



WEST OXFORDSHIRE
DISTRICT COUNCIL

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Parish Flood Report: **Burford**

July 2008

Version 1 – This report may be revised in the future to incorporate ongoing consultation results



Contents

1.0	INTRODUCTION	3
2.0	THE DISTRICT COUNCIL'S ACHIEVEMENTS OVER THE PAST 12 MONTHS.....	6
3.0	EXECUTIVE SUMMARY	7
4.0	SURVEY.....	8
5.0	PROBLEMS AND CAUSES	11
6.0	OPTIONS.....	13
7.0	CONCLUSIONS AND RECOMMENDATIONS.....	17
	Appendix 1: Photographs.....	20
	Appendix 2: Maps	
	Appendix 3: Glossary	

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 of the Head of Street Scene 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 (EA, 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 organisation 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

No part of this report is to be reproduced, copied or used by any third party without the prior express written consent of WODC in its absolute discretion. All those reading this report acknowledge that any conditions, warranties or other terms implied by statute or common law are excluded to the fullest extent permitted by law. Without limiting the scope of the foregoing, West Oxfordshire District Council does not give any warranty, representation or undertaking as to the efficacy or usefulness of the information contained within this report, nor that any advice contained within this report will produce satisfactory results if followed. West Oxfordshire District Council hereby excludes liability to the fullest extent permitted by law for any reliance placed in this report by third parties.

2.0 THE DISTRICT COUNCIL'S ACHIEVEMENTS OVER THE PAST 12 MONTHS

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

Flood Grants

- 1137 WODC Flood Grants totalling £284,250 given out overall
 - £3,250 (£250 for 13 properties) in Burford
- 112 Red Cross Flood Grants totalling £211,590 administered by WODC overall
- 301 Hardship Grants totalling £155,050 given out overall

Reports

- Interim Flooding Report published October 2007
- 12 Parish Flood Reports completed by June 2008, 1 report for Burford

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 during 2008 to progress this
Progress the Strategic Flood Risk Assessment
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 Burford 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 Burford during July 2007 and potential mitigating solutions.

Burford is a small town situated within predominantly rural surroundings and is located south of Fulbrook and situated approximately 3 miles northwest of Carterton and 3.8 miles south of Shipton-under-Wychwood.

Visual walkover surveys have been conducted in the flooded areas and properties with a meeting held with affected residents. WODC have a record of 13 applicants for Grant Aid in Burford.

Flooding experienced in Burford in July 2007 was caused by the volume of water in the River Windrush being greater than its capacity causing it to flow out of bank. In addition, the A361 road bridge (Burford Bridge) over the river at the northern extent of the town caused a significant constriction to the flows. As a result, water backed up and flooded the Island House area.

The backing up of flows at Burford Bridge was sufficient to cause water to flow around it, to the south, flooding the properties in this location due to the topography of the land creating a flow path into them. In addition, the topography of the land is such that water could flow along Lawrence Lane and into St John the Baptist's Church.

Properties to the north of the river, adjacent to the northern channel of the River Windrush, experienced flooding due to the high levels of water in this channel spilling through spillways such as steps and gates.

Prior to the 2007 events, work was undertaken in the River Windrush to the west (upstream) of Burford. This included the raising of bed levels and creation of spillways to allow the river to flood local land more readily therefore reducing the volume of water flowing into Burford.

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 Section 5.

Conclusions and recommendations, including maintenance and flood defence improvement schemes and programme, are shown in Section 6.

This report also includes an Options Summary, Appendix 1 shows photographs taken during the events in 2007 and during the site visit in 2008, Appendix 2 showing maps of the area and Environment Agency Flood Zones and Appendix 3 is a Glossary.

4.0 SURVEY

4.1 Description of Area

The town of Burford is located to the south of Fulbrook and situated approximately 3 miles northwest of Carterton and 3.8 miles south of Shipton-under-Wychwood.

The Parish is made up of urban development and several greenfield areas located within the catchment of the River Thames. The town is separated from Fulbrook by the River Windrush, which takes its source from Taddington approximately 18 miles northwest of Burford and discharges into the River Thames at Newbridge.

