Flooding
Report to Hurstbourne Tarrant Parish Council March - 2014

Introduction. This report is intended to generate discussion on how we in Hurstbourne Tarrant can mitigate flooding in the future. A number of residents have contributed their views and advice has been taken from expert sources and from articles in the New Civil Engineer magazine.

Flood Plain. It must be emphasised that Hurstbourne Tarrant is not on a flood plain and is not subject to flooding. Some houses and The George & Dragon were flooded in 2014 partly as the result of blocked culverts, ditches and road drains, but also due to the unusually heavy and sustained rainfall (exceedance). Annual maintenance of culverts, ditches and road drains should prevent many of their problems in future, but there may be other relatively cost-effective measures which could assist, such as realignment of kerbs.

Hurstbourne Tarrant Water Catchment area. Hurstbourne Tarrant is in a water-catchment basin. All the rain which falls within the basin eventually flows through the village.
The edges of the basin extend from the top of Hurstbourne Hill to Pill Heath, Conholt Hill, along the Causeway and Roman Road, North of Oxenwood and Buttermere, along Inkpen Hill, along Wayfarer's Walk, branching off to Faccombe to Essebourne Manor and along the high ground down to The Square.

Rain falling in the separate catchment area between Wayfarer's Way to the East and Faccombe to the West joins the Bourne just South of Hurstbourne Tarrant.

Water Catchment Management Plan. To ensure that the flow and holding of water within the catchment area is fully understood, we have been advised that we need to commission a Water Catchment Management Plan showing by ground modelling. A number of agencies may be able to provide one (at a cost) or it may be possible to obtain one as a project for a hydrology study by a university. Increased sophistication of new flood models are making it easier to identify which properties are at risk rather than general areas. Our experience in 2014 has given us important modelling data which must be recorded and passed on.
It is necessary to understand how the groundwater interacts with the surface and how it flows. It is a combination of how likely the water table is to reach the surface and the amplitude of fluctuation. Some shallow ground may get wet, but due to the permeability off the ground there will be little flow.

Development of a strategy to deal with flooding. It may be possible to ensure that the flooding in Hurstbourne Tarrant does not recur provided a holistic approach is taken. Initially the strategy should consider the cost-benefit of all solutions to every part of the village. The plans may then be extended to other communities both above and below HbT in the water catchment area. The cost of any solution involving other bodies, such as the Environment Agency (EA), HCC or Highways, needs to be balanced against any perceived benefits in financial terms. We will need to identify the value of what we are protecting by each solution. Infrastructure items are of particular value. We need to bear in mind the possible costs and benefits of making repairs to damage caused by flooding to:

a. Road surfaces on the A343, B3046 and Church Street;
b. Drains and culverts and the cost/benefit of their enlargement;
c. All bridges (foot and vehicle) and the cost of raising/widening them where appropriate;

d. The pavements. The pavement in Newbury Road will need complete replacement from the bus shelter to The Square. The pavement in Church Street is still under water and cannot yet be inspected.
e. The Primary School;
f. The St Peter's Church;
g. The electricity substation, which may need to be raised;
h. Public buildings, especially those contributing to the community, such as The George and Dragon public house, The British Legion Club and, in the future, the planned Community Centre.
i. Local businesses.

Historical Data. It may prove helpful to any study for historical data of the wells and water courses to be gathered from local knowledge and any maps, so that the effects of any subsequent developments can be seen. Mr Trevor Wheeler has some local knowledge of where fields were allowed to flood in the past when a "drowner" was employed to close "hatches" to divert flood water onto water meadows. On the attached 1910 map gravel pits are shown on The Green. These appear to have been much larger and to have been filled in. From the website:
http://www.bbc.co.uk/history/domesday/dblock/GB-436000-153000/page/4
The River Swift used to be much deeper than it is now, and was used as the water supply for the village. Most of the houses along the valley still have wells in their gardens, and although some wells have been boarded up, others feature as garden ornaments. There are old photographs of floods in Church Street, and in the 19th century 2 people and a pig were drowned in the river.
A pumping station has been built between Ibthorpe and Upton which pumps water into a covered reservoir on Pill Heath. This supplements the Andover water supply and reduces the flow of the River Swift to below flood level. Many of the valley houses, and the church, had walls as protection against flood water.

