

Appendix D Cumulative Impact Assessment Evidence Review

1 Background

1.1 Introduction

Under the revised 2021 NPPF Strategic Flood Risk Assessments (SFRAs), Cumulative Impact Assessments are required to consider cumulative impacts in, or affecting, local areas susceptible to flooding (para. 160).

When allocating land for development, consideration should be given to the potential cumulative impact of the loss of floodplain storage volume and potential effects of increased volumes of runoff from proposed development. The cumulative impact of development should be considered at both the Local Plan making and the planning application and development design stages.

All developments are required to comply with the NPPF and demonstrate they will not increase flood risk elsewhere. Therefore, providing developments near watercourses in neighbouring authorities comply with the latest guidance and legislation relating to flood risk and sustainable drainage, they should result in no increase in flood risk within Newham Borough.

Nevertheless, there will be areas where significant levels of concurrent development could alter catchment characteristics through changes to land elevations, peak runoff intensity and volumes of runoff. The potential effect of this will be amplified in circumstances where there are already existing problems or concerns over the level of flood risk.

To understand the potential cumulative effects of proposed development, it is therefore important to identify catchments and receptors that are sensitive to changes in catchment hydrological processes

This is complicated in Newham due to the highly urbanised nature of the catchments within the borough, meaning that the natural catchment processes are heavily modified by the sub-surface sewer systems and alterations to natural drainage pathways. Where the diversion of "natural" watercourses into culverts or pipes has occurred, it can result in a reduced available design capacity during rainfall events in the piped system, when sewers drain the watercourse catchment as well as the formal network.

Plans for urbanisation and redevelopment within Newham may present a crucial opportunity to address long-standing issues and problems relating to surface water improvements and upgrades to the drainage system.

2 Broadscale Approach

In the Level 1 SFRA, future development sites within the study area were provided by Newham Borough Council. Predicted flood risk was assessed using the following datasets:

- Total number properties within the merged 1% AEP surface water flooding extent and Flood Zone 3a for each catchment
- Total number properties within the merged 0.1% AEP surface water flooding extent and Flood Zone 2

The difference in the number properties at risk in these two datasets has then been used as an indicator to identify which catchments are more sensitive to increases in flood flows

To identify which catchments are more sensitive to cumulative impacts, each sewer catchment was given a ranking for each of the three metrics:

- proposed level of growth,
- historic flood risk and
- properties sensitive to growth.

These rankings were then combined to give an overall ranking which was divided into three categories - high, medium, and low according to how sensitive each catchment is to cumulative impacts relative to one another.

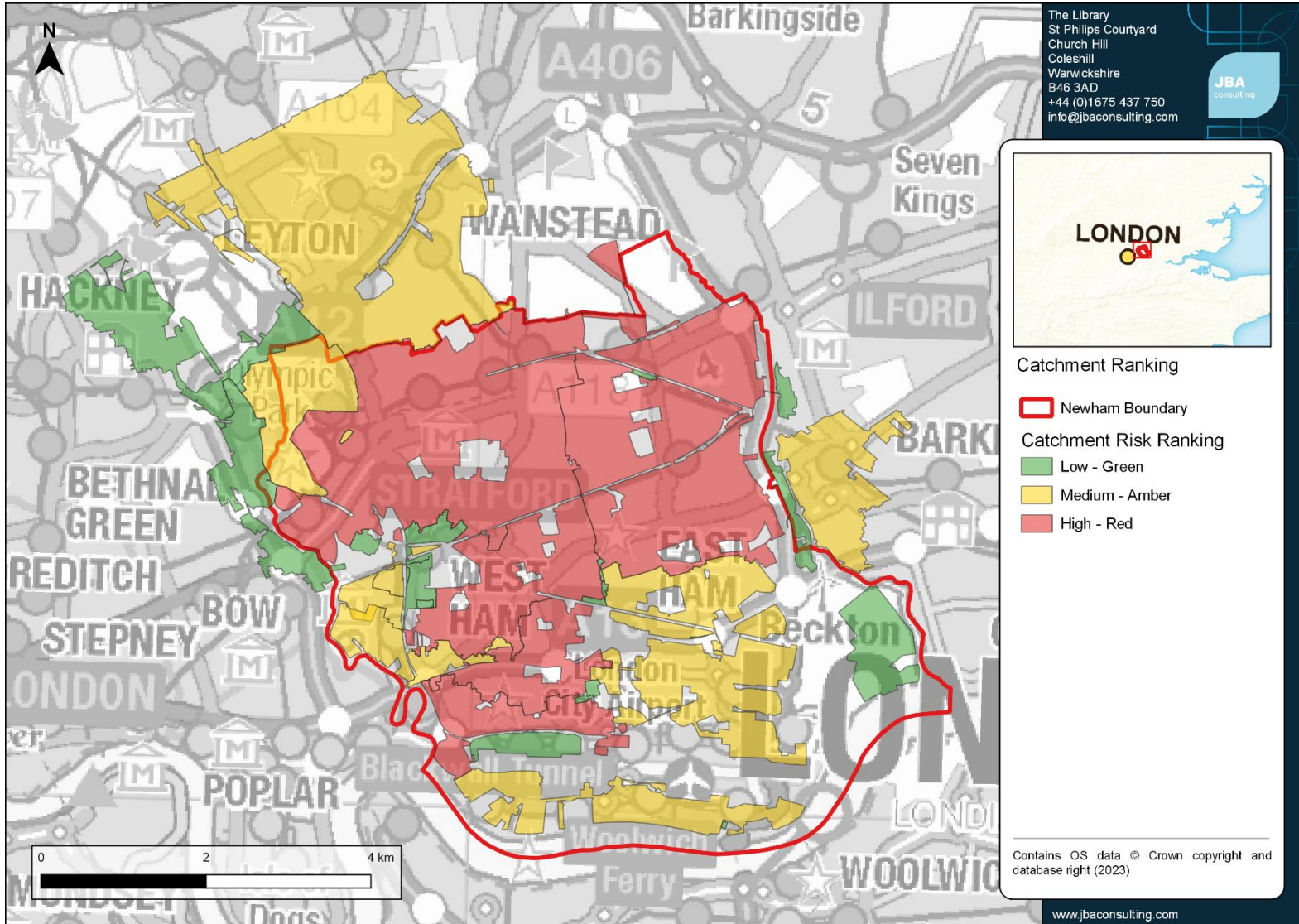
Table 2-1 Summary of datasets used in the Broadscale CIA

