



WEST OXFORDSHIRE  
DISTRICT COUNCIL

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# Parish Flood Report: Chadlington

November 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 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 powers<sup>1</sup> 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 riparian<sup>2</sup> land owner, and permissive powers<sup>1</sup> 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.

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<sup>1</sup> 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

<sup>2</sup> Riparian owners are responsible for the maintenance of any watercourse within or adjacent to the boundaries of their property.  
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## **1.5 Legal**

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

### Flood Grants

- 4 WODC Flood Grants totalling £1000 given out.

### Reports

- WODC Parish Flood Report for Chadlington completed in November 2008.

### 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 the Emergency Plan recognises the role the elected members can play in emergency and recovery situations   |
| 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 for publication in December 2008   |
| 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  |
| 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   |
| 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   |
| Held flood report road-shows to cover all of district .Held in September 2008   |
| Flood defence product fair , held on 9 <sup>th</sup> October.   |
| Submitted bid to DEFRA for funding of main river surveys in the district.   |

### 3.0 EXECUTIVE SUMMARY

#### 3.1 General

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 village of Chadlington and has been prepared by the Council's Engineering team. It pulls together information from external agencies and individual property owners. It identifies the causes of flooding in Chadlington during July 2007 and potential mitigating solutions.

The report itself is broken down into a number of sections and will include;

- An overview of flooding history in Chadlington and flood related issues raised by residents
- A presentation of the problems and causes of flooding in Chadlington during July 2007.
- A summary of all the flooding issues and potential mitigation options.
- A breakdown of the recommendations for immediate, mid-term and long term actions including the responsibly agency based on the options identified.

The table below provides a summary of some of the main causes of the flooding in Chadlington and the mitigation options that could be applied to alleviate the different flooding problems. More detail is provided regarding the specific locations and the causes of flooding in section 5 of the report.

| Source of flooding                             | Potential mitigation measures  |
|--|--|
| Overtopping of Bull Hill Stream                | De - silt channel and clear silt from highway culvert crossing   |
| Overtopping of Rill Brook                      | Provide larger diameter culvert crossing where Rill Brook passes beneath the highway at Green End      |
| Insufficient Highway Drainage                  | Provide additional gullies either side of Crosses Lane   |
| Uncontrolled Field Run-off                     | Provide double gully in Crosses Lane with culvert to Bull Hill Stream                                  |
| Blocked Highway gullies and connections        | Clear out gullies and connections at Brook End, Green End and opposite Jasmine Cottage.                |
| Permanent obstructions within Bull Hill Stream | Thames Water to relay foul sewer crossing away from Bull Hill Stream.                                  |
| Under-capacity combined sewer                  | OCC to remove all highway drainage connections from the combined sewer and connect to adjacent streams |
| Porous stone slab floors and walls             | Relay floors using hygroscopic membrane and internally seal walls                                      |

## **3.2 Survey**

### **3.2.1 Description of area**

The Parish of Chadlington is approximately 1760 Ha (4350 Acres) in size.

A map of the parish is shown in figure 2.

### **3.2.2 Survey approach**

Visual walk-over surveys have been undertaken. Photographs of some of the flood affected areas are shown in Appendix I.

A review of all correspondence, received by the Council about the July 2007 flooding in the Parish of Chadlington has been carried out and incorporated within the findings of the report.

### **3.2.3 Meetings**

Details of key meetings and site visits attended by District Council representatives that are relevant to the flooding of Chadlington in July 2007 are given in the table below;

| <b>Date</b> | <b>Main participants and Venue</b>  | <b>Description</b>  |
|-------------|---|---|
| 24/01/08    | Site Visit – Mrs Hater and Nick Hands (WODC) at 3 Daisybank Cottages                        | Discussions about flooding of property garden and Rill Brook flooding of Green End. |
| 18/06/08    | Site Visit – Adrian Tremlett (Chairman of Chadlington Parish Council) and Nick Hands (WODC) | Discussions about Parish flooding causes and solutions                              |
| 23/06/08    | Site Visit – Adrian Tremlett (Chairman of Chadlington Parish Council) and Nick Hands (WODC) | Discussions about Parish flooding causes and solutions                              |

The District Council has liaised with the Environment Agency, Oxfordshire County Council and Thames Water. The Environment Agency has carried out visual surveys of the flooded areas affected by the main river.

