# Environment Agency – Southern Region
# Hampshire and Isle of Wight Area

# Winter 2002-2003 Flooding in Hampshire
# Thruxton

## June 2005

*Groundwater Flooding in Hampshire*

ENVIRONMENT AGENCY

# Environment Agency

## Winter 2002-2003 Flooding in Hampshire
## Thruxton

June 2005

## Contents Amendment Record

This report has been issued and amended as follows:

| Issue | Revision | Description | Date | Signed |
|---|---|---|---|---|
| 1 | 0 | Draft | June 2005 | CC |
| 2 | 0 | Final | August 2006 | IC |

# Executive Summary – Thruxton

- The Environment Agency has a supervisory duty for all flood defence matters and this duty should be used to influence other agencies into making appropriate flood defence improvements.
- The Environment Agency provides information on groundwater levels and the risk of flooding by email, on the Internet and through Floodline. Individual property owners can register with the Agency to receive such information direct.
- The Environment Agency and Hampshire County Council supports Village Flood Plans and Flood Action Groups, where communities have an active role in preparing for, and responding to flooding.
- One property in Thruxton suffered internal flooding and two additional properties suffered external flooding. Stanbury Road alongside The George Public House through Thruxton also suffered flooding.
- The flooding at Thruxton is attributed to a combination of the Pilhill Brook breaching its banks and surface water drainage being overwhelmed.
- The following actions are recommended:
    1. **The Environment Agency** should continue to review and enhance its groundwater flooding information service, and **Residents** affected by groundwater flooding should register to receive information by email, by contacting the Hampshire and Isle of Wight Area Office of the Environment Agency on 01962 764983.
    2. **Thruxton Parish Council** should work with **Hampshire County Council** Emergency Planning Unit to develop a Flood Plan so that the community is prepared for responding to future events.
    3. **Hampshire County Council, Test Valley Borough Council**, in conjunction with **Riparian owners**, should continue to review the maintenance and provision of the highway drainage system.

# Contents

## ACTION PLAN

Town/Parish: **THRUXTON**

| Action | Statutory Authority (Lead/*Assisting)* | Findings of Review | Any further actions required as a result of review |
|---|---|---|---|
| Residents should register with the Environment Agency to receive river flood warnings direct. | Environment Agency to liase with residents | | |
| Continue to review and enhance the groundwater flooding information service. | Environment Agency | • The review of the groundwater flooding information service has been completed. Following future groundwater flooding events the procedures will be reviewed further. | EA: Agree |
| Residents affected by groundwater flooding should register to receive information by e-mail by contacting the Environment Agency | Environment Agency to liase with Thruxton PC & residents | | |
| The Parish Council should work with Hampshire County Council Emergency Planning Unit (EPU) to develop a Village Flood Plan | Thruxton PC,<br>*Hampshire County Council (EPU)* | | *PC: Agree* |
| In liaison with the Environment Agency and local authority, the Parish Council should set up a Flood Action Group. The Group's activities should include a watercourse inspection programme to identify and assess land drainage concerns and resolve issues locally. | Thruxton PC,<br>*Environment Agency,*<br>*Test Valley Borough Council* | | PC: Agree |

| Action | Statutory Authority (Lead/*Assisting)* | Findings of Review | Any further actions required as a result of review |
|---|---|---|---|
| Continue to review the maintenance and provision of the highway drainage system. | Hampshire County Council, *Test Valley Borough Council, Thruxton Parish Council to liase with property owners* | | |
| Property owners may wish to review the need for installing sump pumps at individual properties | Thruxton PC to liase with property owners* | | |

* Riparian owners/property owners are responsible and will bear any costs associated with improvements.

# 1 Introduction

## *1.1 Background*

Following the flooding of 2000/01 the Environment Agency (the Agency) commissioned Halcrow Group Limited (Halcrow) to assess the flooding incidents, with a view to analysing the mechanisms of flooding in each case, and identifying and assessing possible mitigation works wherever these are likely to be feasible. 88 reports were published in August 2002 which covered the flooding in 106 villages. During the publication of these reports Action Plans were prepared for each parish affected by flooding, and the Action Plans were agreed with the appropriate authorities.

During the winter of 2002/03, well above average rainfall was experienced across Hampshire and the Isle of Wight. The Agency committed themselves to investigate the event, and review the Action Plans where appropriate.

The Environment Agency is investigating all flooding incidents drawn to the Agency's attention that entailed:

- flooding in cellar/basement used either for (a) storage or (b) living space;
- other internal flooding;
- flooding leading to the deposition of sewage in domestic gardens;
- problems with the wastewater drainage system;
- Flooding leading to financial loss for commercial enterprises (severed access, damaged stock or equipment etc).

This report details the flooding of winter 2002/03 at Thruxton.

# 2 Flooding at Thruxton

## *2.1 Location*

The small village of Thruxton lies some 6km west of Andover, in the upper catchment of the River Test at an elevation of approximately 75m above sea level (see Figure 1).

Local geology comprises predominantly Upper Chalk, although within the base of the valley, this is overlain by a thin drift of river and valley gravels.

The principal local watercourse is a tributary of the Pilhill Brook, which flows in a north easterly direction through Thruxton. The tributary is classified as non-main river. This means that the Environment Agency does not have permissive powers enabling it to carry out flood alleviation work there.

The Parish Council for Thruxton is Thruxton Parish Council and the local authority is Test Valley Borough Council. Hampshire County Council has powers that enable it to maintain all adopted roads and their associated drainage. The local authority has permissive powers that enable it to carry out flood prevention work on all watercourses that are not "main river". In addition, individual property owners are responsible for the drainage of their own land, and for dealing with and accepting the natural catchment flows from adjoining land. They must not permit an obstruction to the natural flow.

Further information on flood defence powers and responsibilities is included in Appendix A.

It is understood that the properties investigated in Thruxton are connected to the public sewerage system owned and operated by Southern Water. Whilst Southern Water maintains the sewers themselves, householders are responsible for maintaining the full length of the laterals by which their properties are connected to those sewers.

## *2.2 Winter 2002/03 Flooding*

The Agency is only aware of one property in Thruxton that was affected by flooding of the type being investigated by the Agency (see Section 1.1). Agency data and findings from our consultations with some local residents have been used to help prepare Table 1.

**Table 1 Avaliable details of flooding at Thruxton, Winter 2002/03**

| Location | Nature of flooding | Dates/duration | Sources of Information |
|---|---|---|---|
| Harcourt, Stanbury Road | Internal | Unknown | Agency questionnaire |

Harcourt suffered internal and external flooding. Unfortunately no further information is available regarding flooding at this property.