Dataset	Coverage	Source of Data	Use of Data
Catchment Boundaries	London Borough of Newham and neighbouring authorities	Thames Water foul network	Assessment of susceptibility to cumulative impacts of development by catchment.
National Receptor Dataset	Newham Borough Study Area	Environment Agency	Assessing the number of properties at risk of surface water flooding within each catchment.
Risk of Flooding from Surface Water	Thames Water foul network	Environment Agency	Assessing the number of properties at risk of surface water flooding within each catchment.
Fluvial Flood Zones	London Borough of Newham and neighbouring authorities	Environment Agency	Assessing the number of properties at risk of fluvial flooding within each catchment
Future development areas (recently built out sites/sites under construction/sites with planning permission/previously allocated sites/currently allocated sites)	London Borough of Newham and neighbouring authorities	LBN Neighbouring Councils	Assessing the impact of proposed future development on risk of flooding.
Historic Flooding Incidents	London Borough of Newham	LBN Thames Water	Assessing incidences of historic flooding within the study area.

The rating of each catchment in each of these assessments was combined to give an overall ranking and the results are show in Figure 2-1. The five highest ranked catchments are:

- Canning Town
- Folkstone Road East Ham SPS
- Plaistow North
- Plastow SE
- West Ham

Figure 2-1: Final catchment rankings of cumulative impacts (from Newham Level 1 SFRA)



3 Review

This Section reviews the Surface Water Management Plan, Drainage Water Management Plan, and Section 19 Reports from previous flood events to further refine area where there is particular sensitivity to the cumulative impacts of developments and provides recommendations for developers and the council to mitigate these impacts and opportunities to provide benefits through development.

3.1 Surface Water Management Plan (2019)

The London Borough of Newham forms part of the 'Group 4' group of boroughs established through Drain London. This includes Enfield; Hackney; Haringey; Tower Hamlets and Waltham Forest.

According to the Surface Water Management Plan, there are 13 Critical Drainage Areas (CDAs) in the borough. The highest priority catchments (in terms of receptors impacted) are summarised in Table 3 1.

Table 3-1 Critical Drainage Areas within Newham

Group Name	Location	Mechanism	Main receptor
Group4_031	Jubilee Line at West Ham Station	Railway is in a cutting at this location and flooding is a result of a low point on the railway just north of West Ham Station	Essential infrastructure (Railway line)
Group4_032	Royal Albert Way (A1020) underpass beneath Connaught Roundabout, Canning Town	Surface water flows along the A13 from both easterly and westerly directions, ponding beneath Connaught Roundabout.	Essential infrastructure (Road network)
Group4_033	Gainsborough Avenue near Little Ilford Park, Little Ilford	Surface water runoff flows along from north to south. Ponding at low points and at the railway embankment.	Residential properties
Group4_034	Charlemont Road, Bream Gardens, Hartshorn Gardens, Hameway, East Ham	Surface water from Vicarage Lane is conveyed in a southerly direction towards Hameway. Water then ponds behind the A13 embankment	Residential properties