The District Council has contacted some of the owners of properties that flooded in July 2007.



### **3.2.4 Application for Grant Aid**

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

- Emergency Flood Relief Grant Aid of £250

To date the owners of 4 residential properties in the Parish of Chadlington have received Emergency Flood Relief Grant Aid, however it is acknowledged that this is not the total number of properties affected 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.

### **3.2.5 Flooding History**

From discussions with local residents it was noted that the Parish of Chadlington has flooded twice in the last 10years. The flooding profiles being similar to that of July 2007.

## **4.0 PROBLEMS AND CAUSES**

### **4.1 Plans**

Appendix 2 contains two plans (Figure 1 and Figure 2).

Figure 1 is a map showing areas in Chadlington where flooding occurred in July 2007.

Figure 2 shows the following:

- **Chadlington Parish boundary**
- **Environment Agency** - main rivers and enmained water courses in the area.
- **Flood Zone 2, January 2008** - 0.1% annual probability of flooding occurring or low to medium risk. Previously referred to as 1:1,000 year flooding.
- **Flood Zone 3, January 2008** - 1% annual probability of flooding occurring or high risk. Previously referred to as 1:100 year flooding

**Note – this EA map has been updated to reflect the events of July 2007. All references to flood zones in this report refer to the previous EA flood zone map i.e. pre July 2007.**

### **4.2 Area 1 – Bull Hill Stream**

It is believed that up to nine properties flooded adjacent to the Bull Hill Stream crossing at Brook End in July 2007.

Flooding was attributable to either or a combination of the following: (i) Extensive uncontrolled surface water running down Crosses Lane, (ii) Field run-off discharging directly onto the highway at Crosses Lane, (iii) Build up of silt preventing the free passage of water through the six tier approach and culvert crossing at Brook End.

The cause of flooding is the following:

#### **4.2.1 Uncontrolled highway drainage run-off from Crosses Lane**

Large volumes of surface water/highway run-off flows southwards down the hill at Crosses Lane.

#### **4.2.2 Field drainage discharging directly onto the highway at Crosses Lane**

Water channelled off adjacent fields directly onto the highway on the west side of Crosses Lane. This location is 50 metres west of the Bull Stream culvert crossing.

#### **4.2.3 Bull Mill Stream Culvert Crossing**

Build up of silt preventing the free passage of water through the six tier approach and culvert crossing at Brook End.

### **4.3 Area 2 – Brook Place and Boot Cottage**

Three properties flooded south of Bull Hill Stream crossing adjacent to “Brook Place” and “Rose Cottage” at Brook End in July 2007.

Flooding was attributable to either or a combination of the following: (i) Water discharging out of and onto the Public Highway from a drainage gully outside “Forge Bungalow”, (ii) Under capacity combined sewer,

(iii) Flood water over-topping Bull Mill Stream, (iv) Foul water sewer crossing creating an obstruction within Bull Mill Stream outside “Little Brook”, (v) Water ingress through the walls and floor.

The cause of flooding is the following:

#### **4.3.1 Gulley outside “Forge Bungalow”**

It has been noted by local residents that in periods of heavy rainfall water discharges out of this highway gulley in contrast to receiving it.

#### **4.3.2 Combined Sewer**

Excess surface water reaches the 150mm diameter combined sewer running through the village causing surcharging.

#### **4.3.3 Bull Mill Stream Flooding**

During periods of heavy intense rainfall flood water builds up and overtops Bull Mill Stream flooding the adjacent properties and surrounding area.