In addition to the internal flooding referred to above other properties were affected by flooding as described below:

- Frogis Land, Lambourne Way suffered external flooding to the land and garden belonging to the house. Residents report that floodwaters within the garden reached a depth of 12 inches (30cm) and were caused by surface water flowing into the garden from the highway. The occupant also reported that land drains in the surrounding area often become blocked resulting in floodwaters being unable to escape efficiently.
- May Tree Cottage suffered external flooding to the driveway caused by surface water flowing off the road into the driveway. Residents report that the floodwaters within the driveway reached a depth of 3 inches (8cm).

Stanbury Road and Lambourne Close both suffered flooding during winter 2002/03. Flooding on Stanbury Road occurred as a result of the Pilhill Brook overtopping its banks onto the road. Water then flowed down hill via Lambourne Close before making its way into Mullens Pond Water meadows. The situation on both these roads is made worse by land drainage becoming overwhelmed causing surface water run-off to inundate houses and driveways.

Road flooding can give rise to: -

- Safety risks where vehicles come upon unexpected flooded areas at speed
- Damage to verges, mud being deposited onto roads and consequent increased risk of minor accidents, where closures cause traffic to divert along unsuitable and / or narrow alternative routes.
- Costs and delays associated with detours around closed sections of road, particularly where diversion signings are inadequate.

# 3 Hydrological Context

## *3.1 Background*

In Hampshire, groundwater levels in the Chalk rise and fall on an annual cycle. Peak levels are usually around March and the lowest levels are generally recorded around October. The extent to which groundwater levels rise is a combination of the rainfall falling in the area and the local characteristics of the Chalk.

Groundwater flooding is normally caused by prolonged periods of above average rainfall falling in the autumn and winter months. Although above average levels in the summer months may heighten the risk of flooding in the subsequent winter, it is the winter rainfall which determines if flooding will occur.

This short report will explain the rainfall conditions leading to flooding in 2002/3 and will show how the river flows and groundwater levels responded to this rainfall. The conditions will also be compared to those seen in 2000/01.

## *3.2 Rainfall Data*

Rainfall for the area is recorded at Andover (NGR SU 3680 4670). Figures 3 and 4 show that rainfall was above average throughout the winters of 2000/01 and 2002/03. In 2000/01 the rainfall was consistently above average between September and April. In 2002 rainfall was only above average in October, November and December with particularly heavy rainfall in November.

When this information is viewed cumulatively in figure 5 it is apparent that by the end of March rainfall had been less in 2002/03 than in 2000/01. The particularly heavy rainfall in late 2002 meant that the cumulative rainfall totals were generally higher in 2002/03 up to February.

## *3.3 River Flows*

River flow has been measured at Fullerton (NGR SU 3789 3923) since 1981 with regular current meter gaugings in order to calibrate the data (see figure 6). Figure 7 compares the flow recorded in 2000/01 with 2002/03. In general flows were higher in 2000/01 however during the month of January flows were higher in 2002/03 due to higher cumulative rainfall.

Current meter gaugings are also carried out on a monthly basis at Upper Clatford. Figure 8 shows a comparison between flows recorded in 2000/01 and 2002/03. The spot flows are broadly similar and reflect flows recorded at Fullerton. The flow in 2000/01 was generally greater than in 2002/03.

On 22nd November 2003 the Anton was flowing through Penton Grafton and rising near Ramridge House. The Pilhill Brook was rising in Kimpton. By the end of December the Anton was flowing from Biddesden and from Hatherden.

The Pilhill Brook was rising from Great Shoddesden and was flowing through Kimpton.

### *3.4 Groundwater Data*

The telemetry borehole for this area is Clanville Lodge Gate (NGR SU 32224902). Figure 9 shows actual groundwater levels compared with average levels from 1999 to 2003. It is clear from the hydrograph that levels were significantly above average in the winters of 2000/01 and 2002/03.

When groundwater levels are above 87.2 mAOD at Clanville Lodge Gate flooding is expected at Appleshaw with cellar flooding at Hatherden. Above 88.2 mAOD flooding is also expected at Penton Mewsey and Kimpton. Figure 10 shows a comparison between groundwater levels in 2000/01 and 2002/03. It appears that flooding was more prolonged in 2000/01.

Clanville Lodge Gate can be used as a guide for the villages in the Anton valley. Other groundwater monitoring points are used for more information on specific areas.

In general the recorded groundwater levels from the flooded villages are similar in 2000/01 and 2002/03. In these cases the water level reaches a certain point and cannot get any higher due to the water reaching an outlet to the surface. Clanville Lodge Gate is a good indicator of changing groundwater conditions in the Anton Valley as it does not “top out”.

# 4 Scope for Mitigation

***Introduction***

An action plan is included towards the front of this report.

*4.1.1 Flooding Information*

The Agency provides a flood warning service to Parish Councils, residents' associations and individual property owners who have registered to receive flood warnings by telephone, fax or pager within designated areas including Thruxton that are predominantly adjacent to main river. Whilst groundwater flooding is not presently covered by a formal flood warning service, the Environment Agency provides information on groundwater levels and the risk of flooding by email, on the internet and through Floodline. Residents can contact Floodline on 0845 988 1188 and use the Quick Dial Code 01226 to find out the latest groundwater information. Details are also available on the Environment Agency web site at www.environment-agency.gov.uk. Residents can also register to receive the information by e-mail, by contacting the Hampshire and Isle of Wight Area Office of the Environment Agency on 01962 764983.

Such information is very useful in enabling people to prepare adequately, provided they receive and react to it in good time. Property owners can receive river flood warnings direct to their home or work by phone, fax or pager. However people have to request or 'opt in' to receive warnings, and despite successive flood awareness campaigns since 1996, only 1 in 4 properties at risk have registered to receive flood warnings. In addition to the automatic receipt of warnings, residents can call Floodline on 0845 988 1188 and use the quick dial code 0122211 for the Upper Test, which includes the Pilhill Brook for the latest information.

In addition to residents taking full advantage of the current flood warning system and groundwater flooding information service, the Agency should continue to review and enhance it. These measures may be of value in reducing any adverse impacts at the properties that suffered groundwater-related internal flooding in Thruxton, should similar incidents occur in the future.

#### *4.1.2 Village Flood Plans*

Thruxton Parish Council should work with Hampshire County Council Emergency Planning Unit to develop a Village Flood Plan for Thruxton, so that the community is prepared to respond to future events. The Plans should include parish-specific routine actions to reduce the risk of flooding within the village, as well as guidance on how to respond to floods effectively – for example, best local source for sandbags etc. A template for the Plans can be obtained from the Hampshire County Council Emergency Planning Unit, who are also able to support Plan preparation. As part of that process, Thruxton Parish Council, in conjunction with Riparian owners, Test Valley Borough Council and Hampshire County Council could usefully review the provision of surface water drainage to reduce road flooding. The review should also confirm ownership of roadside ditches, where uncertainties exist.

