



Norfolk County Council

Flood Investigation Report

Report Title:

King's Lynn & West Norfolk

Walpole Cross Keys

Sutton Road

Report Reference: 000117

August 2013

Report Status: Approved Report

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Flood Investigation Report

Sutton Road, Walpole Cross Keys, Borough Council of King's Lynn and West Norfolk

1. Reason for this investigation

It was deemed necessary to complete a formal investigation into the flood incidents at Sutton Road, Walpole Cross Keys that occurred on 6 November and 23 December 2012 as;

- A residential property on Sutton Road was flooded internally on both occasions.

This met Norfolk County Council's threshold for triggering the undertaking of a formal flood investigation, as prescribed by Norfolk County Council's Flood & Water Management Protocol

2. Location of flooding incident

- 1.1 Walpole Cross Keys is located approximately 12km West of Kings Lynn. Sutton Road is situated to the East of Walpole Cross Keys. The area of reported flooding is at a residential property on Sutton Road.

3. Flood Incident as reported

- 3.1 26 November 2012, Norfolk Fire Services pumped flood water from affected residential premises.
- 3.2 23 December 2012, residents contacted Norfolk County Council to report internal flooding of a residential property on Sutton Road.
- 3.3 Subsequent reports were made directly to the Borough Council of King's Lynn and forwarded to Norfolk County Council.

4 Desk Study

- 4.1 The location of the flooding:
 - Is in the River Great Ouse catchment.
 - Is sited within an area of geology likely to have a very poor rate of infiltration.
 - Lies wholly within EA flood Zones 2 and 3.
 - Lies wholly within the King's Lynn IDB Internal Drainage

District and a number of IDB Main Drains serve the settlement.

- Is in close proximity to a drainage ditch which is riparian owned.
- All immediate roads are adopted by NCC Highways, there is a gully in close proximity to the flooding location and a number of kerb offset drains along the length of Sutton Road.
- No Anglian Water sewerage services serve the flood site, suggesting that properties on Sutton Road are on non-mains drainage.
- Is not within 2.5km of a registered rain gauge and no known flow data exists for the local drainage system.

5 Summary of site investigation and information received

- 5.1 Site visits were undertaken by Norfolk County Council at Sutton Road on 10 December 2012 and 14 February 2013.
- 5.2 Please see annotated Map attached to this report summarising the information received by third parties and through on-site investigations.
- 5.3 Anglian Water were consulted and carried out tests on their potable water apparatus and found there were no leaks (Feb 2013).
- 5.4 Norfolk County Council Highways were consulted and informed the LLFA that they had already jetted the carrier drain from Sutton Road to the watercourse.
- 5.5 As a result of the above investigations the LLFA therefore looked at the riparian owned network in the IDB area. The LLFA contacted the King's Lynn IDB and their response is detailed below in section 7.

6 Summary of impacts

- 6.1 Information relating to the impacts experienced at the flood location are detailed below; *(Please see Annex 6 within the PFRA Annexes to the final guidance for the classification of property types to be used in filling in the section below).*

Risk to life: None

Internal Flooding: Yes

External Flooding: Yes

Critical services: None

Priority Gritting Routes: None

Obstruction of Access: None

7 Investigation findings

7.1 What caused the flooding?

7.1.1 The flooding at Sutton Road was experienced due to a number of factors;

- Significant weather events had occurred over the previous months including snow and extreme rainfall.
- Exceptionally high ground water levels.
- Poorly maintained watercourse to the South of the flood site.
- Block/damaged culvert adjacent to Station Road down stream of open watercourse.
- Damaged highways drain chamber cover in driveway.
- Existing surface water discharges were exacerbated by the following:
 1. Neighbouring sewage treatment package plant discharging to watercourse.
 2. Highways surface water drainage contributed to volume of flow.

7.2 Who has responsibilities to manage the cause(s) of the flood?

7.2.1 With reference to the above factors, responsibilities to manage the causes of the flood are listed below.

7.2.2 King's Lynn Internal Drainage Board (IDB);

- Walpole Cross keys is within the King's Lynn Internal Drainage District (IDD) and the King's Lynn IDB has powers to maintain or improve existing drainage works, or construct new ones.

