

Product 4 (Detailed Flood Risk) for: Strathmore School, Meadlands Drive, Petersham,
Richmond

Reference: KSL140710 JB95

Date: 20th August 2014

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The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements to the data for this location have been made. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

This information is provided subject to the enclosed notice which you should read.

Flood Map Confirmation

The Flood Map for Planning (rivers and the sea):

The Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map shows Flood Zone 3 - areas with a 1% (or 0.5% in tidal areas) chance of flooding in any given year and Flood Zone 2 – areas with a 0.1% chance of flooding in any given year. In addition, the map also shows the location of some flood defences and the areas that benefit from them.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time and also take into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at <http://maps.environment-agency.gov.uk>. Select “Flood Map for Planning (Rivers and Sea).”

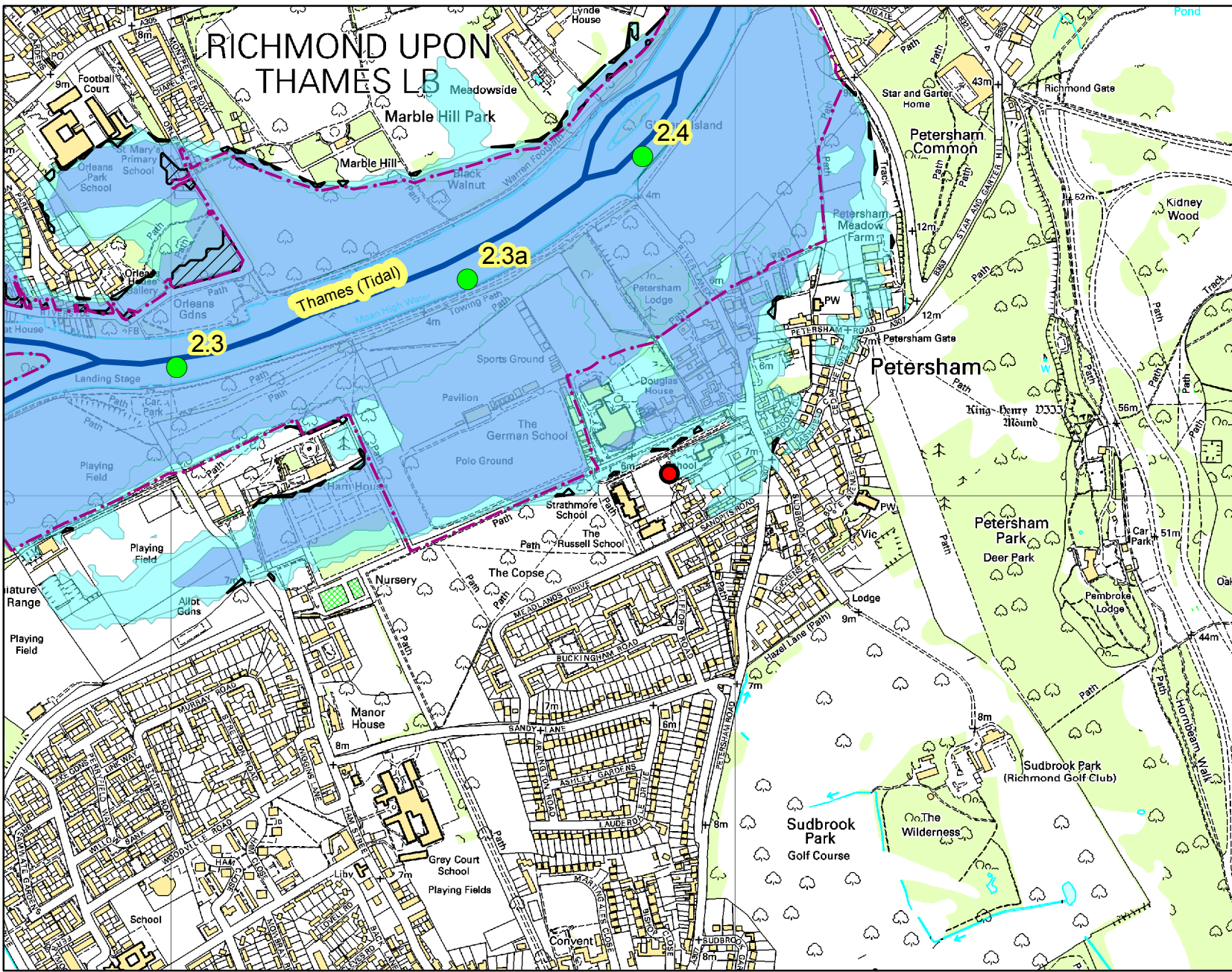
At this Site:

The Flood Map shows that this site lies partially within Flood Zone 2 with a 0.1% chance of flooding from rivers (fluvial flooding) and, or the sea (tidal flooding) in any given year.

