WEST OXFORDSHIRE
DISTRICT COUNCIL

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Parish Flood Report:
Salford

June 2008

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

Contents

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[1] 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[2] land owner, and permissive powers[1] 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

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
    - 6 (£1500) for Salford
- 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 Salford

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 Salford 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 Salford during July 2007 and potential mitigating solutions.

Salford is a rural parish located in the North West corner of the West Oxfordshire District. Salford is adjacent to the parish of Chipping Norton, which is reached following Worcester Road from Chipping Norton in a northerly direction. There are no statutory main rivers within Salford, however many of the drains throughout the Parish emerge from springs in the north towards the Cornwell Brook, a tributary of the River Evenlode, which runs along a section of the southern boundary of the parish. The topography of Salford generally slopes in a southerly direction, which is reflected by the drainage network. The village of Salford slopes towards a low point located in the south east corner, close to The Village Farm.

The Parish falls within the River Thames Environment Agency flood warning area of "River Evenlode and its tributaries from Moreton-in-Marsh to Shipton-under-Wychwood".

Visual walkover surveys have been undertaken of the flooded areas and properties and meetings have been held with some affected residents WODC have record of 6 applications for Flood Grant Aid in Salford.

Flooding experienced in Salford has been assessed as four main areas (see section 4.1) compromising:

- Lower End (Area 1)
- Golden Lane (Area 2)
- The Leys (Area 3)
- Chapel Lane (Area 4)

Historically, Salford is not prone to regular flooding, though within recent years the problem of flooding has become increasingly more pronounced. In July 2007 WODC have record of 1 property flooding in Area 1 although many properties suffered with damp caused by the flood waters. Property along Lower End suffered with direct water damage from the flood waters entering the property. Within the village of Salford the majority of the surface water runoff from the surrounding fields flows southwards, down Roses Lane towards the eastern end of Lower End (Area1). This is the main cause of flooding, exacerbated by blockages within the drainage system. This causes more water to pool in the lowest point by The Village Farm along Lower End, where water can't drain into the natural watercourses that lead on to the Cornwell Brook.

The area referred to as Golden Lane (Area 2), to the north east of the village of Salford has record of 3 properties flooding during the July 2007 event. Flooding has been attributed to surface water runoff not being able to easily make its way into the drainage system, therefore causing it to pool in low areas. The low level flooring in some of the cottages results in any excess water on the roads flowing into properties.

WODC has no record of properties flooding in Area 3 – The Leys. Flooding in this location is caused by surface water runoff from the fields behind. Poorly maintained ditches and drains lead to large volumes of water flowing onto pathways and roadways, which then act as drainage channels. As The Leys is situated in the higher northern section of the village, much of the water is directed southwards, down Roses Lane and on towards Lower End, adding to flooding problems.

Within Chapel Lane (Area 3), WODC has record of 2 properties flooding during the July 2007 flood event.

A watercourse emerges from Springhill to the North and West of the village and flows southwest to a ford in the farm track north of Greathouse Barn. The watercourse then flows south and to the west of the village to a confluence with Cornwell Brook. In times of high flow, or following periods of prolonged or heavy rain, the watercourse overtops and excess water flows along the farm track from the ford towards the village. At Greathouse Barn, there is an ephemeral stream/fossil channel that receives the water from the track and channels it towards the Church, Manor Farm and the north of the properties at Chapel Lane. Here, the channel has been culverted to channel flow to and under Cooks Lane and then south where the watercourse emerges at The Village Farm and continues to flow south to Cornwell Brook.

Flooding in the Chapel Lane area has been attributed to the culverts surcharging and overflowing into properties. This caused serious damage where several feet of water collected inside properties. The floodwaters continue to flow overland towards Cooks Lane where they are channelled south along the road to re-enter the open watercourse at The Village Farm.

4.0 SURVEY

4.1 Description of Area

Salford is a rural parish located in the North West corner of the West Oxfordshire District. Salford is adjacent to the northern boundary of the parish of Chipping Norton, which is reached following Worcester Road. There are no statutory main rivers within Salford apart from the Cornwell brook which runs along a section of the parish boundary. However many of the drains throughout the Parish emerge from springs in the north of the parish and flow towards the Cornwell Brook, a tributary of the River Evenlode, which runs along a section of the southern boundary of the parish. The topography of Salford generally slopes in a southerly direction, which is emphasised by the drainage network. The village of Salford slopes towards a low point, which is located in the south east corner of the village along Lower End.

The drains in Salford and the Cornwell Brook (which is classified by the Environment Agency as a main river), are spring fed. The springs are located to the North of the village, marked by hedgerows.
There are a number of other small watercourses that flow through and around Salford as they make their way towards the Cornwell Brook:

North of The Leys water runs off the high ground towards the village of Salford. On the approach to the village the water enters drainage ditches that run to the north and west of properties by The Leys. Here water makes its way through the village using the roads as drainage paths. The majority of the flow continues down Roses Lane towards Lower End. Here the watercourse runs in an open channel to the west of the Village Farm. From here the natural watercourse flows away towards Cornwell Brook.

A watercourse emerges from Springhill to the North and West of the village and flows southwest to a ford in the farm track north of Greathouse Barn. The watercourse then flows south and to the west of the village to a confluence with Cornwell Brook. In times of high flow, or following periods of prolonged or heavy rain, the watercourse overtops and excess water flows along the farm track from the ford towards the village. At Greathouse Barn, there is an ephemeral stream/fossil channel that receives the water from the track and channels it towards the Church, Manor Farm and the north of the properties at Chapel Lane. When the channel reaches Cooks Lane, water flows towards the small culverted watercourse at Lower End, which then flows to Cornwell Brook.

In the north east of the Village surface water and runoff from the springs to the north of the Parish flow off high ground towards the village. The water is channelled along a track which lies approximately 30cm (1 foot) lower than the adjacent land. The channelled water flows towards Golden Lane. Once water enters the drains and culvert that run northwards along Golden Lane, the water is channelled in an easterly direction towards the Cornwell Brook.

4.2 Survey Method

A visual walkover survey of properties and land affected by the July 2007 flooding has been undertaken and discussions have been held with WODC and some local residents.

See Appendix 2 – Photographs.

4.2 Meetings

A summary of meetings about Salford flooding in July 2007 are given in Table 1.

Table 1: Summary of meetings and flooding descriptions

Date	Location	Description
16.07.08	Local Residents in Salford	• Meeting with local residents to review the causes and extents of the July 2007 floods. • Identified areas of the village affected by flooding; Lower End, Golden Lane, The Leys and Chapel Lane. • Water flowed off the surrounding land, towards the village which is at a lower level. • Increased hard-standings across the village have added to more surface runoff. • Flooding in Salford has been attributed to large amounts of surface water flowing southwards towards the Cornwell Brook. These drainage paths are through the village. Problems were exacerbated due to poorly maintained or inadequate drainage throughout the village. • Large amounts of village water runoff the surrounding fields. • To the North of the village the water flows well, in adequate drainage systems. However much of the water cannot get into this system towards Golden Lane and instead follows the road down Roses Lane. Approximately 90% of the flow is directed down Roses Lane. • Water on Roses Lane did not drain into the ditches that are along the verge, to the side of the small field between Roses Lane and Cooks Lane. • Along Roses Lane the gullies became blocked, allowing more water to flow onto Lower End. • In July 2007 water trying to flow towards the Cornwell Brook in the south of the village, backed up in the area of Lower End. Water pooled in this area as the water could not drain away due to blocked drains and partially blocked culverts. • This level of flooding is historically not a common occurrence within the village. The village is not naturally prone to flooding. • Properties along Chapel Lane were flooded to the greatest depth as a result of the floods, approximately 0.6 metres (2 feet). • Flooding along Chapel Lane occurred by the culverted watercourse flowing next to properties. The culvert which has two 90 degree bends in, backed up and water overflowed and pooled at the bottom of Chapel Lane where it then entered properties • Residents along Chapel Lane have spent considerable amounts on flood proofing their properties, including tanking, to avoid flood damage to the same extent as July 07. The majority of Chapel Lane is privately owned and maintenance and repair works are therefore the responsibility of the riparian owners.

		• Ongoing building work at Chapel Lane has straightened the culverted watercourse , (taking out the two 90 degree bends). The watercourse is now contained in a larger diameter 12" pipe to carry a larger flow. It runs to the north of properties on Chapel lane and on towards Cooks Lane. • The inspection chamber on Cooks Lane marks the course of the culverted watercourse which flows to Cooks Lane from Chapel Lane. . • Properties on the small estate by Golden Lane were surface water flowing towards the estate and pooling in low points as it could not drain into gullies. Drains were blocked and could not carry enough water. • Just south of Golden Lane there is an effective drainage system, designed for the new developments along this road. This drainage system works well and is not fully utilised as most of the water in this section of the village runs off down Roses Lane. • North of Golden Lane water drains down the track from the north and off the fields. Water then gathers in a 'holding pool' at the junction of Golden Lane with the track. • The flow of water down the track is high enough to cause damage such as pot holes or washouts to the tracks resurfacing works. The track had resurfacing works completed within the last two years. • From the holding pool, water makes its way into drains and a 9" culvert. This takes water along Golden Lane, adjacent to the fields by Larches Farm, in a new 300mm culvert and connects into the existing system which then heads towards the Cornwell Brook. • Drainage problems at the exacerbate flooding further down in the village. The ditch that runs to the north and west of properties that back onto the fields is poorly maintained. This is allows the ditch to become blocked forcing more water towards properties. • Problems are experienced closer to the properties, these include; water seeping up in car park areas, • Water doesn't run into the gullies, but runs off down the road towards Roses Lane • The first gully between the houses and the fields is slightly raised so water doesn't enter it, • Inspection cover lid gets lifted due to the force of water flowing through, • Problems with damp from water not efficiently draining away.

WODC has liaised with the Environment Agency and Oxfordshire County Council.

Table 2: Summary of telephone calls/emails/correspondence made with EA,

Date	Agency	Comment
	TW	TW have not been contacted as there are no reports of foul water flooding in Salford.

4.4 Application for Grant Aid

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

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

To date the owners of 6 residential properties in Salford 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 Plans

Figure 1 in appendix 2 shows areas in Salford where properties flooded in July 2007 and where owners have made claims for grant assistance. The flooding can be broadly split into four areas being:

- Area 1: Lower End
- Area 2: Golden Lane
- Area 3: The Leys
- Area 4: Chapel Lane

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

A further map is included in Appendix 2 showing the drainage paths towards the Cornwell Brook.

5.2 Area 1 – Lower End

In July 2007, 1 property located in Lower End claimed Flood Grant Aid. This property is not located within an Environment Agency Flood Zone.

Flooding is attributed to the following:

5.2.1 Surface water runoff

Flooding in Lower End is attributed to large volumes of surface water finding its way to the low point in the village at Lower End. Water runs off the fields that surround Salford. Due to the geology of the land being predominately clay based, land becomes quickly saturated and water flows directly off the surface of the land.

Local residents reported how the water pools in along Lower End as it cannot drain away. Large volumes of water running down Roses Lane adds to the problem at Lower End.

5.2.2 Inadequate drainage

Drainage ditches along Roses Lane that carry a lot of the water towards Lower end could not cope. It is reported that water was overflowing from the ditches and adding to the water running down Roses Lane. Drains along Lower End and up Roses Lane were blocked which meant more water was forced to flow down these roads. This resulted in more standing water along Lower End as it could not drain away.