Acts of Parliament.
a. The Water Resources Act 1991 regulates water resources, water quality and pollution, flood defence, the general structure for the management of water resources, explains the standards expected for controlled waters; and what is considered as water pollution and provides information on mitigation through flood defence.
b. The Land Drainage Act 1991 and 1994 requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The riparian owner must accept the natural flow from upstream but need not carry out work to cater for increased flows resulting from some types of works carried out upstream, for example a new housing development. If a riparian owner fails to carry out his responsibilities under the Land Drainage Act, or if anyone else causes a watercourse to become blocked or obstructed, the County and District Councils have powers of enforcement by serving a notice under the Act. If this is ignored, the Council concerned may carry out the necessary itself and then recharge the person responsible for the full cost incurred. The District Council normally implements these powers but the County Council will deal with problems that affect the highway. The person responsible may also be prosecuted for nuisance under the Public Health Act 1936.
c. As riparian owners have responsibility for maintaining the water courses through their property, we need to examine deeds to ensure that riparian owners are aware of

their responsibilities and are abiding by them. Residents who have impeded the stream bed, which may have been dry for many years, may need to remove impediments to prevent flooding of other properties.

d. The Flood Management & Water Act 2010 states that local authorities are responsible for groundwater and surface water flood risk, while the Environment Agency handles the effect of river flooding. Surface water occurs when rainfall is too heavy for the existing drainage system to cope. Groundwater flooding occurs when subsurface water emerges when the aquifers are full or because high river levels drive water through near surface soil. Some property may be at risk from both forms of flooding.

Public Health & Safety. A note should be taken of where the failure to implement a solution may be a danger to life or impact health:

a. There was a smell of diesel in the floodwater.
b. A rise in haemorrhaging diarrhoea in dogs, probably through bacteria carried in the polluted flood water has been reported.
c. Reports of sewage in some of the inflow into the village.
d. The Bourne River has risen significantly and is flowing fast. The school footbridge has been closed off as a precaution and trellis has been erected alongside the school garden to prevent children climbing over and falling in.

Rainfall in 2014. This year we have seen significant flooding as a consequence of very heavy rain-fall exceeding the capacity of the drains, culverts, the River Swift and The Bourne. Water needs to be able to flow freely, but where it exceeds the capacity of areas downstream it needs to be held-back until it can be released without causing damage. Left to its own devices, surface water that cannot get into the road drain system, or overflows from it, will simply follow the path of least resistance until it reaches somewhere to settle.

1. In the Daily Telegraph, it was suggested that land owners and farmers should consider ways to manage their land to retain water. In this area compacted clay soil may cause heavy rain to run off too quickly to be absorbed into the aquifers and may carry with it topsoil to fill drainage ditches, less-compacted soil may assist water-retention further "up-stream". It might be useful to invite local farmers to discuss this as a way of helping the community.
2. Culvert in Newbury Road. It would appear that a blockage somewhere in the drain either in Church Street or Newbury Road caused the culvert near Dean Rise to burst. Debris from the breakage may have reduced its capacity further. Water pressure (head) is considerable as there is a significant drop between the garage and The Square. It appears to have cleared the drain in Newbury Street as the volume of water entering the pipe in The Green, which is at full capacity, and, according to Highways, equals the volume of water flowing out measured at the manhole in The Square.

   It appears that the culvert from The Green, which was installed in 1961-62, merges with the road drains and takes the surface water from Newbury Road, the water from The Green and the presumably road drains in Dene Rise/The Crescent. Highways stated that the volume of water entering the pipe in The Green equals the volume of water flowing out measured at the manhole in The Square and there are no obstructions; however their statement did not take into account additional inflow pipes from Dene Rise/The Crescent. It is clear therefore that either their figures are in error or there is a significant leak elsewhere as the downstream capacity is insufficient to take both or there are obstructions in the drainpipe.

   In 1988, when Netherton Valley last flooded, the Newbury Road drain coped more effectively. Since then, we've seen a noticeable reduction in the frequency when

drain manhole covers are checked and cleared and for the road to be swept. In 2013, there was a very heavy build up of leaves, dirt and grit in the gutters throughout the village and road drains became partly blocked reducing their flow capacity. A CCTV scan should reveal blockages and, it is felt that the Parish Council should be routinely informed of the dates of street cleaning and drain clearing and satisfy itself that what we pay for is done properly. Such dates should be published in PC minutes so that residents can avoid parking when cleaning is due. Where appropriate, residents should be encouraged to sweep up the leaves or gravel on the pavement outside their property or on the road to reduce the debris in the gutters and drains.

