



WEST OXFORDSHIRE
DISTRICT COUNCIL

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Parish Flood Report: **Filkins & Broughton Poggs**

May 2008



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1.0 INTRODUCTION

On the 20th July 2007 large parts of the South of England were subjected to intensive storms. The scale and speed of the rainfall was unprecedented and took most communities by surprise causing widespread flooding of highways and property. On this occasion, unlike previous storms / flooding experienced, this impacted on many properties that had never been affected before, due to much of the flooding coming in the form of rain water run off from land.

A swathe of the district was particularly badly affected by the massive storms, which commenced in the morning and subsided in the evening. During the following days further disruption occurred due to rising river levels. At RAF Brize Norton, the records show that over 125 mm (5 inches) of rain fell in 12 hours, and this is a record going back over 100 years. Not only that, but the period from May to July had been the wettest on record since 1903 and meant that the ground was saturated and unable to absorb any more water.

On the 10th October 2007, the District Council's Cabinet considered a report and approved additional resources in order that a review of the affected areas could be carried out and further reports be prepared for the Council's considerations.

1.1 Purpose of the report

In response to requests from both the Parish and Town Councils and the general public West Oxfordshire District Council has produced a number of reports that identify each individual cause of flooding within the Parish / Town, what work is being carried out by external agencies (Environment Agency, Thames Water etc); what the potential options are for future mitigation - and who might be best placed to fund such schemes. The reports themselves reflect the series of water systems that all played a part in the flooding experienced in July 2007 and will help all the organisations involved understand the need to sequence their activities.

This report has been prepared by a qualified Engineer in consultation with the key external agencies and seeks to explore the main reason behind why the floods happened in July 2007 and give an overview of the event itself. It will also provide an understanding of the different roles and levels of responsibility for the agencies involved.

This report should be used to make sure that all the agencies involved with flood prevention – like the Environment Agency, Thames Water, Oxfordshire County Council, Town / Parish Councils and private land owners – work in true partnership for the good of everyone in the local community.

A key outcome of the reports is that residents are given a broad overview of the complex linkages between the different organisations involved and also the range of options available.

1.2 Roles and responsibilities

One of West Oxfordshire District Councils key ongoing roles is to continue to lobby National agencies / Government on behalf of the residents and businesses of the district to secure funding and/or additional resources to assist with flood prevention and other relevant activities. The Council will also work closely

with other agencies and organisations in order to highlight the local issues and actions identified in the report.

The legal responsibility for dealing with flooding lies with different agencies and is complex, so below is a simplified summary.

Environment Agency (EA) – Permissive powers¹ for main rivers

Oxfordshire County Council (OCC) – Responsible for adopted highways and highway drainage.

Thames Water (TW) – Responsible for adopted foul and surface water sewers.

West Oxfordshire District Council (WODC) – Duties as a riparian² land owner, and permissive powers¹ under Land Drainage Act 1991, Public Health Act 1936, Highways Act 1980 and Environmental Protection Act 1990.

Private land owners - Duties as a riparian land owner.

1.3 Consultation and consent

The key organisations mentioned above are currently carrying out their own investigations, but operate independently of each other, have different methods of prioritisation and different funding criteria. The District Council has consulted with these agencies together with Parish Councils, Town Councils and individual property owners in order to prepare this report.

It is recognised that the majority of the options proposed in this report require further investigations / feasibility studies and / or consultation before they are carried out. Therefore these options may not be appropriate in every case when full costings, environmental, landscaping, biodiversity, built environment and historic factors are fully considered.

When considering protection against future flooding, it must be emphasised that the risk and impact of flooding can be mitigated against but in some cases not fully removed.

1.4 Response to this report

The options section of this report highlights the potential areas of work / activities under the responsible agency, for example the Environment Agency, West Oxfordshire District Council etc. If you have any specific questions relating to these activities please contact the relevant agency using the contact details provided at the top of the chart.

If you have any general questions please contact your Parish / Town Council who have been a key contributor to the production of the report and have agreed to act as the first point of contact.

The Council is also planning to hold a series of road shows in the Parish areas where representatives from all the relevant areas will be available to answer any questions local residents have as well as provide more information on ways residents may help themselves.

¹ Permissive powers are when an organisation may choose whether or not to exercise their powers. I.e. they are NOT under a duty. In making this choice account must be taken of any factors required by the legislation, plus for example how urgent, how necessary they are, cost, likely result, etc

² Riparian owners are responsible for the maintenance of any watercourse within or adjacent to the boundaries of their property.

1.5 Legal

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2.0 DISTRICT COUNCIL'S ACHIEVEMENTS OVER THE PAST 12 MONTHS

2.1 Ditch Clearance

- 1731 Linear metres WODC owned ditches cleared overall
- 1923 Linear metres Privately owned ditches cleared overall
- Overall 2.27 miles of ditches have been cleared

2.2 Flood Grants

- 1137 WODC Flood Grants totalling £284,250 given out overall
 - 43 (£10,750) for the Parish of Filkins & Broughton Poggs
- 40 Red Cross Flood Grants totalling £80,929 administered by WODC overall
- 301 Hardship Grants totalling £155,050 given out overall

2.3 Reports

- Interim Flooding Report published October 2007
- 12 Parish Flood Reports completed by June 2008, 1 report for Filkins & Broughton Poggs

2.4 Actions from the Council's Interim Report published in January 2008

The table below provides a summary of some of the completed actions identified in the report

Bronze command procedure to be updated to recognise the need for ensuring shift rotas are in place in the early stages of an emergency
Consider producing a revised warning system that identifies a higher category of risk that is only issued in exceptional circumstances
The emergency plan specifically addresses the need to keep in regular contact with elected members
That in future emergency situations District Councils ensure that they have a representative present at Silver Command from the start of the emergency to act as a conduit for information between Silver Command and the District Councils
The council should encourage all residents residing in the flood plain and in areas at risk of flooding to sign up to the EA Flood Alert system.
Provide clear information to residents and businesses about what type of waste we can collect and how it will be collected
Explanations to residents of our need for bulky waste to be placed on the roadside for collection
Commence a review of the mapping of the many thousands of privately owned ditches and culverts, and ensure they are kept clear and well maintained in accordance with the new policy (2 TOR 3)
Lobby central government for a single agency to take control of all land drainage issues
WODC continues to act in a coordination capacity with key external agencies
Continue to liaise with EA to ensure that procedures relating to planning consultations are robust. Seminar being arranged to take place early in 2008 to progress this
Progress the Strategic Flood Risk Assessment
Consider producing a revised warning system that identifies a higher category of risk that is only issued in exceptional circumstances
Approaches to be made to the EA and Metrological Office with regard to improving their predictive capability
During emergency events, have an external media person (BBC) in Bronze Command
Purchase digital TVs to assist with reviewing weather, local and national news to assist emergency management

3.0 EXECUTIVE SUMMARY

Following the flooding events of July 2007, West Oxfordshire District Council (WODC) has responded to requests from both Town and Parish Councils to aid the coordination of all the agencies and bodies that were undertaking their own investigations into the floods through the production of Parish Flood Reports.

