

3421 - 57 River Road, Littlehampton
Flood Risk Assessment
February 2025

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- 1 Topographical Survey
- 2 Arun District Council SFRA Maps
- 3 Environment Agency Flood risk summary

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1 Introduction

This Flood Risk Assessment (FRA) has been prepared by AKTII on behalf of the Applicant, for the proposed redevelopment of 57 River Road, Littlehampton BN17 5DB.

This report identifies potential sources of flooding and risk to the Proposed Development. This study has been prepared in accordance with the guidance contained in the National Planning Policy Framework (NPPF) and the Arun District Council Strategic Flood Risk Assessment (SFRA).

This report should be read in conjunction with the Drainage Assessment report dated February 2025, also prepared by AKTII.

This report is prepared for the exclusive use of AKT II and the Applicant. All comments and conclusions in this report are based on the assumption that the sourced data is reliable. AKT II accept no liability for any inaccurate conclusion or assumptions resulting from inaccurate information.

2 The Site

2.1 Site Location

The site that is to be redeveloped is located at 57 River Road, Littlehampton BN17 5DB.

The site is bounded to the north east by River Road, to the north west by 47 River Road, to the south east by 49 River Road and to the south west by the River Arun.

The site is not located within a conservation area and there are no listed buildings in close proximity to the site.

The National Grid Reference for the site is TQ 02371 02109 and the nearest postcode is BN17 5DB.

Figures 2.1 to 2.3 below show the location of the proposed development.

2.2 Site description

The adjacent recently developed site, 47 River Road, is the first property on the eastern bank of Littlehampton's Arun riverside just after entering the town from the A258 across a bridge. It was developed originally in the early 19th Century as home to a small blacksmith's shop and warehouses and in recent years was used as a car repair workshop. The current site, 57 River Road, is a further workshop building associated with the garage and the yard area that serves it.

The site occupies an area of approximately 475 m² and is fairly flat with the maximum level difference approximately 0.1 m. The average ground surface level on site is approximately 3.40 m AOD. A site specific topographical survey for 55-57 River Road has been included in Appendix 1 for reference.



Figure 2.1 Site Location (StreetMap)



Figure 2.2 Site Location (Google Earth)



Figure 2.3 Site Location (Google Maps)

3 Proposed Development

It is proposed to redevelop the site for residential purposes in a similar manner to the adjacent site 47 River Road which is owned by the same developer and has already received planning permission.

The ground floor level will consist of communal car parking, bicycle parking, bin store areas and residential space and the three upper floors will provide the habitable residential space.

Nine apartments are proposed with each apartment ranging from two to three bedrooms.

All habitable space has a finished floor level above 5.17m.

The proposed ground, first, second and third floor layouts are shown in Figures 3.1 to 3.4 below for reference.

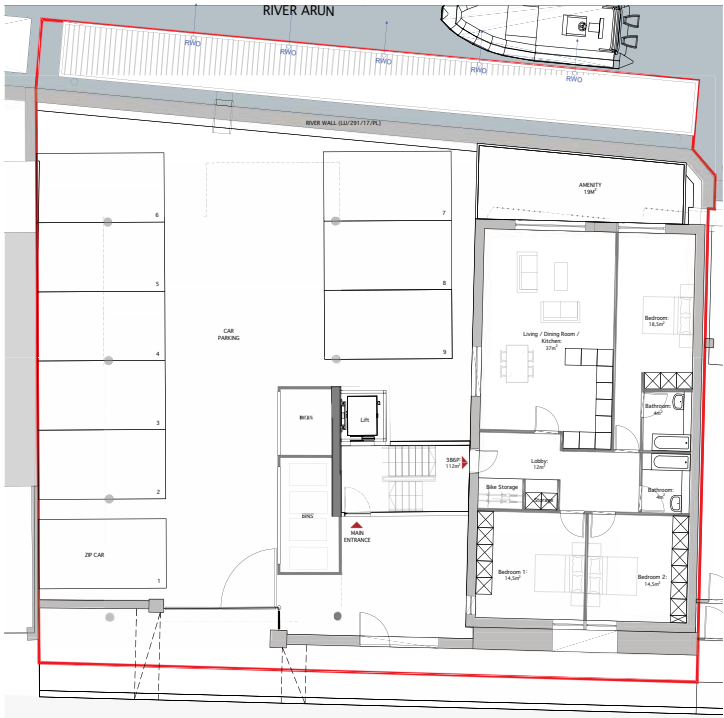


Figure 3.1 Proposed Ground Floor Layout

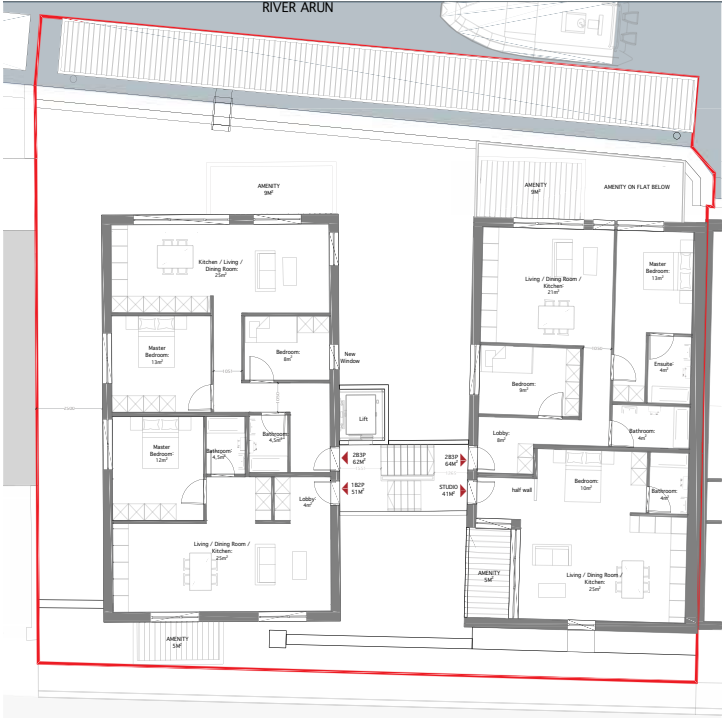


Figure 3.2 Proposed First Floor Layout

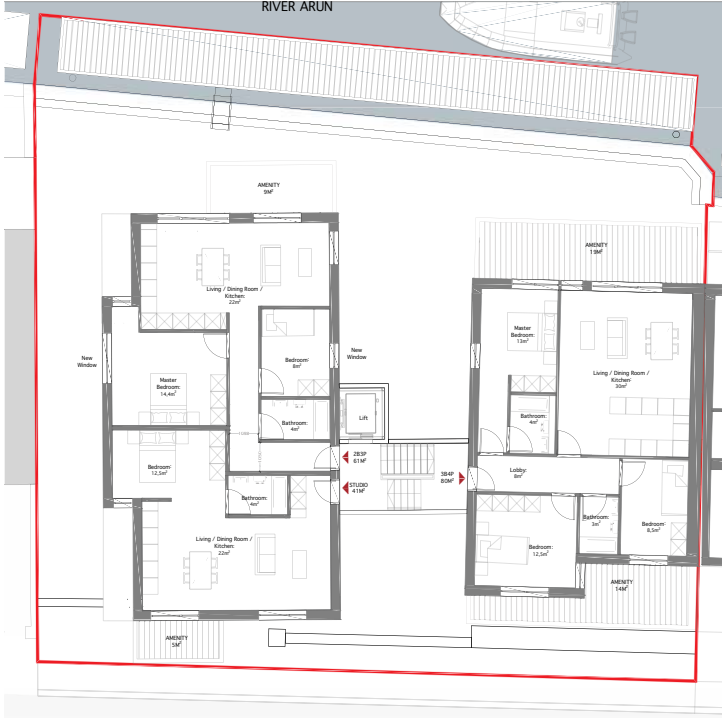


Figure 3.3 Proposed Second Floor Layout

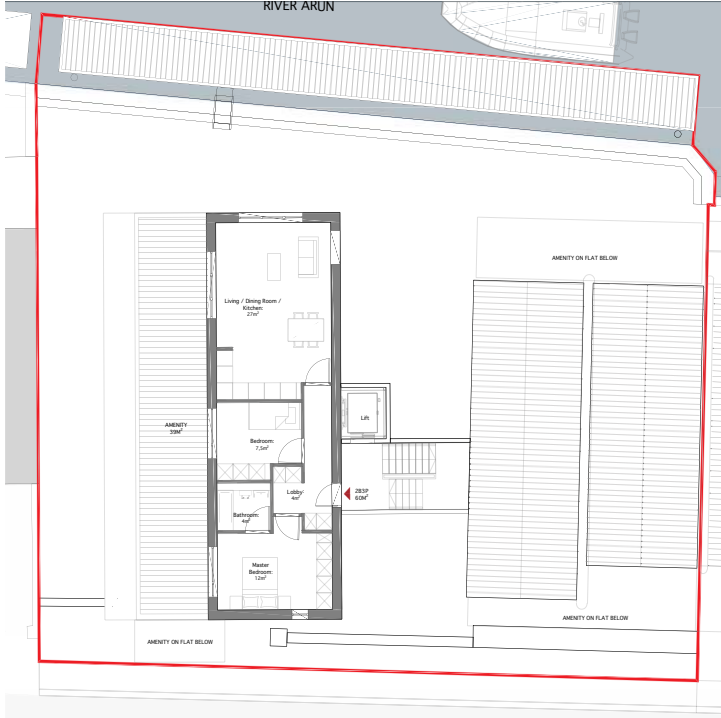


Figure 3.4 Proposed Third Floor Layout

4 Requirements of National Planning Policy Framework (NPPF)

4.1 Summary

The National Planning Policy Framework (NPPF) has superseded Planning Policy Statement 25 “Development and Flood Risk” (PPS 25) although the requirements and goals remain essentially the same:

- The susceptibility of land to flooding is a material planning consideration;
- The Environment Agency has the lead role in providing advice on flood issues, at a strategic level and in relation to planning applications;
- Planning decisions should apply the precautionary principle to the issue of flood risk, using a risk-based search sequence to avoid inappropriate development on undeveloped and undefended flood plains etc;
- Developers should fund flood defences and warning measures required because of the development;
- Planning policies and decisions should recognise that the consideration of flood risk and its management needs to be applied on a whole-catchment basis and not only be restricted to flood plains.

