Somerford Keynes Parish Council - Flooding Report - May 2024

1. Introduction

This report, co-authored by parish councillor, Hilary Collins and her husband, Jim Thomson, brings together information on flooding and flood prevention in our parish. Its purpose is to inform the council and residents, and to be a workplan for on-going monitoring, research, and action. To be useful over time, the report will be periodically updated, most likely annually, in response to changes and events.

Currently, as readers will see, the report is a work-in-progress. The SKPC's target is to have a substantially complete report (with maps, figures, and photos) posted on the council's website by the end of July, 2024. In the meantime, we invite Somerford Keynes residents to provide comments and additional information.

In summary, the report covers:

The report draws on a variety of sources, including knowledgeable parishioners, detailed mapping by former council members and others, meetings with district, county, and regional agency personnel, on-line data and information, etc. THANK YOU to the many people who helped create this report by providing information, input, and comments.

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Further comments, corrections and additions would be gratefully received.

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2. Sources of Information – Maps

The principal map is the **Somerford Keynes Parish Council's "Parish Map with Drains Layer"** which comprises the Ordnance Survey (OS) base map of the parish, overlain with an extremely informative and detailed set of hydrologic features and observations. This map was developed in 2012, by Karen and Lynton Mogridge, along with local farmers Fred Timbrell and Mike Harris (sadly both now deceased) and Roger Sleeman. Karen and Roger are former SKPC chairs. As noted on the Parish Council's website, "The map shows what we understand of the drainage of the area, which the Parish Council has been concentrating on for some years"[1].

The map was created using Inkscape, a readily available drawing package, which saves by default as an .svg file The .svg map can be amended within the Inkscape software, and then saved as a .pdf file (which cannot then be amended). However, a more flexible solution would be to purchase mapping software which can be amended online. It is believed that such software exists, and hopefully available at a reasonable price to Parish Councils. Bledington parish council member, Ian Simpson, noted that his parish uses "LandApp" a free (basic version) drawing program (https://thelandapp.com) which they have found to be adequate. *Action item* Ask Karen if Land App is suitable for our needs. If not, research this further and find a useable method to make changes to the drains layer map now and into the future.

Another potentially useful local map is the **WILD Project parish map**, dated 15.06.2015, which indicates 37 watercourse-related, issues and opportunities throughout the parish. Currently, we only have a small format map showing locations. WILD Project newsletters available on-line, note that work was done in our parish, but more information is needed. *Action item* Learn more about the map and the WILD project.

The **Ordnance Survey** provides mapping at many scales for the UK. The Parish has access to many OS products free of charge via the Public Sector Geospatial Agreement (PGSA)[2].

The **British Geological Survey**, among many other products, provides: geological map sheets[3] (i.e. digital versions of the original paper sheets); the "Geology Viewer" with digital coverage of bedrock, superficial, or combined geology[4] and the "GeoIndex" which includes wells and boreholes, with links to the original paper records[5].

The **National Library of Scotland** has digitised and georeferenced many UK mapping coverages, including very detailed historic 25-inch and six-inch scale maps from the 1800s. These can be viewed side-by-side with present day base maps and aerial photography[6]. These historic maps show the locations of watercourses before modern developments (e.g., gravel quarrying and road construction).

The **Environment Agency** provides national LIDAR maps[7]. These allow recent (2022) Lidar-based land and water elevations to be viewed and compared with benchmark datums. The colour elevation contouring and slope shading can help to detect subtle or hidden land features.

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[1] https://www.somerfordkeynes.org.uk/wp-content/uploads/2020/11/Parish-map-with-drains-layer.pdf
[2] https://www.ordnancesurvey.co.uk/customers/public-sector/psga-memberfinder?term=somerford%20keynes
[3] https://largeimages.bgs.ac.uk/iip/mapsportal.html?id=1001745
[4] https://geologyviewer.bgs.ac.uk/
[5] https://mapapps2.bgs.ac.uk/geoindex/home.html
[6] https://maps.nls.uk/geo/explore/side-by-side/swipe/
[7] https://experience.arcgis.com/experience/753ad2ebd3554fa696885b8c366c3049/page/page_16/

Spot elevations can be useful for comparing relative elevations of fields, lakes, rivers, and watercourses.

The **UK Government** provides long-term flood risk maps[8]. These are divided into risk types, distinguishing flooding from: Rivers and Sea; Surface Water; and Reservoirs. Apparently, the areas of Flood Zones 1 and 2 (see table below) in the flood zone map for the Parish were based on the recorded extent of the nationwide 1947 flooding. Since 1947, there have been major changes in the parish topography, due to gravel extraction, and installation of flood protection works, so that the original historic analogue is no longer valid. *Action item* Consider adding a more thorough summary of flood types, risk levels, and warnings/alerts. The main takeaway at this stage is that in this area the distinction between rising rivers, rising groundwater, and surface water runoff events is not always clear-cut.

Flood Zones 1, 2, and 3 [9]

Flood Zone	Probability	Annual probability (Rivers)
1	Low	Less than 0.1% ("1000-year")
2	Medium	Between 0.1 and 1% ("1000 to 100-year")
3a	High	Greater than 1% ("100-year")
3b	Functional flood plain	Greater than 3.3% ("30-year"), or "designed to flood" [10]

The methodology for flood risk mapping has steadily evolved with improved survey data and computer modelling techniques[11]. In 2014, the **Environment Agency** updated the older methodology with better flood risk modelling for the upper River Thames (MRL to St Johns). Notably, this modelling includes effects of climate change. The EA offers what is called a "Product 4" flood map using the updated modelling. This can be requested by email according to the EA website[12], and the turnaround time is approx. 20 days. Example of this product can be seen appended to recent Stantec (consultants) reports for various Lower Mill Estate planning applications, available on the CDC Planning portal.

