



## **Cirencester Sluice Gates**

### **Background and Operational Information**

#### **1. Introduction**

- 1.1 The background and operational information contained within this document should be read in conjunction with the quick guide. The quick guide provides an operational overview of how and when the Cirencester sluice gates are operated.
- 1.2 This document is based on current operational practice and takes account of the consultation undertaken with local community groups, stakeholders, and partners, as well as improvement works which the Environment Agency has carried out as part of the River Churn Flood Risk Management Strategy and the on-site training and review undertaken in the Spring of 2022.
- 1.3 Stream and river flow of water through Cirencester can be manually controlled by the operation of sluice gates. The operation of these gates is undertaken by riparian landowners. A riparian landowner is where a water course runs through, or adjacent to, someone's land. The Town Council is one such landowner.
- 1.4 Mitigating the risk of flooding, responding in an emergency and ensuring the sufficient flow and environmental condition of the water, falls within the role and remit of various statutory bodies:
  - 1.4.1 The Environment Agency (EA) is responsible for main river flood issues. They are responsible for managing flooding and flood prevention in those water courses. The EA is an executive, non-departmental public body which works to create better places for people and wildlife and supports sustainable development. It is the principal flood risk management operating authority. It has the power (but not the legal obligation) to manage flood risk from designated main rivers and the sea.
  - 1.4.2 Thames Water is the water provider for Cirencester and is responsible for the local sewer system and any flooding that may affect the sewers.
  - 1.4.3 Gloucestershire County Council is responsible for strategic flood risk assessment across the County, including Cirencester and the Cotswold district. As the lead **local** flood authority (**LLFA**) for the area, the County Council is responsible for:
    - investigating and reporting flooding incidents;
    - managing flood risk from surface water, groundwater and ordinary 'non-main' watercourses;
    - producing a local flood risk management strategy;
    - consenting works on ordinary water courses.

Whilst the County Council is legally responsible, the authority for consenting and enforcement of the Land Drainage Act has been delegated to the district councils' flood risk management teams enforcing works to maintain the flow on ordinary water courses.

- 1.4.4 Cotswold District Council (CDC) is the local authority which provides emergency response in the event of flooding; CDC is part of the Gloucestershire Local Resilience Forum which provides a multi-agency response to major emergencies in the county.
- 1.4.5 Cirencester Town Council (CTC) operates the sluice gates **on the River Churn** at Gloucester Street and **on the Gumstool Brook** **offtake to the Gumstool Brook Balancing Stream**; CTC also provides support to, and liaises with, CDC in the event of an emergency and provides resources at a local level.
- 1.5 In addition, there are local community groups and non-statutory organisations who provide support, advice and information:
  - 1.5.1 Farming Wildlife Advisory Group provides independent environmental advice to the farming community, building a reputation for its ethical ethos and stewardship schemes which deliver environmental benefits to farmland.
  - 1.5.2 Friends of Gumstool Brook is a group of local people interested in Cirencester's Gumstool Brook and its associated streams – all connected to the River Churn in one way or another. Founded in 2013 'The Friends of the Gumstool Brook and associated waterways' was set up in response to deteriorating environmental and water conditions, especially with the growing phenomenon of a summer 'drying up' and occasional flooding of the Gumstool waterways.
  - 1.5.3 **Churn Catchment Flood Prevention Group is a residents' social media group set up as a continuation of the Cirencester Flood Action Group. The aim is to connect those affected by flooding and share flood prevention opportunities.**
  - 1.5.4 **Local flood wardens, trained, supported and managed by Gloucestershire Rural Community Council (GRCC), that support CTC in help the community to prepare for, respond to and recover from flooding.**
- 1.6 Private Operators:
 

There are two private operators of sluice gates in Cirencester:

  - 1.6.1 Bathurst Estate (Barton Mill)
  - 1.6.2 Old Mill House (**known locally as New Mill**)
- 1.7 The Memorandum of Understanding quick guide is the operational document used by the Town Council in operating the sluice gates. It is **internally** reviewed annually to ensure it is fit for **purpose and bi-annually reviewed with other stakeholders including the EA, community groups and flood wardens**. It is important to note that officers will only deviate from the operational guidance outlined in this Memorandum, if directed to do so in an emergency by the flood authority or Environment Agency.
- 1.8 In situations of high-water levels and/or risk of flooding, the Town Council is not lawfully able to close the sluices gates to reduce the water flow and risk of flooding downstream, as it could be legally liable for upstream impact.
- 1.9 The operational guidance in this Memorandum will only be amended, if approved by the statutory agencies listed in 1.4.
- 1.10 It is acknowledged that weather fluctuations, groundwater **levels in underlying aquifers**, changes in land use and the maintenance or improvement to local infrastructure can all have an impact on the **river** water levels **and** rate of flow, **as well as the type and extend of** flooding. It is vital that the background and operational information and quick guide are used and reviewed as 'living' documents which can respond to changing circumstances.

## 2. The Purpose of the Sluice Gates and Other Factors Impacting Flow

- 2.1 The two sluice gates at Barton Mill and New Mill were originally designed to control water to power the two mills when in operation. The Gloucester Street sluice was designed to divert The Churn into the Barton Mill Pond to power Barton Mill.
- 2.2 Since the mills ceased to be operational, the purpose of the sluice gates has been to maintain water levels for environmental benefit and to manage the flow of water through Cirencester.
- 2.3 Other factors affecting the flow and level of water include various overflows and some culverts situated along the water-courses in Cirencester; in times of high levels of water they served to divert water into local flood plains. However, some were blocked up decades ago during times of drought to retain as much water as possible in the water courses.
- 2.4 There are many watercourses which are not visible or easily accessible as they flow through culverts under streets and houses through Cirencester; with historic properties being built with flood cellars. Over time some of these cellars have been blocked up and used for other purposes, sometimes being waterproofed to prevent groundwater ingress.
- 2.5 Low bridges across watercourses can act as barriers in high flow increasing flood risk. Pipework in and crossing watercourses can also act to constrain flow.
- 2.6 There are four trash screens within Cirencester which require clearing when blocked to manage flood risk:
  1. Thomas Street Trash Screen on the Gumstool Brook  
Installed, maintained, and cleared by the EA
  2. Powells School Trash Screen on the Gumstool Brook Balancing Stream  
Located on locked school premises  
Maintenance is the responsibility of the school, with support from the EA
  3. Hereward Road Trash Screen on the River Churn  
The Town Council has agreed to monitor this trash screen and clear it if it is safe to do so, or alert the EA if they are unable to safely clear it
  4. Abbey Grounds Trash Screen on the Gumstool Brook  
Managed and cleared by the Town Council as required.
- 2.7 Flood wardens, citizen scientists, and members of the public can report blocked trash screens to the relevant responsibly party when observed, but should not attempt to clear trash screens due to risks involved in working over water. No trespassing on private property should be undertaken by members of the public in order to check trash screens.
- 2.8 The EA endeavour to inspect pinch points and trash screens during periods of flood risk, subject to resource availability.

## 3. Flow of the River Churn

- 3.1 The River Churn flows to the sluice gates at Gloucester Street, which split the flow of the water into two main routes.

Route 1: The main channel which flows through the Jack Gardner to Hereward Road, along the north-east edge of the Abbey Grounds, the rear of Beeches Road and Beeches Wood, through New Mills and along the east side of Watermoor Point (formerly Mitsubishi) site.

