

# Cotswold District Local Plan 2018 – 2031 Update

## Town and Country Planning (Local Planning) Regulations 2012

### Regulation 18 “Issues and Options” consultation/participation

#### Evidence Paper: Water Quality, Water Resources and Flooding

## 1. Introduction

- 1.1 In the future, the District will experience a higher temperature climate and more extreme weather and adverse weather-related events. These are likely to include flooding especially in the wider river valleys such as the River Churn and the River Thames. An increase in surface water flooding is also likely, particularly in areas that are already susceptible such as Moreton in Marsh and Fairford. Flooding from groundwater sources may also occur.
- 1.2 Hotter, drier summers may exacerbate low river flows and concentrate pollutant loads from wastewater effluents, affecting water quality.
- 1.3 Increase in water demand also adds pressure to existing water resources. Supply infrastructure and upgrades may be required, combined with the uncertainty over the impact of climate change in an already ‘*seriously water stressed*’ area.

## 2. Objectives

- 2.1 The strong link between climate change and flood risk is demonstrated in [Local Plan Strategic Objective 6](#) “Climate Change and Flood Risk”:

*Reduce the environmental impact of development and vulnerability to the impacts of climate change by:*

*a. Maximising water and energy efficiency, promoting the use of renewable energy sources and sustainable construction methods, and reducing pollution and waste.*

*b. Supporting the principle of waste minimisation.*

*c. Locating development away from areas identified as being at high risk from any form of flooding or from areas where development would increase flood risk to others.*

- 2.2 To sharpen its focus and encompass broader relevant concerns, it is recommended that the Objective is updated as shown below:

## 6. Climate Change and Flood Risk

~~Strong outcome-focussed action to reduce emissions and adapt to climate change Reduce the environmental impact of development and vulnerability to the impacts of climate change~~ by:

- a. ~~Assessing the potential of policies to achieve local emissions reductions over the plan period, set a target against that potential and monitor the performance of policies;~~
- b. ~~Work with the government, businesses, communities, developers and utility providers to deliver Net Zero;~~
- c. ~~Making the best use of land by maximising the use of previously-developed land;~~
- d. Maximising water and energy efficiency, promoting the use of renewable energy sources and sustainable construction methods, and reducing pollution and waste.
- e. Supporting the principle of waste minimisation ~~and where possible encourage the reuse of buildings to avoid unnecessary demolition.~~
- f. Locating development away from areas identified as being at high risk from any form of flooding or from areas where development would increase flood risk to others.

## 3. NPPF, NPPG and other Material Considerations

### National Planning Policy Framework (NPPF)

- 3.1 The NPPF at paragraphs 160 and 161 requires Local Plans to develop policies to manage flood risk from all sources and apply a sequential, risk based approach (the Sequential Test) to the location of development. The Sequential Test is designed to steer new development to areas with the lowest probability of flooding.
- 3.2 Paragraph 168 requires major developments to incorporate sustainable drainage systems (SUDS) unless there is clear evidence that this would be inappropriate.
- 3.3 There is also an emphasis on river catchment areas and basin management plans (para 174 & 175) reflecting the acceptance of managing flood risk at the catchment level. Planning policies should also improve local conditions where possible such as in respect of air and water quality, and consider water supply and flooding long term as part of wider climate change mitigation and adaptation. This is also reflected in paragraph 153.
- 3.4 Planning policies and decisions should contribute to and enhance the natural and local environment (para 174) by preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of water pollution.
- 3.5 The Planning Practice Guidance on Flood Risk and Coastal Change<sup>1</sup> (PPG) sets out how the NPPF should be implemented. The guidance advocates a tiered approach to risk assessment and identifies the following two levels of Strategic Flood Risk Assessment (SFRA):
  - Level 1: where flooding is not a major issue in relation to potential development sites and where development pressures are low; and
  - Level 2: where land outside Flood Zones 2 and 3 cannot appropriately accommodate all the necessary development creating the need to apply the National Planning Policy Framework (NPPF) Exception Test.