5.2.3 Inadequate capacity of culvert carrying the natural watercourse

At lower End the natural course of water enters a culvert which channels the water away from the village towards Cornwell Brook. In the July 2007 floods this culvert could not take the volume of water that was

accumulating along Lower End. The culvert was partially silted up which meant that it could not carry its full volume of water. The open channel carries a flow even after a small rain event. In the July 07 event the channel did not appear to be big enough to deal with the large volumes of water. This culvert carries a natural watercourse and therefore is the main drain for water out of the south of the village towards the Cornwell Brook.

5.3 Area 2 – Golden Lane

In July 2007, 3 properties claimed flood damage grant located in the North East of the village at properties to the east of Golden Lane.

This property is located in the 2007 Environment Agency Flood Zone 1, being at low risk, 0.1% probability of flooding (previously referred to as 1 in 1000 year Flood Zone).

Flooding is attributed to the following:

5.3.1 Surface water runoff

Direct overland flow occurs when the ground either becomes fully saturated, preventing any percolation into the upper layers of soil, or where the rainfall intensity and rate is greater than the percolation rate of the receiving ground. Both result in sheet runoff, or water flowing directly off the surface of the land.

Flooding at Golden Lane has been attributed to surface water runoff. It was reported that water was flowing off the fields onto Golden Lane. Water from higher up in the Parish was directed off fields and Channelled down the track that meets golden lane. At this point there was a large pool of water.

At the small estate to the east of Golden Lane, flooding problems have been partly attributed to surface water flowing from Golden Lane towards properties as well as off the surrounding fields and gardens.

5.3.2 Private Drainage

The small housing estate to the east of Golden Lane becomes overwhelmed by large amounts of water gathering in the private roadways. During periods of heavy rainfall ponding occurs at low points in the middle of the estate. As the rainfall intensity increases surface water drains and gullies become overwhelmed and the roads become channels. Where properties have floor levels below the road level, water enters property. Blocked drains along the private road to the small estate allowed more water to gather as it could not drain away.

5.3.3 Inadequate Highway Drainage

Flooding in the north of the village is attributed to the large volumes of water that are channelled down the track off Golden Lane. This track resides approximately 1 foot lower than the surrounding land. There is no drainage along the length of the track, allowing the volume water to steadily increase on the approach to Salford. Drains in the proximity of the junction of the track with Golden Lane become easily blocked with silt and mud from the fields. Water therefore does not easily drain away into the 9" culvert at the bottom of the field.

Pooled water then enters the 300mm culvert which is a new private development carried out by the landowner. Once the water gets into the culvert, it connects to the drainage system that runs towards Cornwell Brook.

5.4 Area 3 – The Leys

In July 2007 no properties in this area claimed flood grant aid, however there was flooding to roads. The problems in this area added to problems elsewhere in the village of Salford. If some of the problems are tackled here, this may help flooding issues in other areas of the village.

Problems associated with flooding include:

5.4.1 Overland Flow

Direct overland flow occurs when the ground either becomes fully saturated, preventing any percolation into the upper layers of soil, or where the rainfall intensity and rate is greater than the percolation rate of the receiving ground. Both result in sheet runoff, or water flowing directly off the surface of the land.

Flooding in the Leys occurs from water running off the higher land surrounding this northern section of the village. The fields slope towards Salford, forcing water to flow in this direction. Water cannot drain away efficiently and so flows along the roads.

As the water rushes towards the cross roads of Golden Lane and Roses lane, the levels of the road result in approximately 90% of the flow being directed down Roses Lane, and the remaining surface water running through the village passes on towards Golden Lane. At the crossroads, along the Eastern Road on the approach to the small estate the highway drainage system is better designed to deal with larger amounts of water.

5.4.2 Inadequate and poorly maintained drainage

Large volumes of surface water runoff the land and cannot drain away efficiently. Ditches surrounding the area of the Leys are not correctly maintained and in places gradually become part of gardens. The ditches were blocked and did not carry enough water. This caused more water to runoff onto the roads. The volume and force of water entering the drainage system was high enough to lift the manhole inspection cover on The Leys Road effectively

At the top of Cooks Lane on the approach to The Leys, there is a gully. This could not effectively drain water as it is raised above the road level. Water instead flowed around it, across the road and on towards Roses Lane.

Some of the water flowing from The Leys is directed down Cooks Lane. There is little drainage along Cooks Lane. The first gully that water comes to as it runs down Cooks Lane is often silted up. The gully surcharges and water flows down the road towards Lower end.

5.5 Area 4 – Chapel Lane

In July 2007, 2 properties located in the Chapel Lane area claimed flood grant aid. This area is not located in any Environment Agency Flood Zone.

Flooding is attributed to the following:

5.5.1 Inadequate capacity of culvert

The Fields surrounding the area of Chapel Lane drain water towards this part of the village. Historically old fish ponds to the west of this section of the village stored some of the water on its approach. The natural flow of water from the springs in the north towards Salford is now culverted and flows through a pipe that runs in an easterly direction at the end of Chapel Lane, towards Cooks Lane.

In July 2007 the flow in the watercourse soon exceeded the culvert capacity and so it backed up and surcharged in the Chapel Lane area. The slope of the land meant that water flowed towards the low point at the end of chapel Lane, flooding property.

5.5.2 Overland Flow

Direct overland flow occurs when the ground either becomes fully saturated, preventing any percolation into the upper layers of soil, or where the rainfall intensity and rate is greater than the percolation rate of the receiving ground. Both result in sheet runoff, or water flowing directly off the surface of the land.

Flooding in Chapel Lane has been partly attributed to overland flow. Water was not able to infiltrate into the ground as it was saturated and instead flowed overland towards the village and inundated property.

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.