7.2.3 Norfolk County Council Highways Authority;

- Responsible for the adopted highway drainage network serving the flood site.

7.2.4 Riparian owners are responsible for the ditches and culverted watercourse in the downstream network.

The owners affected by the flooding may protect their property with flood prevention techniques to divert the flow away from their

property

7.3 What was their response in relation to the cause of the flood?

7.3.1 The responses of the organisations to the cause of the flooding are listed below.

7.3.2 Norfolk County Council Highways Authority;

- Jetting of the carrier pipe was conducted from the highway system to the outfall point.
- The damaged chamber cover was replaced with a sealed cover type to minimise the risk of surface water entering the chamber and to reduce the possibility of the drain surcharging in the future.
- Works were carried out to identify the functioning of the highway drainage system, which was found to be working effectively.
- Stated that the flooding at Sutton Road is beyond their area of responsibility.

7.3.3 King's Lynn & West Norfolk Borough Council

- carried out its own investigation on the integrity of the culverted watercourse (Marked C on the Map) and attempted to jet the system but due to the condition of the culvert it was not possible to complete the survey.

7.3.4 Anglian Water carried out two tests on their apparatus to check for leaks to their systems and found none.

7.3.5 King's Lynn IDB;

- Sent an official letter dated 2 May 2013 to Norfolk County Council as the Lead Local Flood Authority outlining their response (see Appendix 1). To summarise, the key points in the IDB letter please see below:
- King's Lynn IDB carried out a visual survey of the drainage system down stream of the affected property.
- Identified that the route of the former watercourse heading generally south-westwards from Sutton Road no longer appears to be continuous due a number of obstructions of which some are believed to be unauthorised.
- Due to the length of time elapsed the board state that they believe it would not be possible to take enforcement action regarding unauthorised structures
- This extends to requiring riparian owners to maintain where there is no watercourse and/or no continuous drainage route.

- Identified possible improvement works to re-instate an effective drainage scheme pending agreement by various affected parties regarding ownership and cost, planning application, investigation and level surveying.
- The IDB state they have no obligation to fund or carry out works directly but if an improvement scheme was put in place they would recommend this be en-mained to safe guard the future maintenance.
- The board states it has certain powers to maintain or improve existing drainage works, or construct new ones.

8 Recommendations

- 8.1 The recommendations highlighted below are referenced against the factors detailed above and should not be considered in isolation.
- 8.1.1 King's Lynn IDB shall exercise a general supervision over all matters relating to the drainage of land within their district and could lead and support the delivery and implementation of the identified mitigation measures for the flood risk experienced by the affected parties as described in the attached letter.
- 8.1.2 Residents need to be made aware of their riparian responsibilities and appropriate measures they could take to protect their property without prejudicing the rights and responsibilities of adjoining property holders. The King's Lynn IDB should communicate with relevant residents.
- 8.1.3 Norfolk County Council's Flood and Water Management Team will work with King's Lynn IDB to;
- identify the possibility of securing funding to mitigate flood risk in this community where it is necessary beyond the individual property level protection. This recommendation will be subject to priorities and availability of resources.
- 8.1.4 Norfolk County Council to work with Risk Management Authorities to identify structures or features that have an effect on local flood risk within Walpole Cross Keys in order to;
1. establish an overview of the drainage and watercourse systems in the affected area, allowing for quicker identification of the responsible authority in incidences of flooding.
 2. develop more informed maintenance regimes which take account of assets considered important for managing local flood risk. Where structure or features are associated with significant flood risk these will be included on a public register. This will provide transparency for residents as to ownership and condition.

- 8.1.5 Residents could seek further guidance and advice from the Upper Tribunal (Lands Chamber) (formally Agricultural Lands Tribunal) who may be able to enforce against those riparian owners who are required to maintain their watercourse and seek appropriate costs.

9 Disclaimer

Although every effort has been taken to ensure the accuracy of the information contained within the pages of the report, we cannot guarantee that the contents will always be current, accurate or complete.

This report has been prepared as part of Norfolk County Council's responsibilities under the Flood and Water Management Act 2010. It is intended to provide context and information to support the delivery of the local flood risk management strategy and should not be used for any other purpose.