With regard to the NPPF, those proposing particular developments are responsible for:

- Providing an assessment of whether any proposed development is likely to be affected by flooding and whether it will increase flood risk elsewhere and the measures proposed to deal with these effects and risks and;
- Satisfying the local planning authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed with the minimum environmental effect thus ensuring the safe development and secure future occupancy of the site.

After this has been addressed, it is then the local planning authority’s responsibility (advised as necessary by the Environment Agency) to determine an application for planning permission after taking into account all material considerations, including the issue of flood risk and how it might be managed or mitigated. Local planning authorities are required to adopt a risk-based approach to proposals for development in flood risk areas. The assessment of risk should take into account:

- The area liable to flooding;
- The probability of it occurring, both now and over time;
- The extent and standard of existing flood defences and their effectiveness over time;
- The likely depth of flooding;
- The rates of flow likely to be involved; and
- The nature of the development proposed and the extent to which it is designed to deal with flood risk.

Local planning authorities in conjunction with the Environment Agency are responsible for determining that the threat of flooding should be managed. This is to ensure that the development is and remains safe throughout its lifetime (i.e. it has an appropriate degree of protection) and does not increase flood risk elsewhere.

Following flooding in December 2000 the Environment Agency (EA) provided indicative flood plain maps to all authorities and published them on the EA website. In addition to these indicative maps (following a national programme adopted by the Agency in 1996), detailed data and maps for priority areas at risk are available, to provide precise information for building developments.

The Government looks to local planning authorities under the NPPF to apply the risk-based approach to their decisions on development control through a sequential test. Under the test, sites are to be categorised under the following zones.

- 1 Areas with little or no potential risk of flooding (annual probability less than 0.1% for rivers, tidal & coastal). These areas would have no constraints on development other than the need to ensure that the development does not increase run-off from the site to greater than that from the site in its undeveloped or presently developed state. For development proposals on sites located within Flood Zone 1 comprising one hectare or above the vulnerability to flooding from other sources as well as from river and the sea flooding, and the potential to increase flood risk elsewhere through the addition of hard surfaces and the effect of the new development on surface water run-off, should be incorporated in an FRA.
- 2 Areas with low potential risk of flooding (annual probability between 1.0% - 0.1% for rivers and between 0.5% - 0.1% for tidal & coastal). These areas would be suitable for most developments.
- 3a Areas with high potential risk of flooding (annual probability greater than 1.0% for rivers and greater than 0.5% for tidal & coastal). These areas will generally be suitable for “Less Vulnerable” uses such as commercial, retail and industrial uses, provided there are adequate flood defences in place, that ensure buildings are designed to resist flooding, there are suitable warning and evacuation procedures in place and the new development does not add to flood risk downstream. “More Vulnerable” uses such as residential, health and education will require the Exception Test to be passed.
- 3b Areas at highest risk from flooding (including those areas behind defences that offer a standard of defence less than 1% for rivers and less than 0.5% for tidal & coastal or where there is a significant risk that failure could lead to rapid inundation by fast flowing water). These areas may be suitable for recreation, sport and conservation use.

5 Strategic Flood Risk Assessments

Strategic Flood Risk Assessments are produced by Local Authorities in order to form the basis for preparing appropriate policies for flood risk management. The Environment Agency advise that Developers “should consult the Strategic Flood Risk Assessment prepared by your local planning authority” when preparing their design.

The site has been the subject of the Arun District Council Strategic Flood Risk Assessment (SFRA) which was originally undertaken by Capita Symonds and published in February 2008. JBA Consulting were then commissioned to update the report during 2016 with the last update being published as Revision Final v5.0 in November 2016.

The key findings and recommendations from this report relating to the development site are summarised in the following section and have been used to inform the preparation of this site-specific flood risk assessment.



Figure 5.1 Arun District Council Strategic Flood Risk Assessment

5.1 Arun District Council SFRA

Arun District Council commissioned JBA Consulting to undertake an update of the Strategic Flood Risk Assessment (SFRA) during 2016. This assessment revised the previous SFRA for the Borough which was completed in February 2008.

The update of the SFRA was to be used in decision making and to inform decisions on the location of future development and the preparation of sustainable policies for the long-term management of flood risk.

The key objectives of the review performed during the preparation of the 2016 SFRA were:

1. To take into account the latest flood risk policy
2. Take into account the latest flood risk information and available data
3. To provide individual flood risk analysis for sites identified by the Council as part of their local plan preparation.
4. To provide a comprehensive set of maps

The main sources of flooding were identified as follows:

- Arun District has a history of documented flood events from several sources of flood risk. Flood records indicate that the main source of risk is from surface water and groundwater sources, although fluvial and tidal/coastal flooding has also occurred previously and fluvial/tidal interactions can influence surface water flood risk through reducing discharge from surface water drainage systems.
- The principle watercourses flowing through Arun District are the River Arun and Aldingbourne Rife and their tributaries. The main source of fluvial flood risk is associated with these watercourses.
- The most significant flood events reported to have affected the district occurred in 1968, 1974, 1980/81, 2010, 2012, most of which included surface water flooding.
- Historic records indicate that Arun District has experienced numerous surface water / drainage related flood events, which have been attributed to a range of sources. Indeed, SWMPs have been prepared to investigate these. The primary source of surface water flooding is attributed to heavy rainfall overloading highway carriageways and paved areas, drains and gullies, as well as blockages and high water levels impeding free discharge from surface water drains and gullies. The updated Flood Map for Surface Water (uFMfSW) shows a number of surface water flow paths which predominantly follow topographical flow paths along existing watercourses with some isolated ponding located in low lying areas.
- Significant groundwater flood events have been recorded across the district. This risk is supported by the Areas Susceptible to Groundwater Flooding (AStGWF) mapping suggests that susceptibility to groundwater flooding is generally high through the district.

- The Sewer Incident Report Form data supplied by Southern Water indicates a total of 315 recorded flood incidents in the district. Several post code areas have recorded incidents, with the two indicating the greatest number of entries being P022 7 (36) and P021 3 (30).
- In relation to artificial sources of flooding, there are no records of flooding from reservoirs impacting properties inside the district. The Environment Agency's Risk of Flooding from Reservoir's flood extent mapping indicates that there are three reservoirs that could affect the district in the event of a breach. The extent of flooding from these is predicted to be relatively confined in the content of the district, and located within rural areas

Recommendations for Flood Zone 3a

Development in Flood Zone 3a is significantly constrained by flood risk. Highly Vulnerable development is not permitted within this zone and More Vulnerable development and Essential Infrastructure are only permitted if the Exception Test can be passed.

- An FRA is required for all developments within this zone.
 - It should be demonstrated that flood defences provide an acceptable standard of protection, including an allowance for climate change for the lifetime of the development.
 - Residual risks should be assessed, and the Environment Agency consulted regarding whether there is a need for a breach analysis to map a rapidinundation zone.
- The layout of buildings and access routes should adopt a sequential approach, steering buildings towards areas of lowest risk within the site. Where rapid inundation zones have been identified, development should be avoided in these areas.
- Development should not impede flow routes, reduce floodplain storage or consume flood storage in a 'flood cell' within a defended area. If the development does result in a loss of storage, compensatory floodplain storage should be provided on a 'level for level' and 'volume for volume' basis.
- If existing defences are to be upgraded as part of the development, an assessment should be undertaken to ensure this does not result in an increase in flood risk elsewhere.
- Development design should incorporate mitigation measures, to manage any flood risk to the development, including residual risk for the lifetime of the development. FFLs should be above the 1 in 100-year (1% AEP) flood level, plus an allowance for climate change.
- It is recommended that all types of new development behind flood defences is avoided, where possible, due to the residual risks of breach and overtopping
- Consideration should be given to the type of building that will be permitted, for example single-storey buildings and basements should be avoided .

6 Sources of Flooding

In accordance with the NPPF, it is a requirement to assess the flood risk to the Site from all potential sources. For the purposes of this assessment this has been broken down into five potential sources:

- Flooding from rivers and sea
- Flooding from sewers
- Flooding from groundwater
- Flooding from artificial sources (e.g. reservoirs and canals)
- Flooding from surface water

These sources are discussed and assessed in more detail in Sections 6.3 to 6.7 below.

6.1 Sequential Test

A risk-based Sequential test should be applied at all stages of the planning process. The aim is to steer developments to areas at the lowest probability of flooding (i.e. to Flood Zone 1).

Referring to the Environment Agency’s “Flood Map for Planning” (Figure 6.2), the site is located entirely within Flood Zone 3a but benefits from the flood defences along the banks of the River Arun.

The proposed residential use is classified as ‘more vulnerable’ in accordance with NPPF Table 2 (refer to Figure 6.1).

Referring to NPPF Table 3 (shown below in Figure 6.3) “More Vulnerable” classifications are suitable in Flood Zones 1 and 2 but require the Exception Test to be undertaken for sites within Flood Zone 3a.

6.2 Exception Test

The Exception Test requires two additional elements to be satisfied (as set out in paragraph 164 of the National Planning Policy Framework) before allowing development to be allocated or permitted in situations where suitable sites at lower risk of flooding are not available following application of the sequential test. It should be demonstrated that:

- Development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk; 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.