Parish Flood Options

Salford

Version 1 – June 2008

Option ref	Flood Overview **Options**	Description of work required **Environment Agency**	**Oxfordshire County Council**	**Thames Water**	**WODC**	**Private**	Key issues **Effectiveness**	**Affects on adjacent land**	**Cost**	Comments
		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 – Lower End										
	Inadequate capacity of culvert carrying the flow of water out of Salford towards Cornwell Brook. During July 2007, the culvert was exceeded with the large amount of water trying to discharge into the Cornwell Brook. Water backed up and pooled on Lower End.									
A	Increase the capacity of the culvert carrying water away from the village. This culvert follows the natural course of water, so water will continue to flow in this direction. Increasing the capacity will allow more to discharge so there will be less water backing up along Lower End. Ownership of culvert needs to be determined.		OCC to be consulted. OCC may be able to finance some of project as the culvert does take a large volume of road drainage.		WODC to provide co-ordination role and help determine the ownership of the culverted watercourse.	Riparian owner's responsibility to carry out works.	Increasing the size of the culvert will allow more water to drain from Lower End	Will prevent water pooling at Lower End.	£5k to £20k	Riparian owners have not been contacted
B	Install higher kerbing along Lower End to keep water on the road and stop runoff into properties. Kerbing should direct water to the culvert or gullies that drain to the culvert where possible.		OCC Highways department to complete works.		WODC to provide a co-ordination role	Riparian owner of culvert will need to be consulted as works may enter their land.	More water should enter the drainage system.	Less water will be on the roads to pool at Lower End.	£5k to £10k	Further consultation required to decide responsibility / possibility of funding project.
C	Create an overflow channel to allow excess water to drain the lower land to the north of Village Farm to the fields behind. This water could be further channelled along the edge of the fields towards the Cornwell Brook.		OCC to be contacted. OCC to be involved to drain roads towards pond.		WODC to investigate riparian ownership of land and provide a co-ordination role where required.	Landowner agreement required. Riparian owner may have to fund works as this will be on private land.	Will take pressure off Lower End and alleviate flooding.	Will involve works to private land. Will direct water across more land.	£5k to £20k	Riparian owners have not been contacted
D	Create a flood storage area e.g. Pond, on the small field separating Roses Lane and Cooks Lane. Excess water could be directed to the storage area instead of pooling on Lower End threatening property.				WODC to investigate riparian ownership of land and provide a co-ordination role where required.	Landowner agreement required.	Extra flood storage provided on existing field.	Flood waters will be introduced to a field that didn't flood heavily before.	£5k to £20k	
E	Flood- resilient measures on properties. Additionally the parish needs to create its own emergency flood plan.	The EA website contains reference information on flood resilient measures to properties			WODC to approve emergency flood plan	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing of exterior walls, sand bags.	Only effective if defences are put in place before the water level rises.	May increase flood risk to adjacent properties as flood water will be displaced	£5k to £20k	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.
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 – Lower End (Cont...)										
	Flooding caused by inadequate drainage. Poor drainage along Roses Lane and Lower End meant water flowed down Roses Lane, pooled along Lower End and flooded property, as water could not enter the drainage system and drain away.									
F	OCC to carry out survey on drainage system. Results from the survey will determine if there are any blockages and whether the system is adequate enough to deal with large volumes of water.		OCC to carry out survey and appropriate works.		WODC to provide co-ordination role		Survey will identify any problems with the existing system.	Improved land drainage, reducing flooding, dependent on the outcome of the survey	Up to £5k	Further consultation required. OCC to be contacted.
G	Clear drainage ditches and increase capacity along Roses Lane. These ditches take a lot of water from Roses Lane and Cooks Lane. In July 2007 they were reported to be overflowing and adding to the water running down Roses Lane		OCC Highways to be involved. Ditches take highway drainage.		WODC to provide a co-ordination role where required	Landowners to carry out appropriate works on their land.	Will allow more water to enter ditches so less water is forced onto roads.	Improved land drainage	Up to £5k	Riparian owners have not been contacted
H	Clear silted up drains and gullies along Roses Lane and Lower End.		OCC Highways to undertake works.		WODC to provide co-ordination role		Will improve land drainage	Reduced flooding	Up to £5k	
I	Carry out maintenance works on the drainage along Roses Lane and Lower End. This will allow more water to enter the culvert at Lower end towards Cornwell Brook. .		OCC Highways to undertake works.		WODC to provide co-ordination role		Will improve land drainage	Reduced flooding	Up to £5k	
J	Install more gullies or increase the capacity of drains depending on the outcome of the survey, along Roses Lane and Lower End Especially in areas where there is a lot of flow and pooling water. The survey will determine whether there is a problem with the gullies or capacity of the drainage pipes.		OCC Highways to undertake works.		WODC to provide co-ordination role		Will improve land drainage	Reduced flooding	£5k to £20k	Survey will need to be carried out before the appropriate works are decided up on.
K	Install new kerbing along Roses Lane. Kerbing should be indented around gullies to channel the water into the drainage system.		OCC Highways to undertake works.		WODC to provide co-ordination role		Will improve land drainage	Reduced flooding		
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 – Golden Lane										
	Surface water runoff from the Land to the North uses the track off Golden Lane as a channel. Create better drainage so that water doesn't pool when it reaches Golden Lane.									
A	Direct water down the track off Golden Lane into drainage channels either side of the roadway to connect into the drainage system,		OCC Highways to undertake works.				Water will be channelled so that it can more easily enter the drainage system	Should maintain the road surface for longer	£5k to £10k	
B	Unblock drains and gullies. Maintenance work should be carried out to ensure that the drains remain clear.		OCC Highways to undertake works.				Will improve land drainage	Reduced flooding	Up to £5k	
C	Create larger gullies at the junction of the track with Golden Lane. With the larger culverts installed by the land owners, the drainage system should be able to cope with a larger volume of water entering the system.		OCC to possible carry out works depending on land ownership. OCC may be able to part fund works as other work is required in the area		WODC to investigate riparian ownership of land and provide a co-ordination role where required.	Riparian owner to carry out appropriate works where responsible	Less water will pool at the area around the junction of the track with Golden Lane	Less surface water will runoff towards properties.	Up to £5k	Further consultation required
D	At present there are gullies present along the track near Golden Lane that are totally covered over with mud from the fields. Install more gullies in more suitable locations where they will efficiently drain water.		OCC Highways to undertake works.		WODC to provide co-ordination role		Less water will run off the track and towards Salford. Less water will pool at the junction.	Less surface water will runoff towards properties	£5k to £20k	Further consultation required
E	Maintain drainage ditches that along Golden Lane which then channel water towards the Cornwell Brook.				WODC to provide co-ordination role	Riparian owner responsibility.	Better land drainage will mean water can drain away quicker towards the Brook.	Reduced flooding and backing up of system upstream	Up to £5k	Further consultation required. Landowners not approached regarding option
F	At present water in this area is directed down a drainage ditch opposite Rectory Farm. Create a secondary channel to act as an overflow to carry excess water in times of high flow towards the Cornwell Brook.				WODC to provide co-ordination role	Riparian owner responsibility. Landowner to carry out works.	Increased land drainage	Will help prevent flooding, with extra water carried towards the Cornwell Brook.	Up to £5k	Further consultation required. Landowners not approached regarding option
	In times of heavy rain, water from surrounding fields and from Golden Lane runs down towards the properties and pools.									
G	Maintain existing drainage system, ensuring drains are unblocked and clear		OCC Highways to undertake works.		WODC to provide co-ordination role		Increased land drainage	Reduced flooding	Up to £5k	
H	Channel water away from properties towards the more adequate drainage system by the cross roads. This water is then directed on towards the Cornwell Brook.	EA to be consulted regarding discharge consents into the drainage system which will affect the Cornwell Brook.	OCC Highways to possibly help with works.		WODC to provide co-ordination role		Increased land drainage. Will help prevent flooding.	Will help prevent flooding, with extra water carried towards the Cornwell Brook.	Up to £5k	
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 – Golden Lane (Cont..)										
I	Flood- resilient measures on properties. Additionally the Parish needs to create its own emergency flood plan.	The EA website contains reference information on flood resilient measures to properties			WODC to approve emergency flood plan	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing of exterior walls, sand bags.	Only effective if defences are put in place before the water level rises.	May increase flood risk to adjacent properties as flood water will be displaced	£5k to £20k	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.
Area 3 – The Leys										
	Inadequate highway drainage Following periods of intense rain (such as July 2007), surface water drains and road gullies surcharge as a result of under capacity or blockage. Surface water flooding occurs to roads.									
A	Drainage ditches surrounding the area of The Leys needs to be maintained. Undertake blockage and clearance works on ditches.				WODC to provide a co-ordination role where required	Riparian owner's responsibility as it will be on their own land.	More water will be directed into the ditches so that there will be less surface runoff towards the Village	Reduced flooding to the adjacent land and in the Village.	Up to £5k	
B	Reset gullies at a lower level so that water can easily enter.		OCC Highways to undertake works.		WODC to provide a co-ordination role where required				Up to £5k	
C	Install drainage system along the road in the north of the village from Cooks Lane towards Roses Lane. Create gullies so that water enters drains and does not flow along the road, this will then connect to the drainage system the other side of the crossroads.		OCC Highways to undertake works.		WODC to provide co-ordination role		Less water will be directed along roads and down Roses Lane. More surface water can enter the drainage system.	Less water running off the roads to cause damage further down in the village	£5k to £20k	Further consultation required
D	Re-Level the road at the junction of Roses Lane to direct more water on towards the drainage system on the other side of the cross roads. This should help flooding problems in Lower End.		OCC Highways to undertake works.		WODC to provide co-ordination role		If the road was levelled and built up built up slightly on the side of the playground, a larger proportion of the water could flow onwards towards the drainage system and not towards Lower End	Lower End would have less water coming from the north of the village, so less water should pool at the bottom.	£5k to £20k	The road is at present not level and as a consequence is channelled towards Roses Lane.
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 – Chapel Lane										
	Inadequate capacity of the channel carrying the natural flow of water from north west of the village, southwards towards Lower End and the Cornwell Brook. Following periods of intense rainfall the channel overflows									
A	Flood- resilient measures on properties. Additionally the parish needs to create its own emergency flood plan.	The EA website contains reference information on flood resilient measures to properties			WODC to approve emergency flood plan	Homeowners to provide protection against flooding to their properties e.g. flood boards, flood proofing of exterior walls, sand bags.	Only effective if defences are put in place before the water level rises.	May increase flood risk to adjacent properties as flood water will be displaced	Up to £5k	On completion of the emergency flood plan, it should be sent to WODC for approval and registration.
B	Increase size of culvert carrying the watercourse to the north of Chapel Lane. In times of high flow more water will be able to flow and reduce the risk of surcharging.				WODC to provide a co-ordination role where required	Riparian owners to carryout appropriate works.	More water will be able to flow reducing the risk of the system backing up.	Reduced flooding along Chapel Lane	£5k to £20k	This work is already underway by riparian owners.
C	Reinstate old fish ponds to act as storage for the watercourse on the approach to Salford.	EA to be consulted for design advice. Land drainage consent may be required for temporary works. EA to possibly provide part funding			WODC to provide a co-ordination role where required	Landowner to carry out work. Funding may be able to be sought from elsewhere. Landowner agreement required.	Extra flood storage provided on fields.	Fields may flood more frequently.	£5k to £20k	Further consultation required to decide responsibility / possibility of funding project.
	Inadequate road drainage									
D	Further work and maintenance - Undertake blockage and siltation inspections of road gullies and ditches. From chapel Lane to Cooks Lane. Where necessary undertake jetting or other clearance measures.		OCC Highways to undertake works.		WODC to provide co-ordination role		Will improve land drainage	Reduced flooding	Up to £5k	

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Area 1 – Lower End

7.1.1 Maintenance

The following on-going maintenance is recommended:

All adopted highway drainage should be maintained by OCC through clearing blockages from drains and gullies (Option H). Private owners should maintain drainage ditches and associated grips (Option G). The ditches along Roses Lane and Lower End should be maintained by the responsible owner (Option I). Regular inspections and maintenance should be carried out on the culverted watercourse at Lower End, as this is the main flow of water away from the village.

7.1.2 Flood defence improvement schemes

Immediate (under 1 year)

- Flood- resilient measures on properties. Additionally the parish needs to create its own emergency flood plan. (Option E)
- Carry out survey on drainage system. This will help determine whether more gullies should be implemented or whether the drainage capacity is insufficient. (Option F)
- Clear drainage ditches and increase capacity along Roses Lane. (Option G)
- Clear silted up drains and gullies along Roses Lane and Lower End. (Option H)

Mid-Term (under 1 -2 years)

- Increase the capacity of the culvert carrying water away from the village (Option A).
- Install higher kerbing along Lower End to keep water in the road to stop water running off the road into properties (Option B).
- Create an overflow channel to allow excess water to drain to the lower land to the side of village Farm to the fields behind (Option C).
- Install more gullies along Roses Lane and Lower End. Especially in areas where there is a lot of flow and pooling water (Option J).
- Install new kerbing along Roses Lane. Kerbing should be indented around gullies to channel the water into the drainage system (Option K).

Long-Term (3 years or more)

- Create a storage area e.g. pond on the small field separating Roses Lane and Cooks Lane (Option D).

7.2 Area 2 – Golden Lane

7.2.1 Maintenance

The following maintenance is recommended:

- OCC to maintain highway drainage system to include blockage and siltation inspection of surface water drains and road gullies (Option B). It should be ensured that the track off Golden Lane has an adequate surface and is maintained to a safe and acceptable standard (Option A). The quality of the roads surface will help with drainage.
- Private drainage should be kept clear and inspected regularly to make sure that the systems remain clear and efficient. (Options E, G and H).

7.2.2 Flood defence improvement schemes

Immediate (under 1 year)

- Create drainage channels adjacent to the track off Golden Lane (Option A).
- Unblock drains and gullies (Option B).
- Install more gullies in more suitable locations where they will efficiently drain water (Option D).
- Flood- resilient measures on properties. Additionally the parish needs to create its own emergency flood plan (Option I).

Mid-Term (under 1 -2 years)

- Create larger gullies at the junction of the track with Golden Lane (Option C).
- Create a secondary drainage ditch channel to act as an overflow to carry excess water in times of high flow (Option F).
- Create small drainage channels. These will channel water away from properties towards the more adequate drainage system by the cross roads (Option H).

Long-Term (3 years or more)

- Create a storage area e.g. Pond on the small field separating Roses Lane and Cooks Lane (Option D).

7.3 Area 3 – The Leys

7.3.1 Maintenance

The following maintenance is recommended:

- OCC to maintain highway drainage system to include blockage and siltation inspection of surface water drains and road gullies. Drainage ditches surrounding the area should be unblocked and maintained. This will be the responsibility of the riparian owners. (Option A)

Immediate (Under 1 year)

- Drainage ditches surrounding the area of The Leys need to be maintained (Option A).
- Re- set gullies at a lower level so that water can easily enter (Option B).
- Re-Level the road at the junction of Roses Lane to direct more water on towards the drainage system on the other side of the cross roads (Option D).

Mid-Term (under 1 -2 years)

- Install drainage system along the road in the north of the village from Cooks Lane towards Roses Lane. Create gullies so that water enters drains and does not flow along the road (Option C).

7.4 Area 4 – Chapel Lane

7.3.1 Maintenance

The following maintenance is recommended:

- As the majority of Chapel Lane is a private road, riparian owners should maintain the drainage. Blockage and siltation inspections should be undertaken. OCC should carry out maintenance works on highway drainage along Cooks Lane and adopted sections of Chapel Lane. (Option D)

Immediate (Under 1 year)

- Flood- resilient measures on properties. Additionally the parish needs to create its own emergency flood plan (Option A).

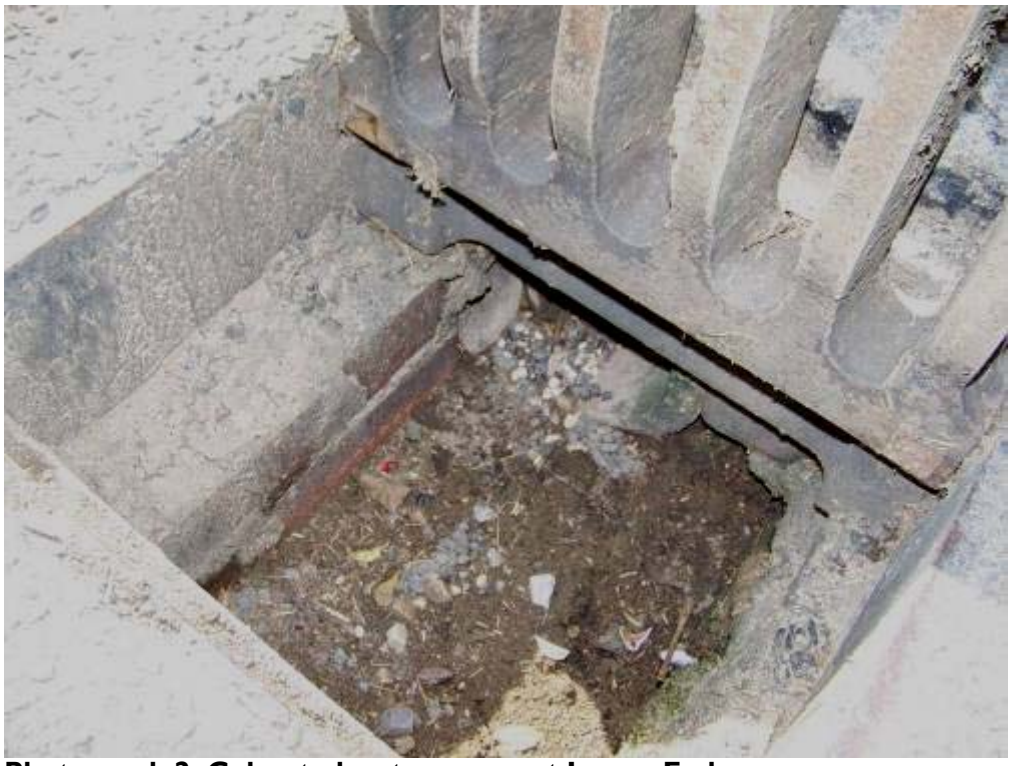
Mid-Term (under 1 -2 years)

- Reinstate old fish ponds to act as storage for the watercourse on the approach to Salford (Option C).