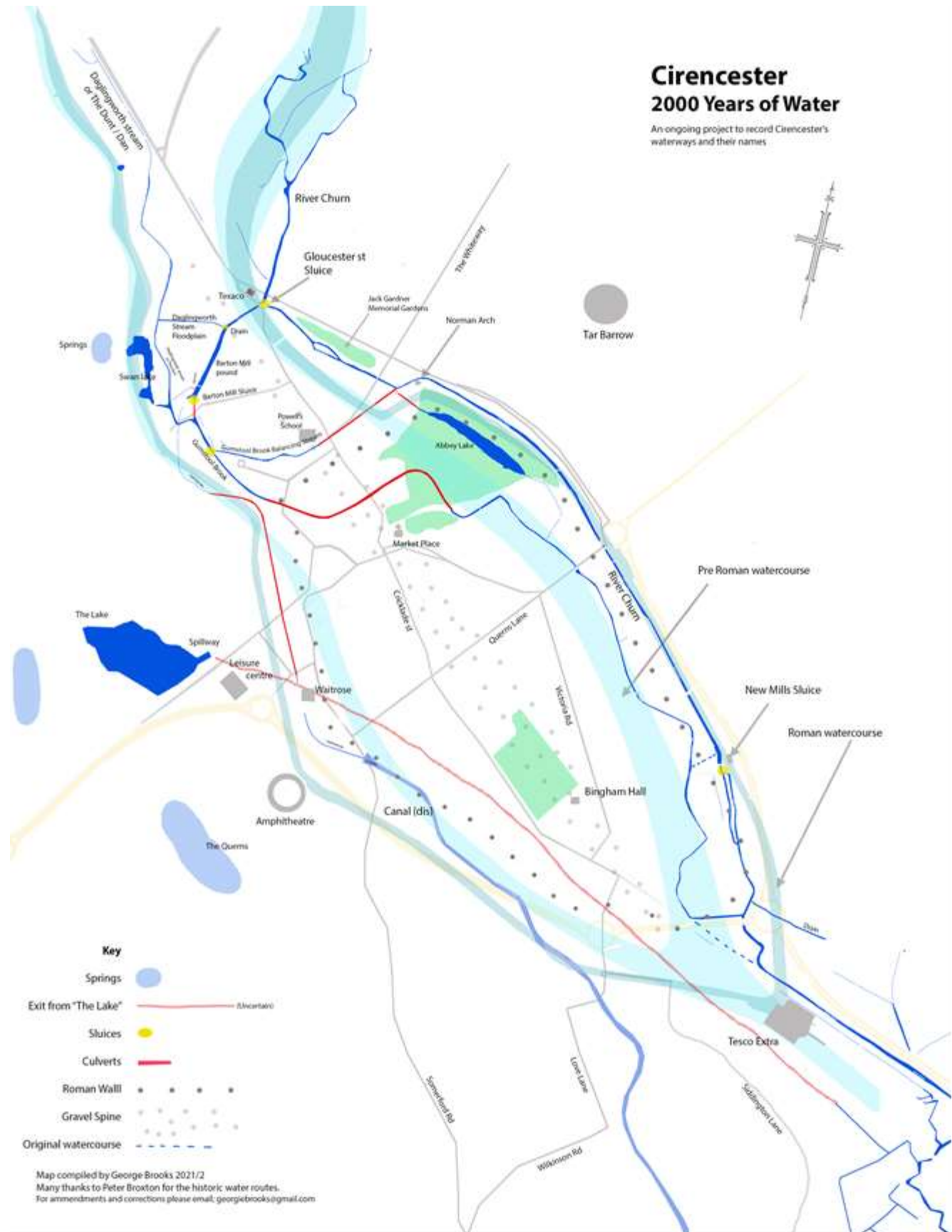
Route 2: The **Barton** Mill Pond (**or Pound**) that joins the **Churn to the** Daglingworth Stream (locally known as Gumstool Brook) **at the end of Barton Lane, then flows along the Gumstool Brook Balancing Stream past Powell's School to rejoin the Churn which flows into the Abbey Lake. This channel is joined by the Gumstool Brook in The Waterloo and continues** under London Road, Beeches Car Park, Victoria Road school field, City Bank Playing fields, under City Bank View and around the **west side of** Watermoor Point.

The east and west branches **of the River Churn rejoin south of Watermoor Point** prior to flowing under the **Tesco roundabout then past** the Picnic area **and Tesco superstore.**