Method of Production

The Flood Map at this location has been derived using detailed modelling of the Thames Tidal Defences Study completed in March 2006 by Halcrow Ltd. The fluvial flood zones were derived from the Teddington Fluvial Flood Risk study completed in April 2009 by Halcrow Ltd.








Flood Map for Planning (Rivers & Sea) Extract centred on Strathmore School, Meadlands Drive, Petersham, Richmond
Created 29/06/2014 - ref KSL140710JB95



Scale 1:10,000



Legend

-  Site Location
-  Model Nodes
-  Main Rivers
-  Flood Map - Defences
-  Areas Benefiting from Flood Defences
-  Flood Map - Flood Zone 3
-  Flood Map - Flood Zone 2

Flood Map Areas (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
 – from the sea with a 0.5% or greater chance of occurring each year
 – or from a river with a 1% or greater chance of occurring each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 0.1% chance of occurring each year.

Model Output Data – Thames Estuary 2100

You have requested in-channel flood levels for the tidal river Thames. These have been taken from the **Thames Estuary 2100 study completed by HR Wallingford in 2008**. The modelled node closest to your site is **2.3a**; the location of these nodes is also shown on the enclosed map.

The TE2100 plan is now live and within it are a set of levels on which the flood risk management strategy is based. The plan is the overarching flood management strategy for the Thames Estuary and therefore any development planning should be based on the same underlying data.

What is the difference between the TE2100 levels and the 2008 Joint Probability levels that have previously been provided?

The values of the two sets of levels are very similar for the present day scenario. However, the TE2100 takes into account operation of the Thames Barrier when considering future levels. The Thames Barrier requires regular maintenance and with additional closures the opportunity for maintenance will be reduced. When this happens, river levels for which we would normally shut the barrier, will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upstream of the barrier will increase and the tidal walls will need to be heightened to match. The levels previously provided do not take this scenario into consideration.

Why is there no return period for levels upstream of the barrier?

The levels upstream of the barrier are the highest levels permitted by the operation of the Thames Barrier. If levels and flows are forecast to be any higher, the Thames Barrier would shut, ensuring that the tide is blocked and the river maintained to a low level. For this reason the probability of any given water level upstream of the Barrier is controlled and therefore any associated return period becomes irrelevant. The Thames Barrier and associated defence system have a 1 in 1000 standard which means they ensures that flood risk is managed up to an event that has a 0.1% chance of occurring in any given year. The probability of water levels upriver is ultimately controlled by operation of the Thames Barrier.

For further information about the Thames Barrier please visit our website at:

<http://www.environment-agency.gov.uk/homeandleisure/floods/38353.aspx>

TE2100 flood levels:

Upstream of the Thames Barrier, the levels provided are the highest levels permitted by the Barrier. Downstream of the Thames Barrier they are the 1 in 1000 (0.1%) levels.

In West London, there is a heavy influence from upstream (fluvial) flows. The flood defences are built to manage tidal flood risk only. With very high fluvial flows, the river levels in west London could be above the tidal defence level.

Location	Node	Easting	Northing	Present Day Water Level	Future 2065-2100 Water Level	Future 2100 Water Level
Richmond	2.3	517010	173227	5.80	5.97	6.42
	2.3a	517525	173383	5.77	5.95	6.40
	2.4	517837	173600	5.67	5.93	6.38

TE2100 defence levels:

The table below shows both the current defence level, and the TE2100 plan future defence levels. New development should either include future defence raising or demonstrate that future raising has been allowed for.

Note: The defence levels near Teddington may be lower than the water levels because they take into account high fluvial events. The defences are tidal only.

