Arborfield & Barkham Neighbourhood Plan 2019-2036

Annex XII

Flood Risk Management Statement

July 2017

A plan for the community by the community

Arborfield and Barkham Neighbourhood Plan

Flood Risk Management Statement

This paper has been prepared as a supporting document for the Arborfield and Barkham Neighbourhood Plan.

Opening statement

Barkham and Arborfield PC promote the use of an integrated catchment based approach to flood risk management. The aim of this integrated approach is to manage local flood risk through natural processes along with the maintenance and upgrading of local drainage assets and to 'slow the flow' of local water entering the local rivers and streams which will help manage flood risk elsewhere in the catchment.

As a tributary to the Thames any reduction in peak flows and heights from the Loddon catchment with benefit the Thames.

Events in the past few years suggest that we are experiencing more severe flood events which current protection measures cannot always cope with. A different and more joined-up approach to flood risk management is needed.

All supporting evidence and information can be found in Appendix A.

1. **Household level:**

- Minimising the use of impermeable surfaces, for instance promoting the use of flood friendly permeable drives and patios. The National Flood Forum are suggesting that councils run projects to get residents to replace impermeable drives with more permeable alternatives).
- Promote the use of water butts and other rain harvesting techniques. This also aids water supply during periods of drought.
- Where front gardens are converted for off road parking, the design should minimise hard surfaces, limiting them to wheel running areas, with the remainder of the parking comprised of gravel or planted surfaces (permeable surfaces).

2. **Local amenities**

- Promote creating 'buffer' zones around rivers and streams of grassland, scrubland and/or trees to slow the flow of surface water/rain water into local rivers and streams and to allow more water to be absorbed into the soil. The use of 'buffer' zones also reduces diffuse pollution going into our rivers and enhances the environment and biodiversity.
- Promote the implementation of buffer zones for roads i.e. using trees, shrubs and grass verges to enable highway water to readily clear the roads but to enter drains more slowly, filtering through the plants and soil rather than running across hard surfaces.
- Promote the development of wet woodlands and woodlands. These provide an opportunity to create community areas when on public land. Wet woodlands and woodlands in general have a positive impact on flood risk and also have large positive environmental and biodiversity impacts.

Note: care must be taken with the location of wet woodlands and the trees used (the right tree in the right place) to ensure that they don't cause flooding by backing up water in places where flooding will affect properties, business's and essential infrastructure nor generate woody debris in locations where it could be a flood risk. Advice must be sought from the Environment Agency.

- Over and above woodlands, to work with local land owners to implement flood risk management project which also improve the local environment, for example reducing run-off from local field that not only increases flood risk but can also pollute local waterways.
- To work closely with Wokingham Borough Council to identify and address specific highways flood risk issues both in terms of highways which flood or highways which have the potential for run-off to flood local properties.

3. Improving current infrastructure and re-naturalising local streams and rivers

- De-culverting local streams and drainage systems and re-profiling where possible. Both are designed to increase capacity and improve ecological and amenity value. Consent from the Environment Agency must be sought to ensure flood risk is not increased elsewhere.
- Re-naturalising local ponds, streams and rivers with aim of slowing the flow of local water into the river Loddon. Re-naturalisation also has amenity, environmental and biodiversity benefits and creates natural environments for the benefit of local residents.
- Maintenance of flood assets on a regular basis for example, balancing ponds, ditches, drains, etc. to ensure they can function effectively and do not contribute to flood risk.
- When possible (for example during repair) retro-upgrading of drainage systems. Many drainage systems are only designed to handle 1:30 events, which results in surcharging drains during periods of heavy rainfall.

4. Development

- **All** new houses and development must utilise SUD's and have a maintenance plan for the lifetime of the development. New houses and developments should not cause an increase in run-off but should create greater retention of surface water. For the protection of current and future residents of Barkham and Arborfield Wokingham Borough Council must adopt the SUD's and ensure their maintenance.
- **All** new houses and developments must comply with Wokingham Borough Councils policies CC09 and CC10 of the MDD policy suite.
- To pro-actively engage with local developers to ensure that flood risk is managed at the earliest opportunity in the building of the development.
- To identify future sites for development which do not pose a threat of flood risk and which actively support the environment.