#### *4.1.3 Pumping of Flood Water*

Individual property owners may also wish to consider making provision to improve surface water drainage in the immediate vicinity of their houses. Where flooding is associated with high local groundwater levels, pumping may be effective in solving the problem (for example, from a sump constructed beneath floor level within or immediately outside the house). Groundwater pumping from cellars may similarly be effective in maintaining flood levels below the ground floor; however, lowering of the water table within the property in this way should be approached with caution and kept to a minimum relative to surrounding groundwater levels. There is a risk that cellar walls could be damaged if the water level (pressure) outside exceeds that on the inside by more than a small amount.

Surface drainage improvements or sump/cellar pumping would require an effective water disposal route and, if the discharge is to a main river, consent from the Environment Agency (see Appendix A). Also discharge should not be disposed of via the public sewerage system, as this may cause further problems elsewhere in the system. Even with an effective disposal route, such measures are not always successful in controlling flooding.

### ***4.2 Actions to Date***

#### *4.2.1 Land Drainage*

Since the flooding of winter 2002/03 Hampshire County Council has applied for a special maintenance bid, which will be used to build a brick faced retaining wall along a section of the Pilhill Brook. Works will be subject to the 2004/05 special maintenance bid.

In March 2003 the 2003 Flood Defence Funding Review was announced. A number of changes were announced including that the Environment Agency would have responsibility for all rivers creating greatest flood risk, sometimes known as critical ordinary watercourses. The Pilhill Brook through Thruxton

was redesignated in November 2004 to main river, and therefore the Environment Agency has powers to maintain and improve the watercourse for the efficient passage of flood flow and the management of water levels.

# 5 Next Steps - Thruxton

In light of this review of the 2002-2003 flooding in the village of Thruxton, the following actions are recommended:

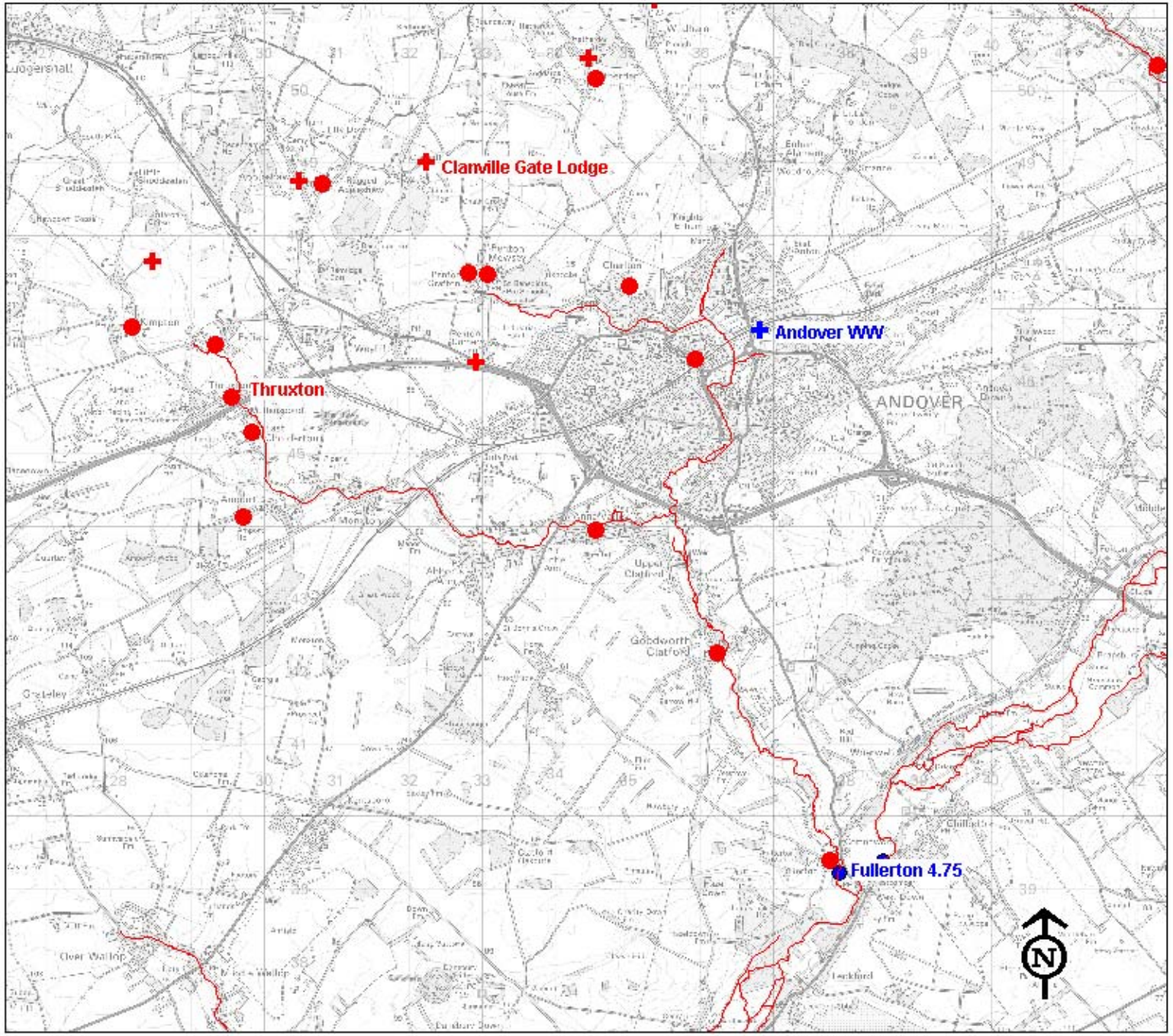
1. **The Environment Agency** should continue to review and enhance its groundwater flooding information service, and **Residents** affected by groundwater flooding should register to receive information by e-mail, by contacting the Hampshire and Isle of Wight Area Office of the Environment Agency on 01962 764983.

2. **Thruxton Parish Council** should work with **Hampshire County Council** Emergency Planning Unit to develop a Flood Plan so that the community is prepared for responding to future events.

3. **Hampshire County Council, Test Valley Borough Council**, in conjunction with **Riparian owners**, should continue to review the maintenance and provision of the highway drainage system.