This document is the Parish Flood Report for the Parish of Filkins & Broughton Poggs and has been prepared by the Council's Engineering team. It pulls together information from external agencies and individual property owners and seeks to identify the causes of flooding in Filkins & Broughton Poggs during July 2007 and potential mitigating solutions.

This report recognises the statutory duties of WODC to maintain and enhance the biodiversity, protect local habitats in the UK Biodiversity Action Plan, protect specially protected species, conserve and enhance the character and appearance of Conservation areas and protect/ maintain listed buildings.

Filkins & Broughton Poggs is a rural parish of 1500 Hectares (3700 Acres) forming part of the catchment area of the River Thames via Broadwell Brook. Broadwell Brook runs through the centre of the village joining the River Thames at Radcut Cut. Several visual walkover surveys were undertaken of the flooded areas and properties. Meetings were held with affected residents and the Parish Council. The number of Flare Reports and Applications for Grant Aid has also been investigated.

Filkins & Broughton Poggs flooding has been assessed in nine separate areas (see section 4.1) comprising Clark's Barn (Area 1), Meadow Cottage and Chantry Cottage (Area 2), Filkins & Broughton Poggs Thoroughfare (Area 3), Broughton Poggs Mill (Area 4), Filkins & Broughton Poggs Bypass overbridge (Area 5), Filkins & Broughton Poggs Bypass Highway (Area 5A), Goodfellows (Area 6), Broughton Hall Access Road (Area 7) and Broughton Poggs (Area 8).

The flooding of Clark's Barn (Area 1) was due to large volumes of agricultural run-off arriving from the east that could not be taken by the overgrown highway drainage ditch east of the old A361. Properties off Meadow Cottage & Chantry Cottage Access Road (Area 2) flooded due to a combination of high water table levels, low floor levels, lack of intercepting highway and extension cutting drainage. Filkins & Broughton Poggs thoroughfare (Area 3) flooded due to a combination of the following: blocked/ undersized culverts, incorrect gully spacing, low kerb face level and insufficient property threshold falls to the carriageway. The flooding at Broughton Poggs Mill (Area 4) was caused by any or a combination of the following: excessive fill within the culvert, uncontrolled volumes of water arriving from the upstream "Goodfellows" area and uncontrolled highway drainage run-off.

The flooding in the village originated from Barrington Lane which in heavy rain is totally submerged (Area 5) under the new A361 bypass overbridge (The highway drainage either side being unable to cater for the large volumes of water arriving at this low point in the carriageway vertical alignment). Flooding in the village was also caused by uncontrolled run-off from the A361 bypass (Area 5A) reaching Broadwell Brook.

"Goodfellows" (Area 6) flooded, due to the above A361 overspill as well as the Broadwell Brook culvert under Barrington Lane being under sized. Broughton Hall Access Road (Area 7) flooded due to either the over-topping of Manor Farm pond and/or low floor levels. Properties in Broughton Poggs (Area 8) flooded due to a build up of trapped water from flooded land unable to reach Broadwell Brook at the required rate through a network of undersized culverts (In July 2007 this build up caused the wall to Broughton Hall grounds to collapse).

Flooding problems and options, including description of works and how each public and private body is affected, effectiveness of each solution, affects on adjacent land and cost, are included in Sections 5 and 6.

Conclusions and recommendations, including maintenance and flood defence improvement schemes and programme, are shown in Section 7.

4.0 SURVEY

4.1 Description of Area

Filkins & Broughton Poggs Parish is approximately 1500 Hectares (3700 acres) in size comprising the communities of Filkins and Broughton Poggs.

The parish is rural in nature forming part of the catchment area for the River Thames via Broadwell Brook. The parish is abuts the parishes of Holwell, Broadwell and Langford within West Oxfordshire.

There are eight farms (Holwell Down Farm, Filkins Down Farm, Oxleaze Farm, Filkins Farm, Furzey Hall Farm, Manor Farm, Peartree Farm, College Farm), one school, two Halls (Filkins Hall, Broughton Hall), three tree plantations, numerous listed buildings and a Conservation Area located within the Parish.

4.2 Survey

Several visual walk-over surveys and visits of the parish have been undertaken to review properties that were flooded in July 2007.

See Appendix I – Photographs.

4.3 Meetings

A meeting and site walk over was held on 25 February 2008 with Richard Martin (Parish Council Chairman), Chris Hoad (Parish Clerk) and other Parish Council members to discuss the flooding events of 2007. Views were expressed relating to the causes, origin and preventative measures that could be applied to mitigate any future flooding events similar to that of July 2007. A subsequent site meeting was held on 27 February 2008 with Richard Martin and Charlie Payne of Broughton Poggs Mill and Ben Morley of 'Goodfellows'. Additionally telephone discussions were held with Tony Mullen of Foxfield House, Peter Huggett of Sunnyside, Peter Gray of Field Cottage and Mick Hambidge of The Glassons.

The Parish Council conducted a survey among residents and provided WODC with a file containing feedback from those who were affected by the floods of July 2007.

