

16.0 Bow Common Gas Works

Site Number:	15
Site Location:	Bow Common Lane
Grid Reference:	537110, 182070

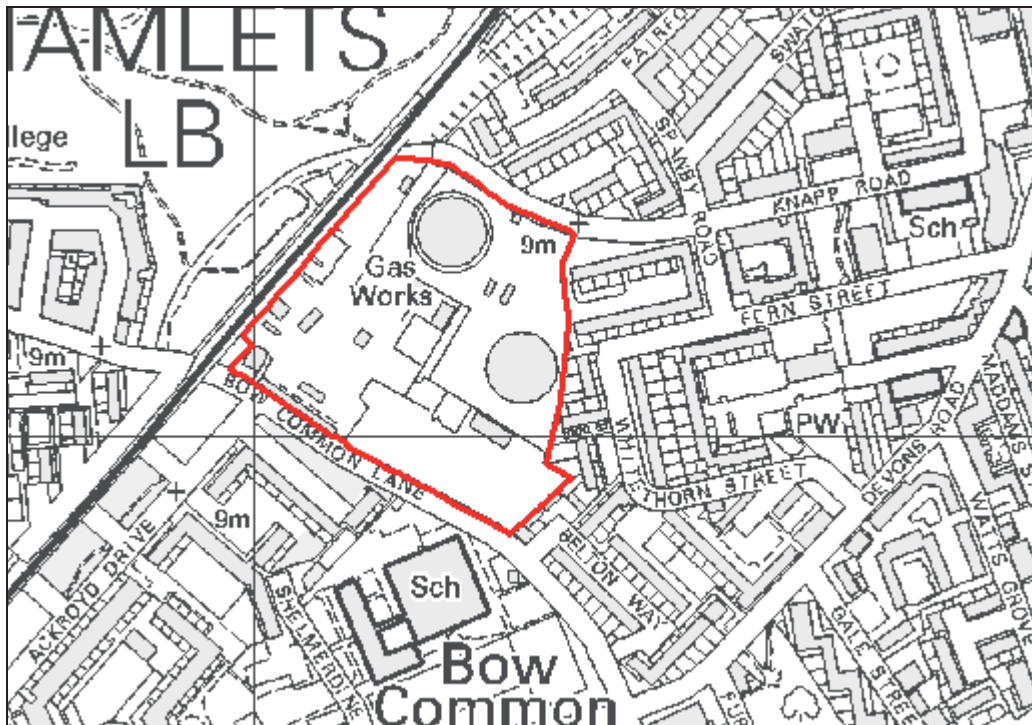


Figure 16-1 Bow Common Gas Works Site

16.1 SITE DESCRIPTION

The site occupies an area of 3.94ha and currently comprises of two distinct areas, the area to the north of site containing gas holders with paved open space, and the southern portion of the site containing mainly parking and warehousing. Along the northwest boundary of the site there are railway arches beyond which lies Tower Hamlets Cemetery Park. Ground levels vary across the site with levels around 9.3mAOD in the south west of the site increasing to 10.2mAOD in the south east of the site. The proposed uses of the site include a large-scale housing development and a district heating facility. Public accessible open space will also be incorporated into the development.

In accordance with Table D2 of PPS 25, the classifications of the proposed uses are as follows:

Proposed Land Use	Vulnerability Classification
Large-scale housing development	More vulnerable
District Heating Facility	Less vulnerable

16.2 SUMMARY OF FLOOD RISK

16.2.1 FLOOD ZONE MAPS

The entirety of the site is shown to be located within Flood Zone 1. All of the proposed land uses for this site are compatible with this flood zone.

16.3 SOURCES OF FLOODING

16.3.1 TIDAL

Actual Risk

The site is defended from tidal inundation during the 0.5% AEP tidal event by the existing Thames Tidal Flood Defences (including the Thames Barrier) for the lifetime of the development. The site is considered to be at low risk of tidal flooding.

Residual Risk

There is a residual risk of tidal flooding from an extreme surge event. The site is defended against inundation from the River Thames during a 0.1% AEP tidal event and is considered as having a low probability of the defences overtopping.

A breach of the tidal defences is unlikely to result in flooding of the site due to its distance from the Thames and its location on higher ground.

16.3.2 FLUVIAL

Actual Risk

The site is located outside of the 1% AEP event with inclusion of climate change flood extent of the River Lee. The site is located on ground approximately 10m higher than the floodplain of the River Lee and is located over 1km away to the east. The site is concluded as being at a low risk of actual fluvial flooding.

Residual Risk

The site is located outside of the 0.1% AEP event flood extent of the River Lee.

The risk of a breach in the fluvial defences is unlikely to result in inundation of the site due to its distance from the watercourse and its location on much higher ground. The site is concluded as being at a low risk of residual fluvial flooding.

16.3.3 SURFACE WATER/SEWER

Small, isolated areas of shallow (up to 0.2m) flooding are predicted in the 1% AEP rainfall event, however this may be due to inaccuracies in the LiDAR or assumptions in the hydraulic modelling, and do not necessarily indicate a high potential of surface water flooding. The site is concluded as being at a low risk of surface water flooding.

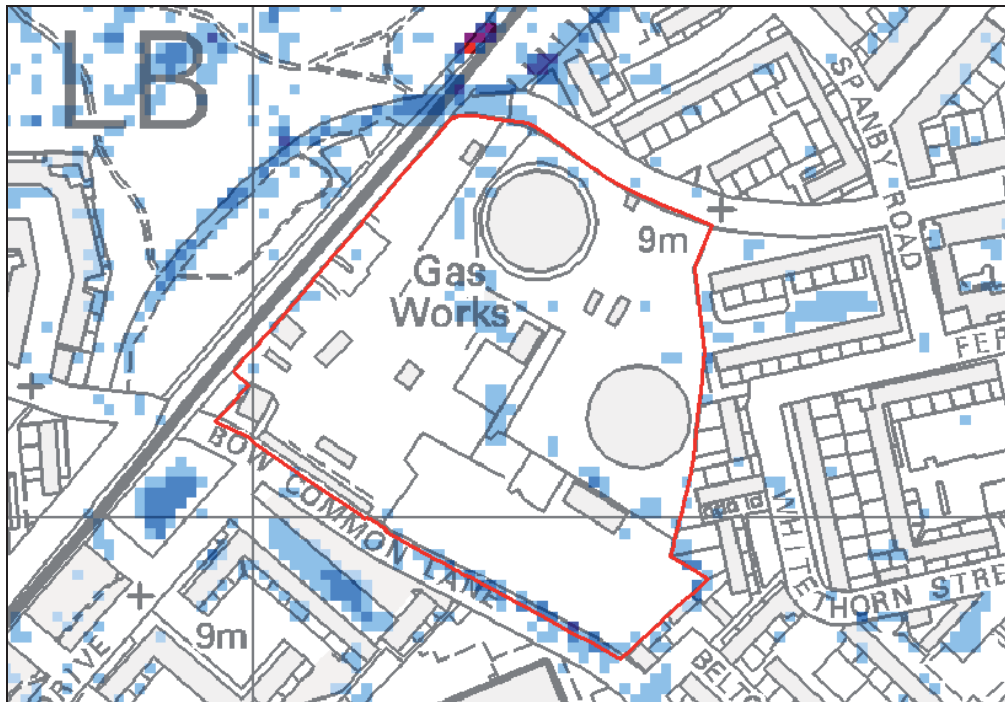


Figure 16-2 Maximum Depth of Surface Water in a 1% AEP Rainfall Event at the Bow Common Gas Works Site

16.3.4 GROUNDWATER

The site is not shown to have an increased potential of elevated groundwater, however the area immediately to the south of the site is shown to have potential. It is recommended that the susceptibility of the site to groundwater flooding is investigated. If the site or parts of the site are shown to be at risk, development proposals will need to consider site ground conditions and groundwater levels over the lifetime of the development. In particular the design of any underground structures or services and foundations.

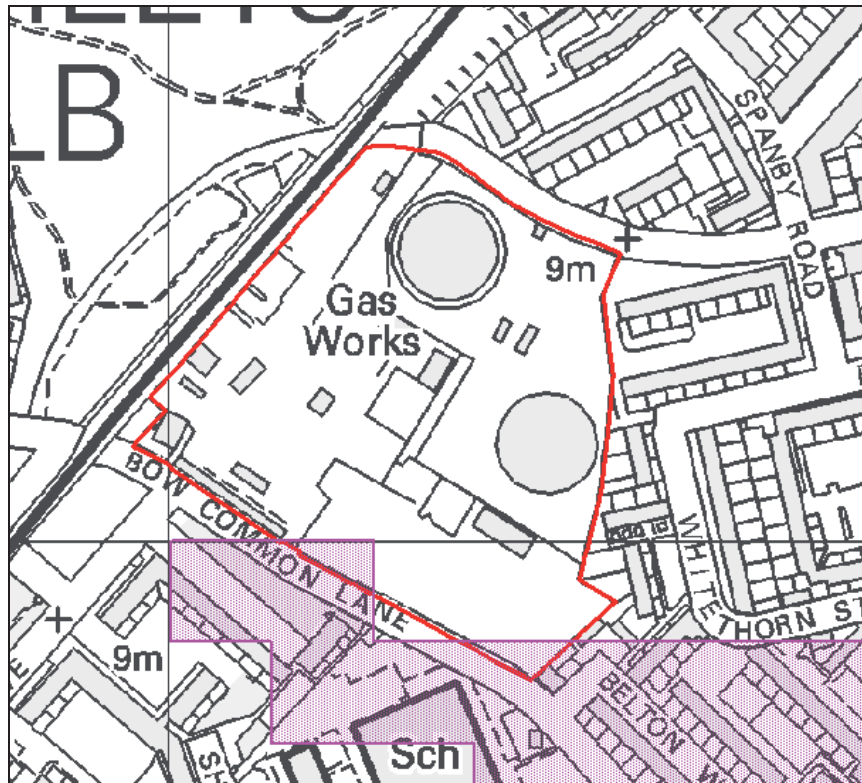


Figure 16-3 Increased Potential of Elevated Groundwater at the Bow Common Gas Works Site

16.3.5 ARTIFICIAL SOURCES

The Grand Union canal lies 600m to the east of the site. The Grand Union canal is not above natural ground level and therefore breaching of the canal embankments is not considered to be a risk of flooding. In addition, British Waterways have confirmed there are no flooding issues directly related to this canal.

The Limehouse Cut lies 400m to the south of the site. The canal is classified as a main river and has been designated by British Waterways as a flood storage area, storing flood waters should a major fluvial event occur in the Lower Lee catchment. The Limehouse Cut is therefore more vulnerable to flooding. Should the banks of the canal overtop, it is unlikely this will result in flooding of the site as ground levels on site are over 3m higher than the land adjacent to the canal.

16.4 GENERAL FLOOD RISK MANAGEMENT

The site is located within Flood Zone 1. All of the proposed land uses for this site are compatible with this flood zone.

The site is potentially at risk from elevated groundwater levels. It is recommended that groundwater levels are monitored as part of a geo-environmental site investigation to determine the depth to groundwater. Depending on the results of the groundwater monitoring, any underground structures in the development may require mitigation using impermeable materials.

The EA have stated that the site contains Bow Common Gas works Hydrometry Point which may need to be retained as part of any development.