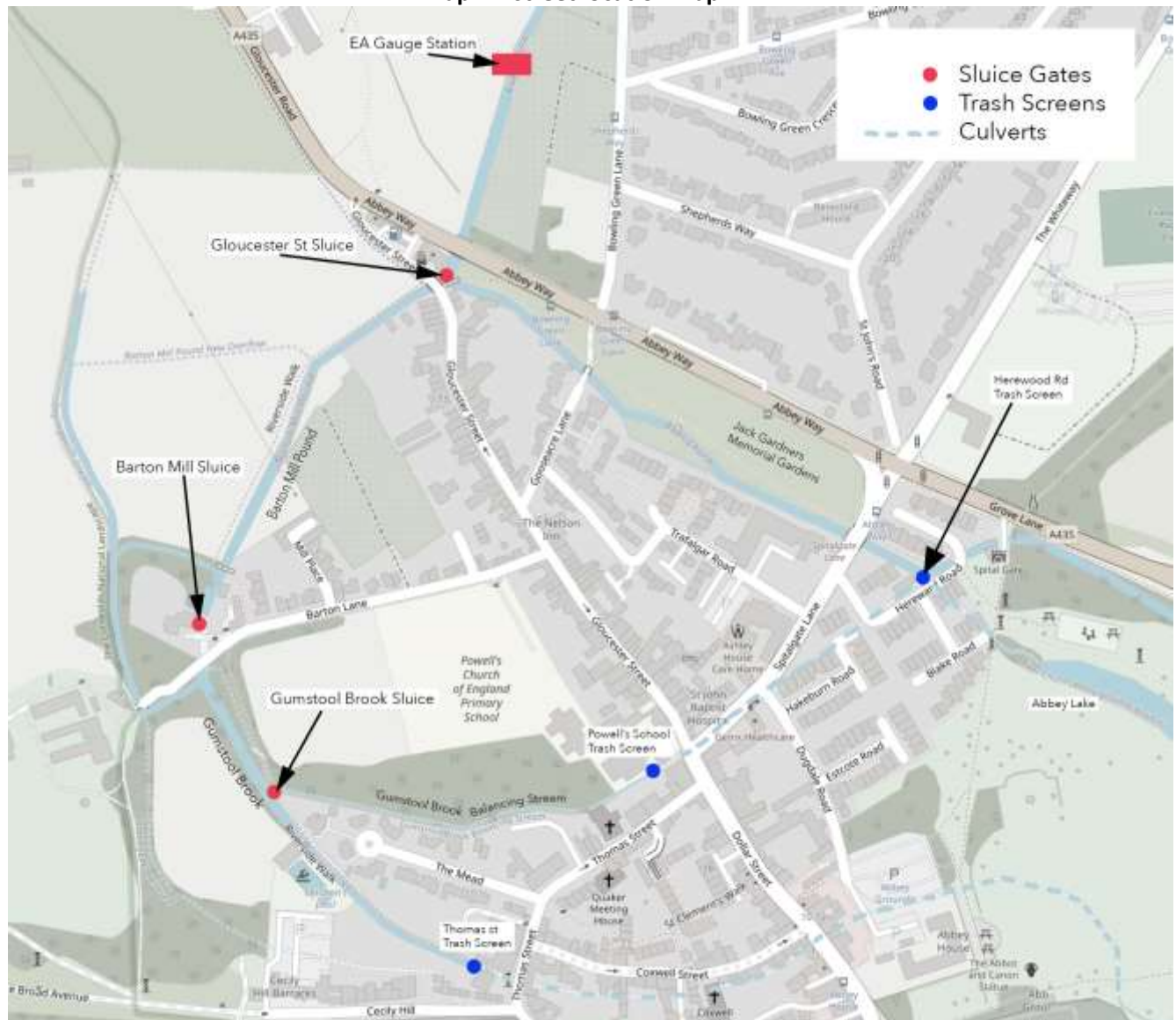
- 3.2 The stretch of water from Barton Lane to Thomas Street, fed from the Daglingworth Stream and the Barton Mill Pound is locally known as Gumstool Brook. The offtake which flows along the back of The Mead to Powell's School is referred to as the **Gumstool Brook Balancing stream**. From the school it flows through a culvert to meet with the River Churn at Hereward Road. At this point **flow from the Churn and the Gumstool Brook Balancing Stream** is the feed to the Abbey Lake. The outflow from the lake flows through Corinium Gate to meet **at The Waterloo** with the **Gumstool Brook** flow **joining via the Thomas Street** culvert.