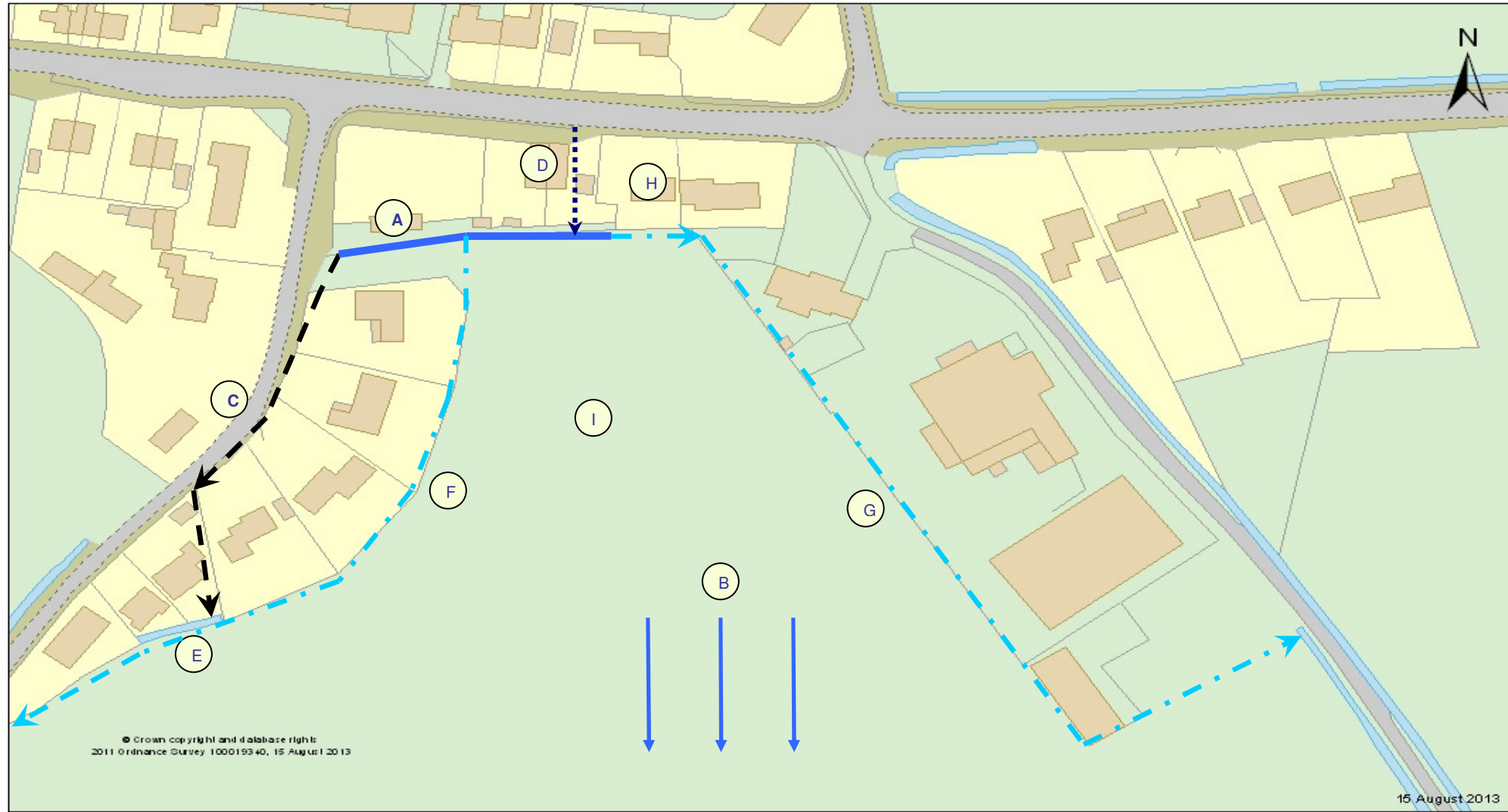
The findings of the report are based on a subjective assessment of the information available by those undertaking the investigation and therefore may not include all relevant information. As such it should not be considered as a definitive assessment of all factors that may have triggered or contributed to the flood event.

