Flood Risk Assessment
November 2023

ABERFELDY VILLAGE MASTERPLAN

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ECOWORLD INTERNATIONAL
CREATING TOMORROW & BEYOND

New Aberfeldy Masterplan

Flood Risk Assessment

Job No: 2272

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Document Revision History

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1.4	07/04/2022	Updated to include Jolly's Green within the application boundary
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1.6	03/11/2023	Description of development updated

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1.6	3/11/2023	Description of development updated			
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		Initials	JA/TP	TP	KL

Contents

1 Introduction

1.1 Purpose of Report

Parmarbrook has been instructed by Aberfeldy New Village LLP (joint venture between EcoWorld London and Poplar HARCA) to prepare a Flood Risk Assessment (FRA) in support of a hybrid planning application for the New Aberfeldy Masterplan.

The scope of this report is limited to an assessment of flood risk at the site and the measures required to appropriately mitigate flood risk for the lifetime of the development, taking into consideration the vulnerability of the proposed use to flood risk. A preliminary surface water drainage scheme is reported separately.

This report supersedes the Flood Risk Assessment 1.5 dated 21/10/2022 previously submitted in support of the Hybrid Application (LBTH Ref: PA/21/02377/A1 and GLA Ref: 2023/0300/S3) and should therefore be read on a standalone basis.

Following a resolution to refuse planning permission by the London Borough of Tower Hamlets (LBTH) Strategic Development Committee (SDC) in February 2023, and the subsequent direction that the Mayor of London will act as the local planning authority for the purposes of determining the Hybrid Application, the design of the scheme has been amended to accommodate second staircases in all buildings over 18m in height.

For the sake of completeness only it should be noted that the above referenced amendments follow previous amendments to the Hybrid Application, made prior to its consideration by the LBTH SDC, the assessments of which were set out within previous revisions of this [document name]. In summary the previously assessed changes were: the incorporation of Jolly's Green within the red line boundary, the removal of the previously proposed Block A3 and associated increase in open space and play space, an increase in the number of affordable rented family homes, and the inclusion of second staircases in Plots F & I.

To confirm, the new Description of Development will be read as follows:

"Hybrid application seeking detailed planning permission for Phase A and Outline planning permission for future phases, comprising:

Outline planning permission (all matters reserved) for the demolition of all existing structures and redevelopment to include a number of buildings (up to 100m AOD) and up to 140,591 (GEA) of floorspace comprising the following mix of uses: Residential (Class C3); Retail, workspace, food and drink uses (Class E); Car and cycle parking; Formation of new pedestrian route through the conversion and repurposing of the Abbott Road vehicular underpass for pedestrians and cyclists connecting to Jolly's Green; Landscaping including open spaces and public realm; and New means of access, associated infrastructure and highway works.

In Full, for residential (Class C3), retail, food and drink uses and a temporary marketing suite (Class E and Sui Generis), together with access, car and cycle parking, associated landscaping and new public realm, and open space. This application is accompanied by an Environmental Statement."

Further information is set out within the accompanying Covering Letter (as prepared by DP9 Ltd, dated November 2023) and the updated Planning Statement (as prepared by DP9 Ltd, dated November 2023).

1.2 Information Source

The assessment has been undertaken in accordance with the below documents and guidance detailed within the National Planning Policy Framework (NPPF) and the accompanying Planning Practice Guidance (PPG).

- Ordnance Survey (OS);
- British Geological Survey (BGS);
- Environment Agency (EA);
- Department for Environment, Food and Rural Affairs (DEFRA);
- Thames Water Sewer Records;
- National Planning Policy Framework, July 2021
- National Planning Practice Guidance (NPPG) August 2021
- Policy SI 12 Flood Risk Management, The London Plan 2021
- Policy SI 13 Sustainable Drainage, The London Plan 2021
- London Borough of Tower Hamlets Local Plan 2020
- London Borough of Tower Hamlets Strategic Flood Risk Assessments
- London Borough of Tower Hamlets Preliminary Flood Risk Assessment
- London Borough of Tower Hamlets Local Flood Risk Management Strategy
- London Borough of Tower Hamlets Surface Water Management Plan

It is to be noted that this FRA has been undertaken as a desktop study and no intrusive site investigations have been undertaken to inform this report.

2 Planning Policy and Guidance

2.1 National Planning Policy Framework

The thrust of national planning policy, as articulated in the NPPF is that inappropriate development in areas at risk of flooding should be avoided where possible, as summarised below:

- Inappropriate development in areas at risk of flooding should be avoided and that development should be directed away from areas at highest risk (whether existing or future), but where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere (NPPF para. 159).
- The policy of seeking to steer development to areas with the lowest risk of flooding, from any source, is implemented through the application of the flood risk sequential test. Development should not be allocated or permitted if there are reasonably available sites, appropriate for the proposed development in areas with a lower risk of flooding. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding (NPPF para. 162).
- If it is not possible for development to be located in zones with a lower risk of flooding (taking into account wider sustainable development objectives) the exception test may have to be applied. The need for the test will depend on the potential vulnerability of the site and of the vulnerability of the development proposed (as set out in Annex 3 of NPPF; also PPG Table 2 and Table 3) (NPPF para. 163). For example, the exception test need not be applied for less vulnerable development in any flood zone, or for more vulnerable development in flood zones 1 or 2.
- Where the exception test must be applied, application of the test for development proposals at the application stage should be informed by a site-specific flood risk assessment. For the test to be passed it should be demonstrated that: (a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; (b) and the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall (NPPF para. 164). Both elements of the test should be satisfied for the development to be permitted (NPPF para. 165).
- A site-specific flood risk assessment should be provided for all development in flood zones 2 and 3 [whilst] in flood zone 1, an assessment should accompany all proposals involving: sites of 1 ha or more; land which has been identified by the Environment Agency as having critical drainage problems; land identified in a strategic flood risk assessment as being at increased flood risk in future; or land that may be subject to other sources of flooding, where its development would introduce a more vulnerable use (NPPF para. 167).
- Development should not increase flood risk elsewhere (NPPF para. 167).
- Development should only be allowed in areas at risk of flooding where the flood risk assessment (and the sequential and exception tests, as required), demonstrate that: a) within the site, the most vulnerable development is located in areas of lowest flood risk (unless there are overriding reasons to prefer a different location); b) the development is appropriately flood resistant and resilient such that, in the event of a flood, it could be quickly brought back into use without significant refurbishment; c) the development incorporates sustainable drainage systems, unless there is clear evidence that this would be inappropriate; d) any residual (flood) risk can be safely managed; and e) safe access and escape routes are included where appropriate, as part of an agreed emergency plan (NPPF para.167).

- Applications for some minor development and changes of use should not be subject to the sequential or exception tests (NPPF para. 168). The exceptions are stated in Footnote 56.
- Major development should incorporate sustainable drainage systems unless there is clear evidence that this would be inappropriate. The systems should: a) take account of advice from the lead local flood authority; b) have appropriate proposed minimum operational standards; c) have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and d) where possible, provide multifunctional benefits (NPPF para. 169).

2.2 The London Plan 2021: Policies SI 12 & SI 13

The London Plan 2021 provides an overall strategic plan for the Mayor of London, 32 London boroughs and the City of London Corporation. The plan sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20 – 25 years.

Policies SI 12 and SI 13 are related to improving water quality, flood mitigation and reducing flood risk through sustainable urban drainage systems.

Policy SI 12 (Flood Risk Management) states that:

A. Current and expected flood risk from all sources (as defined in paragraph 9.2.12) across London should be managed in a sustainable and cost-effective way in collaboration with the Environment Agency, the Lead Local Flood Authorities, developers and infrastructure providers.
B. Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies, where necessary, to identify areas where particular and cumulative flood risk issues exist and develop actions and policy approaches aimed at reducing these risks. Boroughs should cooperate and jointly address cross-boundary flood risk issues including with authorities outside London.
C. Development proposals should ensure that flood risk is minimised and mitigated, and that residual risk is addressed. This should include, where possible, making space for water and aiming for development to be set back from the banks of watercourses.
D. Developments Plans and development proposals should contribute to the delivery of the measures set out in Thames Estuary 2100 Plan. The Mayor will work with the Environment Agency and relevant local planning authorities, including authorities outside London, to safeguard an appropriate location for a new Thames Barrier.
E. Development proposals for utility services should be designed to remain operational under flood conditions and buildings should be designed for quick recovery following a flood.

Policy SI 13 (Sustainable Drainage) states that:

A. Lead Local Flood Authorities should identify – through their Local Flood Risk Management Strategies and Surface Water Management Plans – areas where there are particular surface water management issues and aim to reduce these risks. Increases in surface water run-off outside these areas also need to be identified and addressed.
B. Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible. There should also be a preference for green over grey features, in line with the following drainage hierarchy:

1) rainwater use as a resource (for example rainwater harvesting, blue roofs for irrigation)
2) rainwater infiltration to ground at or close to source
3) rainwater attenuation in green infrastructure features for gradual release (for example green roofs, rain gardens).
4) rainwater discharge direct to a watercourse (unless not appropriate)
5) controlled rainwater discharge to a surface water sewer or drain
6) controlled rainwater discharge to a combined sewer.

C. Development proposals for impermeable surfacing should normally be resisted unless they can be shown to be unavoidable, including on small surfaces such as front gardens and driveways.
D. Drainage should be designed and implemented in ways that promote multiple benefits including increased water use efficiency, improved water quality, and enhanced biodiversity, urban greening, amenity and recreation.

2.3 London Borough of Tower Hamlets Local Plan 2031

The Local Plan was adopted in January 2020, it sets out how the borough of Tower Hamlets will grow and develop until 2031 and identifies how many new homes, jobs and services are needed to support our growing population, and where and how they should be provided. It will also shape how our places will look and feel and influence the way that our communities interact with each other and the spaces around them. It also provides a series of policies to ensure development is well-designed, accessible, safe and respects and enhances the environment, and can be delivered alongside new infrastructure and local services.

Policy D.ES4 (Flood Risk) states that:

1. Development is required to be located in areas suitable for the vulnerability level of the proposed uses with:
    a. highly vulnerable uses not allowed within flood zone 3a
    b. essential infrastructure and more vulnerable uses within flood zone 3a required to pass the exception test, and
    c. highly vulnerable uses within flood zone 2 required to pass the exception test.
2. Development is required to provide a flood risk assessment if it meets any of the following criteria:
    a. The development site is over 1 hectare in size within flood zone 1
    b. The site is within flood zones 2 or 3a
    c. The development may be subject to other sources of flooding, as defined in the Tower Hamlets Strategic Flood Risk Assessment.
3. The flood risk assessment should include:
    a. A sequential test if the development is in flood zone 2 or 3
    b. The risks of both on and off-site flooding to and from the development for all sources of flooding including fluvial, tidal, surface run-off, groundwater, ordinary watercourse, sewer and reservoir
    c. An assessment of tidal risk in the event of a breach in the River Thames defences
    d. The impact of climate change using the latest government guidance
    e. Demonstration of safe access and egress, and
    f. Mitigation measures, taking account of the advice and recommendations set out in the Tower Hamlets Strategic Flood Risk Assessment.
4. Site design of development which meets criteria outlined in Part 2 above is required to:

   a. undertake a sequential approach to development layout to direct highest vulnerability uses to areas of the site with lowest flood risk, and
   b. incorporate flood resilience and/or resistance measures.
5. Development is required to protect and where possible increase the capacity of existing water spaces and flood storage areas to retain water.
6. Development is required to enable effective flood risk management through:
   a. requiring development along the River Thames and the River Lea and its tributaries to be set back by the following distances unless significant constraints are evidenced:
      i. A minimum of a 16-metre buffer strip along a tidal river, and
      ii. A minimum of a 8-metre buffer strip along a fluvial river.
   b. optimising opportunities to realign or set back defences and improve the riverside frontage to provide amenity space and environmental enhancement.

Policy D.ES5 (Sustainable Drainage) states that:

1. Development is required to reduce the risk of surface water flooding, through demonstrating how it reduces the amount of water run-off and discharge from the site through the use of appropriate water reuse and sustainable drainage systems techniques.
2. Major development is required to submit a drainage strategy which should demonstrate that surface water will be controlled as near to its source as possible in line with the sustainable drainage systems hierarchy.
3. Development is required to achieve the following run-off rates:
   a. New development in critical drainage areas is required to achieve a greenfield run-off rate and volume leaving the site
   b. All other development should seek to achieve greenfield runoff rate and volume leaving the site. Where this is not possible, the minimum expectation is to achieve at least 50% attenuation of the site's surface water run-off at peak times prior to redevelopment.

2.4 London Borough of Tower Hamlets Strategic Flood Risk Assessments

The LBTH Strategic Flood Risk Assessment was published in August 2017 to determine flood risk across the borough.

The Level 1 SFRA aims to collate and review all information available regarding flood risk for the borough, to enable the Sequential Test to be undertaken. In addition, it identifies areas at risk of flooding from all sources and provides information to allow the LBTH to set suitable policies to address flood risk management.

The Level 2 SFRA allows the Exception Test to be undertaken for Sites which cannot be located within a lower flood risk area. This report also provides enough information to assist each borough with strategic planning for their administrative area.

Information from both SFRAs regarding tidal, fluvial, surface water, sewer and groundwater flooding is included within Section 2 of this FRA.

2.5 London Borough of Tower Hamlets Preliminary Flood Risk Assessment

The LBTH's Preliminary Flood Risk Assessment (PFRA) was published in May 2011, to provide a high-level summary of flood risk to the borough.

The report describes the probability and subsequent consequences of past and future flooding, and considers flooding from overland surface water runoff, groundwater, sewers and ordinary watercourses. Information from the PFRA regarding flooding is included within Section 2 of this FRA.

2.6 London Borough of Tower Hamlets Local Flood Risk Management Strategy

The LBTH Local Flood Risk Management Strategy (LFRMS)xii was published in June 2015, to provide guidance and information for residents, businesses and developers regarding Tower Hamlets strategy for dealing with flooding within the borough.

It was completed to fulfil LBTH's requirement and duties as Lead Local Flood Authority (LLFA) and sets out how LBTH plan to manage flood risk across the Borough. In general, the LFRMS describes LBTH's commitment to work to address local flood risk and provides a framework of how local flood risk will be managed.

2.7 Environmental Permitting and Land Drainage Consent

Under the Environmental Permitting (England and Wales) Regulations 2016 an Environmental Permit for Flood Risk Activities is required from the Environment Agency for any permanent or temporary works, including works:

- In, over or under a designated main river
- Within 8 m of the top of bank of a designated main river or of the landward toe of a flood defence (16 m if it is a tidal main river or a sea defence).

In addition, any permanent or temporary works within the floodplain of a designated main river may also require an Environmental Permit for Flood Risk Activities. A permit is separate to and in addition to any planning permission granted.

Land drainage consent may be required from the lead local flood authority or drainage board for work to an ordinary watercourse.

Undertaking activities controlled by local byelaws also requires the relevant consent.

3 Site Description & Context

3.1 Site Location

The Aberfeldy estate is located in Lansbury ward in the south-east of Tower Hamlets. Aberfeldy is one of the most physically and geographically segregated parts of the borough, with the A12 and A13 road networks splitting the estate from the rest of Poplar and Blackwall.

The site is located to the south of the River Lea and the Leven Yard Gasworks site. It is bounded to its west by the A12 and borders the Aberfeldy Village Development and Culloden Primary School to the south.

The site is centred on the approximate National Grid Reference TQ 38483 81132, as shown in Figure 1.

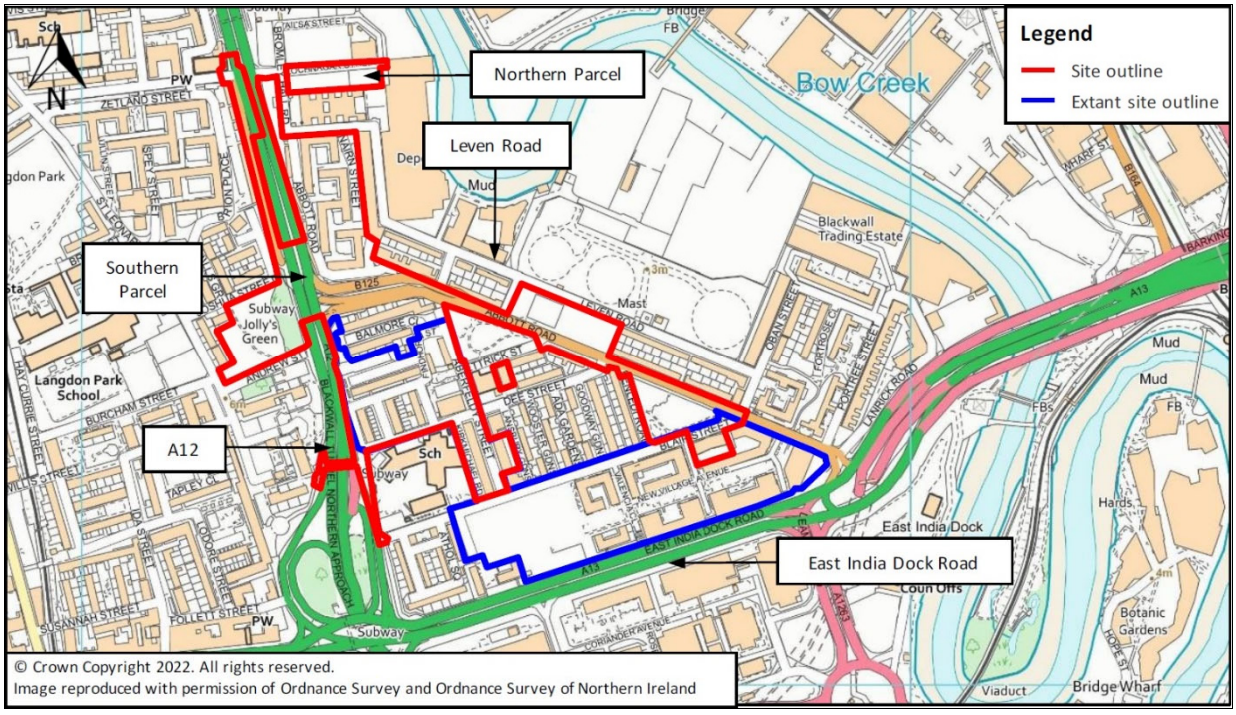


Figure 1 - Site Location

3.2 Existing and Proposed Development

The existing site includes:

- Existing homes on the Aberfeldy estate, including the properties and land around Balmore Close
- The Nairn Street Estate to the north and the new Poplar Works development adjacent to the A12.
- Land at Lochnagar Street to the north of Bromley Hall School
- Abbott Road and the existing green spaces or Braithwaite Park and Leven Road Open Space
- Land along Blair Street, adjacent to Braithwaite Park, which will complete the courtyard building within the built phase of Aberfeldy Village; and
- The existing vehicular underpass, Jollys Green, land parallel to the A12 and the pedestrian underpass at Dee Street.

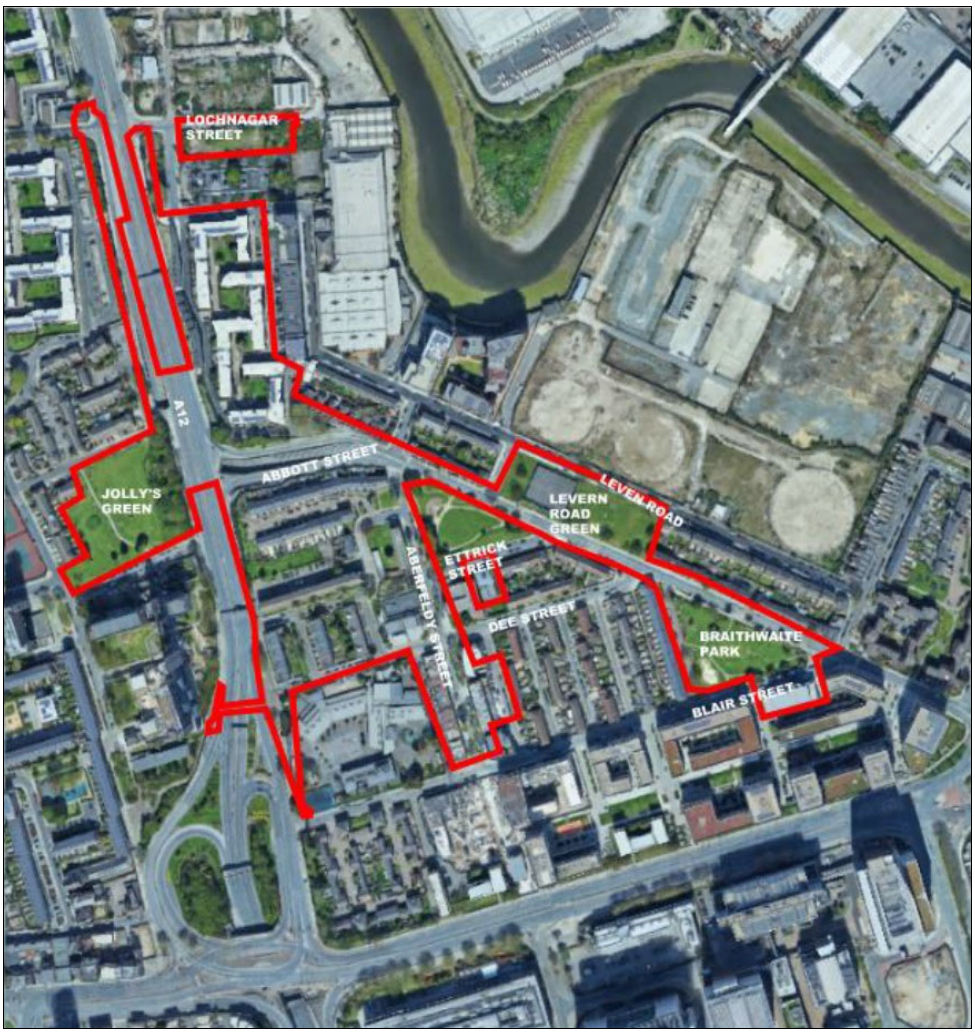


Figure 2 - Site Aerial View

A portion of the site benefits from an extant outline planning permission (ref: PA/11/02716/PO) for the construction of 1,176 residential units, of which 901 will have been constructed following completion of phase 3.

The proposed new masterplan is a once in a generation opportunity to reshape the heart of Poplar by maximising the LLP, Poplar HARCA and Tower Hamlets' landholdings which will deliver:

- A neighbourhood that fosters growth through high quality mixed use redevelopment
- A revitalised local centre with new retail, commercial workspace, civic and faith facilities
- Considerable public realm focused on walkability, healthy streets and creating a child friendly place
- Opportunity for improved connectivity to, from and through the site
- A significant number of new high quality homes providing a significant contribution to LBTH housing targets.

