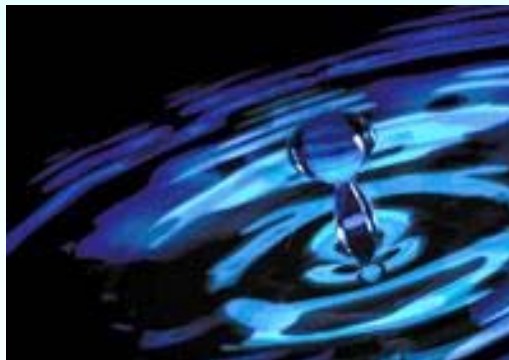


Basingstoke Water Cycle Study

Phase 1 Non technical summary

March 2007



1 The need for a water cycle study

KEY MESSAGES

The Draft Regional Spatial Strategy (Draft RSS) for the South East known as the South East Plan proposes about 16,500 new dwellings within Basingstoke and Deane Borough by 2026. A key objective of this study is to inform the Examination in Public (EiP) of the implications arising from South East Plan. This study will be a key piece of evidence to inform the debate and ensure that development does not have a detrimental impact on the water environment. The provision of new dwellings should not exceed the total environmental capacity, ensuring that the water cycle infrastructure can adapt to meet the demand.

The draft South East plan provides for 16,500 new homes to be built in Basingstoke and Deane Borough between now and 2026. The majority of the development will be in the Western Corridor and Blackwater Valley area, with a small proportion falling within the rest of the Borough area. Basingstoke is a Regional Hub under South East Plan policy and therefore a significant proportion of the housing delivery will be focused in and around Basingstoke town.

The new homes will require water supplies and will generate waste water and sewage that will need collecting and treating before return to the local water environment. Despite work by the Environment Agency and Water Companies looking at the impact of development in the South East on water quality and water supply, there were unresolved doubts about the capacity of the water environment in Basingstoke to satisfy these requirements.

Basingstoke and Deane Borough Council and Hampshire County Council have expressed concern at the ability of the foul drainage and river system to cope with the 16,500 properties proposed in the South East Plan, and have suggested that a development level of 14,800 is more achievable. This study looks at these two difference growth scenarios, and an additional higher scenario of 19,800 properties.

Basingstoke draws on the same water resources as the rest of the South East and cannot therefore be considered in isolation. The South East is the driest region in the UK with the highest demand for water. Increased water abstraction for use by a growing population has to be

balanced with environmental need. Projections are showing that there is currently no surplus to satisfy additional demand. The future need for demand management measures and water supply infrastructure must be planned. There is a need for wide recognition and co-operation to overcome the issues faced.

Wastewater from the main settlement of Basingstoke is presently treated at the sewage treatment works at Chineham before discharge to the River Loddon. The works already operates with the most stringent discharge consent standards in the UK and the process represents the best available technology. One of the key requirements of this study is to address serious concerns about the future impact of increased discharges on the ecology of the river.

In order to assess these and other water associated issues, a Basingstoke Water Cycle group was set up comprising key stakeholders to combine the best current knowledge of the issues and address the implications. The group comprised:

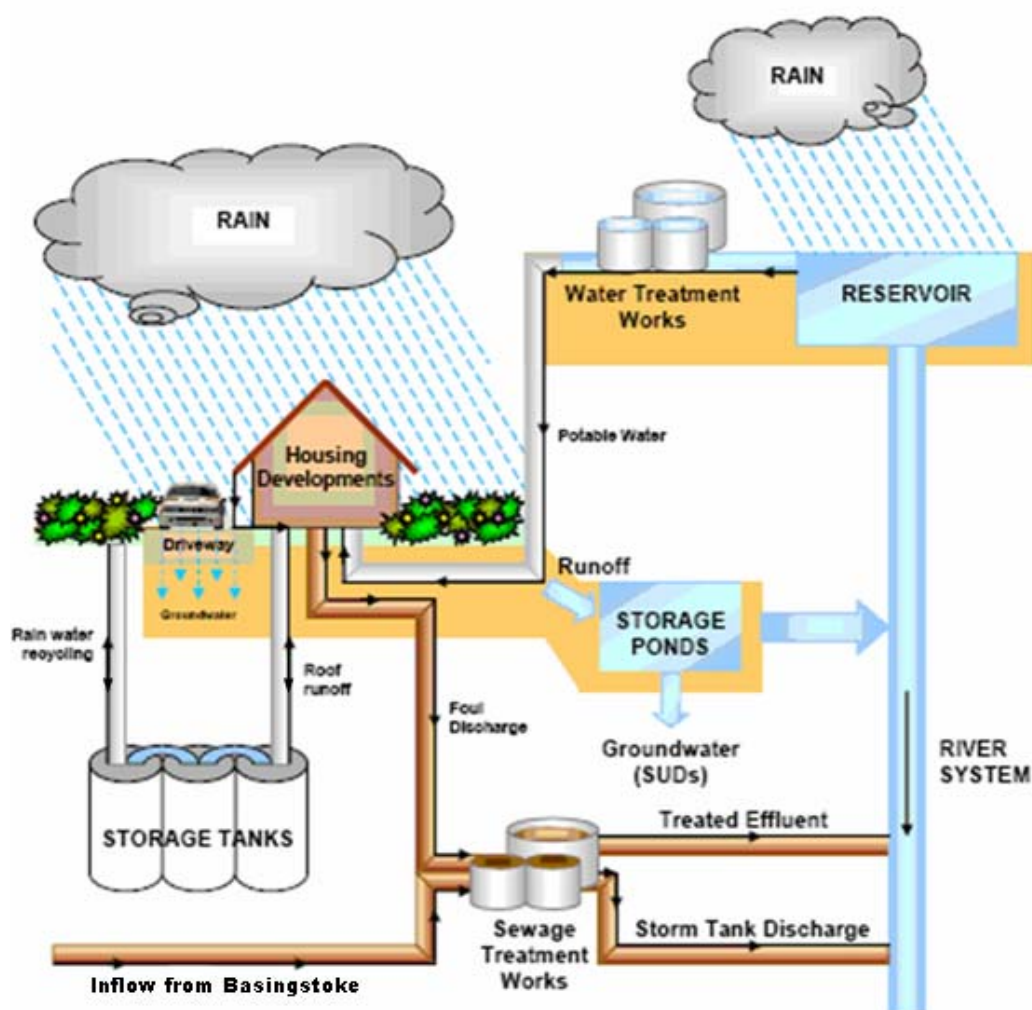
- *Environment Agency*
- *Basingstoke and Deane Borough Council*
- *Hampshire County Council*
- *Natural England*
- *Thames Water*
- *South East Water*
- *Southern Water*

2 The Water Cycle

KEY MESSAGES

More development means more water: more potable water demand, increased flows to the sewage treatment works and a greater risk of flooding as rainwater runs off new houses, driveways and roads. This study has considered all these elements and how they interact. It has looked at measures to ensure that water is properly managed and that new developments do not compromise existing ones.

Figure 1 below summarises the Water Cycle and shows how water enters, leaves and returns to the river system.



3 Proposed Developments and Planning Process

KEY MESSAGES

The Examination in Public (EiP) of the draft Regional Spatial Strategy will consider the appropriate number of new dwellings to be delivered sustainably at Basingstoke between 2006 and 2026. Basingstoke and Deane Borough Council will then be the responsible authority to ensure that this scale of growth can be delivered sustainably through the Local Development Framework (LDF) process.

Phase 1 of the Basingstoke water cycle study is to assess the strategic capacity to accommodate development at Basingstoke. The specific detail of delivering the scale of growth should be considered through further technical work to assist the delivery of the Local Development Framework (LDF).

In accordance with Planning Policy Statement 11 (PPS11) the Draft Regional Spatial Strategy (dRSS) should indicate the broad scale and location of growth, but not identify specific locations. This will be for the appropriate LDF to determine. Consequently, the understanding of the Water Cycle Group is that the focus of the Examination in Public (EiP, also known as the Public Examination) Panel will be on the overall capacity of the wider area to accommodate development, not site specifics. This approach lends itself with regard to waste water treatment and water quality, and water resources, but is more difficult when quantifying river and urban flooding. Whilst clean water and sewage can be moved around a network, ensuring sufficient lead in time to provide the necessary infrastructure and subject to energy requirements and other issues, flood risk cannot.