The opinions, conclusions and any recommendations in this Report are based on assumptions made by Norfolk County Council when preparing this report, including, but not limited to those key assumptions noted in the Report, including reliance on information provided by third parties.

Norfolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with any of the assumptions being incorrect.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the time of preparation and Norfolk County Council expressly disclaims responsibility for any error in, or omission from, this report arising from or in connection with those opinions, conclusions and any recommendations.

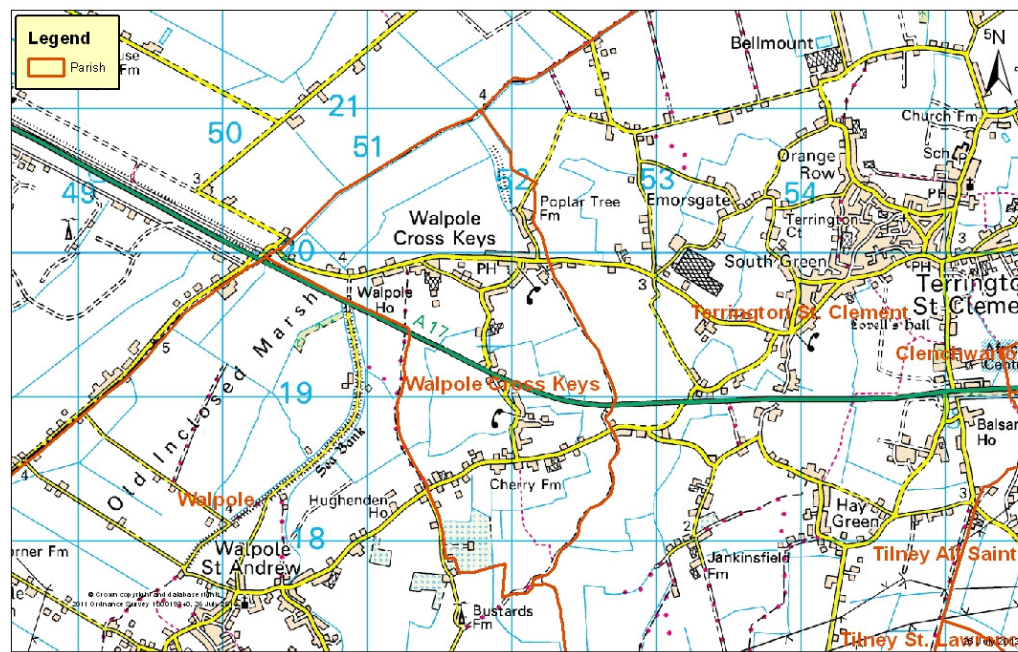
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Sutton Road
Walpole Cross Keys



