Flood Risk Sequential Test

Assessment of Proposed Development Sites

Stroud District Council

Evidence Base (December 2013 & April 2014 with additional evidence update November 2014)

Development and Flood Risk

Sequential Test

1.0 Introduction

1.1 This document considers the extent to which potential development sites within Stroud District are at risk of flooding and helps to inform the process of allocating suitable sites through the Development Plan preparation process. The sites considered through this report are taken from a number of sources, most notably the District Council's Strategic Flood Risk Assessments (Level 1 and Level 2 including two addendums), Strategic Housing Land Availability Assessment and Employment Land Review. The two sets of maps within this Sequential Test document are the latest Environment Agency Flood Zone Maps (the Flood Map for Planning (Rivers and Sea)) and the maps within the SFRA2 (that show flood zones 3b, the functional floodplain) It is important that readers also have regard to all the flood risk information in the SFRAs to gain a more detailed picture of flood risk.

1.2 It is important that this document is read in conjunction with the Council's Submission version of the Local Plan (December 2013) as this provides the context for the future development strategy that the District Council is proposing. The document clarifies the development choices made within Stroud District and is a result of on-going collaboration with the Environment Agency.

2.0 Policy Background

The National Planning Policy Framework and National Planning Practice Guidance (NPPG) require local planning authorities to assess the sustainability and deliverability of potential development sites. To date the District Council has produced Strategic Flood Risk Assessments (Level 1 and Level 2) and a Sustainability Appraisal at all stages of the Plan production. A specific requirement of this particular evidence base study is to address the issue of flood risk concerning potential development areas. This is considered further below.

2.1 National Policy

2.11 The National Planning Policy Framework continues to stress the importance of ensuring Local Plans take full account of the risk of flooding. The NPPF identifies that:

Local Plans should take account of climate change over the longer term, including factors such as flood risk, coastal change, water supply and changes to biodiversity and landscape. New development should be planned to avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure.

2.12 The NPPF provides the strategic framework for considering proposals at a local level. One of the key elements of ensuring flood risk is considered appropriately within the Local Plans is the production of a Strategic Flood Risk Assessment, which is considered in further detail overleaf. This document has also been assessed against the National Planning Practice Guidance (NPPG) 2014. This seeks in plan-making, local planning authorities apply a sequential approach to site selection so that development is, as far as reasonably possible, located where the risk of flooding (from all sources) is lowest, taking account of climate change and the vulnerability of future uses to flood risk. The NPPG requires the sequential test approach and exception test require proposed development to show that it will provide wider sustainability benefits to the community that outweigh flood risk, and that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall.

2.2 Strategic Flood Risk Assessment

2.21 A key requirement of assessing flood risk within the District is provided through the Strategic Flood Risk Assessment (SFRA). Due to the importance and potential impact of flood risk within the District a Level 1 and subsequent Level 2 Strategic Flood Risk Assessment have been originally undertaken by consultants Halcrow. Two further Addendum SFRA2 reports were completed in April and November 2014 to reflect updates to flood risk mapping at the Environment Agency. All these studies provide information on the vulnerability of flooding for the proposed development sites within the District. The results of the SFRA provide the basis for undertaking the sequential and exception test to inform the allocation of development sites.

2.22 For more information on the Level 1, Level 2 and associated addendum SFRA's please visit the Council's website at http://www.stroud.gov.uk/docs/planning/planning_strategy.asp#s=sectioncontent2&p=BASE,environev,sfra

2.3 The Sequential Approach

2.31 The National Planning Policy Framework provides guidance for the requirement to ensure a sequential approach to site selection is followed. The following extract from the NPPF provides the relevant information in considering flood risk:

Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.19 Local Plans should be supported by Strategic Flood Risk Assessment and develop policies to manage flood risk from all sources, taking account of advice from the Environment Agency and other relevant flood risk management bodies, such as lead local flood authorities and internal drainage boards. Local Plans should apply a sequential, risk-based approach to the location of development to avoid where possible flood risk to people and property and manage any residual risk, taking account of the impacts of climate change, by:

- *applying the Sequential Test;*
- *if necessary, applying the Exception Test;*
- *safeguarding land from development that is required for current and future flood management;*
- *using opportunities offered by new development to reduce the causes and impacts of flooding; and*

- *where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to facilitate the relocation of development, including housing, to more sustainable locations.*

The aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding. The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding. 102. If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. For the Exception Test to be passed:

- *it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and*
- *a site-specific flood risk assessment must demonstrate that 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.*

Both elements of the test will have to be passed for development to be allocated or permitted.

2.32 The following exercise therefore carries out the flood risk sequential test on the District's proposed allocation sites and makes recommendations regarding their suitability for development in line with the sequential test, as identified above. This follows feedback from the Environment Agency. Judgements will also need to be made in line with other, sometimes competing, national planning policy advice, and in line with the development strategy that is provided within the Local Plan Core Policies in Chapter 2. A balanced approach to planning policy requirements is therefore proposed for the future development of the District.

3.0 Methodology

3.01 This section outlines the approach taken in carrying out the sequential test of the potential development sites within Stroud District that are being considered for allocation within Core Policy CP2 – Strategic Growth and Development Locations. Essentially in order to meet the identified development requirements for Stroud District, the Council will need to identify sites to accommodate 11,200 dwellings from 2006 – 2031 to accommodate its housing requirement and 58 hectares of employment land (using an historic land take up method) over the same time frame. Using employment forecasts, there will be a surplus of employment land by 2031 of between 13.84 and 39.36 ha. Using historic take up rates, the Plan provides sufficient employment land. A worst case scenario is a shortfall of 6 ha by 2031 On the basis of the review there is no need for further allocations now, but a need to review within 5 years However, it is important to note that the time frame of the plan runs from 2006 and therefore completions and current commitments since that time need to be factored in to the decision making process regarding the Local Plan allocations. The Local Plan development strategy is clear that housing development will take place within settlement development limits, B class employment within designated employment areas and retail development will take place in accordance with the retail hierarchy.

Some of the strategic sites are located at principal settlements to promote sustainable communities by bringing housing, jobs and services close together and reduce the need to travel elsewhere.

3.02 The main body of the sequential/exception test is in the form of a number of schedules as follows:

- Hunts Grove Extension (500 Houses)
- Quedgeley East (13ha employment)
- North East Cam (450 Houses and 12ha employment)
- Sharpness (300 Houses and 17ha employment)
- Stroud Valleys (Employment Intensification and 450 Houses)
- Stonehouse (1350 Houses and 10ha employment)

3.03 The Tables within Section 5.2 show the following information on each of the sites:

1. Site reference number
2. Address / Location
3. Site Size and existing use
4. Flood Zone 1?
5. Flood Zone 2?
6. Flood Zone 3a?
7. Flood Zone 3b?
8. Comments regarding relative sustainability, community needs and exception testing

3.04 The Assessment has been carried out using a number of evidence base studies but has primarily focussed on the Council's Level 2 Strategic Flood Risk Assessment (including two supporting Addendum reports) and the Sustainability Appraisal, as these provide clear guidance in terms of allocated development sites and any flood risk associated with these sites.