As the plastic pipe put in by the parish council joins a cement one, it is possible that there is a size difference. During this last rainfall, a significant amount of water has been "stored" on The Green in the remaining gravel pits; but this may have had a significant effect on raising the ground water in that area. The water flowing down the road is the excess over the capacity of the drain.

a. It is felt that, where water flow has exceeded the capacity of culverts, the culverts should be doubled or enlarged. The capacity of a drain or culvert is its narrowest point. The capacity of the culvert feeding water into a 24" diameter culvert on the Green is wasted if the pipes lower down are of probably 12" diameter, and put undue pressure on such pipes.
b. All culverts need to be examined by a CCTV survey to determine their capacity, to locate any damage and clear any blockages;
c. If the through-put capacity of the culvert from The Green is still insufficient at the next flooding occurrence, it is recommended that the over-flow (exceedance) is directed down the road from the farm track that splits The Green. Sandbagging or a "sausage" and single lane traffic may be necessary;
d. Another possible solution would be to join the garage culvert directly to the Rank culvert laying pipes via the existing ditch. Highways might be interested in funding it. Although it is on PC land, they are going to have to inspect and repair the existing stream pipe as it is adopted by them. Highways would be saving themselves hassle by avoiding any stream diversion down the road, and in the long term reducing the cost of repairs. The "fall" from the garage to the Rank may be too steep and there would still have to be some run-off access for rain water from Essebourne hill;
e. It is noticeable that some road drains are blocked by gravel which has been washed out of nearby drive-ways; blockages have been exacerbated by sand washed out of sandbags. All such gravel drives should be re-graded or a lip installed to prevent this occurring.
f. Highways has stated that the flooding of houses in Newbury Road is due mainly the volume of rainfall exceeding the capacity of the drains, which, unable to run off, has caused the water-table to rise and that this is a "one in 20 years" event. Many of the houses included on the EA website map within the area at risk of groundwater flooding, which have been given a risk ranking based primarily on the number of properties which were reported to have flooded during 2000/01, were not flooded in 2000/01 or in 2014. The below website should be referred to:
http://documents.hants.gov.uk/flood-water-management/groundwater/GWMPBourneRivuletActionPlan.pdf It is felt that, based on the evidence of the last month which is "a one in 20 year event", the map could and should now be made property specific.

3. Floor levels. Several buildings in the village have flooded this year, in some cases because the floor level has been lowered to conform to building regulation in respect

of head-room. It is felt that the blanket imposition of such building regulations should be revisited by the authorities and those prone to flooding as a result of compliance should be protected (where possible) by ditches, dykes and tanking. If there is a likelihood of flooding to individual properties, it is recommended that instead of replacing timber flooring, replace it with concrete with a water-resistant wall finish up to 1.2m at ground floor level and all services should be fed top down and sockets moved much higher. This would reduce damage and disruption and the approach would be welcomed by the insurance industry. Old properties may not be suitable for such measures, but may have to do what they can, however unsuitable, for insurance purposes.

4. Water drainage ditches. Many of the water drainage ditches leading into HbT are blocked by bushes and debris which has been allowed to build up over several years. The ownership of many of these is unknown at present and responsibility for maintaining them needs to be established. Some argue that debris should be allowed to build up and bushes allowed to grow as this reduces the speed of flow and allows water to soak into the soil, although this is true, the EA advice is that all culverts and ditches should be cleared on a regular basis to enable rainwater to flow away, controlled, where suitable, by sluices to ensure that, during extreme rainfall conditions, minimum flooding damage occurs.
5. Water Holding. Water holding was attempted in The Green, but this has proved to be an unsuitable location as, being so close to houses and drying barns, it appears to have raised the local water-table significantly and caused nearby houses to flood. Water holding areas should be identified well clear of the village, if up-stream, so as not to have a significant impact on the water table and prepared, if necessary by digging and the construction of dykes, to hold excess water during heavy winter rain-fall.
    a. Downstream. The road is raised above the water meadows so a large area such as the water meadows with a dyke across the area just North-West of the electricity sub-station would be suitable, provided sluices were installed and agreement could be obtained from the landowner.
    b. Upstream. This poses more of a problem as the road is mainly level with the streams in both the Netherton valley and Bourne valley. Building a dyke would therefore tend to flood the road. A ground survey may be able to identify areas which could be used to retain floodwater without having to raise the road. Mr Trevor Wheeler knows where some used to be in the past.
    c. It should be noted that the NFU has expressed their opposition to forcing farmers to flood fields to protect communities in lower ground.
6. Overflow diversion ditch. It may be possible to reduce the flooding to some cottages and the school by allowing any overflow of an agreed level of the Bourne Rivulet to run around the back of the playing fields to rejoin the main course in the water meadows. Agreement of owners would be necessary to enable this.
7. Boreholes. If the heavy rainfall of this winter becomes a regular event in future years, it may become necessary to drill bore-holes, monitor water table levels and install telemetric pumps.
8. The Flood & Water Management Act 2010, the implementation of which is delayed, is intended to regulate the introduction of the SuDS (Sustainable Drainage System) to reduce the potential impact of new and existing developments with respect to surface water drainage discharges (see http://www.susdrain.org) , which appears to be a very useful document and should be assessed at the very start of any development project in order to:
    a. make best use of the topography for routing and storing water;