The following items have been considered as part of the Exception Test:

1. The location adjoins the town centre, railway station and bus routes meaning the development is highly sustainable, the mitigation measures taken in the design mean the development is not an unacceptable risk nor does it pose an unacceptable risk to existing developments in the area.
2. It provides safe and attractive residential units in a very popular, sought after riverside location which cannot be provided elsewhere in a lower risk site.
3. The proposed development forms an extension of the recently developed 47 River Road by the same Client.
4. The proposed development is on previously developed land.
5. Mitigation measures are proposed as part of the development in the form of attenuation which will reduce the surface water flood risk to both the site and the wider area.
6. The proposed development is located within the Littlehampton Economic Growth Area which is an area identified for development from the Housing and Economic Land Availability Assessment (HELAA)

It is therefore believed that the proposed development meets the requirements of the Exception Test and the proposed land use is acceptable on this site.

Essential infrastructure • Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
Highly vulnerable • Police stations, ambulance stations and fire stations and command centres and telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as “essential infrastructure”).
More vulnerable • Hospitals. • Residential institutions such as residential care homes, children’s homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, <i>subject to a specific warning and evacuation plan.</i>
Less vulnerable • Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops, financial, professional and other services, restaurants and cafes, hot food takeaways, offices, general industry, storage and distribution, non-residential institutions not included in “more vulnerable”, and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works (if adequate measures to control pollution and manage sewage during flooding events are in place).
Water-compatible development • Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, <i>subject to a specific warning and evacuation plan.</i>

Figure 6.1 National Planning Policy Framework: Table 2 - Flood Risk Vulnerability Classification

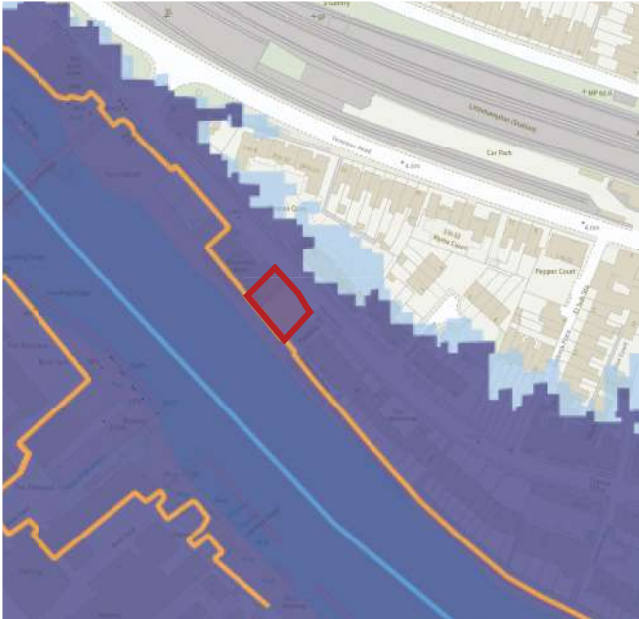


Figure 6.2 Environment Agency Flood Map for Planning

Legend

Flood Zone 3

Flood Zone 2

Flood Zone 1

Area Benefitting from Flood Defences

Flood Defences

Flood Risk vulnerability classification (see Table 2)		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone (see table 1)	Zone 1	✓	✓	✓	✓	✓
	Zone 2	✓	✓	Exception Test required	✓	✓
	Zone 3a	Exception Test required	✓	✗	Exception Test required	✓
	Zone 3b functional floodplain	Exception Test required	✓	✗	✗	✗

Figure 6.3 National Planning Policy Framework: Table 3 - Flood Risk Vulnerability and Flood Zone “Compatibility”

6.3 Flooding from Rivers and Sea

Fluvial flooding is caused by rivers, watercourses or ditches overflowing. Tidal flooding is caused by elevated sea levels or overtopping by wave action. In estuarine areas, flooding might arise from either fluvial or tidal flooding, or a combination of the two.

Based on the Environment Agency’s “Flood Map for Rivers and Sea” (refer to Figure 6.4), the site is located entirely within an area assessed as having a low chance of flooding - between a 0.1% and 1% annual probability of river or sea flooding.

The Environment Agency’s Flood risk summary also assesses the site to be at low risk of flooding from rivers and the sea (refer to Appendix 3).

Since the publication of the SFRA in 2016, the Littlehampton Flood Defence Improvement Scheme has recently been implemented which has raised the top of the flood wall to 4.80m AOD along the frontage of the site. This has been carried out to protect against a flood with a probability of 1 in 300 years.

In addition to the raised flood defences, the lowest accommodation level has been set at 5.18m AOD which places it above the 1 in 300 year flood level in the unlikely event of a breach in the flood defences.

The site also falls within Flood Warning Area o65FWC26o2 and residents would be required to register for flood warnings.

Using all the available evidence it is therefore considered that the site has a **low** probability of flooding from fluvial and tidal sources.

6.4 Flooding from Sewers

Sewer and highway drainage flooding occurs when the capacity of systems are exceeded, or the function of the system is impeded (e.g. tide locking), which results in surcharging of the system and water being forced to the surface via gullies, manholes, foul water appliances such as toilets or other dedicated overflows.

The available Southern Water record plan (Figure 6.5) indicates that the only public sewer in the vicinity of the site is a 450 mm combined sewer running under River Road to the north of the site.

Appendix E - Surface Water Flood Risk, Sheet No. 25 of the Arun District SFRA (contained in Appendix 2) shows that there is no surface water flooding adjacent to the site up to an including the 100 year extent. Even in the 1,000 year extent the flooding is confined to the centre of River Road adjacent to the site.

Appendix H - Historic Flooding Records, Sheet No. 25 of the Arun District SFRA (contained in Appendix 2) does not record any instances of sewer flooding within the vicinity of the site.

Using all the available evidence it is therefore considered that the site has a **very low** probability of flooding from sewers and the local drainage network, as long as they continue to be adequately maintained.

6.5 Flooding from Artificial Sources

Where infrastructure exists that retains, transmits or controls the flow of water; flooding may result if there is a structural, hydraulic, geotechnical or mechanical failure of the infrastructure.

The available Southern Water record plan (Figure 6.6) indicates that the only water main within the vicinity of the site is a 4” dia. distribution main running under River Road to the north of the site.

Although unlikely, a water main can burst at anytime which can result in the flooding of nearby properties.

To further reduce the flood risk from water mains, any initial sign of a burst water main should be reported to Southern Water as soon as possible and the local highway drainage system should be adequately maintained.

There are no artificial sources of flooding in the immediate vicinity of the site.

Figure 6.7 shows the Environment Agency’s Flood Map for Reservoirs which indicates that the site is not at risk from flooding associated with reservoirs or artificial sources.

Appendix H - Historic Flooding Records, Sheet No. 25 of the Arun District SFRA (contained in Appendix 2) does not record any instances of flooding from artificial sources within the vicinity of the site.

The Environment Agency’s Flood risk summary also assesses that flooding from reservoirs is unlikely in this area (refer to Appendix 3).

Based on this information it is therefore considered that the site is at **low** risk of flooding from artificial sources.

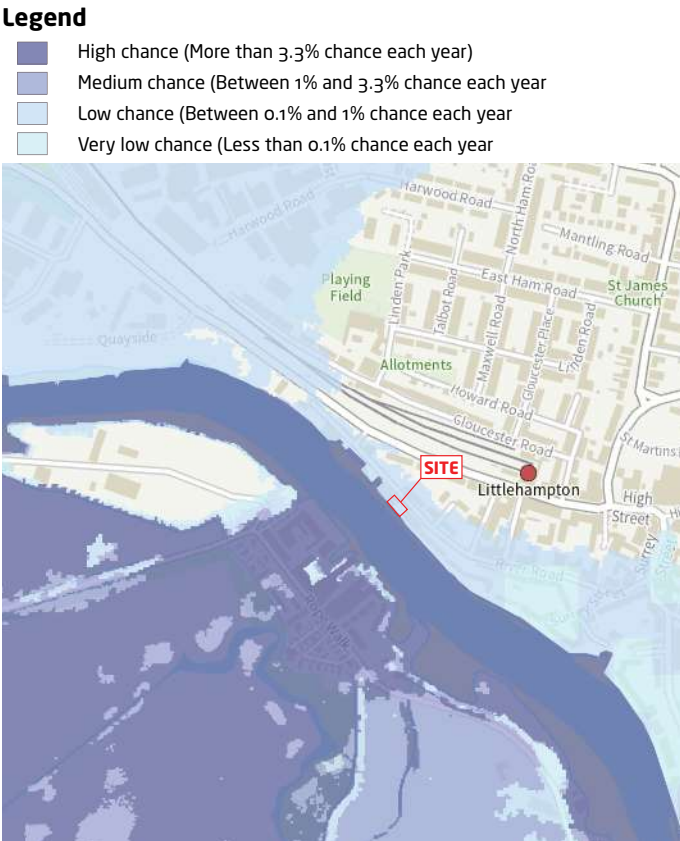


Figure 6.4 Environment Agency Flood Map for Rivers and Sea



Figure 6.5 Thames Water Asset Record - Sewers



Figure 6.6 Thames Water Asset Record - Water Mains

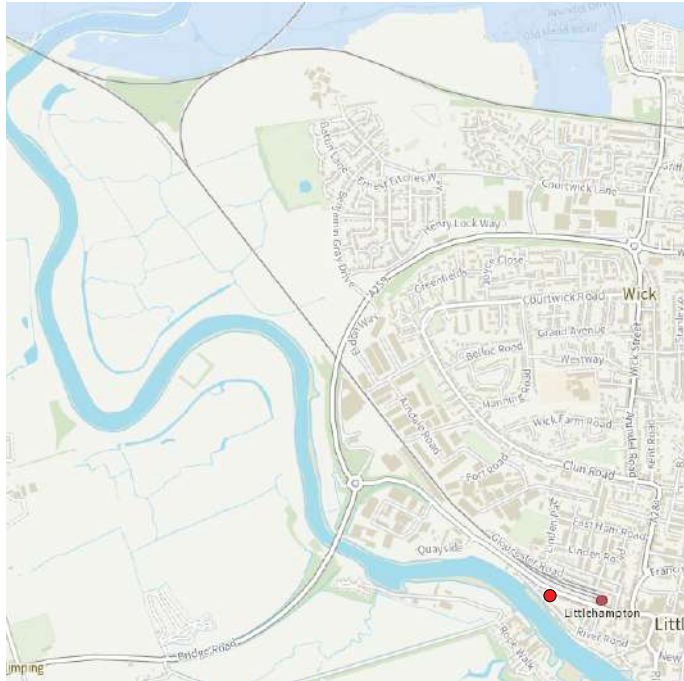


Figure 6.7 Environment Agency Reservoir Flood Map

6.6 Flooding from Groundwater

Groundwater flooding is caused by the emergence of water originating from sub-surface permeable strata and is often highly localised and complex. After a prolonged period of rainfall, a considerable rise in the water table can result in inundation for extended periods of time.