#### **4.3.4 Stream Obstruction**

A foul sewer pipe crossing located near “Little Brook” creates an obstruction to the free passage of water and surcharging occurs.

#### **4.3.5 Water ingress through the walls and floor**

During periods of intense and prolonged rainfall the water table in the locality rises and there is water ingress through the porous walls and floor of Brook Place, Boot Cottage and some adjacent properties.

### **4.4 Area 3 – Rill Brook**

Three properties flooded, where Rill Brook crosses under the Public Highway at Green End, in July 2007. The terrace of properties “ Daisybank Cottages” was badly affected.

Flooding was attributable to either or a combination of the following: (i) Water unable to pass under the highway at the required rate of discharge due to under-sized culverts crossing. (ii) Blocked highway gullies opposite Jasmine Cottage unable to take surface water run.

The cause of flooding is the following::

#### **4.4.1 Under-sized Culvert Crossing at Green End**

Rill brook that passes through the garden of No. 3 Daisybank Cottages and floods where it meets the undersized highway culvert crossing at Green End. The brook flows through the garden in a 750mm x 750mm landscaped open channel until it reaches the highway boundary where flow is restricted through two 300mm diameter culvert crossings.

#### **4.4.2 Blocked Gullies**

Three blocked highway gullies opposite Jasmine Cottage are unable to take surface water run. The water therefore by-passes the gullies and floods the highway in the low point adjacent to Rill Brook culvert crossing.

### **4.5 Area 4 - Greywalls**

“Greywalls” flooded for two possible reasons: (i) Overland field run-off cascading through and over the garden boundary wall or (ii) Highway drainage flooding from a small gulley and culvert in the carriageway adjacent to the south-western corner of the property.

## 5.0 OPTIONS

The following tables show the possible options available for flood alleviation schemes throughout the Parish, and their potential effectiveness, as assessed by the District Council Engineers.

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 may 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 (6.0).

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.

### Area One – Bull Hill Stream

| <b>Area</b>                                    |   | <b>I</b>  |  |  |
|--|---|---|--|--|
| <b>Flooded Properties &amp; Causes</b>         |   | Up to nine properties flooded – estimated frequency every 5 years.<br><u>Primary causes</u> – (i) Extensive uncontrolled surface water running down Crosses Lane, (ii) Field drainage discharging directly onto the highway at Crosses Lane, (iii) Build up of silt preventing the free passage of water through the six tier approach and culvert crossing at Brook End. |  |  |
| <b>Options</b>                                 |   | <b>I</b>  | <b>2</b>   | <b>3</b>   |
| <b>Description of options</b>                  |   | Provide 6 highway drainage gullies in Crosses Lane to intercept surface water and discharge to Bull Hill Stream.  | Provide double gully and culvert crossing to discharge into Bull Hill Stream | Dredge out silt from channel and clear silt from culvert crossing.                         |
| <b>Responsible Agencies</b>                    | <b>EA</b><br>For queries<br>Tel: 08708 506506           | .   |  |  |
|  | <b>OCC</b><br>For queries<br>Tel: 08453 101111          | OCC to undertake this work as this is highway drainage.   | OCC to be approached to fund this work.                                      | OCC to undertake this work as this is highway drainage. Bull Hill Stream is not En-mained. |
|  | <b>Thames Water</b><br>For queries<br>Tel: 08459 200800 |   |  |  |
|  | <b>WODC</b><br>For queries<br>Tel: 01993 861000         | WODC to co-ordinate works with this proposal.   | WODC to co-ordinate works with this proposal.                                |  |
|  | <b>Private/Other Organisations</b>                      |   |  | Riparian owners to be contacted to fund watercourse channel work.                          |
| <b>Effectiveness/ Effects on adjacent land</b> |   |   |  |  |
| <b>Cost</b>                                    |   | Up to £5K   | Up to £5K  | Up to £5K  |