Will development increase flood risk elsewhere?
<ul style="list-style-type: none">Unlikely. Development layout must consider surface water flow routes and manage runoff on site sustainably with a target to achieve Greenfield runoff rates.
How can development reduce flood risk overall?
<ul style="list-style-type: none">Include 'at source' SUDS control measures to reduce existing site runoff in accordance with London Plan and local policy.
How can the development be made safe?
<ul style="list-style-type: none">Design of development to consider mitigating the risk of groundwater flooding with use of impermeable materials
Is there a reasonable prospect of compliance with part c of the Exception Test?
N/A

17.0 Crisp Street Town Centre

Site Number:	16
Site Location:	Crisp Street / East India Road / Kerbey Street
Grid Reference:	537588, 181164



Figure 17-1 Crisp Street Town Centre Site

17.1 SITE DESCRIPTION

The site occupies an area of 3.62ha, the site currently consists of commercial uses, housing, and community facilities. It is situated to the north of East India Dock Road and bound to the east by Crisp Street and Kerbey Street on the west. Ground levels are generally between 6-7mAOD with ground levels typically higher in the east of the site. The proposed uses of the site include a large-scale housing development and a district heating facility which will form a part of a larger, mixed use development.

In accordance with Table D2 of PPS 25, the classifications of the proposed uses are as follows:

Proposed Land Use	Vulnerability Classification
Large-scale housing development	More Vulnerable
District Heating Facility	Less Vulnerable

17.2 SUMMARY OF FLOOD RISK

17.2.1 FLOOD ZONE MAPS

The entirety of the site is located within Flood Zone 2. All of the proposed land uses for this site are compatible with this flood zone.

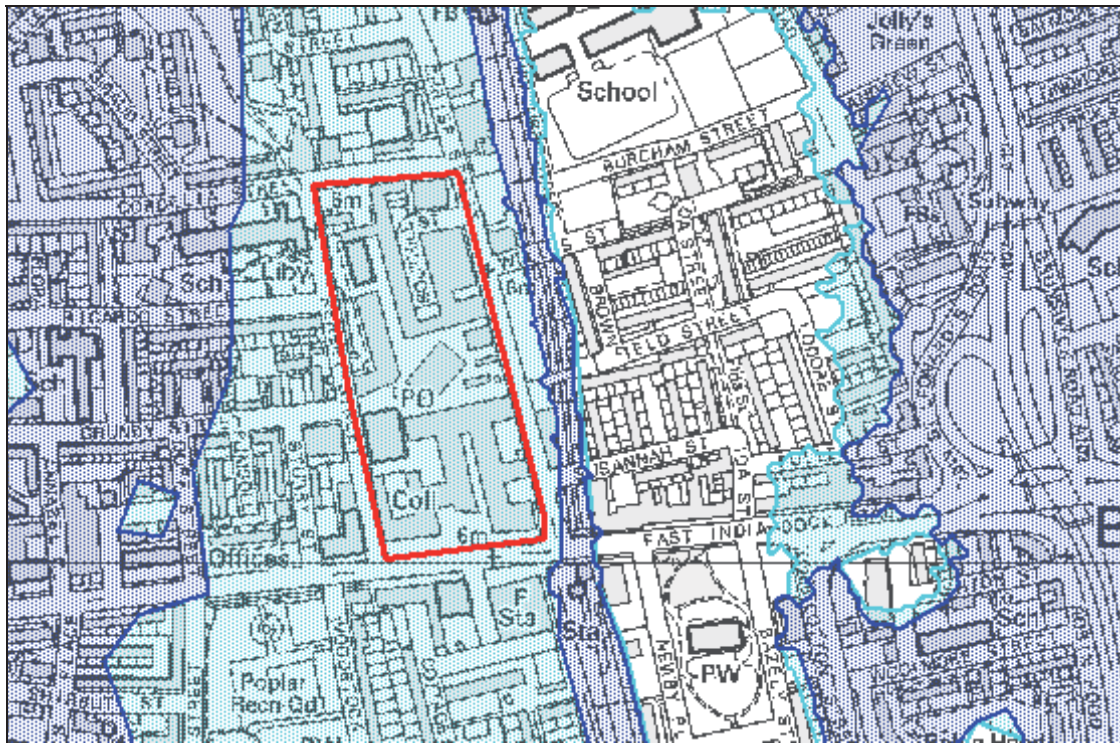


Figure 17-2 PPS25 Flood Zones at Crisp Street Town Centre Site

17.3 SOURCES OF FLOODING

17.3.1 TIDAL

Actual Risk

The site is defended from tidal inundation during the 0.5% AEP tidal event by the existing Thames Tidal Flood Defences (including the Thames Barrier) for the lifetime of the development. The site is considered to be at low risk of tidal flooding.

Residual Risk

There is a residual risk of tidal flooding from an extreme surge event. The site is defended against inundation from the River Thames during a 0.1% AEP tidal event and is considered as having a low probability of the defences overtopping.

A breach in the tidal defences is unlikely to result in flooding on site as ground levels are sufficiently high. Breach assessments carried out as part of the Level 1 SFRA, show that a breach in the tidal defences at Blackwall (Breach 2) does not flood the site, however floods the neighbouring DLR track.

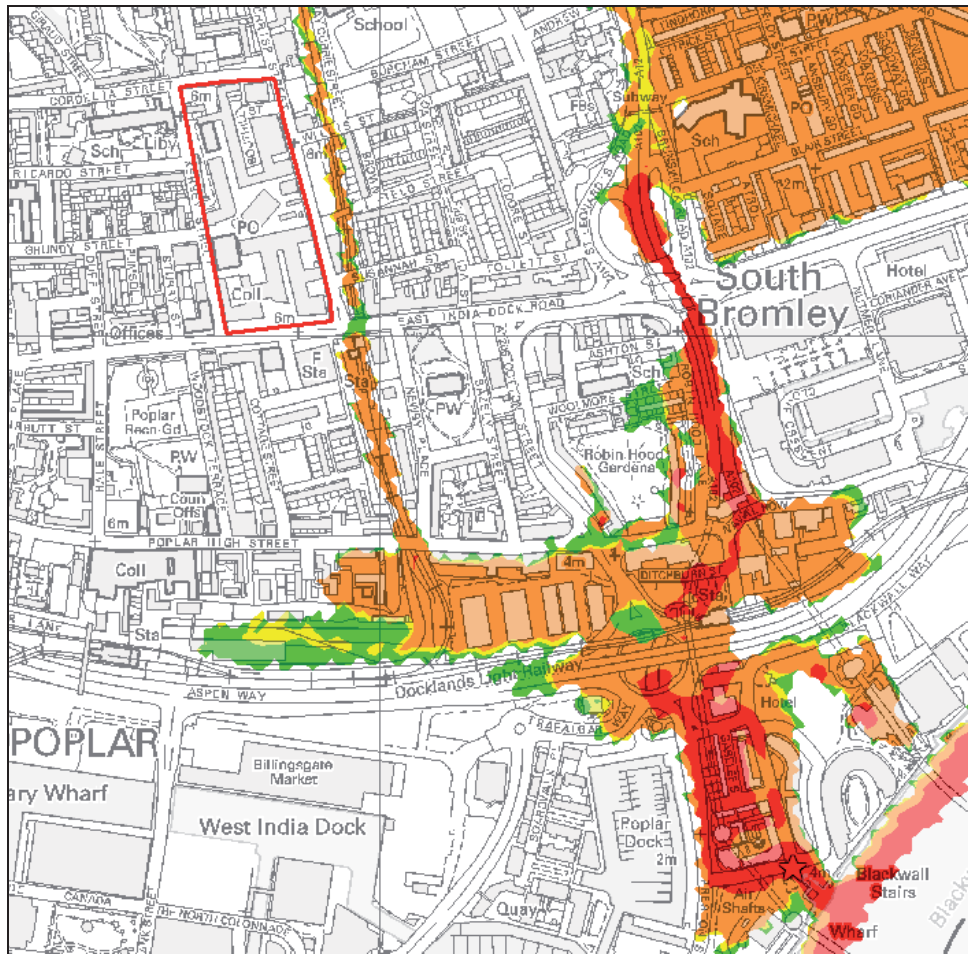


Figure 17-3 Blackwall Breach Extent at Crisp Street Town Centre Site

17.3.2 FLUVIAL

Actual Risk

The site is located outside of the 1% AEP event with inclusion of climate change flood extent of the River Lee. The ground levels on site are observed to be 3-4m above the floodplain of the River Lee. The site is concluded as being at a low risk of actual fluvial flooding.

Residual Risk

The site is located outside of the 0.1% AEP event flood extent of the River Lee.

A breach in the fluvial defences is unlikely to result in flooding on site as ground levels are sufficiently high. Breach assessments carried out as part of the Level 1 SFRA, show that a breach in the fluvial defences at Bromley (Breach 1) does not flood the site, however floods the neighbouring DLR track. The site is concluded as being at a low risk of residual fluvial flooding.

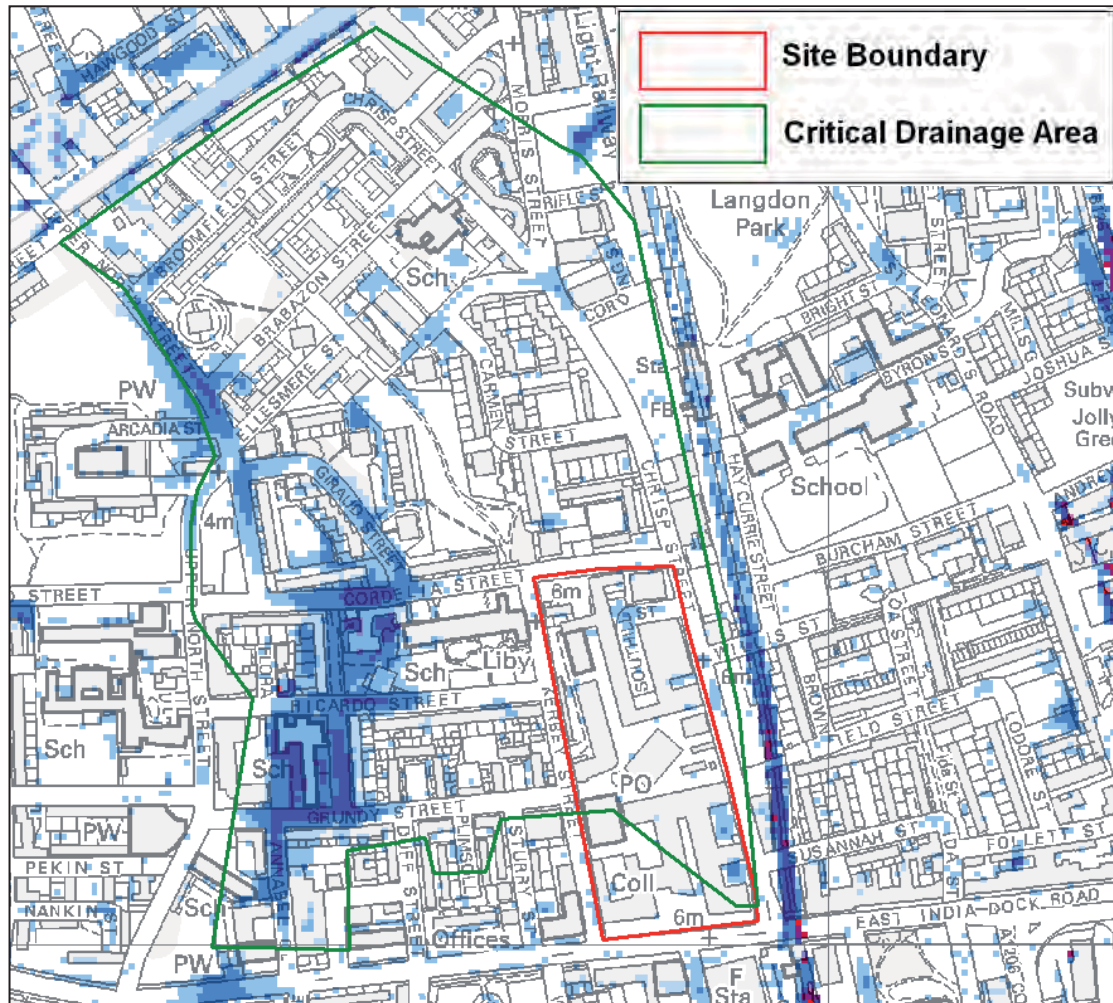


Figure 17-5 Maximum Depth of Surface Water in a 1% AEP Rainfall Event at the Crisp Street Town Centre Site

17.3.4 GROUNDWATER

The site is not shown to have an increased potential of elevated groundwater, however the area surrounding the site is shown to have potential. It is recommended that the susceptibility of the site to groundwater flooding is investigated. If the site or parts of the site are shown to be at risk, development proposals will need to consider site ground conditions and groundwater levels over the lifetime of the development. In particular the design of any underground structures or services and foundations.

