwater Master Plan

## 9.2 Flood Management and Public Safety

Watercourses and their associated floodplains can convey significant volumes of water under flood conditions. For the purposes of this policy, a floodplain is defined as the area susceptible to inundation by the 100-year flood, as indicated in Figure 1 below.

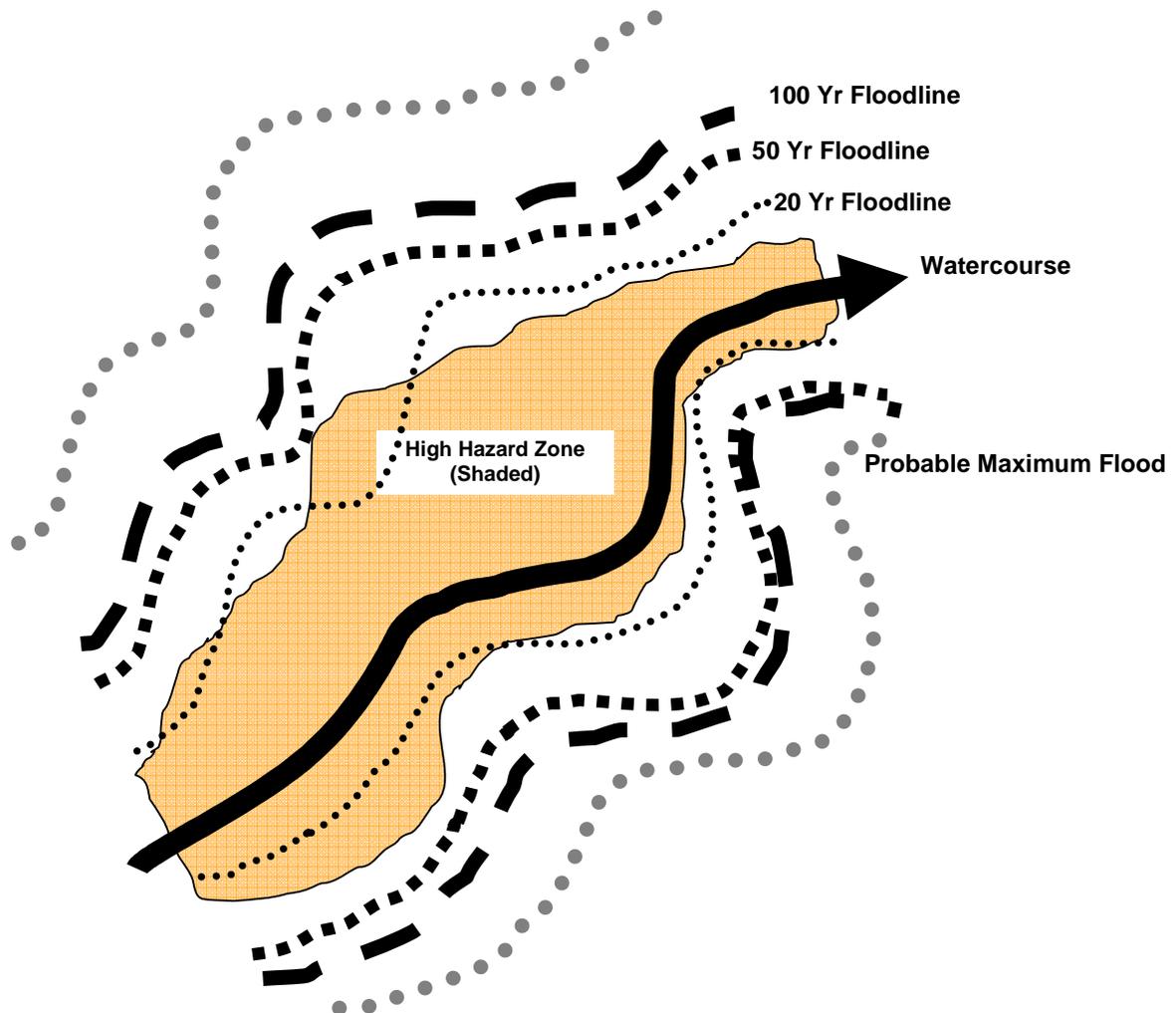
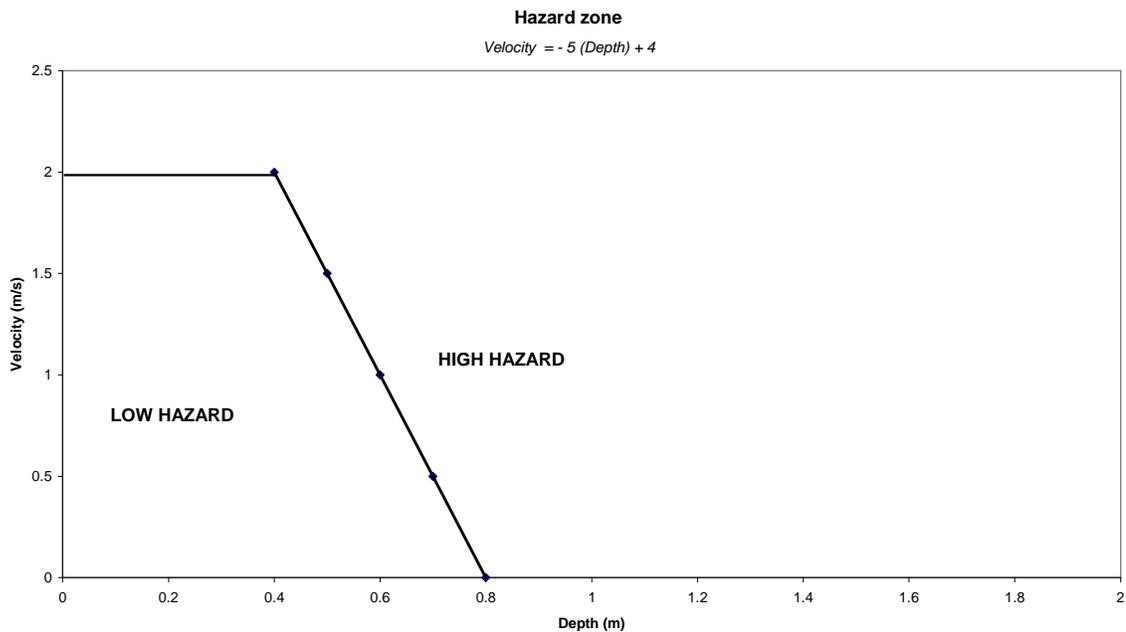