The proposals comprise a Hybrid application seeking detailed planning permission for Phase A and Outline planning permission for future phases, comprising:

Outline planning permission (all matters reserved) for the demolition of all existing structures and redevelopment to include a number of buildings (up to 100m AOD) and up to 140,591 (GEA) of floorspace comprising the following mix of uses: Residential (Class C3); Retail, workspace, food and drink uses (Class E); Car and cycle parking; Formation of new pedestrian route through the conversion and repurposing of the Abbott Road vehicular underpass for

pedestrians and cyclists connecting to Jolly's Green; Landscaping including open spaces and public realm; and New means of access, associated infrastructure and highway works.

In Full, for residential (Class C3), retail, food and drink uses and a temporary marketing suite (Class E and Sui Generis), together with access, car and cycle parking, associated landscaping and new public realm, and open space. This application is accompanied by an Environmental Statement.

The NPPG classifies residential development as More vulnerable to flood risk, and commercial and retail development as Less Vulnerable to flood risk.

Refer to Appendix A for the illustrative Aberfeldy New Masterplan Layout.

3.3 Waterbodies in the Vicinity of the Site

Waterbodies in the vicinity of the site are identified in Figure 3.

The River Lee is located a minimum of approximately 160 m east of the site and flows in a generally southerly direction to its confluence with the River Thames. The River Thames is located approximately a 550 m south of the site and flows in an easterly direction towards the Thames Estuary.

According to the main river map both the River Lee and the River Thames are classified as a 'main river'. The Environment Agency carries out maintenance, improvement and construction work on main rivers to manage flood risk.

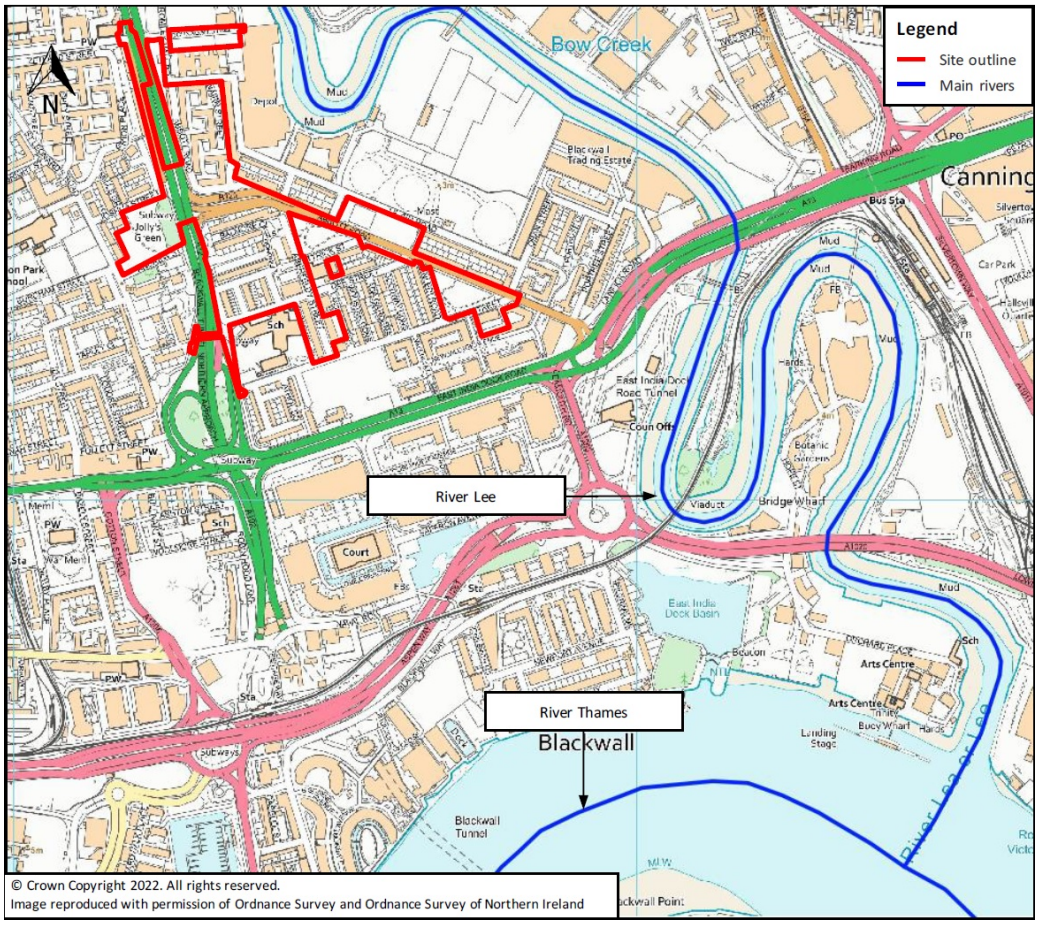


Figure 3 – Location and Designation of Waterbodies

3.4 Site Levels and Topography

The existing site levels have been extracted from the Lidar Digital Terrain Model (DTM) provided by the Department for Environment, Food & Rural Affairs (DEFRA) Survey Data portal. The maps identify the existing levels to Ordnance datum as illustrated in Figure 4.

The DTM indicates that the site levels range between approximately 1.4 and 5.3 metres Above Ordnance Datum (m AOD), with the northern site parcel situated approximately 2.0 m higher than the southern parcel.

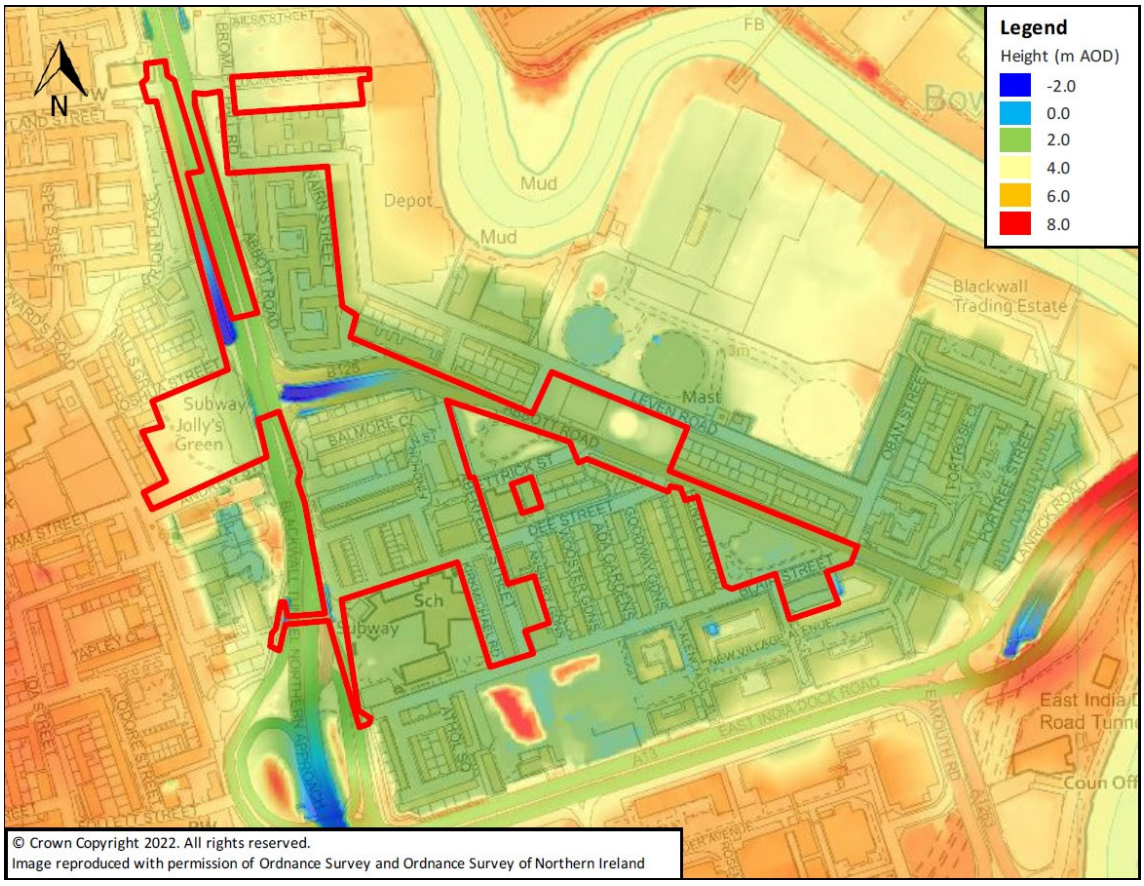


Figure 4 – Lidar level data

3.5 Site Geology and Hydrogeology

British Geological Survey (BGS) mapping indicates that the superficial deposits at the majority of the site comprise alluvium - clay, silt, sand and peat formed up to 2 million years ago in the Quaternary Period. In the western area Sands and Gravels of the Kempton Gravel Member appear at shallow depths. (Figure 5).

The bedrock geology at the site comprises clay, silt and sand of the London Clay formation - sedimentary bedrock formed approximately 48 to 56 million years ago in the Palaeogene Period (Figure 6).

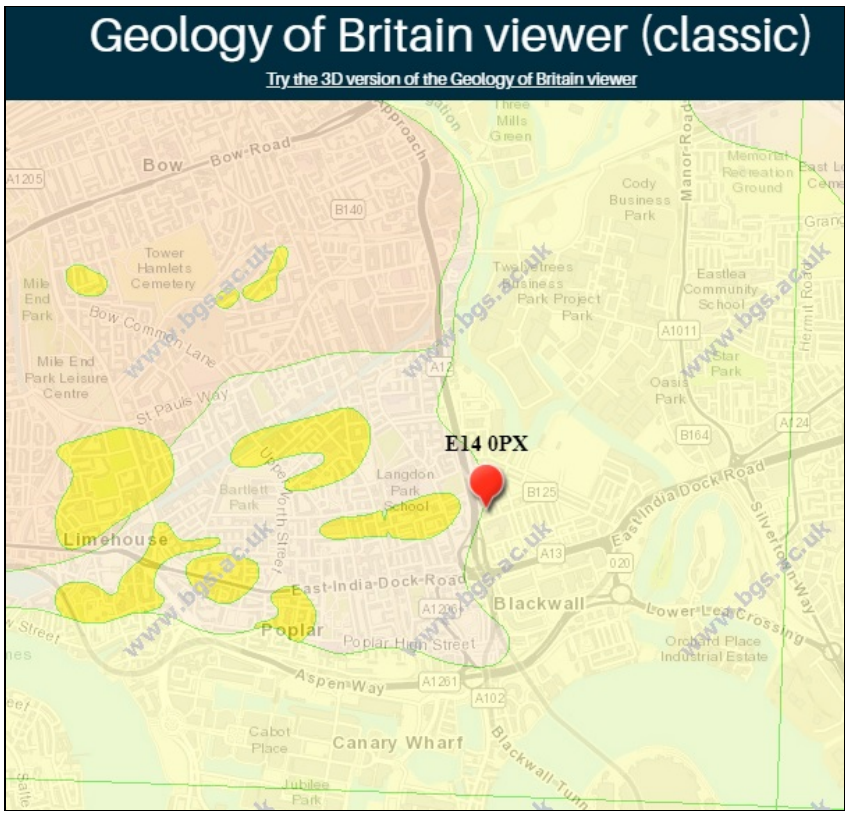


Figure 5 - Site Superficial deposits

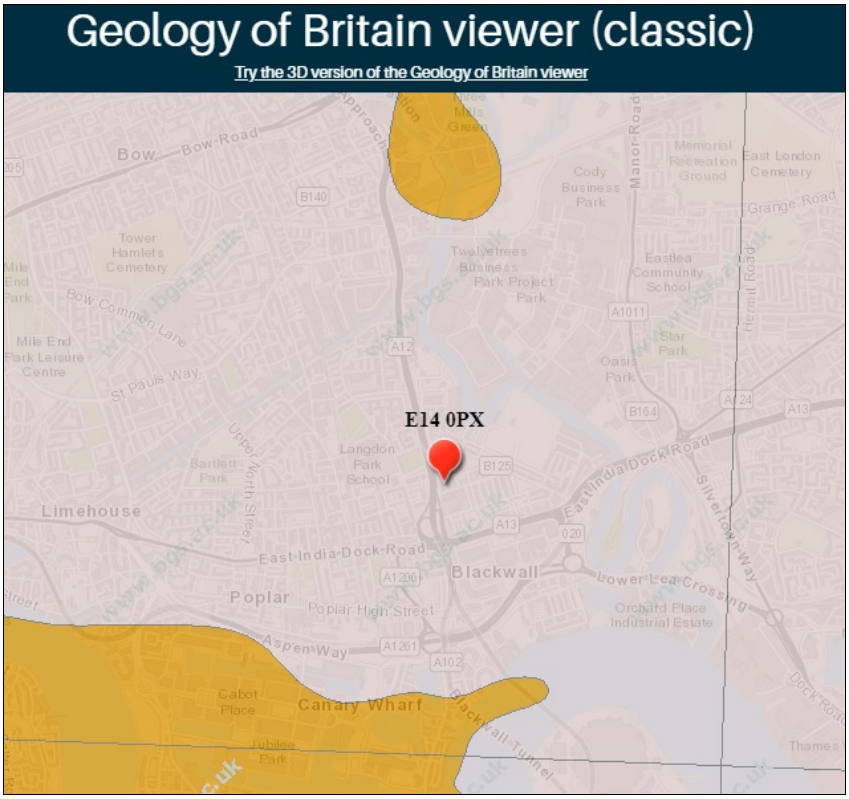


Figure 6 - Site Bedrock Geology

The National Geoscience Data Centre's Single Onshore Borehole Index holds five records of boreholes within the site boundary. These indicate that made ground is present to a maximum depth of 2.5 m below ground level (bgl) underlain by silty sandy clay interlaid with gravel to a depth of 25.0 m bgl.

Refer to Appendix B for the BGS Historic borehole logs.

The EA provides publicly available mapping which indicates the aquifer classifications and groundwater vulnerability of geological deposits of England and Wales.

Aquifer designations reflect the importance of aquifers in terms of groundwater as a resource and in their role in supporting surface water flows and wetland ecosystems. Aquifer maps are split into two different types of aquifer designations; superficial, which are permeable unconsolidated deposits and bedrock which are solid, permeable formations.

Environment Agency (EA) records indicate that the Sands and Gravels of the Kempton Gravel Member are considered a Secondary A Aquifer. Alluvium deposits are considered a Secondary Aquifer (undifferentiated) (Figure 7).

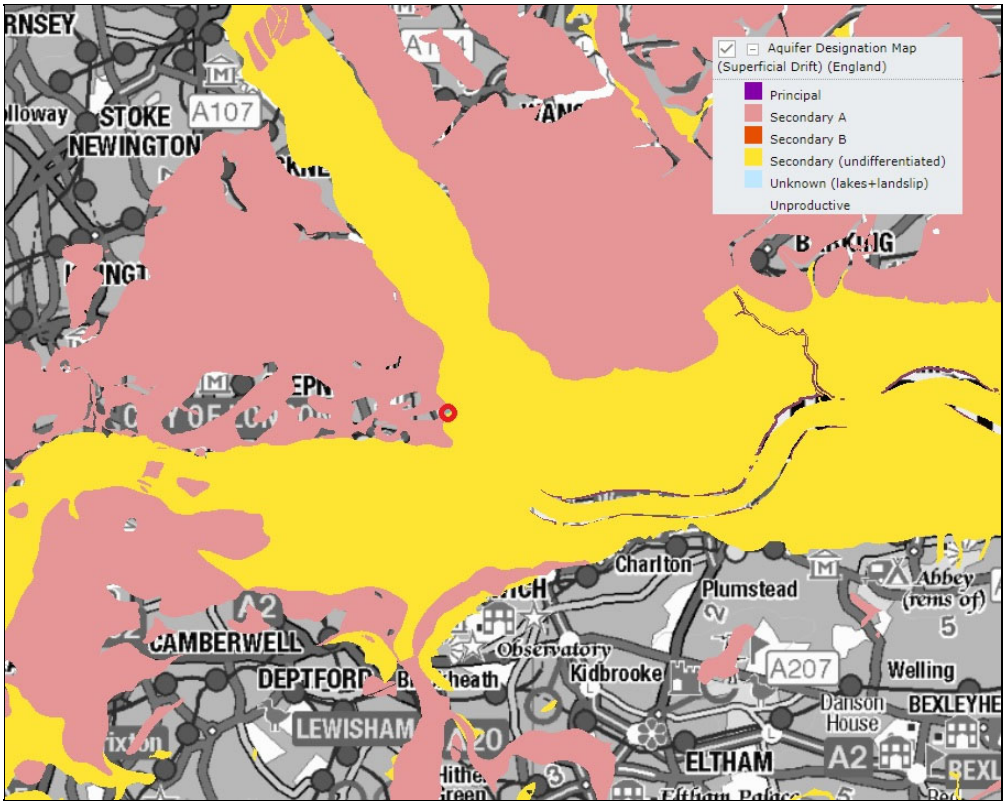


Figure 7 – Environment Agency Aquifer Designation Map (Superficial)

The London Clay in the bedrock is considered an Unproductive strata (Figure 8).

Figure 8 – Environment Agency Aquifer Designation Map (Bedrock)

Therefore, the Groundwater Vulnerability Zone is considered to be Medium-Low. (Figure 9).

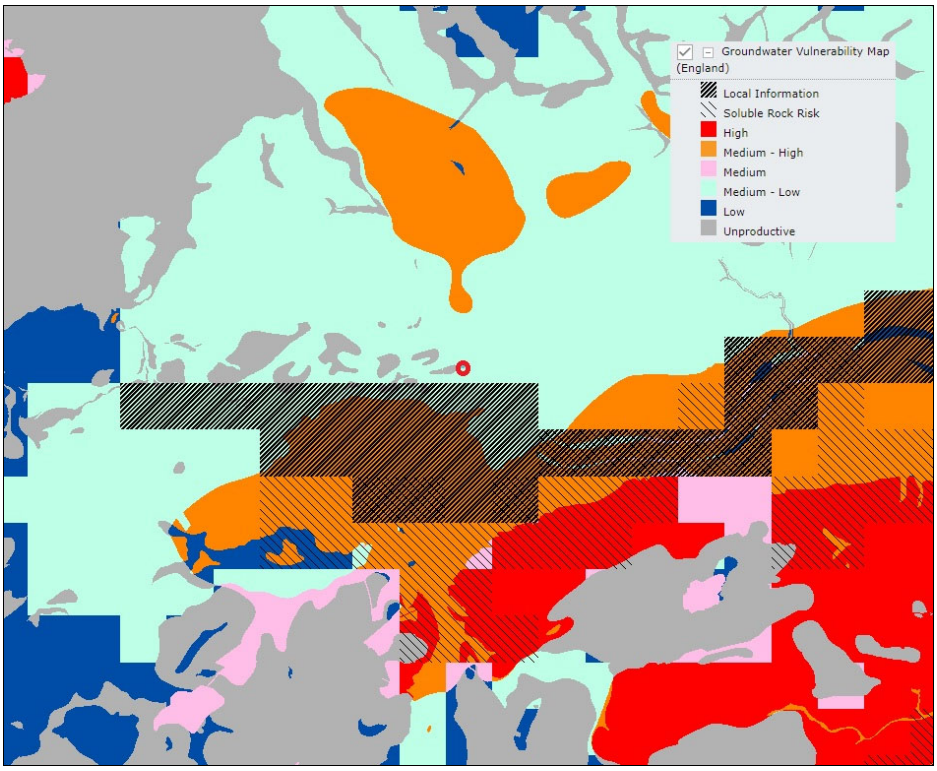


Figure 9 – Environment Agency Groundwater Vulnerability Map

According to the Soilscapes maps produced by the National Soils Research Institute, soil conditions at the western area of the site are described as 'Loamy soils with naturally high groundwater'. In the central and eastern areas they are indicated as 'Loamy and clayey soils of coastal flats with naturally high groundwater' (Figure 10).

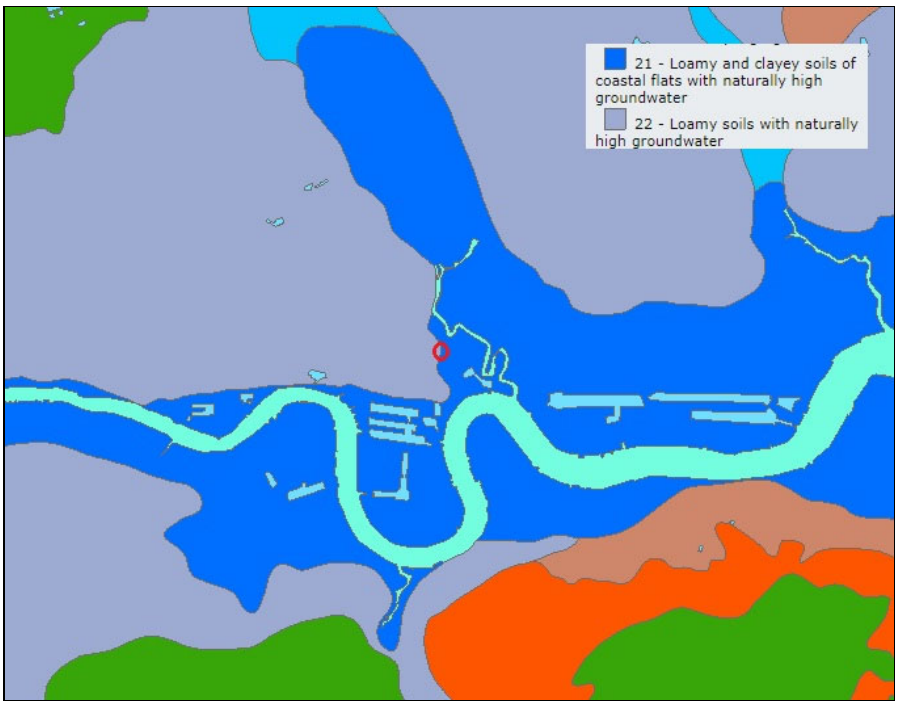


Figure 10 – Soilscape (England) Map

EA define Source Protection Zones (SPZs) for groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area. The closer the activity, the greater the risk.

The SPZ map in the area shows that the site is not located within a catchment, outer or inner designated source protection zones **(Figure 11)**.