Action item Order a Product 4 for Somerford Keynes by contacting the EA communications team at 0800 807060 to request mapping for SK parish.

[8] https://check-long-term-flood-risk.service.gov.uk/postcode
[9] https://geosmartinfo.co.uk/2016/03/flood-zones-explained/
[10] https://geosmartinfo.co.uk/2016/03/flood-zones-explained/
[11] https://assets.publishing.service.gov.uk/media/5db6ded540f0b6379a7acbb8/What-is-the-Risk-of-Flooding-from-Surface-Water-Map.pdf
[12] https://flood-map-for-planning.service.gov.uk/

3. Sources of Information – Other

The **UK Government** provides real-time flood alerts[13], including at the Somerford Keynes Thames gauge on the upstream side of Spine Road. We have been told that the levels reported for this gauge are incorrect, due to an erroneous stage datum (indicated online as 88.2m AOD).

Action item This should be discussed with the EA, and if in error, corrected as soon as possible.

The UK Government's "**Live Flood Map**" shows areas of flood warnings and alerts[14]. It also contains map links to river level and weather station data, including a rainfall gauge at Shorncote sewage treatment plant[15], which collects readings at 15-minute intervals.

The **River Levels** website provides a full listing of all river level monitoring stations across the UK, with hydrographs showing annual river-level changes, as well as flood alerts and flood risk forecasts from the Flood Forecasting Centre[16]. The "Thames at Somerford Keynes" water level record on this site dates back to 26th November 2012.

The **Department for Environment Food & Rural Affairs (Defra)** provides an alternative, more detailed river-level data set, with data shown at 15-minute intervals[17]. The "Thames at Somerford Keynes" water level record on this site dates back to 20th May 2002. It is unclear whether there are earlier data. The raw Defra graphs appear to show that there have been data problems with the Somerford Keynes station since early May 2023. *Action item* This was discussed with EA in February 2024, but follow up is needed.

The **Rivers Trust** website shows permitted sewage discharges to groundwater and watercourses[18].

4. Local Environment

Topography and drainage The parish is within Natural England's National Character Area 108[19], the "Upper Thames Clay Vales" - a broad belt of open, gently undulating lowland farmland on predominantly Jurassic and Cretaceous clays. In the parish it presents a gently-sloping plain dipping from north to south (average slope approx. 3m/km), traversed by the river Thames, which flows from NW to SE, on the west side of the parish.

Notable historic modifications to the natural landscape:

- The Thames has been altered in many places over time, including diversions, straightening of channel segments, mill races, leats, and weirs.

- The water mill at what was called Somerford Mill in the 1800s (later Lower Mill), one of the many water mills along the upper Thames, sets a minimum level for the Thames above the mill and downstream of Somerford Keynes.

[13] https://www.gov.uk/check-flooding
[14] https://check-for-flooding.service.gov.uk
[15] https://check-for-flooding.service.gov.uk/rainfall-station/248332TP
[16] https://riverlevels.uk/map
[17] https://environment.data.gov.uk/hydrology/explore
[18] https://theriverstrust.org/sewage-map
[19] https://publications.naturalengland.org.uk/file/6557755053703168

- Many of the watercourses that form the principal drainage routes through the parish, including County Ditches A and B, were in place as early as 1806, as shown on the framed "R. W. Hall" map in the Parish Hall.

- The late 1800s OS maps show a diverted watercourse (Winter Brook), from the Thames downstream of Washburn's Mill, leading via field boundaries to Somerford Keynes Manor House and supplying a fish pond, and continuing south to rejoin the Thames at Neigh Bridge.

- Runoff from the fields to the north of the parish that do not discharge to (from west to east) the Thames, Winter Brook, or Ewen Ditch[20], lead to the County Ditch, referred to here as "County Boundary Ditch"[21]. This runs alongside Spratsgate Lane to the junction with Spine Road. There it diverts into two branches, "Branch A" and "Branch B."

- Branch A runs along the eastern section of Water Lane, then flows into the watercourse that traverses Mack's Farm. It can be followed through LME, running along the east side of Mill Lake, north of the Thames footpath, and along the north side of Farmhouse Lake until it joins Branch B. During floods it overflows into Farmhouse Lake, and receives flow back from Farmhouse Lake, at two culverts about 100m apart that are maintained by LME.

- Branch B is culverted across Spratsgate Lane and across Spine Road[22], from where it flows south through the lake system, being joined by Branch A, and continuing south, culverted under the river Thames, and ultimately flowing into Swill Brook at Pikes Corner, at the SE extremity of LME.

- Gravel quarrying in the 1960s converted many fields to lakes. The lakes typically follow former field outlines, with many perimeter ditches retained and now acting as lake overflow channels.

- Spine Road was constructed in the 1970s to serve quarry traffic. It by-passed Somerford Keynes, but effectively created an east-west aligned dam just south of the village. As a result, the only "cheap" options for discharge of water away from the village are the culverts that were put in place when the bypass was built.

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[20] *Action item* Next version - include map showing simplified principal drainages and their "catchment areas".

[21] The roughly N-S running ditch is presumably named the County Ditch as it marks the boundary between Ashton Keynes and Somerford Keynes parishes (and the counties of Gloucestershire and Wiltshire). It runs through formerly common land shared between the two parishes, and was redefined with straight boundaries in 1788 (ref: https://www.british-history.ac.uk/vch/wilts/vol18/109-140). Gloucestershire County Council is not responsible for this ditch.

[22] Lynton Mogridge noted that flows have been observed in the culvert across Spratsgate Lane during heavy water flow in the County Ditch. Whether these are adequate is subject to debate; but the flow is only intended to occur during periods of heavy flow in the County Ditch A. No questions have ever been raised about the flow of County Ditch B across the Spine Road, which primarily takes water from Lake 32.