The water cycle study looked at three different development scenarios to quantify the implications:

- a) Scenario 1 - 740 dwellings/annum – This scenario is based on Basingstoke and Deane Borough Council's preferred level of development for the Borough as established in 2006 as the Council's response to consultation on alternative levels of future growth for inclusion in the RSS.
- b) Scenario 2 - 825 dwellings/annum – This scenario is based on the proposed level of housing provision in the dRSS.
- c) Scenario 3 - 990 dwellings/annum – This is a notional higher growth scenario based on increasing the dRSS by 20%

Of this, the majority of the increase in dwellings occurs within the Blackwater and Western Corridor area, and only a small increase occurs within the Basingstoke & Deane borough outside of this area. To calculate the impact of these scenarios on the water cycle, they must be converted into population estimates. This was carried out by Hampshire County Council on behalf of Basingstoke & Deane Borough Council using the Chelmer model.

Water Company planning

There are three water companies with a stake in this water cycle strategy. Thames water are responsible for providing sewerage and wastewater treatment for Basingstoke. South East Water is responsible for

providing clean water to the east of the Basingstoke & Deane Borough Council area, and Southern Water responsible for providing clean water to the west of the area. The water companies responsible for providing water supply and wastewater collection and treatment, are funded in 5 year planning periods. The money they have available to spend on infrastructure is determined by OFWAT in consultation with government, the Environment Agency and consumer organisations amongst others. The consultation process is known as the Periodic Review (PR). The next review, PR09, will determine how much money the water companies have to spend between 2010 and

2015. The review will start in 2008 and conclude in November 2009. The water companies will have to submit a draft business plan with detailed plans and costs for new infrastructure by June 2008, with the final submissions following in early 2009. Once funding has been obtained for new or upgraded infrastructure, there can be a significant lead in time for planning and construction before the infrastructure can be used. Therefore the water companies require detailed information on likely housing developments up to 2016 in advance of 2008 if they are to plan and provide the infrastructure required to meet those levels of growth.

4 Strategic Proposals and Sustainable Development

KEY MESSAGES

Strategic development at Basingstoke of a scale tested through the three scenarios is not constrained by flood risk or water resource issues. Development will not cause a failure of any statutory water quality objectives. However, because of a lack of understanding of the current ecological quality of the river, there are a number of uncertainties that affect the extent to which water quality and ecology should be seen as a barrier to development in Basingstoke. Further technical work, Phase 2, needs to be undertaken concurrently with the LDF process to identify a preferred strategy to ensure that development and infrastructure provision run hand in hand.

Water supply

This study has identified that there are sufficient planned resources in the Water Companies strategic water resources plans up to 2029 to accommodate all the development scenarios assessed.

Planned growth up to 2026 can be supplied without extra resource development, beyond that currently planned in the water companies strategic resource plans (WRP04), for all the development scenarios assessed.

Additional resources identified in WRP04 will not impact on the hydrology of the River Loddon; therefore do not need to be considered within the flood risk or water quality sections of this report.

A twin track approach to demand management is recommended via demand management, to constrain demand, in parallel with developing additional resources when required.

The need for new resources could be offset by adopting greater water efficiency and demand management measures, but this would need to be supported with strong enabling mechanisms and incentives, and may need a change in legislation covering water companies and planning authorities.

Flood risk mitigation

The impact of development on flood risk, and the impact of flood risk on development can be reduced by following the sequential approach of PPS25, and by ensuring that any development in the study area is subject to runoff control.

Development should incorporate runoff control via SUDS to ensure runoff and infiltration rates do not change with development.

The study recommends that a strategic flood risk assessment should be carried out to direct development away from flood risk areas where possible, and ensure that any development in high risk areas conforms to the PPS25 exception test. The key objectives for this study are:

- a) To gather further information to further understand flood risk in the Borough;
- b) Determine land allocation for development following the PPS25 sequential approach (and exception test where necessary);
- c) Identification of both structural and non-structural options that reduce the overall flood risk;

- d) To inform the preparation of the Borough's Local Development Framework and sustainability appraisal.

Wastewater treatment and water quality

Additional discharge from Basingstoke STW will not lead to a failure of statutory water quality objectives for any of the development scenarios assessed. The STW may need a tighter discharge consent for some parameters to achieve this, but these would not be difficult to achieve with conventional STW technology.