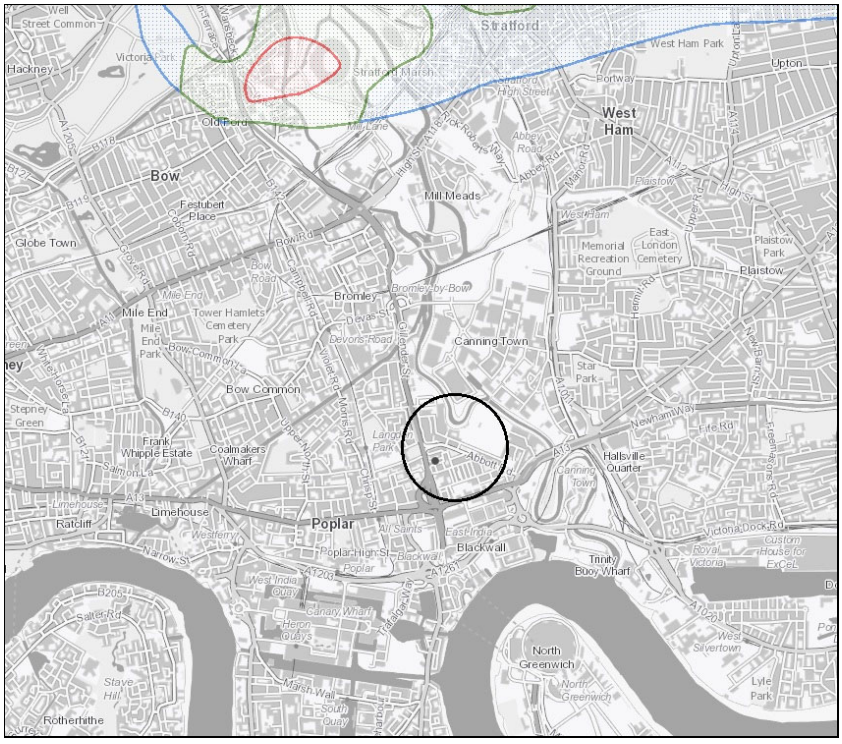


Figure 11 – Environment Agency Source Protection Zones Map

4 Assessment of Flood Risk

4.1 Flood Zone Designation

Flood Zones refer to the probability of river and sea flooding, ignoring the presence of defences. The NPPF and PPG defines Flood Zones as follows:

a. Flood Zone 1 (Low Probability): Land having a less than 1 in 1,000 annual probability of river or sea flooding.
b. Flood Zone 2 (Medium Probability): Land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding; or Land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding.
c. Flood Zone 3a (High Probability) Land having a 1 in 100 or greater annual probability of river flooding; or Land having a 1 in 200 or greater annual probability of sea flooding.
d. Flood Zone 3b (The Functional Floodplain): This zone comprises land where water has to flow or be stored in times of flood.

The flood zones are shown on the Environment Agency Flood Map for Planning (Rivers and Sea). The flood zones shown on the flood map are defined by the predicted extent of flooding during the present day 1 in 100 (non-tidal rivers), 1 in 200 (tidal rivers and sea) and 1 in 1,000 (rivers and sea) annual exceedance probability (AEP) events. The zones do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding.

Flood zone 3b (functional floodplain) is not separately distinguished on the Flood Map for Planning but is usually identified by local planning authorities in their SFRAs. The boundary of flood zone 3b is normally defined as land that would flood during the present day 1 in 20 AEP event, although definitions may vary particularly in some districts and in urban areas.

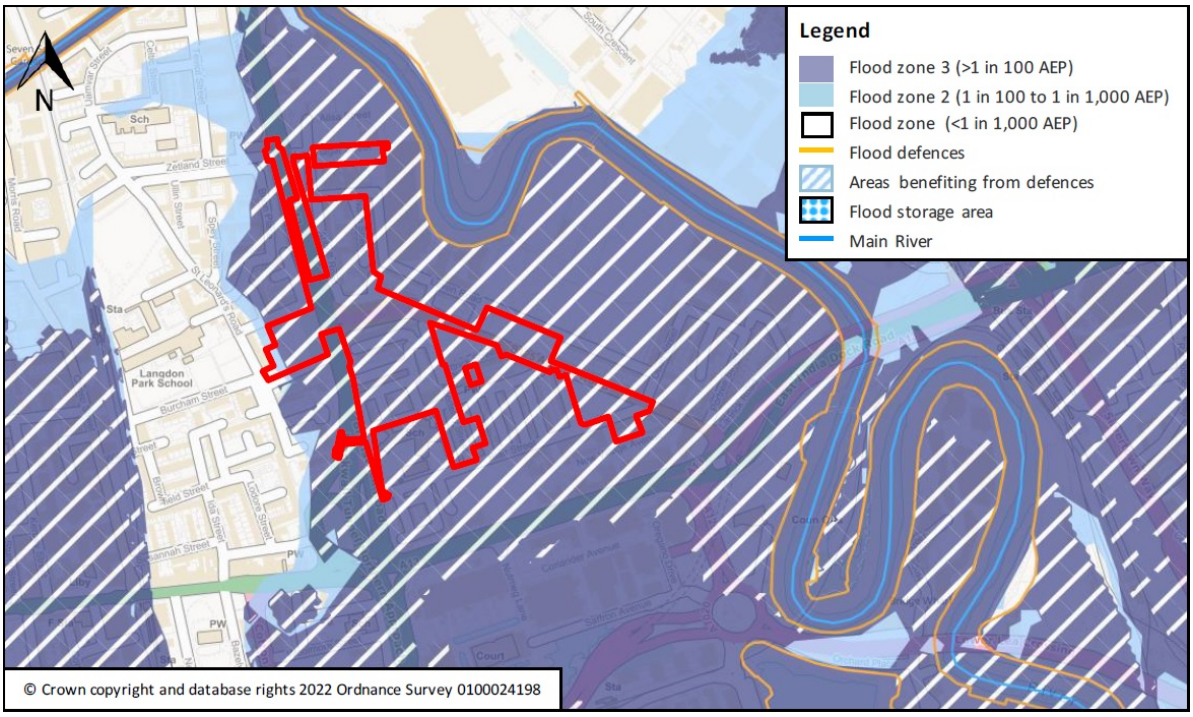


Figure 12 – EA Flood Map from Rivers & Sea

Where an area benefits from formal flood defences providing a minimum standard of protection, the defended area may be indicated as an area benefiting from flood defences. However, not all areas are shown as such, and unless specifically indicated, the Flood Map for Planning conservatively shows land at risk of flooding in the absence of flood defences. The Flood Map for Planning (Figure 12) indicates the site to be located in flood zone 3 and is in an area benefiting from the presence of flood defences.

4.2 Historical Records of Flooding

The Environment Agency historic flood map indicates that extensive flooding of the site occurred in 1928 and that land beyond the south-east corner of the site was also flooded in 1947 (Figure 13).

It should be noted that raised defences were not present along the River Lee when flooding occurred at the site. The London Borough of Tower Hamlets SFRA indicates that flood defences were constructed following the 1947 flood event.

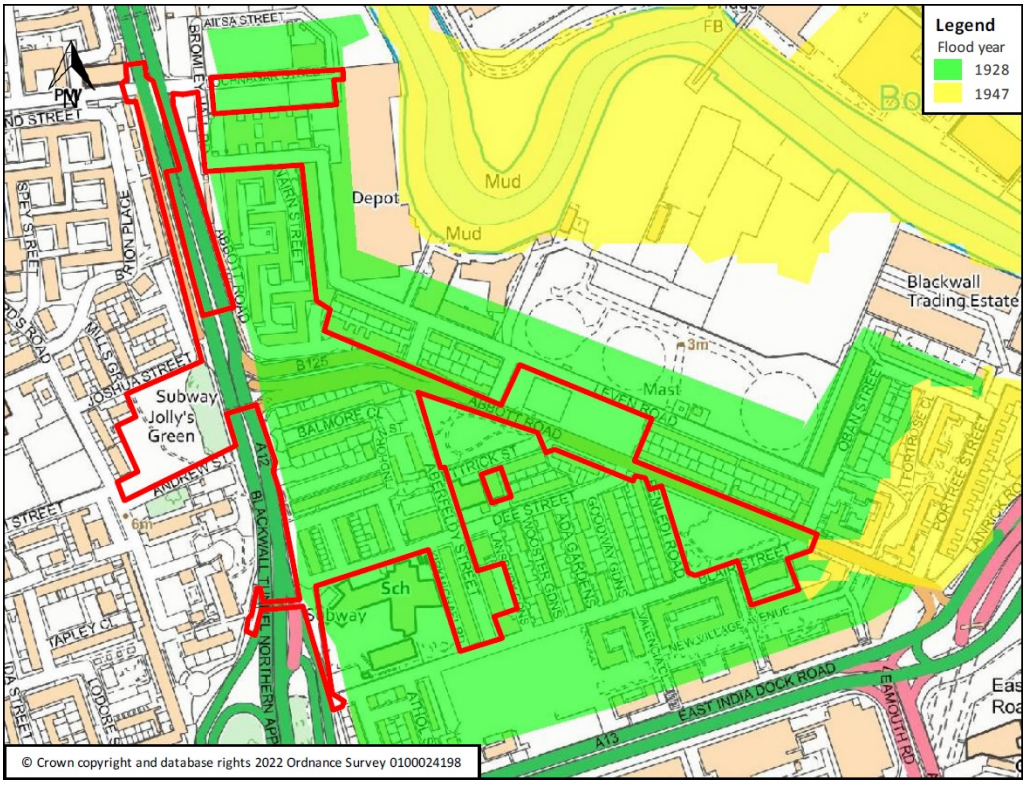


Figure 13 – Recorded Flood Outlines.

4.3 Flood Risk – River Lee

As detailed in Section 3.3, the River Lee is located a minimum of approximately 160 m east of the site and flows in a generally southerly direction to its confluence with the River Thames.

The Environment Agency (EA) has confirmed that the flood defences along the River Lee prevent flooding in up to the 1 in 1,000 AEP event and that the planning application should be informed by an assessment of flood risk from the River Thames. Refer to Appendix C for the Product 4 Detailed Flood Risk Maps provided by the EA.

4.4 Flood Risk – River Thames

As detailed in Section 3.3, the River Thames is located approximately a 550 m south of the site and flows in an easterly direction towards the Thames Estuary.

The extent of flooding presented by the Flood Map for Planning does not take into account the presence of flood defences. However, the site is located in an area benefitting from formal defences, including the Thames Barrier.

The Thames Barrier and the raised defences along the banks of the River Thames and are designed to provide a 1 in 1,000 annual probability Standard of Protection (SoP) and therefore mitigate the risk of flooding from the River Thames in up to the present day 1 in 1,000 annual probability event.

The crest level of the defences situated adjacent to the site is currently 5.23 m AOD. It is expected that the crest level of the defences will be raised to 6.20 m AOD in accordance with the TE2100 Plan in order to maintain the current SoP up to 2100.

Based upon the above, the site is assessed to be at a low risk of flooding form the River Thames. However, a residual risk of flooding exists due to potential overtopping of the defences for events exceeding the SoP, due to a structural failure of the flood defence walls, or due to a failure of Thames Barrier to operate as intended.

The Environment Agency has provided outputs from its 2017 Thames Tidal Upriver Breach Inundation Modelling Study. The extents of flooding resulting from a breach of the River Thames flood defences for the present day and 2100 climate change scenarios are presented by Figure 14 and indicate that the site is at risk of flooding.

Maximum flood levels for the present day and 2100 climate change scenarios are presented by Figure 15 and Figure 16 respectively. The model results indicate that peak flood levels across the southern site parcel for the present day and 2100 climate change scenarios are 2.80 m AOD and 3.68 m AOD respectively. Peak flood levels within the northern site parcel are shown to range from 3.18 – 3.55 m AOD in the present day scenario and 3.65 – 5.10 m AOD in the 2100 climate change scenario.

Flood hazard mapping for the present day and 2100 climate change scenarios are presented by Figure 17 and Figure 18 respectively. The flood hazard at the site is generally shown to be significant (i.e. dangerous for most people), with areas of extreme hazard (i.e. dangerous for all) identified along the site access roads in the 2100 climate change scenario. Refer to Appendix D for the Environment Agency EIA response letter.

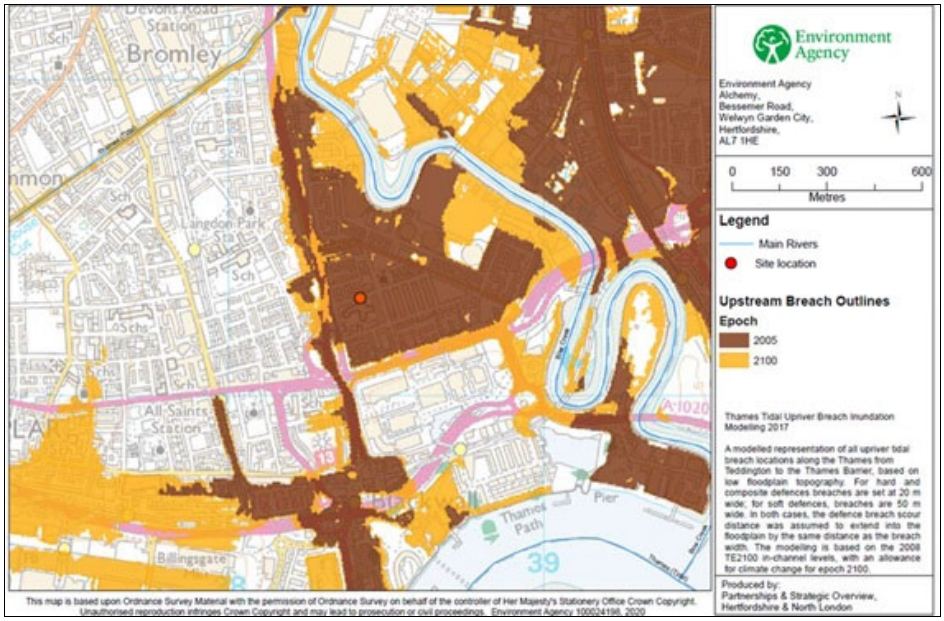
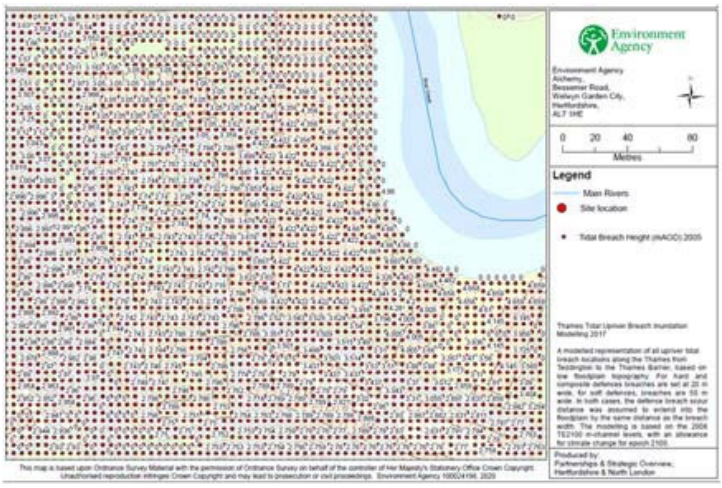
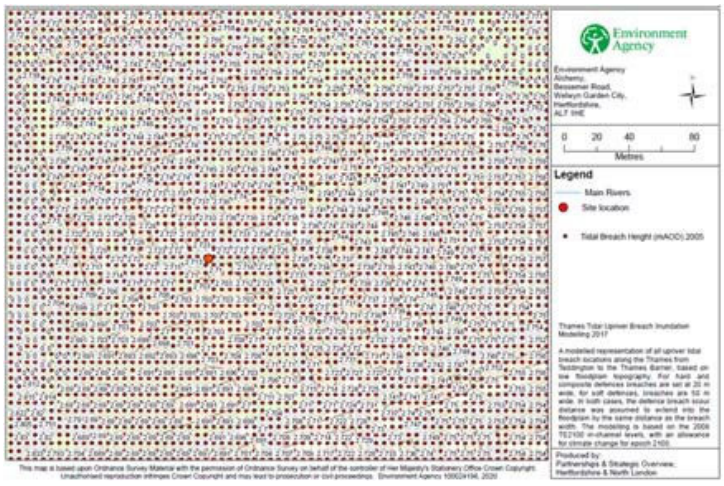


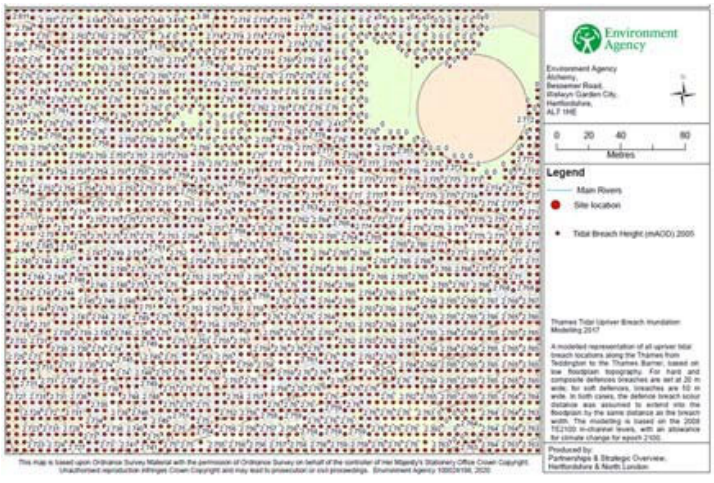
Figure 14 – Modelled Flood Extent – Breach. Tidal Upriver Breach Inundation Modelling Study 2017



North Aberfeldy Village

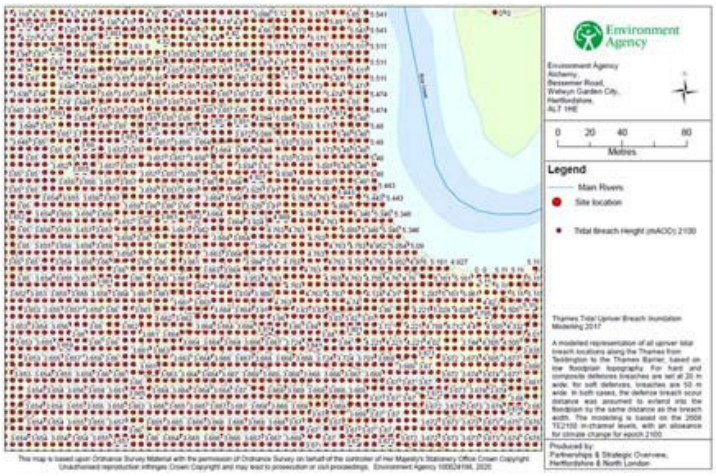


South-west Aberfeldy Village

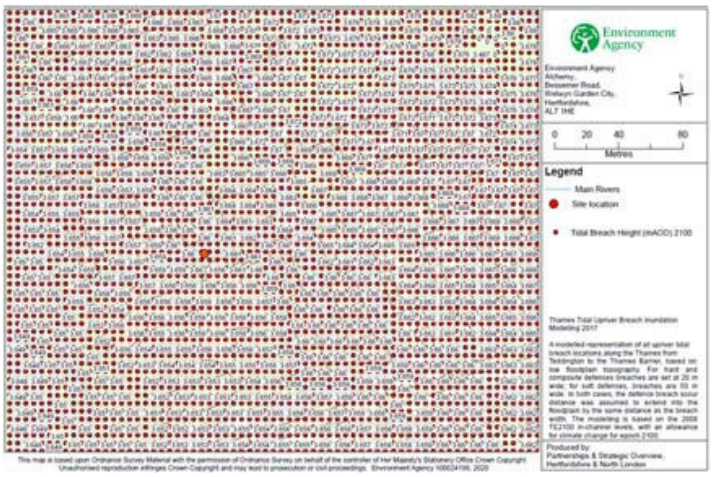


South-east Aberfeldy Village

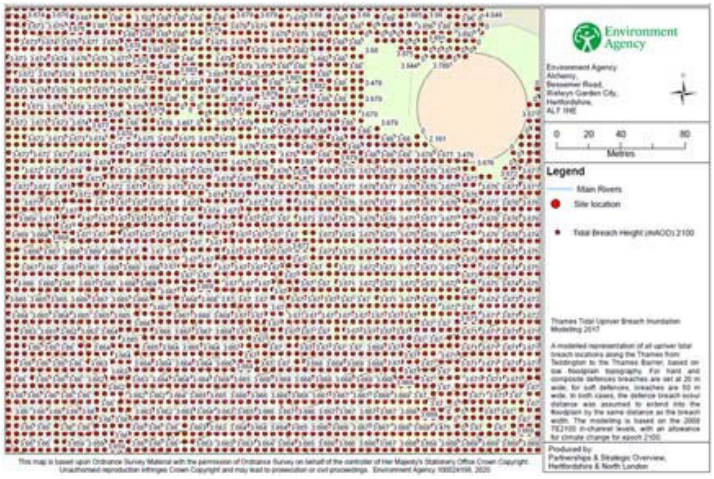
Figure 15 – Maximum Water Level – Breach (2005). Tidal Upriver Breach Inundation Modelling Study 2017



North Aberfeldy Village



South-west Aberfeldy Village



South-east Aberfeldy Village

Figure 16 – Maximum Water Level – Breach (2100). Tidal Upriver Breach Inundation Modelling Study 2017