#### **4. Sluice Gate Location**

- 4.1 The main sluice gates are at Gloucester Street and are operated by Cirencester Town Council, as shown in the maps below. At this location there is one large gate and two small gates which are operated according to the level of water, measured by a numeric gauge **board affixed to Gloucester Street bridge.**



Map 2 – street location map



#### 4.2 There are three other sets of sluice gates:

- Gumstool Brook **offtake to the Gumstool Brook Balancing Stream**, operated by the Town Council controlling flow **back to the River Churn** alongside Powell's School;
- Barton Mill, Mill Pond (also known as the Mill Pond), operated by the Bathurst Estate;
- Old Mill House (**New Mills**), City Bank, operated by a private landowner.

### 5. Sluice Gate Operation

- 5.1 The **River Churn** water level at the Gloucester Street and Gumstool Brook sluices will be checked weekly by the Town Council's Land and Property Team when the water level rises above 0.15 on the Gloucester Street gauge. This is monitored visually and using data provided by the Environment Agency **on the gov.uk "Check for flooding webpage"** <https://check-for-flooding.service.gov.uk/river-and-sea-levels?q=Cirencester>.

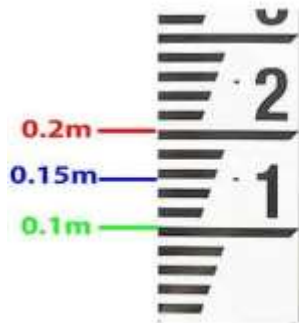
To assist with the prompt and effective operation of the sluice gates, advice and information is obtained via BBC weather forecasts, the Met Office and Environment Agency flood warnings. These sources of information are monitored by the Town Council's Land and Property Manager and senior management team. Further

information is also available on flow rates in the River Churn at the EA Cirencester gauging station here, <https://environment.data.gov.uk/hydrology/station/60914c18-1838-43e3-92c3-62765dfc7a99>.

- 5.2 Adjustments to the sluices are to be made according to the River Churn water level, and other sluice gate operators notified, in accordance with the table below. It is recognised, however, that pragmatic actions may be required in response to the particular weather and river level conditions as flood risk increases and subsides in each event. These actions may result in deviation from the adjustments tabulated below. Further details on actions to be taken are provided in the following paragraphs.

| Gloucester Street         | Large Gate                                                                   | Small Gates | Monitoring | Communication                                                                                                                    |
|---------------------------|------------------------------------------------------------------------------|-------------|------------|----------------------------------------------------------------------------------------------------------------------------------|
| at or below 0.1           | Fully Closed                                                                 | Fully Open  | Weekly     | Advise New Mill Owner and Bathurst Estate when large gate fully closed                                                           |
| at or above 0.2           | Gradually Open to keep level at or below 0.2 until Fully Open subject to 5.6 | Fully Open  | Daily      | New Mill – inform the owner of each large gate adjustment<br><br>Barton Mill – inform Bathurst Estate when large gate fully open |
| fallen to, or below, 0.15 | Close Gradually subject to 5.7                                               | Fully Open  | Weekly     | None                                                                                                                             |

- 5.3 When water levels rapidly rise above 0.2, the large gate should be gradually opened by turning the wheel approx. two full rotations, twice daily, until the gate is fully open to prevent a surge of water downstream. This operation is a guideline as the Town Council will respond pragmatically to fast-changing situations.
- 5.4 The water level gauge is situated on Gloucester Street bridge and is monitored using the gauge guide information as below:



**5.5 Gloucester Street – Water Level Gauge at or under 0.1m**

When the water level is at, or under, 0.1m the large gate will be fully closed and the two small gates fully open. The water level will be monitored weekly.

**5.6 Gloucester Street – Water Level Gauge at or above 0.2m**

When the water level reaches 0.2m or above, the large gate will be fully opened. Alternative actions may be taken, with the following operations being guidelines as the Town Council will respond pragmatically to fast-changing situations:

- The large gate may be opened gradually to keep the water level at or below 0.2 until fully open to, for example, balance water flow between the River Churn and the Barton Mill Pound.
- When water levels rise rapidly from below to above 0.2, the large gate should be opened gradually by turning the wheel approximately two full rotations, twice daily, until the gate is fully open to prevent a surge of water flow downstream.