- A bund* was installed parallel to the southern part of Winter Brook. It was constructed by the EA after the 1991 flood and completed in 1998.

- The former Lower Mill Farm (now Lower Mill Estate) includes a flood management system* for the river Thames, with spillways, weirs, and culverts directing flood flows south via the lake system to Swill Brook.

- Neigh Bridge Park was at one time outside the Somerford Keynes parish boundary. A few years ago, it was incorporated into the parish.

- Another notable, and somewhat unusual, feature of the parish is that septic tank sanitation is standard for most properties, except within Lower Mill Estate. This is also discussed later under "Geology and Groundwater".

*These elements are described below under "Flood Protection."

5. **Geology and Groundwater**

The British Geological Survey's 1:50,000 Swindon Sheet 252 (and more recent digital mapping) shows that the bedrock of the parish consists largely of **Jurassic claystone** (Kellaways Clay and Oxford Clay). These formations have low permeability to groundwater.

About 100 m below these clay beds (and sealed off from the surface by them) is a locally important aquifer, the **Cornbrash Limestone**. This aquifer is the source for Thames Water's Ashton Keynes pumping station, which provides the local piped water supply. Wells drilled into the Cornbrash aquifer in this area are typically prolific, due to both the limestone having high permeability, and the artesian water pressure being up to a few metres above the ground surface. An uncontrolled flow from this type of well could potentially give rise to local flooding, until rectified. However, the BGS's well and borehole viewer (GeoIndex) shows only two wells in the parish that intercept the deep aquifer. Both are in the Lower Mill Estate and provide part of the estate's water supply. These wells already located in the downstream Thames flood mitigation area, and they are not considered a risk to the village of Somerford Keynes.

Overlying the clay bedrock are beds of **limestone gravel**, derived in glacial times from the Cotswolds hills. The gravel can be up to several metres thick, and is a shallow aquifer of high permeability. The gravel has been extracted for construction purposes starting in the 1960s. Gravel excavation operations are "dry", i.e., following preliminary dewatering of the gravel by pumping. Further information about dewatering operations (how they are regulated, what volumes and periods) would be extremely useful. The delivery of pumped-out water from gravel quarries upstream of Somerford Keynes, and feeding into lakes or watercourses near the village, would be of concern for local flooding.

Due to the permeability of gravel, the worked-out quarries that have refilled with water are expected to interact with the adjacent groundwater. The degree of connection will mainly depend on the amount of silt and clay (or other fill material) backfilled into the pits before abandonment, and the amount of organic material formed afterwards, but overall, lake and groundwater table elevations would be expected to equilibrate. Similarly, in stream reaches

(especially those without level control by weirs or sluices), water levels in watercourses and groundwater would be expected to be similar.

BGS records show that the groundwater level in shallow gravel wells was close to the surface, less than 1 m deep. (Local residents will have better knowledge, either from private wells or accessible soakaways.)

As mentioned earlier, there is no main sewer line serving the village, or anywhere else in the parish, except Lower Mill Estate, which has a pumped sewer line to the Cirencester Treatment Works, located northeast of Shorncote. As well as soakaways from individual houses, there are 11 permitted sewage discharges in the village (typically from small groups of houses) that discharge either to groundwater, or to small watercourses that may interact with groundwater.

Due to its high permeability, the gravel should be a good soakaway for domestic septic tanks. However, the performance of septic tank soakaways can vary significantly, depending on elevation relative to the water table, which varies seasonally. During times of high water table (e.g. winter months), the effectiveness of soakaways can be reduced.

Overlying the gravel, more recent **alluvial deposits** (following the present and older paths of the Thames and its tributaries) include lower-permeability sands, silts, and clays. Alluvium is mapped in part of the village along the north side of Water Lane, presumably along an abandoned channel of the Thames, and the lower alluvium permeabilities may also account for some variability in septic tank soakaway performance.

6. History of flooding

Over the years serious flooding has occurred in the lower part of the village, notably in 1919, 1924, 1925, 1926, 1947, the 1960s, and most recently in 1991. Although the fields next to the Thames still suffer winter inundations, the village has not flooded since 1991[23].

Based on research and interviews to date, during the last 35 years the parish has suffered three major flood events, each caused by a different circumstance as described below. In addition, the parish has several locations where areas and roads regularly flood (due to low elevation, drainage pinch points, or inadequate road design). This is particularly the case if adjacent ditches, culverts, or street drains have not been regularly maintained. ("Normal" winter waterlogging of footpaths, fields etc. is not being considered to be "flooding" in this report.)

During January 1991, the **River Thames Flood** affected the southern portion of Somerford Keynes village. Several areas in the village were flooded, along with several older properties including Mill End, the Old School House, the Vines, the Old Bakery, and possibly Beech Cottage. Reportedly, the flood lasted about three days, and may have been caused by a sluice being accidentally closed on what is now the LME estate (exact location unknown). One owner reported having six inches of water in their house and having to move out for two months while repairs were made. Flooding of The Street reached as far as the phone box, according to John Barratt. Lynton Mogridge noted that in Water Lane, the height of the flood was controlled by the flow of water from the south side of Water Lane into the County Ditch by Mack's farm over the

[23] https://www.somerfordkeynes.org.uk/history-group/village-history-timeline/ - does this say 1991?

bank. The water level was about 5 cm higher than the flooding caused by blocked drains in Water Lane in Winter 2023/24.