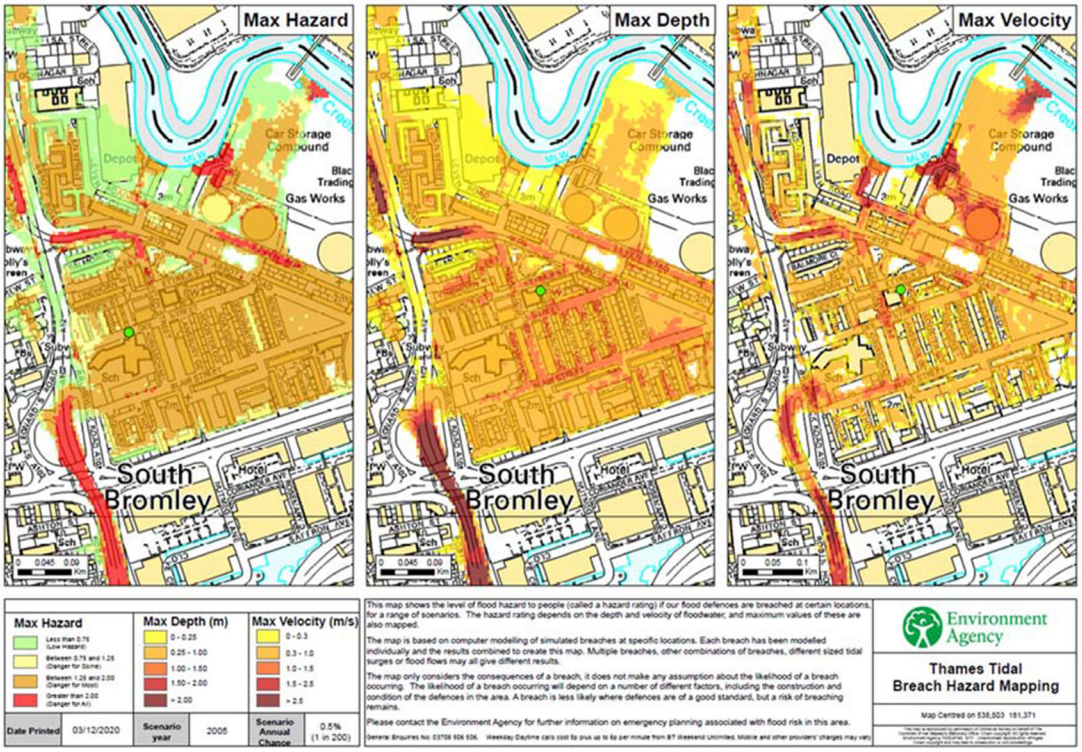


Figure 17 – River Thames Hazard Mapping Breach (2005). Tidal Upriver Breach Inundation Modelling Study 2017

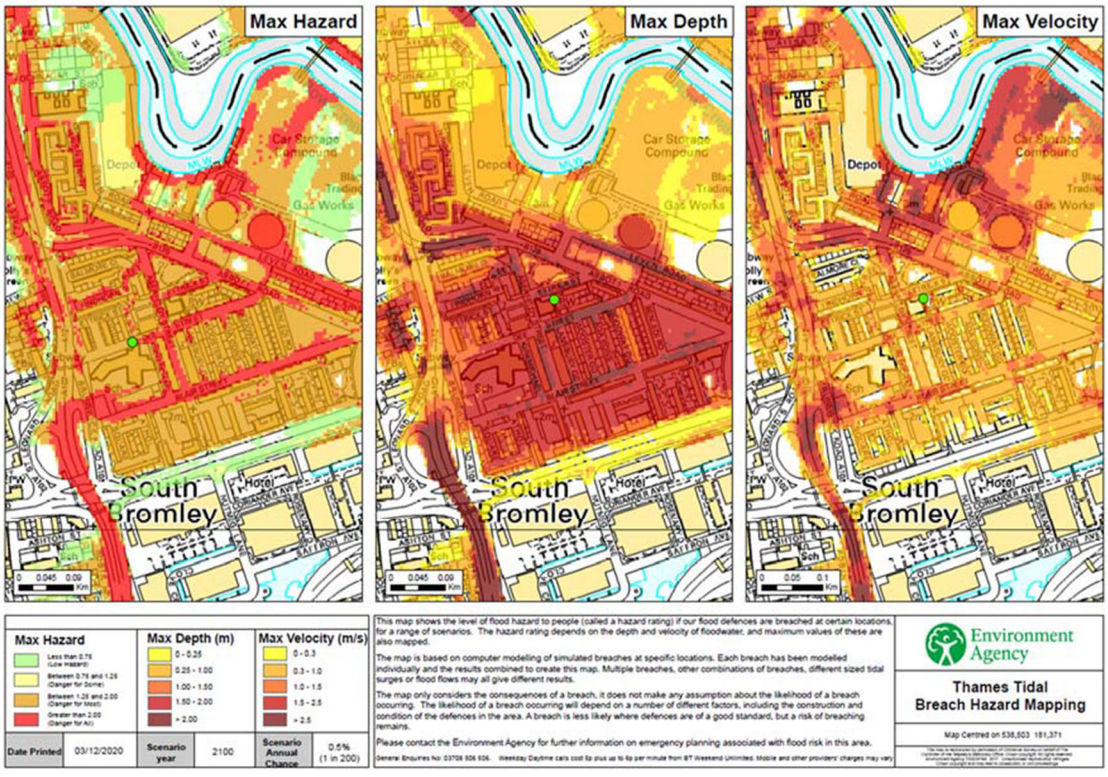


Figure 18 – River Thames Hazard Mapping Breach (2100). Tidal Upriver Breach Inundation Modelling Study 2017

4.5 Surface Water Flooding

Pluvial flooding occurs when natural and engineered systems have insufficient capacity to deal with the volume of rainfall. Pluvial flooding can sometimes occur in urban areas during an extreme, high intensity, low duration summer rainfall event which overwhelms the local surface water drainage systems. This flood water would then be conveyed via overland flow routes dictated by the local topography.

Appendix A, Map 006, of the SFRA indicates that the site is located within a Critical Drainage Area.

The Flood Risk from Surface Water map (Figure 19) shows the majority of the site to be at very low risk of flooding from surface water, with the site access roads identified as being at increased risk.

Potential flood depths along the site access roads for the low, medium and high risk events are presented by Figure 19. Flood depths are shown to be approximately 300 mm, with the exception of the A12 underpass where flood depths are expected to exceed 900 mm.

It should be noted that the modelling approach used to generate the Flood Risk from Surface Water map generally underestimates the capacity of urban drainage networks. It is typically assumed that drainage networks provide a surface water removal rate of 12 mm per hour, equivalent to 33 litres per second per hectare of impermeable area. As such, it is likely that the Flood Risk from Surface Water map overstates the risk of flooding at the site from this source.

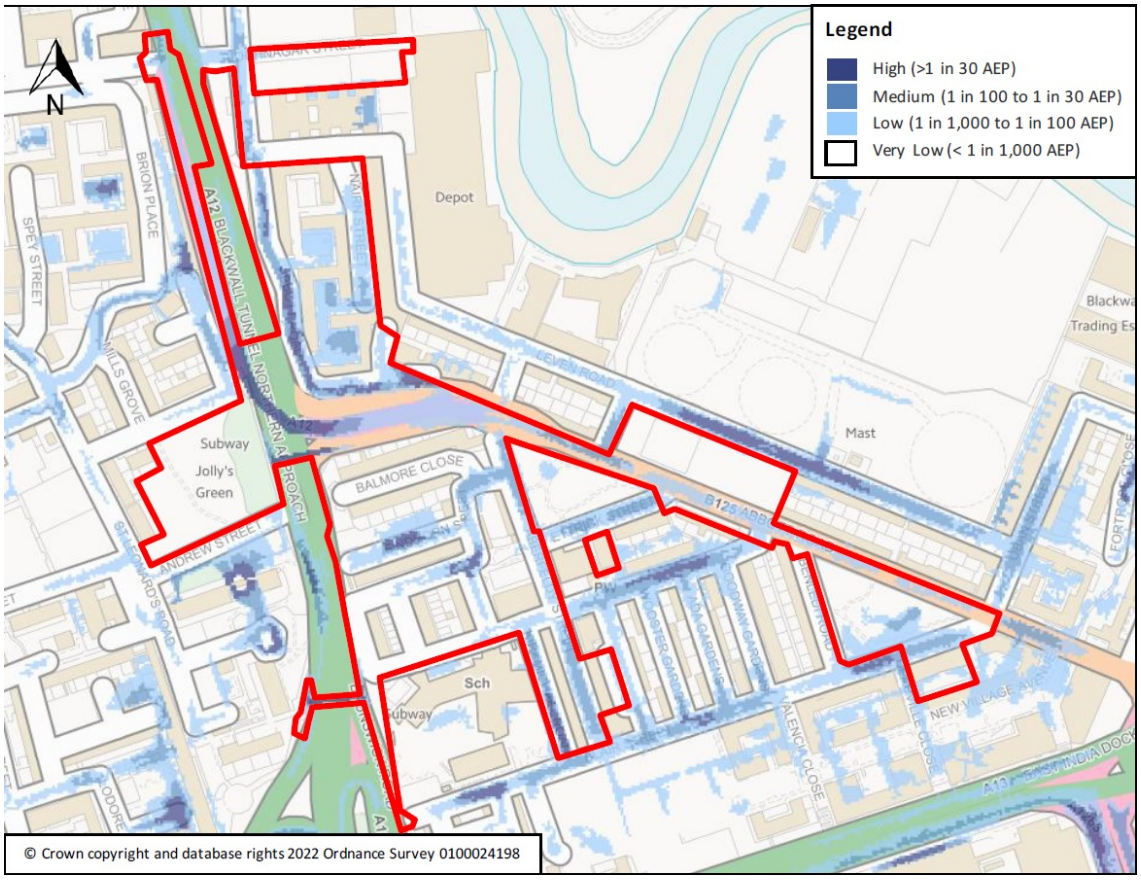


Figure 19 – EA Flood Risk from Surface Water

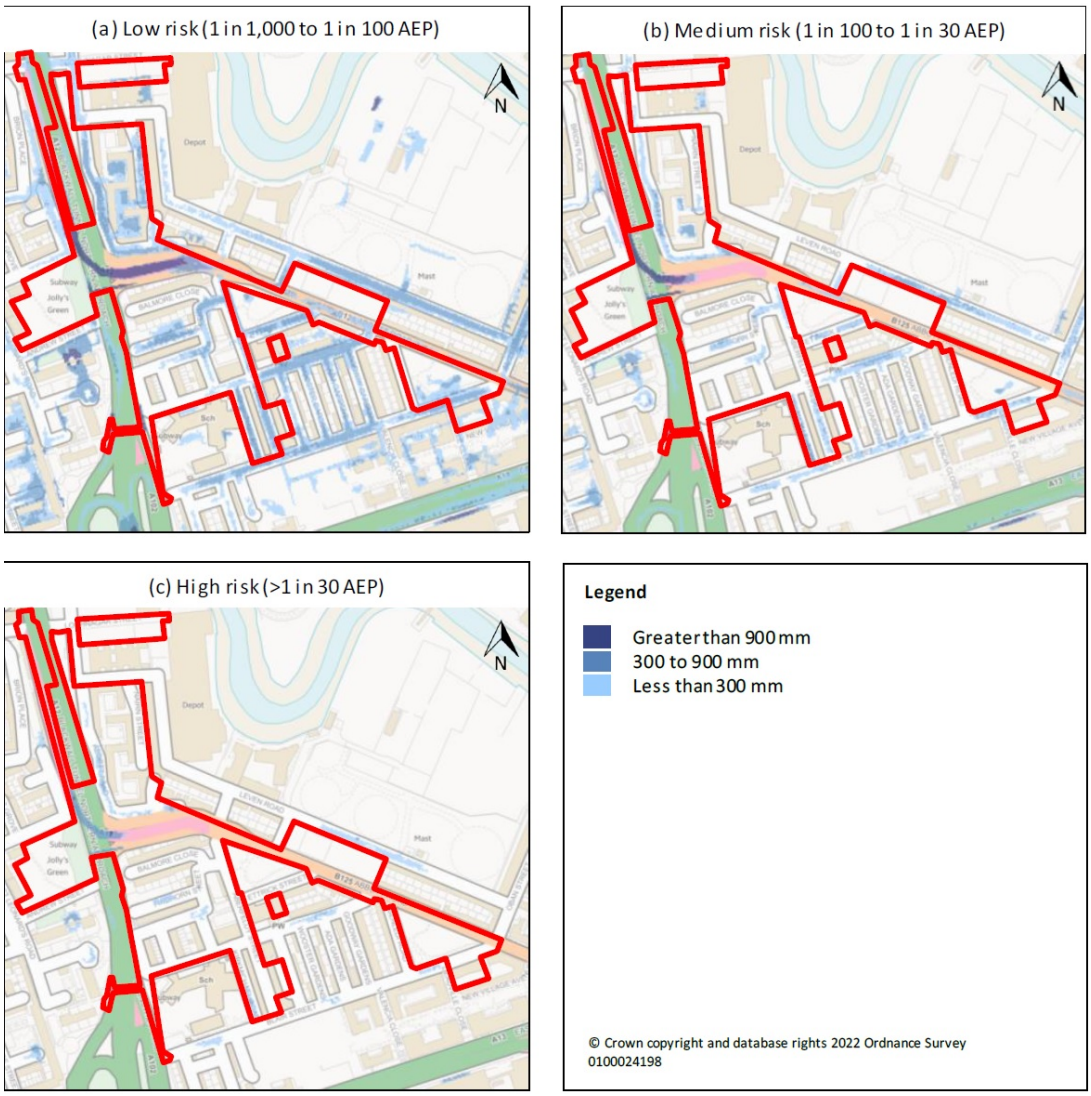


Figure 20 – EA Flood Risk from Surface Water - Depth

In Abbot Road the existing properties are at high risk of surface water flooding with a water depth less than 300mm as shown on Figure 20. The reason is that there are overland surface water flows coming from the northwest into the site (Blackwall Tunnel Northern Approach, Bromley Hall Road, Abbot Road) as indicated on the Environment Agency surface water velocity map (Figure 21).

The surface water runoff is currently channelled along Abbot Road between the existing buildings and retaining walls. The development proposals will minimise the risk of surface water flooding providing a wider area between existing and proposed buildings to spread overland surface water flows without affecting properties and reducing water depth for all exceedance storm events.

Refer to Meinhardt's Aberfeldy Village Drainage Strategy report and Overland Flow Routes Map

Figure 21 – EA Flood Risk from Surface Water Velocity Map

4.6 Sewer Flooding

The existing sewer system in London was constructed in the 19th century. The sewer system consists of combined sewers which were initially designed to collect foul waters only. However, the spare capacity of the sewers at the time and surface water flood risk incidents, resulted in a decision to use the sewers, also for the collection of surface water. Six main interceptor sewers were built and fed by 450 miles of main sewers and 13,000 miles of local sewers which historically discharged into the River Thames.

In the LB of Tower Hamlets the sewer network is a largely combined foul and surface water system managed by Thames Water. The combined sewers have brickwork culverts which outfall into the River Thames. Based on present day forecasting for heavy rainfall events, it is predicted that the culverts only have capacity for the 1 in 10 annual probability flood event. Additionally, any new surface water sewers have been designed to hold the 1 in 30 annual probability flood event. Subsequently, London experiences flooding as a result of a lack of sewer capacity, although they are generally of small consequence (mainly flooding of roads). However, climate change will result in summer storms increasing in frequency, and winter storms becoming more prolonged. This means that the current standard of protection for the existing sewer system will be reduced and more frequent localised flood events, as a result of sewer flooding, can be expected.

The data provided by Thames Water shows postcodes where properties are known to have experienced sewer flooding. The majority of the incidents of sewer flooding are clustered in the north of the borough around Bow and Victoria Park - post codes E3 2, E3 5, E9 5 and E9 7. The relatively high number of incidents reported in post code areas E3 2 and E3 5 may be the result of a shallow gradient drainage network. There are recorded 3no internal sewer flood records at the site post code E14 0.

The sewer system was not modelled for the SWMP explicitly hence interaction between the sewer system and surface water modelling was not investigated.

Sewer flooding generally results in localised short-term flooding caused by intense rainfall events overloading the capacity of the sewers. Flooding can also occur as a result of a blockage, poor maintenance or structural failure.

There are existing Thames Water adopted combined sewers in the vicinity of the proposed development. It is anticipated that the adopted sewers will be regularly maintained by Thames Water and therefore risk of failure should be considered to be minimal. Should the existing sewers flood, they will follow the proposed flood exceedance routes and existing topography.

The proposed development is a Brownfield site which discharges unrestricted surface water flows into the existing public sewers; post-development the surface water discharge rates will be heavily restricted to the Greenfield Qbar rate. Therefore, the proposed development is considered to be at low risk of sewer flooding.

4.7 Flood Risk from Reservoirs, Canals and Other Artificial Sources

The Flood Risk from Reservoirs map (Figure 21) indicates that the site may be at risk of flooding from reservoirs when there is also flooding from rivers. However, all large reservoirs are regularly inspected by reservoir panel engineers with essential safety work carried out as required. As detailed on the gov.uk website, reservoir flooding is therefore extremely unlikely to occur. There are no canals or other artificial sources located within the vicinity of the site that are expected to present a risk of flooding.

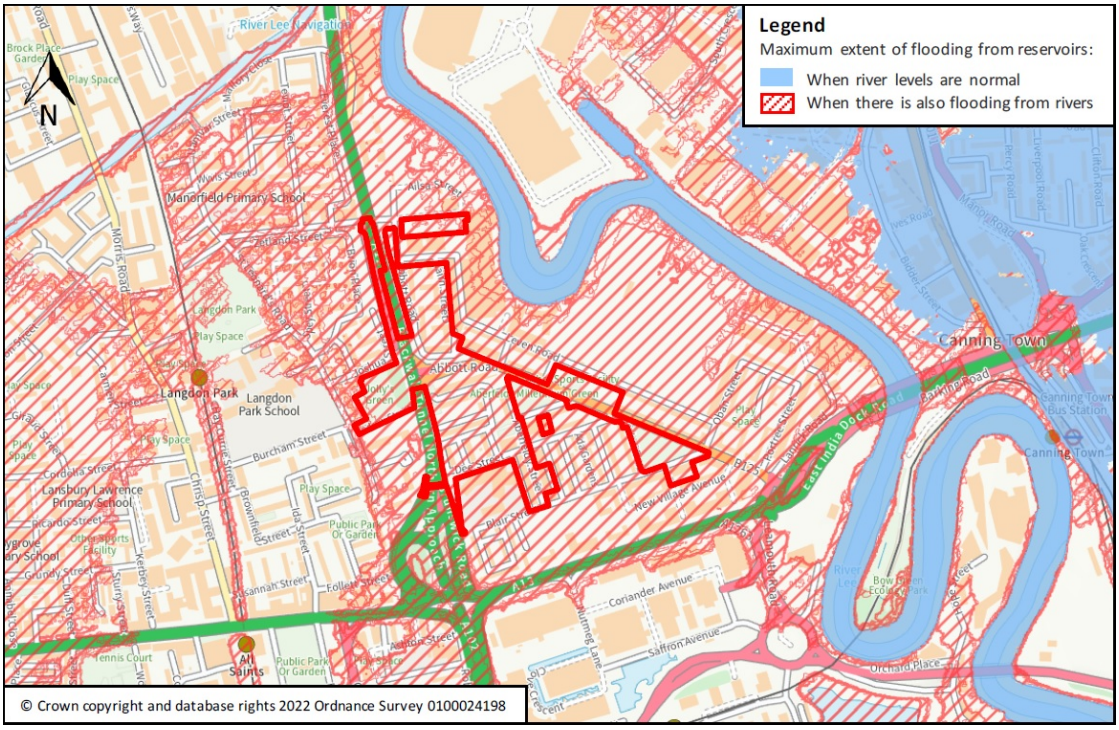


Figure 21 – Flood Risk from Reservoirs Map

4.8 Water Main Burst

A burst water main can occur at any time and can have a serious impact on both property and infrastructure.

Any pipe burst can result in flooding of roads and property however the locations at most risk are considered to be low points in the topography along roads and tunnels and locations where large water mains run along streets and open spaces. This is because flood water would accumulate at low points and burst flows are much larger for larger pipes.

Thames Water has recently undertaken a review of bursts on their trunk main network following a series of incidents in 2016. This review came to the following findings regarding the causes of bursts; 'there is no single common

cause of the bursts. Whilst age and condition of the pipes is an underlying factor in the eight high-profile failures, there were no systematic failings that could be said to have consistently caused or enabled the bursts.'

At present no assessment of the risk of water main burst flooding has been undertaken as it has not been possible to obtain water main asset information, such as pipe sizes and locations. Therefore as a pre-cautionary approach and in the absence of 2d modelling or data from Thames Water, any infrastructure or property in the vicinity of the areas at high risk (low points and large water mains) can be assumed to be at high risk from this source. Good management of the infrastructure itself is the key to minimising the threat of flooding from these sources.

Thames Water outlines their plans to improve their distribution network in order to reduce leakage and the risk of burst mains; this is set out in their 'Long-Term Strategy 2015-2040' document. The programme to replace the oldest and leakiest pipes and replacement of trunk mains has already started. Thames Water will make use of latest technology to monitor and manage the performance of their system and to reduce losses of water. Information from 'smart' meters will help target key locations to improve performance. Improved knowledge of deterioration rate of trunk mains and improved monitoring will help, to better predict and prevent these bursts.

Therefore, the site is considered to be at low risk of flooding from water main burst.

4.9 Ground Water Flooding

Groundwater flooding generally occurs during intense, long-duration rainfall events, when infiltration of rainwater into the ground raises the level of the water table until it exceeds ground levels. It is most common in low-lying areas overlain by permeable soils and permeable geology, or in areas with a naturally high water table.

Flood risk due to groundwater has been assessed by reviewing the Strategic Flood Risk Assessment and borehole data available on the British Geological Survey's (BGS) website. The SFRA notes that flood risk due to groundwater is generally low; however, some areas have a significant risk for elevated groundwater levels.

In these areas, basements are most likely to obstruct groundwater flows which will increase the risk of flooding to these buildings

The British Geological Survey Groundwater Flooding Hazard map (Figure 22) indicates that the majority of the site is at low risk of flooding from this source, with the western most side of the site (Sands and Gravels superficial deposits of the Kempton Gravel Member) at a significant risk of groundwater flooding.

Typically the areas, where the secondary aquifer is thinnest in depth and are primarily covered by impermeable areas such as buildings and roads. In these areas, rainwater cannot infiltrate into the ground and subsequently raise groundwater levels. The main cause for rising groundwater levels is therefore caused by sewers leaking and the lateral transmission of high water levels from the River Thames and River Lee. Due to the impermeable surfaces in these areas, groundwater flooding is most likely to affect basements and utilities that are not waterproofed properly.