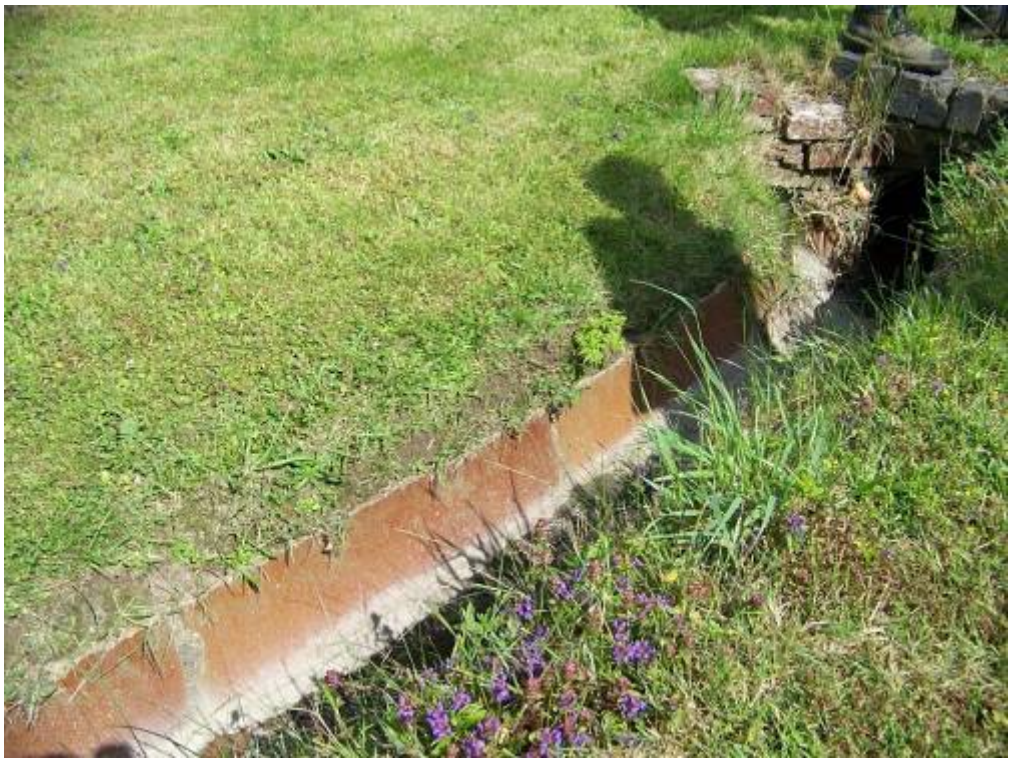
Appendix 1: Photographs

Area 1

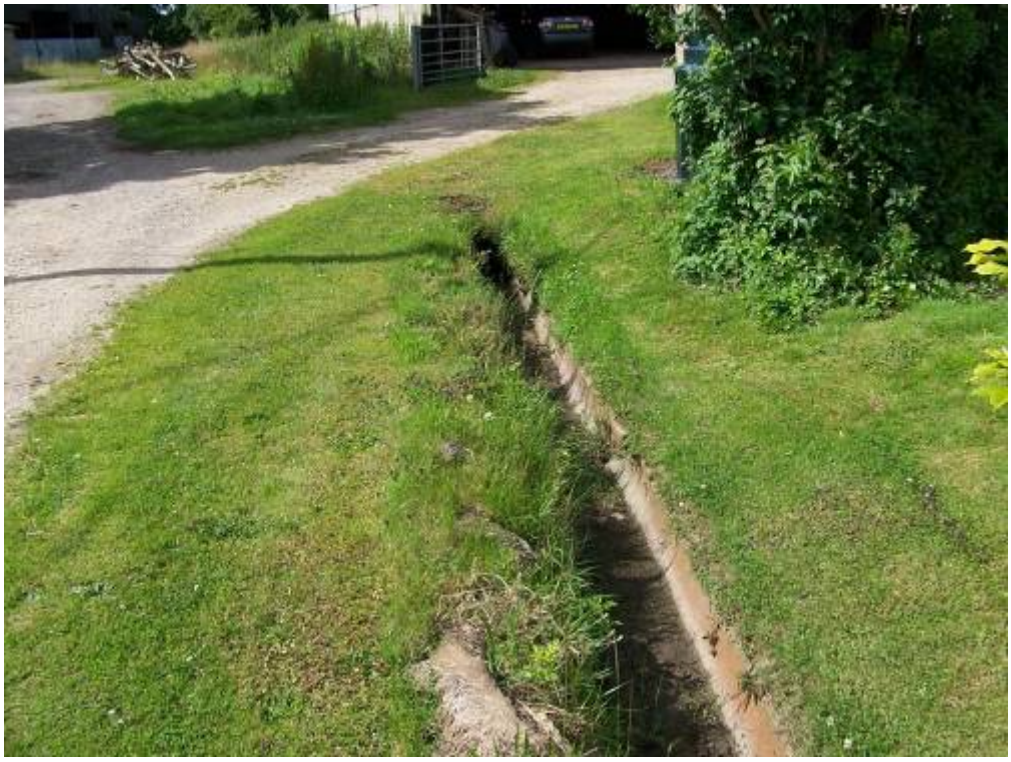
Photograph 1: Blocked drain at Lower End



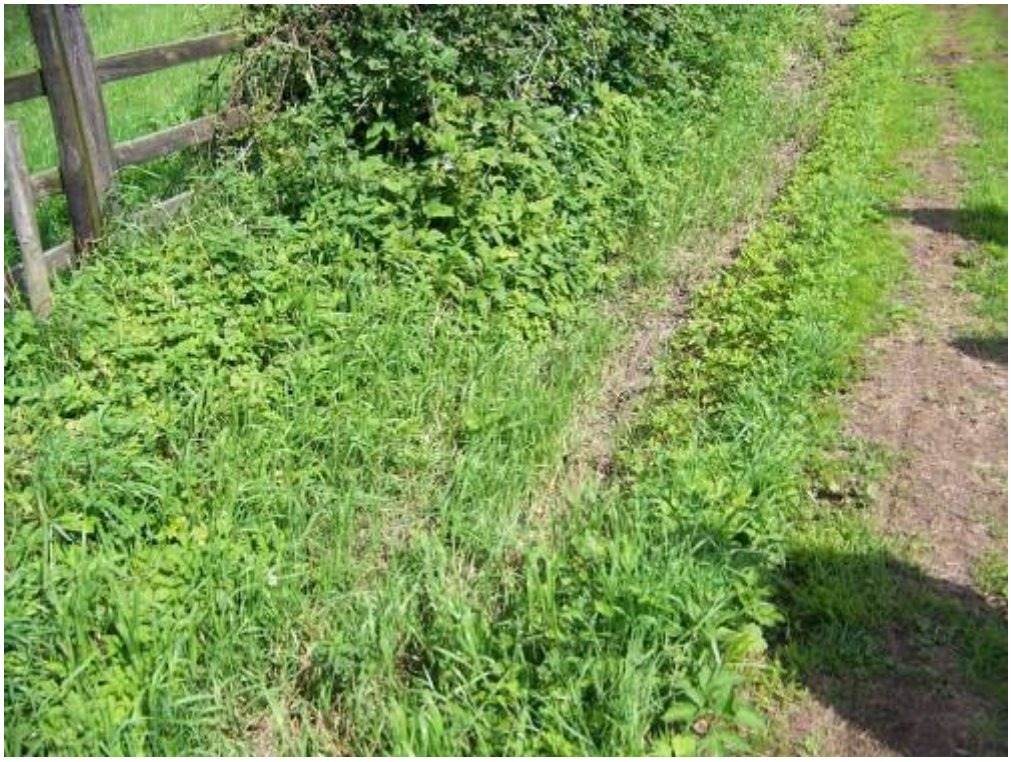
Photograph 2: Culverted watercourse at Lower End



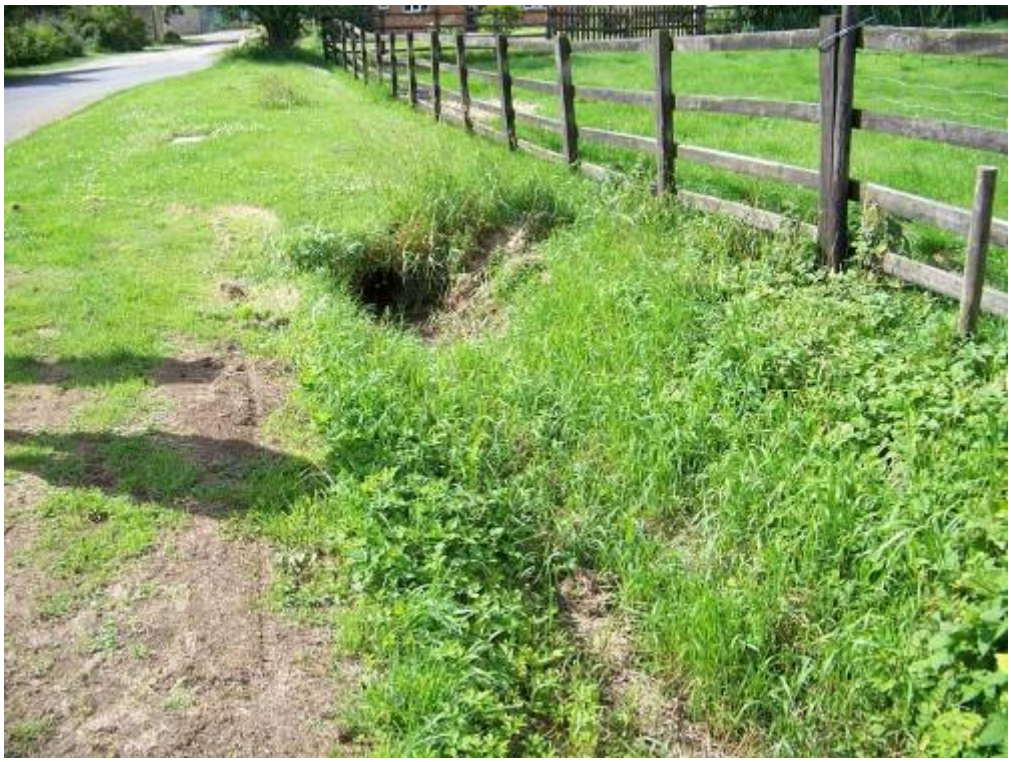
Photograph 3: Culverted watercourse at Lower End