## Table 2: Potential Mitigation Measures - Thruxton

| Location | Flooding Type | Flooding Cause | Approximate Frequency Of Occurrence | Potential Mitigation Measures | Remarks | Powers to Implement |
|---|---|---|---|---|---|---|
| Harcourt, Stanbury Road | Internal Flooding | River overtopping | Unknown | Enhancement of groundwater information service<br><br>Construction of retaining wall along Stanbury Road | See text | Environment Agency to enhance service and property owners to register to receive information<br><br>Hampshire County Council |




ENVIRONMENT AGENCY

Hampshire & Isle of Wight Office
Colvedene Court
Wessex Way
Colden Common
WINCHESTER
SO21 1WP

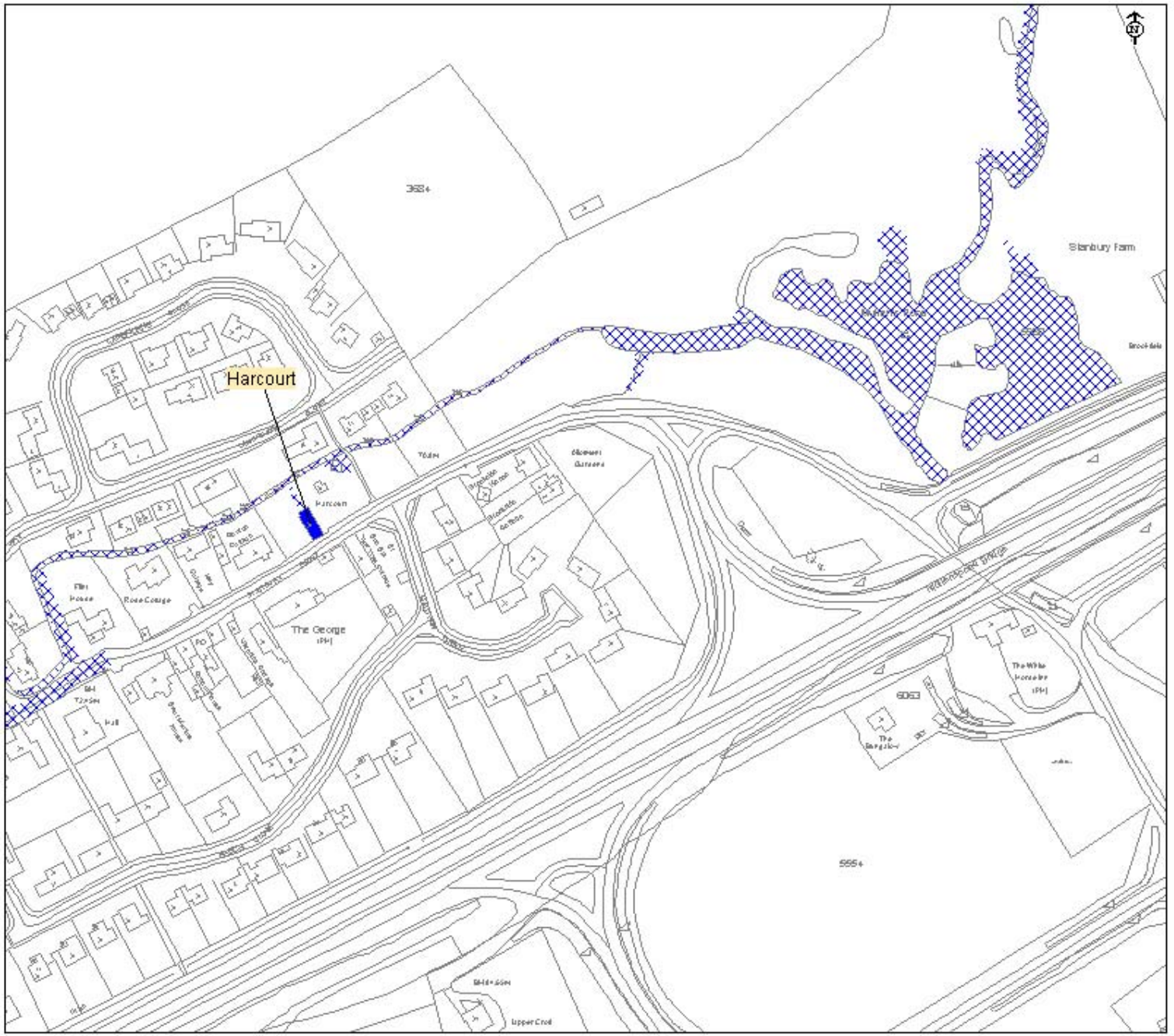
Tel: 08708 506506
Fax: 01962 841573

# Figure 1: Location Plan, Thruxton

Date: February 2005

Legend:

- Location of flooding
- Main River
- Rain gauge
- River gauging station
- Observation borehole

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Colvedene Court
Wessex Way
Colden Common
WINCHESTER
SO21 1WP