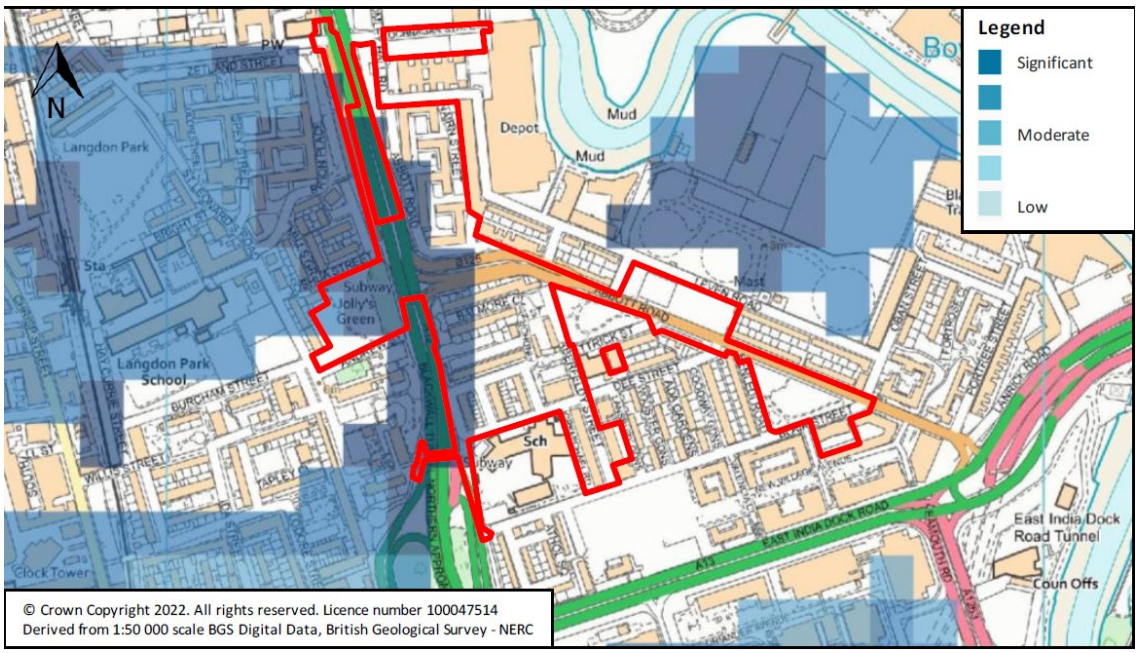


Figure 22 – Groundwater Flooding Hazard Map

In addition to the natural geology beneath the LB of Tower Hamlets, there can be a substantial depth of made ground that comprises material that has been deposited as a result of human occupation and development since settlement by the Romans in the 1st century AD. This material which sits above the other geologies is highly variable but can hold perched groundwater and therefore pose a risk of groundwater flooding to basements and other buried structures.

Groundwater flood risk is not expected to increase in the short to medium term. However, climate change is likely to increase the existing groundwater flood risk due to higher rainfall, and increased leakage from drains and sewers infiltrating into ground. Sea level rise will increase the water level within the River Thames which will also increase groundwater levels, although this will dissipate with distance from the river. Additionally, the defence improvements by the TE2100 and Thames Barrier may help to mitigate this.

Considering the BGS historic boreholes, the groundwater is likely to be present towards the base of the Kempton Gravel Member layer which extends to a depth of approximately 3 to 5m below ground level and above the impermeable London Clay (Refer to RSK Phase 1 report and RSK Intrusive Pile Assessment SI Report). Therefore, groundwater may be encountered within the proposed basement excavation.

The possibility for seasonal fluctuations in the ground water level should also be considered with the contractor being required to have suitable remediation and de-watering measures in place during works to construct the basement.

Therefore, the majority of the site is considered to be at Low risk of groundwater flooding at ground level and the western areas at Medium risk of groundwater flooding below ground.

5 Flood Risk Mitigation Measures

The risk of flooding to the proposed development will be mitigated through the implementation of the measures proposed within the following section of this report.

5.1 Finished Flood Levels

For the Residential Development the Finished floor levels of the proposed units will be set a minimum of 0.15 m above adjacent ground levels and above peak flood levels in the 2100 climate change breach scenario. Where it is not practicable to raise finished floor levels to this degree, sleeping accommodation (i.e. bedrooms) will be provided at first floor level to ensure that safe refuge is available. For the Retail Development the Finished floor levels of the proposed units will be set a minimum of 0.15 m above adjacent ground levels. Finished floor levels of the proposed units adjacent to areas at high risk of surface water flooding will be set a minimum of 0.30 m above adjacent ground levels.

5.2 New Basement

The construction for the proposed new basement should consider a cavity drain system behind the blockwork lining wall. A drainage channel behind the lining wall and at the base of the slab would then collect any groundwater which would be pumped to ground floor level and ultimately convey it into the public sewers via the existing below ground drainage network.

5.3 Safe Refuge

Evacuation of the site is unlikely to be feasible given that the risk of flooding is principally associated with defence failure, the occurrence of which cannot be predicted. As such, areas of safe refuge should be provided at first floor level for the proposed retail units.

5.4 Flood Resistant and Resilient Construction

Flood resistant and resilient construction techniques should be incorporated into the design of the buildings where appropriate, in line with the CIRIA Code of Practice for Property Flood Resilience (C790). These include design features and finish materials to minimise the entry of water and/or reduce the damage in the unlikely event of the development being inundated. The use of non-return valves should be considered given the presence of surrounding public combined sewers.

5.5 Flood Warning and Evacuation Plan

It is recommended that a Flood Warning and Evacuation Plan is prepared in consultation with London Borough of Tower Hamlets emergency planning team. The objectives of the plan would be to reduce the risk to property and life by ensuring that all residents are aware of the potential risk of flooding and the procedures that should be implemented in the event that flooding is expected or has occurred. This would be achieved by: 1) Setting out the measures that would need to be taken if flooding is forecast, during flooding and following an 'all-clear' notification; 2) Summarising the roles and responsibilities for flood response and management; and 3) Describing how flood warnings are issued, flood warning codes and what they mean, and other sources of flood information

The site is included in an Environment Agency flood alert and warning area. This provides the opportunity for the relevant response procedures set out in the Flood Plan to be invoked in response to receipt of a flood warning from the Environment Agency.

6 Sequential Test and Exception Test

6.1 Sequential Test

The NPPF requires the Local Authority to apply the Sequential Test in consideration of new development. The aim of the Test is to steer new development to areas at the lowest probability of flooding.

Given that the subject site has not been allocated as one of the London Borough of Tower Hamlets proposed future development sites, it has not been specifically assessed within the SFRA. The Sequential Test is based on the EA Flood Zones and information contained within the SFRA.

The site is located within Flood Zone 3 benefiting from flood defences and is therefore classified as being at a very low fluvial and tidal flood risk. No significant risks have been identified from any of the other sources assessed. Therefore, the site is considered to be sequentially preferable for development and passes the Sequential Test.

6.2 Exception Test

In accordance with the Flood Risk Vulnerability Classification in Table 2 of the Planning and Practice Guidance Flood Risk and Coastal Change, the proposed development is classified as 'More Vulnerable' development.

Table 3 of the Planning Practice Guidance indicates that 'more vulnerable' developments are considered appropriate within Flood Zone 3 benefitting from flood defences without the requirement to apply the Exception Test. Therefore, application of the Exception Test is not required for the proposed development.

7 Summary and Recommendations

Parmarbrook has been instructed by Aberfeldy New Village LLP (joint venture between EcoWorld London and Poplar HARCA) to prepare a Flood Risk Assessment (FRA) in relation to the proposed redevelopment of Aberfeldy Village, East India Dock E14 within the London Borough of Tower Hamlets.

The Flood Map for Planning shows the proposed development site is located within the 1 in 100 / 1 in 200 annual probability flood outline and is therefore defined by the NPPF as being situated within flood zone 3.

The River Lee is located a minimum of approximately 160 m east of the site. The Environment Agency has confirmed that the flood defences along the River Lee prevent flooding in up to the 1 in 1,000 AEP event.

The Thames Barrier and the raised defences along the banks of the River Thames provide a present day 1 in 1,000 standard of protection. The TE2100 Plan states that the crest levels of the defences will be raised to maintain this standard of protection to the year 2100.

The site is shown to be at a residual risk of flooding in the event of a failure of the River Thames flood defences. The maximum flood levels at the site are shown to range between 3.65 and 5.10 m AOD in the 2100 climate change scenario.

The Flood Risk from Surface Water map indicates the majority of the site is at a very low risk of flooding from surface water. However, the site access roads identified as being at increased risk.

The Flood Risk from Reservoirs map indicates that the site may be at risk of flooding from reservoirs. However, all large reservoirs are regularly inspected by reservoir panel engineers with essential safety work carried out as required and reservoir flooding is therefore extremely unlikely to occur.

There may be some susceptibility to groundwater flooding at the site.

This report has demonstrated that the proposed development may be completed in accordance with the requirements of planning policy subject to the following:

- Finished floor levels of the residential units will be set a minimum of 0.15 m above adjacent ground levels;
- Finished floor levels of the residential units will be raised above the peak flood levels in the 2100 climate change breach scenario, or sleeping accommodation to be provided at first floor level;
- Finished floor levels of the proposed retail units will be set a minimum of 0.15 m above adjacent ground levels and safe refuge to be provided at first floor level;
- Finished floor levels of the proposed units in areas of high risk of surface water flooding will be set a minimum of 0.30 m above adjacent ground levels
- The construction for the proposed new basement should consider a cavity drain system behind the blockwork lining wall.
- The latest best practice flood resistant and resilient construction techniques to be incorporated into the design of the building where appropriate; The use of non-return valves should be considered given the presence of surrounding public combined sewers; and
- Flood Warning and Evacuation Plan to be developed in consultation with London Borough of Tower Hamlets.

APPENDIX A

ILLUSTRATIVE NEW ABERFELDY MASTERPLAN LAYOUT

Layout

The adjacent plan shows the proposed layout of the illustrative masterplan, including the removal of building A3, the extension of Nairn Square and creation of new additional public space, Nairn Park.

1. Lochnagar Street
2. Allotments
3. Enterprise Yard
4. Community Lane (North)
5. Slip Road
6. Works Square
7. Nairn Park
8. Nairn Square
9. Repurposed Underbridge
10. Jolly's Green
11. Highland Place
12. Healthy Street / Abbott Road
13. Community Lane (South)
14. Millennium Green
15. Ettrick Street
16. Leven Road Open Space
17. Culloden Green
18. Town Square
19. Dee Street underpass
20. Dee Street
21. School Square
22. Kirkmichael Road
23. High Street
24. Lansbury Gardens
25. Braithwaite Park

Fig.3 Illustrative Masterplan

APPENDIX B

BGS HISTORIC BOREHOLE LOGS

Borehole Log

Shell and Auger

Site: POPLAR ABBEY MILLS
Job No.: 80520
Date: 4/5/9.8.88
Machine Type: DANDO
Vertical Scale: 1:50

C.J. associates

Borehole No. 7

Sheet 1 of 3

Depth m	Sampling Details	Depth m	Penetration Tests (mm) 75	75	75	75	75	75	Boring Details	Depth m	Thickness m	Legend	Description of Strata	Datum m O.D.
														2.27
0	Ch1	0.20											Mottled brown/dark brown/orangey-brown reddish-brown gravelly sandy silty CLAY FILL with brickwork etc. MADE GROUND	
	D1	0.50									1.20			
	Ch2	0.70												
1										1.20				1.07
	Ch3	1.20											Orangey-brown sandy clayey SILT/clayey silty fine to medium SAND MADE GROUND	
	U3	1.50-2.00							* 25 100%					
	Ch4	1.50									1.30			
2	D4	2.00												
	Ch5	2.00												
	c5	2.50	5	6	7	7	8	9	C.P.T. N = 31	2.50				-0.23
											0.50		Medium dense orangey-brown gravelly clayey fine to medium SAND ALLUVIUM/THAMES BALLAST ?	
3										3.00				-0.73
	D6	3.25												
	c7	3.50	6	6	7	8	8	9	C.P.T. N = 32					
4	D8	4.25												
	c9	4.50	7	7	8	9	9	10	C.P.T. N = 36					
5											4.00		Dense orangey-brown sandy fine to coarse angular to rounded GRAVEL with occasional rounded cobbles THAMES BALLAST	
	D10	5.25												
	c11	5.50	6	8	8	9	10	11	C.P.T. N = 38					
6														
	D12	6.50												
7	D13	7.00								7.00				-4.73
	U14	7.10-7.60							* 110 95%		0.25		Soft to firm mottled orangey-brown/ brown silty CLAY	
	D15	7.60								7.25				-4.98
8	D16	8.10											Firm to stiff brown with occasional dark greenish-grey mottling fissured very silty CLAY/fine sandy clayey SILT with occasional plant remains, white fine sandy streaks and fine sandy pockets and partings LONDON CLAY.	
	U17	8.60-9.10							* 125 100%					
9	D18	9.10												
	D19	9.60												
10														

Client: L.D.D.C.

Remarks: Co-ordinates E538356 - N181533
Ch = Chemical samples
Chemical water sample taken at 6.00m

Water level observations during boring

Date	Time	Depth of Hole (m)	Depth of casing (m)	Depth of water (m)	Remarks
5.8.88.	08.00	6.00	6.00	4.60	STANDING LEVELS AT START OF SHIFT
6.8.88.	08.00	10.60	10.60	6.00	

Sampling		Properties			Strata			
Depth	Type	Cu kPa	w%	SPT N	Description	Depth	Level	Legend
						G.L.	1.78	
0.50-0.70	B				MADE GROUND: Brown fine to coarse sand with a little fine to medium angular to sub-rounded gravel and many brick and concrete fragments. A2			
0.70-1.00	B							
1.40-1.70	B					1.40	0.38	
					MADE GROUND: Firm brown silty clay with a little fine to medium angular to sub-rounded gravel and many brick fragments. A1	1.70	0.08	
2.00-2.45	CB			34	Dense brown silty fine to coarse SAND with some fine to coarse angular to sub-rounded gravel and occasional pockets of firm brown-grey silty clay. B6	2.45	-.670	
3.00-3.45	CB			43	Dense yellow-brown slightly sandy fine to coarse angular to sub-rounded GRAVEL. C4			
4.00-4.45	CB			46				
5.00-5.45	CB			51				
6.00-6.45	CB			31				
6.20	D					6.20	-4.42	
6.50-6.95	U(47)	87	28		Stiff mottled brown and orange-brown silty CLAY. A66	6.50	-4.72	
7.25	D				Stiff dark grey faintly laminated very closely fissured very silty occasionally slightly sandy CLAY with some light brown silty fine sand partings and occasional plant remains. D66			
8.00-8.45	U(38)	107	28					
8.75	D							
9.50-9.95	U(36)	96	25					

Drilling

Type	From	To	Size	Fluid
Cable Tool	0.00	25.00	0.15	

Groundwater

Co-ordinates: TQ 538414 181438 Ground Level: 1.78m AOD

Struck	Behaviour	Sealed	Date	Hole	Cased	Water
19.00	Rose to 14.45m in 20 minutes		19.09.89 20.09.89	6.00 19.00	6.00 6.50	4.35 14.45

Remarks

Borehole Record

Exploration Associates

Project

Northern Drainage - Phase 2A - Job No. 1079
London Docklands Development Corporation

Contract M9049

Borehole 5A (1 of 3)

Sampling		Properties			Strata			
Depth	Type	Cu kPa	w%	SPT N	Description	Depth	Level	Legend
					MADE GROUND**: Black ash fill and domestic refuse. A2	G.L.	1.92	
1.20-1.50	B				Stiff mottled brown and orange-brown silty sandy CLAY with occasional fine to medium angular to sub-angular gravel and rootlets. B1	1.20	0.72	
1.50-1.95	U(49)					2.00	-.080	
2.50-2.95	CB			46	Dense yellow-brown sandy fine to coarse angular to rounded GRAVEL. C4			
3.50-3.95	CB			34				
4.50-4.95	CB			44				
5.50-5.95	CB			47				
6.20-6.50	B					6.20	-4.28	
6.50-6.95	U(49)	98	24		Stiff grey-brown very silty slightly sandy CLAY. D6b	6.50	-4.58	
7.30	D				Stiff dark grey-brown faintly laminated very closely fissured very silty occasionally slightly sandy CLAY with some light brown silty fine sand partings and plant remains. D6b			
8.00-8.45	U(55)	71	26					
8.75	D							
9.50-9.95	U(51)	104	27					

Drilling

Type	From	To	Size	Fluid
Cable Tool	0.00	25.00	0.15	

Groundwater

Co-ordinates: TQ 538453 181323 Ground Level: 1.92m AOD

Struck	Behaviour	Sealed	Date	Hole	Cased	Water
19.60	Rose to 13.00m in 20 minutes		27.09.89	6.00	6.00	4.28
			28.09.89	15.00	8.00	DRY
			29.09.89	25.00	18.00	13.00

Remarks Permeability tests carried out at 4.60m, 6.00m and 7.30m.

Borehole Record

Exploration Associates

Project
Northern Drainage - Phase 2A - Job No. 1079
London Docklands Development Corporation

Contract M9049

Borehole 6A (1 of 3)

APPENDIX C

ENVIRONMENT AGENCY PRODUCT 4 DETAILED FLOOD RISK MAPS

Product 4 (Detailed Flood Risk) for: Aberfeldy Village, London, E14 0PT
Reference: HNL 195148 AS
Date: 03/12/2020

Contents

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.

Please refer to the Open Government Licence which explains the permitted use of this information.

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Flood Map for Planning (Rivers and Sea)

The Flood Map:

Our 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 indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea 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 https://www.gov.uk/check-flood-risk

At this Site:

The Flood Map shows that this site lies within Flood Zone 3 - with a 1% chance of flooding from rivers (fluvial flooding) and a 0.5% chance of flooding from the sea (tidal flooding) in any given year.

Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed modelling of the tidal River Thames through the Thames Tidal Defences Study completed in 2006 by Halcrow Ltd.

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Thames Estuary 2100 (TE2100)

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 Thames node closest to your site is **2.46**; the locations of nearby nodes on the River Thames are also shown on the enclosed map.

Details about the TE2100 plan

The Plan sets out how the Environment Agency and our partners can work together to manage tidal flood risk, from now until the end of the century. It is an adaptive plan for managing the Thames Estuary, including the tidal defence system, until 2100 so that current standards of flood protection are maintained or improved taking into account climate change effects e.g. sea level rise. The Plan has 3 phases of activity:

- Until 2035 – maintain and improve current defences, safeguard areas required for future improvements, and monitor climate change indicators.
- 2035-2050 – raise existing walls, defences & smaller barriers whilst reshaping the riverside environment.
- 2050-2100 – determine and implement an option for the future of the Thames Barrier, and adapt other defences as required to work alongside this to protect the estuary.

The Thames Estuary 2100 Plan can be found at: https://www.gov.uk/government/publications/thames-estuary-2100-te2100

Details about the TE2100 in-channel levels

The TE2100 in-channel levels take 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 the Barrier would normally shut for the 2008 epoch – will have to be allowed through to ensure that the barrier is not shut too often. For this reason, levels upriver of the barrier will increase and the tidal walls will need to be heightened to match.

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

The levels upriver 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 upriver of the Barrier is controlled and therefore any associated return period becomes irrelevant. The Thames Barrier and associated defence system has a 1 in 1000 year standard which means it ensures that flood risk is managed up to an event that has a 0.1% annual probability. The probability of water levels upriver is ultimately controlled by the staff at the Thames Barrier.

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TE2100 2008 levels:

Levels downriver of the Thames Barrier are 0.1% AEP (1 in 1000) and levels upriver are the highest levels permitted by the Thames Barrier, described as the Maximum Likely Water Levels (MLWLs). The defence levels (left defence, right defence) are the minimum levels to which the defences should be built.

Node	Easting	Northing	Extreme water level (m)	Present Day Statuatory Defence Level (Thames Left Bank) (m)	Allow for future 2100 defence raising to a level of... (Thames Left Bank)
2.46	538943	180471	4.67	5.23	6.20
2.46au	539436	180390	4.66	5.18	6.20

TE2100 climate change levels:

			2065 to 2100		**2100**	
Node	Easting	Northing	Design water level	Defence level (both banks)	Design water level	Defence level (both banks)
2.46	538943	180471	5.16	5.70	5.65	6.20
2.46au	539436	180390	5.15	5.70	5.64	6.20

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Thames Tidal Upriver Breach Inundation Modelling

The map attached displays site-specific modelled flood levels at your site. These have been taken from the Thames Tidal Upriver Breach Inundation Modelling Study 2017 completed by Atkins Ltd. in May 2017.

We have developed a modelling approach where all upriver breach locations along the Thames are equitably modelled, to ensure a consistent approach across London. This modelling simulates 5679 continuous tidal breaches along the entire extent of the Thames from Teddington to the Thames Barrier. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width.

For breaches upriver of the Thames Barrier, there is no return period for modelled levels as the levels are controlled by barrier closures. The levels used are referred to as Maximum Likely Water Levels (MLWLs). Therefore 2005 and 2100 epochs were modelled on that basis.

This modelling has two epochs to consider; the 2005 epoch is a representation of today's flood levels without climate change considerations taken into account, and the 2100 epoch which takes into account changes likely to be seen due to climate change.

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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** flood event. The defences are all raised, man-made and privately owned. It is the riparian owners' responsibility to ensure that they are maintained to a crest level of **5.23m** mAODN (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 **3 (fair),** 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://www.gov.uk/government/publications/riverside-ownership-rights-and-responsibilities

There are no planned improvements in this area. 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/thames-estuary-2100-te2100

Areas Benefiting from Flood Defences

This site is within an area benefiting from flood defences, as shown on the enclosed extract of our Flood Map. Areas benefiting from flood defences are defined as those areas which benefit from formal flood defences specifically in the event of flooding from rivers with a 1% (1 in 100) chance in any given year, or flooding from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would be flooded. An area of land may benefit from the presence of a flood defence even if the defence has overtopped, if the presence of the defence means that the flood water does not extend as far as it would if the defence were not there.

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Recorded Flood Events Data

We hold records of historic flood events from rivers and the sea. Information on the floods that may have affected the area local to your site are provided in the enclosed map.

Due to the fact that our records are not comprehensive, we would 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

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding and drainage systems that have been overwhelmed.

Other Sources of Flood Risk

The Lead Local Flood Authority for your area are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse) and may hold further information .

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources.

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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:-

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

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, the technical guidance to the National Planning Policy Framework and the existing PPS25 Practice Guide for information about what flood risk assessment is needed for new development in the different Flood Zones. These documents can be accessed via:

https://www.gov.uk/flood-risk-standing-advice-frsa-for-local-planning-authorities

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

https://www.gov.uk/government/publications/development-and-flood-risk-practice-guide-planning-policy-statement-25

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.