Generally the responses comprised the following issues:

- (i) Sluice gates should be controlled/ managed effectively between 'Goodfellows', Broughton Poggs Mill and Filkins Mill.
- (ii) A new bridge/culvert is required under the old A361 at Broughton Poggs Mill.
- (iii) The existing culvert at Broughton Poggs Mill needs to be cleared of silt/ backfill etc.
- (iv) Broadwell Brook should be dredged and cleaned out for its entire length.
- (v) Provide an emergency relief bypass channel at Broughton Poggs Mill.
- (vi) Increase the size of the Filkins to Broughton Poggs storm water culvert.
- (vii) Replace the Filkins to Broughton Poggs storm water culvert with a larger diameter pipe.
- (viii) Establish ownership of ditches in Filkins & Broughton Poggs and serve notice on the riparian owner to force them to be cleaned out.
- (ix) Clean out all gullies in village.
- (x) Replace the flood protection bund in the field adjacent to Broughton Poggs Mill.
- (xi) Provide more gullies.
- (xii) Lower the level of Manor Farm driveway.

- (xiii) Re-establish the highway drainage ditch across the verge frontage to Clark's Barn.
- (xiv) Re-establish the surface water/ highway drainage link to Filkins Mill thereby diverting all run-off from upper Filkins,
- (xv) Increase the diameter of the pipes running towards Broughton Hall to match that of the A361 field inlet of 1000mm.

4.4 The Flooding Event

The EA has advised that the extreme rainfall event in July 2007 was unprecedented and comprised 119.6mm precipitation in 24 hours which easily surpassed the previous peak recorded event in July 1969. The District Council has liaised with the Environment Agency, Oxfordshire County Council and Thames Water.

4.5 Application for Grant Aid

The District Council has distributed a range of financial support to the residents of district in the form of;

- Emergency Flood Relief Grant Aid of £250
- 'Hardship' Grants
- Red Cross Grants

To date the owners of 43 residential properties in the Parish of Filkins and Broughton Poggs have received Emergency Flood Relief Grant Aid, however it is acknowledged this is not the total number of properties affected in the Parish as some owners have been reluctant to claim.

Whilst the Emergency Flood Relief Grant Aid was not paid to industrial and commercial properties, the Council did provide advice and support to local business affected by the flooding on funding available from Business Link and other organisations.

5.0 PROBLEMS AND CAUSES

5.1 Location maps

Appendix 2 contains:

- A location plan showing areas in Filkins & Broughton Poggs Parish where properties flooded in July 2007 and where owners have made claims for grant assistance.
- A map showing:
 - Parish boundary
 - Environment Agency enained watercourses
 - 0.1% annual probability and 1% annual probability of flooding occurring (previously referred to as 1:100 & 1:1,000 year storms)

5.2 Area 1 – Clark’s Barn

Three properties were flooded in the Clark’s Barn area due to land drainage from the fields to the east being unable to escape into the highway drainage ditch east of the old A361 as it was heavily overgrown. Surface water overtopped the ditch and flooded properties between Clark’s Barn and Peartree Farm. The situation was not assisted by the ditch being filled where it crosses the landscaped verge frontage of Clark’s Barn.

5.3 Area 2 – Meadow Cottage and Chantry Cottage

Two properties flooded (Chantry Cottage and Willow Cottage) off the access road to Meadow Cottage and Chantry Cottage off the old A361. This was due to one or a combination of the following: (i) Low floor levels (ii) Local high water table (iii) Insufficient off-road surface water drainage at the driveway/ highway interface for both properties (iv) Extensions built into sloping land without adequate cutting drainage.

5.4 Area 3 – Filkins and Broughton Poggs thoroughfare (old A361)

Thirteen properties flooded either side of the old A361, which now forms the main thoroughfare through Filkins and Broughton Poggs, due to one or a combination of the following:

5.4.1 Blocked Culvert

Part of the highway drain/surface water sewer, which is in a culvert, from Peartree Farm to Broughton Poggs Mill, is blocked with silt and tree roots etc.

5.4.2 Under-sized Culvert

The above culvert had insufficient spare capacity to accept the large volumes of surface water in July 2007.

5.4.3 Incorrect Gulley Location

Some gullies are sited at high points along the carriageway.

5.4.4 Insufficient kerbface

Low kerb face depth of 20mm as located in a Conservation Area. A deeper kerb face is to be agreed with WODC Planning Department and kerbs re-laid. Typical Department of Transport kerbface for new roads is 125mm.

5.4.5 Substandard threshold fall

Insufficient fall from property thresholds to the carriageway. A minimum of 1 in 40 would be desirable yet in places thresholds are almost flush with the carriageway.

5.4.5 Cutting run-off

Housing new build extensions cut into sloping land without adequate drainage.

5.5 Broughton Poggs Mill

Four properties flooded in the area adjacent to Broughton Poggs Mill.

This was caused by one or a combination of the following:

5.5.1 Insufficient bridge clearance

There is insufficient soffit to invert level clearance under the existing bridge/ culvert at Broughton Poggs Mill.

5.5.2 Uncontrolled upstream discharge

High uncontrolled volumes of water arrive at Broughton Poggs Mill from the upstream 'Goodfellows' direction.

5.5.3 Excess highway drainage run-off

Excess highway drainage run-off arrived at Broughton Poggs Mill in July 2007 as detailed in 4.4.

5.6 Area 5 – Filkins & Broughton Poggs Bypass (new A361) Overbridge

Four properties flooded due to the flooding of Barrington Lane where it passes beneath the new A361 overbridge.

This occurred for the following reasons:

5.6.1 Bypass discharge

Excess water collected in ditches either side of the new A361 and cascaded down onto Barrington Lane. The highway drainage in Barrington Lane was overwhelmed and flooding occurred. Additionally water eroded soil away from the back of the overbridge abutments.

5.6.2 Lack of Maintenance

Gullies, pipework and ditches either side of Barrington Lane are heavily overgrown/ blocked up and are in urgent need of immediate and constant maintenance. OCC advise this section of highway drainage is part of an on-going annual maintenance cycle.

5.7 Area 5A - A361 Filkins & Broughton Poggs Bypass

Large volumes of surface water from the A361, which is generally raised above the level of the village, discharges with little control into Broadwell Brook with the net effect of adding to the village flooding problems.

5.8 Area 6 – Goodfellows

Heavy rainfall flooded land and property in and around 'Goodfellows'. This was due to one or a combination of the following: (i) peak volumes of uncontrolled storm water travelling along Broadwell Brook; (ii) overflow highway drainage from Barrington Lane (see 4.6) (iii) insufficient clearance through the culvert that passes beneath Barrington Lane; (iv) water backing up from Broughton Poggs Mill.