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<sup>1</sup> <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

- 3.6 The Environment Agency has produced advice on flood risk which should be read in conjunction with the NPPF as well as how to prepare an SFRA (2019)<sup>2</sup>.
- 3.7 **Cotswold District Council Corporate Strategy** is a material consideration and has one aim relating to flood mitigation and protection although there are a large number of references throughout to climate change, including making the Local Plan 'green to the core'. This is a "golden thread" running through and linking many of the Topic Papers and suggested updates to the adopted local Plan.

## 4. Background evidence and Sustainability Appraisal – setting out the issues

### Background

- 4.1 Flood risk information is updated continuously as new information, guidance and legislation becomes available.
- 4.2 The Government's policy paper Meeting our Future Water Needs<sup>3</sup> brings together two of the government's pledges that were set out in its 25-year environment plan;
- leave the environment in a better state than we found it; and
  - to improve the nation's resilience to drought and minimise interruptions to water supplies
- 4.3 The Environment Act 2019-2021<sup>4</sup> has four priority areas: biodiversity, air quality, water and waste. It seeks to strengthen and update the existing regulatory and long-term planning framework for water, helping to reduce environmental risks and tackle climate change.
- 4.4 The Planning For the Future White Paper (July 2020)<sup>5</sup> mentioned flood risk, where other environmental challenges such as drought, coastal erosion and overheating were not referred to RTPI, initial analysis, 10 Aug 2020).
- 4.5 In its proposed zonal approach to reform of the planning system there are three zones 'Growth areas,' 'Renewal areas' and 'Protected areas'. The 'protected areas' would include "areas such as Green Belt, Areas of Outstanding Natural Beauty, Conservation Areas, Local Wildlife Sites, **areas of significant flood risk** and important areas of green space."
- 4.6 **Flood Risk Regulations (2009) and Flood and Water Management Act FWMA (2010)** - The Flood Risk Regulations transpose the EC Floods Directive into UK law and place responsibility upon all Lead Local Flood Authorities (LLFAs) to manage local flood risk. Gloucestershire County Council is the LLFA. .
- 4.7 Water Framework Directive, 2000/60/EC is a key piece of European legislation designed to improve and integrate the way water bodies are managed throughout Europe. It has been retained in UK law following the UK's exit from Europe. At its core it aims to prevent

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<sup>2</sup> <https://www.gov.uk/guidance/local-planning-authorities-strategic-flood-risk-assessment>

<sup>3</sup> <https://www.gov.uk/government/publications/future-water-the-government-s-water-strategy-for-england>

<sup>4</sup> <https://www.gov.uk/government/news/world-leading-environment-act-becomes-law>

<https://www.gov.uk/government/publications/environment-bill-2020/10-march-2020-water-factsheet-part-5>

<sup>5</sup> <https://www.gov.uk/government/consultations/planning-for-the-future>

deterioration of the water environment and improve water quality by managing water in natural river basin districts, rather than by administrative boundaries.

#### **Thames River Basin Management Plans (Environment Agency 2015)<sup>6</sup>**

- 4.8 The River Basin Management Plans are documents which set out the current state of the water environment, pressures affecting the water environment, environmental objectives for protecting and improving waters, and a programme of measures and actions needed to achieve the objectives as set through the WFD. Cotswold District is mainly covered by the river Thames basin.
- 4.9 Significant issues include;
- Physical modifications - for example, flood defences and weirs, and changes to the size and shape of natural river channels for land drainage and navigation;
  - Pollution from waste water;
  - Pollution from towns, cities and transport;
  - Changes to the natural flow and level of water;
  - Negative effects of invasive non-native species;
  - Pollution from rural areas and agriculture.
- 4.10 *'UK climate projections show that temperatures will continue to rise, with increased winter rainfall and more rain falling in intense storms and continuing sea level rise. The impact on river flows, water quality and ecosystems is less clear. Studies to learn more about the effects of climate change on the river basin district are underway. In the meantime, it makes sense to implement measures that are flexible or increase resilience to extreme weather events and future warming'. (Thames River Basin Management Plans (Environment Agency 2015) page 12)*

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Figure 1 Thames River Basin (TRBMP)