Tel: 08708 506506
Fax: 01962 841573

# Figure 2: Flooding extent in Thruxton, Einter 2002/03

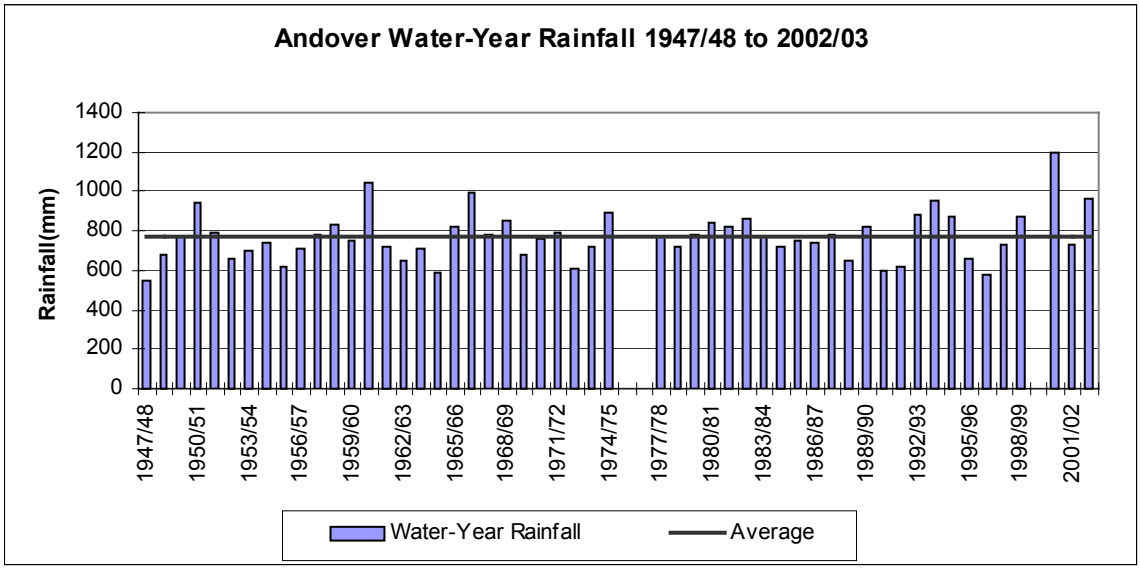
Date: 05/05/2005

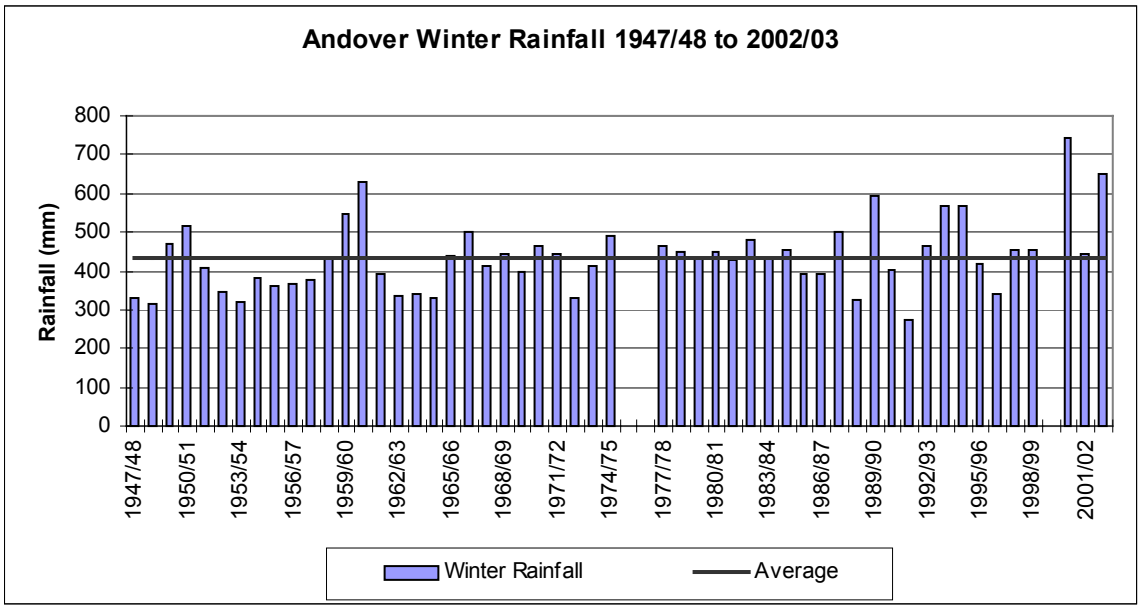
Scale: Basemapping 1:1250

Legend:

- Location of Flood Water
- Internal Flooding

## Figure 3: Andover Water Works Rainfall Data, 1947 - 2003



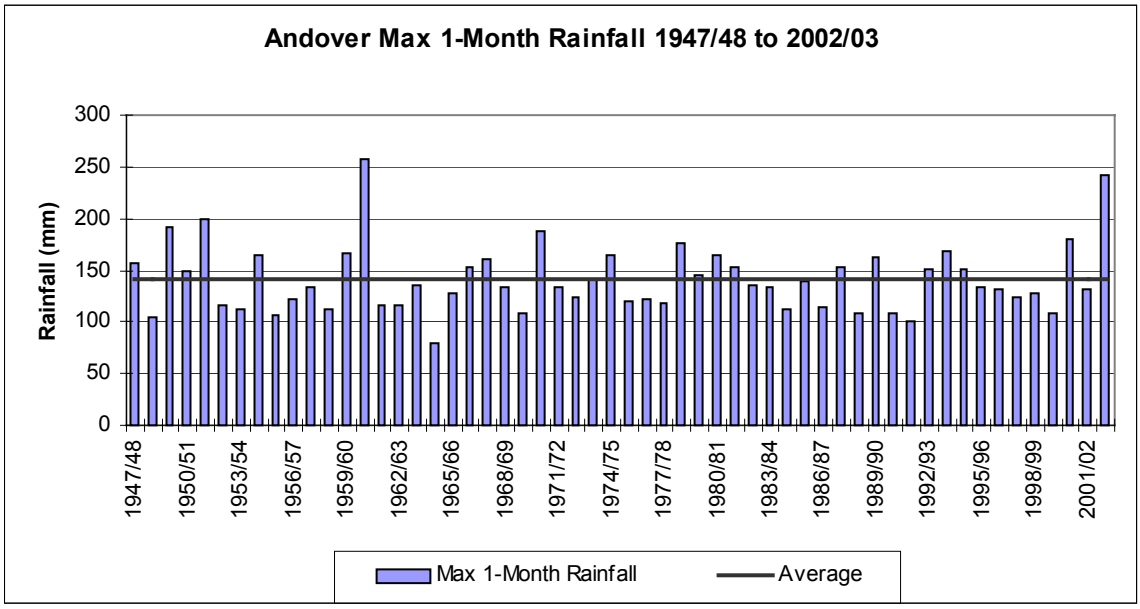



**Figure 4: Andover monthly rainfall data, comparison between 2000/01 and 2002/03**

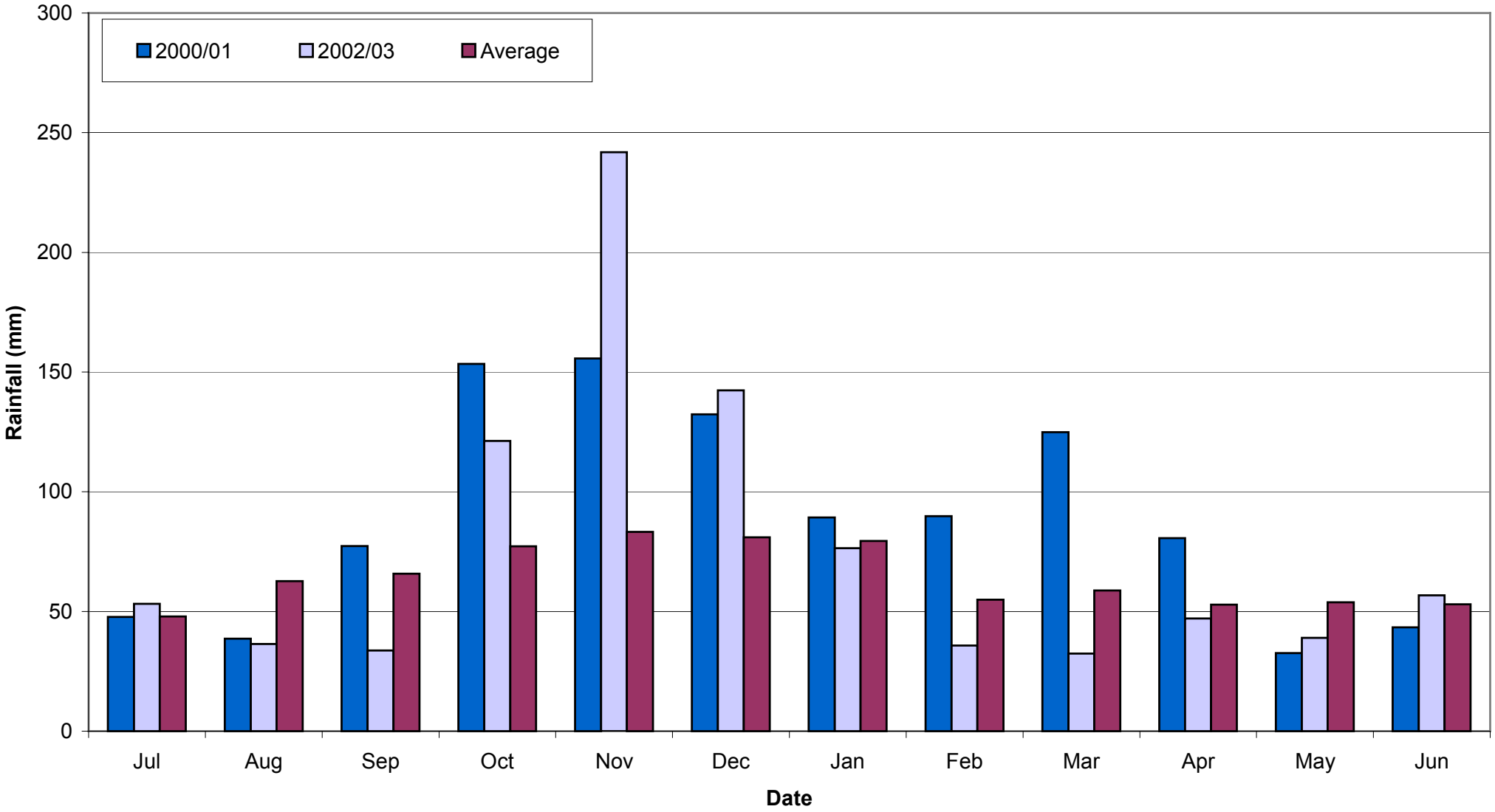