In approximately 2013, the **County Boundary Ditch Flood** involved a blocked culvert on the County Boundary ditch, at the northern end of Coke's Pit (Lake and Nature Reserve), and caused flooding at Spratsgate Lane. To clear the road, County Highways dug a channel from the Spratsgate ditch into Coke's Pit. This in turn, led to high water levels in Coke's Pit, leading to rising groundwater, and flooding in Water Lane. It is reported that only Evergreen Cottage flooded during this event, due to high groundwater causing a known spring in the field behind this property to rise to the surface. The Mack's Farm ditch (County Ditch Branch B) is an important drainage in this area, taking water from Water Lane to Spine Road and beyond. Most likely, this ditch protected more houses in Water Lane from being flooded in 2013. However, there is also a possibility that poor drainage along the Mack's Farm ditch may have contributed to the 2013 event; a concern that was addressed when WILD Project volunteers cleaned the ditch in 2015.

The Water Lane Flood (October 2023 to February 2024) was a significant flooding event, that occurred during an unusually wet winter, and was caused by a blockage in the street drain system. Water Lane in Somerford Keynes is low lying and prone to flooding. The lane has flooded occasionally over the years, with some of the older adjacent properties affected. In the 1970's, 50+ years ago, County Highways installed a road drain system, along Water Lane, between The Street and Mack's Farm ditch, to drain surface runoff into Macks Farm ditch. This is also discussed in the next section.

During this flood event, a 150- to 200-metre section of Water Lane (between the Parish Hall and the property "Ashcroft") was repeatedly flooded up to a maximum depth of about 12 inches. Sandbags were supplied by County Highways to protect The Old Bakery, and at one point, Cllr. Mike McKeown asked the Fire Department to mobilise a pumper truck to lower the water level to stop this property from being flooded. As can be imagined, the depth of the flood and its long duration made life particularly difficult for Water Lane residents in many ways. County Highways undertook several investigations (mostly jetting, as the water was too deep and turbid for CCTV photography) and found:

(a) all the drains in Water Lane between The Street and Macks Farm ditch are one, connected system that drains east to Macks Farm ditch. This was confirmed at an on-site meeting with Gill Portlock, County Highways. A diagram of this system will be included when this report is posted on the SKPC website

(b) that the drain system was blocked where it entered the Mack's Farm Ditch. After review it was determined that the blockage was located on land (between the hedge and the road) without ownership. In this situation, Highways was able to arrange a digger to uncover the blocked pipe, and Cllr. Lisa Spivey, was able to obtain £2,000 in funding to help this work happen quickly.

Action item Confirm that Highways have documented that the drains on Water Lane are one, connected system as discussed.

While finding the solution was protracted, this project was a good example of residents, the parish council, County highways and the District Council Flood Prevention Team working together to fix a problem. Loaned, hired, or purchased pumping equipment was considered by the parish council. LME offered a pump and hose but then found they were having to use it on their own high-water situation. Many thanks to all who were involved. Highways were diligent in identifying the cause, even though flooding was an issue across the region. Since the drain pipe was cleared, no further flooding has occurred to date.

Other Flooding

Other areas where smaller-scale flooding has occurred, in the past or currently, are:

- Spine Road immediately east of Mill Lane and south of the Village Lake, where water ponds next to the footpath due to lack of road drainage.
- The area around Glebe farm in Shorncote
- Old Mill Farm next to the Thames
- Ashton fields drain – which was temporarily closed by Hills and then reinstated.
- In Shorncote there is a blocked culvert under a driveway, opposite the entrance to Manor farm, causing water to flow down the road, and degrading the road surface.
- Also, in Shorncote, north of the houses, there is a section of road, that is culverted between two open ditches, which forms a low spot with connection to the culvert or the ditches. Sometimes this section is only passable with a high vehicle.
- Shorncote nature reserve
- Downs farm

Action item Not all these locations have been observed or considered, during the preparation of this report. This should be accomplished.

7. Flood Protection Infrastructure

Fundamental to flood protection within the parish is the intricate system of river channels, streams, lakes and ponds, low lying fields and water meadows, ditches, culverts, and street drains, that contain and move water from higher to lower elevations, and ultimately to the sea. Some of the features of this system are ancient (the meandering course of the Thames following the last ice age), some are old (ditches created hundreds of years ago, when fields were enclosed and drained), and some are modern. Flooding occurs when this system is challenged by periods of heavy rainfall, snowmelt, blockages due to overgrown vegetation, or other factors, failure of equipment, etc.

It is likely that the most important component of flood protection is regular maintenance of the drainage system so that it operates effectively. The parish took a huge step forward in this when it created the drainage map showing all the key features of the system. Responsibility for ditch cleaning generally rests equally between the landowners on either side of the ditch (i.e. riparian landowners). Much of the land abutting ditches within the parish is owned by local farmers, or publicly-owned along roadways. On the whole ditch, culvert and drain maintenance across the parish is generally good. Local farmers and the County Highways department are to be commended for the diligence they bring to this task. Also key, and deserving of much thanks, are the many residents who take the time to monitor parts of the system and bring problems to the notice of the parish council, the district council, and other agencies.

Another important component of flood protection is engineering works along with automated monitors and pumps that help the drainage systems to operate more efficiently. The main examples of these in the parish were installed by the Environment Agency in response to the 1991/1992 river flood, and comprise numbers 1-4 below. To date, these engineering measures appear to have been effective and the 1991 level of river flooding has not recurred.

1. A raised clay and earth bund, with a core of prefabricated concrete 'piles' was installed west of the Winter Brook ditch, in the fields to the west of the southern portion of Somerford Keynes village[24]. This feature, known as the "bund," is approximately one metre high, two metres wide, and about 500 metres long, with a break as it crosses the Thames at Neigh Bridge. The northern portion of the bund in the Timbrells' field, divides the Winter Brook into two flows, now known as the inner and outer ditches. The inner ditch is the Winter Brook in its original channel which flows under The Street and into the Thames via a pumping station (see below). The outer ditch runs west of the bund and flows into the Thames west of the bridge. South of The Street, the bund runs east of the river Thames.