The European Water Framework Directive (WFD) aims to improve the ecological health of inland and coastal waters and prevent further deterioration, especially by protecting against diffuse pollution in urban and rural areas through better land management. There is a requirement for nearly all inland and coastal waters to achieve 'good status' by 2015. Exactly how the WFD will affect the regulation of the water environment is unclear at the present time. However, the UK technical advisory group (UKTAG) on the WFD implementation in the UK have published draft environmental standards and conditions. If these standards do become transposed into regulatory standards, the River Loddon would currently fail to meet the phosphorus standards for good ecological status. The river also fails the Common standards for phosphorus in chalk rivers recommended by the Joint Nature Conservation Committee. Although these standards are not statutory, they are exceeded by a very large margin and further development at Basingstoke would compound this situation.

The ecological appraisal carried out has not found any evidence that the elevated phosphorus levels have had an impact on the ecology. However, many of the indicators used to determine ecological condition may be considered to be inadequate indicators in the light of recent work by UKTAG to determine ecological water quality standards, and hence there is uncertainty over the current ecological quality.

The study found that it is unlikely that any of the development scenarios assessed will cause a significant change in the river chemistry. However, because of the uncertainty in the current ecological condition of the river, further survey work will be required to establish it. It therefore cannot be determined whether the present levels of phosphorus have caused harm to the river's ecology or whether there are threshold levels of phosphorus above which significant, or even catastrophic adverse impacts would occur. If such thresholds exist it is not known how close they are to being breached.

Any increase in population carries a residual risk that it could cause a threshold change in the river ecology, especially given the current failure of the river to meet UKTAG draft WFD standards for good ecological quality.

Technology currently in use would not be capable of reducing phosphorus to the recommended levels. There may be scope to make use of new technologies but they are presently untested for sewage treatment and may themselves have unacceptable environmental impacts.

There are a number of uncertainties that affect the extent to which water quality and ecology should be seen as a barrier to development in Basingstoke. It is recommended that further work be carried out to identify all sources of phosphorus in the catchment, to assess the long term feasibility of reducing phosphorus levels in the catchment and further assess the ecological impacts of current and predicted levels.

Sustainable development

The South East Plan has high level policy requirements for development to be sustainable. For example Policy NRM1 on sustainable water resources, groundwater and river water quality management requires that water supply, ground water and river water quality will be maintained and enhanced through avoiding adverse effects of development on the water environment.

It also states that new developments should achieve high-levels of water efficiency and reflect current best practice. This study aims to fulfil this because in addition to protecting water quality and meeting demand, the water cycle strategy will also require developments to be sustainable. This will help reduce the need to control water entering rivers, by use of sustainable drainage systems (SuDS); and will reduce the need for water supply by recycling where practicable.

Rainwater from roofs can be recycled into storage tanks and will be used for watering gardens, cleaning cars etc. Driveways can be made from permeable pavings to allow water to soak into the ground and prevent additional run-off into drains. Subject to site specific assessments following the strategic flood risk assessment, developers will be required to limit the run-off from their sites by using balancing ponds or other storage facilities. In combination with the sustainable drainage and recycling described above, this will limit the volumes of water entering watercourses to pre-development levels.

5 Summary and Recommendations

Summary

- ✓ Development in Basingstoke can be accommodated without causing a failure of statutory environmental water quality objectives, subject to infrastructure being funded and delivered in the right place and at the right time.
- ✓ The River Loddon currently fails proposed draft standards for nutrients in a river of this type to meet good ecological status under the draft WFD standards, and also fails to meet guideline standards for chalk rivers. It is not known whether the ecology of the river has been harmed by the current high levels of phosphorus, although the development scenarios assessed cause only a minor increase in the modelled nutrient levels in the river.
- ✓ The use of greater demand management techniques may be used to offset the requirement for some water cycle infrastructure, or delay the time by which it is needed; although this would require strong incentives and enabling mechanisms and may require a change in legislation.
- ✓ The exact location and phasing of development will need to be determined as part of the Basingstoke & Deane Borough local development framework (LDF) process to ensure that infrastructure is provided in the right place and at the right time.

Recommendations

- ✓ A second phase study needs to be carried out to further reduce some of the uncertainties still remaining, and to work alongside the preparation of the LDF
- ✓ The extent to which water quality and ecology should be seen as a barrier to development in Basingstoke is not yet known. It is strongly recommended that further work be carried out to identify all sources of orthophosphate in the catchment, to assess the long term feasibility of reducing nutrient levels in the catchment.
- ✓ A strategic flood risk assessment should be carried out as part of the Phase 2 of this project to inform the LDF, and ensure that new developments are sympathetic to flood risk