- 4.11 The Cotswold District [Water Cycle Study](#) states there are failures of WFD standards in the District, with some very high concentrations of phosphate. The Cirencester WwTW may require further upgrade to prevent a WFD deterioration for Ammonia. Phosphate is an issue that will need to be addressed across the wider Thames River Basin (see illustration below) including catchment-sensitive farming.
- 4.12 Natural England have since advised in a comment on the SA Scoping Report 2021 ‘*that you {CDC} should consider the potential for hydrological linkages to designated sites both within and outside the district and the scope for adverse effects from elevated phosphate levels*’.
- 4.13 New houses add pressure to the existing sewerage system. The Environment Agency advised in 2016 that it would be necessary to undertake an assessment of the water quality impact of development in the 13 WwTW catchments which will receive the majority of additional flows in Cotswold District. In conclusion the Environment Agency stated that ‘*t here are no limiting factors for growth based on the levels of growth indicated within the Local Plan, subject to the relevant mitigation measures and infrastructure upgrades stated within the WQA being delivered*’.<sup>7</sup>
- 4.14 [Thames Water Resources Management Plan 2019](#) covers the 80-year period from 2020 to 2100 and sets out how Thames Water plans to manage water resources efficiently alongside developing new supplies of water.
- 4.15 ‘*Population growth, climate change and the need to protect the environment are all putting increased pressure on our water resources. And the South East region, already designated as seriously water stressed, is facing potentially greater pressures and challenges than most other regions*’ (VRMP).

<sup>7</sup> Sustainability Appraisal Scoping Report (2021) Appendices, taken from Cotswold Water Cycle Study (2016)

- 4.16 The Thames WRMP 2019 predicts a shortfall between the amount of water available and the amount needed, that starts within the next 5 years. This will be most severe in London but also Swindon and other parts of the Thames valley. This is based on the forecasted rise in population growth and reduction in amount of water which can be taken from Rivers due to hotter, drier summers (climate change) which means a supply-demand deficit.
- 4.17 All proposed Water Supply Options (i.e. new sources of water) now include a new reservoir at Abingdon by 2037 which would help supply the District. A pipeline, at the time of writing, also remains the preferred way of the moving water (Severn Thames Transfer) rather than use of the restored canal network<sup>8</sup>; as well as implementing household water efficiencies and leakage reductions. (SA Scoping Appendices 2021)
- 4.18 As a Lead Local Flood Authority (LLFA), under the Flood and Water Management Act 2010, Gloucestershire County Council (GCC) has responsibilities for:
- investigating and reporting flooding incidents
  - managing flood risk from surface water, groundwater and ordinary watercourses (i.e. non main rivers)
  - producing a local flood risk management strategy
  - consenting works on ordinary water courses
  - enforcing works to maintain the flow on ordinary water courses
- 4.19 Technical guidance on **sustainable urban drainage** or SuDS design is provided by GCC, as LLFA, as well as the Defra Non-statutory Technical Standards and CIRIA SuDS Manual. The SFRA appendices provide recommendations where SUDs may be appropriate in the District.
- 4.20 As LLFA, GCC produced the first **Surface Water Management Plan (SWMP)**. The SWMP identified within CDC that surface water was an issue. The worst affected areas then included Moreton-in-Marsh, Fairford and Whelford. The exact source of flooding was not necessarily clear, but the perceived sources listed include overwhelmed sewers, road gullies or blocked drains combined with fluvial sources.
- 4.21 Sewer flooding within Cotswold District was identified within the SWMP as an issue in nine areas where properties were flooded internally. These then included Fairford, South Cerney, Ampney St Mary, Upper and Lower Slaughter, Moreton-in-Marsh, Bourton-on-the-Water and Quenington.
- 4.22 Gloucestershire County Council is also required to prepare and publish a **Preliminary Flood Risk Assessment (PFRA 2013)** on past and future flood risk from local sources of flooding. The 2010 legislation also gave GCC the statutory duty to develop and maintain a **Local Flood Risk Management Strategy (LFRMS)** and they have a leadership and coordinating role for flood risk across the county. Seven parishes in Cotswold District are