Although Appendix F - Areas Susceptible to Groundwater, Sheet No. 25 of the Arun District SFRA (contained in Appendix 2) indicates the site to be at an elevated risk of flooding from groundwater, there has been no historic groundwater flooding incidents on the site and no groundwater flooding was encountered during the construction of the adjacent site.

The Environment Agency's Flood risk summary also assesses that flooding from groundwater is unlikely in this area (refer to Appendix 3).

Based on this evidence, we consider that the site is at **low** risk of flooding from groundwater sources.

6.7 Flooding from Surface Water

Surface water flooding can occur as a result of either overland flow or ponding. Overland flow occurs following heavy or prolonged rainfall, snow melt, or where intense rainfall is unable to soak into the ground or enter drainage systems due to blockages or capacity issues. Unless it is channelled elsewhere, the run-off travels overland, following the gradient of the land. Ponding occurs as the overland flow reaches low lying areas in the local topography. These flood events tend to have a short duration and depend on a number of factors such as geology, topography, rainfall, saturation, extent of urbanisation and vegetation. As the surrounding area is highly developed it entirely comprises of impermeable hardstanding area, which, during high intensity storms, will generate large surface water runoff flows.

The Environment Agency's Risk of Flooding from Surface Water map shown in Figure 6.8 indicates that the site is predominantly located in an area identified as having a low or very low risk of surface water flooding with a narrow strip of high risk area along the kerbline of River Road.

The Environment Agency provide further maps which illustrate the depth of flooding for various flood events with varying probabilities of occurring, ranging from a "high" probability event with a 1 in 30 (3.3%) or greater chance of occurring each year, a "Medium" probability event has between 1 in 30 (3.3%) and a 1 in 100 (1%) chance of occurring and a "Low" probability event has a 1 in 100 (1%) or less of occurring.

- The up to 200mm flooding depth map (Figure 6.9) indicates that the majority of the site is clear of flooding with a narrow strip of low risk along River Road and a small patch of high risk at the southern end. This is consistent with the topographical survey which shows levels falling to a localised low point between River Road and the flintstone boundary walls in that corner which could pond to approximately 150mm deep.
- The up to 300mm flooding depth map (Figure 6.10) indicates that there is no surface water flooding on the site with the exception of the small patch referred to above which has reduced to a low risk of occurring.
- The up to 600mm flooding depth map (Figure 6.11) shows the site is completely clear of any risk of surface water flooding.

The Environment Agency's Flood risk summary also assesses the site to be at low risk of flooding from surface water (refer to Appendix 3).

Therefore, based on the above information the site is considered to be at **low** risk of flooding from surface water.

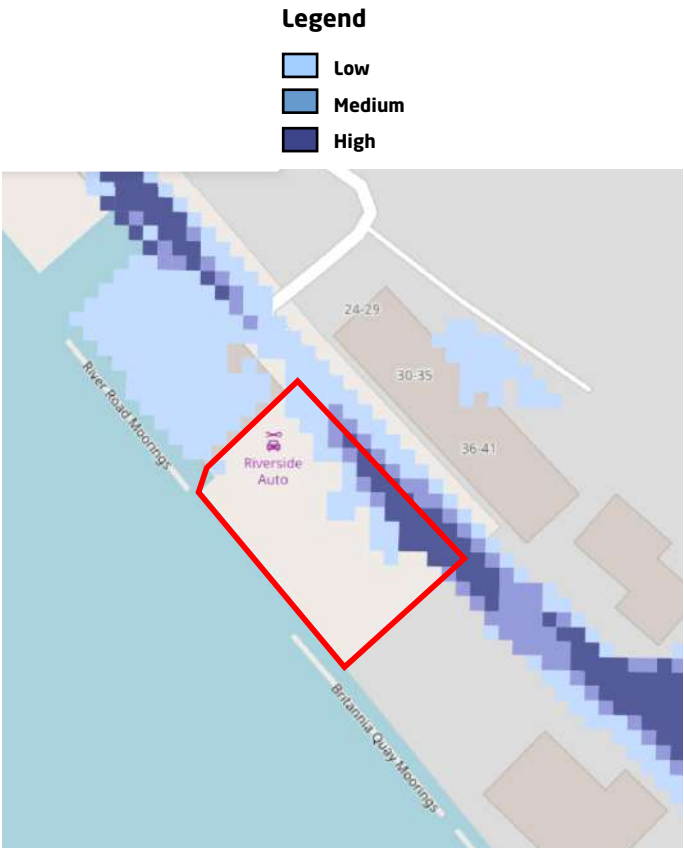


Figure 6.8 Environment Agency's Extent of Flooding from Surface Water Map



Figure 6.9 Environment Agency's Risk of Flooding from Surface Water Map (up to 200mm deep)



Figure 6.10 Environment Agency's Risk of Flooding from Surface Water Map (up to 300mm deep)



Figure 6.11 Environment Agency's Risk of Flooding from Surface Water Map (up to 600mm deep)

6.7.1 Safe Access

The occupiers could safely remain in the buildings during any flood in the surrounding area without endangering themselves.

In the event that occupiers do wish to leave the site during flood events, the EA and Defra published FD2321/TR2 “Flood Risks to People” in March 2006. Guidance Note 2. Figure 6.12 provides details on combinations of flood depth and velocities that cause danger to people. This table shows that people can become endangered in shallow but fast moving water through to still but deep water.

According to the EA Surface Water Flood Maps there is no flooding to the building and only very shallow flooding along the kerbline of River Road which also has only a low risk of occurring. Therefore, residents can safely remain within their property or take one of two routes to leave the area:

- To the north west along River Road and onward to Terminus Road
- To the south east along River Road, on to Purbeck Place and then Terminus Road

The preferred route would be to the north west as there is a slightly greater extent of flooding to the south east albeit still less than zoomm deep.

These are shown in Figure 6.13 for reference.

Velocity (m/s)	Depth (m)										
	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50	
	0.00	0.13	0.25	0.38	0.50	0.63	0.75	0.88	1.00	1.13	1.25
	0.50	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.25	2.50
	1.00	0.38	0.75	1.13	1.50	1.88	2.25	2.63	3.00	3.38	3.75
	1.50	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
	2.00	0.63	1.25	1.88	2.50	3.13	3.75	4.38	5.00	5.63	6.25
	2.50	0.75	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50
	3.00	0.88	1.75	2.63	3.50	4.38	5.25	6.13	7.00	7.88	8.75
	3.50	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
	4.00	1.13	2.25	3.38	4.50	5.63	6.75	7.88	9.00	10.13	11.25
4.50	1.25	2.50	3.75	5.00	6.25	7.50	8.75	10.00	11.25	12.50	
5.00	1.38	2.75	4.13	5.50	6.88	8.25	9.63	11.00	12.38	13.75	

Flood Hazard Rating (HR)	Colour Code	Hazard to People Classification
< 0.75		Very low hazard - Caution
0.75 to 1.25		Danger for some - includes children, the elderly and the infirm
1.25 to 2.00		Danger for most - includes the general public
> 2.00		Danger for all - includes the emergency services