Figure 1: Schematic representation of floodplain depicting watercourse and significant floodlines

The high hazard zone within a floodplain, based on an analysis of the expected flow characteristics of the 100-year flood, is graphically indicated in Figure 2 below. The ability to wade or gain vehicular access as well as the stability of structures such as dwellings or boundary walls are deemed seriously compromised under these conditions. No new or additional rights or the exercising of existing development rights will be granted to properties located within the high hazard zone.

The permissible extent and nature of land use, development or activities within floodplains must be subject to stringent evaluation and control in the interests of public safety. In particular, obstruction to the free flow of water within the 20-year floodline area shall not be permitted. However, between the 50 and 100-year floodlines, some developments or activities may be permitted, subject to such conditions as the City may in its discretion impose, while developments with particular evacuation or emergency response issues and high risk developments will only be permitted above the 100-year floodline (refer to Table 1).

Any proposed development or redevelopment within the floodplain must be supported by a report by a registered professional engineer to ensure that any new or existing structure can withstand the forces and effects of floodwaters (refer to requirement R1 in Table 1). If building plans are submitted in respect of proposed buildings within the floodplain and such a report has not previously been submitted, it must be included with the building plans.



**Figure 2: Flood hazard zones**

### 9.2.1 Floodline Determination

Where floodlines have not previously been determined for a particular location, the developer will be required to procure the services of a suitably qualified registered engineering professional to undertake such determinations at own cost and to submit a report in connection therewith together with such planning or building plan approval applications he or she may lodge with the City. This should take place prior to any detailed planning being undertaken and must be in accordance with generally accepted practice.

In determining catchment runoff, the foreseeable ultimate development scenario for the catchment must be considered. All floodlines must be based on the theoretical energy level as opposed to the water surface level.

Permissible landuse / development / activity and applicable conditions within the floodplain are indicated in Table 1: Framework for the assessment of proposals (section 10). Depending on the type of application a range of floodlines must be determined as indicated below:

<b>Floodline (Annual Probability)</b>	<b>Rationale</b>
2 year (50%)	Determine if required (see Table 1)

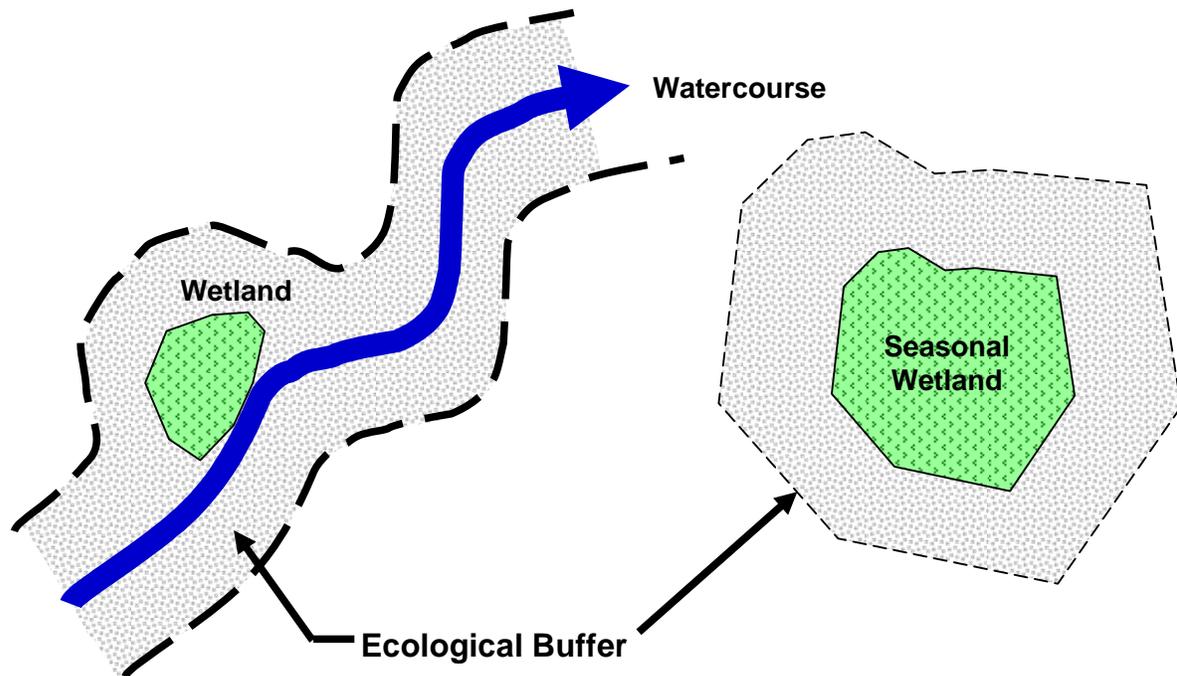
<b>Floodline (Annual Probability)</b>	<b>Rationale</b>
20 Year (5 %)	Required for parking and other activities
50 Year (2%)	Controls a number of development activities
100 Year (1%)	Controls floor levels and high risk development activities

Note: Other legislation (e.g. NEMA) may require additional floodline determinations and therefore further restrictions may apply.