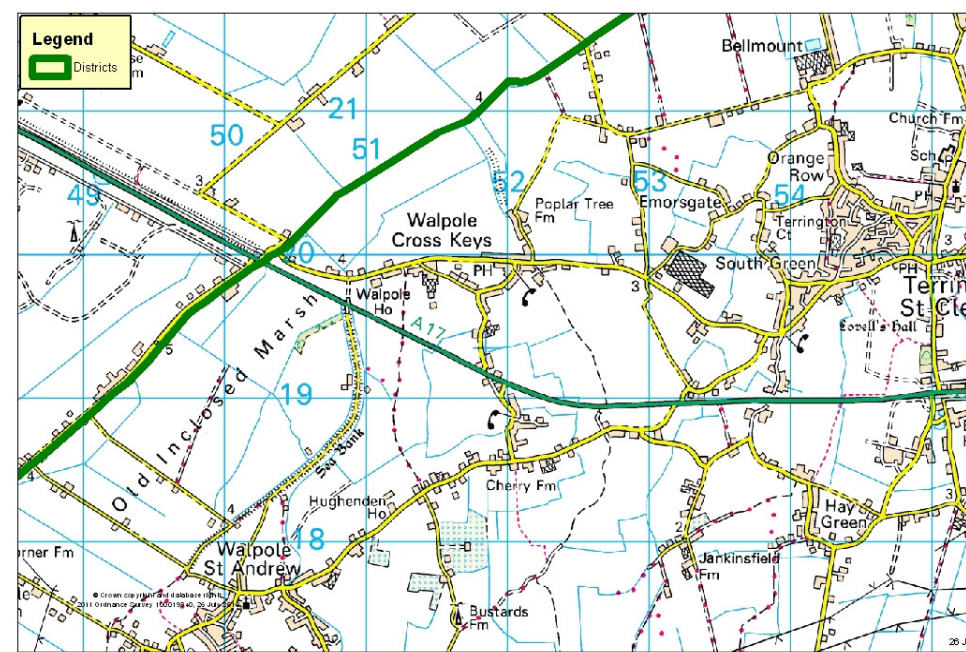
Scale 1: 1250 Centred on 552179 319880



Sutton Road
Walpole Cross Keys



Scale 1: 25000 Centred on 552081 319467



Sutton Road
Walpole Cross Keys



Scale 1: 25000 Centred on: 552081 3

Annotated Map

Flood Investigation Report: 000117, Sutton Road

It should be noted that the order in which these are listed does not reflect the significance of the issue and may require more detailed analysis or surveying to ascertain their level of influence over the incidents experienced at this location.

- A Location of open watercourse. Initial site investigations found this watercourse to be full and poorly maintained. Due to the connection to the downstream watercourse being in disrepair, this can not outfall effectively causing a backflow of water within the ditch.
- B General direction of surface water flow.
- C Assumed path of existing culvert (pending a camera survey to assess the extent and integrity of the system). King's Lynn & West Norfolk Borough Council have attempted to jet the system but this could not be completed due to the poor condition of the culvert.
- D Highways drainage found to run parallel with the affected property's boundary which outfalls into the open watercourse to the South. A site visit found the outfall pipe to be submerged approximately 0.3 to 0.4m below the water's surface and the chamber cover on the property's driveway to be damaged allowing additional surface water to enter the system.
- E The open trench as shown on the OS map is no longer apparent, this may have been culverted to join an open watercourse to the South but there is no evidence to support this and this would need further investigation.
- F Possible route for new open trench to connect with existing watercourse to the South.
- G Possible route for new open trench to connect with existing open watercourses to the East - as per the pre-existing drainage system shown on the 1905 map. Refer to IDB letter for detail
- H Reports of high water levels at neighbouring properties but no internal flooding, septic tanks also reported to be inundated with surface water and needing continual pumping at the time of the event.
- I It is believed that ground water levels were very high at the time of the flooding..



Our Ref:
Your Ref:

2 May 2013

Flood & Water Management
Norfolk County Council
County Hall
Martineau Lane
NORWICH
NR1 2DH

Environment, Transport & Development Dept	
FAO	
07 MAY 2013	
Onto	
Action	
File	
DEM Ref	

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FOR THE ATTENTION OF MR M HENDERSON

Dear Sirs

DRAINAGE COMPLAINT AT SUTTON ROAD, WALPOLE CROSS KEYS

Further to our recent discussions regarding the above, I have investigated this matter on behalf of the Board, and summarise my findings below. Please note that the Board has not undertaken any intrusive investigations or level surveys to confirm the suggestions in this letter, so further works would be required to establish whether or not the suggested option to resolve this issue would be feasible. Please also note that the property names given in this letter are as shown in the Board's records, and marked on the enclosed plan.

The watercourse to the rear of the properties on Sutton Road appears to exist as an open channel only between the eastern boundary of number 27 to the east and Station Road North to the west. There is no apparent continuation of the drain towards the east, but a concrete pipe is visible in the southern bank of this drain near point 1 on the enclosed plan.

Having looked at the Ordnance Survey plan of this area from 1906 – an extract from which is also enclosed – this drain used to continue along Station Road North before turning and running between the properties now known as Homelands and Greenwood. The Board's records show that consent was granted for the piping of a roadside dyke at Walpole Cross Keys in 1987 in connection with a proposed residential development, and although there is no plan in the Board's records to confirm this, I think the approval probably relates to the section of watercourse between point 1 on my plan and Homelands.

Although the recent Ordnance Survey plan still shows a section of open watercourse behind the properties known as Greenwood and North View – shown as number 2 on the plan – this was no longer evident during my site visit. However, I am not aware of whether a pipe was installed when this section of drain was infilled. I was also unable to find any evidence of a pipe outfall in the open watercourse near point 3 on the plan.