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<sup>8</sup> It is likely that there will be a shift towards opening up the canal from Thames to the Severn in future (by late 2030s) as part of broader sustainable transport, and health and wellbeing agenda change (see Cotswolds Canals Trust, Phase 2)

highlighted as vulnerable: · Chipping Campden · Cirencester · Fairford · Lechlade · Moreton in Marsh · Northleach with Eastington · Weston Subedge

4.23 **The Local Plan evidence base 2018 on water and flood risk comprises:**

- **Strategic Flood Risk Assessment Level 2<sup>9</sup>** - which assists councils in their selection and development of sustainable site allocations away from vulnerable flood risk areas in accordance with the NPPF and PPG
  - Appendices<sup>10</sup> - It provides historic and local flood information for the district, as well as information on **climate change allowances** and potential **future flood storage areas**.
- **Water Cycle Study** - Assesses the capacity of infrastructure in relation to water supply and wastewater treatment and water quality. New development will be designed to Building Regulations water consumption standard for water scarce areas and be in accord with demand management measures in the Water Resources Management Plans of water companies (Local Plan, 2018, 11.8.5)<sup>11</sup>.
- **Sequential Test** -  
<https://www.cotswold.gov.uk/media/onrctph/6202-sequential-testing-report-sep-2014.pdf>

4.24 As part of preparation for the Local Plan Update the council has commissioned a revision of the Strategic Flood Risk Assessment to ensure the evidence base is robust in relation to the job at hand. In addition the Water Cycle Study (WCS) will likely be given a 'light touch' revision for the Local Plan partial update. These revisions will include, for example, some assessment of flood risk (SFRA) and wastewater (WCS) for any settlements with significant additional growth as part of the Local Plan update.

#### **Climate Change Allowances**

4.25 Climate change is expected to significantly change rainfall patterns in the

4.26 United Kingdom. Flooding in the UK is expected to be more frequent, to a greater extent, deeper and faster.

**4.27** To increase resilience to flooding, allowances for climate change should be considered in flood risk assessments (previously river flows were predicted to increase by 20%).

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<sup>9</sup> <https://www.cotswold.gov.uk/media/t5pbt5s/6204-strategic-flood-risk-assessment-level-2-may-2016.pdf>

<sup>10</sup> <https://www.cotswold.gov.uk/media/wwanwbs3/6205-strategic-flood-risk-assessment-level-2-appendices-may-2016.pdf>

<sup>11</sup> <https://www.cotswold.gov.uk/media/klmjkuls/6203-water-cycle-study-aug-2015.pdf>

River basin district	Allowance category	Total potential change anticipated for the '2080s' (2070 to 2115)
Thames	Upper end	70%
	Higher central	35%
	Central	25%
Severn	Upper end	70%
	Higher central	35%
	Central	25%

Figure 2 Climate Change Allowances (% increase in river flow) SFRA 2016

- 4.28** Flood Zone 3a plus climate change, is shown in Map 1 of the SFRA.
- 4.29** **Flood storage** – Flood water storage areas are designed to hold back excess water during a flood. This would reduce the amount of water travelling downstream and reduce the risk of the river overflowing in downstream locations. Potential flood storage areas in the future should be safe-guarded from development. Two have already been identified near Cirencester in discussion with the EA. It is possible that given updated climate change allowances the EA could recommend implementing these areas sooner rather than later (Local Plan, 2018, 10.14.11).
- 4.30** The **Sustainability Appraisal (SA) Scoping Report** 2021 states that the key sustainability issues for this topic area are:
- Increase in population growth may require infrastructure upgrades to enable development, to accommodate higher flows and/or to prevent a WFD deterioration .
  - Thames Water's (and other companies) ability to maintain a continuous supply to customer demands, especially during hot, dry weather and in response to climate change may be tested.
  - Climate change is likely to exacerbate health risks...and disruptions to daily life... Parts of the District are more susceptible to the impacts of climate change, most notably areas with higher flood risk.
- 4.31** The SA Scoping Report recommends that action will be required (red) to address:
- **Fluvial flooding:** On larger main rivers in wider valleys such as the River Churn and the River Thames mapping indicates a noticeable increase in the mapped flood extent. Smaller watercourses in Cotswold tend to be in areas of steeper topography with quite confined floodplains, and in these cases increases in flow do not result in a significant increase in flood extent.
  - **Surface water flooding:** Climate change is predicted to increase rainfall intensity in the future by up to 30%. This will increase the likelihood and frequency of surface water flooding, particularly in impermeable urban areas, and areas that are already susceptible such as Moreton in Marsh and Fairford.
  - **Groundwater flooding:** The effect of climate change on groundwater flooding problems, and those watercourses where groundwater has a large influence on winter flood flows