### 9.3 Ecological Buffers

Watercourses and wetlands with their adjacent riparian areas and associated fauna and flora must be protected or “buffered” from the impacts of adjacent development or activity. Often referred to as ecological buffers, these protected zones / set backs provide continuous corridors and habitat for flora and fauna. Buffers also provide other benefits such as water quality improvement of point or diffuse sources of pollution, stream bank and erosion protection from the hydrological impacts associated with hardened catchments in urban areas, and space for implementation of appropriate water sensitive urban design elements. In addition buffer areas can provide socio-economic benefits in the form public open space, opportunities for recreation and environmental education / awareness, and enhancement of waterway, visual and property values. In instances where watercourses have been canalized, buffers are still required to aid maintenance and, in some instances, to allow adequate space for possible future restoration activities.

Determination of ecological buffer widths is based on classification of the watercourse or wetland in terms of a recognized national classification system followed by an assessment of the ecological condition and importance of the system (using nationally recognized methods). Watercourses and wetlands with high ecological condition and importance require a wider buffer than those which have been exposed to considerable modification. For watercourses, buffer width may also be adjusted on the basis of the width of the active channel. The buffer is measured from watercourse “top of bank” or outer edge of the wetland (which must be delineated according to nationally accepted guidelines / methodologies e.g. DWAF 1999 and 2005). They have been determined for several of the significant watercourses and certain wetlands within the metropolitan area and vary in width between 10 m and 40 m for watercourses, and up to 75 m for wetlands. A minimum buffer of 10 m is required for concrete canals. Buffers must be adjusted to accommodate wetlands in close association with a watercourse as indicated schematically in Figure 3.



**Figure 3: Schematic representation of ecological buffers**

Where ecological buffers have not yet been determined for a particular watercourse or wetland, either the City may determine a buffer width by extrapolation if calculated buffer widths are available for similar situations elsewhere, or the developer is required to procure the services of a suitably qualified freshwater ecologist to recommend buffer widths in terms of Council guidelines or approved best practice at own cost and to submit a report in connection therewith together with such planning and building plan approval applications as he or she may submit to the City. This must take place prior to any detailed planning being undertaken.

Site / case specific adjustment of the recommended minimum buffer width may be necessary to allow for exceptional circumstances such as the presence of sensitive habitats, fauna or flora which may require wider buffers for adequate protection; the intensity of adjacent landuse and the nature of anticipated impacts; and the physico-chemical and/or botanical characteristics of the buffer area which may alter the efficacy of the buffer to mitigate against identified impacts.

Permissible landuse / development / activity and applicable conditions within the ecological buffer are indicated in Table 1: Framework for the assessment of proposals (section 10).

#### **9.4 Geomorphological Processes**

Cognisance must also be taken of the fact that the beds of many watercourses, particularly on the Cape Flats, are dynamic and prone to erosion, sedimentation and meandering. Where the ecological buffer width and/or floodplain setback requirement is considered an inadequate allowance for these natural processes, additional site-specific studies and setback width may be required in the discretion of the City prior to planning and building plan approval. In these instances, the developer will be required to procure the services of a suitably qualified geomorphologist to determine setback widths at own cost and to submit a report in connection therewith upon request.

#### **9.5 Socio-economic Considerations**

Watercourses and wetlands are public resources which have the remarkable potential to stimulate local economies and to break down political, social and economic barriers if managed

and used with this goal in mind. Assessment of developments adjacent to watercourses and wetlands must therefore take cognizance of this potential and promote developments which actively incorporate these systems into the urban fabric of the area.

Without derogating from the general nature of what is stated in this clause, the following specific issues must be considered:

- Water Sensitive Urban Design principles
- Layout / configuration and nature of adjacent development and/or associated activities
- Watercourse / wetland frontage with adjacent development
- Areas of passive and active open space
- Areas for walkways, cycle tracks, picnic facilities
- Aesthetic improvement of degraded systems with appropriate indigenous landscaping
- Public access
- Safety and security
- Economic upliftment
- Environmental education and awareness
- Environmental standards and best practice

Socio-economic considerations such as those listed may be taken into consideration by the City when evaluating planning and building plan approval applications, in its discretion.