3.05 The Level 2 SFRA and the recent update of that work also usefully highlights other sources of flooding that may affect sites. This document should not be used as a sole justification for development as it may give a more positive view on flood risk than is actually the case. The reader MUST therefore refer to the Level 2 SFRA and SFRA 2 Review to understand better the flood risks posed to each site. The Exception Test, as set out in paragraph 102 of the Framework, is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily, while allowing necessary development to go ahead in certain situations. Further advice is available within the National Planning Practice Guidance (NPPG).

4.0 Stroud District Development – Context

4.01 Prior to undertaking the sequential test it is important to understand the development context that provides the framework for considering site allocations. The Local Plan identifies the following quantum of development that Stroud District Council needs to plan for from 2006 – 2031:

- Residential: 39500 dwellings (including a non-specific allowance for the Council housing programme (750) and windfall (150))
- Employment Land: 52ha
- Retail Space: 2,640 sqm convenience goods floorspace and 4,840 sqm comparison goods floorspace

4.02 These figures drive the need for sufficient sites to be allocated through the Local Plan. As well as meeting this numerical target, it is also important that the site selection is in conformity with the Local Plan's Development Strategy. Furthermore, as the plan period runs from 2006 it is important that completions and commitments since that date are factored in to the decision making process, in order to avoid over-provision. This is discussed in more detail under each of the overleaf headings.

4.1 Residential

Table 1: Summary of housing requirement and supply 2006-31

A	**Housing requirement**	**11,200**
B	Completions (1 April 2014)	3,260
C	Commitments (at 1 April 2014)	4,040
D	Additional permissions (1 April - 31 October 2014)	430
E	Undeliverable permissions (at 31 October 2014)	412
F	**Housing supply (1 October 2014) (B+C+D-E)**	**7318**
G	Residual requirement (A-F)	3882
H	Draft Local Plan allocations and windfall	2450
I	Shortfall (G-H)	-1432

4.11 A further assessment of housing supply has been undertaken. In April 2014 a full re-survey of land availability was carried out and in October 2014 a recalculation of the Council's Five Year Land Supply has been undertaken. Following a recommendation from the Planning Review Panel, officers have updated the land supply position to 1 October 2014, taking into account all permissions granted since April 2014.

4.12 The figures demonstrate that in order to identify sufficient housing to meet the Local Plan requirements for the whole plan period, a further allocation of at least 1432 net additional dwellings is required. If the Inspector recommends a revised Plan period of 2011-31, there is a larger shortfall of 1705 net additional dwellings due to the number of completions in the period 2011-2013 being below the annual requirement.

4.13 Monitoring of the current housing supply demonstrates that at 1 November 2014, using a target figure of 11,200, the Council can currently demonstrate a 7.1 years supply of housing, without any additional housing allocations. However, to maintain a 5 year supply into the future, will require the Council to make additional housing allocations, as once current permissions are developed out, the Council will be relying increasingly on housing allocations to deliver the future land supply.

4.14 The following table summarises the main proposed changes to the Local Plan housing requirement and supply figures:

Table 2: Changes to Housing Numbers

	Submitted Plan	**Proposed Changes**
Housing Requirement	9,500	**11,200**
Housing Commitments	7,091	7,318
Housing Allocations		
Hunts Grove Extension	500	500
North East Cam	450	450
Sharpness	300	300
Stroud Valleys	300	**450**
West of Stonehouse	-	**1350**
Council Housing Programme	150	150
Dispersal / windfall	750	750
Total Supply	9,541	**11,268**

A comprehensive review of opportunities within the Stroud Valleys has been undertaken to maximise the amount of housing that could be realistically achieved from brownfield land, whilst reflecting site constraints and issues of deliverability. Analysis has identified the opportunity to increase the housing allocation within the Stroud Valleys from 300 dwellings to 450 dwellings through the following changes

- increase the housing capacity at Ham Mills and Wimberley Mills, to reflect recent active promotion of these sites by site owners through the planning process
- increase the housing capacity at Brimscombe Port, to reflect the latest market testing and revised viability testing.

However, increasing the housing requirement from 9,500 to 11,200 dwellings cannot be achieved solely through additional brownfield land development. Growth of this nature will inevitably involve additional greenfield development.

4.15 The Local Plan proposed changes involve retaining the existing housing allocation at Sharpness. This is fully supported by the Canals and River Trust which is currently preparing detailed proposals to deliver the Local Plan allocation.

4.16 The allocation of an additional mixed use allocation at West of Stonehouse. This site was recommended by the Council as a strategic mixed use allocation in the Preferred Strategy consultation document (Spring 2012) and was recommended as a reserve site by officers in July 2013. Although the site was taken out of the submitted plan, the site was assessed as part of the published Sustainability Appraisal (December 2013) and Infrastructure Delivery Plan (July 2013) which underpin the current draft Local Plan.

4.17 The site is fully in accordance with the development strategy as it involves a planned mixed use urban extension to one of the District's main settlements; it will deliver employment and housing (including over 400 affordable houses) together; and will bring forward significant infrastructure to support the development including a local centre, primary school, open space and community facilities.

4.2 Employment Land

4.21 The employment land requirement for the District, as identified through the Local Plan is 37 hectares and was drawn from the 2013 Employment Study. The text below summarises the Employment Land Supply position.

- 44 Employment Areas constituting 362 ha.
- Current employment land supply definition – 57.91 ha comprising 12 undeveloped but allocated sites in the previous Local Plan plus 12 unimplemented planning consents.
- Identified need to allocate a further 36.5 ha for the period 2012-2031 (which reflects a market equilibrium rate of 7.5 percent of available floorspace). It also identified a need to review existing Employment Areas' Regeneration Opportunities identified by the study and to consider new allocations at Quedgeley East; North of Stroudwater Industrial Estate, Stonehouse; and an extended Severn Distribution Park, Sharpness

- It is to be noted that under Delivery Policy EI2a that the Berkeley Centre is included within the Local Plan. This supports the Berkeley Centre as a B1-B8 employment and educational resource, supporting the proposed SEP GREEN Skills Project. The former Berkeley Power Station site includes office and laboratory employment accommodation in a rural location by the River Severn. A project to develop a GREEN Skills Centre to provide a training centre for STEM skills related to the renewable energy, engineering and nuclear sectors has been promoted by the Gloucestershire gFirst LEP. Proposals for continued B1-B8 uses on the site or that utilise the existing Skills Centre and education uses will be supported. Alternative uses will not be permitted in this rural location. The long standing site has the nuclear related uses. The buildings and structures to be used exist on site currently. This has therefore not been included in this document as no new development is proposed.