The drain heading generally southwards from point 3 is shallow and poorly maintained – see photograph 1 at the end of this letter. The section near 4 on my plan appears to have had some maintenance or minor improvement works carried out relatively recently, and although the drain seems to get slightly deeper as you go further along, it also reverts to being heavily-vegetated and with a significant build-up of silt.

At point 5 on my plan – which appears to have been a field access even in 1906 – and point 6, where the drain used to turn and head eastwards away from the road, I was unable to see any evidence of pipes. There is a 300mm diameter concrete pipe at point 7, although this only connects the drain to the south of Westholme to



Mr J S Austen (Chairman) Mr B Long (Vice-Chairman)

Mr P J Camamile (Chief Executive)



Cert No. GB11990

Mr G Howe (Operations Manager) Mr G R Dann (Planning/Enforcement Officer)

Cert No. GB11991

the Board-maintained watercourse known as Cross Keys Drain. The only pipes evident at point 8, where the course of the 1906 drain recommences, are ones taking roof water run-off from parts of the adjacent nursery.

As you will hopefully have gathered from the above, the route of the former watercourse heading generally south-westwards from Sutton Road no longer appears to be continuous. Although the Board has certain enforcement powers relating to unauthorised obstructions in watercourses, the Board does not believe that these would be applicable or effective here due to the length of time some of these obstructions are likely to have been in place.

Furthermore, although notices could be issued under the Board's powers in section 25 of the Land Drainage Act 1991 to require maintenance works to be carried out to watercourses, including the pipeline in front of the four properties on Station Road North, the same powers cannot be applied where no watercourse exists. The Land Drainage Act 1991 also describes an appeals procedure against notices issued under section 25, and as there is no continuous drainage route in this direction, I believe any appropriate appeals would probably be successful. Even if the Board undertook maintenance works itself, in my opinion the lack of a continuous drainage route and effective outfall means there is unlikely to be any real improvement to local drainage.

Considering the area more generally, there is a watercourse to the east of Fence Bank, marked as 9 on my plan (see also photo 2), which, although currently quite narrow and poorly-maintained, could potentially help to convey water from the rear of the properties on Sutton Road to Cross Keys Drain (see photo 3), if a connection is made to it. Although there is currently no continuation of the drain to the east of 27 Sutton Road, I believe it may be possible, subject to landowner agreement, to construct a new drain along a route similar to the one indicatively shown by a dashed red line on my plan, and then install a new culvert under Fence Bank. Maintenance or improvement works may also be needed along the drain to the east of Fence Bank, but the extent of these and the size of any new drain could only be determined following a level survey from Cross Keys Drain back to the properties on Sutton Road.

While the Board has powers to maintain or improve existing drainage works, or construct new ones, it does not have any right to enter a person's land for anything other than maintenance works. The Board's powers are also solely permissive, and the Land Drainage Act 1991 doesn't impose an obligation on the Board to do these works. The Board has a network of en-mained watercourses and other drainage infrastructure where it regularly exercises its permissive maintenance powers, but getting water to these maintained watercourses is the responsibility of individual landowners.

In my opinion, the best way to try and improve flows from the watercourse to the rear of the properties on Sutton Road would be to construct a new drain from there as far as the east side of Fence Bank, and then, if necessary, for maintenance/improvement works to be undertaken downstream to Cross Keys Drain. However, survey works would be needed to check that this suggestion could be translated into an effective drainage scheme, and agreement would also be required from the relevant landowners (I believe there would be three, or possibly four, affected). I understand that planning permission may also need to be sought.

While I have not until now touched on the issue of cost, this will, of course, be a key consideration. The Board would not fund any part of the works directly, but provided the improvement scheme was suitably designed and constructed, Officers would recommend to the Board that the drainage route from the properties on Sutton Road down to Cross Keys Drain be en-mained by the Board, so that it would be regularly maintained in the future.

If an agreement is not able to be reached between the various affected parties here regarding the design and implementation of a suitable scheme, and the funding of this, then the Land Drainage Act 1991 makes provision for applications to be submitted to the Minister for Environment, Food and Rural Affairs for consent to carry out drainage works.