b. maximize opportunities for using space in a multi-functional way;
c. enable water storage and conveyance zones to form part of the character of the development;
d. Provide the greatest opportunity for the drainage system to deliver multiple planning benefits.

Funding. Some of the recommended action will obviously cost a significant amount of money and funding sources must be identified. The Prime Minister has promised funds for flood mitigating measures from which it may be possible to draw, I understand the our Member of Parliament, Rt Hon Sir George Young, has expressed a willingness to assist in this.
Much of the essential expensive work will be the responsibility of Highways, which is necessary to offset maintenance costs in the future.
Justification for some funding may be that failure to take some measures will result in the loss of business rates or addition costs elsewhere.
Some of the local ditch clearing could be done by volunteers. Riparian owners who refuse to clear their ditches can be recharged with the cost of so doing.
Highways have indicated that, as the 2014 rainfall is a "once in 20 year's event" and the road drains under Newbury Road and Church Street have sufficient capacity to cope with "normal rainfall", they will be unlikely to be enlarged. It would be useful to find out the cost of repairing the culvert, road and pavement and any other costs associated with the lack of capacity in the drains and set this against the cost of enlarging them.

Other agency preparation. The delay between flooding occurring and reaction of various agencies taking action was apparent, although Cllr Tim Rolt was present at the start and almost daily, and TVBC reacted by providing sandbags once their availability became known and the necessary telephone number was distributed. Signage eventually appeared as did pumps once the media publicised the problem. It is felt that there should be better preplanning at District and County level so that traffic can be diverted to reduce damage to roads and stores of sandbags, cones etc held and distributed immediately should such flooding recur and a person made responsible for coordinating "disaster" relief.

House Insurance. The British Property Federation has warned that some homeowners may be excluded from a government scheme to cap flood insurance premiums in high risk areas and that the proposed scheme will exclude cover for leasehold properties, rented property, council and housing association homes and small and medium sized businesses amongst others. We must ensure that our village is not classed as a "high risk area" by taking steps to ensure that flooding does not occur unless there is exceptional rainfall and that we have taken steps to mitigate any damage.

Summary of Suggested Action needed. Based on the above, it is felt that the following action is needed:

1. Commission a Water Catchment Management Plan [HCC/TVBC/PC]. An approach has been made to a university "Catchment Processes and Management Department" to see if this could be done as an undergraduate's project;
2. Gather and study historical date to determine all old local watercourses and areas in which water has been deliberately held in the past [PC];
3. Have all culverts examined by CCTV survey [EA/Highways];
4. Have the broken culverts replaced by larger capacity pipes [EA/Highways];
5. Have the road resurfaced [HCC/Highways];
6. Have the pavements repaired [HCC/Highways];

7. Establish riparian responsibilities for all watercourses [TVBC/PC];
8. Clear all ditches and culverts [PC/Riparian owners/volunteers];
9. Identify and develop water holding areas and, where appropriate, build dykes and sluices to control outflow [TVBC/PC/Riparian owners];
10. Identify possible over-flow ditches to channel water in excess of a certain level away [PC].