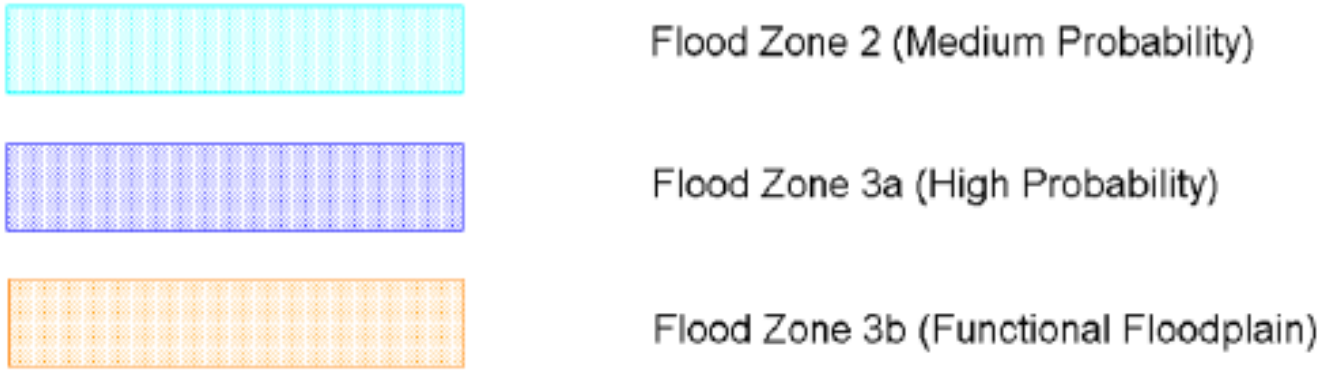
4.3 Implementation

4.31 The above figures help to identify what the residual target for allocations of sites is, but it also identifies the sites that have the benefit of planning permission. This provides certainty for the next six + years of the development plan as sites are considered to be available and deliverable. This certainty is important to ensure that the plan is sound and achievable. The sites selected for allocation through the Council's Development Plan Documents are considered in the following section.

5.0 Site Allocations – Identified Sites for Development

5.10 The sites included within the Local Plan Core Policy CP2 were selected using the various evidence base documents. These sites are identified below and the flood zone that they fall into is shown in each table using both the latest Environment Agency Flood Zone Maps (the Flood Map for Planning (Rivers and Sea)) and all the maps within the SFRA2 (that show flood zones 3b, the functional floodplain). The EA extracted maps show the correct allocation site boundaries and broad flood risks, whilst the SFRA2 maps show greater modelled flood risk information but where site boundaries may have changed during the Local Plan process.. The tables and maps that follow should not be used as a sole justification for development as it may give a more positive view on flood risk than is actually the case. The reader MUST therefore refer to the Level 2 SFRA to understand better the flood risks posed to each site. The Local Plan policy requirements for issues around flood risk, water resources and their management should also be taken fully into account as well as any other relevant guidance.

5.11 The key to the following SFRA2 site maps is set out below:



Category
SHALLOW (<0.3m flood depth)
DEEP (>0.3m flood depth)

5.2 Flood Zones 1, 2, 3a & b:

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1a	**Land at Dudbridge**	3.99 Ha B2 and ancillary B1 & B8 uses.	Brownfield	Yes	Yes	Yes	Yes	Industrial Heritage Conservation Area Potential in addition to employment provision, for canal related tourism and retail provided it complies with the retail policy hierarchy.	Allocated for Canal related tourism development, retail and employment uses

Supporting Commentary and Recommendations

This site is located in Flood Zones 1, 2 3a and with a substantial proportion of the site located within flood zone 3b, the functional floodplain. The site was a protected key employment site in the last Local Plan. The site comprises a variety of business units located in mixed age buildings. . The tables given in Appendix 1 set out the flood risk vulnerability and appropriateness of different land uses. The current uses on site are Less Vulnerable. The Council considers it is appropriate to allocate the site for Less Vulnerable and Water Compatible development only.

All development proposals for this site must be accompanied by a flood risk assessment. The Council will seek opportunities to:

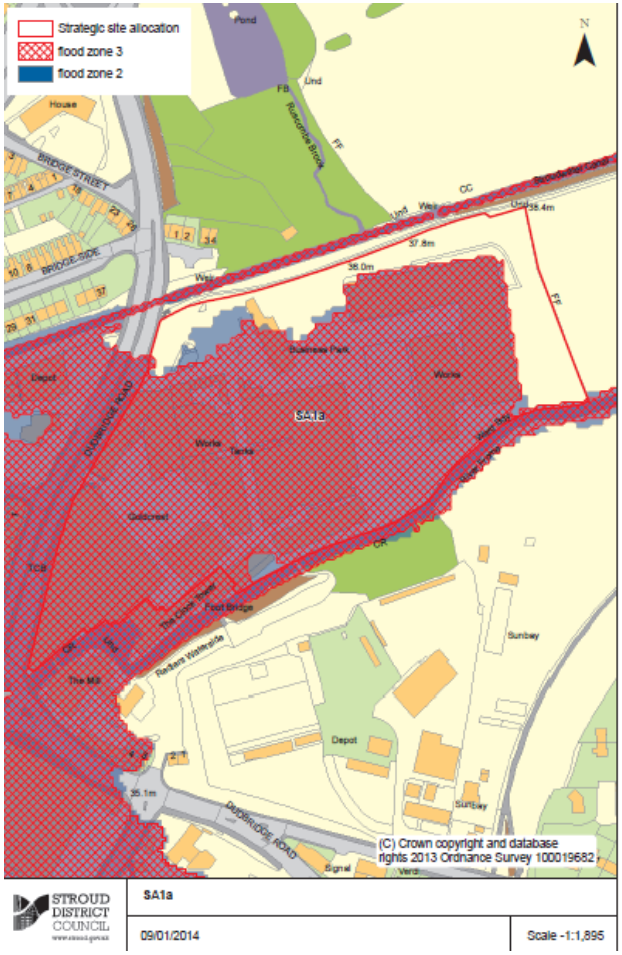
- reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;
- create space for flooding to occur by restoring functional floodplain and flood flow pathways by identifying, allocating and safeguarding open space for flood storage;
- deliver improvements and restoration of the river corridor for biodiversity and flood risk enhancements;

Safe and emergency access considerations are paramount and will need to be fully resolved.