Whenever the river water level is at, or above, 0.2m the water level will be monitored daily. Due to the rate of flow through the main gates at Gloucester Road when the level is above 0.2m, Cirencester Town Council will also regularly check the levels at the Barton Mill, Mill Pond and New Mill, City Bank.

The owner of the New Mill, City Bank, sluice gate will be notified of each movement of the Gloucester Street large sluice gate and when fully open the Bathurst Estate will be informed. In the event that the large sluice gate is to be opened gradually, the owners of the New Mill and Barton Mill sluice gates will be notified of this plan and when the gate is fully open.

**5.7 Gloucester Street – Water Level Gauge fallen to, or below, 0.15m**

When the water level has fallen to, or is below, 0.15m the large sluice gate will be gradually closed until the water level falls to or is below 0.1m. At, or below, 0.1m the large sluice gate is fully closed. Alternative actions may be taken, with the following operation being a guideline on how the Town Council could respond pragmatically considering the community and the water environment:

- When water levels fall to, or below, 0.15m the large sluice gate will be fully closed to, for example,

balance water flow between the River Churn and the Barton Mill Pound.

Whenever the river water level has fallen to, or is below, 0.15m the water level will be monitored weekly

The owner of New Mill and the Bathurst Estate will be notified when **gradual closing of** the large gate **commences and when it** is fully closed.

#### 5.8 **Daglingworth Stream (Gumstool Brook) Offtake**

The offtake sluice from the Daglingworth Stream, known locally as the Gumstool Brook (see Map 1), to the Gumstool Brook Balancing Stream is only opened in stages if rising water levels start to flood the Riverside Walk public footpath and only if water levels along the Mead Flood Plain (see Map 1) are lower than that in the Gumstool Brook.

When the sluice gate to the Gumstool Brook Balancing Stream (pictured is gradually opened, the Town Council will inform the owner of the New Mill, City Bank, sluice gate. This is because flow to the Churn at Hereward Road will increase and potentially direct more flow along Route 1, the eastern branch of the Churn. When water levels start to fall the sluice gate to the Gumstool Brook Balancing Stream will be closed gradually until it reaches the top of the 'V' notch, as shown in the picture below:



## 5.9 **New Mill, City Bank**

This sluice gate is privately monitored and operated by the owner. When water levels at the Gloucester Street bridge are at or above 0.2m, the New Mill sluice will be opened gradually until fully open in order to maintain appropriate levels of water. **It is recommended that a gauge board be installed at this location.** If the New Mill sluice is not opened, the Mill House and Beeches Road will flood, but not as far back as the Abbey Grounds. This advice is subject to guidance from the Environment Agency which may be given from time to time in an emergency, independently of this memorandum of operation.

In the event of an emergency and the private owner not being able to operate the New Mill sluice gate themselves the Town Council will operate the sluice gate with the permission of the owner.

## 5.10 **Barton Mill**

This sluice gate is privately monitored and operated by the Bathurst Estate. If it is not operated in response to increases in flow in the Mill Pond (also known as the Mill Pound) there is a risk of flooding of the Riverside Walk footpath. Recent work undertaken by the Environment Agency has reduced the risk of flooding at Mill Place. The Agency has installed a gauge close to the gate so that the owner can now easily check the levels. This and the additional information are subject to guidance from the Environment Agency which may be given from time to time in an emergency, independently of this memorandum of operation.

In the event of an emergency and the private owner not being able to operate the sluice gate themselves the Town Council will operate the sluice gate with the permission of the owner.

**Under low flow conditions in the River Churn, the two sluice gates at Barton Mill should be closed thus retaining a head of water in the Barton Mill Pound. It is recognised that water may continue to discharge from the Mill Pound under low flow conditions in the Churn via an overflow adjacent to the public footbridge, with the water flowing to join the Daglingworth Stream. Ultimately, with decreasing flow from the Churn to the Barton Mill Pound, levels will fall and flow through the Mill Pound may cease.**

**Ahead of any opening of the sluice gates, the Thomas Street Trash Screen requires checking to ensure that it is clear of debris. This is especially the case under high river flow conditions.**

When flows in the River Churn increase and water levels in the Barton Mill Pound start to rise, the partial opening of a gate at the mill would establish an increased sweetening flow along the Barton Mill channel.