## Area Two - Brook Place and Boot Cottage

| Area   |   | 2  |  |  |  |   |
|--|---|--|--|--|--|---|
| <b>Flooded Properties &amp; Causes</b>         |   | Three properties flooded – estimated frequency every 5 years.<br><u>Primary causes</u> – : (i) Water discharging out of and onto the Public Highway from a drainage gully outside “Forge Bungalow”, (ii) Under capacity combined sewer, (iii) Flood water over-topping Bull Mill Stream, (iv) Foul water sewer crossing creating an obstruction within Bull Mill Stream outside “Little Brook”, (v) Water ingress through the walls and floor. |  |  |  |   |
| Options  |   | 1  | 2  | 3  | 4  | 5   |
| <b>Description of options</b>                  |   | Unblock and investigate gully point of discharge. Connect gully lateral direct to Bull Hill Stream.  | Survey sewer and remove all surface water connections from the combined sewer. | Build a balancing pond on land north of Brook Place to attenuate flow. Control discharge through a hydrobrake. | Divert foul sewer away from Bull Hill Stream.  | Relay stone floors using a hygroscopic membrane. Tank walls internally if required. |
| <b>Responsible Agencies</b>                    | <b>EA</b><br>For queries<br>Tel: 08708 506506           |  |  |  |  |   |
|  | <b>OCC</b><br>For queries<br>Tel: 08453 101111          | OCC to do this work.   |  |  |  |   |
|  | <b>Thames Water</b><br>For queries<br>Tel: 08459 200800 |  | Thames Water to do this work.  |  | Thames Water to do this work.  |   |
|  | <b>WODC</b><br>For queries<br>Tel: 01993 861000         | WODC to co-ordinate works.   | WODC to co-ordinate works.   | WODC to co-ordinate works.   | WODC to co-ordinate works.   | WODC to co-ordinate works.  |
|  | <b>Private/Other Organisations</b>                      |  | Private householder would also need to be involved.                            | Work to be undertaken/ funded by the land owner  |  | Work to be undertaken & funded by property owner                                    |
| <b>Effectiveness/ Effects on adjacent land</b> |   |  |  | Land acquisition required.   | TW could install sealed manhole covers to reduce the amount of water ingress into the system near the river. |   |
| <b>Cost</b>                                    |   | Up to £5K  | £5K – 20K  | £10k to 20k  | £5k to £20k  | Up to £5K   |

### **Area Three – Rill Brook**

| <b>Area</b>                                    |   | <b>3</b>  |   |
|--|---|---|---|
| <b>Flooded Properties &amp; Causes</b>         |   | Three properties flooded – estimated frequency every 5 years.<br><u>Primary causes</u> – (i) Water unable to pass under the highway at the required rate of discharge due to under-sized culverts crossing. (ii) Blocked highway gullies opposite Jasmine Cottage unable to take surface water run. |   |
| <b>Options</b>                                 |   | <b>1</b>  | <b>2</b>  |
| <b>Description of options</b>                  |   | Provide large diameter 750mm ductile iron culvert crossing with minimal cover to replace 300mm diameter pipes. Clear out Rill Brook.  | Gullies to be unblocked and connections cleared.        |
| <b>Responsible Agencies</b>                    | <b>EA</b><br>For queries<br>Tel: 08708 506506           | .   |   |
|  | <b>OCC</b><br>For queries<br>Tel: 08453 101111          | OCC to undertake this work as culvert supporting highway.   | OCC to undertake this work as this is highway drainage. |
|  | <b>Thames Water</b><br>For queries<br>Tel: 08459 200800 |   |   |
|  | <b>WODC</b><br>For queries<br>Tel: 01993 861000         | WODC to co-ordinate works.  | WODC to co-ordinate works.                              |
|  | <b>Private/Other Organisations</b>                      | Rill Brook clearing to be undertaken and/or funded by the land owner  |   |
| <b>Effectiveness/ Effects on adjacent land</b> |   |   |   |
| <b>Cost</b>                                    |   | £5K to £20k   | Up to £5K   |