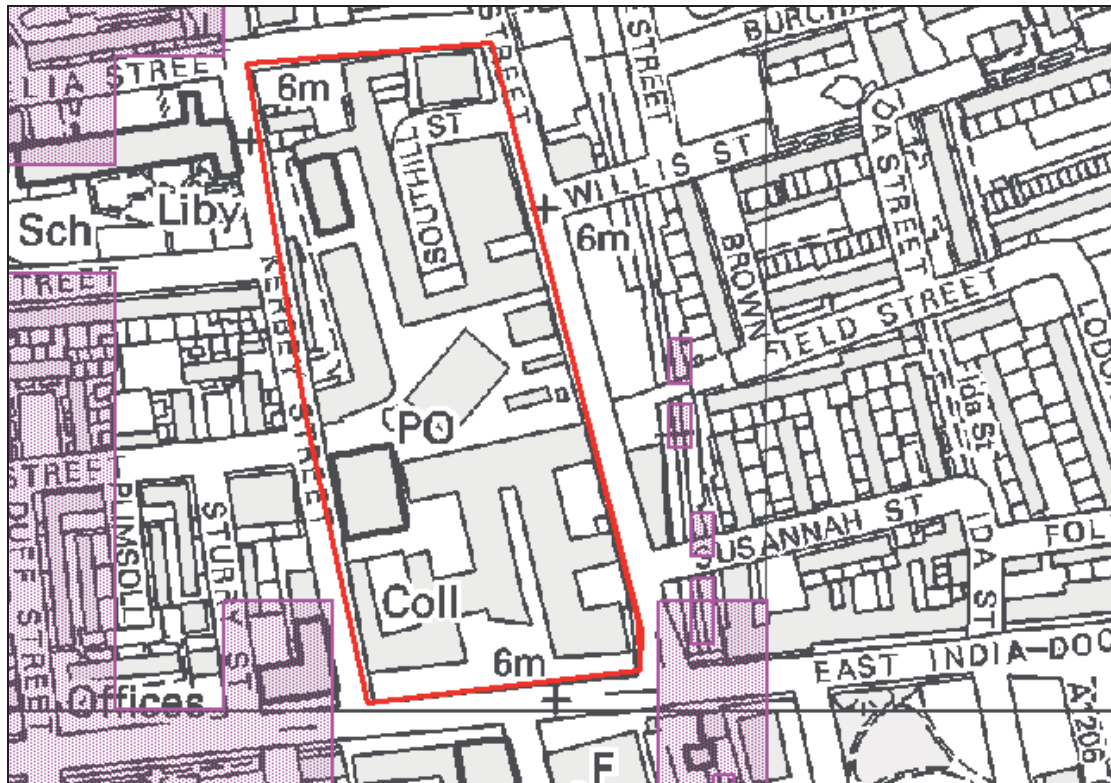


Figure 17-6 Increased Potential of Elevated Groundwater at the Crisp Street Town Centre Site

17.3.5 ARTIFICIAL SOURCES

The Limehouse Cut lies 500m to the north of the site. The canal is classified as a main river and has been designated by British Waterways as a flood storage area, storing flood waters should a major fluvial event occur in the Lower Lee catchment. The Limehouse Cut is therefore more vulnerable to flooding. Should the banks of the canal overtop, it is likely that flood waters will follow the route of the low-lying ground to the west of the site, approximately following Upper North Street. Ground levels at this location are 3m lower than that on site. The site is concluded as being at a low risk of flooding from the Limehouse Cut.

17.4 GENERAL FLOOD RISK MANAGEMENT

The site is located within Flood Zone 2. All of the proposed land uses for this site are compatible with this flood zone.

The site is potentially at risk from elevated groundwater levels. It is recommended that groundwater levels are monitored as part of a geo-environmental site investigation to determine the depth to groundwater. Depending on the results of the groundwater monitoring, any underground structures in the development may require mitigation using impermeable materials.

Development should follow recommendations in the Tower Hamlets SWMP to reduce runoff rates to that of predevelopment Greenfield runoff rates for developments located within CDAs.

The Environment Agency has stated that the site may be contaminated. Remediation may be required.

Will development increase flood risk elsewhere?
<ul style="list-style-type: none">• Development layout must consider surface water flow routes and manage runoff on site sustainably with a target to achieve Greenfield runoff rates.• Development within the CDA to follow guidance set out in the Tower Hamlets SWMP, namely achieving a target of reducing runoff rates to that of predevelopment Greenfield runoff rates.
How can development reduce flood risk overall?
<ul style="list-style-type: none">• Include 'at source' SUDS control measures to reduce existing site runoff in accordance with London Plan and local policy.
How can the development be made safe?
<ul style="list-style-type: none">• Design of development to consider mitigating the risk of groundwater flooding with use of impermeable materials
Is there a reasonable prospect of compliance with part c of the Exception Test?
N/A

18.0 Cording Street

Site Number:	17
Site Location:	Cording Street
Grid Reference:	537838, 181584

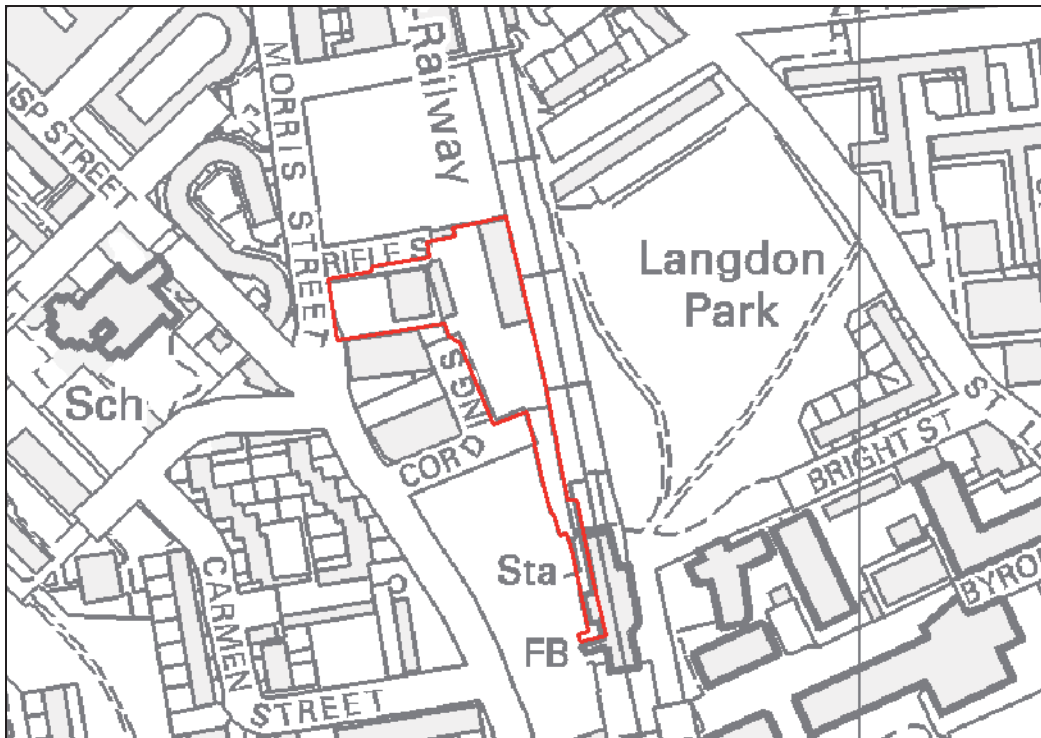


Figure 18-1 Cording Street Site

18.1 SITE DESCRIPTION

The site occupies an area of 0.5ha, and lies to the west of Langdon Park DLR station. The Limehouse Cut lies to the north of the site and the railway track forms the eastern boundary to the site. Ground levels across the site are generally flat and are typically around 5.5mAOD. The site currently consists of warehousing with some vacant land. The proposed use of the site is for a primary school.

In accordance with Table D2 of PPS 25, the classifications of the proposed uses are as follows:

Proposed Land Use	Vulnerability Classification
Primary School	More Vulnerable

18.2 SUMMARY OF FLOOD RISK

18.2.1 FLOOD ZONE MAPS

The site is located within Flood Zones 2 and 3. 'More vulnerable' land uses are permitted within both flood zones, however will be subject to the Sequential and Exception Tests if located within Flood Zone 3.

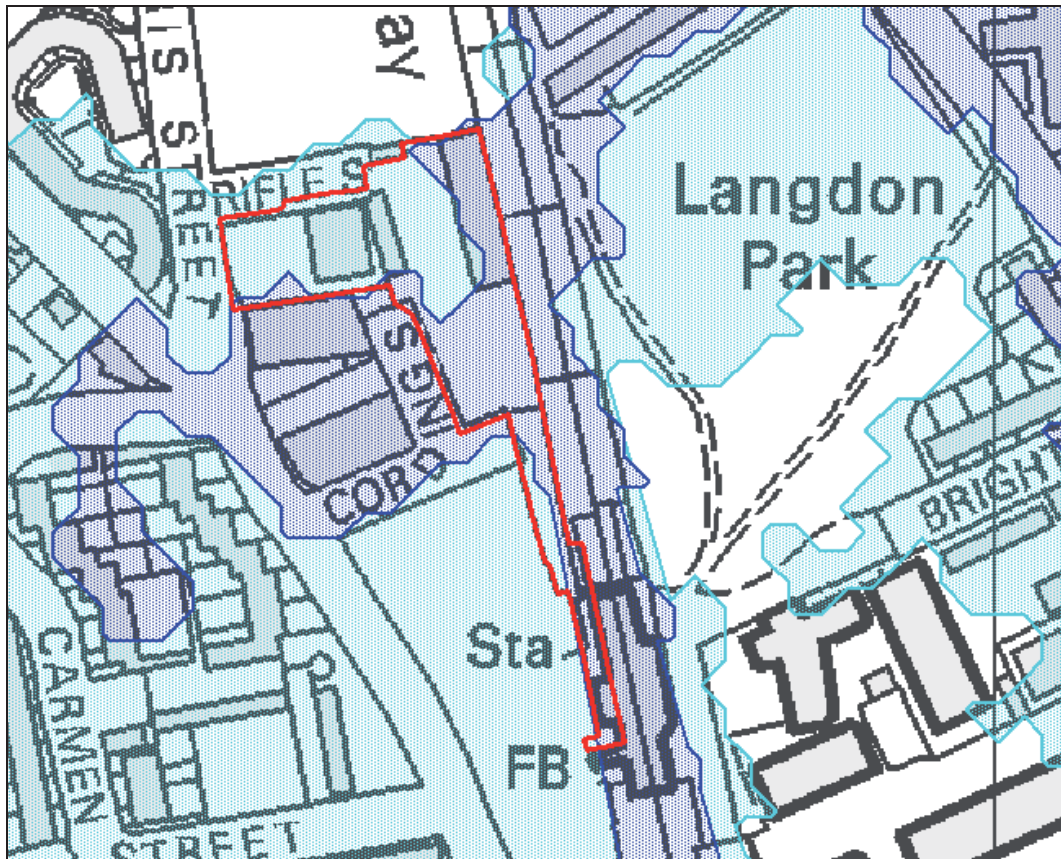


Figure 18-2 PPS25 Flood Zones at the Cording Street Site

18.3 SOURCES OF FLOODING

18.3.1 TIDAL

Actual Risk

The site is defended from tidal inundation during the 0.5% AEP tidal event by the existing Thames Tidal Flood Defences (including the Thames Barrier) for the lifetime of the development. The site is considered to be at low risk of tidal flooding.