5.9 Area 7 – Broughton Hall Access Road

Eleven properties flooded adjacent to Broughton Hall Access Road. This was due to a combination of one of the following:

5.9.1 Manor Farm Mill Pond

Mill Farm Pond is of insufficient size to act as a balancing pond and hold back the flood water and release it at a slower rate. The effect is that water overtops and floods adjacent properties.

5.9.2 Low Floor Levels

Older properties constructed at a lower level, using traditional building practices and materials, flooded due the following: (i) seepage through the floor and walls due to the high water table generated in the area; (ii) excess highway run-off over-spilling onto the adjacent footway which has a low kerbface then flooding under doors to properties with low thresholds.

5.10 Area 8 – Broughton Poggs

Five properties flooded in Broughton Poggs that front the triangle of land bounded by the old A361, the new A361 and Broadwell Brook.

The arm of the Broadwell Brook, which flows into the village underneath the A361 through a culvert, is prone to blockages on the west side with vegetation and other debris. When this occurs water overflows south along a ditch and then under the A361 through another 800mm wide culvert. This culvert empties directly into the field above.

During July 2007 this flood water merged with water overflowing from Broadwell Brook as the flood defence bund had been breached. Water then flowed over the B4477 (primarily through the field entrance opposite Fox House) and toppled the stone wall that abuts Broughton Hall grounds. This was due to the fact that a number of “throttle” constraints inhibit the free flow of water from Broughton Poggs back into Broadwell Brook. These include: (i) 100mm diameter pipe under Broughton Hall driveway; (ii) 300mm diameter pipe under Broughton Manor Access Road; (iii) 300mm diameter pipe from Manor Farm mill pond into the brook.

Broadwell Brook is enmained south of Broughton Poggs Mill.

6.0 OPTIONS

The following table shows the possible options available for flood alleviation schemes throughout the Parish, and their potential effectiveness, as assessed by the District Council Engineers. The areas affected by flooding within the Parish have been given unique area numbers, i.e. Area 1. Several options for flood alleviation projects are identified for each area as 'Actions' or 'Options'.

Many of these options will require further detailed investigation along with the agreement of the responsible landowner, identification of budget and a cost benefit analysis to be carried out before they could be implemented.

Some of the options shown are also mutually exclusive, that is if one option is carried out then another will not be necessary, to find if this is the case for an option, please look at the detailed description in the Conclusions and Recommendations Section (7.0).

If you require further information regarding a particular option, please contact the agency that would be responsible for implementation of the proposal, where this has been shown, using the contact information at the top of the column. If no contact details are shown, there may be a private landowner responsible. If this is the case the District Council will ensure that private landowners are made aware of their responsibilities.

-West Oxfordshire District Council

Parish Flood Defence Report – Options summary

Filkins & Broughton Poggs Parish

Version 1 - May 2008

Option ref	Problem overview	Description of work required					Key issues			Comments
		Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private / riparian	Effectiveness	Effects on adjacent land	
			For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk	For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk	For queries Tel: 08459 200800	For queries Tel: 01993 861000 or e-mail enquiries @westoxon.gov.uk				
Area 1 – Clark’s Barn										
	Following periods of heavy rain flooding occurs to Clark’s Barn and two properties opposite fronting the northern entrance road to Filkins off the A361. This is due to land drainage from fields to the east being unable to escape into the heavily overgrown highway drainage ditch. Surface water overtops and floods properties between Clark’s Barn and Peartree Farm. Broadwell Brook is not maintained north of Broughton Poggs Mill.									
A	Excavate out and replace the highway drainage ditch, including the verge fronting Clark’s Barn, and re-build the collapsed dry stone wall. This should be carried out between Clark’s Barn and Peartree Farm.		OCC to undertake work as soon as possible to protect properties west of the old A361.		WODC to co-ordinate works with this proposal.	New highway drainage to be laid across landscaped verge outside Clark’s Barn	This scheme intercepts field run-off flooding onto the highway and properties to the west.	No effects outside the public highway.	Design Costs = £2K Capital Costs = £5K to £20K.	
B	Excavate out and replace the existing highway drainage ditch and discharge to a new swale (SUD) and balancing pond built on wetland adjacent to Broadwell Brook to the head of Meadow Cottage and Chantry Cottage access road. Utilise redundant manholes in the verge opposite Clark’s Barn.		OCC to undertake this work.		WODC to co-ordinate works with this proposal.	Private land required adjacent to Broadwell Brook.	Scheme would provide 1 in 100 year flood protection.	Requires wetland area (possible SSSI) at the head of access road.	Design Costs = £5K Capital Costs = £50K to £100K	
Area 2 – Meadow Cottage and Chantry Cottage										
	Following periods of heavy rain excess run-off cascades down the access road to Meadow Cottage & Chantry Cottage, off the old A361, and flooding to properties occurs. This is due to a combination of the following: (i) low floor levels (ii) Local high water table (iii) Insufficient off-road surface water drainage (iv) extensions built into sloping land without adequate cutting drainage.									

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Parish Flood Defence Report – Options summary