Group Name	Location	Mechanism	Main receptor
Group4_035	Humberstone Road and New City Road, Newham	Overland flow from surrounding roads (New City, Boundary, Humberstone, and Lonsdale) converge at the lowest point in the catchment. Flow routes are impeded by the Northern Outfall Sewer Embankment, operated by Thames Water.	Residential properties
Group4_036	Woolwich industrial estate, Woolwich	Surface water flows in an easterly direction down North Woolwich Road (A1020) into Charles Street	Industrial properties
Group4_037	Beaumont Road, Kent Street in Plaistow	Overtopping from higher ground ponds in low-lying area towards Kent Street, the lowest point in the catchment. Flow routes are impeded by the Northern Outfall Sewer embankment.	Residential properties, Commercial properties
Group4_038	Woodgrange Park Railway Line near Woodgrange Park Station	Surface water flows along the railway cutting from the west of the CDA to the River Roding. Much of the surrounding land is flat and unlikely to contribute significant volumes of surface water to the railway line	Essential infrastructure (Railway line), residential properties
Group4_039	A13 underpass beneath Prince Regent Lane (A112), Newham	Surface water flowing along the A13 from both easterly and westerly directions, and ponding at the low point where Prince Regent Lane (A112) passes over.	Essential infrastructure (Road network)

Group Name	Location	Mechanism	Main receptor
Group4_040	District line between West Ham and Plaistow where it passes beneath the Northern Outfall Sewer	Surface water flows in a south-westerly direction towards the intersection with the Northern Outfall Sewer. Surrounding land is unlikely to contribute to water within the cutting as the land is observed to slope away.	Essential infrastructure (Railway line)
Group4_050	National Express East Anglia Railway Line from Stratford, through Forest Gate Station and Manor Park	No natural outfall for rain falling within the railway corridor. The drainage path could extend as far as 5km between the River Lea and River Roding	Essential infrastructure (Railway line)
Group4_051	Central Line north of Stratford station	The railway line is in a cutting at this location. Runoff from the surrounding higher ground entering the cutting is observed to be limited.	Essential infrastructure (Railway line)
Group4_053	Wythes Road and Drew Road, North Woolwich	Overland flow ponding at the lowest point in the catchment.	Residential properties

Section 1.5.13 of the SWMP highlights the potential for urbanisation and redevelopment within Newham to increase the pressure on existing drainage system, and identifies the need for the Council to identify locations for potential strategic improvements and upgrades targeting those areas where urbanisation and redevelopment are proposed.

Where development is proposed within an identified critical drainage area, developers should demonstrate that runoff will be limited to the greenfield runoff rate (in line with Newham Local Plan Policy SC3) and strive to achieve additional betterment through the implementation of measures such as retrofitting of SuDs in brownfield sites, oversized SuDs and rainwater harvesting. Newham Borough Council should also identify opportunities for development to provide benefits offsite, contribute to drainage improvements beyond their red line boundary, and where sites are near to each other identify opportunities for developers to coordinate their drainage strategy/share SuDS to maximise benefits.

Developers within an identified Critical Drainage Area should consult the SWMP for considerations specific to individual areas.

3.1.1 Groundwater flooding

In general, groundwater risk is less sensitive to increase development. However, where subsurface development, such as basements and deep foundations, occurs, there is the potential for development to impact groundwater flows and increase risk elsewhere. This is particularly a concern where large areas of subsurface development are proposed.

Therefore, where development is proposed in areas identified as being at risk from groundwater flooding/where groundwater is <5m below the surface, ground investigations, potentially including groundwater modelling, should be undertaken to confirm the risk and ensure there is no increase in risk elsewhere.

Areas with recorded Groundwater Flooding within Newham are listed in Table 3-2.

Table 3-2 Recorded incidences of groundwater flood risk within Newham

03/01/2003	Central Park Road, East Ham
06/01/2003	Green Street, Upton Park
07/01/2003	Wanlip Road, Plaistow
23/01/2003	Seventh Avenue, Manor Park
08/08/2003	Gooseley Lane, East Ham
11/02/2004	Clements Road, Upton Park
17/02/2004	Chaucer Road, West Ham
18/11/2004	Green Street, Upton Park
19/06/2006	Sprowston Mews, Forest Gate
10/10/2009	Sprowston Mews, Forest Gate
20/01/2010	Redriffe Road, West Ham

From the Geosmart Groundwater Flood Risk Mapping, there is potential for groundwater to rise most noticeably in the northern part of the borough, towards the River Lea above the underlying Taplow Gravel formation, which correlates with historic groundwater flood information

Other areas identified as having increased potential to experience groundwater flooding are located along the Thames frontage in Silvertown and Gallions Reach, however groundwater flooding in these areas is not observed in historic records.