In addition to the River Windrush to the north of the town, there are other water features such as drains and a lake (upstream from Burford town), which are connected to the river. The main tributary that discharges into the river within close proximity of the town is the Coombe Brook, which takes its source at Upper Rissington in the north, and flows through Taynton discharging into the river just upstream from Burford.

Upstream of Burford Bridge (A361 road crossing), the river splits into two channels, as part of the former mill system, these two channels converge immediately upstream of Burford Bridge.

The river is culverted beneath Burford Bridge Road and upon its exit, the Mill Race flows in an easterly direction but has an outflow controlled by a weir that diverts water to a northern channel. This northern channel flows past a few properties, including Littleham and Ladyham before meandering in a south-easterly direction and re-joining the Mill Race to the east of the town. The northern channel of the watercourse is believed to be the original channel of the River Windrush.

The topography to the north of the River Windrush, i.e. Fulbrook, is very steep with the ground sloping from approximately 150mAOD to 100mAOD towards the river giving rise to the potential for increased runoff to discharge into the river at the area. The gradients to the south of the river slope more gradually.

Using the Flood Estimation Handbook (FEH), the catchment area of the River Windrush upstream of Burford is estimated to be 278.5km².

4.2 Survey Method

A visual walkover survey of properties affected by the July 2007 flooding has been undertaken. An inspection of the River Windrush and associated drains, lakes and on-line structures was undertaken. Photographs taken during the site visit illustrating these features are shown in Appendix 1.

4.2 Meetings

Table 1: Summary of meetings and flooding descriptions

Date	Location	Description
11.07.08	Meeting with residents regarding flooding issues	<ul style="list-style-type: none"> • Residents explained the events in July 2007 • The main cause of flooding in Burford was from the River Windrush • The A361 road bridge in the village surcharged and resulted in water backing up and flowing into Island House • The bridge surcharged sufficiently to allow water to flow around it and into the properties to the southeast (e.g. Riverside House) • Water also flowed along Lawrence Lane and into the church • The properties to the east of the A361 road bridge experienced flooding as a result of floodwater inundating these areas via spillways such as steps and entrances • Overland flow and surcharging drainage is deemed to be minimal • Flooding in the town occurred approximately 5-6 hours after the peak of the storm • Some flooding was exacerbated by lorries and other HGVs travelling through the water at speed, creating wake • Residents outlined action already taken such as raising of bed levels and creating spillways in fields upstream of the town to allow them to flood. This was undertaken prior to 2007.
September/ October 2007	Various meetings with the local residents and Parish Council	<ul style="list-style-type: none"> • Residents discussed various measures that could be undertaken to reduce the risk of flooding in the village • Local Councillors and OCC were made aware of the resident's wish to include a diversion in the OCC Travel Plan to reduce the amount of lorries passing through the village. Some would like the road to be closed during times of flood

WODC has liaised with the Environment Agency as part of this report. As none of the flooding was caused by highway drainage or foul drainage or water mains, OCC and Thames Water were not consulted as part of this investigation. OCC and Thames Water will continue to inspect and maintain highway and foul water sewers respectively as per their original remit.

Details of all conversations in July 2008 are included in Table 2 below

Table 2 Summary of telephone calls made with the EA

Company	Comments
EA	<p>Phone call to Phil Garver at the Wallingford Office regarding flooding in Burford in 2007. Phil confirmed that this stretch of the watercourse is a Main River and therefore under the jurisdiction of the Environment Agency.</p> <p>Phil confirmed that to the best of his knowledge, the flooding in Burford was caused by the River Windrush and not from other sources.</p> <p>Phil was unaware of the works already undertaken upstream of Burford that allows the fields to flood but was in support of such measures. The Environment Agency would therefore be willing to facilitate similar schemes in the future on this watercourse.</p>

4.4 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 11 residential properties in Burford have received Emergency Flood Relief Grant Aid, however it is acknowledge this may not be the total number of properties affected in the Parish as some owners may 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 Plans