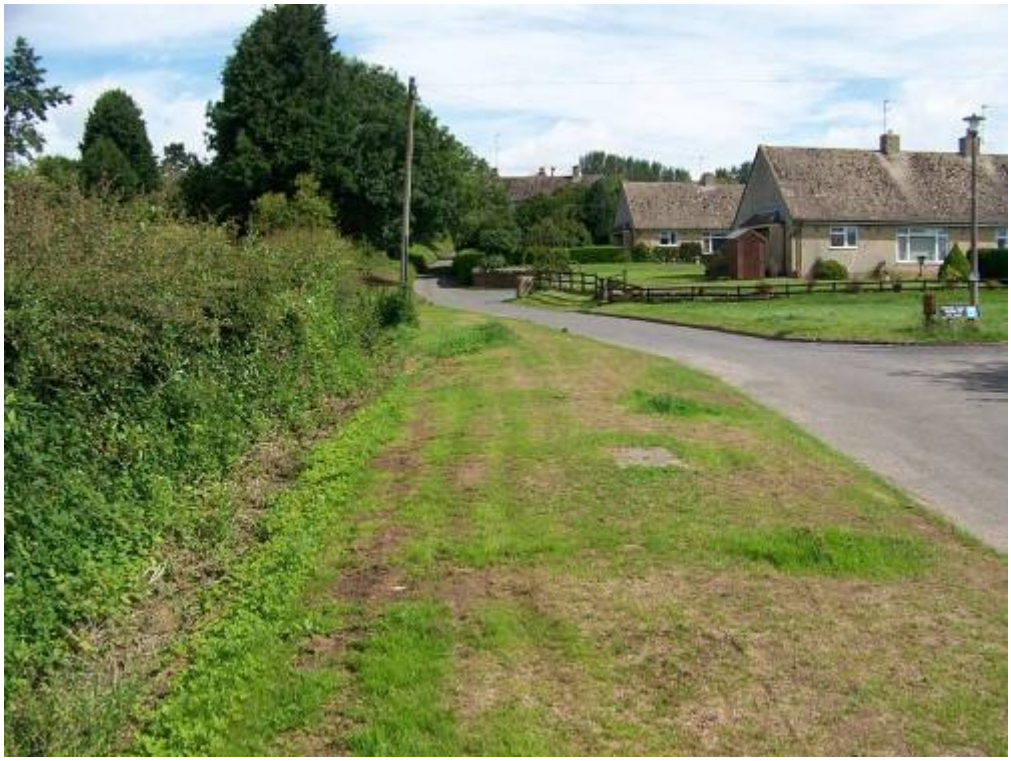
Photograph 4: Blocked drainage ditch along Roses Lane



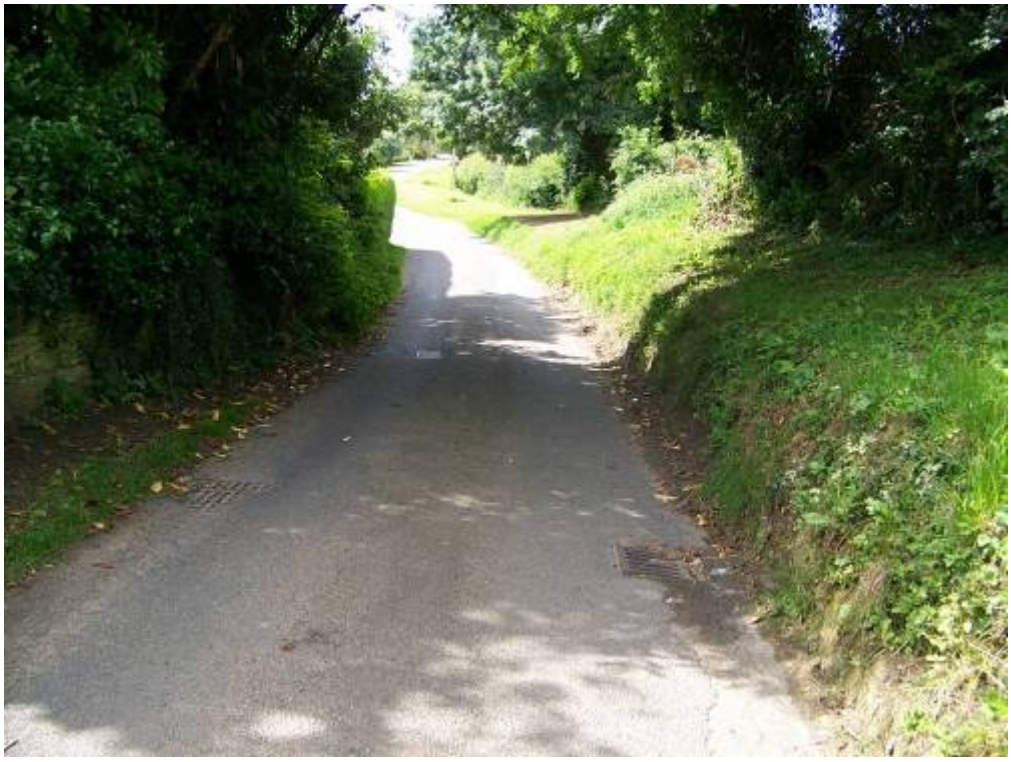
Photograph 5: Overgrown drainage ditch along Roses Lane towards Lower End



Photograph 6: Overgrown drainage ditch along Roses Lane

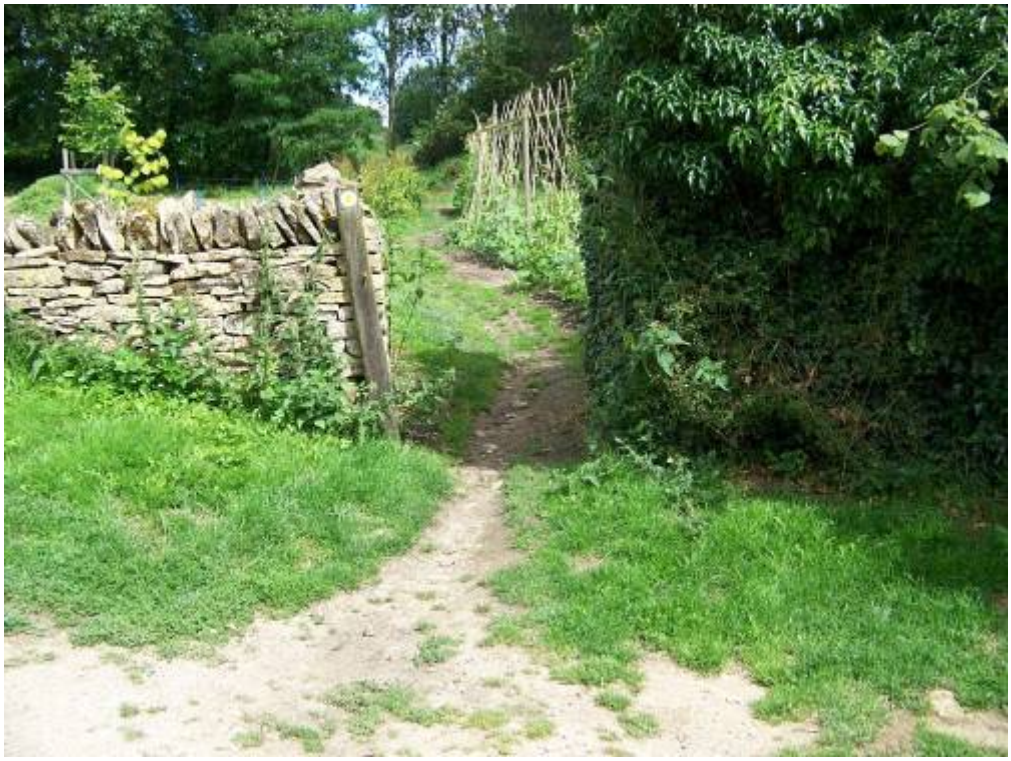


Photograph 7: Roses Lane running down towards Lower End

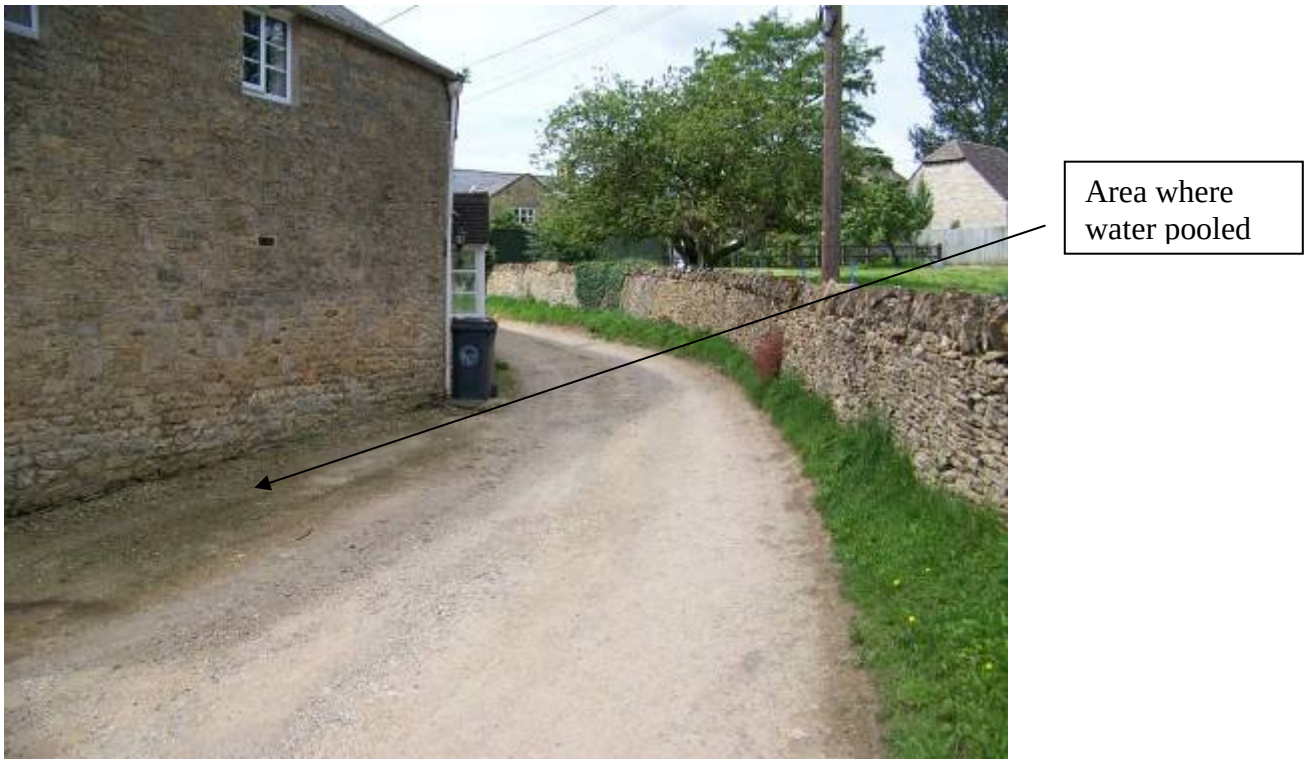


Area 2

Photograph 8: Pathway off Golden Lane which water is channelled down from land behind