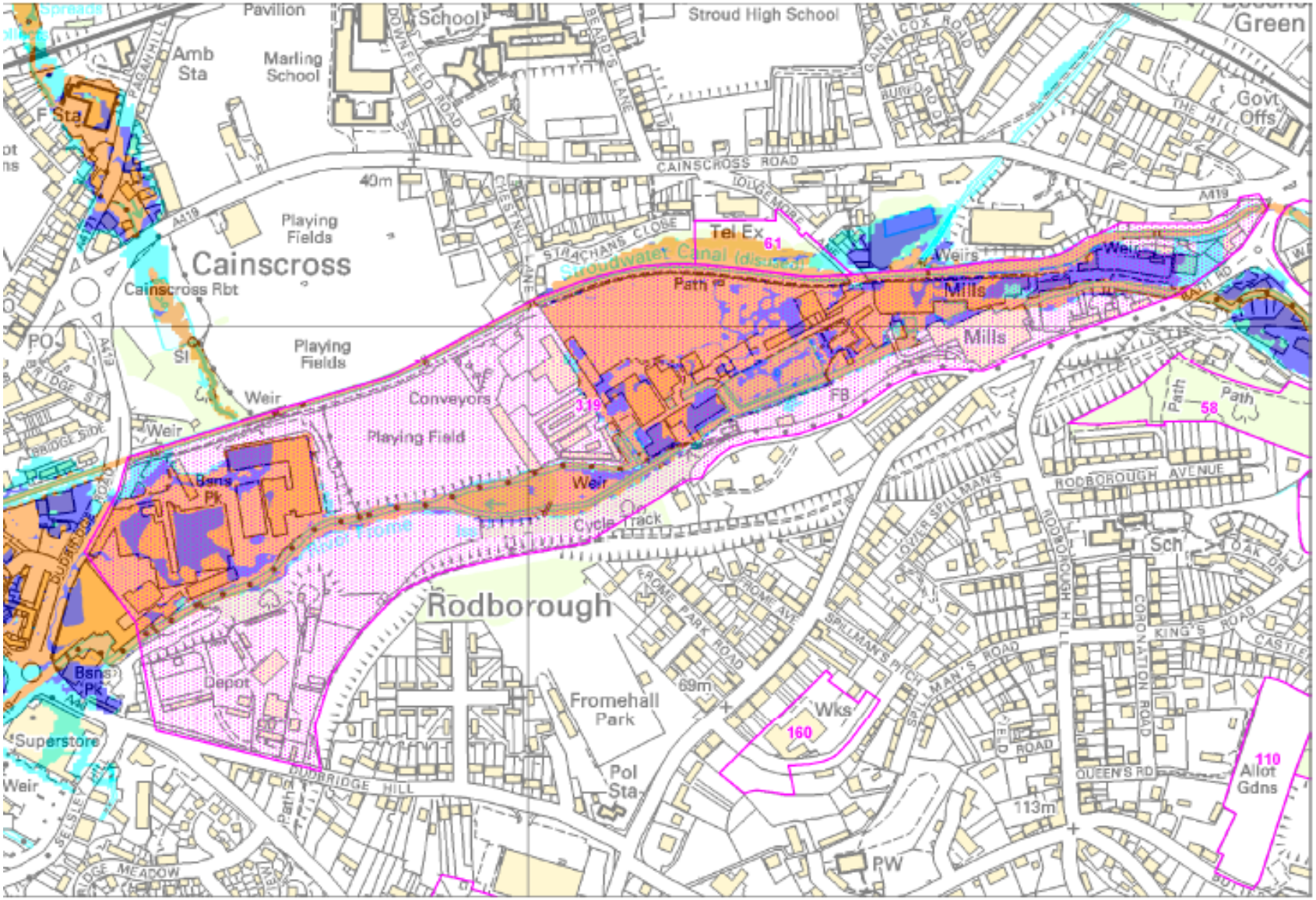
The designation of this brownfield site as a key employment site indicates the importance of this area to the local community for employment in an accessible location. The sustainability appraisal accompanying the Local Plan indicated that whilst there was flood risk, it performed well in many other sustainability indicators. The viability testing of the Plan did not indicate that the site was undeliverable. Sites outside the locality would not be reasonable alternatives for this community.

The site is allocated for Canal related tourism development, retail and employment uses to take account of the potential flood risk matters. In formulating the Local Plan it was considered that redevelopment is required to maintain the sustainability of the local community and the Council has considered flood risk in formulating its redevelopment strategy.

In conclusion the development is required for sustainability reasons and on previously developed land. The developer will need to demonstrate through a site specific flood risk assessment that the development will be safe and will not increase flood risk elsewhere and seek opportunities through use, design and layout to minimise and reduce flood risk.



SA1a Site Boundaries



Source SFRA2

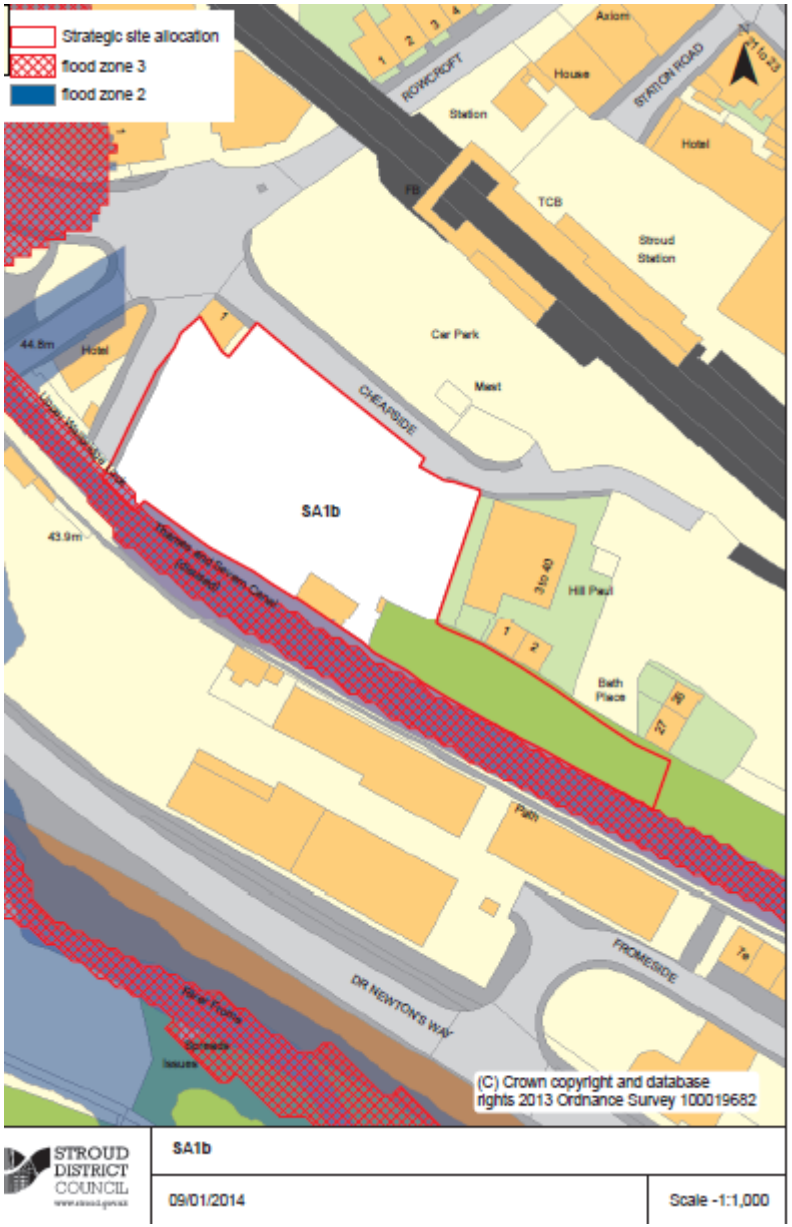
SA1a

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1b	**Land at Cheapside**	0.45Ha. Sui Generis. Former Builders Merchants Yard cleared.	Brownfield	Yes	No	No	No	Industrial Heritage Conservation Area Cheapside is located adjacent to the town centre and town centre uses and housing are appropriate.	Allocated for 30 dwellings, town centre and canal uses