Figure 1 in appendix 2 shows areas in Burford where properties flooded in July 2007 and where owners have made claims for grant assistance. The flooding experienced was sourced solely from the River Windrush with no flooding from surcharged drains, groundwater or overland flow. The Parish can be broadly split into four areas being:

- Area 1: Island House
- Area 2: North of the River
- Area 3: South of the River
- Area 4: Guildenford car park

A map detailing the following is shown in Appendix 2:

- 1% annual probability of flooding - Flood Zone 3 (previously referred to as 1 in 100 year flooding)
A plan showing the 2008 Environment Agency 1% probability Flood Zone, this is the area defined by the EA as the extent of a flood with a 1 per cent chance happening in any year. This is the high probability risk zone.
- 0.1% annual probability flooding – Flood Zone 2 (previously referred to as 1 in 1000 year flooding)
A plan showing the 2008 Environment Agency 0.1% probability Flood Zone, this is the area defined by the EA as the extent of a flood with a 0.1 per cent chance happening in any year. This is the medium probability risk zone

5.2 Area 1 – Island House

Island House is situated on the site of the former mill between the Mill Race and the 'natural' channel. Both of these watercourses flow east and converge before they pass beneath Burford Bridge. This area is shown to be in the Environment Agency defined Flood Zone 3 and therefore potentially at risk from a flood event of 1% annual probability or greater. Two properties applied for Grant Aid at this location.

In 2007 the properties in this area experienced flooding from the River Windrush. It is believed that the flooding was caused by the capacity of the Burford Bridge becoming exceeded, thus causing water to back up and spill into the properties. Observations made during the event suggest that the water within the properties was approximately 0.5m deep. In addition, flood water was observed to be at approximately 101.3mAOD at the bridge on the day of the flood (albeit this level was recorded at 11am, some 5 hours after the 5am peak flow). The typical water level at the bridge is approximately 100.6mAOD. Photographs showing these can be seen in Appendix 1.

5.3 Area 2 – North of the River

This is the collection of properties located adjacent to the northern stretch of the watercourse, to the east (downstream) of Burford Bridge. This area is shown to be in the Environment Agency defined Flood Zone 3 and therefore potentially at risk from a flood event of 1% annual probability or greater. Three properties applied for Grant Aid in this location.

Flooding occurred at the property immediately to the east of the road (Littleham) as the level of this stretch of the watercourse rose above the bankfull level, as shown in the photographs in Appendix 1. However, according to the local residents, the property downstream of Littleham flooded as a result of water spilling onto the land via small spillways such as gates and steps into the watercourse. This is believed to be exacerbated by the number of small bridges and crossings within the watercourse.

5.4 Area 3 – South of the River

This is the largest of the four areas and runs from Burford Bridge to the St John the Baptist's Church, covering the properties that are located along the southern stretch of the River Windrush, known as the Mill Race. The properties in this location are situated in Flood Zone 2 and 3, with eight properties (excluding the church) applying for Grant Aid.

This area predominantly experienced flooding due to water surcharging Burford Bridge and migrating to the south, thus flooding the low lying areas located immediately east of the bridge. Due to the depth of water and the nature of the topography, floodwater flowed up to and along (to the east) Lawrence Lane (i.e. approximately following the line of the Environment Agency's Flood Zone 2). It is worth noting that the floor levels of the properties in this location are lower than the surrounding ground, thus providing a flow path for water.

Flood water continued along Lawrence lane and into the church and graveyard. It is believed that the graveyard was only inundated from water flowing from Lawrence lane and not from overtopping in the Mill Race. It was noted however that the small banks located along Mill Race needed to be raised in local low spots with sandbags and reinforced in other areas where leaking was noticed.

5.5 Area 4 – Guildenford car park

Although no properties are located within the vicinity of the car park, it experienced flooding during 2007 and is known to experience flooding more regularly than other areas within the Burford. Flooding occurs at this location when the levels in the Mill Race rise above the surrounding ground. During the site visit, a small outlet control was seen to be present downstream of the car park that enabled flows to leave the Mill Race and enter the 'natural' channel to the north. However, it was observed during the site walkover that the outlet control has become partially blocked and therefore not functioning to its design capacity.