5. Managing flood risk

- Promote co-operation with other local parish councils to help ensure a more integrated approach to flood risk management.
- To create a local flood prevention action group to and remedy existing flood risks and to build up a preventative programme including regular appraisal.

General background information on natural flood risk management

Floods Directive

Key objectives statement: Reducing human casualties and damage to economic activity and the environment are key objectives shared by all EU countries and implementation of the 2007 Floods Directive has an important role in making this happen. Traditional measures to reduce negative impacts of floods include constructing new or reinforcing existing flood defence infrastructure such as dykes and dams. There are, however, other and potentially very cost-effective ways of achieving flood protection which profit from nature's own capacity to absorb excess waters. Such green infrastructure measures can play a major role in sustainable flood risk management in Europe. Win-win solutions need to be the focus of flood risk management.

Why do we need natural flood management?

As our understanding of the interplay between rivers and the landscape has grown, effective solutions which work with nature, rather than against it, are becoming more important than ever. Flood risk management can go hand in hand with nature protection and restoration, and deliver benefits for both people and nature. Some traditional flood risk management measures have a negative impact on the quality and quantity of waters, or on biodiversity-rich areas. Examples can be the building of hard engineering solutions which change the river flow, by reducing water for related ecosystems in the area or which accentuate problems in dry seasons by altering the natural flow of the river. Measures which improve the storage capacities of flood water temporarily during flood events, can be effective in protecting against flooding, as well as also provide other benefits deriving from ecosystem services, such as for leisure activities and nature protection.

What is natural flood management?

Natural flood management considers the hydrological processes across the whole catchment of a river with a focus on increasing water retention capacities. Examples of such measures are:

- re-connection of rivers with their floodplain.
- restoration of wetlands which can store flood water and help “slow the flow” of flood waters.
- reservoirs in agricultural areas which can store flood water during flood events, and otherwise be high nature value areas.
- urban Green Infrastructure such as green spaces, sustainable urban drainage and green roofs.

What are the multiple benefits of such measures?

Flood prevention measures entailing a more natural flood management approach achieve typical benefits such as avoided costs of damage to society, human health, economic activities, infrastructure, cultural heritage and the environment. This approach often allows the same piece of land to deliver multiple benefits and measures typically have additional benefits, such as:

- maintaining and restoring biodiversity, by strengthening the functionality of ecosystems.
- provision of nature protection areas which can also be valuable for recreation and increasing life quality.
- improving water quality and restoring water resources.
- contributing to the development of a green economy by providing jobs and business opportunities in addition to environmental advantages.

Although such additional benefits may not always be fully quantified or monetised, their advantages are important and compare favourably against traditional measures.

Defra: there are a number of POSTNOTEs on the UK Parliament website relating to flooding

Government POSTNOTE 396: Natural Flood Management

Overview

- The Flood and Water Management Act (2010) and Environment Agency Catchment Flood Management Plans promote working with natural processes where possible.
- Natural flood management (NFM) varies in its effectiveness, for example, water storage or flooding land are often more effective than changing land management practices.
- NFM can reduce erosion and benefit water quality, carbon storage & biodiversity. These positive effects may sometimes be more valuable than the reduction in flood risk.
- Collaboration between land-owners and communities is likely to be a key part of the success of NFM. Long-term funding measures or incentives, and better use of local knowledge, will also be important.

Government POSTNOTE 484: Catchment Wide Flood Management:

Overview

- Flood management measures that work with natural features and processes reduce flood risk at local scales.
- Networks of these measures over a larger scale have the potential to enhance the resilience of existing flood defence systems and reduce the need for dredging. They need to be tailored to catchments using expert and local knowledge.
- Catchment-based approaches may be more cost-effective than relying solely on structural defences, and deliver wider long-term economic, social and environmental benefits.
- A lack of empirical evidence on the effectiveness of catchment-wide approaches is a barrier to their implementation.