Filkins & Broughton Poggs Parish

Version I - May 2008

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		Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private / riparian	Effectiveness	Effects on adjacent land	
			For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk	For queries Tel: 0845 310 1111 or e-mail northernarea@oxfords-hire.gov.uk	For queries Tel: 08459 200800	For queries Tel: 01993 861000 or e-mail enquiries @westoxon.gov.uk				
A	Excavate out and replace the highway drainage ditch and grips opposite the allotment gardens		OCC to undertake and wholly fund this work as soon as possible to protect properties west of the old A361.		WODC to co-ordinate works with this proposal.	Required new highway drainage to be laid across landscaped verge outside Clark's Barn	This scheme intercepts field run-off flooding onto the highway and properties to the west	No effects outside the public highway	Design Costs = £2K Capital Costs = £5K to £20K	
B	Low lying properties that flood to be corralled by a perforated pipe laid with a single size stone bed and surround to a depth of 1 metre. A well point pump is to be provided in the lowest corner of the drainage network to pump out water ingress. This will lower the water table locally around the property. Pumped water to be stored on site in a tank which will be emptied at regular intervals as required. Work to be undertaken by the property owner.				WODC to co-ordinate works with this proposal.	Work to be undertaken and funded wholly by the private owner. WODC to provide guidance only. Riparian Owner to fund on-going maintenance of pump.	This option will prevent water rising through the floor but will not prevent flooding of gardens/ driveway etc.	May require planning permission and land drainage consent.	Design Costs = £5K Capital Costs = £20K to £50K	
Area 3 – Filkins and Broughton Poggs Thoroughfare (old A361)										
	During peak rain storm events water cascades down the old A361, which now forms the main thoroughfare through Filkins and Broughton Poggs, flooding properties adjacent to it. This is due to one or a combination of the following: (i) part of the highway drain/surface water sewer which is in culvert, from Peartree Farm to Broughton Poggs Mill, being blocked with silt/ tree roots etc. (ii) the above culvert being under sized and incapable of accepting large volumes of water. (iii) Incorrect gully specification and in some cases gullies sited incorrectly. (iv) Low kerb face depth of 20mm in places in contrast to the correct specification of 125mm. (v) Insufficient fall from property thresholds to the carriageway. (vi) extensions built into sloping land without adequate cutting drainage									
A	Locate, survey, jet out, repair, clear tree roots as necessary from the highway drain culvert/ surface water sewer between Peartree Farm and Broughton Poggs Mill.		OCC in conjunction with Thames Water to undertake work to protect properties.	Thames Water in conjunction with OCC to undertake work to protect properties.	WODC to co-ordinate works with this proposal.	None	Will improve flow properties within the culvert but capacity problems may remain an	None	Design Costs = £2K Capital Costs = £5K to £20K.	

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Parish Flood Defence Report – Options summary

Filkins & Broughton Poggs Parish

Version 1 - May 2008

Option ref	Problem overview	Description of work required					Key issues			Comments
		Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private / riparian	Effectiveness	Effects on adjacent land	
			For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk	For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk	For queries Tel: 08459 200800	For queries Tel: 01993 861000 or e-mail enquiries @westoxon.gov.uk				
							issue.			
B	Provide new high drain/ surface water sewer for the entire length of the old A361 from Clark's Barn to Broughton Poggs Mill and divert existing highway drainage ditch and gullies into it. Provide additional high capacity gullies where required connecting to the new facility.		OCC in conjunction with Thames Water to undertake work to protect properties.	Thames Water in conjunction with OCC to undertake work to protect properties.	WODC to co-ordinate works with this proposal.	None	Effective solution where correct engineered design can be applied to achieve 1 in 30 year protection in accordance with Sewers for Adoption.	None	Design Costs = £10K Capital Costs = £50K to £100K.	
C	Provide new surface water sewer/ highway drain as above but divert flow through 90 degrees, to run south-east under the Filkins Mill Road, to discharge into the existing highway drainage ditch at the "Glassons" cross road. This will divert discharge from upper Filkins away from the existing outfall at Broughton Poggs Mill.	EA to provide new discharge consent.	OCC in conjunction with Thames Water to undertake work to protect properties.	Thames Water in conjunction with OCC to undertake work to protect properties.	WODC to co-ordinate works with this proposal.	None	Effective solution where correct engineered design can be applied to achieve 1 in 30 year protection in accordance with Sewers for Adoption.	None	Design Costs = £10K Capital Costs = £50K to £100K.	
D	Relay existing gullies on the high side of the old A361 and opposite the church where, they are not intercepting surface water, and provide additional as required.		Work to be carried out wholly by OCC.		WODC to co-ordinate works with this proposal.	None	Improved surface water entry but poor culvert issues remain.	None	Design Costs = £0.5K Capital Costs = Up to £5K.	
E	Relay kerbs for the entire length of the old A361 and other village side roads where there is insufficient carriageway clearance.		Work to be carried out wholly by OCC. OCC to agree, with WODC Planning Department, a deeper aesthetically pleasing kerbface.		WODC to approve kerb selection and kerbface.	Vehicle & pedestrian crossings to be accommodated with falls away from thresholds to road.	Retains all surface water within the carriageway.	Private frontages affected.	Design Costs = £5K Capital Costs = £20K to £50K	

-West Oxfordshire District Council

Parish Flood Defence Report – Options summary

Filkins & Broughton Poggs Parish

Version I - May 2008

Option ref	Problem overview	Description of work required					Key issues			Comments	
		Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private / riparian	Effectiveness	Effects on adjacent land		Cost
			For queries Tel 08708 506 506 or email enquiries@environment-agency.gov.uk	For queries Tel: 0845 310 1111 or e-mail northernarea@oxfordshire.gov.uk	For queries Tel: 08459 200800	For queries Tel: 01993 861000 or e-mail enquiries @westoxon.gov.uk					
F	Relay frontage footway where possible to provide a 1 in 40 fall from house threshold to edge of carriageway. Where this is not possible install a concrete channel to fall as required.			Work to be carried out wholly by OCC.		WODC to co-ordinate works with this proposal.	Vehicle & pedestrian crossings to be accommodated with falls away from thresholds to road.	Slight improvement.	None	Design Costs = £2K Capital Costs = £5K to £20K.	
G	Low lying properties that flood to be corralled by a perforated pipe laid with a single size stone bed and surround to a depth of 1 metre. A well point pump is to be provided in the lowest corner of the drainage network to pump out water ingress. This will lower the water table locally around the property. Pumped water to be stored on site in a tank which will be emptied at regular intervals as required. Work to be undertaken by the property owner.					WODC to co-ordinate works with this proposal.	Work to be undertaken and funded wholly by the private owner. WODC to provide guidance only. Riparian Owner to fund on-going maintenance of pump.	This option will prevent water rising through the floor but will not prevent flooding of gardens/ driveway etc.	May require planning permission and land drainage consent.	Design Costs = £5K Capital Costs = £20K to £50K	
Area 4 – Broughton Poggs Mill											
	Following periods of heavy rain extreme flooding occurs at Broughton Poggs Mill with a number of properties severely affected by flooding. This is due to a number or a combination of the following: (i) insufficient clearance under existing bridge/ culvert at Broughton Poggs Mill. (ii) High uncontrolled volumes of water arriving from "Goodfellows" at Broughton Poggs Mill. (iii) Uncontrolled highway drainage run-off from the old A361. Broadwell Brook is not emained north of Broughton Poggs Mill.										
A	Dredge material from under Broughton Poggs Mill bridge/culvert to increase clearance and increase capacity.			OCC to undertake and wholly fund the works.		WODC to co-ordinate works with this proposal.	None	Localised improvement reducing flood risk at Broughton Poggs Mill.	Localised improvement reducing flood risk for properties at Broughton Poggs Mill.	Design Costs = £0.5K Capital Costs = Up to £5K	