2. **A pump station with trash screen, and a power kiosk** were located at the bridge at the Street at Neigh Bridge designed to pump water from the inner ditch into the river at the other side of the bridge when needed. However, at times of high water in the Thames, the pump has a non-return valve that closes the pump chamber (to prevent water in the Thames flowing back up through the pumping station and into the ditch), but also prevents the ditch from draining. Once levels in the Thames reduce, then the pump will reactivate to move water from the ditch to the Thames.

   James Spicer reported on 24/04/24 that EA has plans to make some minor improvements to the trash screen so that it is easier/safer for EA operatives to clear. There is no timeframe for completion of this currently.

3. **A 25m-wide concrete spillway,** South of Neigh Bridge, immediately after the Thames flows under Spine Road, replaced an existing overspill weir at Lower Mill Estate and extended it to increase the flow of flood water into Spinney Lake. There is a second, 20m-wide spillway into Spinney Lake, next to the LME main entrance.

[24] Hard copy of EA's Extent of Works drawing, 1998

4. **A level gauge with telemetry** at the river Thames at Spine Road.

5. **A CCTV monitor is to be added to the pumping station trash screen**. James Spicer reported on 24/04/24 that he is hoping to have this installed by summer 2024. *Action item* Find out if there are other existing or potential camera locations ocated in the parish.

6. The LME Lake Flood **Routing system** was approved by the Environmental Agency, is maintained by LME, and helps protect Somerford Keynes upstream, Lower Mill Estate itself, and Ashton Keynes downstream. In addition to the spillway, described above, there is also a side weir and two side leats that allow overflow from the Thames above the mill to a lower elevation, making a total of five flood overflows from the Thames below Neigh Bridge (plus the flow over the mill). Water levels in Spinney Lake are controlled by a sheet-piled weir, with a crest at 86.94 mOD, to maintain normal Spinney Lake water levels outside of flood events. Flood water from Spinney Lake overflowing this weir is diverted into Somerford Lagoon via the Copse Mere flood spillway, including a second lower weir just above Somerford Lagoon. From Somerford Lagoon, flood water is directed via culverts and overflow sluices to Flagham Fen, Freeth Mere, and ultimately to Swill Brook.

7. **The Road Drain System at Water Lane** is another component of engineered flood protection in the parish. This connected system of drains (diagram to be added), was installed by County Highways about 50 years ago. Lynton Magridge notes that CDC's map of the layout of the culvert is wrong, as is clear from a visual inspection. There are two culvert inlets on the north of the road, but only one exit on the south. This system has generally worked well to protect this street by draining surface water beneath the road and into the Macks Farm ditch. The system is dependent on Highways regularly cleaning out the drains and jetting the underground piping. *Action item* Monitor that this work is done.

8. **A mitigation scheme at Shorncote**, approved in 2012 by CDC to re-route groundwater and surface water on a triangular section of land south of Shorncote village, and between Lake 31 and Spratsgate Lane. The land was quarried for gravel by Cullimore and then infilled it with a variety of less-permeable fill. An overspill car park (a fenced area of hard-standing) for the Cotswold Country Park and Beach was also added on the southern end. Lynton Mogridge reports that this carpark was part of the agreement between the old Cotswold Water Park Society and the gravel extractors at a time when the Society was being defrauded and the ongoing state of this agreement is unclear.

   Action item There is an outstanding question as to whether this mitigation work is being installed according to the plan approved by CDC[25]. See further discussion under actions needed below.

9. There may be at least one other additional (now defunct) example of engineered flood protection in the parish, which was installed and then made inoperable later. **At Coke's**

[25] SKPC minutes 11.12.2023

Pit Nature Reserve there are reportedly a series of one-way valves that allowed water to flow between Cole's Pit Lake and the County Boundary ditch and vice versa. The details of how and why this installation worked are unknown and a meeting with Ben Welbourne, Cotswold Lakes Trust, confirmed that the valves had been concreted up to prevent this flow. Note: water flow from ditches into lakes can damage lake ecology by bringing in silt, and pollutants from road runoff.

8. Responsibility for Monitoring and Maintenance

Riparian landowners, residents, local flood wardens, the parish council, district and county councils, the Environment Agency, and other entities, such as the Cotswold Lakes Trust, etc. all have a role to play in monitoring and maintaining our community's drainage system and flood protection infrastructure.

There are several excellent resources on this topic:

- Cotswold District Council Watercourses and ditches[26]
- Cotswold District Council Riparian Toolkit 2011, A Guide to Support Community Action[27]
- Cotswold District Council - The Role of Community Flood Wardens Handbook[28]
- Environment Agency section of Gov.UK – Owning a Watercourse29

Riparian Owners are owners of land or property next to a river or other watercourse (stream, brook, beck, millstream, ditch, drain, culvert, pipe, and any other passage through which water may flow). They **must monitor the watercourses for which they have responsibility, and maintain them by clearing vegetation** and other obstructions. Failure to do so, can result in a legal notice to comply[30].

Before undertaking watercourse clearance, riparian owners must consider:

- Conservation Legislation – are protected species present? Advice can be obtained from Natural England and/or your local Wildlife Trust.
- Is an Environmental Permit (also known as a "Flood Risk Activity Permit") required from the Environment Agency?
  How will waste be managed? - ditch spoil is categorised as Medium Level Hazardous Waste. Environment Agency Licenses or Exemptions may be required.
- Volunteer Safety is crucial, it is essential that risks are assessed prior to work getting underway.[31]

[26] https://www.cotswold.gov.uk/environment/flooding/watercourses-and-ditches/
[27] https://www.cotswold.gov.uk/media/zjfkbr2m/riparian-toolkit.pdf
[28] https://www.cotswold.gov.uk/envir
[29] https://www.gov.uk/guidance/owning-a-watercourse#find-out-if-you-own-a-watercourse

[30] https://www.cotswold.gov.uk/environment/flooding/watercourses-and-ditches/
[31] https://www.cotswold.gov.uk/environment/flooding/watercourses-and-ditches/

Parish residents also have a responsibility for monitoring and maintenance of our drainage system and flood protection measures. Many residents possess a good understanding of how the watercourse would normally function, and they notice when changes occur in water flow.[32].