Maintaining a constant water level in the channel is difficult to achieve with an undershot gate and it is likely that frequent gate adjustment will be required.

**When the large sluice gate at Gloucester Street is being opened gradually or fully opened as river water levels are rising, the Town Council will inform the Bathurst Estate.**

When the reading on the gauge board at the Barton Mill reaches 111.30m, one gate should be opened by 150mm (100mm if the height of one or both gates have been reduced). This configuration approximates to the condition of the sluices for all return periods as advised by the Environment Agency.

If water levels continue to rise there is a risk that the grounds of the Mill House will flood via the sill of the disused sluice situated opposite the main Barton Mill sluice gates. This risk can be reduced by either opening the gates further when the reading on the gauge board reaches 111.30m or by blocking off the disused sluice or raising the sill. Assuming that the disused sluice is blocked off and one main sluice gate is open 150mm or 100mm as noted above, water levels could be allowed to rise to the predicted 1 in 30-year level of 111.64m as recorded on the gauge board.

If water levels continue to rise, consideration can be given to opening the sluice gates further or taking no action and allowing water levels to continue to rise. Eventually water will overtop the right bank footpath to spill into the flood plain of the Daglingworth Stream. Surface water exiting from the flood plain is controlled by a culvert under the access road to Bathurst Estate and thus restricts surface water flow passing down to the Mead and Corinium Gate. If, despite allowing water to overtop the footpath, the reading on the gauge board reaches 111.80m there is a risk that water will overtop the left bank and flood Barclay Court. In this situation consideration will need to be given to opening the sluice gates further to try to prevent the water level from rising above 111.90m. At this level water will be spilling over the right bank footpath to a maximum depth of approx. 150mm.

#### **5.11 Abbey Lake Dam Boards**

This structure is operated by the Town Council and controls water levels in the Abbey Grounds lake. Currently, the structure is not operated unless the water level in the lake needs to be lowered for inspection, maintenance or emergency reasons.

#### **5.12 Communication**

As part of the operation of the Gloucester Street sluices, the Town Council informs the owners of the New Mills and Barton Mill sluice gates of the action taken. Action taken by the Town Council is the trigger for action to be taken by the other sluice gate owners. Feedback on actions taken by the other sluice gate owners should be provided to the Town Council.

A record of water level monitoring and the actions taken by the Town Council will be maintained as an operational log. The Town Council is not responsible for the operational logs of sluice gates operated by private land owners, but will keep a record of this information if supplied.

### **6. Routine Monitoring and Maintenance**

The Town Council's Land and Property Team check the course of the river, monthly, for obstructions and ensure that the trash screens at the culverts and lake are kept clear. During the Autumn and Winter the Land and Property Team cut back vegetation on the river banks within its own land ownership, including areas around the Mill Pond.

The Environment Agency monitors the trash screen at Thomas Street via its installed CCTV system and programmes clearance of the screen when debris is noted. The EA uses its permissive powers to clear trash screens and provides support to owners of other screens as required.

All sluice gate owners should monitor the condition of the gates to ensure that they can be operated reliably to meet the requirements of this Memorandum of Understanding. Sluice gate owners should notify each other of any planned and/or emergency maintenance that may impact the ability of their sluices to meet the requirements of this Memorandum of Understanding.

### **7. Local Knowledge and Other Information**

- 7.1 The River Churn can back up into the Jack Gardner Memorial Garden open space and gets close to the properties on Trafalgar Road which are adjacent to the Jack Gardner Memorial Garden. It can also flood across the Beeches Road, spreading out at the City Bank sluice and floods again at the Kingsmeadow picnic site.