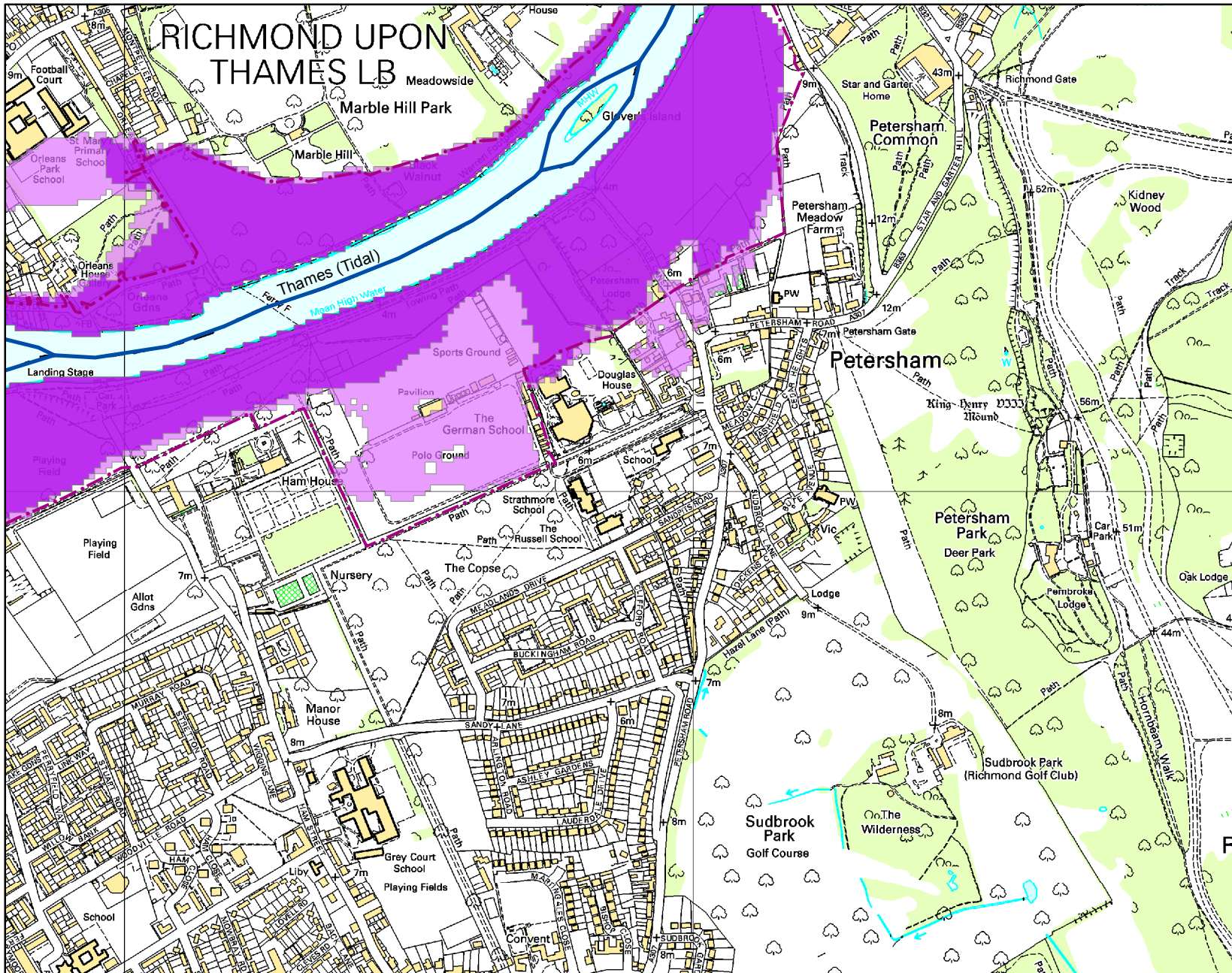
Location	Node	Easting	Northing	Current Defence Levels		Allow for future defence raising (both banks) to a level of...	
				Left	Right	2065-2100	2100
Richmond	2.3	517010	173227	6.02	6.10	6.45	6.90
	2.3a	517525	173383	6.02	6.10	6.45	6.90
	2.4	517837	173600	6.02	6.10	6.45	6.90

Upstream Inundation Modelling

The enclosed map shows the extent of the 1 in 200 (0.5%) & 1 in 1000 (0.1%) return period results for the **Tidal Thames Upstream Inundation modelling study completed by Halcrow in 2011.**

It was modelled based on the depths, velocity & water surface levels as per the results of the Flood Zone modelling done by Halcrow in 2006. However the scenario is that the Thames Barrier is operational but all linear defences have been removed. It uses the joint probability levels calculated in 2008 and only provides data for upstream of the Thames Barrier.