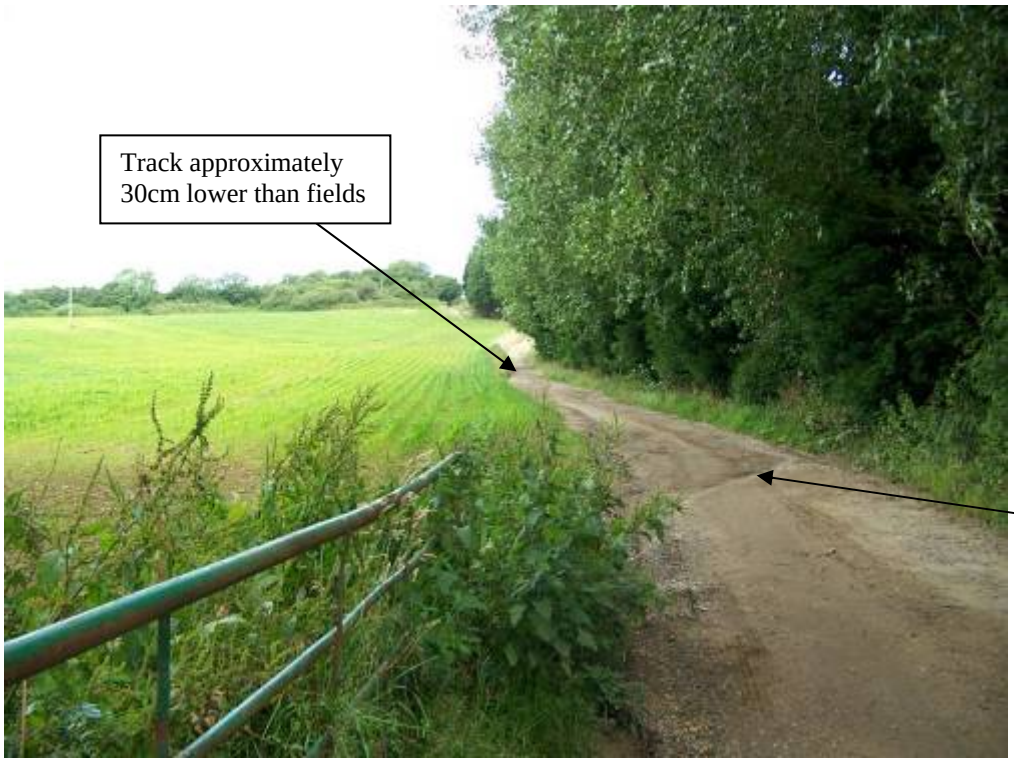


Photograph 9: Property on small estate by Golden Lane. Water pools next to property

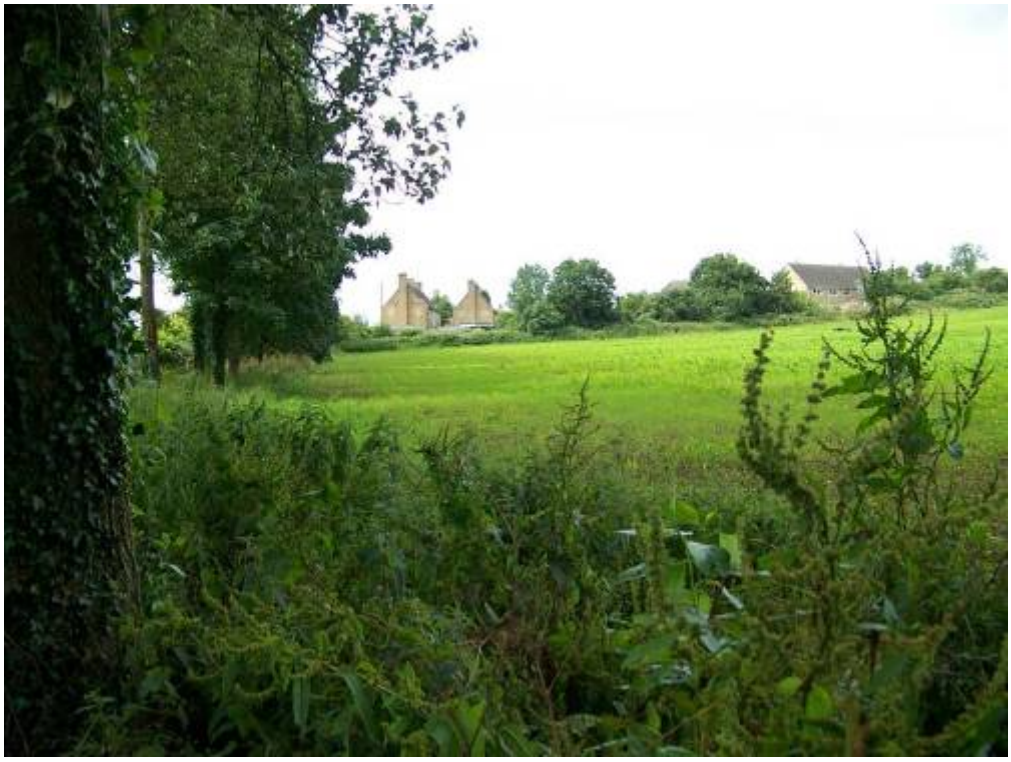


Photograph 10: Blocked drain on estate

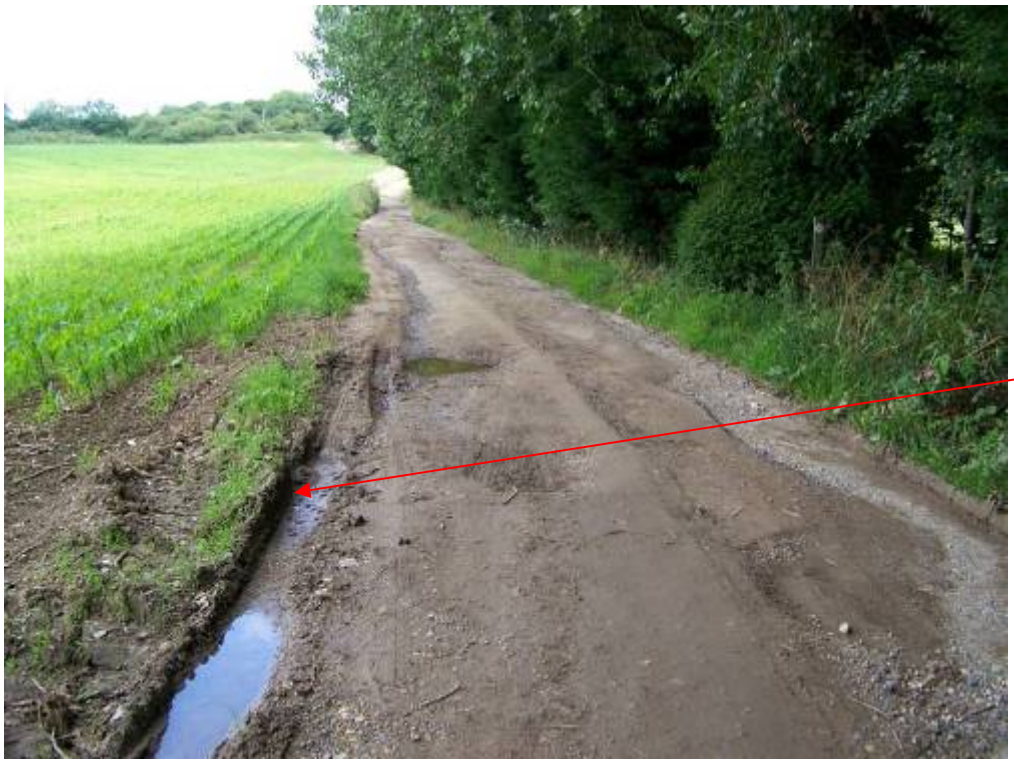
Photograph 11: Track off Golden Lane which water is channelled down



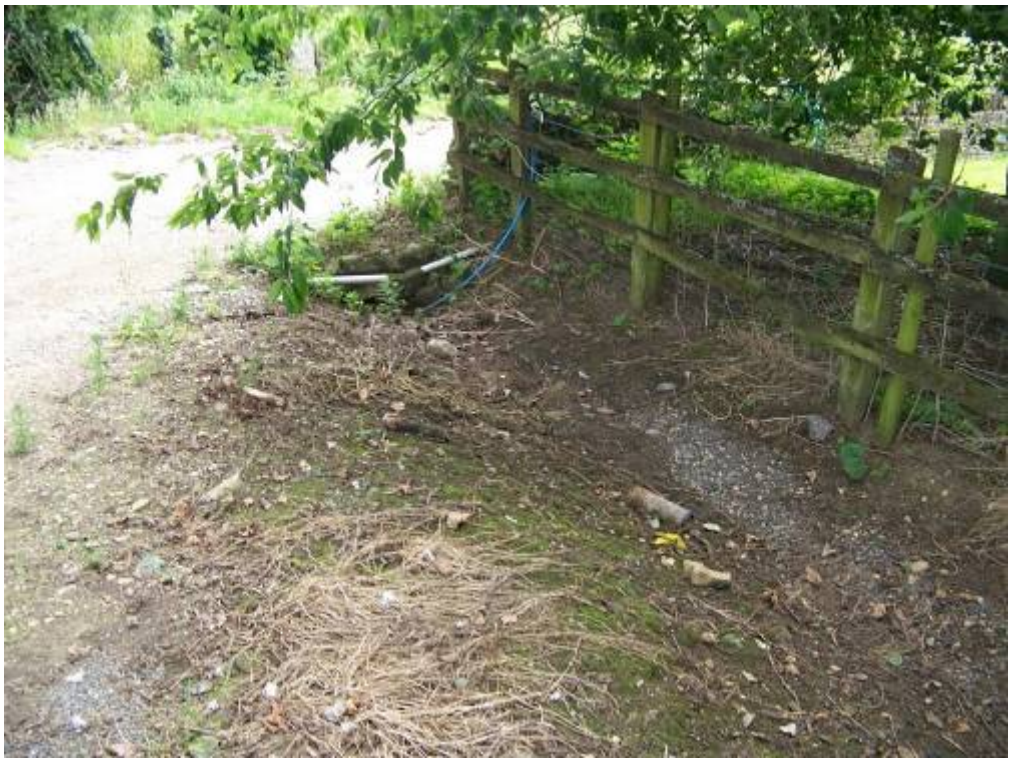
Photograph 12: Fields Drain towards Golden Lane