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B	Provide an engineered swale (SUD) and balancing pond upstream of Broughton Poggs Mill on land owned by and downstream of "Goodfellows" where Broadwell Brook divides to the west and north.	EA to advise on acceptable quantity and quality of discharge from the balancing pond.	Work to be carried out by OCC.		WODC to co-ordinate works with this proposal	Work to be carried out by OCC with some contribution from the Riparian Owner.	Effective solution that will reduce flooding at "Goodfellows", Broughton Poggs Mill and Filkins Mill.	Requires acquisition of land at "Goodfellows".	Design Costs = £5K Capital Costs = £50K to £100K.	
C	Dredge out and clean Broadwell Brook upstream of Broughton Poggs Mill to "Goodfellows" taking care not to disturb the orchid SSSI (Site of Special Scientific Interest).		Work to be carried out by OCC.		WODC to monitor impact on SSSI.	Dredged material to be tipped on private land with EA consent.	Marginal temporary improvement.	Dredged material to be tipped on private land.	Design Costs = £2K Capital Costs = £5K to £20K.	
D	Agree a sluice operating arrangement between the owners of Goodfellows, Broughton Poggs Mill and Filkins Mill to ensure sluices are opened/ closed at correct timings whilst being sensitive to the flooding of others.	EA advice required.			WODC to co-ordinate works with this proposal	Solution involves agreement between land owners at "Goodfellows", Broughton Poggs Mill and Filkins Mill.	Marginal improvement to downstream catchment but upstream flooding may still continue.	None	Design Costs = £0.5K Capital Costs = Up to £5K.	
Area 5 – Filkins & Broughton Poggs Bypass (A361) Overbridge										
	Heavy rainfall also affects the Little Barrington road where it passes beneath the new A361 over bridge. Water collects in ditches either side of the new A361 before cascading down onto the road beneath. This has caused erosion to the bridge abutments and heavy flooding of the road beneath. Surface water cannot escape at a timely rate due blocked/ under-maintained ditches either side of Little Barrington Road.									

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A	Provide new double gullies to intercept highway drainage run-off at the over bridge abutments for the A361 and connect to the existing surface water drainage network in the road below.			Work to be carried out wholly by OCC.		WODC to co-ordinate works with this proposal	None	Effective solution if Little Barrington highway drainage maintained.	None	Design Costs = £1K Capital Costs = Up to £5K.	
B	Clean out existing gullies and ditch course either side of little Barrington Road as required and provide a new outfall to Broadwell Brook.			Work to be carried out wholly by OCC.		WODC to co-ordinate works with this proposal	None	Effective solution if on-going maintenance applied.	None	Design Costs = £1K Capital Costs = Up to £5K.	
Area 5A – Filkins & Broughton Poggs Bypass (A361) Highway											
	Large volumes of surface water run-off from the A361, which is raised above the general level of Filkins & Broughton Poggs, discharges with minimal control into Broadwell Brook. This action exacerbates flooding in the village.										
A	Undertake a hydrological study into surface water discharging from the A361 and how control can be provided to reduce flooding of Broadwell Brook through the village			OCC to undertake this work.		WODC to co-ordinate works with this proposal		Effective solution to study options to prevent flooding of Broadwell Brook caused by highway run-off.	None	Study Costs = Up to £5K	
Area 6 – Goodfellows											

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	Heavy rainfall also floods land and property in and around "Goodfellows". This is due to insufficient clearance through the culvert that passes beneath Little Barrington Road. Additionally, during periods of heavy rain, water backs up from Broughton Poggs Mill accentuating the problem. Broadwell Brook is not emained north of Broughton Poggs Mill.									
A	Provide a new larger diameter culvert crossing and flood relief side culverts at Little Barrington Road where Broadwell Brook passes beneath.		OCC to undertake this work.		WODC to co-ordinate works with this proposal		Effective localised solution reducing flooding in "Goodfellows"	Land drainage consent required.	Design Costs = £2K Capital Costs = £5K to £20K	
B	Provide a new engineered swale (SUD) and balancing pond with hydrobrake on land owned by "Goodfellows" with hydrobrake control.	EA to advise on acceptable quantity and quality of discharge from the balancing pond.	OCC to undertake this work.		WODC to co-ordinate works with this proposal	Work to be carried out by OCC with some contribution from the Riparian Owner. Requires acquisition of land at "Goodfellows"..	Effective localised solution reducing flooding in "Goodfellows"	None	Design Costs = £5K Capital Costs = £50K to £100K	
C	Undertake a hydrological study into surface water discharging from the A361 and how control can be provided to reduce flooding of "Goodfellows".		OCC to undertake this work.		WODC to co-ordinate works with this proposal		Effective solution to study options to prevent flooding of "Goodfellows".	None	Study Costs = Up to £5K	
Area 7 – Broughton Hall Access Road										
	Following periods of heavy rain severe flooding occurs in properties adjacent to Broughton Hall Access Road. This is due to a combination of one of the following: (i) A balancing pond (mill pond) of insufficient size controlling flows outside the frontage of Manor Farm overflowing into adjacent property. (ii) Low floor levels and thresholds to properties fronting Broughton Hall Access Road. Broadwell Brook is not Enmained north of Broughton Poggs Mill.									