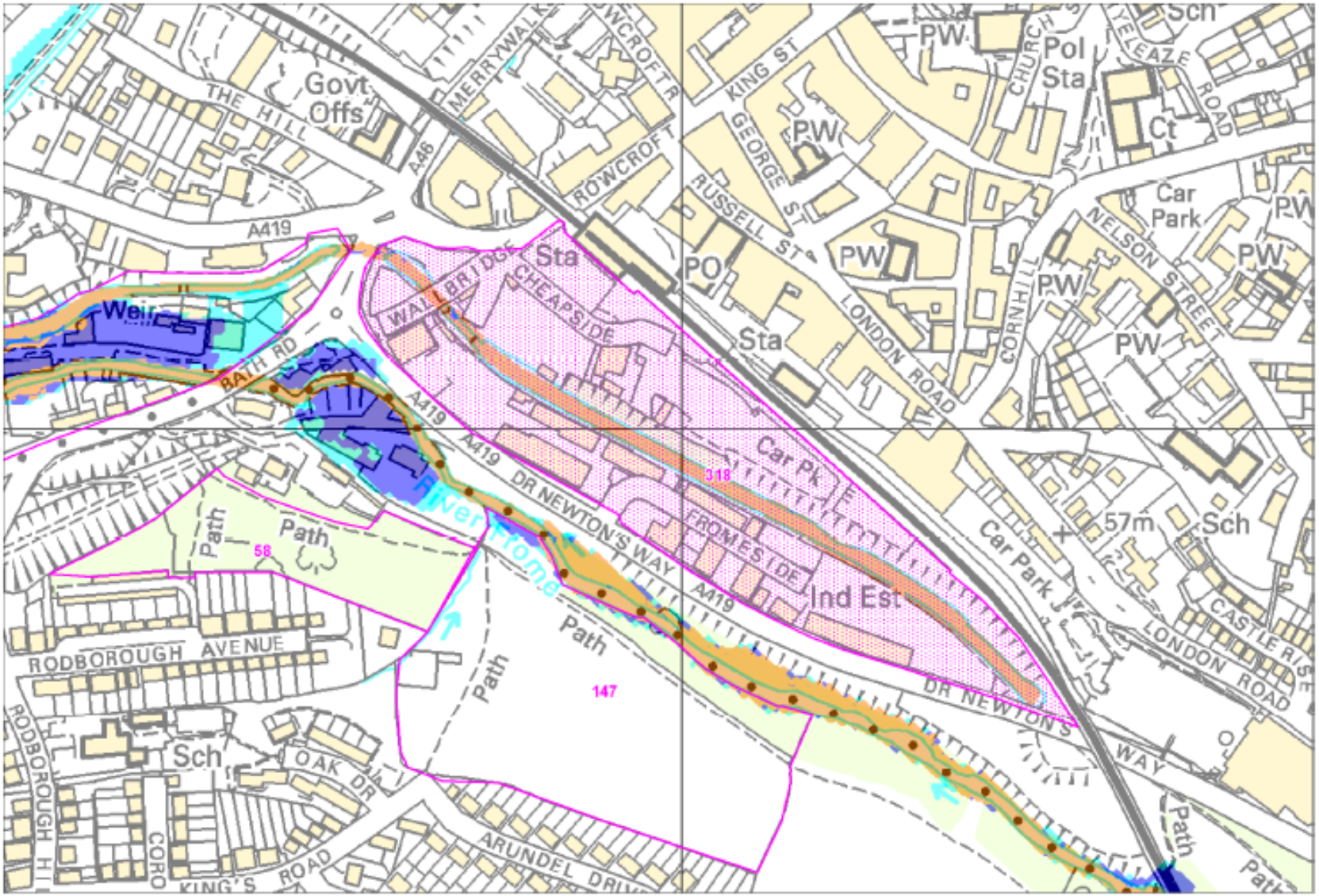
Supporting Commentary and Recommendations

This brownfield site is fully located in Flood Zone 1 where a variety of uses could potentially be carried out. It is located in an important position at the gateway to the town centre. The site comprises vacant land and a historic canal wharf side building. The canal that abuts the site is shown as Flood Zones 2, 3a and 3b in the SFRA. Historically the site comprised a railway goods yard and a variety of other uses making use of its relationship to both the Stroudwater Canal and Rail infrastructure. The site has an embankment which leads down to the Canal edge. The former wharf building on the edge of flood zone 2 could be considered as a water compatible use which is part of the infrastructure to support the canal use.

The site is allocated for 30 dwellings, town centre and canal related uses in the current Draft Plan. The site was allocated in the last Adopted Local Plan for a range of uses to support the Town Centre including residential. There was a resolution to grant planning permission on 9th July 2008 for a revised application varying permissions S.03/930 and S.04/1073/FUL to increase the number of dwellings from 85 to 103, to create 2675 square metres of office space, 860 square metres of office/retail space, 897 square metres of retail space, and a crèche of 123 square metres in area and to decrease car parking provision from 99 to 73 including all consequential elevation changes subject to a legal agreement. This was not completed with issues regarding a housing market downturn, access to a strategic mains sewer and land stability. This allocation has therefore sought to reduce the potential development capacity taking account of the issues which arose previously. This capacity reduction should also allow SuDS features and a reduction in surface water runoff arising from this site. All development proposals for this site must be accompanied by a flood risk assessment.



SA1b Site Boundaries



Source: SFRA2

SA1b

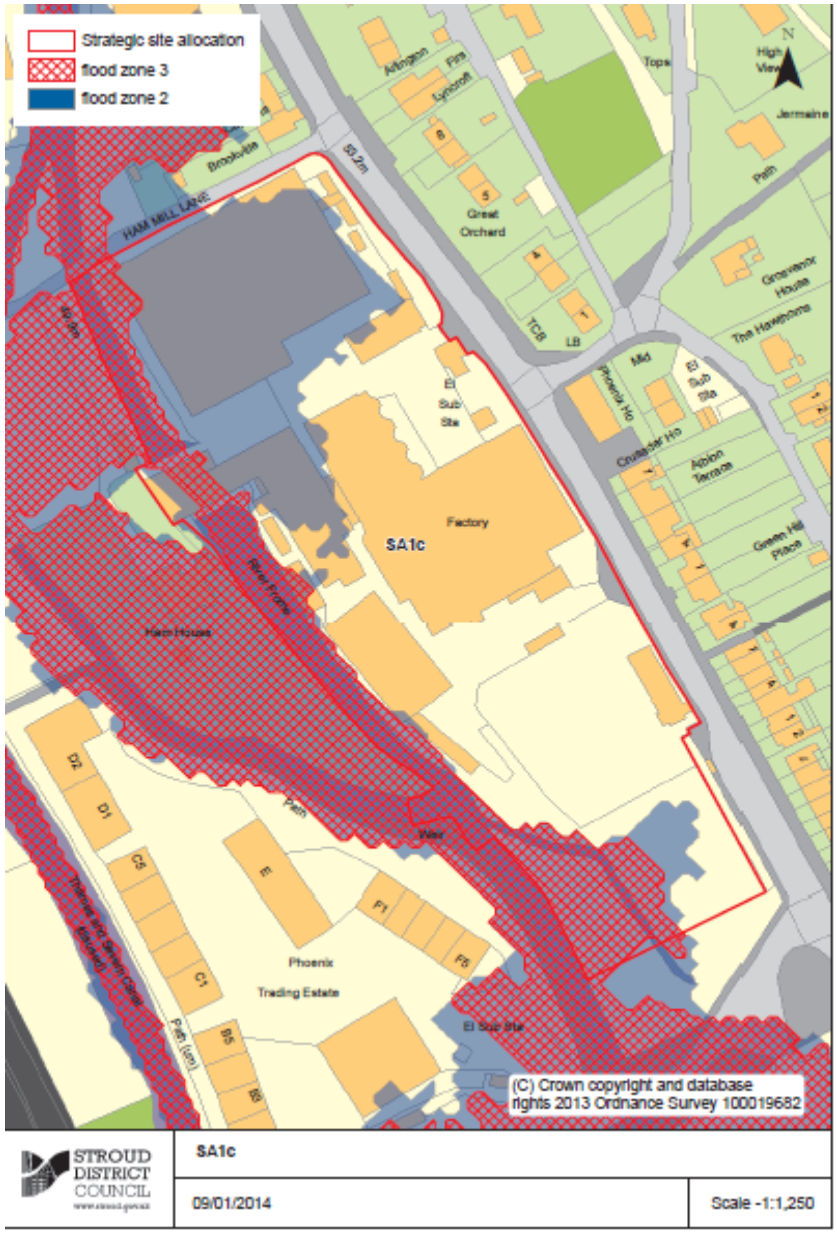
Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1c	**Ham Mill**	2.01Ha B2 – Former Carpet Factory.	Brownfield	Yes	Yes	Yes	Yes	Industrial Heritage Conservation Area Ham Mills has potential for housing and high quality office space based on conserving & adapting the historic mill & enhancement of its setting.	Allocated for 100 dwellings and employment uses