Figure 6.12 FD2321/TR2 “Flood Risk to People” Extract



Figure 6.13 Potential Site Egresses During Flood Events

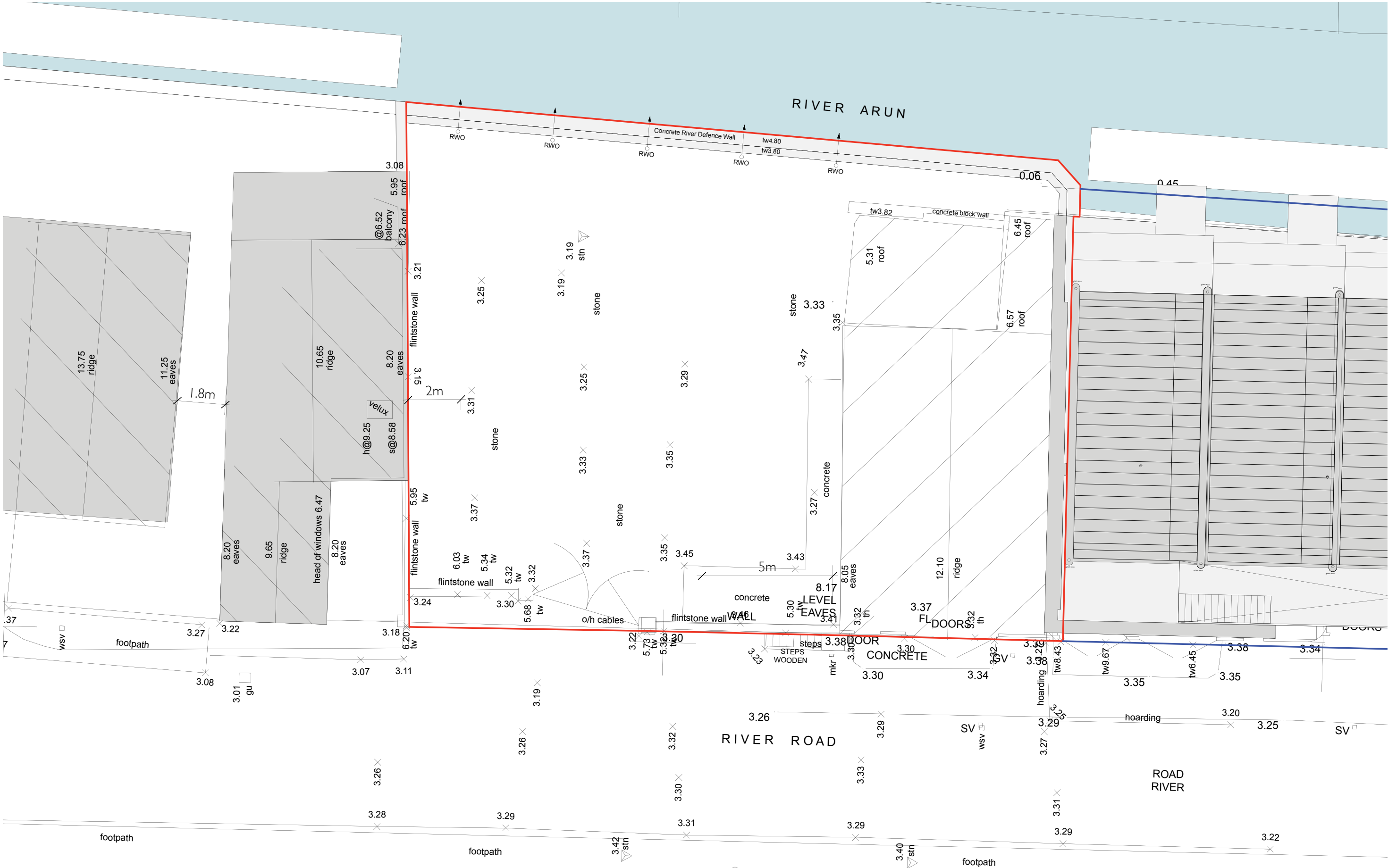
7 Conclusions

- In accordance with the National Planning Policy Framework, we would categorise the site as lying entirely within Flood Zone 3a but benefits from the flood defences along the banks of the River Arun.
- The proposed residential use is classified as 'more vulnerable' in accordance with the NPPF.
- In accordance with the NPPF, "more vulnerable" classifications are suitable in Flood Zones 1 and 2 but require the Exception Test to be undertaken for sites within Flood Zone 3a.
- For the reasons outlined in Section 6.3, it is believed that the proposed development meets the requirements of the Exception Test and the proposed land use is acceptable on this site.
- The site has been assessed as being at **low risk** of flooding from rivers or tidal sources.
- The site has been assessed as being at **very low risk** from surcharging sewers.
- The site has been assessed as being at **low risk** from artificial sources.
- The site has been assessed as being at **low risk** from groundwater sources.
- The site has been assessed as being at **low risk** from surface water flooding sources.
- Therefore, the proposed development has an acceptable flood risk within the terms and requirements of the National Planning Policy Framework.
- The proposed development also has an acceptable flood risk within the terms of the requirements of the Arun District Council SFRA.
- The developer must ensure that all warning and evacuation plans are in place.
- The comments stated above are based on information received from other consultees. The flood risk classification of this site has been based on the above observations, and the recommendations stated. This report is intended for the use of the developer of the site in support of their planning application for the site only.

Appendix 1

Topographical Survey

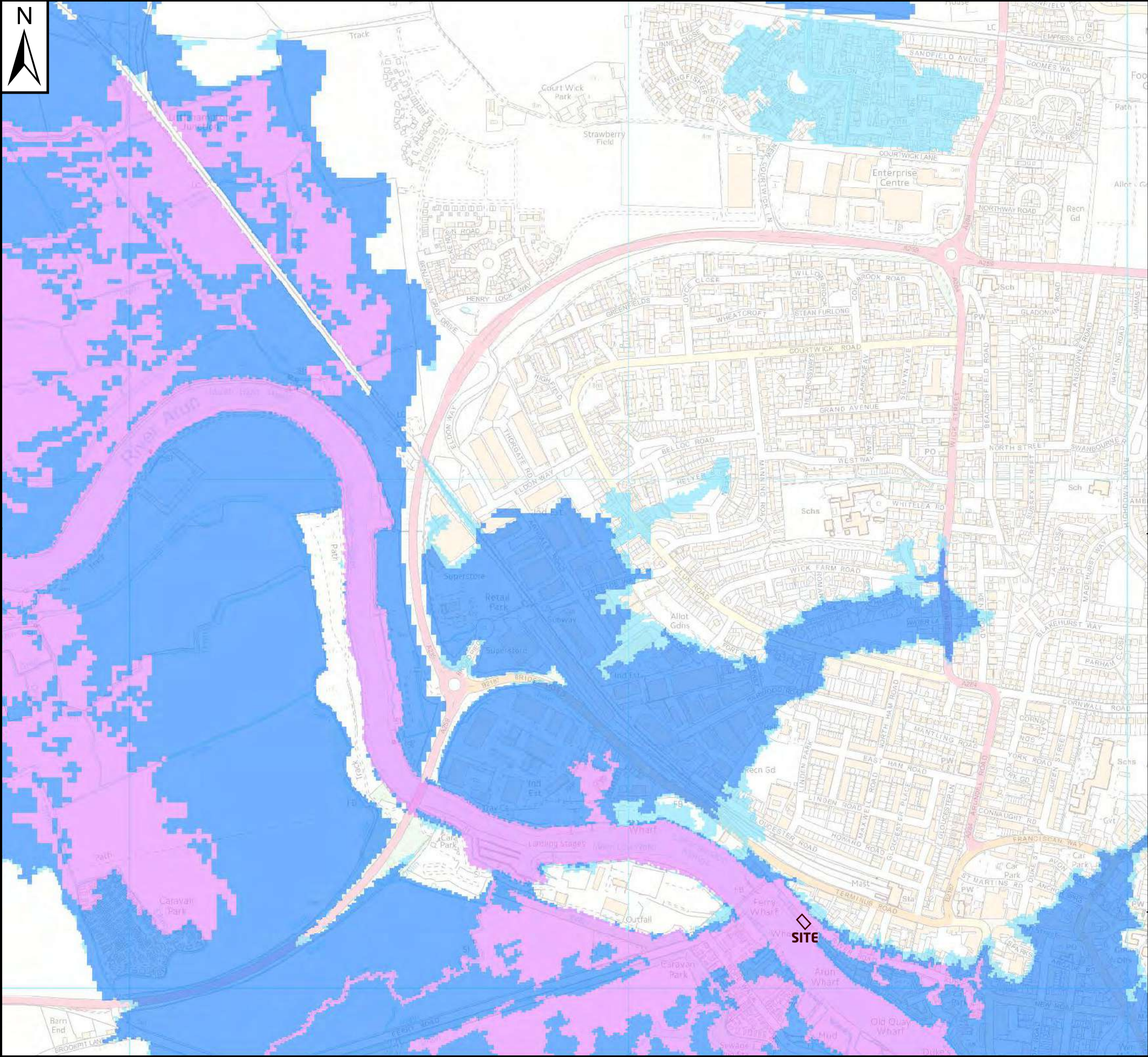




Appendix 2

Arun District Council SFRA Maps





Notes

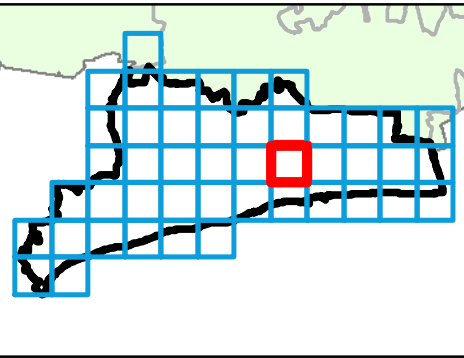
Zone 1: Comprised of land having a less than 1 in 1,000 annual probability of river or sea flooding in any year.

Zone 2: Comprised of land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or 1 in 200 and 1 in 1,000 annual probability of sea flooding in any year.

Zone 3a: This zone comprises land assessed as having a greater than 1 in 100 annual probability of river flooding or a greater than 1 in 200 annual probability of flooding from sea in any year.