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A	Increase the volume of the balancing pond and provide a correctly engineered outfall structure into Broadwell Brook.	EA to advise on allowable discharge rate to Broadwell Brook.	Work to be carried out by OCC.		WODC to co-ordinate works with this proposal.	May require land acquisition to increase size of balancing pond.	Effective localised solution reducing flooding to properties fronting Broughton Hall Access Road.	May require land acquisition to increase size of balancing pond.	Design Costs = £5K Capital Costs = £20K to £50K	
B	Provide perimeter land drainage to flooded properties with well point pump to on-site storage tank. Tank to be emptied at regular intervals during peak rainfall events.	EA to advise on pumping rate and discharge quantity required to lower the water table.			WODC to co-ordinate works with this proposal.	Work to be undertaken and funded wholly by the private owner. WODC to provide guidance only. Riparian Owner to fund on-going maintenance of pump.	This option will prevent water rising through the floor but will not prevent flooding of gardens/ driveway etc.	May require planning permission and land drainage consent.	Design Costs = £2K Capital Costs = £5K to £20K.	
Area 8 – Broughton Poggs										
	Following periods of heavy rain severe flooding occurs within Broughton Poggs which is due to the following: Broadwell Brook, which flows into the village from the west underneath the A361, is prone to blockages. When these occur water overflows south along a ditch and under the A361 through another culvert. This culvert discharges directly into a field opposite Foxfield House. During July 2007 this flood water merged with water overflowing from Broadwell Brook as the flood defence bund had been breached. Water then flowed over the B4477 (primarily through the field entrance opposite Fox House) and toppled the stone wall that abuts Broughton Hall grounds. This was because the only outflow from the area back into the Broadwell Brook, via the Manor Farm mill pond, was a 300mm diameter pipe. Broadwell Brook is Enmained south of Broughton Poggs Mill.									

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A	Reinstate the flood protection bund, which has been breached, in the field opposite Foxfield House.				WODC to co-ordinate works with this proposal.	Work to be undertaken and wholly funded by the Riparian Owner as Broadwell Brook is not Enmained in this location.	Effective solution to prevent flooding to prevent localised flooding.	None	Design Costs = £1K Capital Costs = Up to £5K.	
B	Reinstate/ maintain the overflow ditch that runs in the field opposite Foxfield House.		Work to be carried out by OCC.		WODC to co-ordinate works with this proposal.	Work to be undertaken by OCC and wholly funded by the Riparian Owner as Broadwell Brook is not Enmained in this location.	Effective solution to prevent flooding to prevent localised flooding.		Design Costs = £1K Capital Costs = Up to £5K.	
C	Relocate the field access and gate opposite Foxfield House, Rose Cottage And Field Cottage further west.				WODC to co-ordinate works with this proposal.	Work to be undertaken and wholly funded by the Riparian Owner as Broadwell Brook is not Enmained in this location.	Prevents some localised flooding off the field onto the highway.	Provide alternative field entrance closer to the A361.	Design Costs = £1K Capital Costs = Up to £5K.	
D	Provide an engineered swale (SUD) and balancing pond in field opposite Broughton Hall access road including effective outlet hydrobrake/ weirs etc		Work to be carried out by OCC.		WODC to co-ordinate works with this proposal.	Work to be undertaken by OCC and wholly funded by the Riparian Owner as Broadwell Brook is not Enmained in this location.	Effective solution to prevent flooding south of Broadwell Brook.	None	Design Costs = £5K Capital Costs = £50K to £100K.	
E	Broadwell Brook principal and overflow culverts, taking water from the catchment area west of the A361 Filkins & Broughton Poggs bypass, to be maintained and cleared on a regular basis (min twice per year).		Work to be carried out by OCC.		WODC to co-ordinate works with this proposal.	No land acquisition required.	Effective solution to prevent flooding west of the A361.	Avoids flooding west of the A361	Design Costs = £1K Capital Costs = Up to £5K.	
F	Provide an overflow through the wall to the grounds of Broughton Hall.		Work to be carried out by OCC.		WODC to co-ordinate works with this proposal.	Work required to private boundary wall of Broughton Hall.	Effective solution if correct orifice structure installed e.g. 100mm dia weep holes, letter-box lintel etc	Avoids build up of Broadwell Brook overflow water at Broughton Hall boundary wall and flooding of Foxfield House	Design Costs = £1K Capital Costs = Up to £5K.	

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G	Undertake hydrological study and design of surface water sewer network in Broughton Poggs east of the old A361. Assessment with a view to upsize or replace the following pipes: (i) 100mm dia pipe under Broughton Hall driveway (ii) 300mm dia pipe under Broughton Manor Access Road (iii) 300 mm dia pipe from Manor Farm mill pond to Broadwell Brook		Study and improvement works to be carried out by OCC.		WODC to co-ordinate works with this proposal.	Work to be undertaken by OCC and wholly funded by the Riparian Owner as Broadwell Brook is not Enmained in this location.	Prevents flooding in Broughton Poggs	Reduction of flooding in village.	Design Costs = £2K Capital Costs = £5K to £20K.	

7.0 CONCLUSIONS AND RECOMMENDATIONS

Broadwell Brook is emained south of Broughton Poggs Mill.

The following Flood Defence Improvement Works are recommended:

(* - ownership/responsibility to be confirmed)

7.1 Area 1 – Clark’s Barn

Immediate (under 1 year)

- Option A – OCC* to excavate out and replace the highway drainage ditch, including the verge fronting Clark’s Barn, and re-build the collapsed dry stone wall between Clark’s Barn and Peartree Farm.

Long-Term (under 2-5 years)

- Option B – OCC* to excavate out and replace the existing highway drainage ditch and discharge to a new swale (SUD) and balancing pond built on wetland adjacent to Broadwell Brook at the head of Meadow Cottage and Chantry Cottage access road. Careful consideration to be applied as Broadwell Brook is a SSSI.

7.2 Area 2 – Meadow Cottage & Chantry Cottage

Immediate (under 1 year)

- Option A – OCC* to excavate out and replace the highway drainage ditch and grips opposite the allotment gardens.

Mid-Term (1-2 years)

- Option B - Property owners to corral houses with a perforated pipe laid with a single size stone bed and surround to a depth of 1 metre. A well point pump is to be provided in the lowest corner of the drainage network to pump out water ingress. Pumped water to be stored on site in a tank which will be emptied at regular intervals as required.