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.

Some residents have already undertaken some flood mitigation measures on the River Windrush, most notably this includes the work in the fields upstream of the town. This work has essentially raised the bed level of the river using gravel as substrate, to restore the river to its pre-1950 state (prior to major dredging work). In addition, spillways have been created. Both of these measures effectively creates a flood storage area which allows the watercourse to flood more regularly and therefore reduce the volume of water flowing into the town.

Parish Flood Options										
Burford										
Version 1 – July 2008										
Option ref	Flood Overview	Description of work required					Key issues			Comments
	Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
		For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
Area 1 – Island House										
	River Windrush									
A	Construction of additional flood storage areas upstream of the town.	River Windrush is a Main River therefore EA would have a responsibility to facilitate flood storage areas. Advice, consultation and consent may be required.			WODC to undertake a co-ordination role	Agreement with riparian owners will be required	Will allow the river to flood and thus reduce the volume of water flowing into Burford	Could potentially flood adjoining fields		Subsidies may be available for this work. Holistic approach will ensure more effective results
B	Flood resilient measures to properties Burford Parish Council to create an Emergency Flood Plan	EA website contains details and reference materials on flood resilient design			WODC to approve emergency flood plan	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing, water resistant doors and entrances	Only effective if defences are put in place before the water rises	None	Up to £5,000	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.
C	Ongoing maintenance of the Burford Bridge as well as the various sluice gates	As the River Windrush is a Main River, it is under the EAs jurisdiction to ensure the Burford Bridge is clear of obstructions			WODC to undertake a co-ordination role	Riparian owners are in the best position to identify problems during routine inspection	Will ensure the ongoing effectiveness of the various structures and controls	None	Approximately £5,000 per year	
Area 2 – North of the River										
	River Windrush									
A	Construction of additional flood storage areas upstream of the town.	River Windrush is a Main River therefore EA would have a responsibility to facilitate flood storage areas			WODC to undertake a co-ordination role	Agreement with riparian owners will be required	Will allow the river to flood and thus reduce the volume of water flowing into Burford	Could potentially flood adjoining fields		Subsidies may be available for this work. Holistic approach will ensure more effective results
B	Flood resilient measures to properties. Burford Parish Council to create an Emergency Flood Plan	EA website contains details and reference materials on flood resilient design			WODC to approve emergency flood plan	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing, water resistant doors and entrances	Only effective if defences are put in place before the water rises	None	Up to £5,000	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.

Parish Flood Options										
Burford										
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Option ref	Flood Overview	Description of work required					Key issues			Comments
	Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
		For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
Area 2 – North of the River (cont...)										
C	Ongoing maintenance of the Burford Bridge as well as the various sluice gates	As the River Windrush is a Main River, it is under the EAs jurisdiction to ensure the Burford Bridge is clear of obstructions			WODC to undertake a co-ordination role	Riparian owners are in the best position to identify problems during routine inspection	Will ensure the ongoing effectiveness of the various structures and controls	None	Approximately £5,000 per year	
Area 3 – South of the River										
A	Construction of additional flood storage areas upstream of the town.	River Windrush is a Main River therefore EA would have a responsibility to facilitate flood storage areas			WODC to undertake a co-ordination role	Agreement with riparian owners will be required	Will allow the river to flood and thus reduce the volume of water flowing into Burford	Could potentially flood adjoining fields		Subsidies may be available for this work. Holistic approach will ensure more effective results
B	Flood resilient measures to properties. Burford Parish Council to create an Emergency Flood Plan	EA website contains details and reference materials on flood resilient design			WODC to approve emergency flood plan	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing, water resistant doors and entrances	Only effective if defences are put in place before the water rises	None	Up to £5,000	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.
C	Ongoing maintenance of the Burford Bridge as well as the various sluice gates	As the River Windrush is a Main River, it is under the EAs jurisdiction to ensure the Burford Bridge is clear of obstructions			WODC to undertake a co-ordination role	Riparian owners are in the best position to identify problems during routine inspection	Will ensure the ongoing effectiveness of the various structures and controls	None	Approximately £5,000 per year	
D	Install measures to ensure surcharged water from Burford Bridge is directed along road, back into the stream rather than into properties.	River Windrush is a Main River therefore EA can provide advice and support as well as review and approve any proposed works	Potentially install devices in the road e.g. speed humps to direct flow. these will require street lighting.		WODC to undertake a co-ordination role	Relevant property owners to install measures to ensure floodwater is directed along driveways	Will ensure any surcharging water is directed along the road/driveway rather than into properties	Will help to direct water away from properties	Approx £10,000 - £20,000	Would require confirmation with residents