Residual Risk

There is a residual risk of tidal flooding from an extreme surge event. The site is defended against inundation from the River Thames during a 0.1% AEP tidal event and is considered as having a low probability of the defences overtopping.

A breach in the tidal defences is unlikely to result in flooding on site as ground levels are sufficiently high. Breach assessments carried out as part of the Level 1 SFRA, show that a breach in the tidal defences at Blackwall (Breach 2) does not flood the site, however floods the DLR track adjacent to the site.

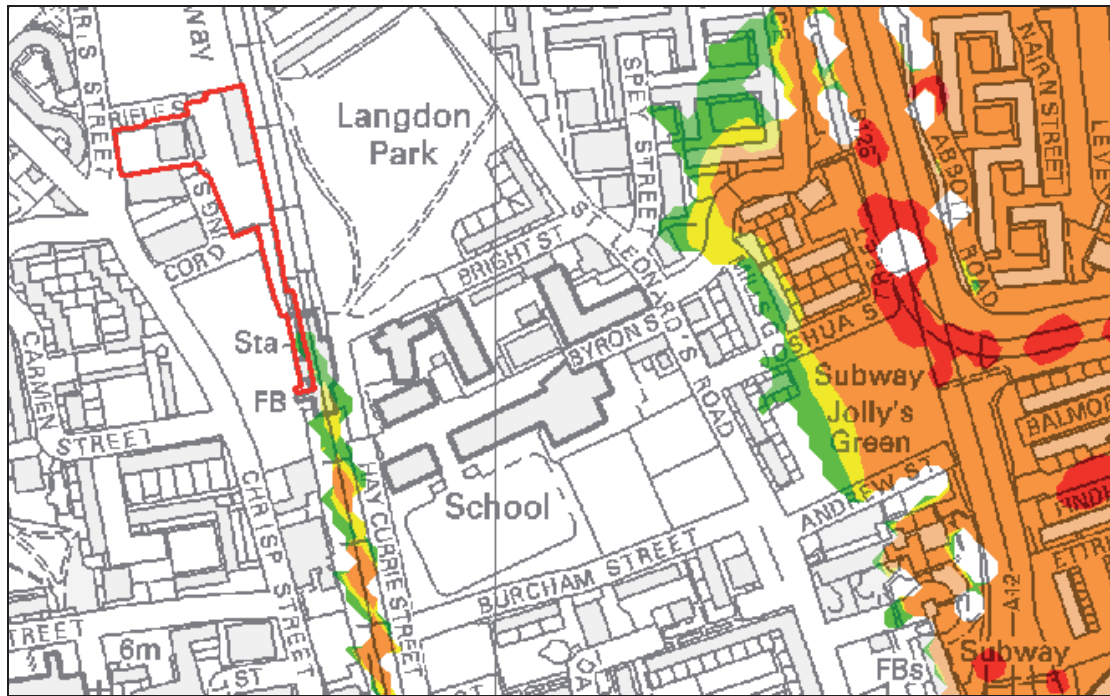


Figure 18-4 Bromley Breach Extent at the Cording Street Site

18.3.3 SURFACE WATER/SEWER

The site is not shown to be at risk of surface water flooding.

The Cording Street site is shown to fall within two Critical Drainage Areas (CDAs), 'Group4_025' and 'Group4_014'. CDAs are areas within the borough where the impact of surface water flooding is expected to be greatest.

Tower Hamlets SWMP has identified a Critical Drainage Area (CDA) within the site, 'Group4_014' and 'Group4_025'. CDAs are areas within the borough where the impact of surface water flooding is expected to be greatest. In this case, runoff from the site has been identified as contributing to surface water flooding along the neighbouring DLR track and in the low-lying area to the west of the site. The SWMP recommends that runoff rates be reduced to that of predevelopment Greenfield runoff rates for developments located within CDAs. The SWMP also contains high level options assessments for each CDA, detailing measures designed to mitigate and manage the impacts of surface water flooding. For more information, refer to the LB of Tower Hamlets SWMP (2011).

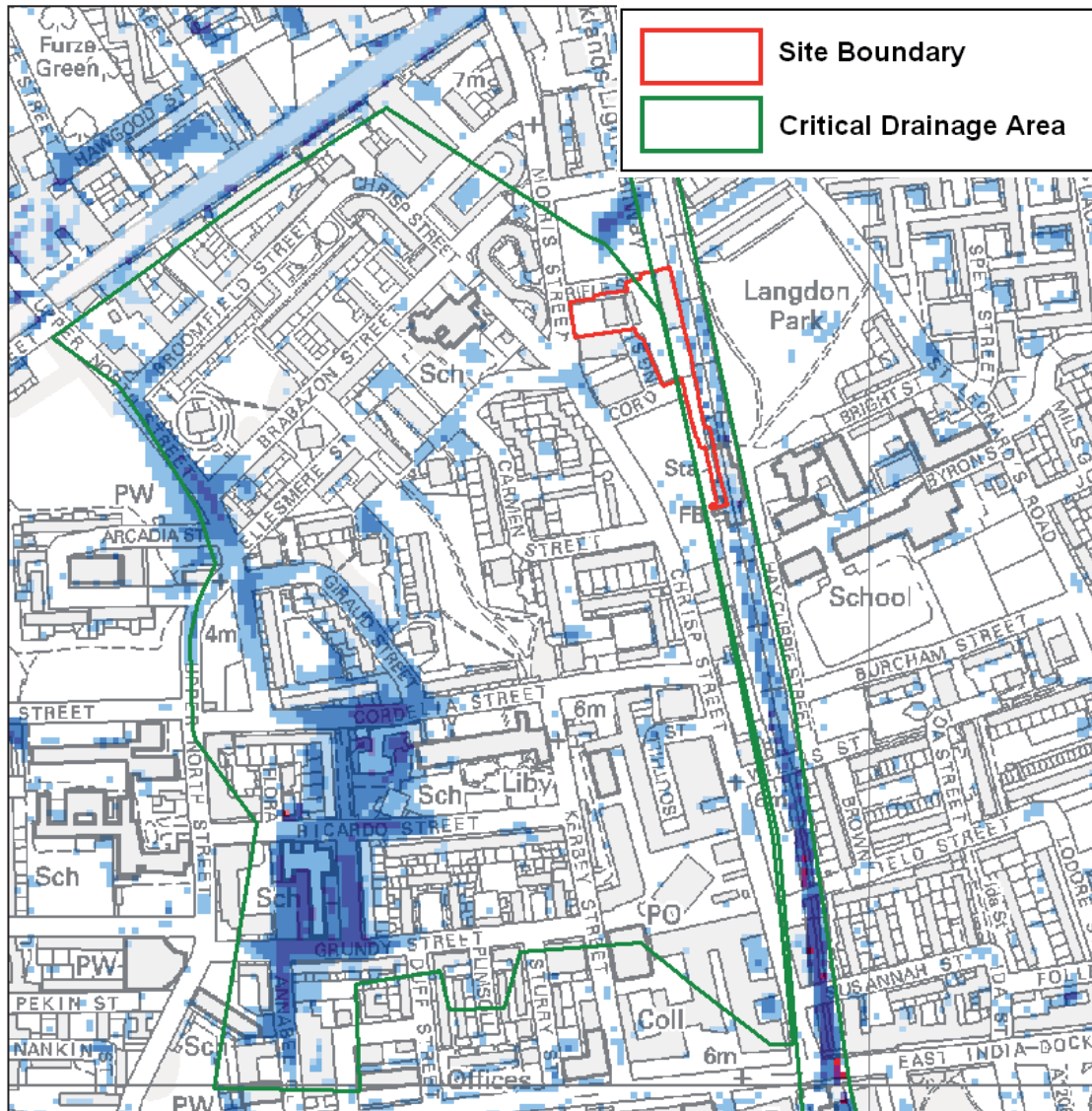


Figure 18-5 Maximum Depth of Surface Water in a 1% AEP Rainfall Event at the Cording Street Site

18.3.4 GROUNDWATER

The southern part of the site is shown to have an increased potential of elevated groundwater. Development proposals will need to consider site ground conditions and groundwater levels over the lifetime of the development. In particular the design of any underground structures or services and foundations.

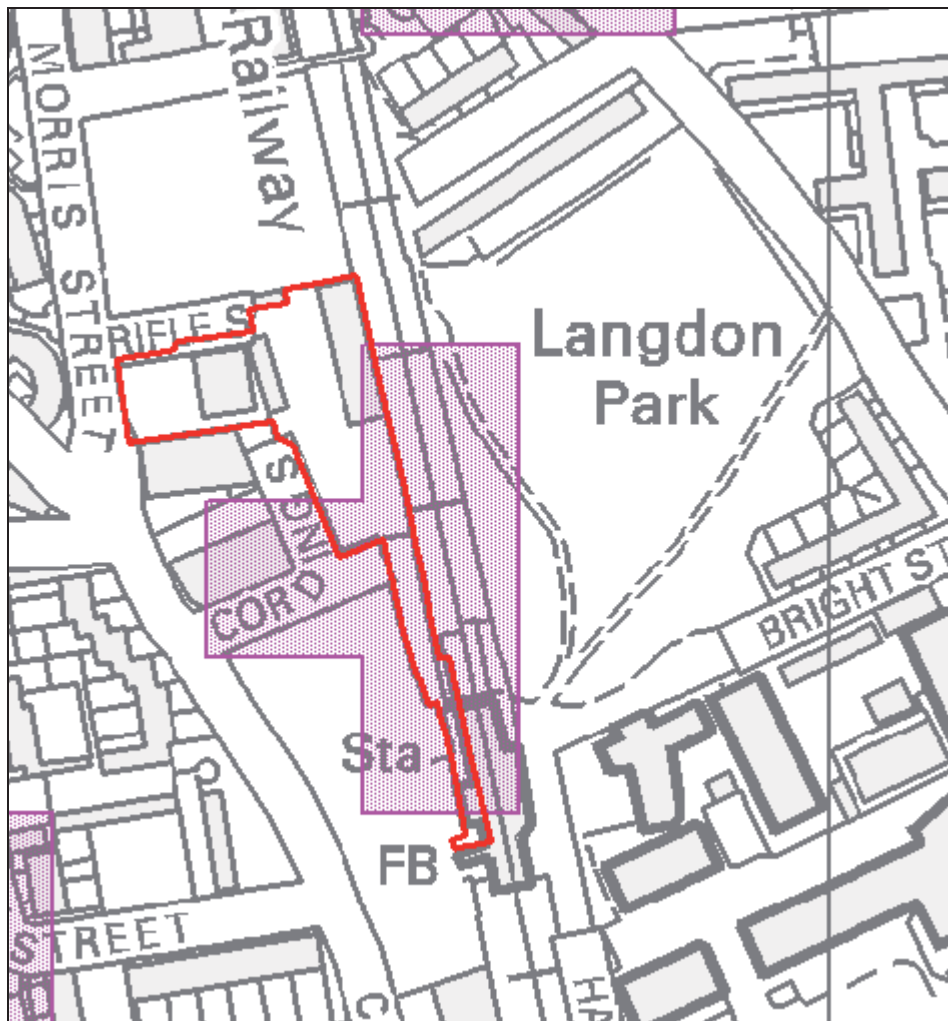


Figure 18-6 Increased Potential of Elevated Groundwater at the Cording Street Site

18.3.5 ARTIFICIAL SOURCES

The Limehouse Cut lies 200m to the north of the site. The canal is classified as a main river and has been designated by British Waterways as a flood storage area, storing flood waters should a major fluvial event occur in the Lower Lee catchment. The Limehouse Cut is therefore more vulnerable to flooding. Should the banks of the canal overtop, it is likely that flood waters will follow the route of the low-lying ground to the west of the site. Ground levels at this location are 3m lower than that on site.