7.3 Filkins & Broughton Poggs Thoroughfare (old A361)

Immediate (under 1 year)

- Option A – OCC* and Thames Water* to Locate, survey, jet out, repair, clear tree roots as necessary from the highway drain culvert/ surface water sewer between Peartree Farm and Broughton Poggs Mill.
- Option D – OCC* to relay existing gullies on the high side of the old A361 and opposite the church where, they are not intercepting surface water, and provide additional as required.
- Option F – OCC* to relay frontage footway where possible to provide a 1 in 40 fall from house threshold to edge of carriageway. Where this is not possible install a concrete channel to fall as required.

Mid-Term (1-2 years)

- Option C – OCC* and Thames Water* to Provide new high drain/ surface water sewer for the entire length of the old A361 from Clark’s Barn to Broughton Poggs Mill and divert the existing highway drainage ditch and gullies into it. Additional OCC to provide high capacity gullies where required connecting to the new facility.
- Option E – OCC* to relay kerbs for the entire length of the old A361 and other village side roads where there is insufficient carriageway clearance. Agreement to be sought with WODC Planning Department regarding providing a deeper kerb face in the Conservation Area of Filkins & Broughton Poggs. Department of Transport typical kerbface is 125mm for new build roads.

7.4 Area 4 - Broughton Poggs Mill

Immediate (under 1 year)

- Option A – OCC to dredge material from under Broughton Poggs Mill bridge/culvert to increase clearance and increase capacity.
- Option D – Owners of Goodfellows, Broughton Poggs Mill and Filkins Mill to agree a mutually acceptable sluice operating procedure.

Long-Term (2-5 years)

- Option B - OCC to provide an engineered swale (SUD) and balancing pond, upstream of Broughton Poggs Mill on land owned by the Ernest Cook Trust and downstream of 'Goodfellows', where Broadwell Brook divides to the west and north. Careful consideration to be applied as Broadwell Brook is a site of special scientific interest (SSSI).

7.5 Area 5 – Filkins & Broughton Poggs Bypass (A361) over bridge

Immediate (under 1 year)

- Option A – OCC to Provide new double gullies to intercept highway drainage run-off at the over bridge abutments for the A361 and connect to the existing surface water drainage network in the road below.
- Option B – OCC* to clean out existing gullies and ditch course either side of Barrington Lane as required and provide a new outfall to Broadwell Brook.

7.6 Area 5A - A361 Filkins & Broughton Poggs Bypass

Immediate (under 1 year)

- Option A – OCC to undertake a hydrological study into surface water discharging from the A361 and how control can be provided to reduce flooding of Broadwell Brook through the village.

7.7 Area 6 – 'Goodfellows'

Immediate (under 1 year)

- Option A – OCC to provide a new larger diameter culvert crossing and flood relief culverts at Barrington Lane where Broadwell Brook passes beneath.

Long-Term (2-5 years)

- Option B - OCC to provide a new engineered swale (SUD) and balancing pond with hydrobrake on land owned by "Goodfellows" with hydrobrake control.

7.8 Area 7 – Broughton Hall Access Road

Mid-Term (1-2 years)

- Option B – Property owners to provide perimeter land drainage to flooded properties with well point pump to on-site storage tank.

Long-Term (2-5 years)

- Option A - OCC to Increase the capacity of Manor Farm mill pond (balancing pond) to provide a correctly engineered outfall structure into Broadwell Brook.

7.9 Area 8 – Broughton Poggs

Immediate (under 1 year)

- Option A – Riparian Owner to reinstate the flood protection bund, which has been breached, in the field opposite Foxfield House.
- Option B – OCC to reinstate/ maintain the overflow ditch that runs in the field opposite Foxfield House.

- Option C – Riparian Owner to relocate the field access and gate opposite Foxfield House, Rose Cottage and Field Cottage further west.
- Option E – OCC to maintain Broadwell Brook principal and overflow culverts, taking water from the catchment area west of the A361 Filkins & Broughton Poggs bypass, on a regular basis (min twice per year).
- OCC to undertake hydrological study and design of surface water sewer network in Broughton Poggs east of the old A361. Assessment with a view to upsize or replace the following pipes: (i) 100mm diameter pipe under Broughton Hall driveway (ii) 300mm diameter pipe under Broughton Manor Access Road (iii) 300 mm diameter pipe from Manor Farm mill pond to Broadwell Brook.

Mid-Term (1-2 years)

- OCC to provide an overflow through the wall to the grounds of Broughton Hall.

Long-Term (2-5 years)

- OCC to provide an engineered swale (SUD) and balancing pond in field opposite Broughton Hall access road including effective outlet hydrobrake weirs etc

Appendix I: Photographs



Area I - Culvert at Clark's Barn



Area I - Highway verge at Clark's Barn



Area I - Field Drainage near Clark's Barn



Area I - Highway verge at Clark's Barn



Area 2 – Attenuation location next to Meadow Cottage



Area 2 - Ground profile to Broadwell Brook



Area 2 - Possible balancing pond site at Broughton Poggs



Area 3 - Highway drainage flood damage



Area 3 - Low kerbface at Filkins



Area 3 - Highway drainage water damage at Filkins



Area 3 - Highway drainage in Filkins



Area 3 - Low kerbface at Filkins



Area 3 - Low kerbface at Filkins



Area 3 -House flood protection



Area 3 - Threshold flood protection at Filkins



Area 3 – ‘Five Alls’ Pub in Filkins



Area 3-Village Hall Filkins



Area 3 - Thoroughfare bridge over Broadwell Brook



Area 4 - Broughton Poggs Mill



Area 4 - Drainage overflow channel at Broughton Poggs



Area 4 - Broughton Poggs Mill



Area 5 - Flood damage under A361 Bridge



Area 5 - A361 over bridge over Little Barrington Road



Area 5 - Flood damage at Little Barrington Road



Area5 - A361 over bridge at Little Barrington Road



Area 5 - A361 Bridge over Barrington Road



Area 6 - Broadwell Brook bridge at 'Goodfellows'



Area 6 - Broadwell Brook at 'Goodfellows'



Area 6 - Drainage ditch near 'Goodfellows'



Area 7 - Possible balancing pond at Broughton Poggs



Area 7 - Manor Farm Broughton Poggs



Area 7 - Outfall from Manor Farm pond



Area 8 - Low kerb face at Broughton Poggs



Area 8 - Broughton Poggs



Area 8 - Foxfield House Broughton Poggs



Area 8 - Flood meadow outside Broughton Poggs Mill