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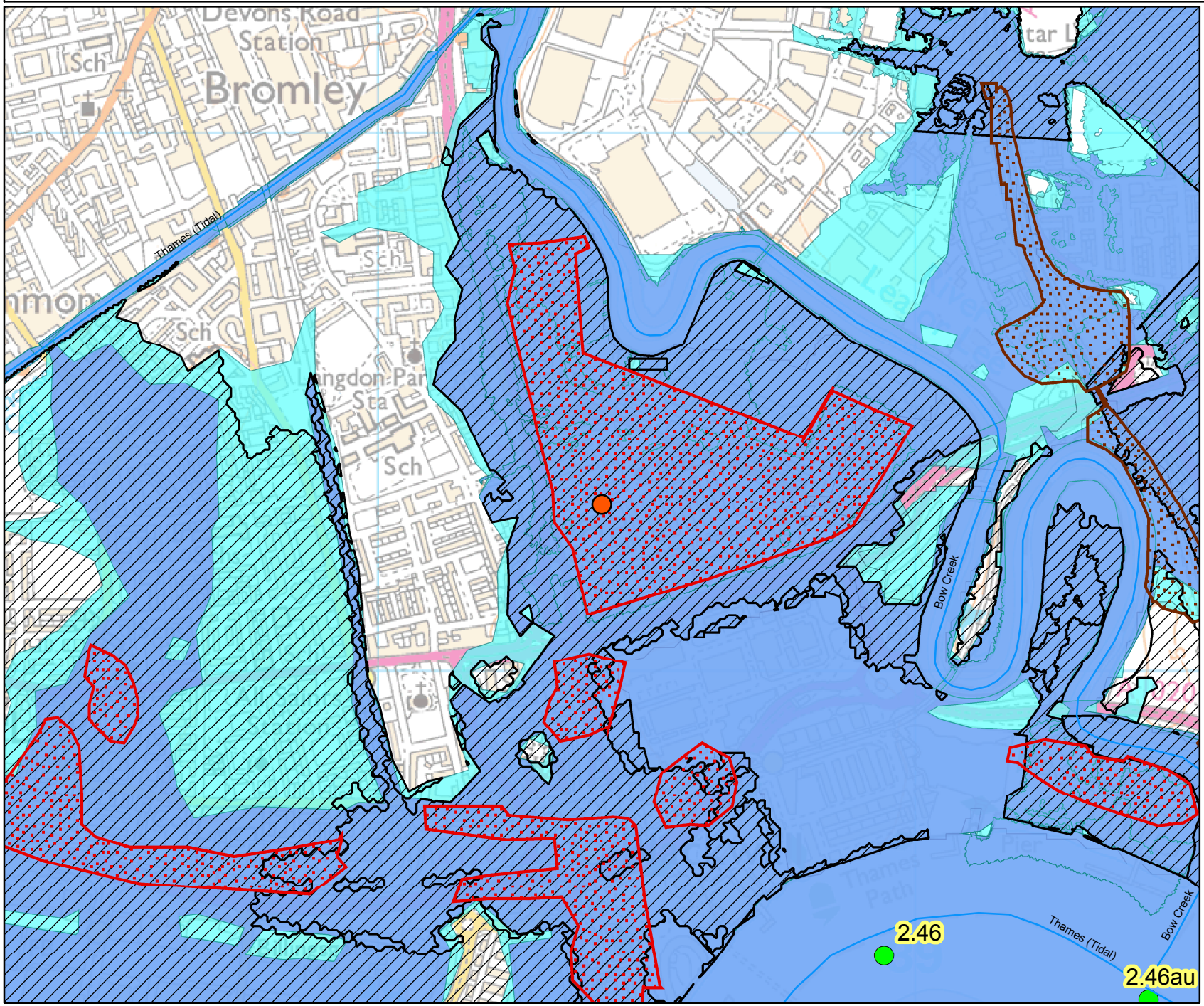
Detailed FRA/FCA for: Aberfeldy Village, London, E14 0PT - 03/12/2020 - HNL 195148 AS



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N

0 150 300 600
Metres

Legend

- Main Rivers
- Site location
- TE2100Nodes
- 1707 Flood Outline
- 1928 Flood Outline
- 1953 Flood Outline
- Areas Benefiting from Flood Defences
- Flood Zone 3
- Flood Zone 2

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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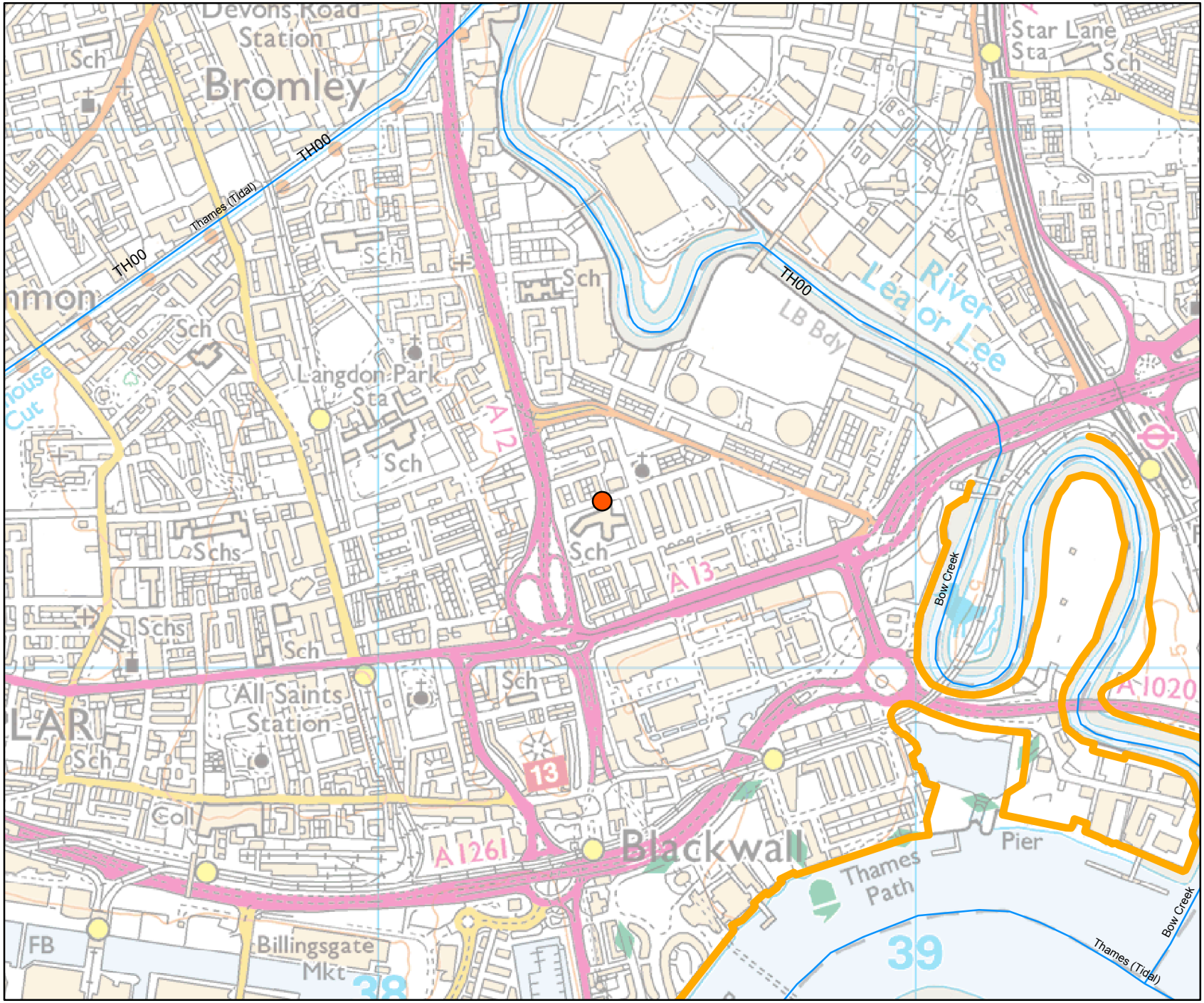
Detailed FRA/FCA for: Aberfeldy Village, London, E14 0PT - 03/12/2020 - HNL 195148 AS



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N

0 150 300 600
Metres

Legend

Main Rivers

Site location

TTD Defences SDL (mAODN)

SDL

5.23

Flood Map for Planning (assuming no defences)

Flood Zone 3 shows the area that could be affected by flooding:
- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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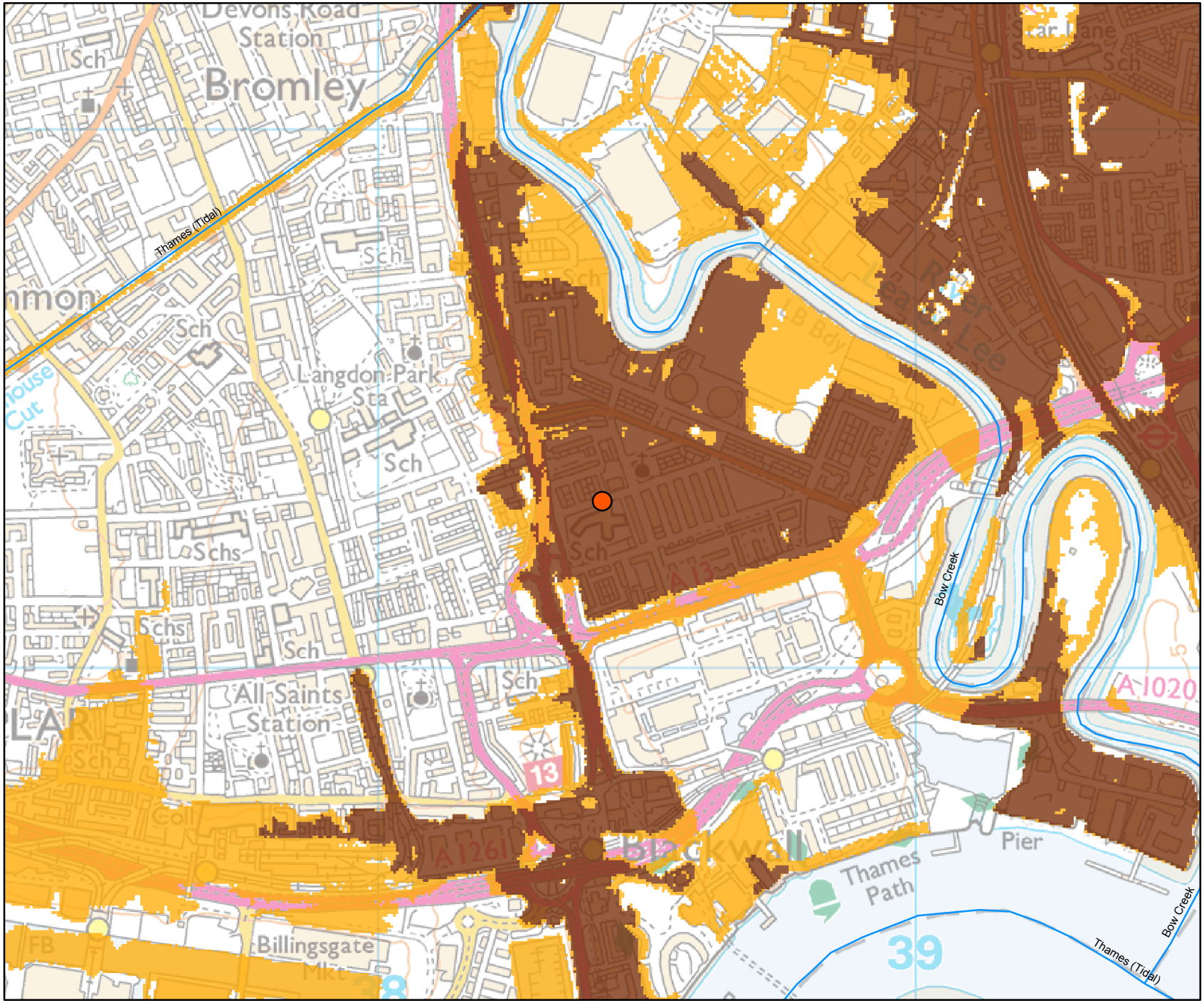
Breach Modelling Map for: Aberfeldy Village, London, E14 0PT - 03/12/2020 - HNL 195148 AS



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N

0 150 300 600
Metres

Legend

Main Rivers

Site location

Upstream Breach Outlines

Epoch

2005

2100

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

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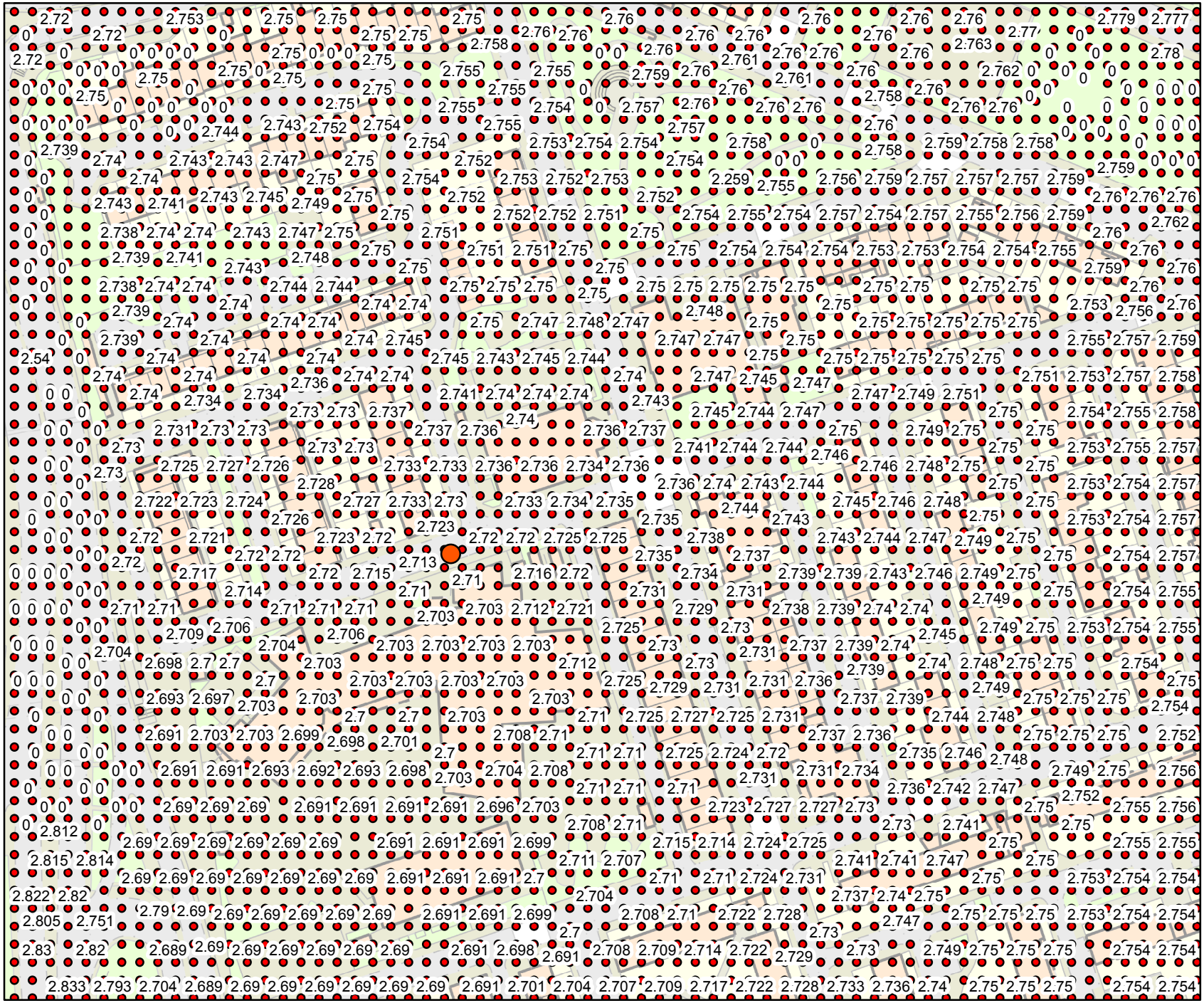
Modelled Flood Levels For: South West Aberfeldy Village, London, E14 0PT - 03/12/2020 - HNL 195148 AS



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N

0 20 40 80

Metres

Legend

- Main Rivers
- Site location
- Tidal Breach Height (mAOD) 2005

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

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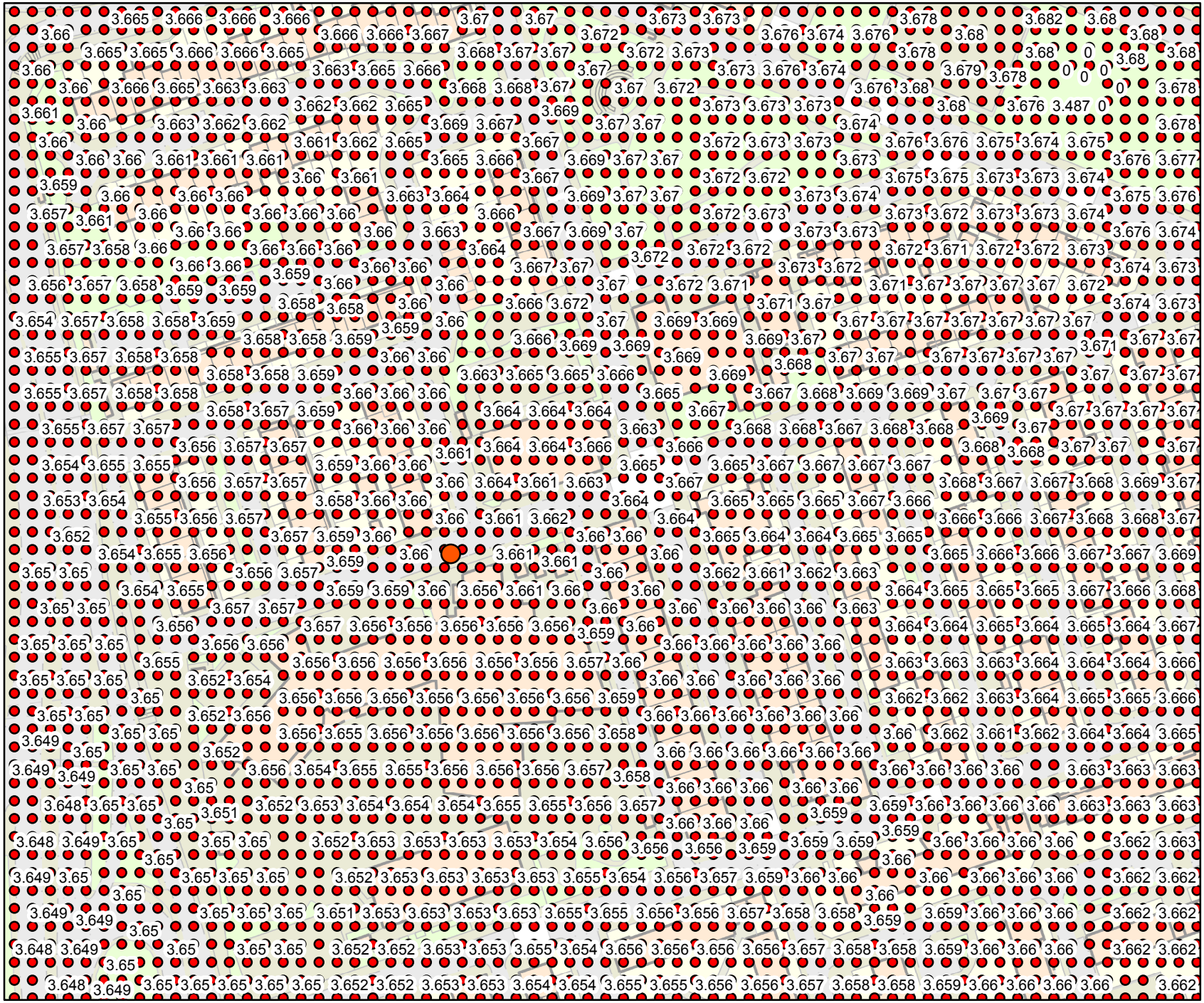

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N

0 20 40 80
Metres

Legend

- Main Rivers
- Site location
- Tidal Breach Height (mAOD) 2100

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

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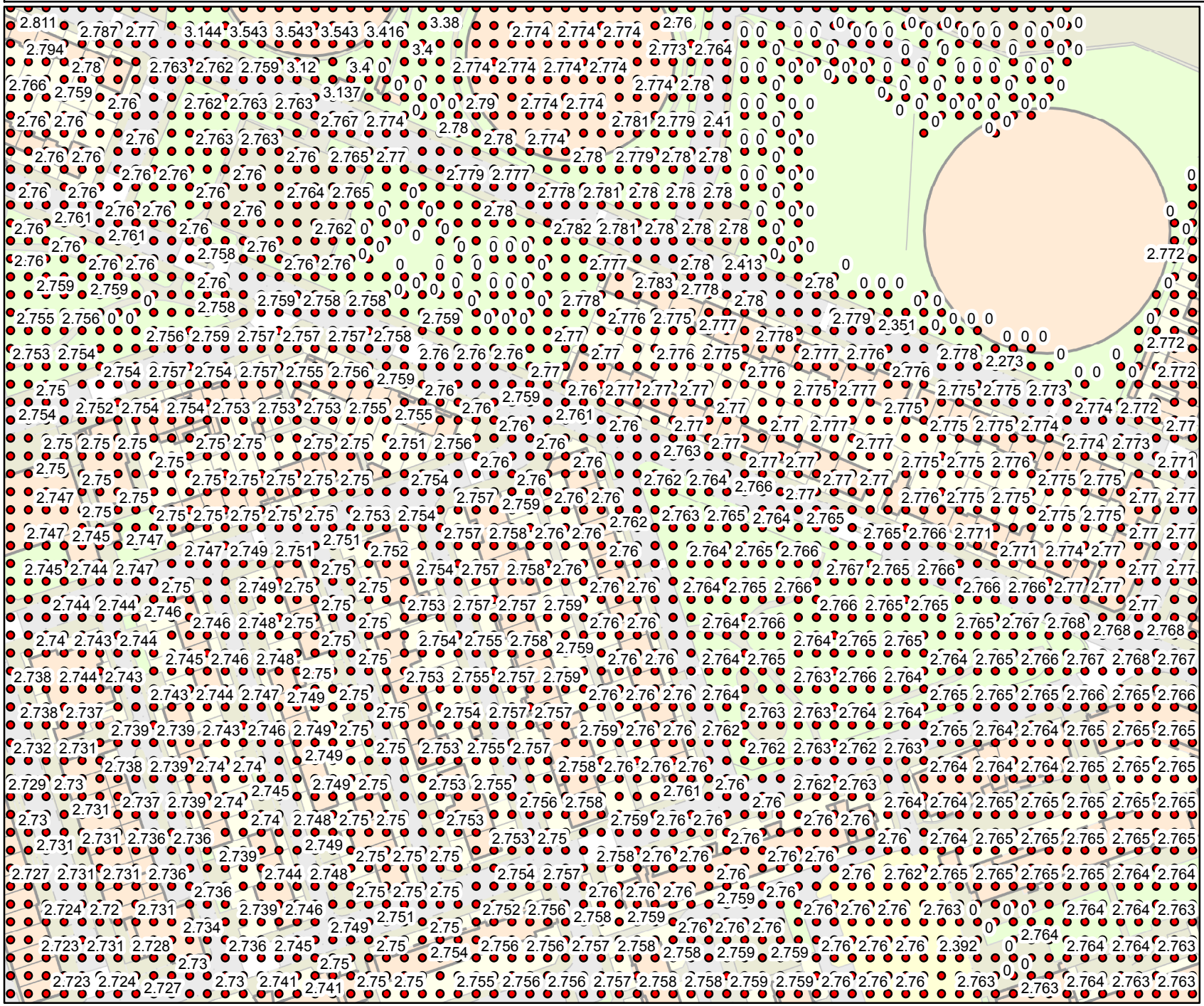