Zone 3b: This zone comprises land where water has to flow or be stored in times of flood (the functional floodplain). The SFRA identified this Flood Zone as land which would flood with an annual probability of 1 in 20 years, where detailed modelling exists. In the absence of detailed hydraulic model information, a precautionary approach has been adopted with the assumption that the extent of Flood Zone 3b would be equal to Flood Zone 3a. If development is shown to be in Flood Zone 3a, further work should be undertaken as part of a detailed site specific

Key Plan



Legend

- Arun District SFRA boundary
- Flood Zone 3b
- Flood Zone 3a
- Flood Zone 2



REF	Date	Comments
A	June 2016	-
B		
C		

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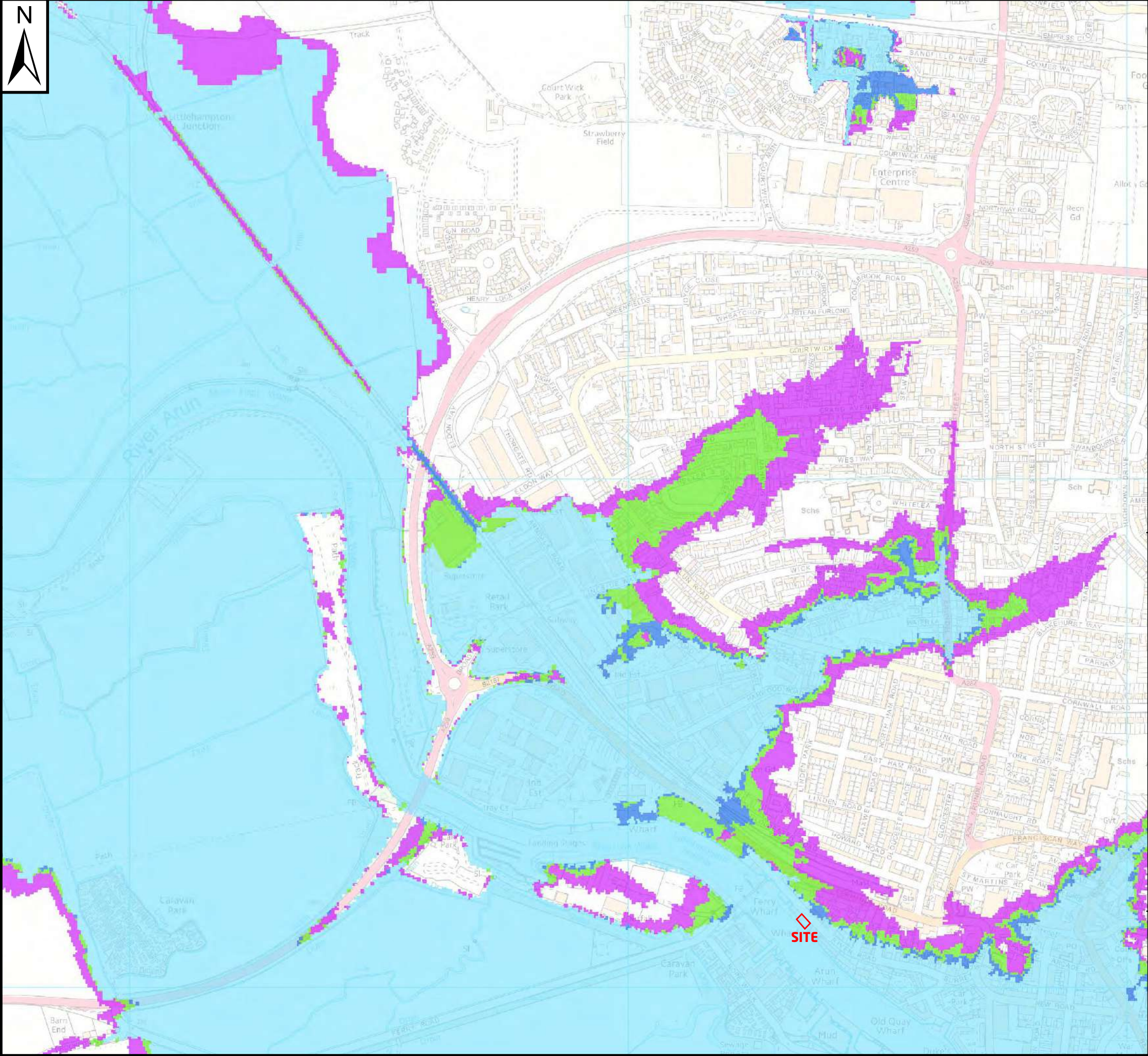
ARUN DISTRICT COUNCIL

LEVEL 1 SFRA: APPENDIX C FLOOD ZONES

Sheet No: 25 of 46 Index Number: ADC_25

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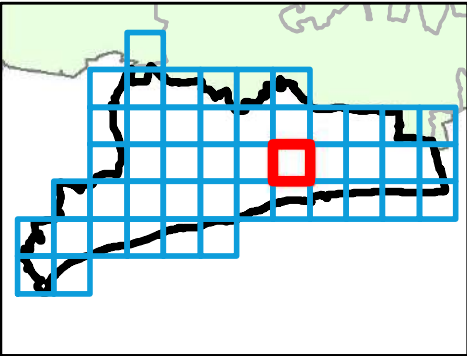
Notes

Hydraulic modelling has been undertaken as part of this SFRA to provide updated climate change flood mapping in the Arun District for Flood Zone 3a. This modelling followed the latest guidance for climate change in FRAs/SFRAs released by the Environment Agency in February 2016 (and updated in April 2016). Climate change for fluvial events has been based on the Higher Central estimates for the years 2031, 2061 and 2111. Present day flood risk information is available for comparison. Arun District is within the South East River Basin District and therefore allowance are:

- 2031 = +15% flows
- 2061 = +30% flows
- 2111 = +45% flows

For tidal/coastal models, undefended case still water level and defended case still water level with wave overtopping simulations have been completed to inform future flood risk within the Arun District. Again, climate change allowance predictions are for the years 2031, 2061 and 2111, with present day outputs for comparison.

Key Plan



Legend

- Arun District SFRA boundary
- Future Flood Zone 3a (2061)
- Present Flood Zone 3a
- Future Flood Zone 3a (2111)
- Future Flood Zone 3a (2031)



REF	Date	Comments
A	August 2016	
B		
C		

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ARUN DISTRICT COUNCIL

LEVEL 1 SFRA: APPENDIX D
CLIMATE CHANGE MAPPING

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Notes

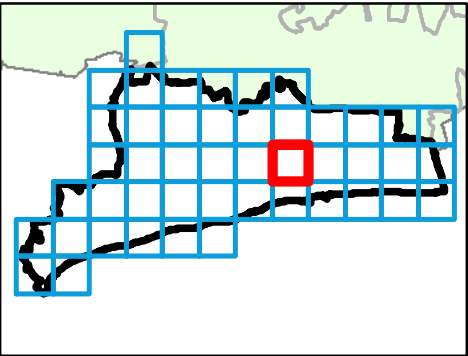
The updated Flood Map for Surface Water (uFMfSW) shows the flooding that takes place from the 'surface runoff' generated by rainwater (including snow and other precipitation) which:

- (a) is on the surface of the ground (whether or not it is moving), and
- (b) has not yet entered a watercourse, drainage system or public sewer.

The uFMfSW will pick out natural drainage channels, rivers, low areas in the floodplain and flow paths between buildings but it will only indicate flooding caused by local rainfall.

Note: The uFMfSW shows predictions of flooded areas but does not show whether individual properties will be affected by surface water flooding or have been affected in the past. The uFMfSW should not be used to predict if individual properties will flood.

Key Plan



Legend

Arun District SFRA boundary

uFMfSW 30-year extent

uFMfSW 100-year extent

uFMfSW 1,000-year extent

REF	Date	Comments
A	June 2016	-
B		
C		

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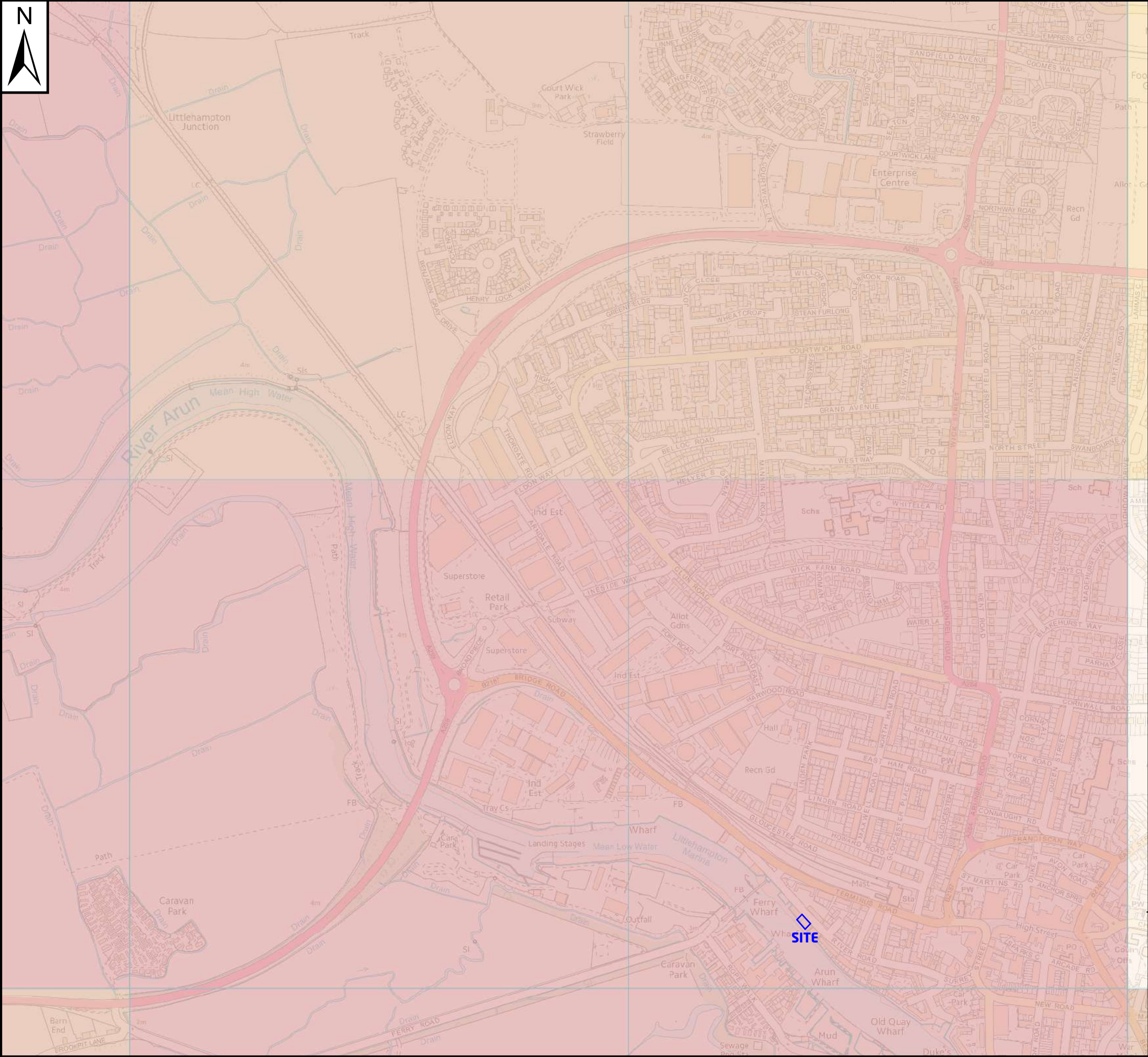
ARUN DISTRICT COUNCIL