Photograph 13: Track draining towards Golden Lane



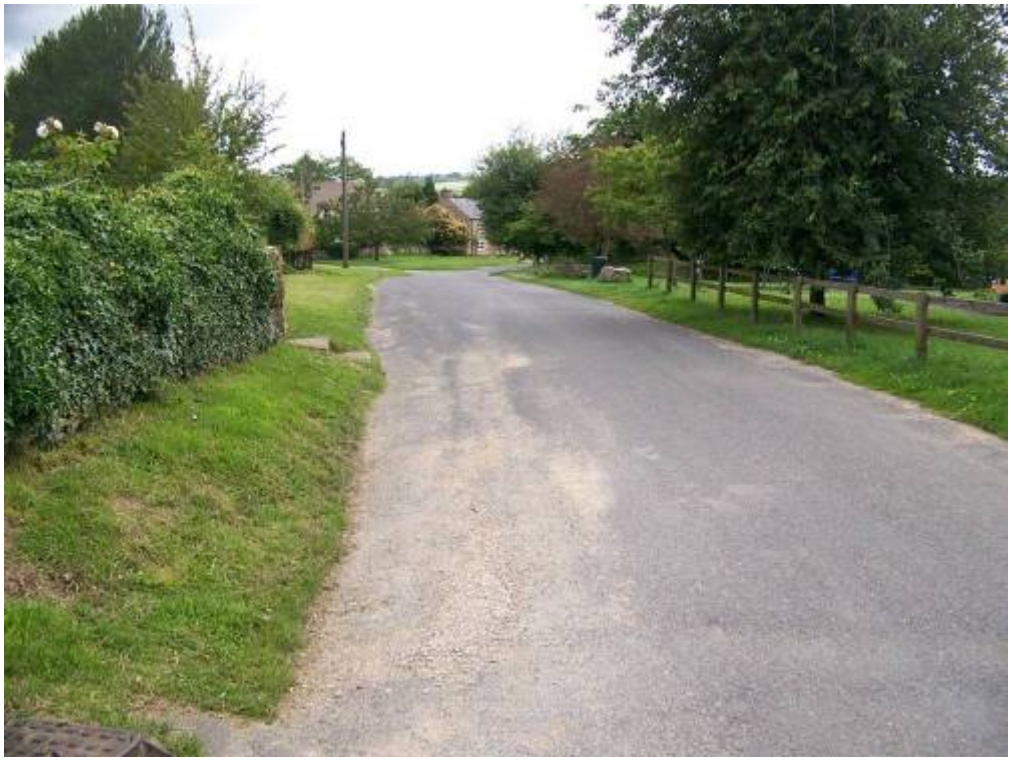
Photograph 14: Culvert at the bottom of fields adjacent to Golden Lane



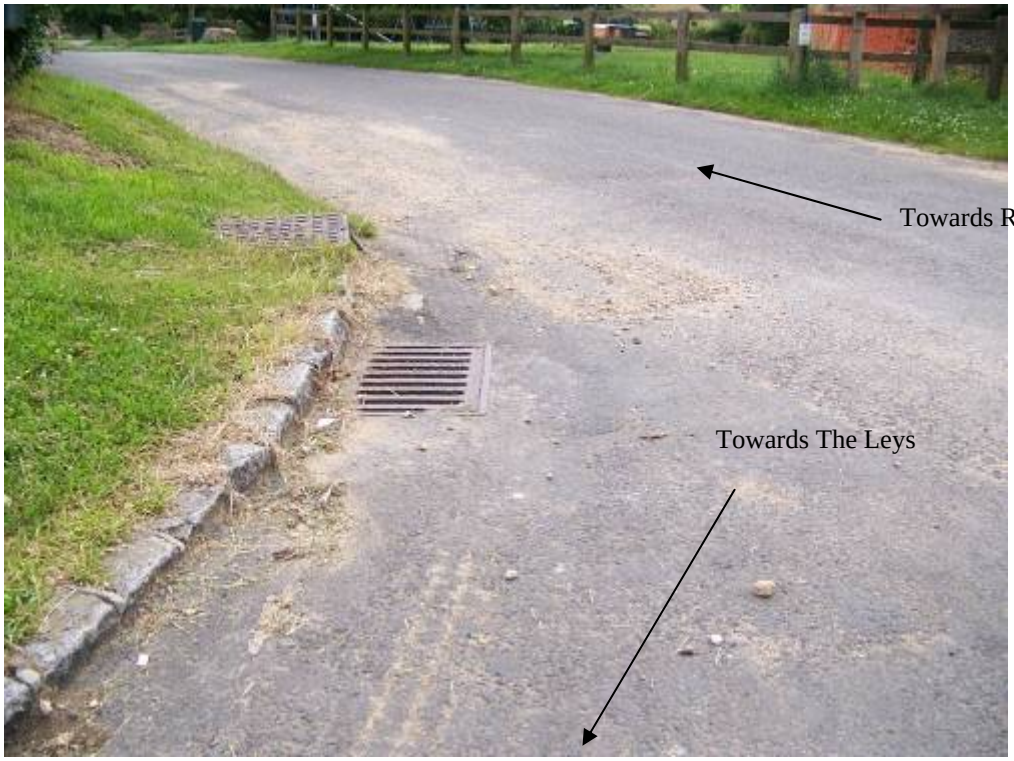
Photograph 15: Larger culvert running along Golden Lane in a north westerly direction

Area 3

Photograph 16: Looking from the Leys towards the cross roads of Golden Lane and Roses Lane. Water is channelled along the road. There is no road drainage.

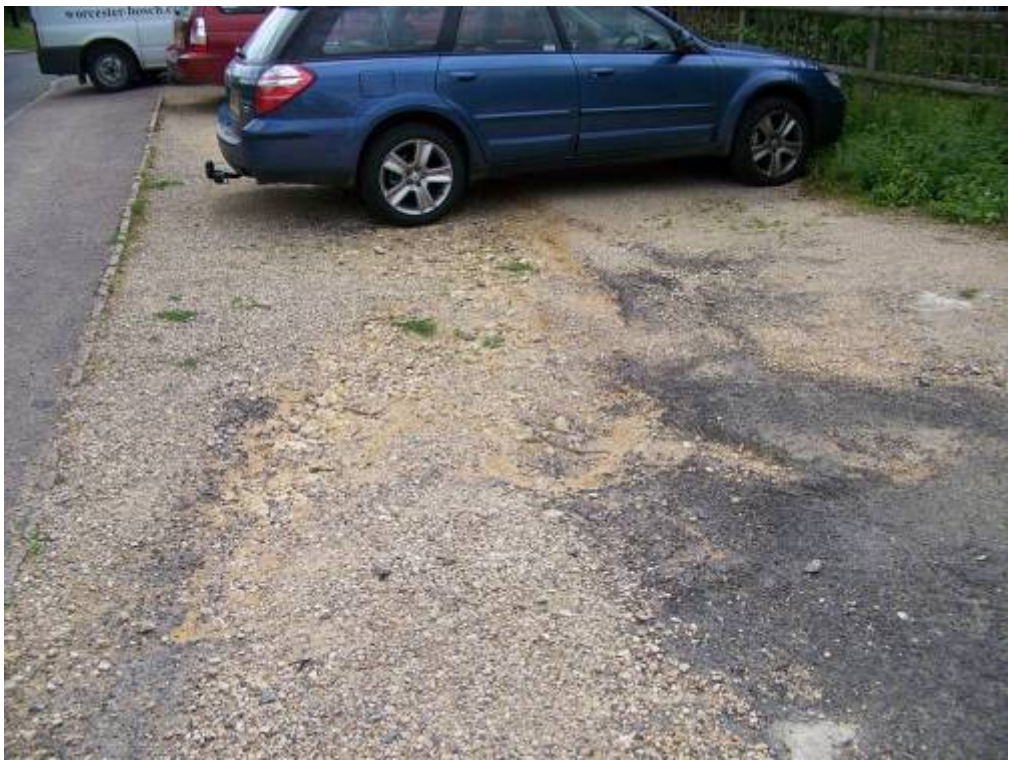


Photograph 17: Gully slightly raised on the corner of road which leads up to The Leys

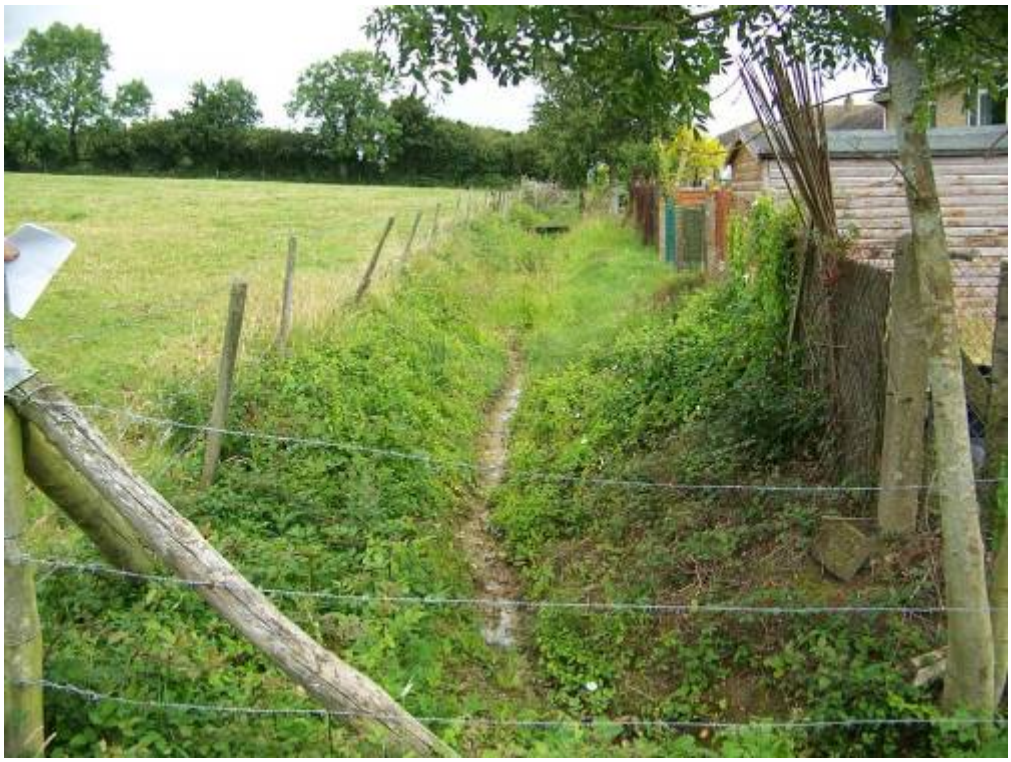


Photograph 18: Inspection Chamber in road by The Leys. In times of intense rainfall the cover is lifted due to the amount of water in the system.