18.4 GENERAL FLOOD RISK MANAGEMENT

The site is located within Flood Zones 2 and 3. 'More vulnerable' land uses are permitted within both flood zones, however will be subject to the Sequential and Exception Tests if located within Flood Zone 3.

The Sequential Approach should be adopted in the development layout. 'More vulnerable' uses such as the school buildings should be located within the Flood Zone 2 areas of the site in the north. 'Less vulnerable' uses such as car parking or 'water compatible' uses such as playing fields should be located in the southern part of the site within Flood Zone 3.

Runoff from the site has been identified as contributing to surface water flooding of the neighbouring DLR tracks and the low-lying area to the west. Development should follow recommendations in the SWMP to

reduce runoff rates to that of predevelopment Greenfield runoff rates for developments located within CDAs. At source' control measures such as green roofs, rainwater harvesting and water butts should be included in the design. Permeable paving should be incorporated within carparking and hard landscape areas. Public gardens and open space should consider benefits of including swales, wetlands, ponds and 'rain gardens' for both surface water management and biodiversity.

The southern part of the site is shown to be at potential risk of elevated groundwater levels. It is recommended that groundwater levels are monitored as part of a geo-environmental site investigation to determine the depth to groundwater. Depending on the results of the groundwater monitoring, any underground structures in the development may require mitigation using impermeable materials.

Will development increase flood risk elsewhere?
<ul style="list-style-type: none"> • Development layout must consider surface water flow routes and manage runoff on site sustainably with a target to achieve Greenfield runoff rates. Runoff from the site has been identified as contributing to flooding on the DLR track. • Development within the CDA to follow guidance set out in the Tower Hamlets SWMP, namely achieving a target of reducing runoff rates to that of predevelopment Greenfield runoff rates.
How can development reduce flood risk overall?
<ul style="list-style-type: none"> • Include 'at source' SUDS control measures to reduce existing site runoff in accordance with London Plan and local policy.
How can the development be made safe?
<ul style="list-style-type: none"> • Application of the sequential approach at site level to be carried out to ensure 'more vulnerable' land uses are located within flood zones 2.
Is there a reasonable prospect of compliance with part c of the Exception Test?
Yes, subject to appropriate site layout adopting a sequential approach.

19.0 Poplar Baths

Site Number:	18
Site Location:	170-172 East India Dock Road
Grid Reference:	537922, 180971

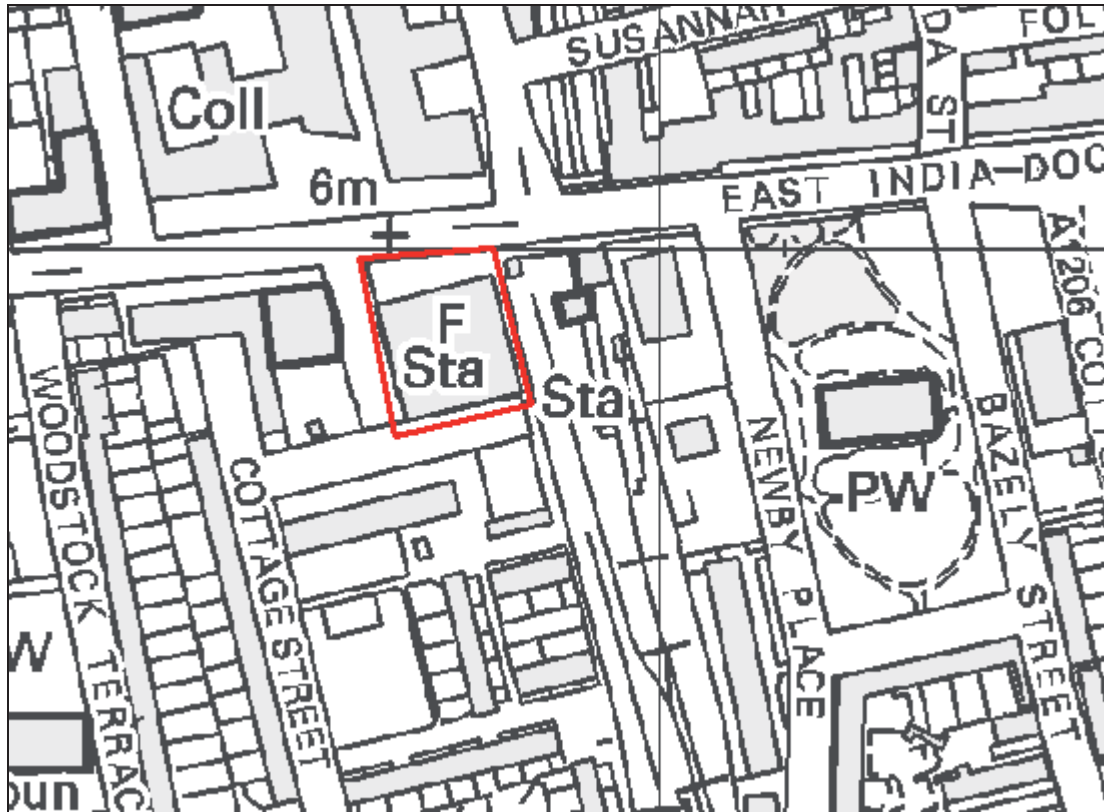


Figure 19-1 Poplar Baths Site

19.1 SITE DESCRIPTION

The site occupies an area of 0.29ha and is located south of East India Dock Road and west of All Saints DLR Station. Adjacent to the site lies an Idea Store along East India Dock Road and 4-6 storey residential buildings. The site currently consists of a vacant Grade II Listed Building. The proposed use of the site is a leisure facility.

In accordance with Table D2 of PPS 25, the classification of the proposed use is as follows:

Proposed Land Use	Vulnerability Classification
Leisure facility	Less vulnerable

19.2 SUMMARY OF FLOOD RISK

19.2.1 FLOOD ZONE MAPS

The site is located within Flood Zone 2. 'Less vulnerable' uses are permitted within this flood zone.

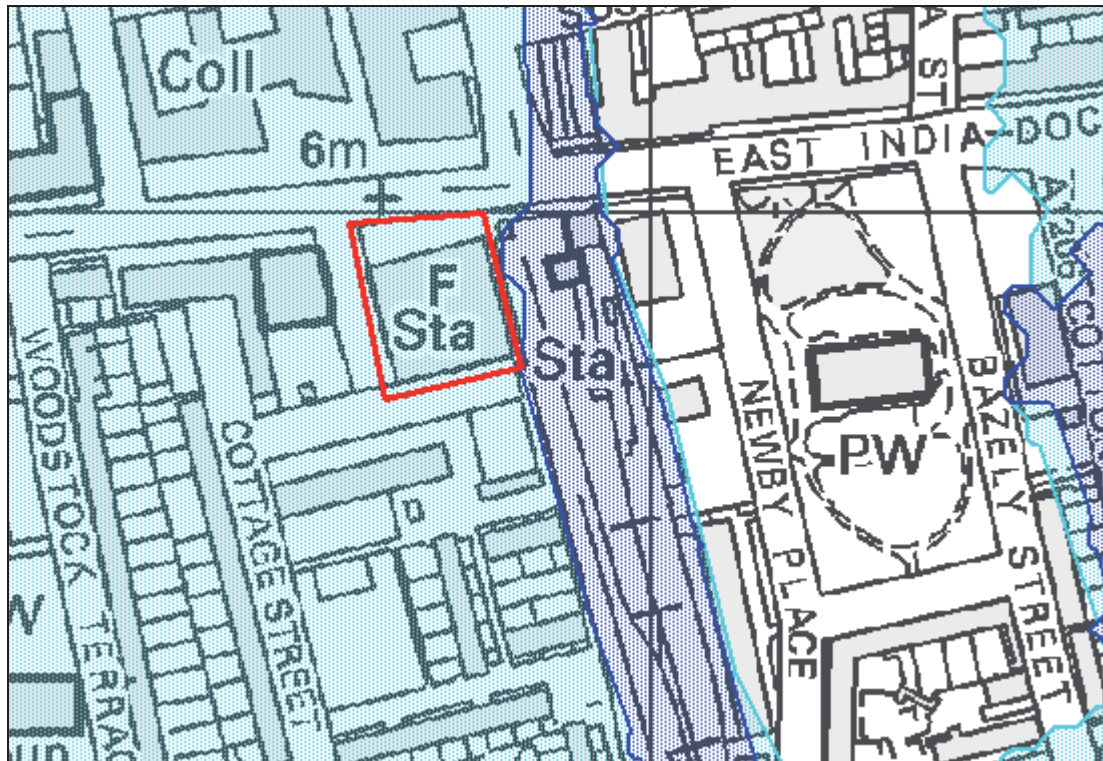


Figure 19-2 PPS25 Flood Zones at the Poplar Baths Site

19.3 SOURCES OF FLOODING

19.3.1 TIDAL

Actual Risk

The site is defended from tidal inundation during the 0.5% AEP tidal event by the existing Thames Tidal Flood Defences (including the Thames Barrier) for the lifetime of the development. The site is considered to be at low risk of tidal flooding.

Residual Risk

There is a residual risk of tidal flooding from an extreme surge event. The site is defended against inundation from the River Thames during a 0.1% AEP tidal event and is considered as having a low probability of the defences overtopping.

A breach in the tidal defences is unlikely to result in flooding on site as ground levels are sufficiently high. Breach assessments carried out as part of the Level 1 SFRA, show that a breach in the tidal defences at Blackwall (Breach 2) does not flood the site, however floods the DLR track adjacent to the site. A site specific breach assessment may need to be carried out to determine the worst case scenario for the site.