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N

0 20 40 80
Metres

Legend

- Main Rivers
- Site location
- Tidal Breach Height (mAOD) 2005

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

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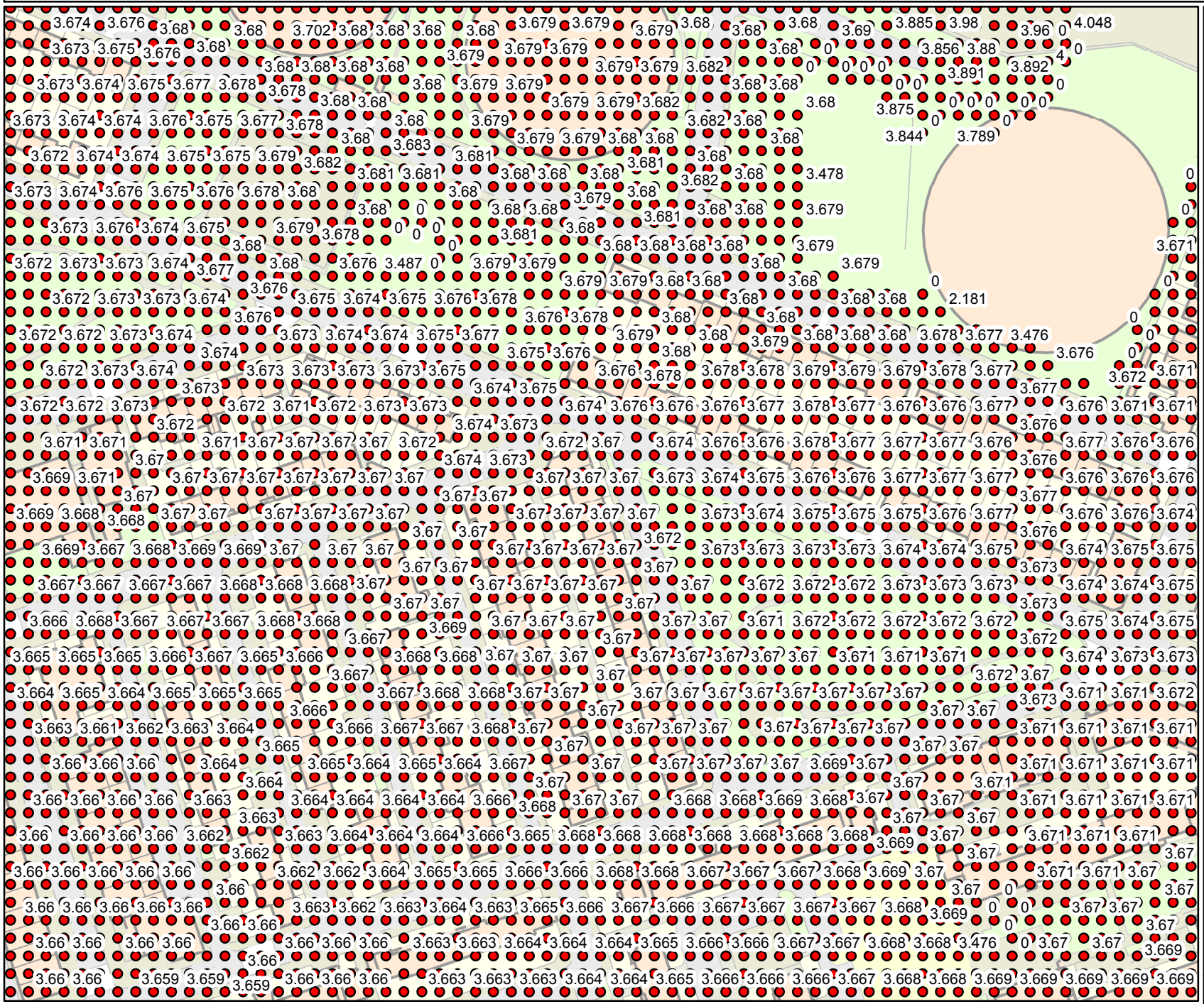

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N

0 20 40 80
Metres

Legend

- Main Rivers
- Site location
- Tidal Breach Height (mAOD) 2100

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

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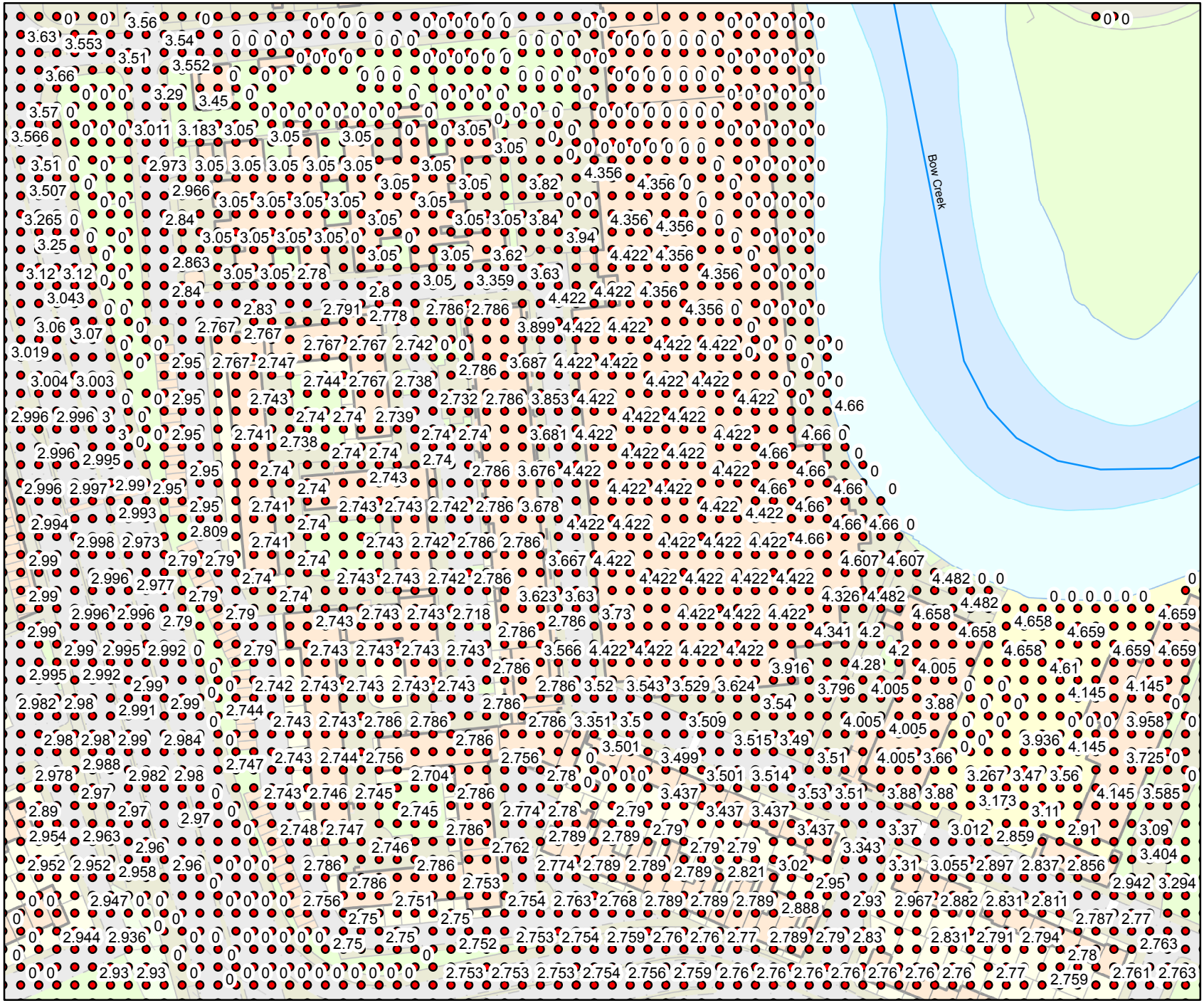

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N

0 20 40 80
Metres

Legend

- Main Rivers
- Site location
- Tidal Breach Height (mAOD) 2005

Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

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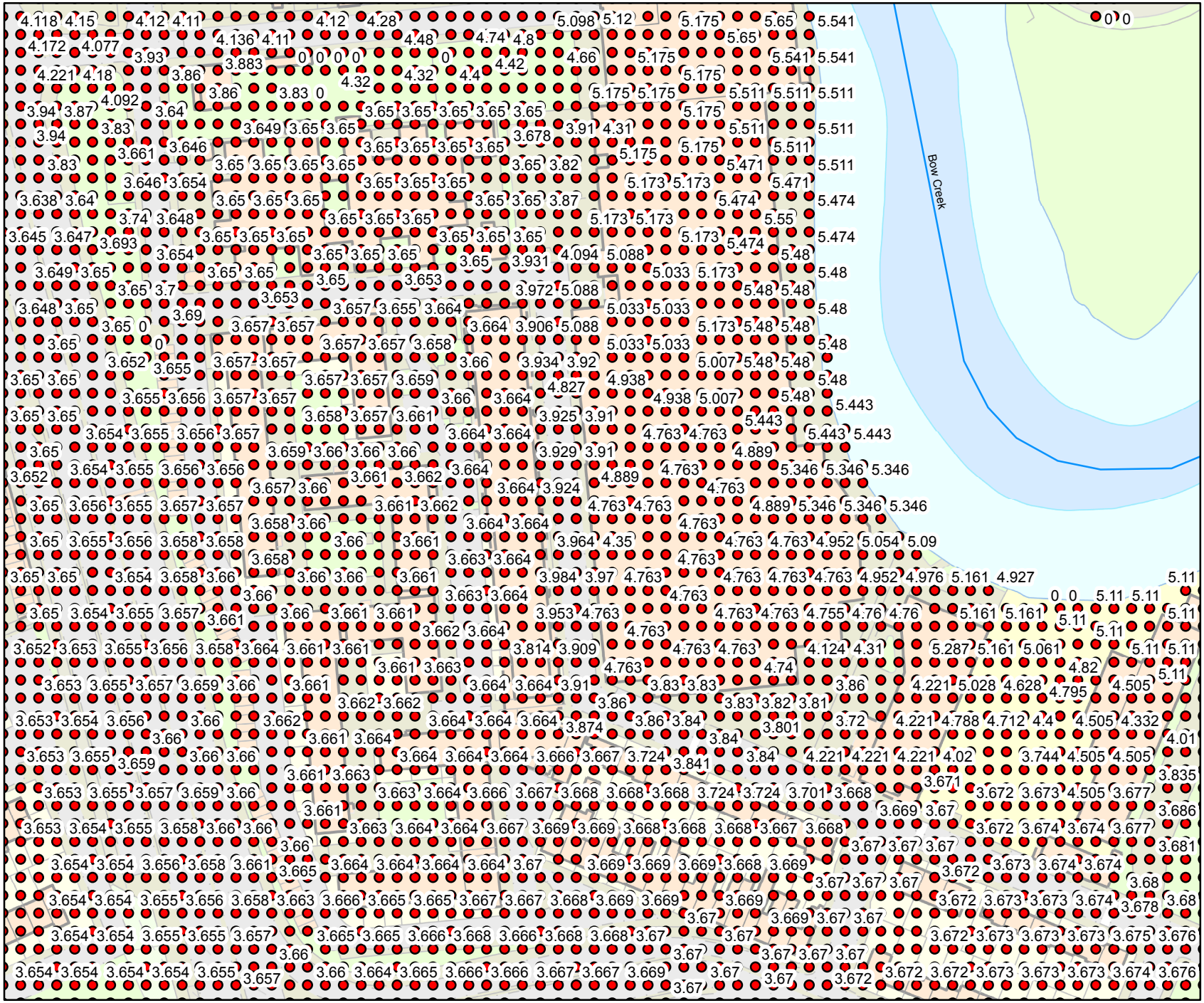
Modelled Flood Levels For: North Aberfeldy Village, London, E14 0PT - 03/12/2020 - HNL 195148 AS



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Hertfordshire,
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N

0 20 40 80
Metres

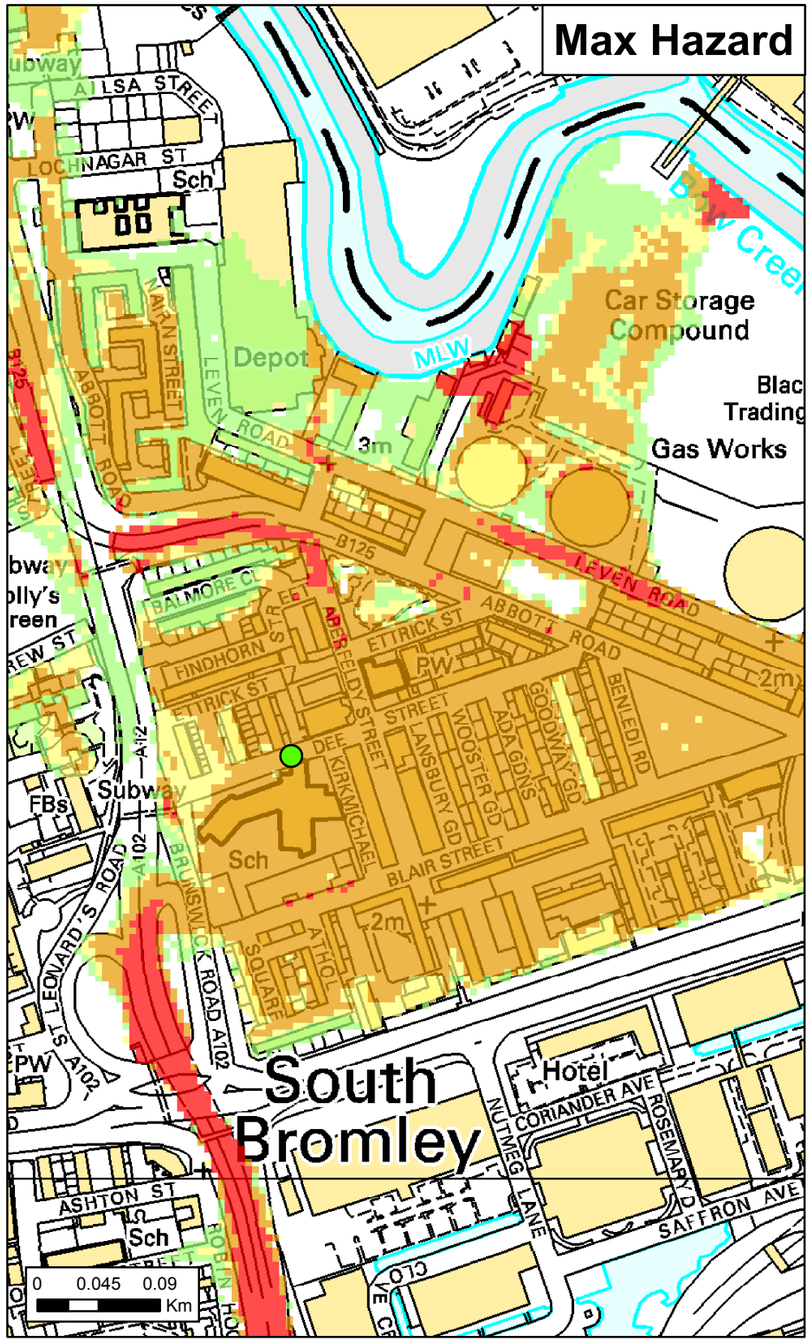
Legend

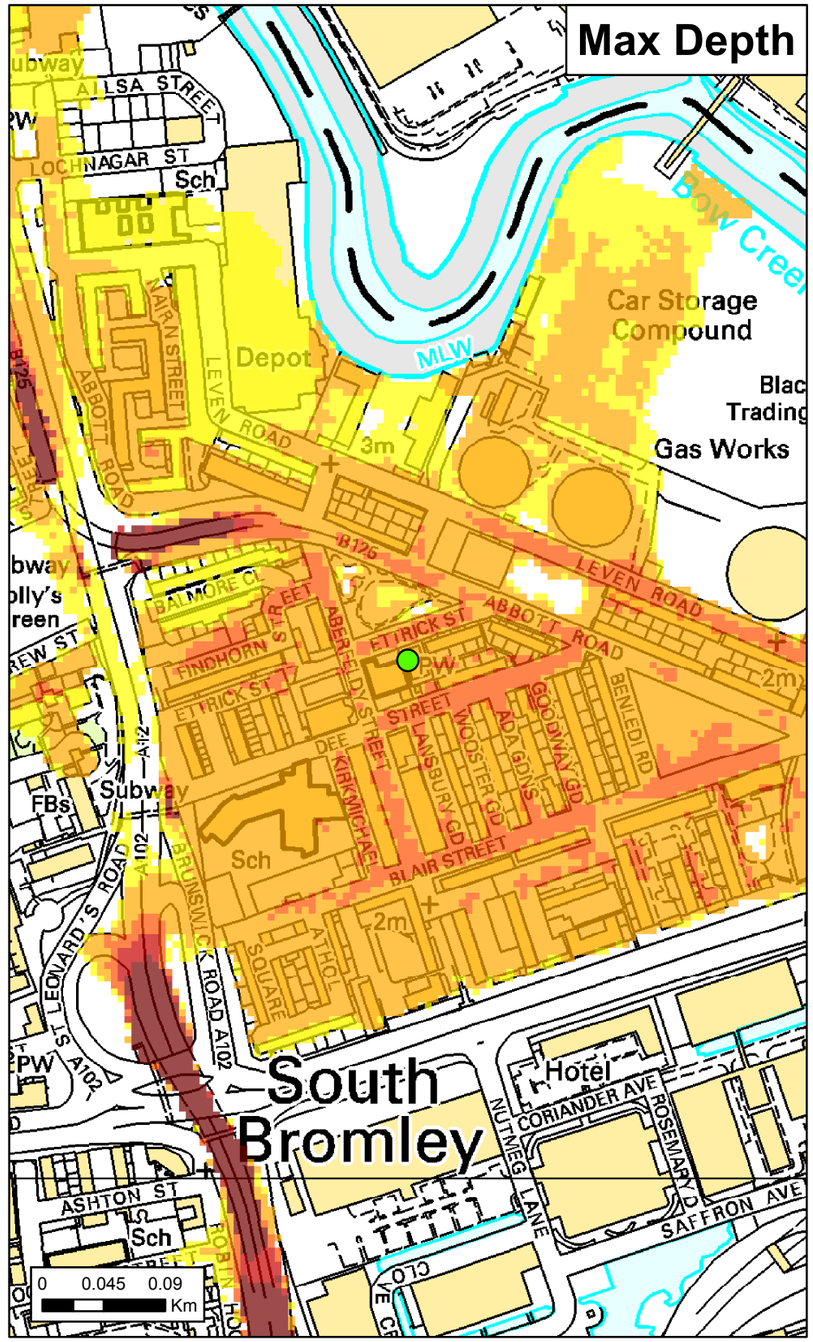
- Main Rivers
- Site location
- Tidal Breach Height (mAOD) 2100

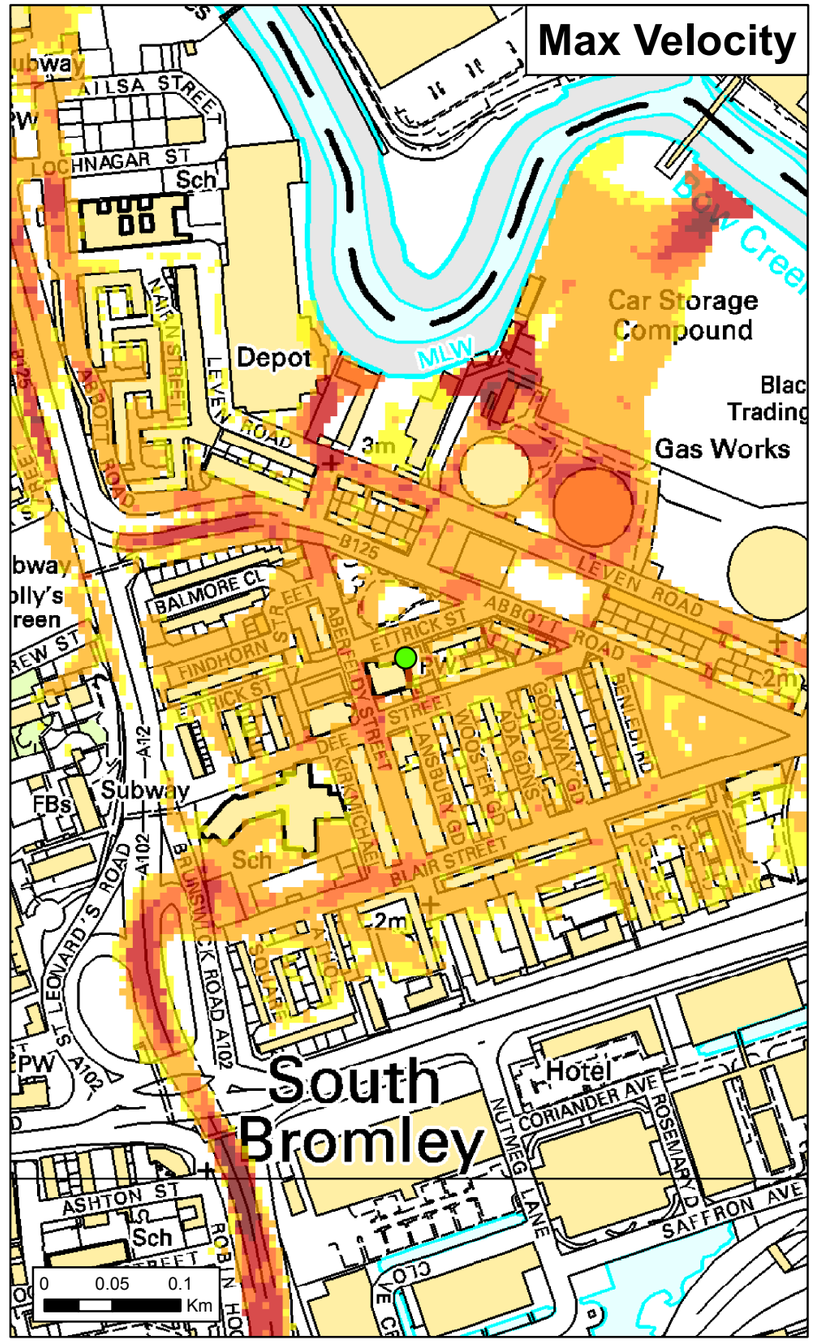
Thames Tidal Upriver Breach Inundation Modelling 2017

A modelled representation of all upriver tidal breach locations along the Thames from Teddington to the Thames Barrier, based on low floodplain topography. For hard and composite defences breaches are set at 20 m wide; for soft defences, breaches are 50 m wide. In both cases, the defence breach scour distance was assumed to extend into the floodplain by the same distance as the breach width. The modelling is based on the 2008 TE2100 in-channel levels, with an allowance for climate change for epoch 2100.