## **9.6 River Corridor**

The “River Corridor” comprises the watercourse and/or associated wetlands (as applicable), the floodplain, the ecological buffer and the area required for specific aesthetic, recreational and/or socio-economic needs. This combined area must be managed in an integrated manner which balances the flooding, environmental, social and economic issues (as outlined in the preceding sections 9.2 to 9.5) . The City shall strive to develop river corridor plans for all river corridor areas within its jurisdiction, in order to give effect ultimately to this holistic vision.

An allowance of up to 10 m (measured from the top of bank or outer edge of the wetland) dependent on the current or future maintenance strategy for the watercourse / wetland must be made for maintenance access.

## **10 Assessment of Proposals and Applications**

This policy advocates a merit-based approach to the assessment of proposals and applications pertaining to property near watercourses and wetlands. Any new land use, development, activity or building must be appropriate for the anticipated flood risk and geomorphological process requirements and compatible with the ecological buffer and socio-economic requirements, whilst allowing access for maintenance. Table 1 provides acceptable land use for the various floodplain zones and buffer, as well as specific requirements in instances where conditional approval is considered.

Proposed land-use / development / activities / buildings must be set back beyond the greater of the applicable floodplain, geomorphological and ecological buffer requirements.

Typical proposals requiring input and approval may be divided into three broad categories as described in the following sections.

### **10.1 Zoning Schemes, Structure Plans and Related Policies**

Only land uses considered appropriate within the applicable floodplain and ecological buffer (Refer Table 1) can be contemplated. In addition geomorphological, maintenance as well as social and economic aspects must be considered.

## **10.2 Land Use Planning Applications**

### **10.2.1 New Development Rights**

Developments or activities falling within this category typically require additional and/or amended land use rights to proceed, such as:

- Rezoning
- Sub-division
- Land use departures
- Consent use
- Amendment of plans or conditions of approval

Only land uses, developments or activities considered appropriate within the applicable floodplain and ecological buffer (Refer to Table 1) can be contemplated. In addition geomorphological, maintenance, social and economic aspects must be considered where appropriate.

### **10.2.2 New Development Rights on Existing Building Footprint**

Where no increase in existing building footprint or usage is proposed, as in the case of the redevelopment of an existing building, deviation from this could be considered, where the development or activity is located outside the high hazard zone, subject to compliance with the following:

- Fulfillment of requirements R1 and R2 on Table 1.
- Implementation of appropriate flood protection and mitigation works, including but not limited to the flood proofing of buildings and flood evacuation plans if appropriate. The developer must make adequate provision for future maintenance or operation.
- The registration of a Notarial Deed of Restraint against alienation, which provides that the registered owner shall not be entitled to alienate his/her property without the consent of the City. Such consent shall be withheld until such time as the new owner/purchaser signs an indemnity on terms and conditions acceptable to council. The issuing of a clearance certificate in terms of section 118(1) of the Municipal Systems Act No. 32 of 2000 shall not constitute consent for the abovementioned purpose.
- Endorsement of all Building Plans to the effect that the owner is aware of the consequences of developing within a floodplain and floodlines to be depicted on all applicable building plans.

## **10.3 Building Plan Applications (Exercising of Existing Development Rights)**

Consideration of building plans for structures, submitted in terms of existing development rights, will be conditional on the following:

- Location of buildings on the higher lying portions of the property with floors above the 100-year flood level where practically possible, the flood proofing of buildings and flood evacuation plans where necessary.
- No buildings will be permitted within the high hazard zone.
- Limitation of all construction / development activity within the ecological buffer.
- Consideration of measures to mitigate potential maintenance impacts as appropriate.
- The registration of a Notarial Deed of Restraint against alienation, which provides that the registered owner shall not be entitled to alienate his/her property without the consent of the

City. Such consent shall be withheld until such time as the new owner/purchaser signs an indemnity on terms and conditions acceptable to council. The issuing of a clearance certificate in terms of section 118(1) of the Municipal Systems Act No. 32 of 2000 shall not constitute consent for the abovementioned purpose.