(such as the River Churn), is more uncertain. Milder wetter winters may increase the frequency of groundwater flooding incidents in areas that are already susceptible. However, warmer drier summers may counteract this effect by drawing down groundwater levels more during the summer months.

## 5. Current Local Plan Policy

5.1 Relevant Local Plan policies are:

5.2 **INF8 Water Management Infrastructure** - includes taking into account impact of development on water and wastewater infrastructure, to make efficient use of water, incorporate SuDS, avoid (hazardous) discharge to groundwater.

5.3 **ENI4 Managing Flood Risk** - avoid areas at risk of flooding in sequential approach, design and layout to take account of flood risk, require site specific FRA, SuDS.

5.4 The **Local Plan Review**<sup>12</sup> assessed these policies and found Local Plan policy to be consistent with the NPPF in directing development away from areas of high flood risk, taking account of climate change, SuDS and cumulative impact for example.

5.5 The requirements of NPPF para 156 are that strategic policies should be informed by strategic flood risk assessments and should manage flood risk from all sources. They should consider cumulative impacts in or affecting, local areas susceptible to flooding.

5.6 The extant Local Plan policies are considered to do this and are also in line with Strategic Objective 6(f). The Review concluded the existing policies to be robust and effective in protection of the natural and built environment and no fundamental policy changes are required.

5.7 Other relevant adopted Local Plan policies include:

5.8 **SP3 Thames and Severn Canal** - to improve and enhance access to, setting, historic value and encourage transport and recreation along the canal.

5.9 Proposed improvements to and restoration of the canal, may require change in policy as part of the District's strategic role in the future of the project. And has clear linkages with encouragement of blue infrastructure (see GI policy/ topic paper) and sustainable transport (see topic paper). It may help in long term demand for water and transfer of water resources.

5.10 **INF2 Green Infrastructure** - may need policy change in due course in relation to Canal policy (among others).

## 6. Potential policy responses

6.1 In terms of the recently-declared Climate Change and Ecological emergencies the water policies of the adopted Local Plan may fall short of the the Corporate Strategy's aspirations in terms of climate change mitigation or adaptation (nature based solutions, GI etc) and

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<sup>12</sup>

<https://meetings.cotswold.gov.uk/CeListDocuments.aspx?Committeed=1154&MeetingId=1310&DF=03%2f06%2f2020&Ver=2>

making the Local Plan more ‘green to the core’, but the policies are robust and in line with national policy and guidance.

- 6.2 The challenges of tackling climate change and population growth suggest that there is likely to be increasing conflict between climate change scenarios and future development demands. Increased development will increase demand for water putting pressure on water resources for both humans and wildlife. Areas of the District are at risk of flooding. Increased flood risk (with development potentially in areas already at higher risk of flooding or causing more flooding downstream) alongside the increased risk of storm events and dry periods will also put pressure on water quality due to increased levels of run-off or lack of dilution.
- 6.3 In the longer term land may be required for future flood storage and more natural methods of flood management measures. These include contributing to the creation or reestablishment of natural features such as tree planting or hedge lines or changes to land management that will reduce flood risk in the catchment, attenuate flood waters or capture pollutants. Natural flood management techniques (such as river bank restoration<sup>13</sup>) should be considered as part of any mitigation scheme alongside more traditional methods of flood defences, creating habitat for wildlife and encouraging tourism for example. It is of note that Neighbourhood Plans often provide local sources of information and data which could be taken into account.
- 6.4 Viewing ‘water management’ flood or drought and part of our natural environment as having multiple benefits; such as reducing flood risk (including SuDs to reduce surface water flooding) and pollution, improving water quality and capture, creating habitats and carbon sequestration (removing carbon dioxide), having health and economic benefits of recreation and tourism which can all improve and make more resilient the environment around us. Development can play a positive and important role in enhancing this environment and the Council can take these impacts into account in decision-making.
- 6.5 It is possible to improve the approach in the short term, clearly linking flood risk policies in particular with support for climate change adaptation and resilience within the Local Plan partial update; and in longer term to assess and investigate future possibilities for the policies, perhaps to more embed the policies with GI strategy or additional evidence to identify for example mapped areas to reduce flood risk in future (climate change allowances) and improve natural flood/pollution/storage measures for example (See GI and Natural Capital Topic Papers for example). However, given the current context and commitment to updating the Local Plan and SFRA for example, the preferred option is to see development as an opportunity to be more proactive and resilient, and investigate and amend the policies accordingly.