We can all be observant about our local surroundings, and notice and report incidents or changes When out walking, residents can consider the following types of questions. Are ditches overgrown with vegetation? Is the flow through a culvert less than usual? Is the water level in street drains higher than normal? Is the pump station at Neigh Bridge operating? Is there flooding where flooding has not occurred in the past? Has something changed that seems to have changed how water is flowing?

Reporting a flood

If a flood occurs, or if you observe something that could lead to flooding, anyone can report it (either by name or anonymously) and the best way to do this, in order of priority, is:

1. Report the flooding online using the FixMyStreet App - this will alert the county council (Lead Flood Authority). Using the map to indicate the location of a flood allows users to "piggyback" on previous reports saving time and reducing duplication.

   The FixMyStreet App can also be used for other issues. It has 39 categories of report to choose from, such as potholes, fallen trees, broken road signs, etc. Depending on the category selected, the report is sent to the county council or the district council for action.

2. Contact the Freephone 24-hour Environment Agency Incident hotline: 0800 807060
3. Let the local Flood Warden know
4. Call or email the parish clerk so that the parish council is alerted

The **Parish Council** is aware of the important role watercourses play in controlling natural water flow and providing protection from flooding. Much excellent work has been done in the past to map ditches, culverts, pitch points in water flow, and other features of the system. The council is also cognizant of the fact that the climate emergency is already resulting in more stormy, wetter weather for our region. *Action item* More work is need to fully appreciate what this may mean for flooding in the parish and how our community can be as resilient as possible.

In 2023, SKPC assigned a councillor to be the lead on flooding. This councillor was tasked with gathering knowledge and information on flooding (hence this report), and attending regional flood meetings and identifying further action. Additional roles such as coordinating the monitoring (of ditches, etc.), arranging an update of the parish map, helping to deal with flood incidents, liaising with district and county councillors and staff, etc., need to be discussed further and determined. *Action item* SKPC to review workplan needs and make decisions on assignments and contracting.

Somerford Keynes parish reportedly has two main riparian owners, i.e. the farming families, surnamed Timbrell and Harris. Over the years the parish council has maintained relationships

[32] https://www.cotswold.gov.uk/media/zjfkbr2m/riparian-toolkit.pdf

with these farming families. The parish also has other riparian owners, such as quarry operators, Cotswolds Lakes Trust, Lower Mill Estate, and others that the parish needs to check in with on a periodic basis. The Riparian Toolkit provides a useful five-step process to resolve riparian issues: identifying the problem, establishing ownership, engaging with the Riparian owner, monitoring, and contacting the local authority for assistance if needed[33]. *Action item* Gain an understanding of key riparian owners within the parish, and any watercourses that need attention. Establish or renew contacts with riparian owners, and maintain these contacts over time.

Mandy Keegan, SKPC, has long established contact with Shorncote Quarry (Hills) which is quarrying land east of Shorncote. Each year, Mandy meets with a representative to walk part of the Ewan ditch through the quarry to monitor it and identify any work. *Action item* It is hoped that in 2024, the lead on flooding will also join this walk.

Contact has already been established with Malcolm Poole, owner of Mack's Farm and the riparian owner of Mack's Farm ditch, between Water Lane and just north of Spine Road. On 31.02.24 at a meeting and visit with Mr. Poole and Sam Carrier, CDC, it was observed that, approximately, the upper two-thirds of Mack's Farm ditch from the farm, are clear and flowing well. The lower one-third section of the ditch is overgrown and flowing more slowly. Malcolm reported that he has arranged to have this portion of the ditch cleared, and that he awaiting a contractor to do this work. *Action item* Follow up to check on progress.

The **Flood Warden Scheme** was launched by CDC in 2021 with help from Gloucestershire Rural Community Council (GRCC). Cotswold Flood Wardens are volunteers who act as the "eyes and ears" in their communities. They are a key link between Cotswold District Council, responsible agencies, and their community, to receive and pass on messages, and to update from their patch to improve local resilience. They will be able to help provide important local information during a flood event and can also act as a key contact during the recovery stage. Flood Wardens might be part of a group working with the parish council to bring together a Community Emergency Plan, or to inform relevant parties about blockages when they have warning of a storm approaching. Cotswold District Council and GRCC work closely to coordinate the scheme and share news and resources to the wider community. GRCC provides support to Flood Wardens outside of emergency events, and coordinates Flood Warden training sessions three times year with input from key agencies e.g. CDC, Civil Protection Team, Environment Agency, and Gloucestershire County Council Flood Risk. They are also available to support communities to create or refresh Community Emergency Plans.[34] Karen Mogridge reports that SKPC did have an emergency plan but its status is unknown. *Action item* Find and review SKPC's emergency plan.

The **Flood Warden** for Somerford Keynes parish is local resident: Rob Abraham. Hilary Collins met with Rob by phone in late 2023. It would be helpful for the parish council to meet him and discuss how to integrate his role with the council's work on flooding. *Action item* Arrange this meeting.

Cotswold District Council (CDC) is responsible for 4,300 metres of ditches with the district, which it monitors and clears annually. There are no county-owned ditches within Somerford Keynes parish.