Parish Flood Options										
Burford										
Version 1 – July 2008										
Option ref	Flood Overview	Description of work required					Key issues			Comments
	Options	Environment Agency	Oxfordshire County Council	Thames Water	WODC	Private	Effectiveness	Affects on adjacent land	Cost	
		For queries Tel 08708 506 506 Or email enquiries@environment-agency.gov.uk	Main switchboard: 0845 310 1111 Or e-mail: online@oxfordshire.gov.uk	Enquiries: 0845 200 800	Switchboard: 01993 861 000					
Area 4 – Guildenford Car Park										
A	Construct weir or similar control structure downstream of the car park	River Windrush is a Main River therefore in the EAs jurisdiction to undertake control structure works	OCC to provide a co-ordination role as works will reduce flooding to the car park		WODC to undertake a co-ordination role		Could reduce water levels locally within the Mill Race and therefore reduce flooding to the car park	Likely to increase flows in the northern channel, the natural channel	Approx £10,000 - £20,000	
B	Carry out maintenance of small outlet control downstream of the car park				WODC to establish ownership rights	Riparian owner to carry out maintenance	Will enable flows to leave the Mill Race and enter the natural channel to the north.	Improved land drainage	Up to £5,000	

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Area 1 – Island House

The main flooding problem in this area is sourced from the River Windrush and more particularly from back up of water behind Burford Bridge.

7.1.1 Maintenance

The River Windrush is a Main River and therefore under the Environment Agency's jurisdiction to undertake routine maintenance. During the site visit, the Burford Bridge and various control structures at Island House appeared to be clear and well maintained, however, this must be continued to ensure the ongoing effectiveness of the structures.

As a result, the following maintenance measures should be undertaken:

- Option C: Ongoing maintenance of the River Windrush, Burford Bridge and sluice gates. The River Windrush is under the jurisdiction of the Environment Agency and therefore their responsibility to undertake maintenance, however, local residents are in a good position to assist in inspections and maintenance

7.1.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Option B: Flood resilient measures to properties. Burford Parish Council to create an Emergency Flood Plan

Mid-Term (under 1 -2 years)

- No measures proposed on this timescale

Long-Term (3 years or more)

- Option A: Construction of storage areas or flood meadows to store water in times of high flow

7.2 Area 2 – North of the River

The main flooding problem in this area is sourced from the River Windrush and more particularly from surcharging of Burford Bridge.

7.2.1 Maintenance

The River Windrush is a Main River and therefore under the Environment Agency's jurisdiction to undertake routine maintenance. During the site visit, the Burford Bridge and various control structures at Island House appeared to be clear and well maintained, however, this must be continued to ensure the ongoing effectiveness of the structures.

As a result, the following maintenance measures should be undertaken:

- Option C: Ongoing maintenance of the River Windrush, Burford Bridge and sluice gates. The River Windrush is under the jurisdiction of the Environment Agency and therefore their responsibility to undertake maintenance, however, local residents are in a good position to assist in inspections and maintenance

7.2.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Option B: Flood resilient measures to properties, including spillways and opening. Burford Parish Council to create an Emergency Flood Plan.