**Figure 5: Andover Water Works cumulative rainfall data, winter 2000/01 & 2002/03**

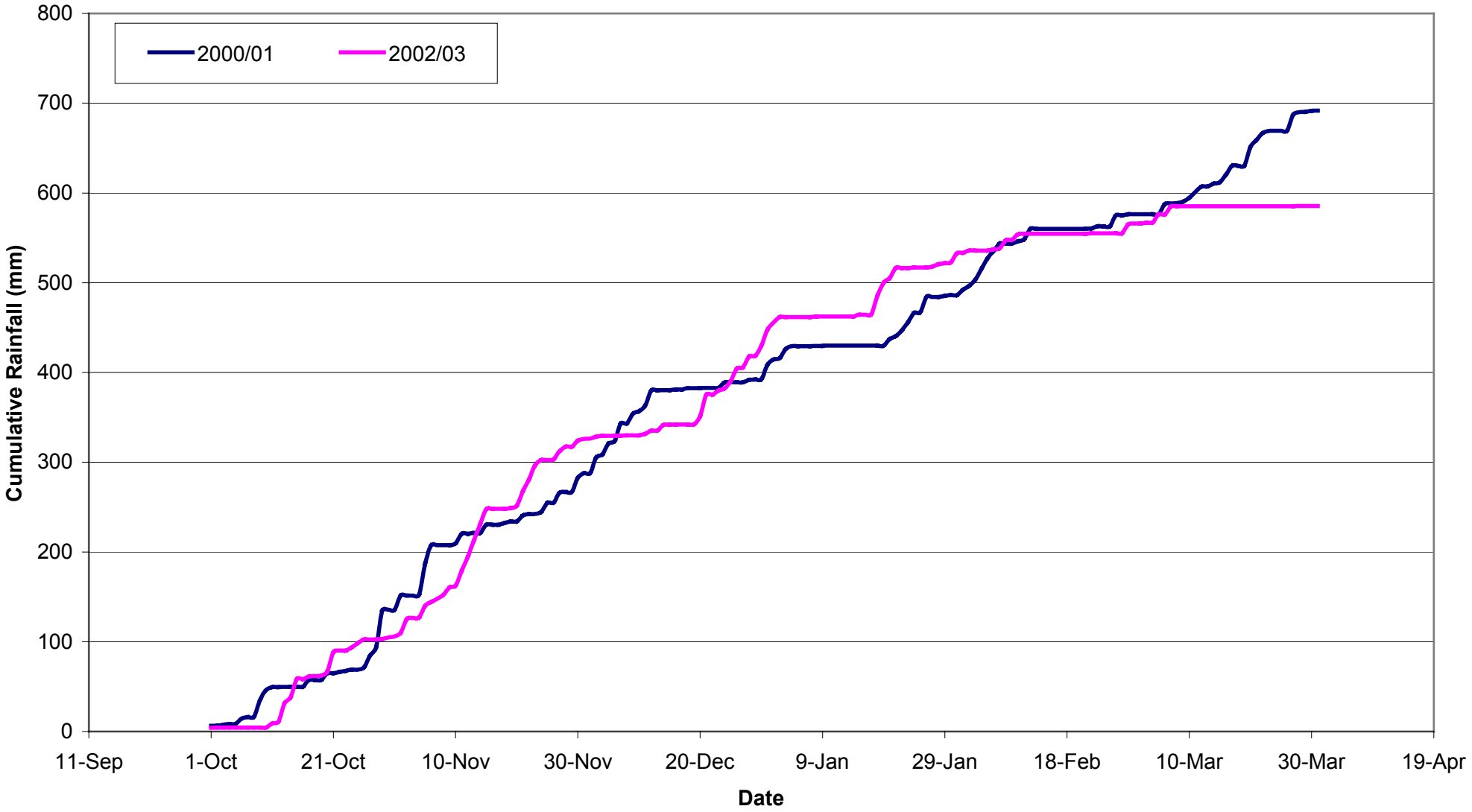


**Figure 6: River Anton at Fullerton, 1975 - 2002 flows**

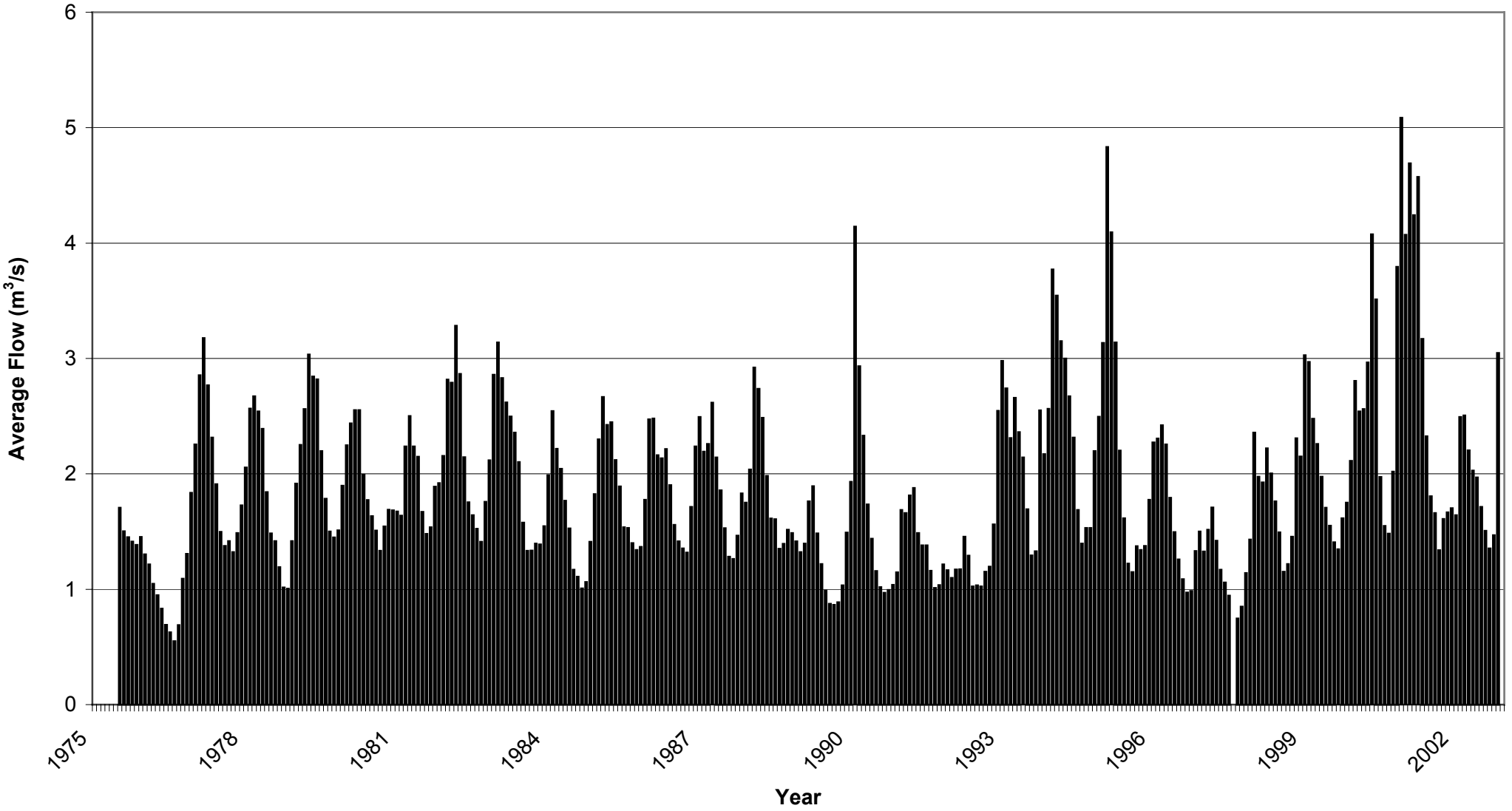


**Figure 7: River Anton at Fullerton, comparison between 2000/01 and 2002/03 flows**

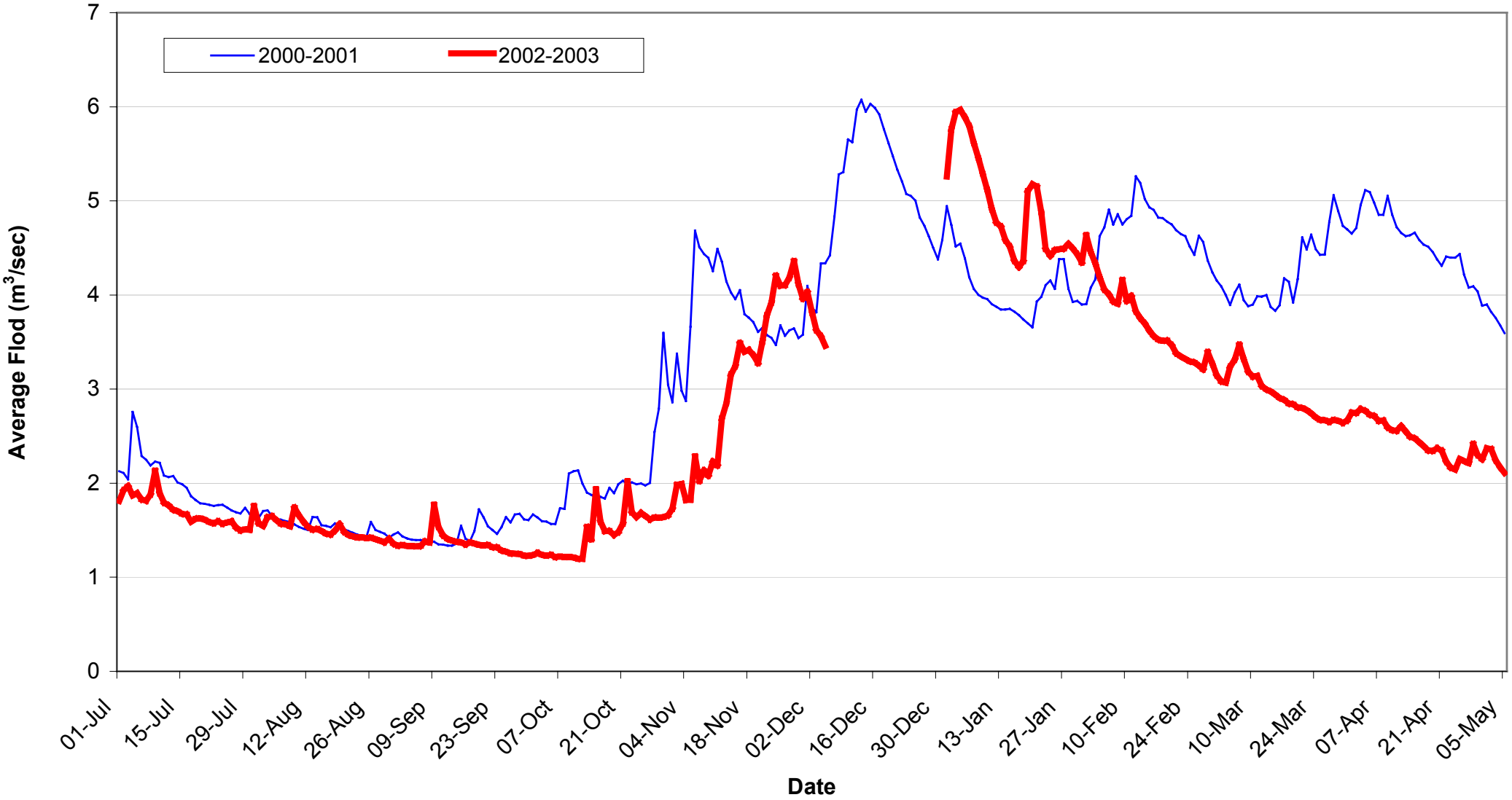