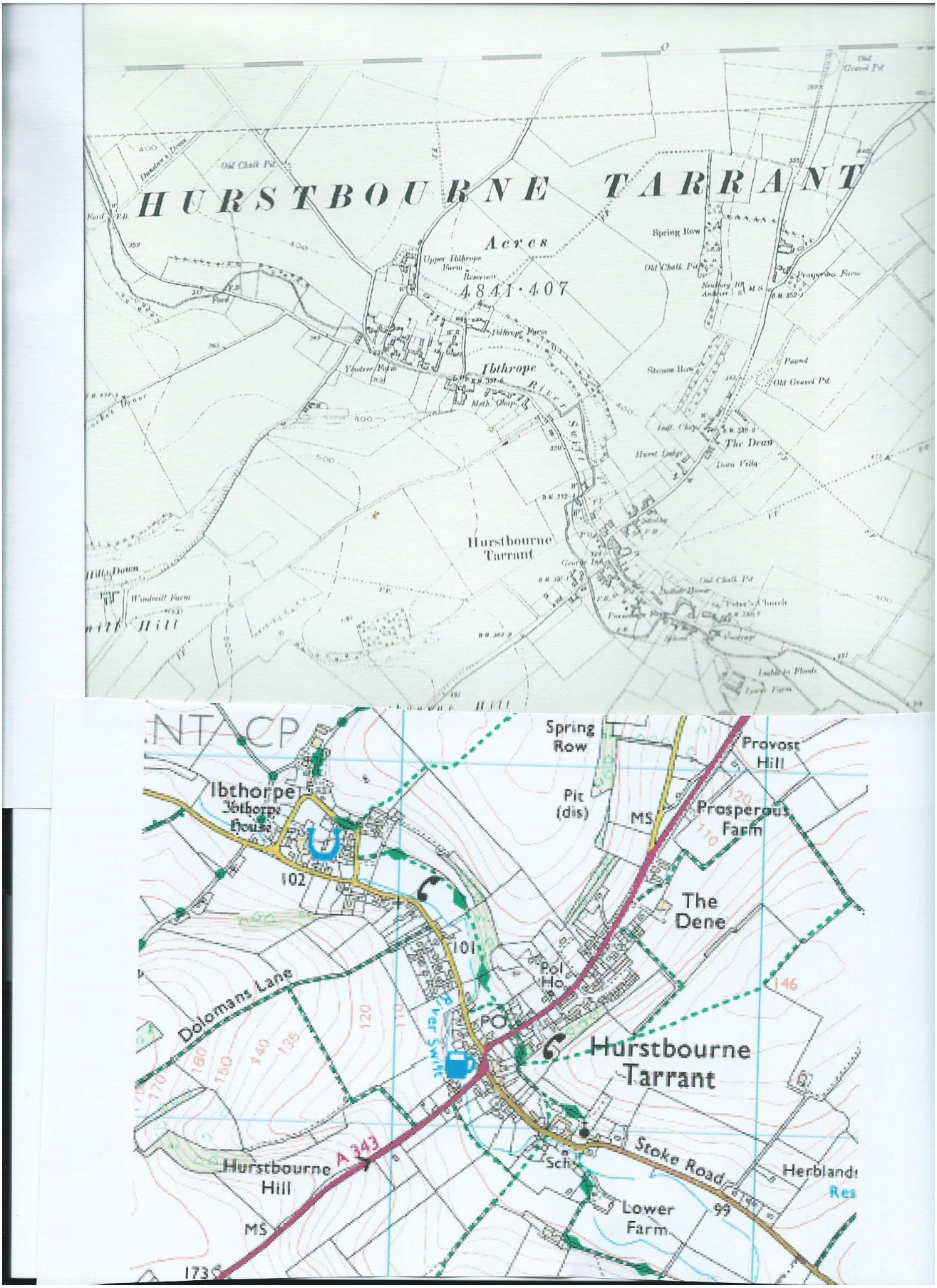
Conclusion.

Although we cannot completely prevent flooding in Hurstbourne Tarrant, there are a number of measures which could and should be taken to mitigate the effects of any flooding in the future.

[RSC]

Legend:
EA – Environment Agency
HbT – Hurstbourne Tarrant
HCC – Hampshire County Council
PC – Hurstbourne Tarrant Parish Council
TVBC – Test Valley Borough Council

Attached: Maps of Hurstbourne Tarrant in 1910 and (for comparison) 2010


HURSTBOURNE TARRANT
Acres
4841·407
Ibthrope
Hurstbourne Tarrant
Spring Row
Old Chalk Pit
Stones Row
Pound
Old Gravel Pit
The Dean
Hurst Lodge
Dean Villa
Hilly Down
Windmill Farm
Hill
St. Peter's Church
Vicarage
Liable to Floods
NT CP
Ibthorpe
Ibthorpe House
102
101
Spring Row
Provost Hill
Pit (dis)
MS
Prosperous Farm
The Dene
Pol Ho
PO
Dolomans Lane
River Swift
Hurstbourne Tarrant
A 343
Hurstbourne Hill
MS
Sch
Stoke Road
Herblands
Res
Lower Farm
99
146
120
110
135
140
150
160
170
173