LEVEL 1 SFRA: APPENDIX E
SURFACE WATER FLOOD RISK

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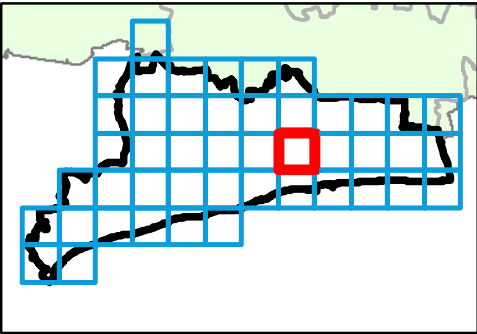
Notes

The Areas Susceptible to Groundwater Flooding (AS_tGW_F) is a strategic scale map showing groundwater flood areas on a 1km square grid. The data was produced to annotate indicative Flood Risk Areas for Preliminary Flood Risk Assessment (PFRA) studies and allow the Lead Local Flood Authorities (LLFAs) to determine whether there may be a risk of flooding from groundwater.

This data shows the proportion of each 1km grid square where geological and hydrogeological condition show that groundwater might emerge. It does not show the likelihood of groundwater flooding occurring. It does not take account of the chance of flooding from groundwater rebound. This dataset covers a large area of land, and only isolated locations within the overall susceptible area are actually likely to suffer the consequences of groundwater flooding.

The AS_tGW_F data should be used only in combination with other information, for example local data or historic data. It should not be used as sole evidence for any specific flood risk management, land use planning or other decisions at any scale. However, the data can help to identify areas for assessment at a local scale where finer resolution datasets exist.

Key Plan



Legend

- Arun District SFRA boundary
- < 25%
- >= 25% < 50%
- >= 50% < 75%
- >= 75%



REF	Date	Comments
A	June 2016	-
B		
C		

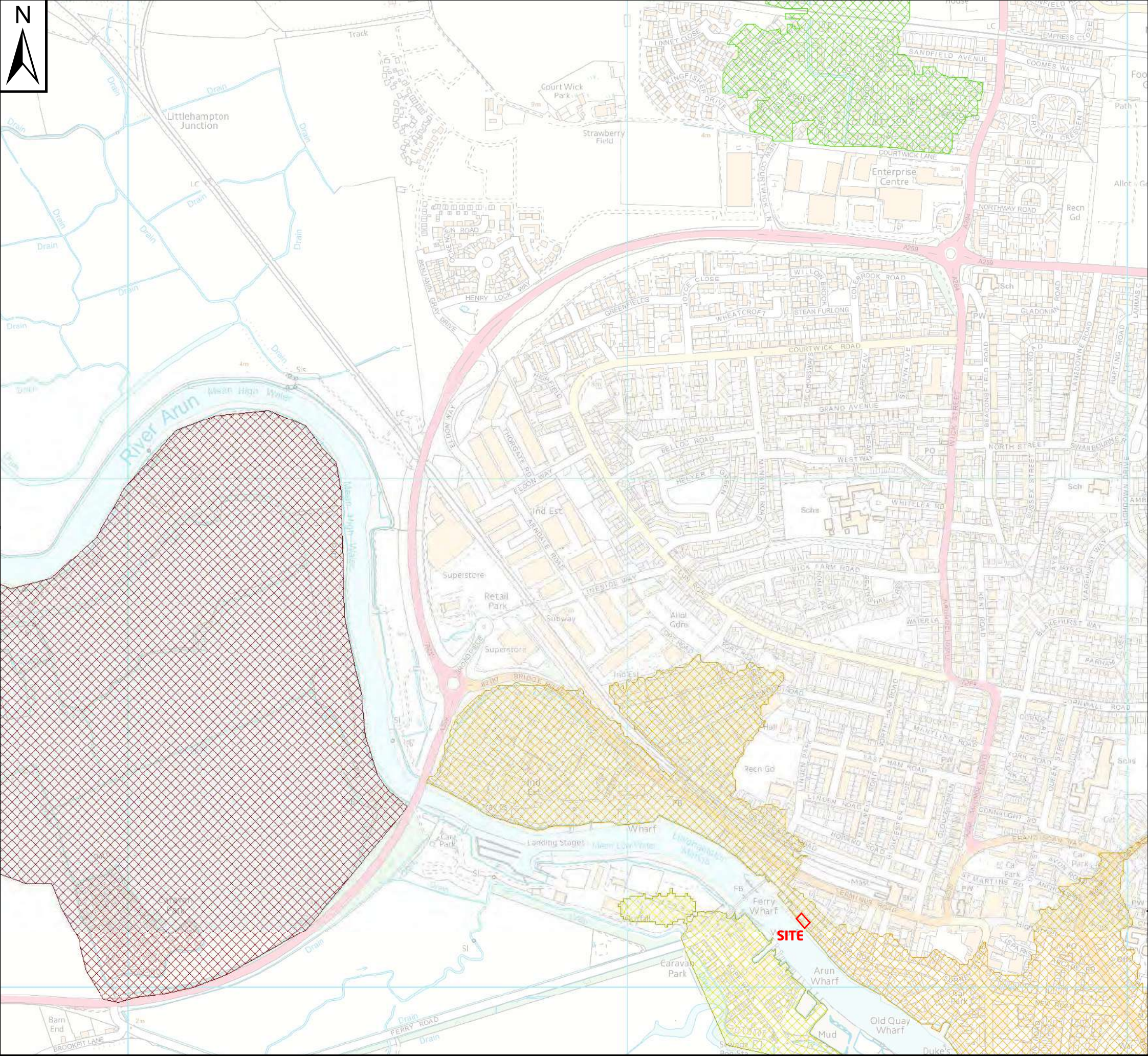
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ARUN DISTRICT COUNCIL
LEVEL 1 SFRA: APPENDIX F
AREAS SUSCEPTIBLE TO GROUNDWATER

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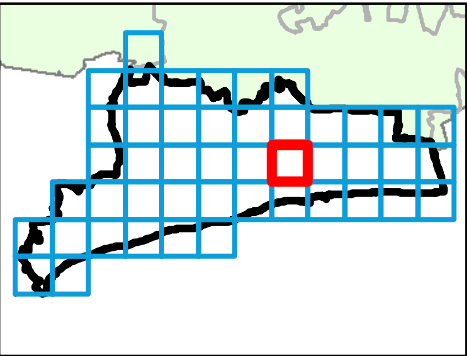
Notes

Flood Alerts are used to warn people of the possibility of flooding and encourage them to be alert, stay vigilant and make early preparations. It is issued earlier than a flood warning, to give customers advice notice of the possibility of flooding, but before we are fully confident that flooding in Flood Warning Areas is expected.

Flood Warnings warn people of expected flooding and encourage them to take action to protect themselves and their property.

Some areas may be covered by more than one flood warning area as they may be at risk of flooding from more than one

Key Plan



Legend

- Arun District SFRA boundary
- 065FWF2401
- 065FWF4903
- 065FWF4904
- 065FWF5301
- 065FWF5302
- 065FWF5007
- 065FWF5008
- 065FWF5005
- 065FWC2601
- 065FWC2602
- 065FWC2501
- 065FWF5006
- 065FWF4901
- 065FWC2402
- 065FWC2402