- 7.2 Mill Place has flooded on one occasion when the Barton Mill sluices were not opened sufficiently.
- 7.3 Water levels in the Gumstool Brook, as it passes along the back of the Mead and down to Powell's School are determined by levels in the River Churn, which backs up from Hereward Road, and flow taken from the Daglingworth Stream and by groundwater.
- 7.4 In most conditions, flow from the Gumstool Brook is controlled by the Balancing Stream sluice. In very low flow conditions no flow is taken from the Gumstool Brook. As water levels increase flow will pass into the Gumstool Brook Balancing Stream over a V notch plate fixed to the sluice. Flow through the sluice can be cut off at any time, if required, leaving reverse flow from the River Churn at Hereward Road to determine water levels in the Gumstool Brook Balancing Stream.
- 7.5 Reverse flow from the River Churn up the Gumstool Brook Balancing Stream can be partially controlled by limiting flow passing through Gloucester Street Sluices. However, this action will have the effect of diverting additional flow into the Gumstool Brook via Barton Mill and raising water levels in the stream.
- 7.6 At high water levels the Gumstool Brook Balancing Stream sluice can be bypassed with flow from the Gumstool Brook passing beneath the Riverside Walk public footpath and then, via a ditch discharging into the Gumstool Brook Balancing Stream immediately downstream of the sluice. This bypass flow reduces the control impact of this sluice. The possibility of closing off this ditch may be a project considered by the Environment Agency.
- 7.7 The legal position is that sluice gate operators cannot hold water back during times of high flow and potentially flood at that point – the water must be allowed to flow through at the potential risk of flooding 'downstream'. The rights and responsibilities of riparian owners are enforced through the Land Drainage Act 1991, Water Resources Act 1991 and Public Health Act 1936. It should be noted that at times of flooding, the responsibility of the Town Council is to ensure that water flows through land in its ownership without restriction. It therefore follows that the same responsibility falls on riparian owners throughout the length of the river.
- 7.8 At times of low flow, especially drought conditions, the current advice from the Environment Agency is that flow from the River Churn should not be diverted to increase the natural flow in the Gumstool Brook (Daglingworth Stream) – the impact on local biodiversity and habitats is noted at these times and should this advice change at any time then the Town Council will amend the operation of its sluices.

## **8. Emergency Planning**

- 8.1 In its role in providing local leadership, for and on behalf of the people and place of Cirencester, it is important that the Town Council provides advice and support in building resilience against the impact of an emergency or disaster.
- 8.2 Advice and support can be provided so that planned actions are undertaken before and during an emergency or disaster which in turn minimises the impact on the community and in helping the local community to recover more quickly after an event.
- 8.3 Building resilience within the community will assist in identifying local needs and priorities arising from an emergency/disaster.
- 8.4 The importance of flood related issues is noted by the Town Council and as such, flooding and emergency response falls within the remit of the Land and Property Committee.

- 8.5 Gloucestershire County Council's Local Flood Risk Management Strategy (LFRMS) was adopted in 2014. It identified the extent of flooding in Gloucestershire, established priorities for managing flooding, and how GCC will work together with Risk Management Authorities (RMAs), other stakeholders, and local communities to manage flood risk.
- 8.6 In line with statutory obligations, the GCC Strategy focuses on flooding from surface runoff, groundwater, and ordinary watercourses, whilst considering the linkages with other sources of flooding. As part of the County Council's leadership role, GCC has identified flood risk which is the operational responsibility of other organisations and will continue to work closely in partnership to support reduction in flood risk across the county irrespective of source.

## 9. Useful Documents and Information

<https://gumstool.org.uk/links/>

Emergency Out of Hours: 01285 623000

[www.cotswold.gov.uk/environment/flooding](http://www.cotswold.gov.uk/environment/flooding)

[www.cotswold.gov.uk/environment/flooding/flood-reports-and-reviews](http://www.cotswold.gov.uk/environment/flooding/flood-reports-and-reviews)

[www.cirencester.gov.uk/community-response-latest-news-1](http://www.cirencester.gov.uk/community-response-latest-news-1)

<https://check-for-flooding.service.gov.uk/river-and-sea-levels>

[www.environment-agency.gov.uk/homeandleisure/floods](http://www.environment-agency.gov.uk/homeandleisure/floods)

[www.gloucestershire.gov.uk/planning-and-environment/flood-risk-management/flood-guide](http://www.gloucestershire.gov.uk/planning-and-environment/flood-risk-management/flood-guide)

[www.thameswater.co.uk/help/emergencies/flooding](http://www.thameswater.co.uk/help/emergencies/flooding)

**Reviewed and Updated:**

**December 2024**

**Approved by the Town Council's Land and Property Committee:**

**April 2025**

**Date of next Review:**

**November 2025**

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