[33] https://www.cotswold.gov.uk/media/zjfkbr2m/riparian-toolkit.pdf
[34] https://www.cotswold.gov.uk/envir

CDC has powers relating to ordinary watercourses under the Land Drainage Act, 1991. Generally, these powers relate to flood prevention, and maintaining flows in ordinary watercourses. The powers can be used to ensure that adequate maintenance and clearance works take place for all ordinary watercourses, drainage ditches and other systems taking land drainage. Permissive powers are also available for the Local Authority to act against individual Riparian Owners who fail to perform their duties and responsibilities.

CDC follows a countywide protocol for dealing with Riparian Issues, and this sets out:

- A staged process for dealing with complaints
- Deadlines for site visits and assessments
- A process for communicating with the Riparian Owner
- A process of actions for unresolved complaints

In practice, CDC endeavours to resolve watercourse maintenance issues through discussion and negotiation with a Riparian Owner in the first instance. Not only has this approach proved effective, but positive communications encourage a long-term relationship with Riparian Owners and help to avoid future maintenance issues.

The CDC Flood Prevention team does respond to complaints about watercourses that have become blocked, or impeded. Under section 25 of the Land Drainage act (1991) where necessary, we have the power to enforce riparian landowners to keep watercourses free of obstruction. However, there is an expectation that parish councils will intervene before a problem arises by communicating directly with local landowners. The contact number for the team is: 01285 623000.

Gloucestershire County Council (GCC) is the Lead Local Flood Authority (LLFA) and is required to develop, maintain, apply, and monitor a strategy for local flood risk management in its area. Contact number 01452 425000. The LLFA is also required to investigate significant flooding incidents, maintain a register of flood defence assets, ensure sustainable drainage on new developments, and build partnerships between authorities with control over flood risks[35].

The County holds flood forum meetings twice a year to facilitate coordination and promote action. These are chaired by Sir Geoffrey Clifton-Brown MP and attended by staff from EA and Thames Water, councillors, and staff from GCC, CDC, Cirencester Town Council, local action groups such as WASP, parish councillors and residents affected by flood-related issues.

The Highways Authority is the Gloucestershire County Council Highways Department (Highways). Highways inspects and maintains nearly 130,000 gullies and kerb weirs. Traditionally these have been inspected (at least once every two years) and cleansed on a routine basis. Over the last 5 years Highways has been collecting data about the condition and location of their gullies and have moved to a 'risk-based approach' to gully cleaning. Effectively each gully is given its own risk level (low risk, low to medium risk, medium to high risk, and high risk) based on a scientific model using the silt-level data and flooding considerations[36].

Highways is generally only responsible for the area that can be travelled on by the public – i.e. the road/ path surface, and including any drains or culverts therein[37] Interestingly, in the case of the Water Lane floods in 2024, the adjacent landowner was able to confirm that they did not

[35] https://www.cotswold.gov.uk/media/zjfkbr2m/riparian-toolkit.pdf
[36] https://www.gloucestershire.gov.uk/roads/flooding-drainage-and-gullies/
[37] https://www.cotswold.gov.uk/media/zjfkbr2m/riparian-toolkit.pdf

own the verge where a drainage pipe was blocked. According to the land registry, there was no ownership for the land in question, and consequently County Highways stepped in to clear the blocked pipe.

The Environment Agency (EA) has oversight responsibility for rivers and the flood risk arising from them. The ultimate responsibility for main rivers, much like ordinary watercourses, rests with the riparian landowners. In Somerford Keynes parish, the river Thames and Swillbrook fall under the EA's remit. The EA can maintain or serve notice on riparian owners to maintain the river, however its enforcement resources are limited.

It is also the EA's responsibility to maintain the flood protection installations within the parish at Neigh Bridge, namely, the bund, north and south of the Street, the pump station (with non-return valve and trash screen) and power kiosk on the Street, the level gauge on the Thames at Spine Road, and the spillway opposite the gauge, south of Spine Road.

A meeting was held with James Spicer of EA on 09.02.24. Regarding regular monitoring and maintenance, James reported that he regularly visits and checks the operation of the pump station, kiosk, and level gauge. EA field teams also periodically check the screen and run the pumps. James noted that the emergency stop on the kiosk was replaced two years after the pump was found to have been inadvertently turned off a couple of times, and a meter on the kiosk was to be replaced within the next week.

Upgrades of the pump and the kiosk, and the relocation of the kiosk from close to the road to behind the adjacent wall were discussed. Shawn Shackleford of EA had met with some Somerford Keynes residents in early 2023, and at that time Shawn said these works were approved and funded. James confirmed that the upgrade and relocation work had not been done, funding had been lost in budget changes, and that he would restart the process to obtain approval and funding for this work.

James noted that following a promotion, Shawn's role had changed. He (James Spicer) is now the primary contact at EA for our parish.

James inspected the kiosk which indicated that the pump was operational. He confirmed that the pumps need to be overhauled due to their age. The kiosk upgrade is needed because the switches and logistics need to be updated, the metal kiosk box is rusting, some of the door hinges are broken, and the door does not close securely when locked. The kiosk relocation is needed so that the kiosk was safer to monitor (away from traffic) and work on. Steps up to the new location need to be installed. Costs of £40,000 to £60,000 were mentioned.

James said he would look at adding a CCTV monitor to the trash screen so that EA could monitor for blockages remotely. He will provide information on other locations where these cameras are installed.

Regarding maintenance of the bund, James reported that both sections of the bund are inspected annually by EA and mowed annually (usually after no-mow May). He was happy with the condition of the bund. Two years ago, there was a survey conducted that showed that the bund is still within design level, even though there has been some erosion along the footpath. At that time some patching was done. The section of bund south of The Street does not have the stone crest installed.

James reported that the spillway is cleared one or two times a year by EA maintenance teams. Note: in 2024, the spillway was also cleared by the Lower Mill Estate grounds crew. James was happy with the condition of the bund.