Produced by:
Partnerships & Strategic Overview,
Hertfordshire & North London







Max Hazard

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- > 2.5

Date Printed	03/12/2020	Scenario year	2005	Scenario Annual Chance	0.5% (1 in 200)

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

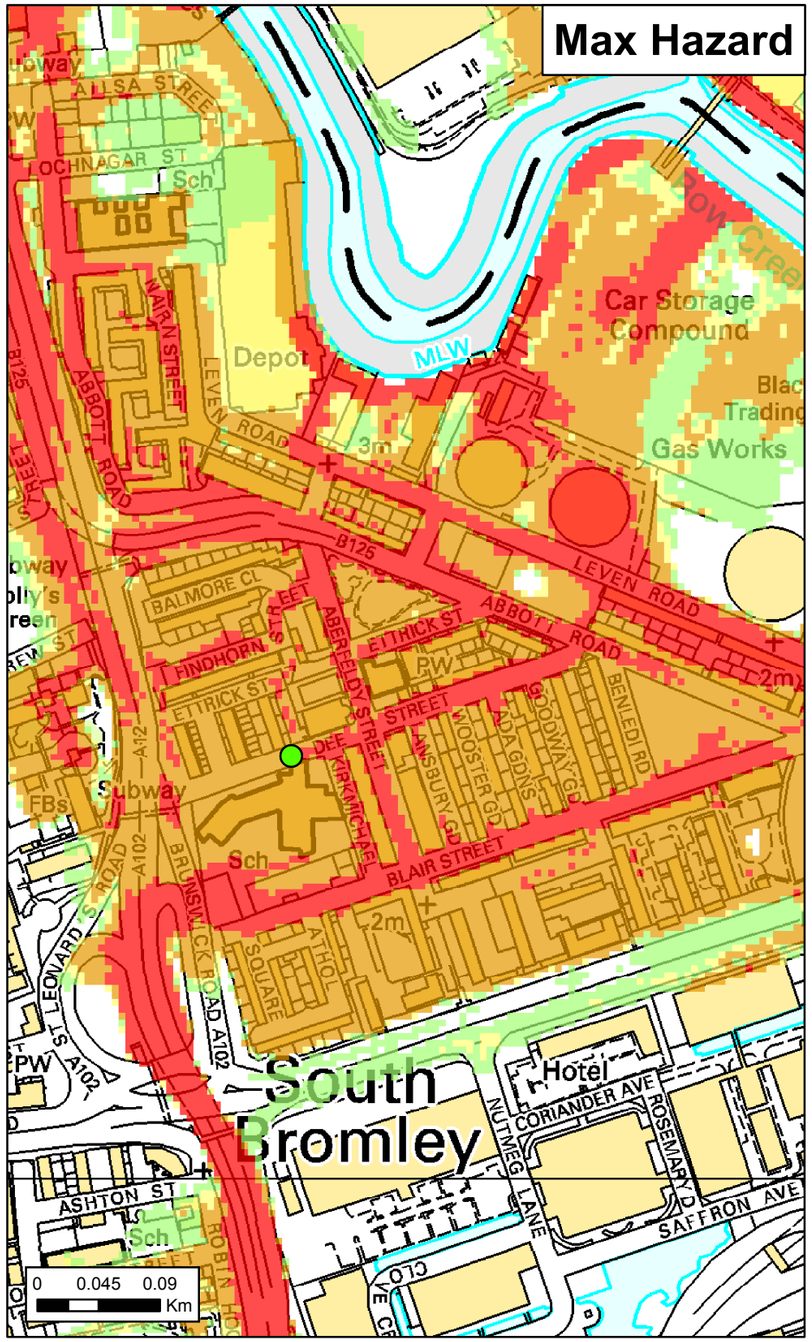
Please contact the Environment Agency for further information on emergency planning associated with flood risk in this area.

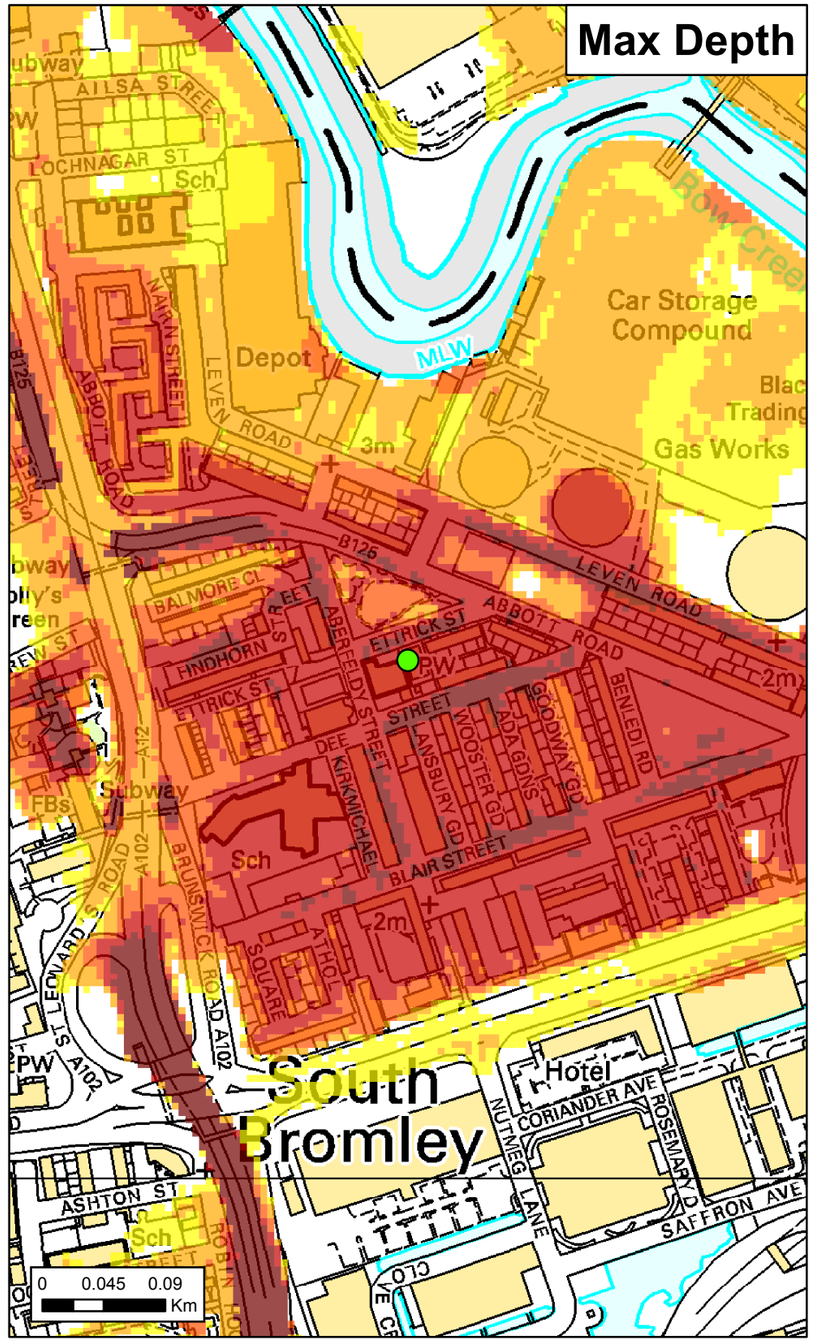
General Enquiries No: 03708 506 506. Weekday Daytime calls cost 5p plus up to 6p per minute from BT Weekend Unlimited. Mobile and other providers' charges may vary

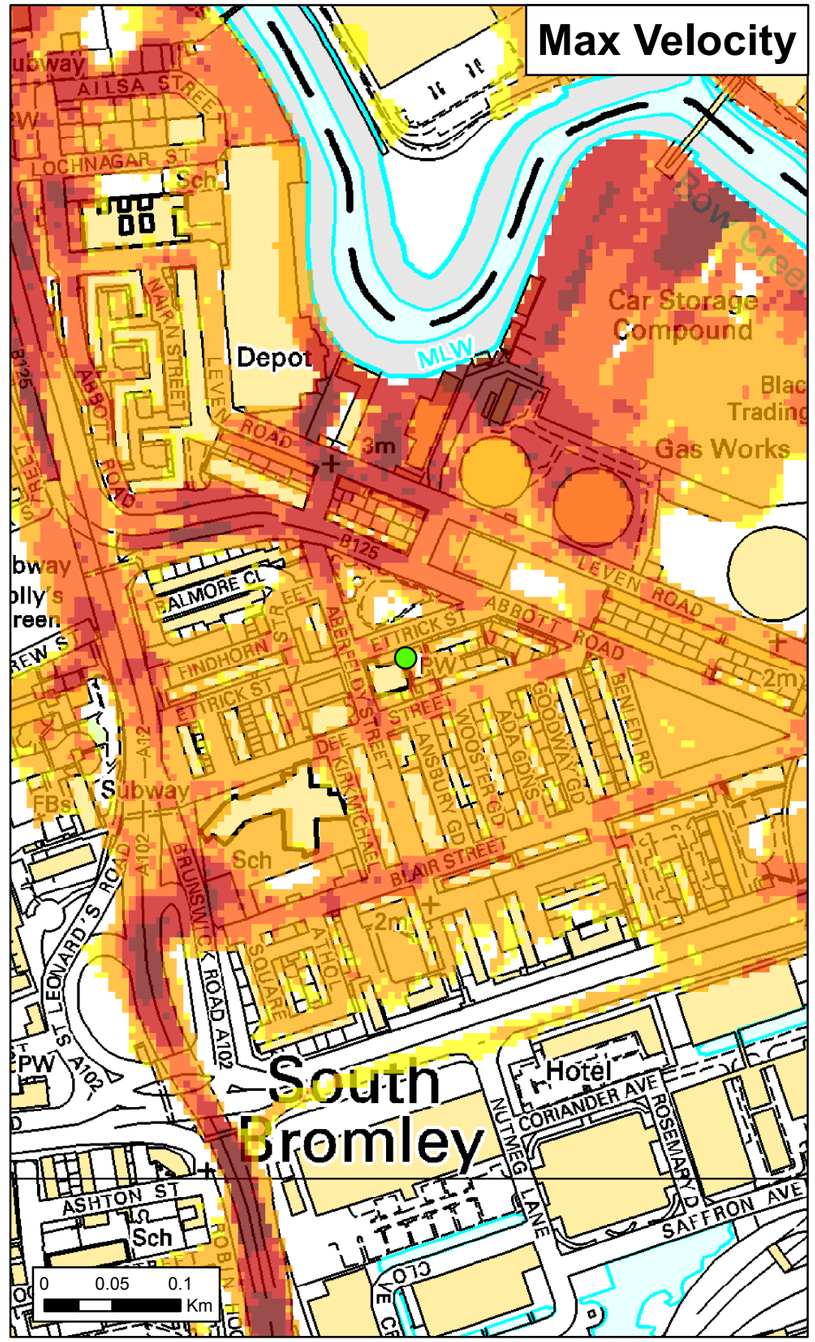
Environment Agency

Thames Tidal Breach Hazard Mapping

Map Centred on 538,503 181,371







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- Less than 0.75 (Low Hazard)
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- Between 1.25 and 2.00 (Danger for Most)
- Greater than 2.00 (Danger for All)

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- 0.25 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
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Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- > 2.5

Date Printed	03/12/2020	Scenario year	2100	Scenario Annual Chance	0.5% (1 in 200)

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

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Environment Agency

Thames Tidal Breach Hazard Mapping

Map Centred on 538,503 181,371

APPENDIX D

ENVIRONMENT AGENCY RESPONSE LETTERS

creating a better place

Environment Agency

Clare Richmond
Development Management
Planning & Building Control
Town Hall, Mulberry Place
5 Clove Crescent
London
E14 2BG

Our ref: NE/2021/133603/01-L01
Your ref: PA/21/01820/NC

Date: 14 September 2021

Dear Clare,

Aberfeldy Estate, Abbott Road, Land to the north of East India Dock Road (A13), London E14

Request for an Environmental Impact Assessment (EIA) scoping opinion under Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) regulations 2017 (as amended), in respect of a hybrid planning application for the demolition of existing buildings and the redevelopment of the site to comprise approximately 1,600 residential units, 7,500sqm of non-residential uses, new and improved access arrangements, associated servicing and landscaping, and public open space. Full planning permission will be sought for approximately 270 residential units and 2,500sqm of non-residential uses.

Thank you for consulting us on the above Environmental Impact Assessment (EIA) on 16 August 2021.

The site is located within **Flood Zone 3** and is protected to a very high standard by the Thames tidal flood defences up to a 1 in 1000 (0.1%) chance in any year flood event. Our latest flood modelling shows the site would be at risk if there was to be a breach in the defences or they were to be overtopped.

We would require an assessment of the most up to date breach data to be included within the Flood Risk Assessment (FRA) to ensure there is appropriate consideration of the residual flood risk. The submitted FRA will need to demonstrate that there will be no sleeping accommodation below the modelled tidal breach flood level OR that there will be a permanent fixed barrier in place at or above the modelled tidal breach flood level to prevent floodwater entering any sleeping accommodation below the modelled breach flood level.

The FRA will need to demonstrate how the proposed development and the site users will be kept safe for the lifetime of the development. The proposal will need to consider a safe means of access and/or egress in the event of flooding from all new buildings to an area wholly outside the floodplain. Lastly, to improve flood resilience, we recommend that, where feasible, finished floor levels are set above the 2100 breach flood level.

Cont/d..

Advice to LPA

Sequential Test
In accordance with the NPPF (paragraph 158), development should not be permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. It is for the local planning authority to determine if the sequential test has to be applied and whether or not there are other sites available at lower flood risk. Our flood risk standing advice reminds you of this and provides advice on how to apply the test.

Insurance eligibility
New homes built in flood risk areas after 1 January 2009 are not covered by the Flood Re-insurance scheme and may not be eligible for home insurance. We advise contacting an insurance provider to discuss whether your development would qualify for insurance.

Flood Risk Management Scheme Funding eligibility
New properties and buildings converted to housings within areas of flood risk after 1 January 2012 will not be counted towards the outcome measures of any proposed future flood alleviation scheme. This is to avoid inappropriate development in flood risk areas. Further information can be found at https://www.gov.uk/government/publications/calculate-grant-in-aid-funding-flood-risk-management-authorities

Flood resistance and resilience
We strongly recommend the use of flood resistance and resilience measures. Physical barriers, raised electrical fittings and special construction materials are just some of the ways you can help reduce flood damage.

To find out which measures will be effective for this development, please contact your building control department. If you'd like to find out more about reducing flood damage, visit the Flood Risk and Coastal Change pages of the planning practice guidance. Further guidance on flood resistance and resilience measures can also be found in:

Government guidance on flood resilient construction
https://www.gov.uk/government/publications/flood-resilient-construction-of-new-buildings

CIRIA Code of Practice for property flood resilience
https://www.ciria.org/Research/Projects_underway2/Code_of_Practice_and_guidance_for_property_flood_resilience_.aspx

British Standard 85500 – Flood resistant and resilient construction
https://shop.bsigroup.com/ProductDetail/?pid=000000000030299686

Advice to applicant

Water Resources
Increased water efficiency for all new developments potentially enables more growth with the same water resources. Developers can highlight positive corporate social responsibility messages and the use of technology to help sell their homes. For the homeowner lower water usage also reduces water and energy bills.

Cont/d..

We endorse the use of water efficiency measures especially in new developments. Use of technology that ensures efficient use of natural resources could support the environmental benefits of future proposals and could help attract investment to the area. Therefore, water efficient technology, fixtures and fittings should be considered as part of new developments.

Residential developments
All new residential development are required to achieve a water consumption limit of a maximum of 125 litres per person per day as set out within the Building Regulations &c. (Amendment) Regulations 2015.

However, we recommend that in areas of serious water stress (as identified in our report Water stressed areas - final classification) a higher standard of a maximum of 110 litres per person per day is applied. This standard or higher may already be a requirement of the local planning authority.

Commercial/Industrial developments
We recommend that all new non-residential development of 1000sqm gross floor area or more should meet the BREEAM 'excellent' standards for water consumption.
We also recommend you contact your local planning authority for more information.

Signing up for flood warnings
The applicant/occupants should phone Floodline on 0345 988 1188 to register for a flood warning, or visit https://www.gov.uk/sign-up-for-flood-warnings. It's a free service that provides warnings of flooding from rivers, the sea and groundwater, direct by telephone, email or text message. Anyone can sign up.

Flood warnings can give people valuable time to prepare for flooding – time that allows them to move themselves, their families and precious items to safety. Flood warnings can also save lives and enable the emergency services to prepare and help communities.

For practical advice on preparing for a flood, visit https://www.gov.uk/prepare-for-flooding.

To get help during a flood, visit https://www.gov.uk/help-during-flood.

For advice on what do after a flood, visit https://www.gov.uk/after-flood.

Final comments
Thank you for contacting us regarding the above application. Our comments are based on our available records and the information submitted to us. Please quote our reference number in any future correspondence. Please provide us with a copy of the decision notice for our records. This would be greatly appreciated.

Should you have any queries regarding this response, please contact me.

Yours sincerely,

Hannah Malyon
Sustainable Places Planning Advisor

Direct dial: 0208 474 9666
E-mail: HNLSustainablePlaces@environment-agency.gov.uk

End

creating a better place

Environment Agency

Nelupa Malik
London Borough of Tower Hamlets
Development Control
PO Box 55739
London
E14 1BY

Our ref: NE/2021/133954/01
Your ref: PA/21/02377

Date: 21 December 2021

Dear Nelupa

Hybrid application seeking detailed planning permission for Phase A and outline planning permission for future phases, comprising: Outline planning permission (all matters reserved) for the demolition of all existing structures and redevelopment to include a number of buildings ranging between maximum heights of 13.5m AOD and 100m AOD and up to 141,014sqm (GEA) of floorspace comprising the following mix of uses: ? Up to a maximum of 133,971sqm (GEA) of Residential floorspace (Class C3); ? Up to 4,444sqm (GEA) of retail, workspace, food and drink uses (Class E); ?Car and cycle parking; ?Formation of new pedestrian route through the conversion and repurposing of the Abbott Road vehicular underpass for pedestrians and cyclists; ?Landscaping including new open spaces and public realm and ?New means of access, associated infrastructure and highways works. In Full, for 30,133sqm (GEA) residential (Class C3) floorspace to include a number of buildings ranging between maximum heights of 25.17m (AOD) and 42.73m (AOD), 1341 sqm of retail, food and drink uses associated with a replacement Neighbourhood Centre and a temporary marketing suite (Class E and Sui Generis), together with access, car and cycle parking, associated landscaping and new public realm, and improvements to Braithwaite Park and Leven Road Open Space. This application is accompanied by an Environmental Statement.

Aberfeldy Estate, Phase A, Land to the north of East India Dock Road (A13), east of the Blackwall Tunnel Northern Approach Road (A12) and to the south west of Abbot Road.

Thank you for consulting us on this planning application. We have **no objections** to the proposed development.

The site is located within Flood Zone 3 and is protected to a very high standard by the Thames tidal flood defences up to a 1 in 1000 (0.1%) chance in any year flood event. Our latest flood modelling shows the site would be at risk if there was to be a breach in the defences or they were to be overtopped.

We are satisfied that:

- *The developer has assessed the risk from a breach in the Thames tidal flood defences using the latest modelled tidal breach data.*
- The developer has not proposed any sleeping accommodation below the modelled tidal breach flood level.

Cont/d..

The proposal does not have a safe means of access and/or egress in the event of flooding from all new buildings to an area wholly outside the floodplain however, safe refuge within the higher floors of the development has been suggested.

To improve flood resilience, we recommend that, where feasible, finished floor levels are set above the 2100 breach flood level, **which is 3.68mAOD in the Southern parcel and 5.10mAOD in the northern parcel of the development**.

Informative – advice to LPA

We do not normally comment on or approve the adequacy of flood emergency response procedures accompanying development proposals, as we do not carry out these roles during a flood. Our involvement with this development during an emergency will be limited to delivering flood warnings to occupants / users covered by our flood warning network.

In line with the Planning Practice Guidance (PPG) to the National Planning Policy Framework, any assessment of the safety of a development from flooding should consider the ability of site residents / users to safely access and exit the building during a design flood event, as well as their ability to evacuate ahead of an extreme flood. One of the key considerations to ensure that any new development is safe is whether or not adequate flood warnings would be available to people using the development.

In all circumstances where warning and emergency response is fundamental to managing flood risk, we advise local planning authorities to formally consider the emergency planning and rescue implications of new development in making their decisions. As such, we recommend you consult with your emergency planners and the emergency services to determine whether the proposals are safe and in accordance with the guiding principles of the PPG.

We have considered the findings of the flood risk assessment in relation to the likely duration, depths, velocities and flood hazard rating against the design flood for the proposal. This does not mean we consider that the access is safe nor the proposals acceptable in this regard. We remind you to consult with your emergency planners and the emergency services to confirm the adequacy of the evacuation proposals. Any assessment should be based on the breach data included within the submitted FRA.

Final comments:

Once again thank you for consulting us on this planning application. Please contact me should you have any questions.

Yours sincerely,

Mr Demitry Lyons
Sustainable Places Planning Advisor

ECOWORLD
LONDON
CREATING TOMORROW & BEYOND

POPLAR HARCA

ABERFELDY VILLAGE MASTERPLAN