- Endorsement of all Building Plans to the effect that the owner is aware of the consequences of developing within a floodplain and floodlines to be depicted on all applicable building plans.

#### **10.4 Development Layouts**

In preparing development layouts cognisance must be taken of the various considerations outlined in the previous sections (10.2 and 10.3) as well as Council's Stormwater Management Planning and Design Guidelines for New Developments. Where appropriate, a servitude protecting the floodplain and / or ecological buffer from alteration or obstruction on completion of the development must be registered in favour of Council by the developer at own cost. Where maintenance access is required, this must also be incorporated in the conditions of servitude.

Buildings must be located above the appropriate flood level or buffer zone, or on the upper extremities of the property if the site is entirely located within the relevant floodline, and must front or provide views onto the watercourse or wetland to ensure adequate visual surveillance and integration of the system into the fabric of the development and the City as a whole. Perimeter fencing below the 50-year floodline must be visually permeable from ground level and not adversely affect the free flow of water and movement of aquatic fauna (e.g. palisade fencing).

### 10.5 Table 1: Framework for the Assessment of Proposals

Table Shading Key	
Colour Coding	Description
Clear	Permitted
	Conditionally Permitted
	Not Permitted

Additional Requirement Key	
Code	Requirement
R1	A registered Engineering Professional must be engaged by the developer to satisfactorily demonstrate and certify that: <ul style="list-style-type: none"> <li>▪ The activity / development will not materially increase flood hazards for other property owners or adversely affect flood behavior or the stability of river channels.</li> <li>▪ Any structure can withstand the forces and effects of flowing floodwaters, including scour of foundations, debris forces and buoyancy forces.</li> </ul>
R2	Floors above 1:100 year flood level. Basements (non-habitable purposes) to be flood-proofed to 1:50-year flood level.
R3	Floors above 1:50 year flood level.
R4	A registered Environmental Professional (Aquatic Ecologist) must be engaged by the developer to determine the ecological buffer (if not available) and to satisfactorily demonstrate and certify that: <ul style="list-style-type: none"> <li>• The activity / development will not negatively impact on the present condition of the watercourse or wetland OR</li> <li>• The activity or development will improve the condition of the watercourse or wetland from its present state</li> </ul>

**The land use / development / activity must be set back beyond the *greater* of the applicable floodplain zone / geomorphological or ecological buffer requirements**

Land use / Development / Activity		Requirements and Conditions							
		Floodplain Zone (Flood Recurrence Interval in Years)					Ecological Buffer (Width in meters)		
Category	Typical Examples	< 2	2-20	20-50	50-100	>100 (Note 1)	Explanatory Notes	Up to 75m (Note 2,3)	Explanatory Notes
Industrial Development	Light, General, High Risk								
	Extractive (Mining)		R1	R1	R1				
Business Development	General				R2				
	Commercial (CBD)								
	Service Stations								
Residential Development	Formal				R2				
	Informal								
Community & Public Facilities	Hospitals, Clinics, Nursing Homes, Old Age Home								