**Figure 8: River Anton at Upper Clatford, comparison between 2000/01 and 2002/03 flows**

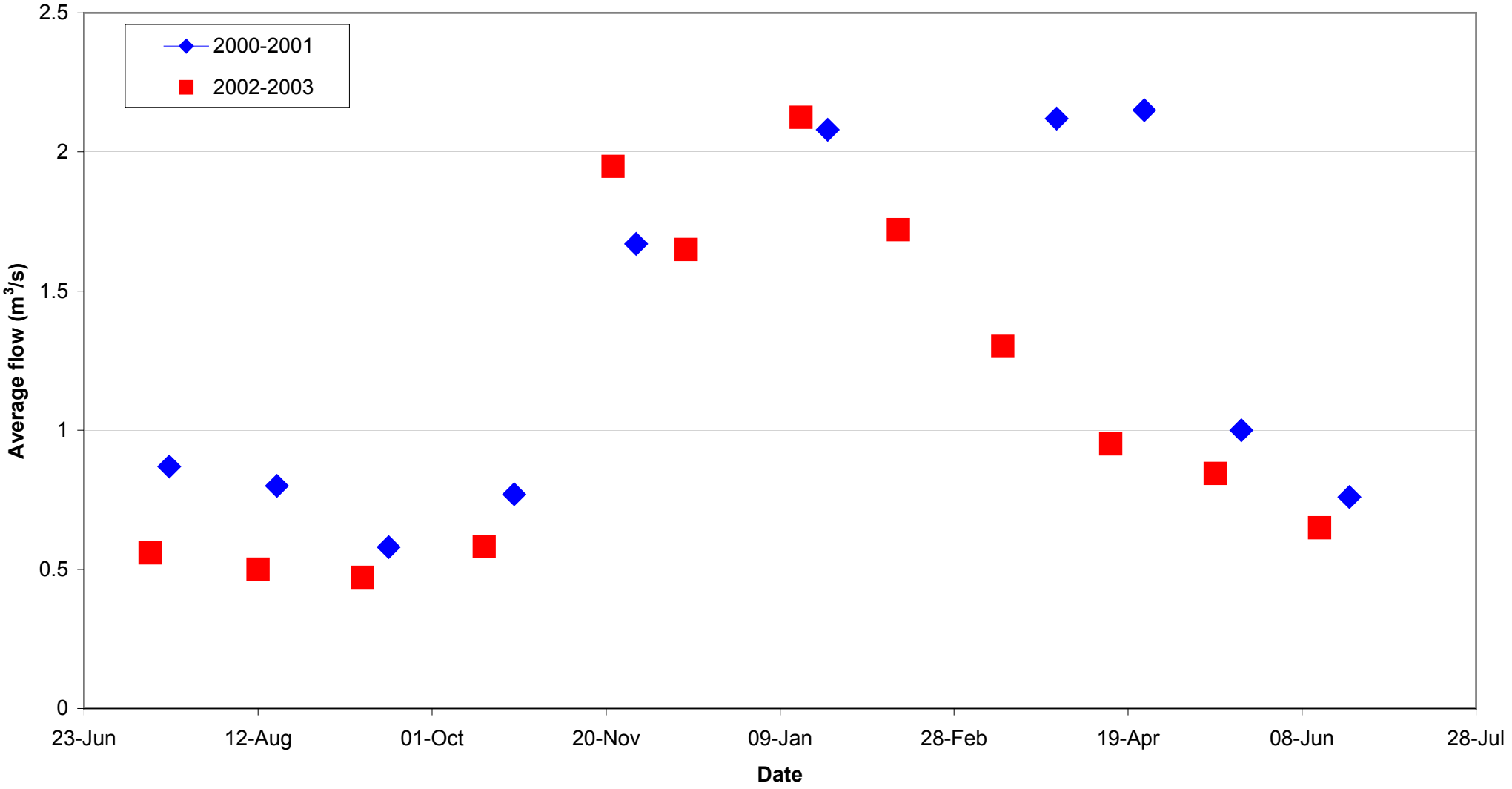


**Figure 9: Well hydrograph for Clanville Gate Lodge, 1998 - 2003**

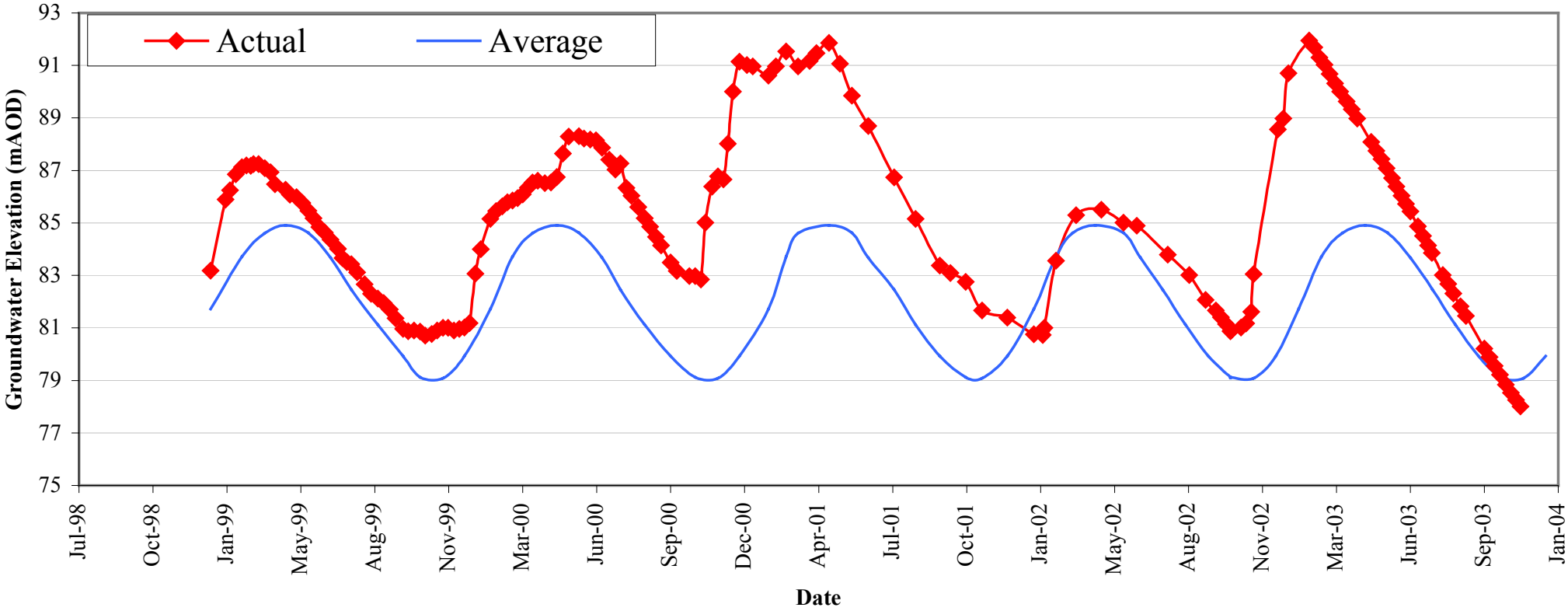


**Figure 10: Well hydrograph for Clanville Gate Lodge, comparison between 2000/01 & 2002/03**