SEPA

Natural Flood Risk Management handbook can be found on the SEPA website.

Preface

Climate change, population growth, economics, and environmental legislation such as the Floods Directive and Water Framework Directive all necessitate a move towards a more integrated, catchment based approach to the management of land and water. Working in this way creates efficiencies in how we manage our environment by recognising that many issues in catchments affect many different sectors and that where land and water are managed together at the catchment scale this can bring about whole catchment improvements and multiple benefits to society. A key component of this integrated, catchment based approach is the recognition that working with natural processes to manage the sources and pathways of flood waters can benefit flood risk in other parts of the catchment, including our coastline. This technique, commonly referred to as natural flood management, can help deliver more expansive landscape changes than has previously been the case, while also saving money and delivering other benefits alongside flood protection, thus benefiting the environment, society and the economy.

The purpose of this handbook is to provide a practical guide to the delivery of natural flood management to benefit flooding, while also bringing about many other outcomes. It is informed by a number of demonstration projects and studies commissioned by SEPA and partners in recent years that have highlighted some of the requirements for the effective delivery of natural flood management. The handbook is not static but will be updated and supplemented in the future as additional data becomes available. While the guidance provided is primarily aimed at local authorities tasked with delivery of actions set out in the Flood Risk Management Strategies, it is also intended to be of use to all those seeking to deliver natural flood management.

Information supporting the flooding policy – summaries. Documents held on the Environment Agency website

Household level

'Guidance on the permeable surfacing of front gardens

Introduction to the leaflet

From 1 October 2008 the permitted development rights (see Glossary) that allow householders to pave their front garden with hardstanding without planning permission have changed in order to reduce the impact of this type of development on flooding and on pollution of watercourses.

You will not need planning permission if a new or replacement driveway of any size uses permeable (or porous) surfacing, such as gravel, permeable concrete block paving or porous asphalt, or if the rainwater is directed to a lawn or border to drain naturally.

If the surface to be covered is more than five square metres planning permission will be needed for laying traditional, impermeable driveways that do not provide for the water to run to a permeable area.

Applying for planning permission will require you to fill in an application form, draw plans (which have to be to scale) and pay a fee of £150. Planning applications for this type of householder development should normally be decided within 8 weeks after submission.

This leaflet explains the different approaches to constructing a driveway or other paved area that controls and reduces rainfall runoff into drains by using permeable surfaces or soakaways and rain gardens (a small planted depression designed to manage rainwater – see Glossary). The advice can also be applied to other paved areas around the house, such as patios.

The guidance has six main sections:

1. What is the problem with paving front gardens?

2. How can we prevent the problems?

3. Types of surfaces

4. How to design and construct permeable surfaces

5. Looking after a permeable driveway

6. Where can I find more information?

7. Glossary

Environment Agency's 'Harvesting rain water for domestic use: an information guide'

1 Introduction

This publication examines rainwater harvesting systems for non-potable domestic uses (those that do not require water suitable for human consumption) in houses and gardens. Many of the concepts can also be applied to industrial and commercial premises. This guidance is for homeowners, house builders, planners, plumbers, architects and building managers. It contains information on the benefits of rainwater harvesting systems, their design, installation, maintenance requirements and cost. It also contains examples of systems that have been installed and are in use.

This guide does not cover recycling of water, for example, from sources like the bath and shower (greywater). This is examined in a separate publication.

1.1 What is rainwater harvesting (RWH)?

Rainwater harvesting is the collection of rainwater directly from the surface(s) it falls on. This water would otherwise have gone directly into the drainage system or been lost through evaporation and transpiration. Once collected and stored it can be used for non-potable purposes. These include toilet flushing, garden watering and clothes washing using a washing machine. You should note that where used for washing machines, if the quality of the collected water is poor, there can be issues with both colour and odour.

1.2 Why consider a RWH system?

Despite the common perception that it rains a lot in England and Wales, our water resources are under pressure. A high volume of water is taken from the environment for human use. Demand for water is rising because the population is increasing, lifestyles are changing and the impacts of a changing climate are becoming clearer. In the South East of England, where large numbers of people live and work, water is scarcer than anywhere else in England and Wales. In fact, there is less water available per person in this region than in many Mediterranean countries.