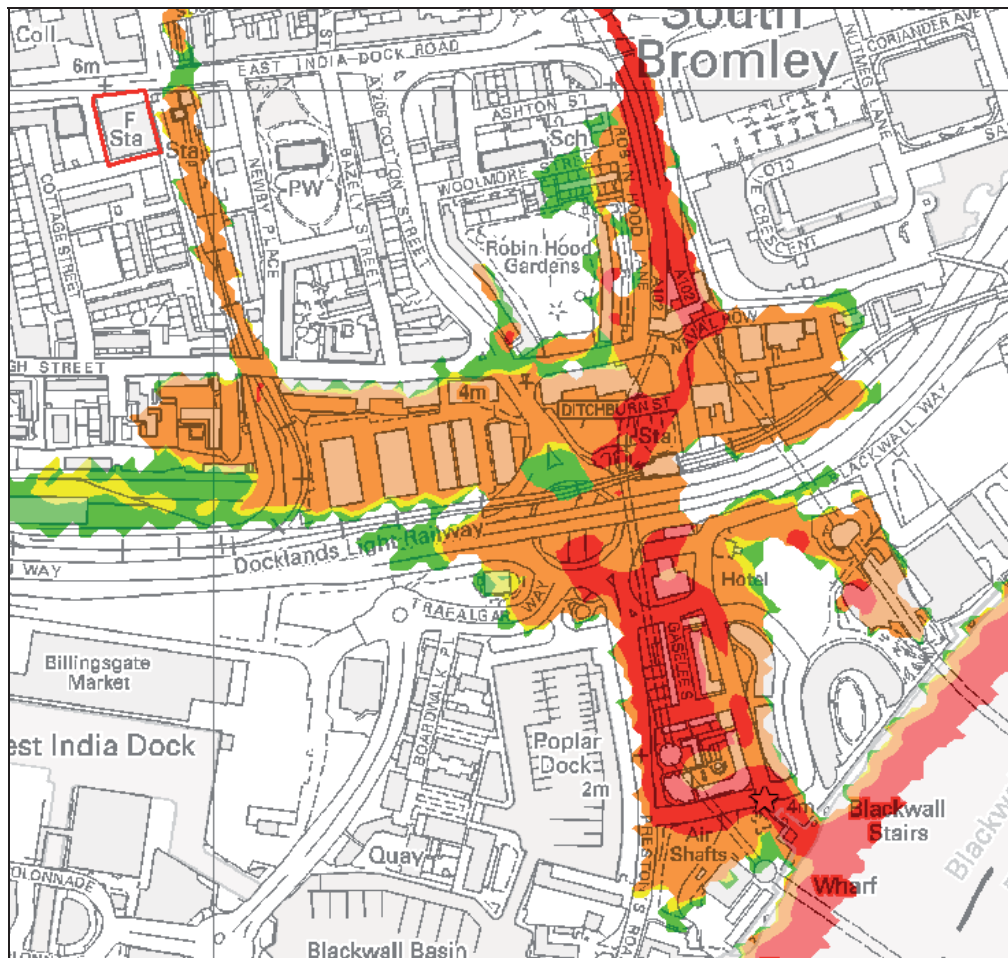


Figure 19-3 Blackwall Breach Extent at the Poplar Baths Site

19.3.2 FLUVIAL

Actual Risk

The site is located outside of the 1% AEP event with inclusion of climate change flood extent of the River Lee. The site is located 3-4m above the floodplain of the River Lee. The site is concluded as being at a low risk of actual fluvial flooding.

Residual Risk

The site is located outside of the 0.1% AEP event flood extent of the River Lee.

A breach in the fluvial defences is unlikely to result in flooding on site as ground levels are sufficiently high. Breach assessments carried out as part of the Level 1 SFRA, show that a breach in the fluvial defences at Bromley (Breach 1) does not flood the site, however floods the neighbouring DLR track. A site specific breach assessment may need to be carried out to determine the worst case scenario for the site.

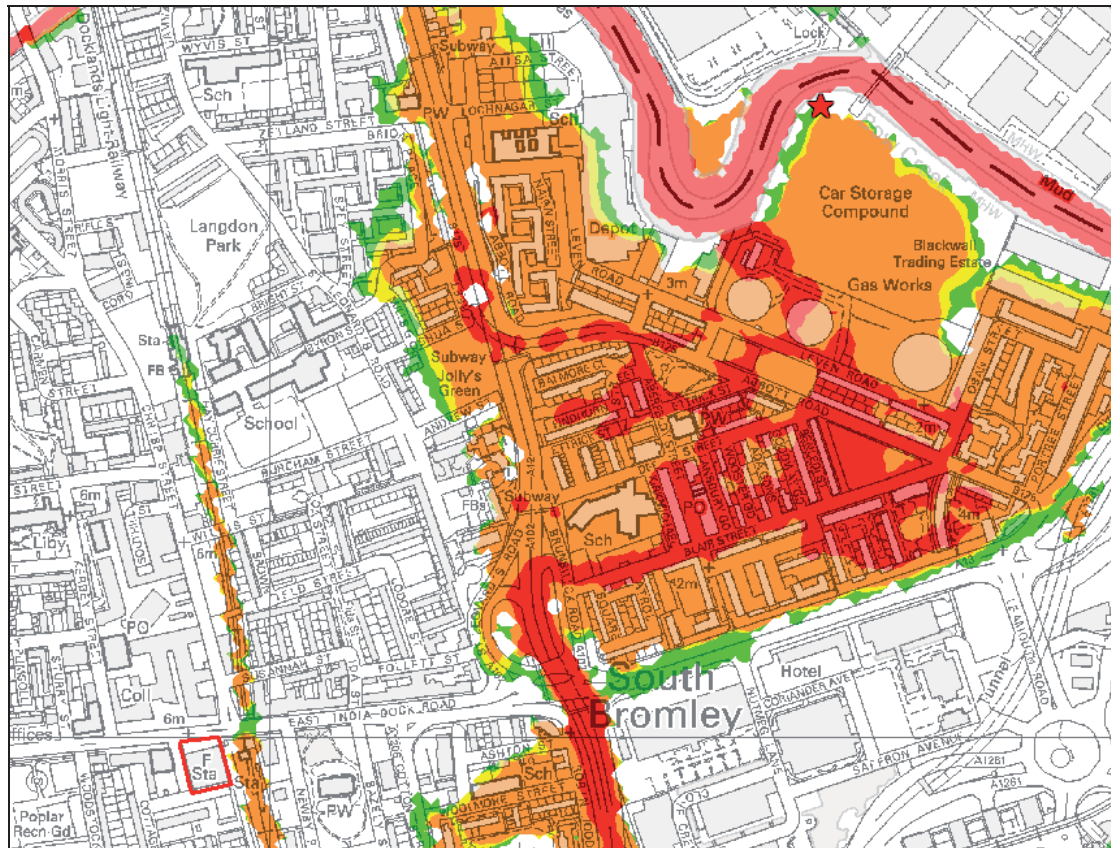


Figure 19-4 Bromley Breach Extent at the Poplar Baths Site

19.3.3 SURFACE WATER/SEWER

The site is not shown to be at risk of surface water flooding.

19.3.4 GROUNDWATER

The site is not shown to have an increased potential of elevated groundwater, however the area to the east of the site is shown to have potential. It is recommended that the susceptibility of the site to groundwater flooding is investigated. If the site or parts of the site are shown to be at risk, development proposals will need to consider site ground conditions and groundwater levels over the lifetime of the development. In particular the design of any underground structures or services and foundations.



Figure 19-5 Increased Potential of Elevated Groundwater at the Poplar Baths Site

19.3.5 ARTIFICIAL SOURCES

The site is located 800m south of the Limehouse Cut. The canal is classified as a main river and has been designated by British Waterways as a flood storage area, storing flood waters should a major fluvial event occur in the Lower Lee catchment. The Limehouse Cut is therefore more vulnerable to flooding. Should the banks of the canal overtop, it is unlikely this will result in flooding of the site as ground levels are sufficiently high.

The site is located 500m north of West India Dock. The Docks are maintained and managed by British Waterways. The area surrounding the docks has been built up and is generally higher than the level of the docks at above 5mAOD. This is at or above the level of the dock walls and therefore there is a low risk of flooding from the docks to the surrounding area.

The water levels within the docks are controlled by a series of lock gates and do not normally fluctuate with the tide level in the River Thames. There is a residual risk that during tidal flood events, the lock gates at the entrances to the docks may fail or be breached. The locks are not single structures and are a series of regularly maintained double gates so the probability of failure is low. The potential hazard of such an event was assessed as part of the LB of Tower Hamlets Level 1 SFRA. The results of the modelled scenario do not show flooding of the Poplar Baths site due to the higher elevations of the surrounding land compared to the docks.

19.4 GENERAL FLOOD RISK MANAGEMENT

The Poplar Baths site is shown to be located within Flood Zone 2. The proposed 'less vulnerable' uses are appropriate within this flood zone.

Due to the sites close proximity to an area at an increased potential of elevated groundwater, it is recommended that groundwater levels are monitored as part of a geo-environmental site investigation to determine the depth to groundwater. Depending on the results of the groundwater monitoring, any underground structures in the development may require mitigation using impermeable materials.

At source' control measures such as green roofs, rainwater harvesting and water butts should be included in the design. Permeable paving should be incorporated within carparking and hard landscape areas. Public gardens and open space should consider benefits of including swales, wetlands, ponds and 'rain gardens' for both surface water management and biodiversity.

Will development increase flood risk elsewhere?
<ul style="list-style-type: none">Unlikely. Development layout must consider surface water flow routes and manage runoff on site sustainably with a target to achieve Greenfield runoff rates.
How can development reduce flood risk overall?
<ul style="list-style-type: none">Include 'at source' SUDS control measures to reduce existing site runoff in accordance with London Plan and local policy.
How can the development be made safe?
<ul style="list-style-type: none">Design of development to consider mitigating the risk of groundwater flooding with use of impermeable materials
Is there a reasonable prospect of compliance with part c of the Exception Test?
N/A

20.0 Ailsa Street

Site Number:	19
Site Location:	Ailsa Street
Grid Reference:	538300, 181790

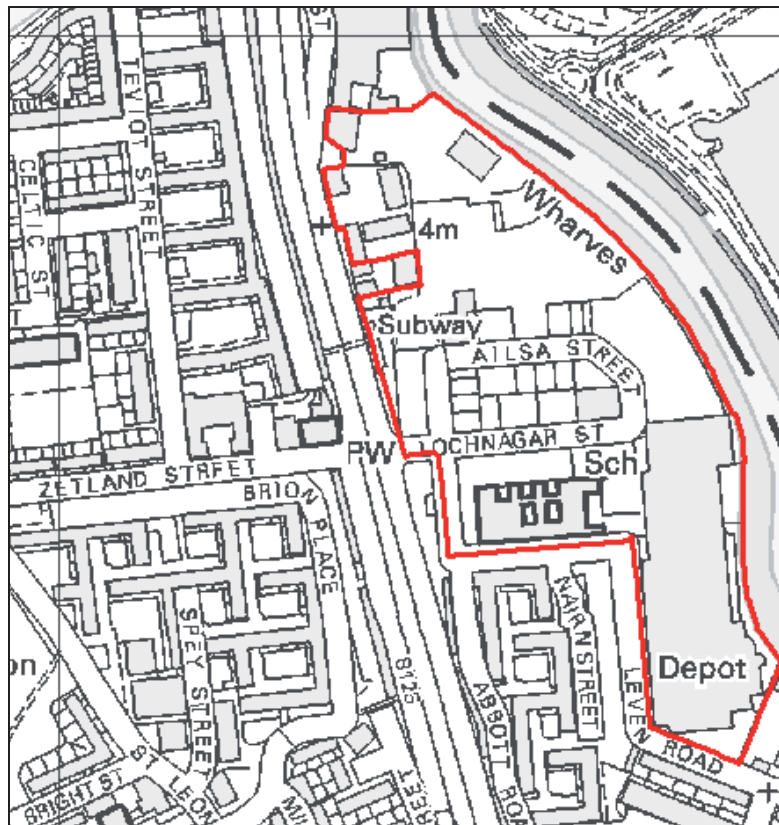


Figure 20-1 Ailsa Street Site

20.1 SITE DESCRIPTION

The site occupies an area of 5.76ha and is bound in the east by the River Lee and the A12 to the west. The topography of the site is found to slope away from the River Lee with ground levels at this location typically at 5mAOD compared to ground levels in the west of between 2.5 to 4mAOD. The site currently consists of industrial land uses, a former primary school, and vacant land. There are two Grade II Listed Buildings adjacent to the site – Bromley House and Poplar Library.