### **Area Four - Greywalls**

| <b>Area</b>                                    |   | <b>4</b>   |  |
|--|---|--|--|
| <b>Flooded Properties &amp; Causes</b>         |   | One property flooded. – Estimated frequency every 5 to 10 years.<br><u>Primary causes</u> – (i) Overland field run-off. (ii) Highway drainage flooding from a small gulley and culvert in the carriageway adjacent to the south-western corner of the property |  |
| <b>Options</b>                                 |   | <b>1</b>   | <b>2</b>   |
| <b>Description of options</b>                  |   | Provide land drainage cut-off to the west and north faces of the boundary wall, connecting via a silt trap to the highway drain in the adjacent road.  | Provide new double gulley and clear culvert adjacent to the south-western boundary corner. |
| <b>Responsible Agencies</b>                    | <b>EA</b><br>For queries<br>Tel: 08708 506506           |  |  |
|  | <b>OCC</b><br>For queries<br>Tel: 08453 101111          |  | OCC to carry out this work.  |
|  | <b>Thames Water</b><br>For queries<br>Tel: 08459 200800 |  |  |
|  | <b>WODC</b><br>For queries<br>Tel: 01993 861000         | WODC to co-ordinate works.   | WODC to co-ordinate works.   |
|  | <b>Private/Other Organisations</b>                      | Work to be undertaken and/or funded by the land owner  |  |
| <b>Effectiveness/ Effects on adjacent land</b> |   |  |  |
| <b>Cost</b>                                    |   | Up to £5K  | Up to £5K  |



## 6.0 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Area 1 – Bull Hill Stream

#### 6.1.1 Maintenance

The following on-going maintenance is recommended:

- Option 3 – OCC to Dredge out silt from channel and clear silt from culvert crossing for Bull Hill Stream at Brook End. OCC to undertake work as this is highway drainage and Bull Hill Stream is not Emained.

#### 6.1.2 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

##### Immediate (under 1 year)

- Option 1 – OCC to provide Highway drainage in Crosses Lane..
- Option 2 – OCC to carry out this work.

### 6.2 Area 2 – Brook Place and Boot Cottage

#### 6.2.1 Maintenance

The following on-going maintenance is recommended:

- Option 1 – OCC to Unblock and investigate gully point of discharge. Connect gully connection direct to Bull Hill Stream.

#### 6.2.2 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

##### Immediate (under 1 year)

- Option 2 – Thames Water to survey sewer and remove all surface water connections from the combined sewer. This action will reduce the frequency of foul sewer flooding.
- Option 5 – Property owner to Relay stone floors using a hygroscopic membrane. Tank walls internally if required.

##### Mid-Term (under 1 -2 years)

- Option 4 – Thames Water to Divert foul sewer away from Bull Hill Stream or provide a siphon as required

### 6.3 Area 3 – Rill Brook

#### 6.3.1 Maintenance

The following on-going maintenance is recommended:

- Option 2 – OCC to unblock gullies as required.

#### 6.3.2 Flood Defence Improvement Schemes

The following flood defence improvement schemes are recommended:

##### Mid-Term (1-2 years)

- Option 1 – OCC to Provide large diameter 750mm ductile iron culvert crossing with minimal cover to replace 300mm diameter pipes and clear out Rill Brook.

### Area 4 – Greywalls

#### 6.4.1 Maintenance

The following on-going maintenance is recommended:

- Option 2 – OCC to unblock gullies as required adjacent to south-west corner of property.

## Appendix I: Photographs



Area 1 - Brook course culvert Brook End



Area 2 - Boot Cottage



Area 2 - Brook Piece



Area 4 - Field wall at Greywalls



Area 4 - Junction at Green End