Supporting Commentary and Recommendations

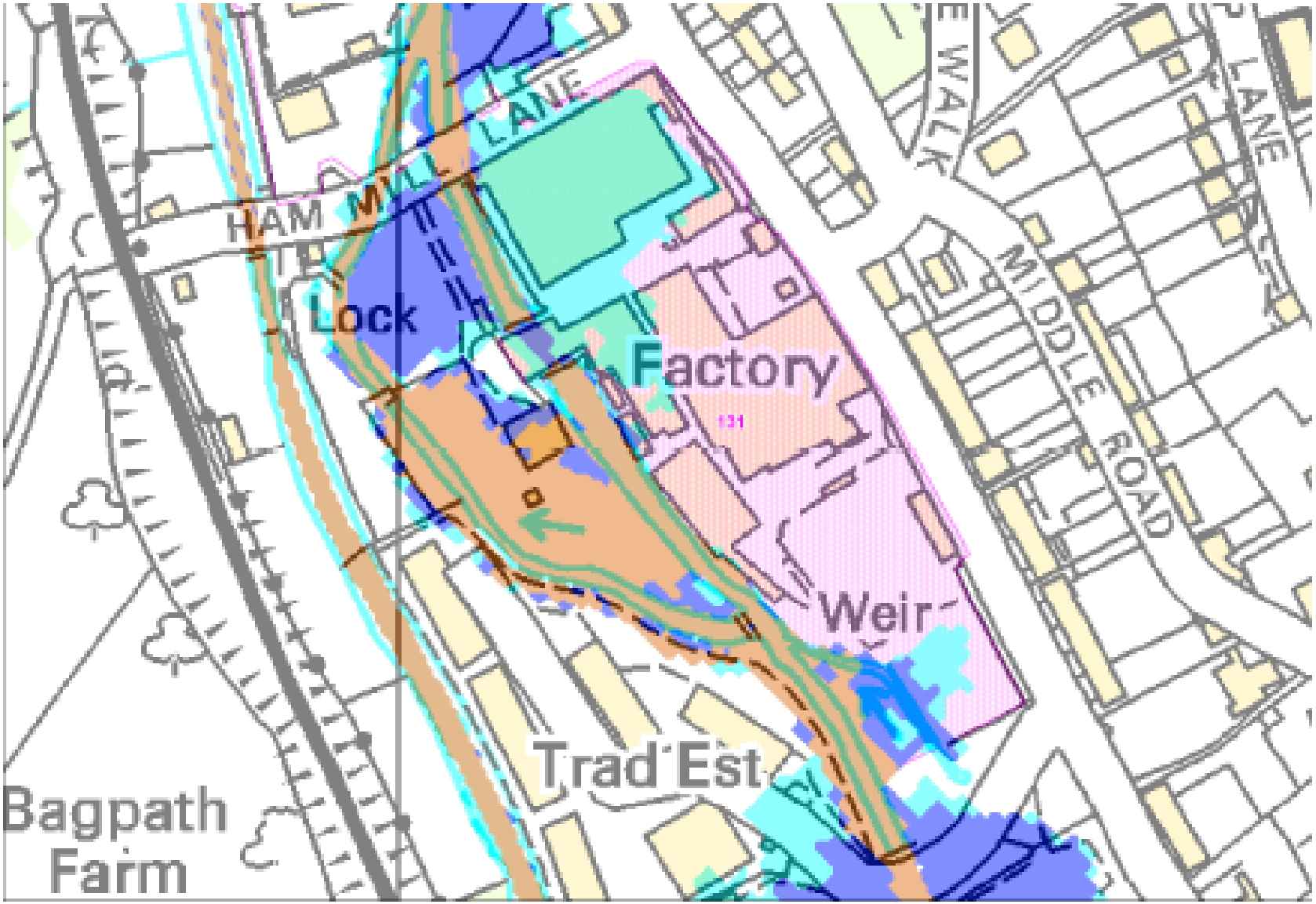
This site is located in Flood Zones 1, 2, 3a &3b. The site was a protected key employment site in the last Local Plan. The site comprises a listed Mill building and other ancillary buildings of mixed age. About 58% of the site is located within flood zone 1. The remaining 42% is located in Flood Zones 2, 3a & 3b. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. All development proposals for this site must be accompanied by a flood risk assessment. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed.

The previous Adopted Local Plan designation of this brownfield site as a key employment site indicates the importance of this area to the local community for employment in an accessible location. The viability testing of the Local Plan did not indicate that the site was undeliverable. Sites outside the locality would not be reasonable alternatives for this community. There may be opportunities to reinstate areas which can operate as functional floodplain. Previously developed land adjacent to watercourses should provide opportunities to incorporate space for flood water to reduce flood risk to new and existing development. This site is important for its historic significance and is a key feature within the Industrial Heritage Conservation Area. The site is accessible. In order to secure longer term conservation of the Listed Building, alternative uses will be sought with less vulnerable uses.

The 2011 SHLAA identified this site for potential 130 dwellings. In the Draft Local Plan the site is allocated for 50 dwellings and employment uses. The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems;; and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. Such an approach should accord with NPPF flood risk requirements and will help ensure that new development is safe, will not increase flood risk elsewhere, , and measures put in place to ensure that flood risk is reduced.