Mid-Term (under 1 -2 years)

- No measures proposed on this timescale

Long-Term (3 years or more)

- Option A: Construction of storage areas or flood meadows to store water in times of high flow

7.3 Area 3 – South of the River

The main flooding problem in this area is sourced from the River Windrush and more particularly from back up of water behind Burford Bridge migrating around the bridge and into properties.

7.3.1 Maintenance

The River Windrush is a Main River and therefore under the Environment Agency's jurisdiction to undertake routine maintenance. During the site visit, the Burford Bridge and various control structures at Island House appeared to be clear and well maintained, however, this must be continued to ensure the ongoing effectiveness of the structures.

As a result, the following maintenance measures should be undertaken:

- Option C: Ongoing maintenance of the River Windrush, Burford Bridge and sluice gates. The River Windrush is under the jurisdiction of the Environment Agency and therefore their responsibility to undertake maintenance, however, local residents are in a good position to assist in inspections and maintenance

7.3.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Option B: Flood resilient measures to properties. Burford Parish Council to create an Emergency Flood Plan.

Mid-Term (under 1 -2 years)

- Option D: Measures Install measures to ensure surcharged water from the bridge is directed along the roads and driveways rather than properties.

Long-Term (3 years or more)

- Option A: Construction of storage areas or flood meadows to store water in times of high flow

7.4 Area 4 – Guildenford Car Park

The main flooding problem in this area is sourced from the River Windrush and more particularly from high water levels causing water to spill. The proposed option a

7.3.1 Maintenance

- No ongoing maintenance of the watercourse at this location is proposed

7.3.2 Flood defence improvement schemes

The following flood defence improvement schemes are recommended:

Immediate (under 1 year)

- Option B - Carry out maintenance of small outlet control downstream of the car park.

Mid-Term (under 1 -2 years)

- None proposed

Long-Term (3 years or more)

- Option A: Construct weir or similar control structure downstream of the car park to better regulate flows from the Mill Race into the 'natural' channel and aid water level control in the Mill Race.

Appendix 1: Photographs

Photographs of the flood event in 2007

Photo1 Surcharging Burford Bridge taken from land adjacent to Island House (Area 1). This was taken at 11am after the peak of the flood



Photo2 River Windrush downstream of Buford Bridge, northern channel to left and Mill Race to the right (Area 2). Taken at 11am after the peak of the flood



Photo3 Lorry driving down A361, towards Burford Bridge (Area 3) through floodwater, looking southwest.
Photograph taken at 11am after the peak of the flood



Photo4 St John the Baptist's Church, looking west from entrance to Lawrence Lane (Area 3)



Photo5 River Windrush spilling at Guildenford car park (Area 4)



Photographs taken during the site walkover in July 2008

Photo6 River Windrush and valley upstream of Burford



Photo7 Burford Bridge taken from Island House (Area 1)



Photo8 River Windrush upstream of Burford Bridge, looking upstream (west). Island House is on the left



Photo9 River Windrush upstream of Burford Bridge, looking upstream (west) at sluice gate controlling flows from the Mill Race into the 'natural' channel



1)

Photo10 Burford Bridge, looking north. River Windrush is to the left



Photo11 View towards properties adjacent to northern channel, downstream of Burford Bridge (Area 2). Weir controlling flows shown in foreground



Photo 12 Example spillway to properties in Area 2



Photo 13 River Windrush (northern channel) and property in Area 2 looking downstream (east)



Photo 14 Fallen trees in River Windrush (northern channel) in Area 2



Photo 15 Topography of land sloping towards property to south of Burford Bridge, looking west towards Burford Bridge and River Windrush (Area 3)



Photo 16 View along Lawrence Lane towards the church from High Street (A361), looking east (Area 3)



Photo 17 Former weir from watercourse (Mill Race) into the northern channel, adjacent to church (Area 3)



Photo18 River Windrush (Mill Race) from bridge to car park (Area 4), looking upstream (west)



Photo19 Outlet from Mill Race taking flow into the northern channel upstream of car park (Area 4)