REF	Date	Comments
A	June 2016	-
B		
C		

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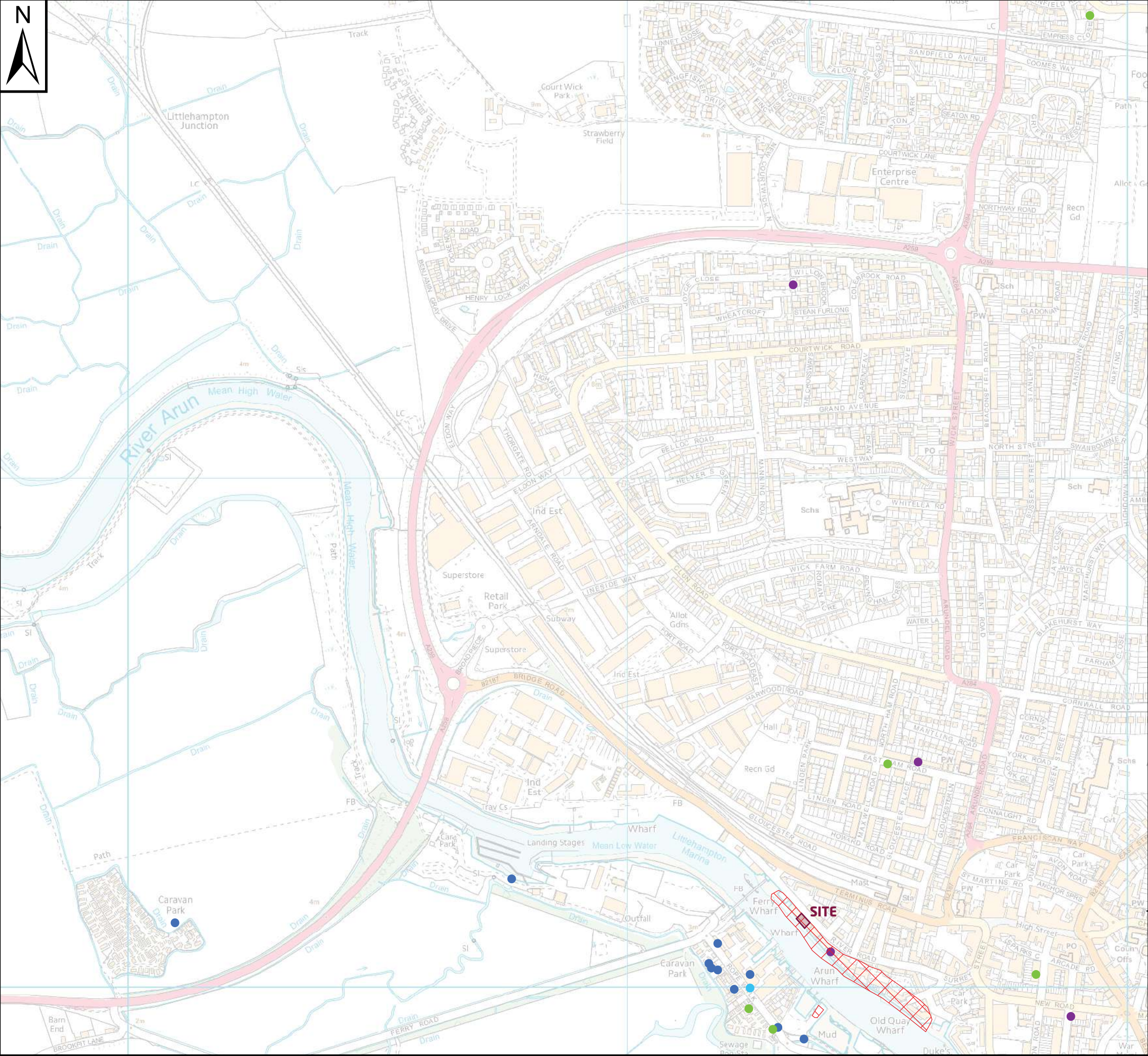
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LEVEL 1 SFRA: APPENDIX G
FLOOD WARNING AREAS

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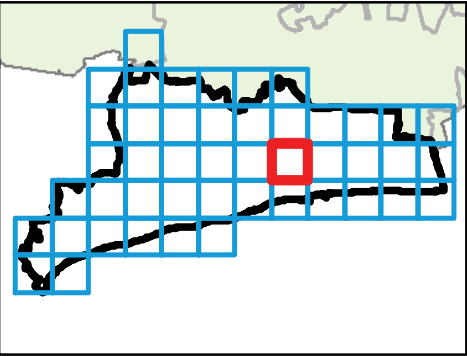
Notes

The Historic Flooding Map shows the recorded incidents and flood outlines provided by Arun District Council, West Sussex County Council, Southern Water and Environment Agency. Historical flood extent was obtained from the Environment Agency.

Flooding incidents provided have been categorised based upon the details provided in the records. Unknown flood points could not be determined from the information provided, and therefore could be from a number of sources.

Please note that not all historical records may be shown on this map, and that it is therefore advised you contact Arun District Council for updated information post 2015.

Key Plan



Legend

- Arun District SFRA boundary
- Historic flood outline
- Tidal
- Surface Water
- Failure
- Unknown
- Fluvial
- Coastal

REF	Date	Comments
A	June 2016	-
B		
C		

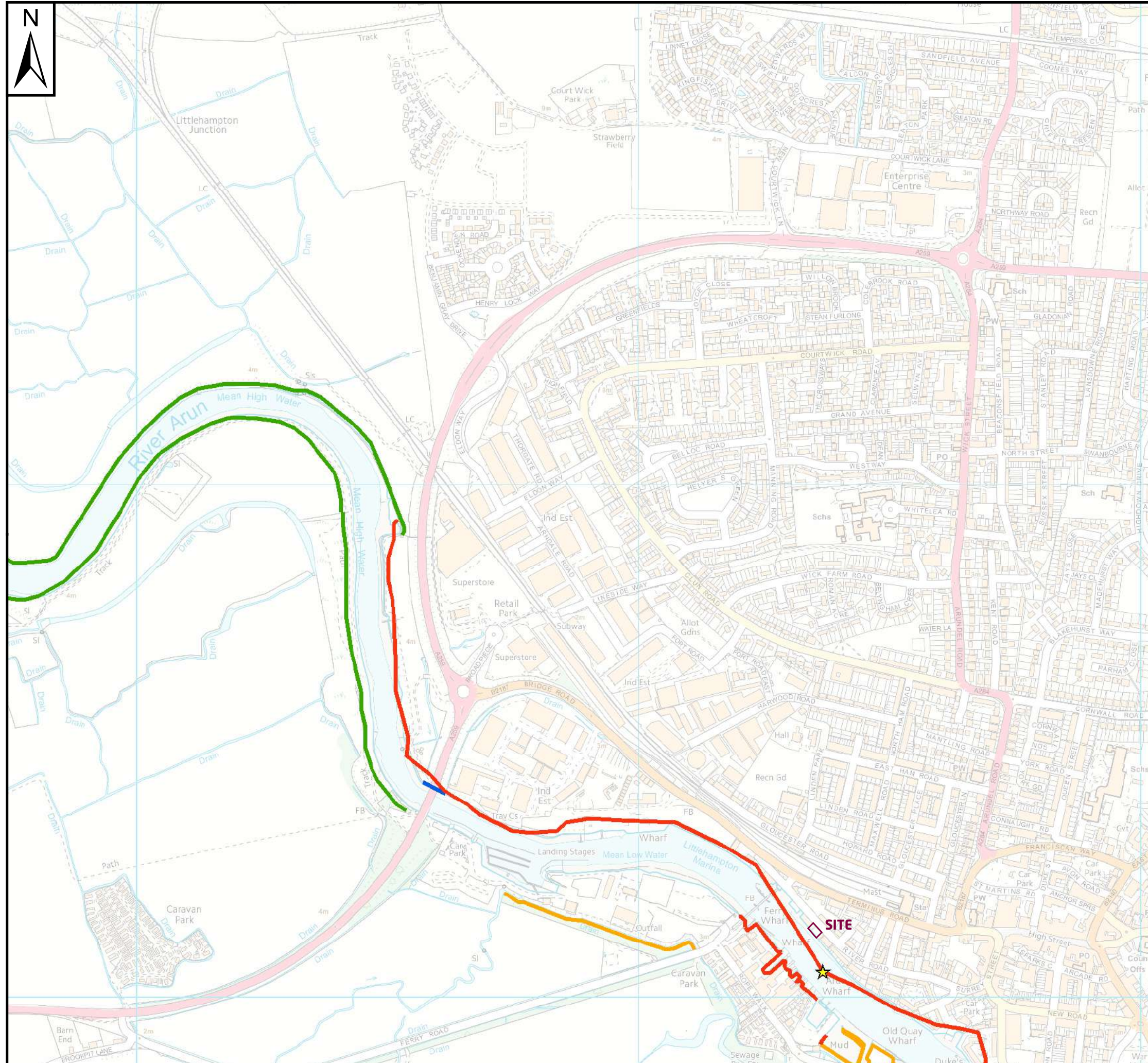
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ARUN DISTRICT COUNCIL
LEVEL 1 SFRA: APPENDIX H
HISTORIC FLOODING RECORDS

Sheet No: 25 of 46 Index Number: ADC_25

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Arun District SFRA boundary

- ★ Gap in Littlehampton defence

- Embankment, Environment Agency
- Embankment, Private
- Embankment, Unknown
- Wall, Environment Agency
- Wall, Local Authority
- Wall, Private
- Shingle Beach, Environment Agency
- Shingle Beach, Local Authority
- Shingle Beach, Littlehampton Harbour
- Shingle Beach, Private
- Shingle Beach, Worthing Borough
- Unknown



REF	Date	Comments
A	June 2016	-
B		
C		

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LEVEL 1 SFRA: APPENDIX I DEFENCES

Sheet No: 25 of 46 Index Number: ADC_25

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Appendix 3

Environment Agency Flood risk summary



[Back to select an address](#)

Flood risk summary

Your selected location: Riverside Autos, 47, River Road, Littlehampton, BN17 5BZ

This information tells you the flood risk of the land around a building, not the building itself.

[How we assess an area's flood risk](#)

The highest risks of flooding at this location are from **surface water** and **rivers and the sea**.

[Flood risk and climate change](#)

Surface water

[More about your surface water flood risk \(/surface-water\)](#)

Yearly chance of flooding

Very low

Low

Medium

High

Yearly chance of flooding between 2040 and 2060

Very low

Low

Medium

High

What surface water is

Surface water flooding is sometimes known as flash flooding. It happens when rainwater cannot drain away through normal drainage systems.

[Why surface water flooding is a problem](#)

3421 - 57 River Road, Littlehampton | Appendix 3 24

05/02/2025, 08:03

Flood risk summary - Check your long term flood risk - GOV.UK

Rivers and the sea

[More about your rivers and sea flood risk \(/rivers-and-sea\)](#)

Yearly chance of flooding

Very low

Low

Medium

High

Yearly chance of flooding between 2036 and 2069

No data available

This data is currently unavailable. We'll publish the data when it becomes available.

What makes rivers and sea flooding more likely

Low-lying areas that are close to rivers or the sea are more likely to flood when water levels rise.

This information takes into account any flood defences.

[Why flood defences cannot completely prevent flooding](#)

Other flood risks

[More about groundwater and reservoirs \(/ground-water\)](#)

Groundwater

Flooding from groundwater is unlikely in this area.

Reservoirs

Flooding from reservoirs is unlikely in this area.

https://check-long-term-flood-risk.service.gov.uk/risk#

1/2

2/2