3.2 Section 19 investigations

Section 19 investigations undertaken by Newham Borough Council in 2014, and 2016-2017 concluded that local drainage infrastructure performance during flooding events has to be considered a major factor in discrepancies between predicted and actual impacts of

flooding. Particular areas that are recorded to have experienced significant flooding exacerbated by the local drainage infrastructure are: Forest Park Gate, West Ham, Upton Park, and Stratford. It is believed that localised intense rainfall was a key factor in these events however, and it is likely that much of Newham is similarly susceptible to flooding due to these short intense rainfall events.

The PFRA suggested that local drainage capacity might be either overestimated in flood risk models or hindered by additional factors during those events. This should be considered wherever flood risk models are used by developers to inform Flood Risk Assessments and Drainage Strategies, and it is recommended that opportunities to deliver improvements to drainage as part of redevelopment in areas that have previously experienced flooding are explored.

3.3 Thames Water Drainage and Wastewater Management Plan (DWMP)

In 2023, Thames Water published their first DWMP. Newham falls within the Beckton sewage system located in North London. Newham is designated as Risk Zone 1 (note this is a reference number and does not signify level of risk).

In Risk Zone 1, there are problems with storm overflow performance, internal sewer flooding and external sewer flooding. The DWMP estimates that 1.2-1.3% of properties are at increased risk of flooding, with 6373 properties at risk by 2050. Additional development in Newham has the potential to increase pressure on the sewer network and may exacerbate these issues.

Strategic solutions identified by the DWMP include large scale surface-water management, disconnecting surface water systems from combined sewers and discharging to the watercourses, and property level protection measures.

Developers should consult with Thames Water as when developing the drainage strategy for any development to determine whether property level protection measures may be required for new development, and to ensure that any surface water drainage delivered as part of development in Newham aligns with Thames Waters strategic objectives. There may also be opportunities to deliver drainage improvements alongside/as part of development.

4 Summary and Policy Recommendations

4.1 Summary

This review has highlighted that most of Newham is sensitive to increased flood risk as a result of increased runoff due to development, in particular flooding due to surface water/surcharging of the surface water drainage network, although there is also the potential for development to increase risk from other sources. In particular, the SWMP highlights Critical Drainage Areas that are particularly sensitive, and any development within these areas will need to be designed and bought forwards carefully to ensure there is no increase in flood risk as a result.

There is however the potential for development to help address these issues within Newham- much of the development proposed within Newham is Brownfield land, therefore there is the opportunity for new development to substantially reduce runoff by the adoption of SuDS, and for improvements to the surface water drainage network to be delivered alongside new development. The below policy recommendations will help to ensure new development can be bought forwards without increasing flood risk, and where possible contribute to reducing flood risk.

4.2 Policy Recommendations for Newham Borough Council

- Newham Borough Council should identify locations for potential strategic improvements and upgrades to the local drainage network, targeting those areas where urbanisation and redevelopment are proposed.
- Newham Borough Council should also identify opportunities for development to provide benefits offsite, contribute to drainage improvements beyond their red line boundary, and where sites are near to each other identify opportunities for developers to coordinate their drainage strategy/share SuDS to maximise benefits.
- When reviewing Site Applications, Newham Borough Council should consult with Thames Water to identify where there are opportunities to deliver improvements to the local drainage network and support the objectives of the DWMP as part of/alongside development.

4.3 Policy Recommendations For Developers

- Where development is proposed within an identified Critical Drainage Area, developers should demonstrate that runoff will be limited to the greenfield runoff rate (in line with Newham Local Plan Policy SC3) and strive to achieve additional betterment through the implementation of measures such as retrofitting of Suds in brownfield sites, oversized Suds and rainwater harvesting.
- Developers within an identified Critical Drainage Area should consult the SWMP for considerations specific to individual areas.

- Where subsurface development (including basements and buildings with deep foundations) is proposed in areas identified as being at risk from groundwater flooding/where groundwater is <5m below the surface, ground investigations, potentially including groundwater modelling, should be undertaken to confirm the risk and ensure there is no increase in risk elsewhere.
- Where developers use local modelling to support a Flood Risk Assessment or drainage strategy, they should show consideration that the local drainage capacity might be either overestimated in flood risk models or hindered by additional factors during rainfall events. This should be considered wherever flood risk models are used by developers to inform Flood Risk Assessments and Drainage Strategies, and it is recommended that opportunities to deliver improvements to drainage as part of redevelopment in areas that have previously experienced flooding are explored.
- Developers should consult with Thames Water as when developing the drainage strategy for any development to determine whether property level protection measures may be required for new development, and to ensure that any surface water drainage delivered as part of development in Newham aligns with Thames Waters strategic objectives.

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