<b>Policy Approach</b>	<b>Discussion of impacts, effectiveness etc - justification</b>
(A) Alternative Option: Policy remains broadly unchanged, but additional comment(s) in supporting text to make possible future changes in a full review.	Policy remains unchanged but in line with corporate strategy amend supporting text to be more explicit about climate change

<p>SFRA to be updated in line with Local Plan partial update; may provide additional text, recommendations now or for full review in due course.</p> <p>More neutral approach</p>	<p>adaptation and a more holistic approach to link with GI for example.</p> <p>Possible text could be along the lines of;</p> <p><i>‘Development will need to be located and designed to cope with the potential adverse impacts of climate change such as flood risk and water scarcity ..... incorporating sustainable drainage systems where possible, green infrastructure and increasing permeable surfaces, water harvesting and layouts that accommodate waste water recycling for example.</i></p> <p><i>Adapting to the likely impacts of climate change includes locating development away from areas at high risk of flooding, and also protecting our water resources and water quality’</i></p>
<p><b>(B) Rejected Option:</b> Do nothing.</p>	<p>LP review does not conclude that the policies require further changes – they are consistent with the NPPF</p>
<p><b>(C) Preferred Option:</b></p> <p>Review policies to be more proactive and Climate Change-led.</p> <p>Likely to need further additional evidence and justification to bridge gap policy and suggestion. - this could come from update SFRA for example. Be mindful of latest EA data and guidance.</p> <p>May need full review of LP to fully commit to this approach however and links with other policies.</p>	<p>Investigate further policy options to proactively be ‘green to the core’ in light Corporate Strategy and declared emergencies.</p> <p><i>Consider policy possibilities such as;</i></p> <ul style="list-style-type: none"> <li>● Requirement to use ‘Flood zone map 3a+CC ‘in flood risk assessments? Propose that the flood risk zone mapping is updated to take into account the most recent climate change predictions (update evidence - SFRA - may be possible short term?) and if appropriate / possible, introduce a policy requirement to submit flood risk assessment using/within the climate change buffer areas?</li> <li>● Retrofitting of SUDs when appropriate? Areas to be identified where it may be possible to suggest this (eg high risk areas?), and where opportunities in already consented development. Minimize flood risk and water pollution</li> <li>● Surface water flooding- Use EA data/mapping of surface water flooding and flows to revise and adopt a Surface Water Drainage constraint map to be required in policy to be used in FRAs?</li> </ul>

	<p>Surface water flood risk will be clearly considered with equal importance as fluvial risk.</p> <ul style="list-style-type: none"><li>● Promote more Natural Methods of Flood Management (link with GI strategy) for drainage and flood storage, improved water quality and recreation and wildlife, for example tree planting within the river/drainage catchment of the development. Or require a financial contribution.</li><li>● Policies to be flexible for drought or flood risk and see water resources as a benefit for humans and wildlife, tourism/ recreation, and flood prevention</li><li>● Provide more land to be safeguarded for future potential flood storage areas</li><li>● Improve how the design/ layout of buildings can contribute to improved water quality and reduce flood risk. eg Properties to be more resilient to flooding (air brick covers), rainwater capture for more efficient use of water. Major /large scale residential development could be accompanied by an Energy Statement which demonstrates a low level of water consumption</li></ul>
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