We need to plan carefully for the future to ensure reliable water supplies are available for everyone whilst protecting the natural environment.

The Environment Agency advocates the 'twin track' approach of developing resources and managing demand. Exploring ways to reduce demand for mains water is essential to ensure a sustainable future for water resources. One of the options is to install RWH systems to substitute mains water use for purposes where drinking water quality is not required.

1.3 What savings can be achieved?

Any RWH system will reduce the dependence on the mains water supply.

Potential savings need to be assessed on an individual basis before any system is implemented. Factors which will influence this are; the demand for non-potable water, the amount of rainwater that can be collected and supplied and whether the property is charged by volume of water used (is metered).

Savings, both financial and environmental, will be higher in commercial/industrial buildings and schools. This is because they generally have larger roof areas and a greater demand for non-potable water than private dwellings.

Only customers with water meters will benefit financially from using a RWH system. At the time of writing (2010) this applies to approximately 37% of domestic properties and almost all industrial and commercial customers. Therefore, in England and Wales, for the majority of domestic customers, there is no financial incentive to install a RWH system.

Financial savings are usually higher when a system is installed during construction as retrofitting can be expensive and disruptive.

1.4 What are the benefits?

RWH systems can reduce demand for mains water and relieve pressure on available supplies. For customers with meters, water bills will be reduced.

Reducing the volume of mains water supplied means less water is taken from lakes, rivers and aquifers and more is left to benefit ecosystems and help sustain the water environment.

RWH systems can also reduce the risk of flooding and pollution as less rainwater is discharged to drains and sewers and, ultimately, to rivers. They can contribute to slowing down the flow of water and reduce the pressure on drainage systems in times of high flow.

Sustainable drainage systems (SUDS) often incorporate rainwater harvesting. SUDS reduce the risk of flooding by increasing the retention and control of surface/storm-water. In England, Planning Policy Statement 25 'Development and Flood Risk' (PPS25)2 requires flood risk to be considered at all stages of the planning process to reduce future loss of life and damage to property from flooding.

The Environment Agency website also has policies and information on the uses and problems of culverts and the maintenance of flood assets

Local amenities

- Buffer zones are used to:
  - reduce sediment loss into rivers. Heavily sedimented rivers can pose a flood risk.
  - absorbs some level of nutrients and pollutants from ground and surface water flow.
  - They can provide shade which keeps rivers cool and prevents excessive algae growth.
  - Buffer zones help to modulate water flows. Without buffer zones, during high rainfall water travels rapidly from catchment to the rivers/streams. Buffer zones act like sponges and slow the flow of water from catchment to river, thus regulating river flows, reducing/preventing flooding and disturbance events.

Development

Sustainable Drainage System – for more information see the Environment Agency website.

Information below from Susdrain (created by CIRIA)

What are SuDS?

SuDS (or Sustainable Drainage Systems) are an approach to managing rainfall in development that replicates natural drainage, managing it close to where it falls. In natural environments, rain falls on permeable surfaces and soaks into the ground; a process called infiltration. In urbanised areas where many surfaces are sealed by buildings and paving, natural infiltration is limited. Instead, drainage networks consisting of pipes and culverts, divert surface water to local watercourses. In some cases, this has resulted in downstream flooding and deterioration in river water quality caused by diffuse pollution or when combined sewers (which collect surface water runoff and foul waste) are overwhelmed by surface water leading to a release of polluted water into rivers.

Benefits of SuDS

There is a growing acceptance that we need a more sustainable approach to managing surface water. Sustainable drainage systems (SuDS) mimic natural drainage processes to reduce the effect on the quality and quantity of runoff from developments and provide amenity and biodiversity benefits. SuDS can also deliver additional benefits (some of which are in table 1). When planning, or specifying SuDS, early consideration of the potential multiple benefits and opportunities will help deliver cost effective SuDS scheme with the best results.

For additional local information please visit the Wokingham Borough Councils website and search for ‘how planning policy works’.