When asked about upstream or downstream work or concerns, James reported that in the section of river north-west of Somerford Keynes up to the Old Mill Farm, two or three blockages had been cleared by EA in the last few years. He was unaware of any recent maintenance downstream from the Somerford Keynes and noted that this would be the responsibility of the riparian landowners.

It was brought to James' attention that the level gauging station on-line log frequently shows zero, which does not make sense. James agreed to investigate this. *Action item* Email a screen shot of the problem to James.

The general contact for EA is the Enquires Team at: enquiries_thm@environment-agency.gov.uk.

WILD Project (Active 2015 to 2017?) This project was a partnership of primarily four organisations working together to bring about environmental improvements to the rivers and other watercourses of the Cotswold Water Park. The partnership is led by Gloucestershire Farming and Wildlife Advisory Group (FWAG) and includes Gloucestershire Rural Community Council (GRCC), Cotswold Water Park Trust (CWPT) and the Countryside and Community Research Institute (CCRI) at the University of Gloucestershire. The partnership aims to improve the ecological status of the water bodies in the Cotswold Water Park.

WILD Project newsletters describe work carried out in Somerford Keynes to improve the ecological status of local water bodies through the following methods; protection from livestock, removing silt and river fencing whilst also working to improve water flow[38]. It is understood that this work included work clearing the Mack's Farm ditch. *Action item* Review https://www.fwagsw.org.uk/the-wild-project-phase-2, and contact Jenny Phelps at FWAG to clarify that this project is no longer active, and if so, ask if it has or will it be replaced, and if there any other groups offering this type of assistance.

[38] https://www.grcc.org.uk/publications/wild-newsletters

9. Somerford Keynes Parish Council - Annual Flood Workplan

This workplan aims to capture **annual, on-going activities** that the parish council's lead on flooding should undertake to monitor the parish's drainage system and flood protection infrastructure.

Focus	Contact	Question	Timing	Action	Date Completed
Bund maintenance	EA	Has the two-part bund been mowed, inspected, and maintained?	Summer	If not, request action	
Pump station and kiosk	EA	Is pump station and kiosk operational, has maintenance been done, any repairs or upgrades?	Spring and Autumn	If not, request action	
River Guage	EA	Do on-line levels appear reasonable?	Autumn	Report any anomalies to EA	
Spillway	EA and LME	Check that EA and LME crews have done clearance	Autumn		
Water Lane Drains	Water Lane residents	Is the water level high in the street drains?	Autumn	If high indicates system is blocked, report to FixMyStreet	
	Highways	Find out if routine pumping and jetting of drains has been completed	Late summer?	If not, report to FixMyStreet	
	Check in with Malcolm Poole	Is Mack's Farm ditch flowing freely	Spring and Autumn	If not, ask Malcolm to address.	
Ditches and culverts	Residents who pay attention to specific locations or installation within the parish	Email asking about any concerns. Meet and do inspections as needed.	Winter and Spring	As applicable, report blockages or overgrown vegetation to landowner, FMS, District or County, EA	
Road Culverts	County Highways	Email as needed asking if	Autumn		

		maintenance has been done			
Ditches and culverts, etc.	Riparian landowners	Email significant landowners to check in on ditch clearance work	Winter and Spring	Liaise with landowner if known issues not addressed	
Flood Report	NA	What updates are need to the flood report? present to council	Once a year?	Do update and present to PC	
Flood Workplan	NA	Has workplan been accomplished?	Once a year?	Report to PC	

10. Further Action Needed

- Explore how the information contained in the **Parish Map with Drains Layer** can be transferred to a mapping program that is amendable.

- Locate text that describes the 37 watercourse-related, issues and opportunities on the WILD project map.

- Prepare a more thorough summary of flood types, risk levels, and warnings/alerts

- Order a Product 4 flood map for Somerford Keynes by contacting the EA communications team at 0800 807060 to request mapping for the whole parish.

- Send screen shot of issue with on-line reports from the water level gauge on the upstream side of Spine Road to James Spicer at EA. Also, we have been told that the levels reported for this gauge are incorrect, due to an erroneous stage datum (indicated online as 88.2m AOD). This should be discussed with the EA, and if in error, corrected as soon as possible.

- In next version of flood report, include a map showing simplified principal drainages and their “catchment areas.”

- Find out more about the smaller-scale flooding that has occurred in the parish, to understand their causes and any action needed.

- Contact James Spicer to ask about other locations in the parish where cameras are being used, or where cameras are planned.

- Follow up with Mandy Keegan on the Shorncote mitigation scheme and the visit by CDC Mitigation and Enforcement.

- Explore what the climate emergency will mean for flooding in the parish and how our community can be as resilient as possible.

- Review with the SKPC, the lead on flooding’s roles in terms of coordinating the monitoring (of ditches, etc.), arranging an update of the parish map, helping to deal with flood incidents, liaising with district and county councillors and staff, etc., Change this to evaluate how this work could be contracted out.

- Find out more on GCC’s role in supporting community emergency planning. Review SKPC Community Emergency Plan.

- Ask the Flood Warden, Rob Abraham, to meet with parish council to discuss his role and how it can be integrated with the council’s work on flooding.

- Confirm that the WILD project no longer active, and if so, find out if it was, or will be replaced? Are there any other groups offering this type of assistance?

- Flooding on Spine Road parallel to Village Lake needs to be addressed by channels being regularly cut into the grass verge. Is this enough? Is the water then able to flow over the bike path?

- Review CDC's register of flood defence assets to make sure we are aware of all in the parish.

- Walk a section of footpath along part of Ewan ditch that runs through the Hills quarry east of Shorncote with Mandy Keegan, planned for September 2024.

- Contact Thames water to ask for a progress report on the expansion of the Cirencester Treatment Plant. Learn where this discharges to? Note: Questions have been asked and now awaiting reply