The proposed uses of the site include the following, which are to form part of a wider mixed use development:

- Large Scale housing development;
- Primary School;
- Secondary School;
- Combined primary and secondary school; and
- Waste management / district heating facility.

In accordance with Table D2 of PPS 25, the classifications of the proposed uses are as follows:

Proposed Land Use	Vulnerability Classification
Large Scale housing development	More Vulnerable
Primary School	More Vulnerable
Secondary School	More Vulnerable
Combined primary and secondary school	More Vulnerable
Waste management / district heating facility	Less Vulnerable

20.2 SUMMARY OF FLOOD RISK

20.2.1 FLOOD ZONE MAPS

The entirety of the site is located within Flood Zone 3. All of the proposed uses are permitted within this flood zone however 'more vulnerable' uses will be subject to the Sequential and Exception Tests.

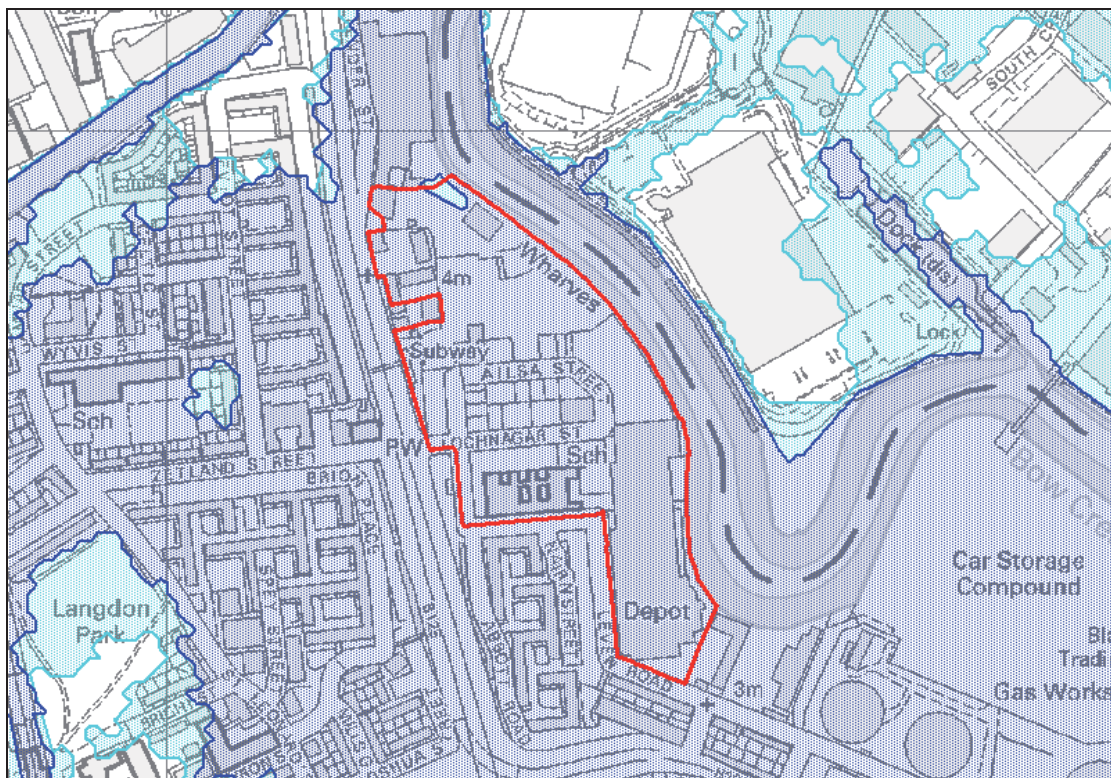


Figure 20-2 PPS25 Flood Zones at the Alisa Street Site

20.3 SOURCES OF FLOODING

20.3.1 TIDAL

Actual Risk

The site is defended from tidal inundation during the 0.5% AEP tidal event by the existing Thames Tidal Flood Defences (including the Thames Barrier) for the lifetime of the development. The site is considered to be at low risk of tidal flooding. Consultation with the Environment Agency should be sought to confirm if the

assessment of a different breach location is required.

Residual Risk

There is a residual risk of tidal flooding from an extreme surge event. The site is defended against inundation from the River Thames during a 0.1% AEP tidal event and is considered as having a low probability of the defences overtopping.

Breach assessments carried out as part of the Level 1 SFRA, show that a breach in the defences at Blackwall (Breach 2) floods the southern portion of the site. The hazard is assessed to be 'low' to 'moderate'.

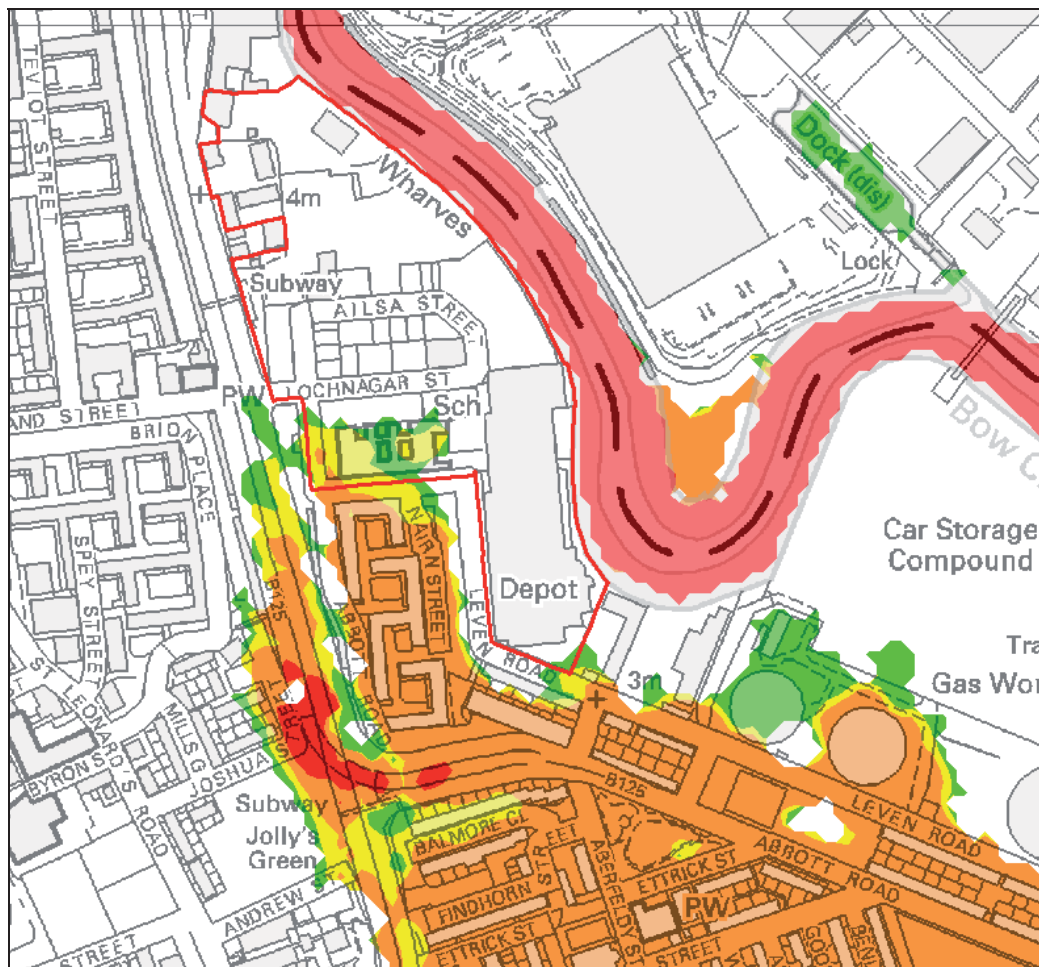


Figure 20-3 Blackwall Breach Extent at the Ailsa Street Site

20.3.2 FLUVIAL

Actual Risk

The site is located outside of the 1% AEP event with inclusion of climate change flood extent of the River Lee. The site is concluded as being at a low risk of actual fluvial flooding.

Residual Risk

The site is located outside of the 0.1% AEP event flood extent of the River Lee.

Offsite breach assessments carried out as part of the Level 1 SFRA, show that a breach in the fluvial defences at Bromley (Breach 1) results in flooding of the western portion of the site. The resulting hazard is assessed to be 'significant', meaning deep, fast flowing waters pose a danger to human life.

Consultation with the Environment Agency should be sought to confirm if the assessment of a different breach location is required. An onsite assessment would aid in the development of site specific flood risk management measures.

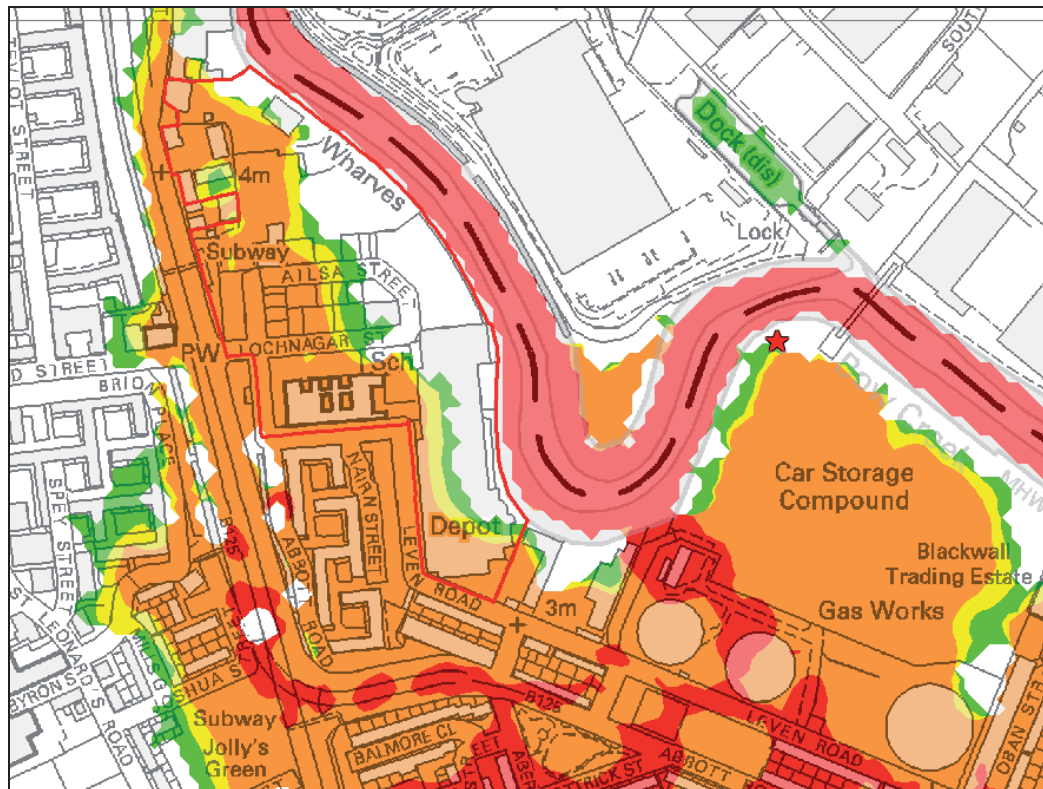


Figure 20-4 Bromley Breach Extent at the Ailsa Street Site

20.3.3 SURFACE WATER/SEWER

The site is not shown to be at risk of surface water flooding.