Land use / Development / Activity		Requirements and Conditions							
		Floodplain Zone (Flood Recurrence Interval in Years)					Ecological Buffer (Width in meters)		
Category	Typical Examples	< 2	2-20	20-50	50-100	>100 (Note 1)	Explanatory Notes	Up to 75m (Note 2,3)	Explanatory Notes
	Prisons, Military Bases, Police Stations, Fire Stations								
	Cemeteries								
	Educational Facilities								
	Public Halls, Places of Worship								
Utility / Infrastructure Services (incl. Private)	Stormwater Management Facilities	R1	R1					R4	
	Underground Sewers, Services						Manhole cover levels above 1:50 year flood level. Structure to be suitably protected and integrated into surrounds		
	On Site Sewage Treatment								
	Water & Wastewater Works, Pump Stations								
	Solid Waste Disposal Sites								
	Power Generation, Electrical Substations								
	Telecommunication Exchanges & Transmitters.								
Environment, Open Space & Recreation	Nature Reserves and Conservancies						All structures/earthworks to be subject to conditional approval		All structures/earthworks to be subject to conditional approval
	Sports Fields, Golf Courses, Picnic Areas		R1	R3			All club houses and similar structures to be above the 50 year floodline	R4	
	Public & Private Open Space						All structures/earthworks to be subject to conditional approval		All structures/earthworks to be subject to conditional approval
Agriculture	Cultivation, Free-range animal husbandry		R1	R1			Subject to Conservation of Agricultural Resources Act (CARA) Regulations		

Land use / Development / Activity		Requirements and Conditions							
		Floodplain Zone (Flood Recurrence Interval in Years)					Ecological Buffer (Width in meters)		
Category	Typical Examples	< 2	2–20	20–50	50-100	>100 (Note 1)	Explanatory Notes	Up to 75m (Note 2,3)	Explanatory Notes
	Agricultural Processing / Industry				R1,R2				
	Feedlots, Piggeries and Battery Farming			R1	R1		Subject to Conservation of Agricultural Resources Act (CARA) Regulations		
Resorts	Hotels, Holiday Resorts and Bungalows,				R2				
	Caravan and Camping Sites		R1	R3			All ablution facilities to be located above the 20 year floodline	R4	
Transport Systems	Roads and Railways elevated above NGL		R1	R1	R1				
	Modal Interchanges, Bus Depots, Railway Stations								
	Parking Areas			R1					
Bank Protection Works, Flow Diversion Structures, & Earthworks	Revetments, Training Walls, Levees	R1	R1	R1				R4	
	Dams, Weirs, Bridges	R1	R1	R1	R1	R1	Dam-break analysis to be performed where required in terms of National Water Act	R4	
	Filling				R1	R1	In exceptional circumstances minor "smoothing" of the 50 / 100 year floodline may be considered, provided equivalent compensatory stage storage volume is provided within the development precinct		

Note 1: The effects of the 100-year storm event on all developments and infrastructure, including adjacent and downstream properties, must be evaluated to comply with the above requirements.

Note 2: Watercourses: 10 to 40 m; Wetlands: up to 75 m

Note 3: Conditional approval may be granted for certain low impact social needs / activities, appropriate landscaping, indigenous planting, pathways

# 11 Commencement and Implementation

## 11.1 Commencement Date

Unless otherwise specified, the commencement date for this policy will be the date of adoption by Council

## 11.2 Existing Policies / Guidelines Repealed

The following existing policies / guidelines are repealed:

Title	Commencement Date	Resolution
Floodplain Management Guidelines: Version 1.0	September 2003	MC37/11/03

# 12 General

## 12.1 Statutory Permits and Approvals

Certain developments or activities may be subject to approvals in terms of national legislation by Provincial and National Government Departments.

Examples include, but are not limited to:

- Storing water
- Impeding or diverting the flow of water in a watercourse
- Altering the bed, banks, course or characteristics of a watercourse
- Using water for recreational purposes
- Abstraction
- Land reclamation
- Agricultural cultivation in close proximity to watercourses.

## 12.2 Indemnity

The degree of flood and/or environmental protection recommended by this policy is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Mere compliance with its provisions cannot ensure complete protection from flooding particularly from high order events or reduced environmental impact and must therefore not be construed as a warranty.

This policy shall not create liability on the part of the City of Cape Town or any officer thereof, for any damage that may result from reliance thereon.

## 12.3 Copyright

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## 12.4 References

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