Upstream Inundation Modelling Flood Outlines Map centred on Petersham, Richmond created 28 August 2014 [Ref: KSL140710 JB95]



Scale 1: 10,000



Legend

-  Main Rivers
-  Flood Map - Defences
-  0.5% AEP (1 in 200 year) Maximum Flood Extent
-  0.1% AEP (1 in 1000 year) Maximum Flood Extent

Upstream Inundation Modelling 2011

A modelled representation of at-risk areas, assuming no defences, based on the upstream levels from the Thames Barrier operational scenarios. These are the levels that are provided to developers to include in flood risk assessments. The modelling is based on the Extreme Water Levels 2008 (current year 2005), and includes 0.5% (1 in 200) and 0.1% (1 in 1000) chance in any year.

Defence Details

The design standard of protection of the flood defences in this area of the Thames is 0.1% AEP; they are designed to defend London up to a 1 in 1000 year **tidal only** flood event. The defences are all raised, man-made and privately owned. They are maintained to a crest level of 6.02 m AODN (the Statutory Flood Defence Level in this reach of the Thames). We inspect them twice a year to ensure that they remain fit for purpose. The current condition grade for defences in the area is 2 (good), on a scale of 1 (very good) to 5 (very poor). For more information on your rights and responsibilities as a riparian owner, please see our document 'Living on the edge' found on our website at:

<https://publications.environment-agency.gov.uk/skeleton/publications/default.aspx>

Please see the 'Thames Estuary 2100' document on our website for the short, medium and long term Flood Risk Management strategy for London:

<https://www.gov.uk/government/publications/flooding-thames-estuary-2100-te2100-plan>

Historic Flood Data

We do not hold records of historic flood events from rivers and/or the sea affecting the area local to this property. However, please be aware that this does not necessarily mean that flooding has not occurred here in the past.

Please note that our records are not comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:

- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Additional Information

Use of Environment Agency Information for Flood Risk / Flood Consequence Assessments

Important If you have requested this information to help inform a development proposal, then we recommend that you undertake a formal pre-application enquiry using the form available from our website:- <http://www.environment-agency.gov.uk/research/planning/33580.aspx>

Depending on the enquiry, we may also provide advice on other issues related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In **England**, you should refer to the Environment Agency's Flood Risk Standing Advice and the technical guidance to the National Planning Policy Framework for information about what flood risk assessment is needed for new development in the different Flood Zones. These documents can be accessed via:

<http://www.environment-agency.gov.uk/research/planning/82587.aspx>

<https://www.gov.uk/government/publications/national-planning-policy-framework-technical-guidance>

You should also consult the Strategic Flood Risk Assessment produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk / Consequence Assessment (FRA / FCA) where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. The information produced by the local planning authority referred to above may assist here.
3. Where a planning application requires a FRA / FCA and this is not submitted or deficient, the Environment Agency may well raise an objection.
4. For more significant proposals in higher flood risk areas, we would be pleased to discuss details with you ahead of making any planning application, and you should also discuss the matter with your local planning authority.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.

Customer services line: 01732 223 202

Email: kslenquiries@environment-agency.gov.uk

Website: <https://www.gov.uk/government/organisations/environment-agency>

Development and Flood risk

Finished floor levels using TE2100 levels

We now issue water levels from the TE2100 project as part of data requests. Developers should use these levels as part of their flood risk assessments for elements impacted by in-river levels, for example defence crest heights etc. We are in the process of carrying out revised breach modelling for the floodplains based on these new in-river levels. Until this new breach modelling is available, developers may continue to use our existing (2008) breach modelling levels to inform their flood risk assessments and to set finished floor levels in developments at residual risk (where this data is available). Developers should be aware that these levels will be changing in the future and are likely to result in recommended finished floor levels being set at a higher level to that currently used. Developers may wish to undertake their own updated breach modelling using our TE2100 data, which we can supply on request where available.

Surface Water

Managing the risk and responding to surface water flooding is a role for Lead Local Flood Authorities. The Environment Agency was funded by the government to produce new national surface water maps, which went live on our website from December 2013. See <http://maps.environment-agency.gov.uk> and select "Risk of Flooding from Surface Water". We have produced these maps for the whole country and have worked with Lead Local Flood Authorities to incorporate their local surface water flood risk information where this is available.

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