20.3.4 GROUNDWATER

The site is not shown to have an increased potential of elevated groundwater, however the area to the west of the site is shown to have potential. It is recommended that the susceptibility of the site to groundwater flooding is investigated. If the site or parts of the site are shown to be at risk, development proposals will need to consider site ground conditions and groundwater levels over the lifetime of the development. In particular the design of any underground structures or services and foundations.

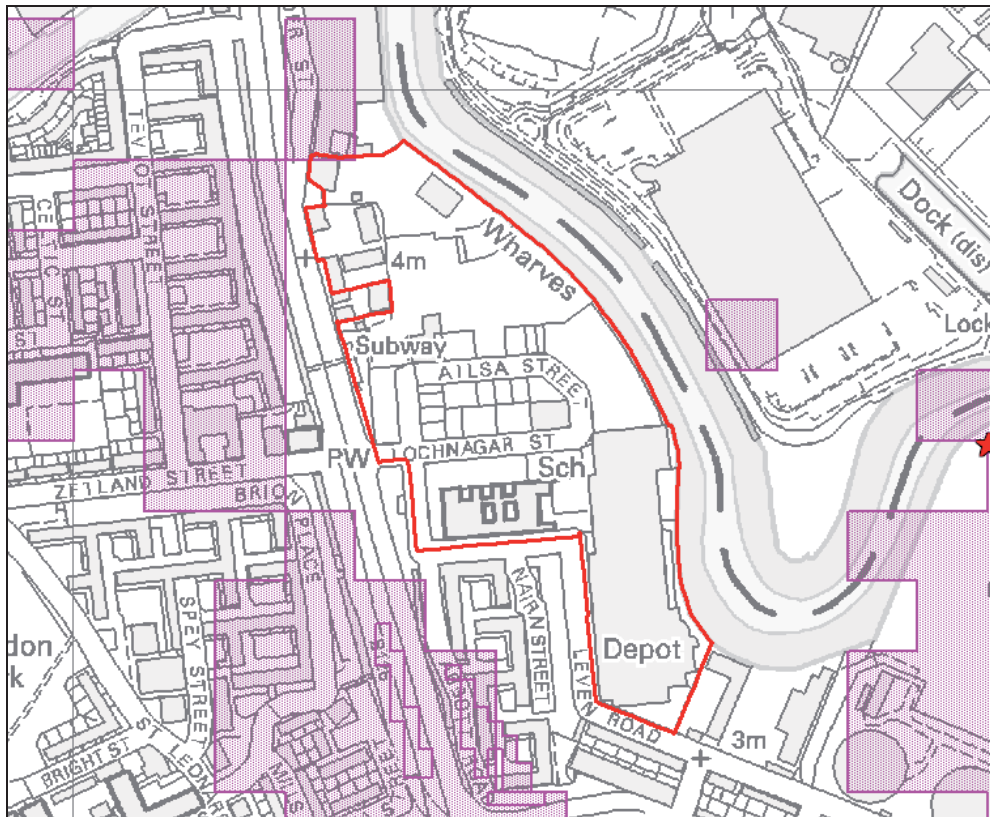


Figure 20-5 Increased Potential of Elevated Groundwater at the Alisa Street Site

20.3.5 ARTIFICIAL SOURCES

The Limehouse Cut lies less than 200m to the north of the site. The canal is classified as a main river and has been designated by British Waterways as a flood storage area, storing flood waters should a major fluvial event occur in the Lower Lee catchment. The Limehouse Cut is therefore more vulnerable to flooding. Overtopping of the canal banks is not shown to result in flooding of the site in a 1% AEP plus climate change event. Consequently, the risk of flooding from the Limehouse Cut is deemed to be low.

The Alisa Street site is shown to be at risk of flooding from reservoir breach. A breach in either of the William Girling or King George V reservoirs located in the LB of Enfield is predicted to affect the western portion of the site. No information was provided from the Environment Agency on the rate of onset of flooding nor the hazard associated with the event, however a breach of either of these large reservoirs is likely to result in catastrophic consequences due to fast, deep flowing water. The site is located over 13km away from the closest reservoir, hence it is likely that adequate warning could be provided to site users in the event of a breach. Development should consider the impacts for a reservoir breach and consult the Environment Agency to determine the most appropriate response.

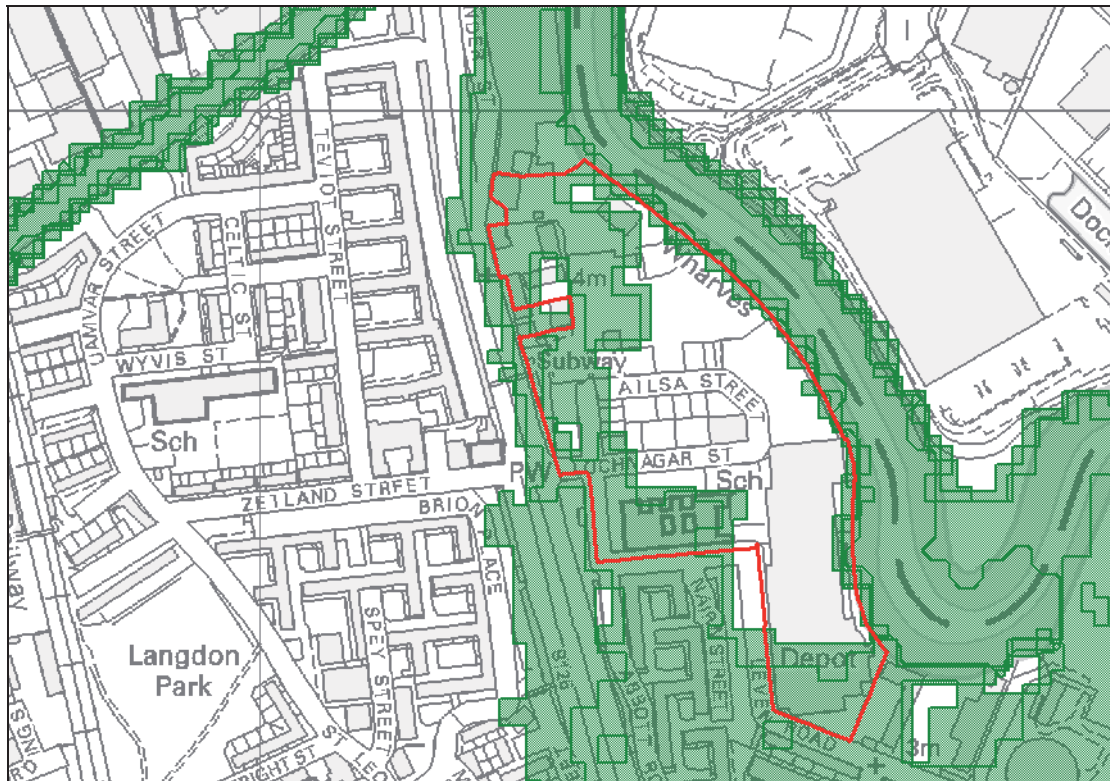


Figure 20-6 Reservoir Inundation Map at the Alisa Street Site

20.4 GENERAL FLOOD RISK MANAGEMENT

The entirety of the site is located within Flood Zone 3. 'Less vulnerable' uses are permitted within this flood zone. 'More vulnerable' uses are permitted however the Sequential and Exception Tests will be required.

The highest ground levels on site are in the east along the banks of the River Lee. Feasibility of adopting the Sequential Approach (i.e. location of higher vulnerability uses on higher ground) should consider the likelihood of a breach in the River Lee fluvial defences.

The site is shown to be at risk of flooding from a breach in the tidal or fluvial defences, or as a result of a breach in the reservoirs located in the LB of Enfield. A site specific assessment may be required to determine the worst case scenario for the site and to aid in the development of site specific flood risk management measures.

Finished flood levels for sleeping accommodation should be 300mm above the 0.5% AEP breach level. Where possible, 'less vulnerable' uses should be located on the ground floor with 'more vulnerable' uses located on the first or upper floors.

Future development must be made safe by consideration of safe access and egress during a breach event. Where possible, safe access routes into areas of high ground should be established. The Alisa Street site is located on low-lying ground and access to and from the site may be difficult as surrounding roads are likely to be flooded. The construction of a bridge to convey site users to high ground on the eastern bank of the River Lee may be feasible.

The difficulty in establishing a safe access route highlights the importance of providing safe refuge for all occupants within the development. The proposed schools could potentially be designed as suitable refuge centres. Consideration should also be given to the duration at which the site is inundated, as this could be significant given the nature of the topography. This could have a considerable impact on the provision of safe

refuge, evacuation routes, and safe access / egress.

Safe access / egress and refuge should also be considered for existing developments. It is recommended that an assessment of existing residential developments is carried out and the retrofitting of resistance / resilience measures considered where appropriate to reduce the impact of flood events.

Depths of water in a 0.5% AEP breach event are predicted to exceed 1m in low-lying areas of the site. It is recommended that flood resilience measures are incorporated into buildings to withstand the hydrostatic forces associated with deep water. Where possible, electrical fittings and appliances should be raised above the flood level.

All site users are to receive an 'information pack' from developers identifying, as a minimum, the risk of flooding, how this is being managed on site, actions site users should take in the event of a flood, appropriate emergency contact details.

A site specific flood emergency plan should be prepared, in consultation with Council emergency planners, emergency services, and with reference to Multi Agency Flood Plan to evacuate site users out of the floodplain in an 'emergency' flood event.

'At source' control measures such as green roofs, rainwater harvesting and water butts should be included in the design. Permeable paving should be incorporated within carparking and hard landscape areas. Public gardens and open space should consider benefits of including swales, wetlands, ponds and 'rain gardens' for both surface water management and biodiversity.

Development proposals should verify the susceptibility of the site to groundwater flooding. Development may need to consider site ground conditions and groundwater levels over the lifetime of the development. In particular the design of any underground structures or services and foundations.

The Environment Agency may impose a buffer of 16m around the River Lee requiring developments to be set back from the River Lee defences. As part of development in this area, an assessment of the existing defences and their current condition should be made as part of the FRA. Any vulnerable points should be identified and proposals made to improve these to a standard agreed with the Environment Agency as part of the development process.

Will development increase flood risk elsewhere?
<ul style="list-style-type: none"> Unlikely. Development layout must consider surface water flow routes and manage runoff on site sustainably with a target to achieve Greenfield runoff rates.
How can development reduce flood risk overall?
<ul style="list-style-type: none"> Include 'at source' SUDS control measures to reduce existing site runoff in accordance with London Plan and local policy. Maintain and/or improve the standard of protection provided by the defences on site, in accordance with EA strategy. Consider opportunities through development to make defence length on site 'unbreachable'.
How can the development be made safe?
<ul style="list-style-type: none"> Adoption of Sequential Approach (if appropriate) Floor levels of all sleeping accommodation to be raised 300mm above flood level. Consideration of safe access / egress from the site and safe refuge. Implementation of a flood emergency plan.

- Incorporation of flood resistance / resilience measures up to the flood level.

Is there a reasonable prospect of compliance with part c of the Exception Test?

Yes, subject to appropriate site layout adopting a sequential approach, raising ground flood levels above the 0.5%AEP event tidal breach level and agreeing emergency access arrangements.