Site Boundaries



Source: SFRA2

SA1c

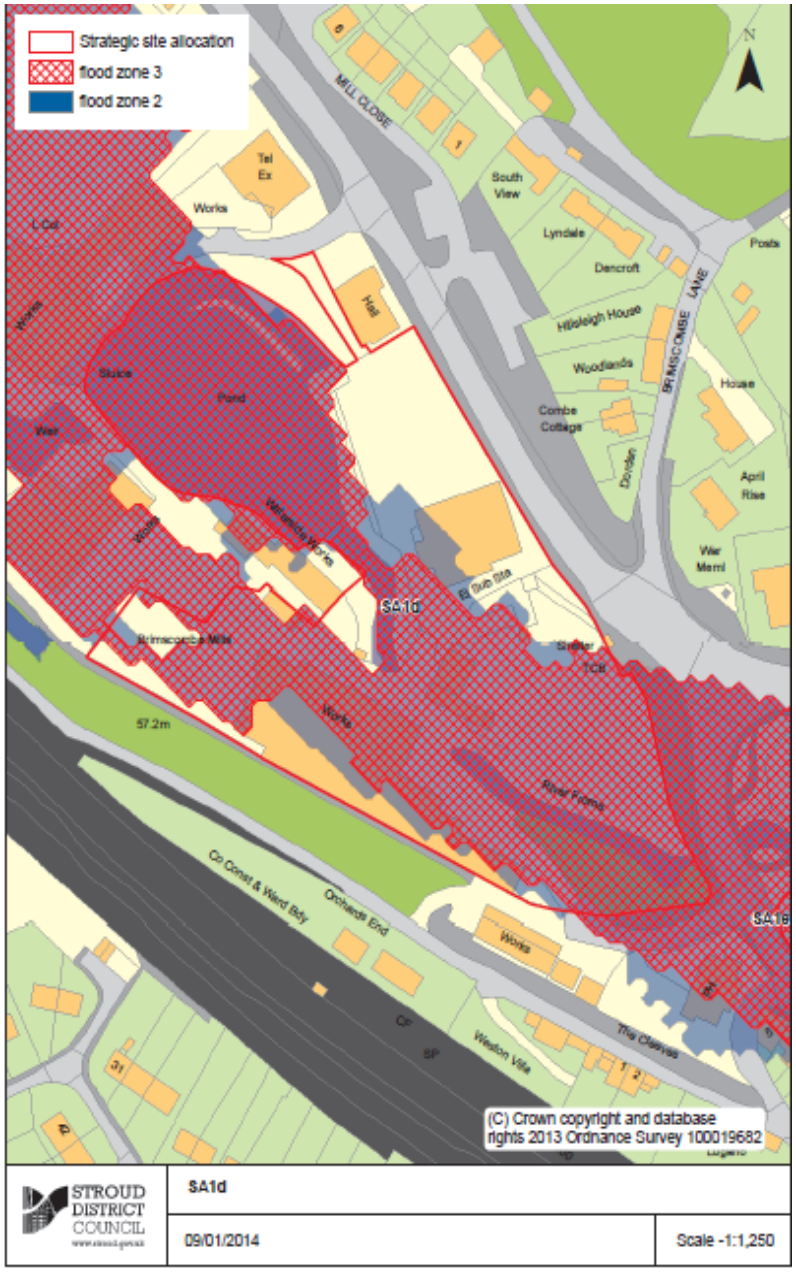
Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1d	**Brimscombe Mill**	1.71Ha B1- B8 uses.	Brownfield	Yes	Yes	Yes	Yes	Industrial Heritage Conservation Area Brimscombe Mill has potential for housing and employment to achieve environmental enhancement & to create a restored mill pond.	Allocated for 40 dwellings and employment uses

Supporting Commentary and Recommendations

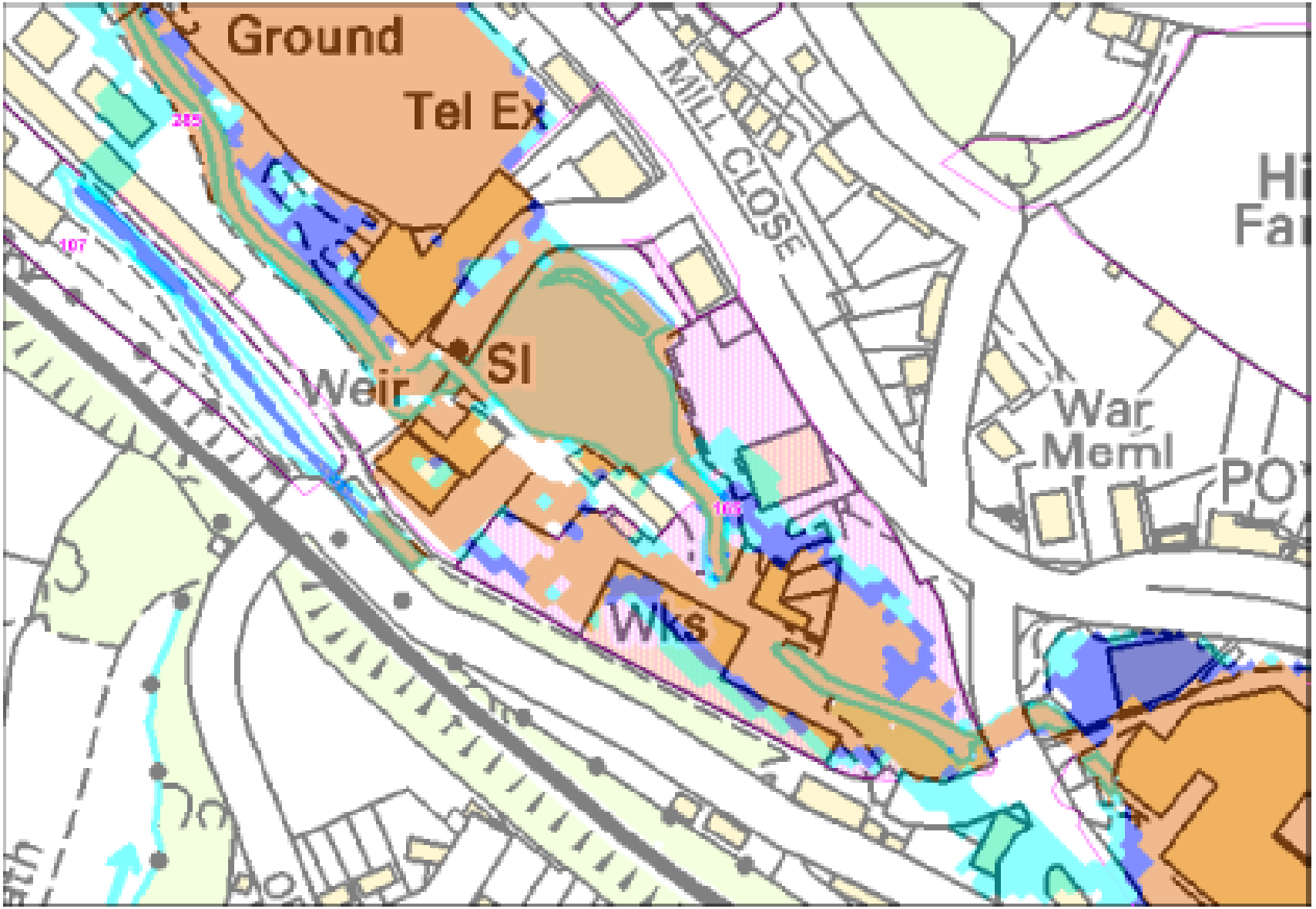
This site is located in Flood Zones 3b, 3a, 2 and 1. The site was a protected key employment site in the last Local Plan. The site comprises a variety of buildings of mixed age. About 24% of the site is located within flood zone 1. The remaining 76% is located in Flood Zones 2 3a & 3b.. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed. The site should not be developed until the adjoining Cotswold Canal has been reinstated from Brimscombe Port to Ocean Bridge, or until a site specific Flood Risk Assessment demonstrates that the site can be safely developed with more vulnerable development being located in Flood Zone 1 and without increasing flood risk on or off site.