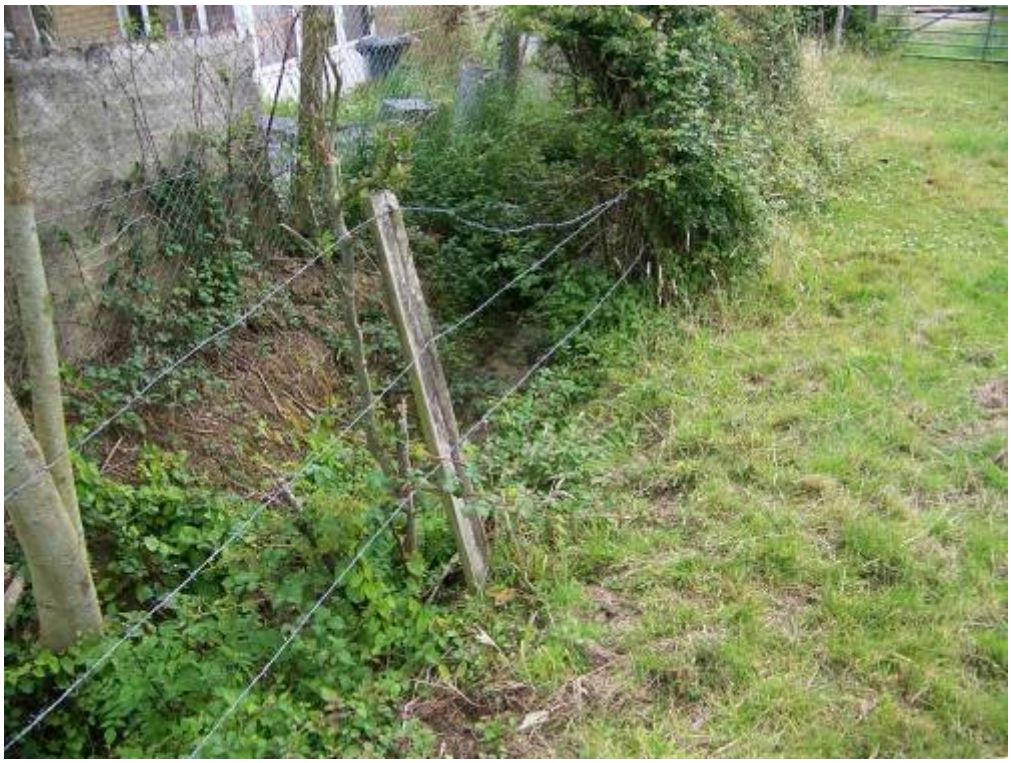
Photograph 19: Car Park at The Leys where water pools



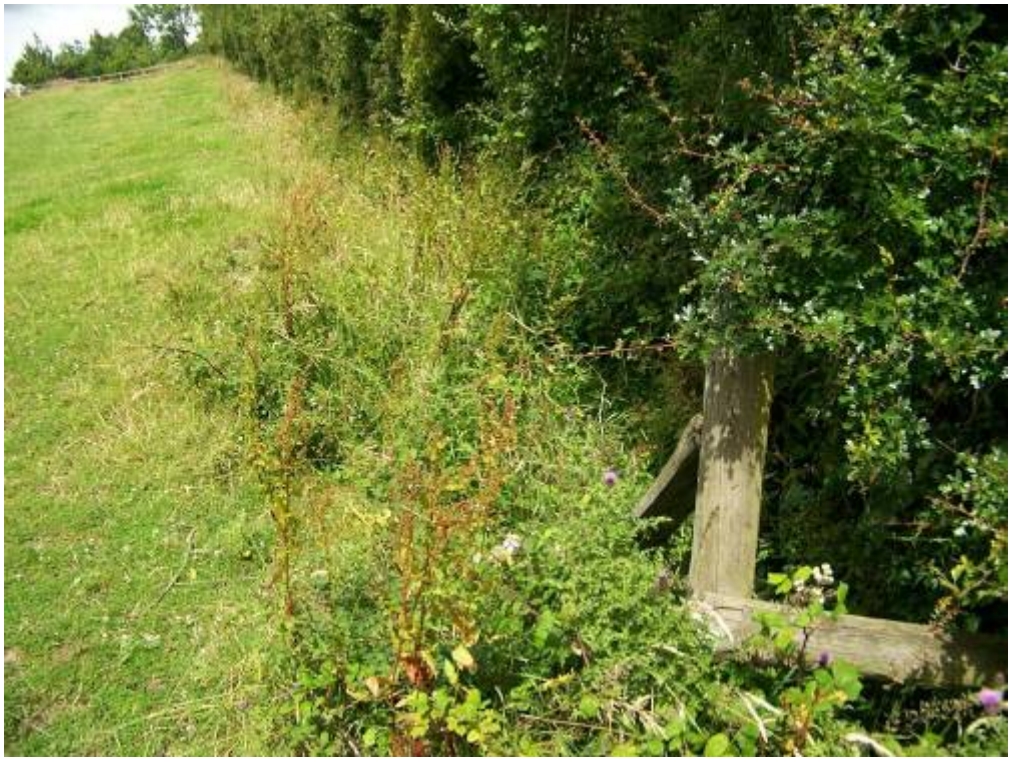
Photograph 20: Overgrown drainage ditch at the back of property



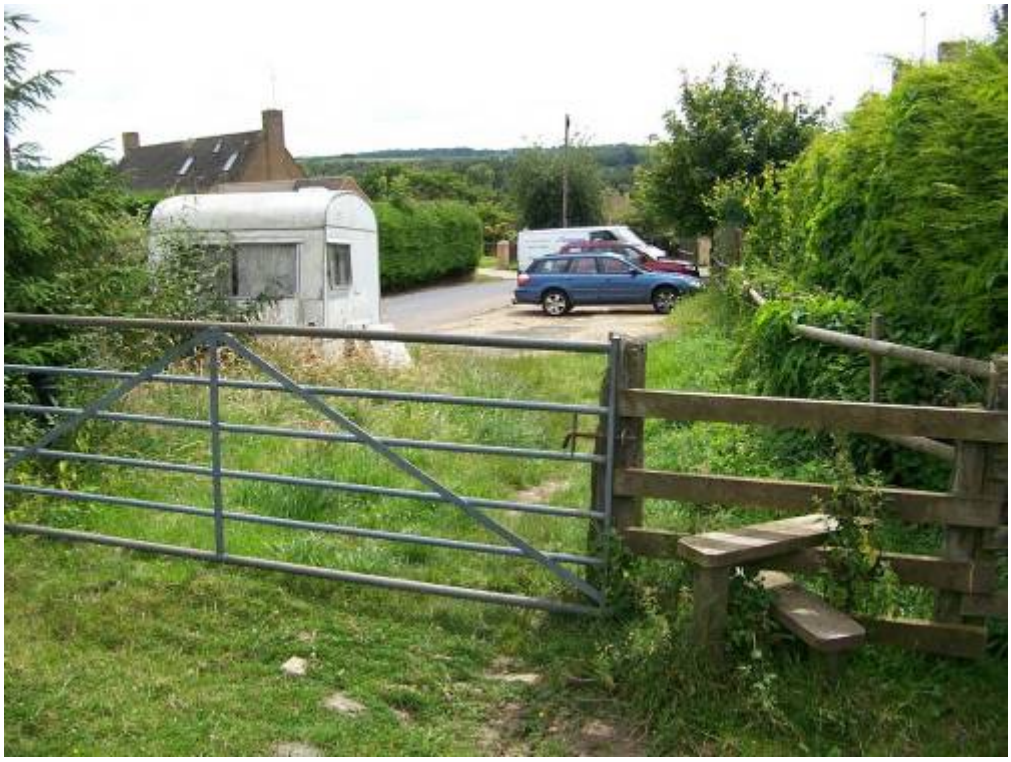
Photograph 21: Poorly maintained drainage ditch



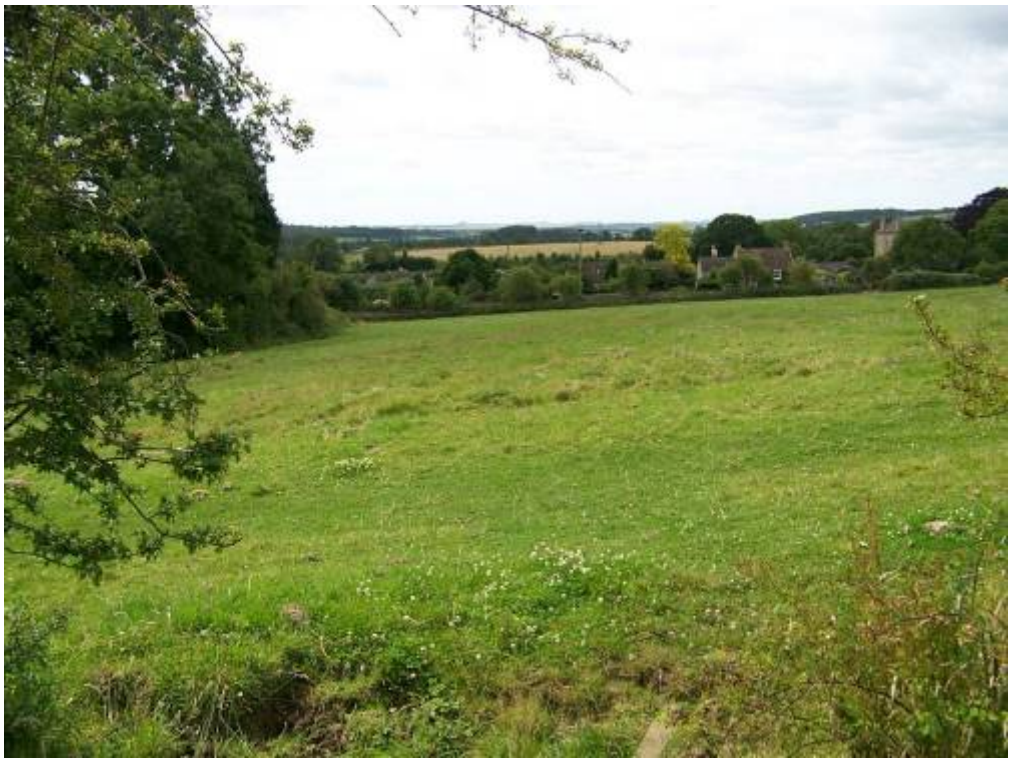
Photograph 22: Overgrown drainage ditch in field at the back of the Leys.



Photograph 23: Water comes off fields and drains through gateway towards The Leys

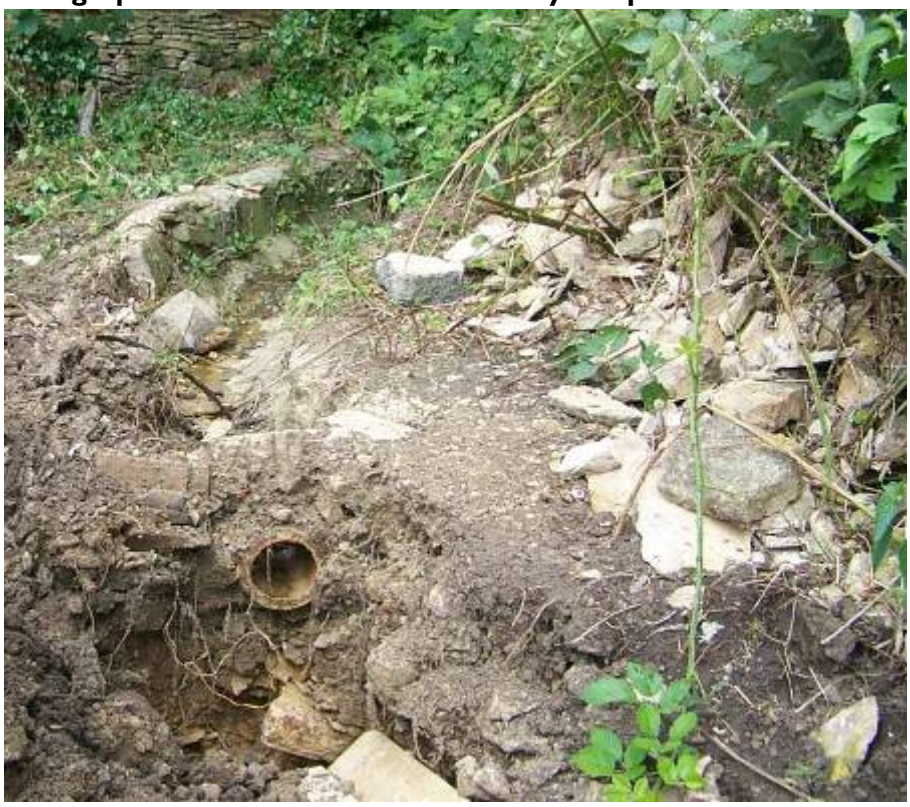


Photograph 24: Fields slope towards Salford. Runoff is directed towards The Leys.



Area 4

Photograph 25: Culverted watercourse by Chapel Lane



Photograph 26: Newly engineered watercourse. The 2 90 degree bends were removed, so that it now runs in a straight line behind the properties.