If you require any further information, please do not hesitate to contact me.

Yours faithfully



G R DANN
PLANNING OFFICER

Enc



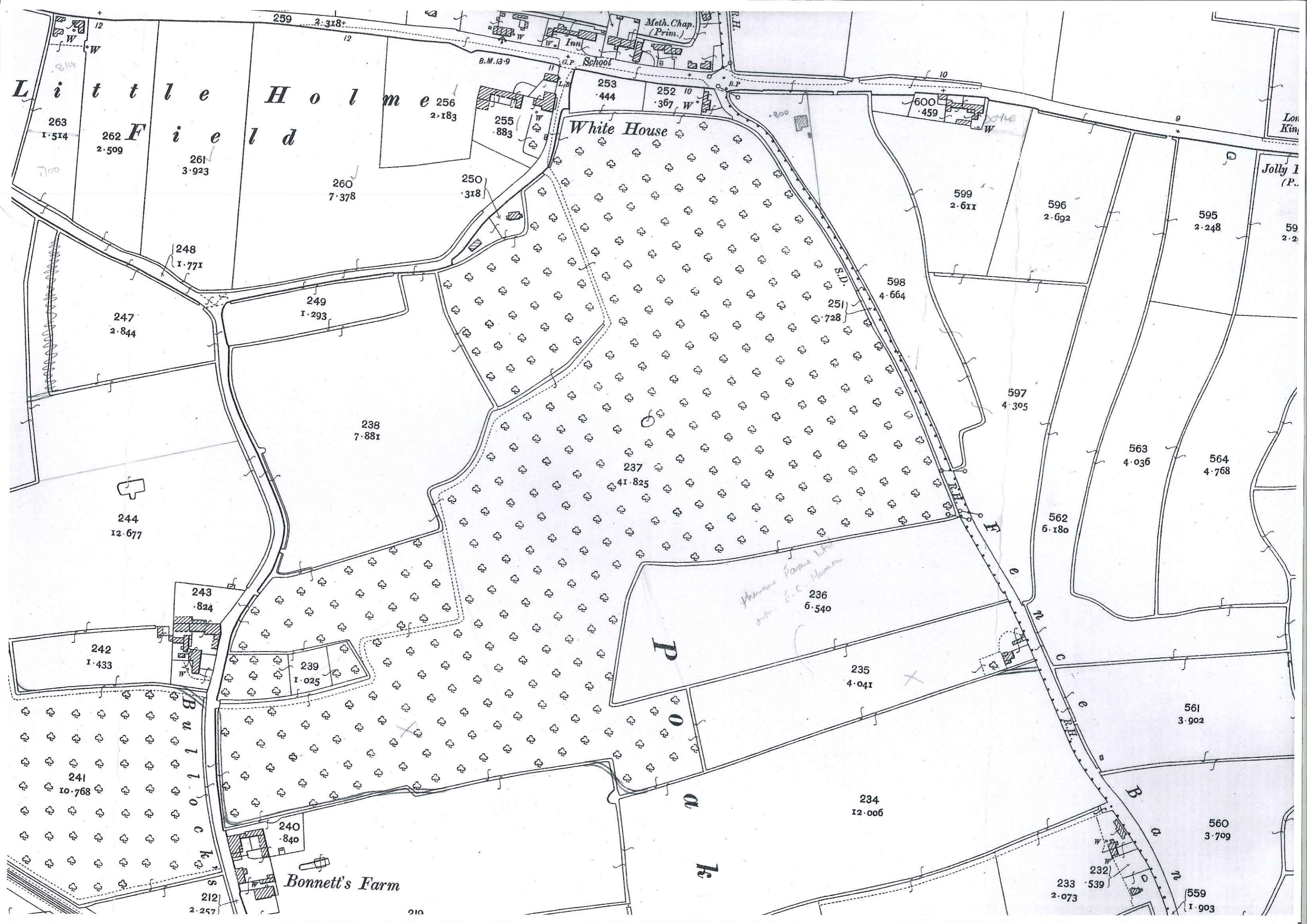
Photo 1

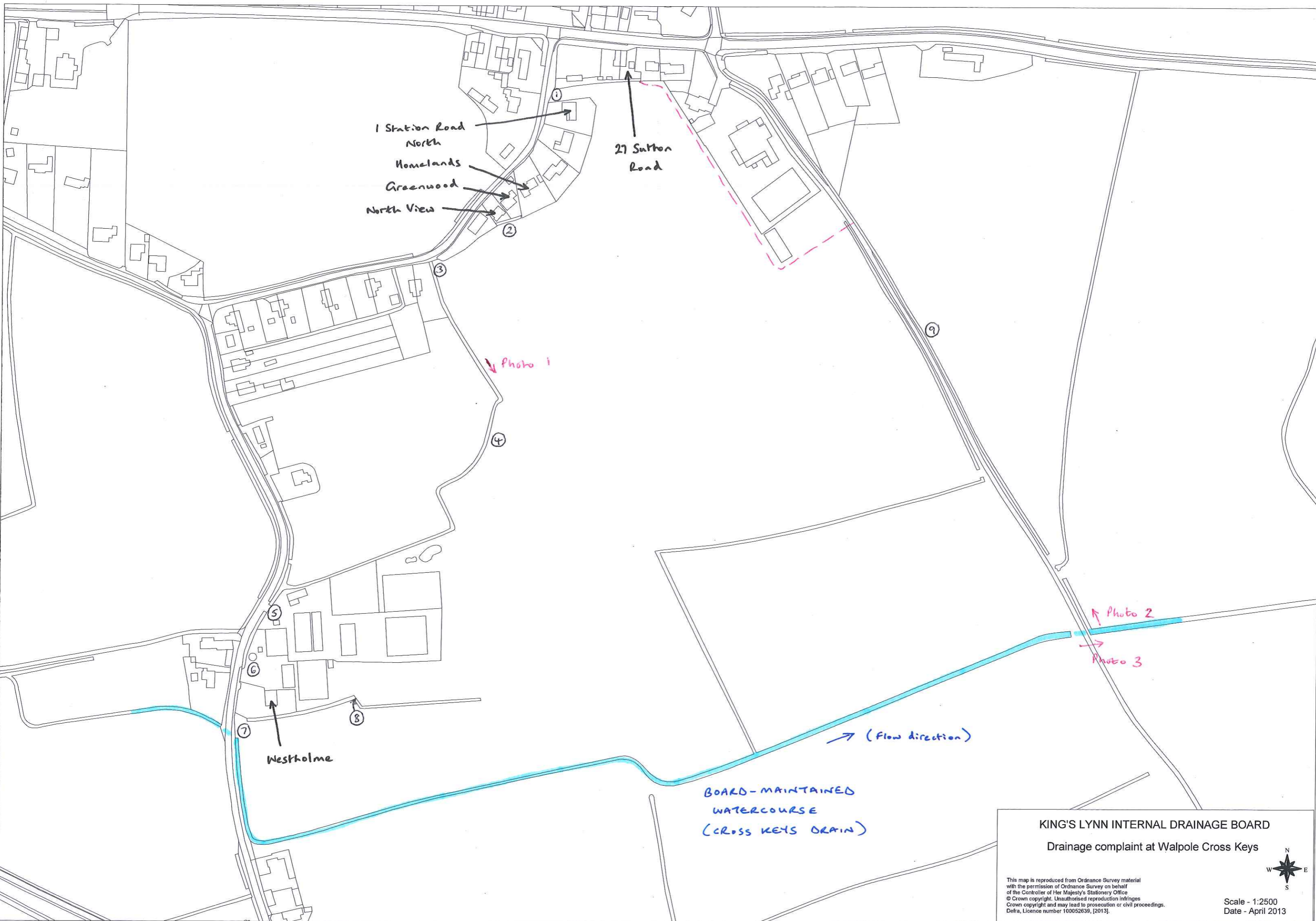


Photo 2



Photo 3





1 Station Road
North
Homelands
Greenwood
North View

27 Sutton
Road

Photo 1

Photo 2

Photo 3

Nestholme

BOARD-MAINTAINED
WATERCOURSE
(CROSS KEYS DRAIN)

(Flow direction)

KING'S LYNN INTERNAL DRAINAGE BOARD
Drainage complaint at Walpole Cross Keys

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Date - April 2013