The previous Adopted Local Plan designation of this brownfield site as a key employment site indicates the importance of this area to the local community for employment in an accessible location. The viability testing of the Local Plan did not indicate that the site was undeliverable. Sites outside the locality would not be reasonable alternatives for this community. There will be opportunities to enhance areas which can operate as functional floodplain and flood storage such as the on-stream Mill Pond which is heavily silted at present. Sluice gate redesign may also help floodwater management.. Previously developed land adjacent to watercourses should provide opportunities to incorporate space for flood water to reduce flood risk to new and existing development. This site within the Industrial Heritage Conservation Area and the Mill Pond is valued by the Local community as a feature. The site does contain some former Mill structures and ancillary buildings. The site is accessible. Development here should support the Canal restoration and functioning. The Canal will contribute to flood water conveyance and storage upon completion. The sustainability benefits of this brownfield site to the community from careful regeneration are considered to outweigh flood risk. Any development will need to be accompanied by a site specific flood risk assessment to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and will reduce flood risk overall.

The 2011 SHLAA identified this site for potential 77 dwellings. In the Draft Local Plan the site is allocated for 40 dwellings and employment uses. The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems; relocate existing development to land in zones with a lower probability of flooding; and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. Such an approach should accord with NPPF flood risk requirements and will help ensure that new development is located in the parts of the site at lower risk , and measures put in place to ensure that flood risk is reduced.



Site Boundaries



Source SFRA2

SA1d

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1e	**Brimscombe Port**	3.85Ha D2, B1-B8 uses	Brownfield	No	No	No	Yes	Industrial Heritage Conservation Area Brimscombe Port has opportunities to provide canal facilities including moorings on a reinstated stretch of water, listed buildings, providing visitor facilities & housing & high quality employment.	Allocated for 150 dwellings, canal related tourism development and employment uses

Supporting Commentary and Recommendations

This site is located fully within Flood Zone 3b. . The site must not be developed until the Cotswold Canal has been reinstated from Brimscombe Port to Ocean Bridge. Upon completion the Canal will alter the flood zones at this site by creating flood water conveyance and storage. This means the site will be developable in future. The site was a protected key employment site in the last Local Plan. The site comprises a variety of buildings including Listed Buildings and other buildings of mixed age. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed.

The previous Adopted Local Plan designation of this brownfield site as a key employment site indicates the importance of this area to the local community for employment in an accessible location. The viability testing of the Local Plan did not indicate that the site was undeliverable. Sites outside the locality would not be reasonable alternatives for this community. Development should accord with the NPPF and measures put in place to ensure that flood risk is reduced. There are a no. of recent permissions regarding changes of use. These permissions are set below:

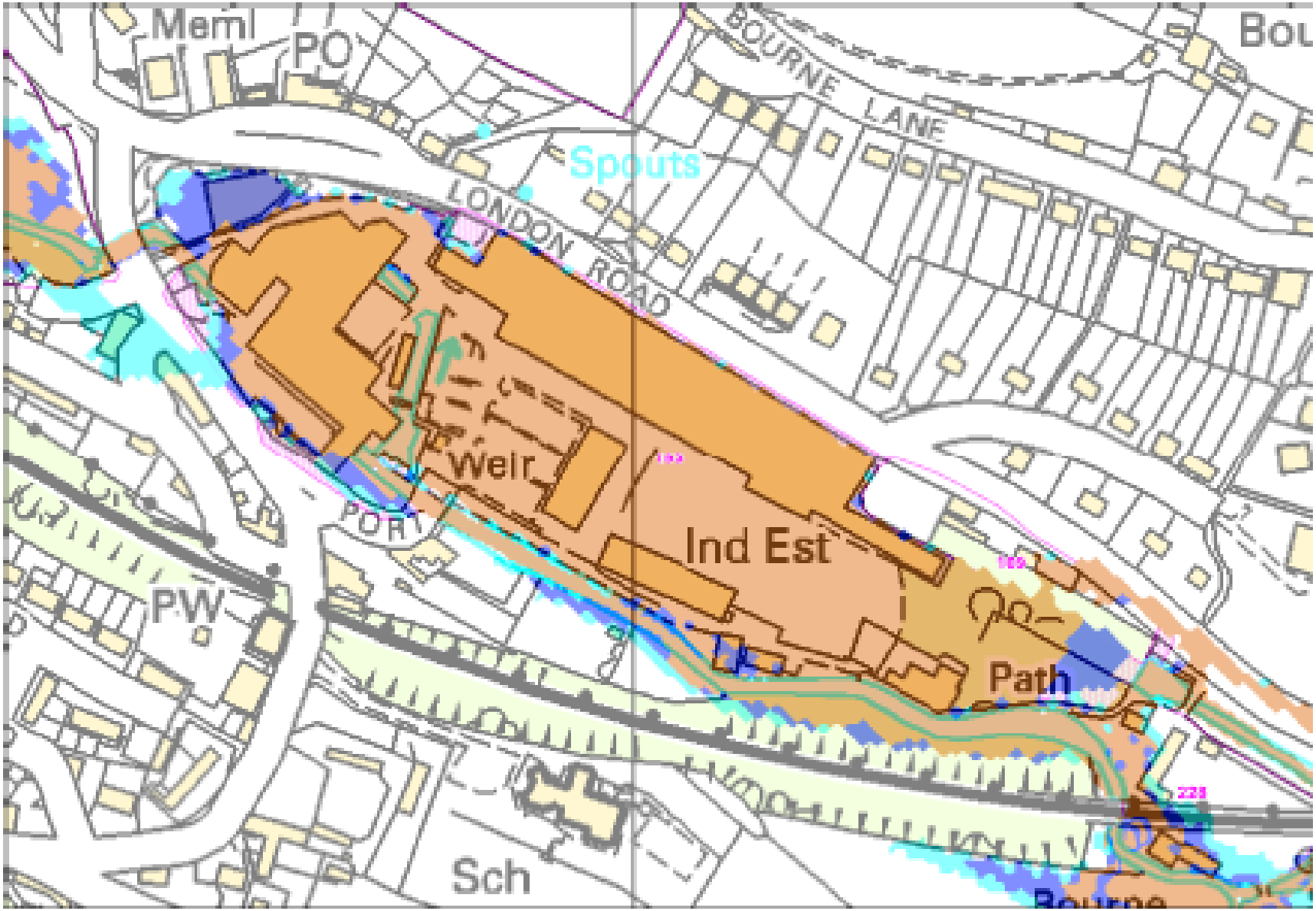
- Unit 2 Brimscombe Port – S.13/1377/COU - Change of use from an Industrial unit (B2 use) to leisure activity with cafe (D2 use) together with the creation of entrance doors.
- Unit 3 Brimscombe Port – S.13/1654/COU - Change of use from industrial unit to a leisure activity centre with ancillary shop and cafe. Creation of new window openings and internal alterations to fire exits .
- Unit 4 Brimscombe Port - S. 13/0080/COU - Proposed change of use from industrial (B2) to a mixed use - psychological, therapeutic and education services with gym, exercise and activity space.

There will be opportunities on the Port with redevelopment to enhance significant areas which can operate as functional floodplain and flood storage such as the former Port Area (currently filled in and built upon). Previously developed land adjacent to water courses may provide opportunities to incorporate space for flood water to reduce flood risk to new and existing development. This site is an essential part of the Industrial Heritage Conservation Area. The

site is accessible to a range of services. Development here will support the Canal restoration and functioning. The Canal and Port will contribute to flood water conveyance and storage in due course. This site's importance and significance to the local community and the wider District was recognised within the abortive Brimscombe Port Area Action Plan (AAP) work. This document was not proceeded with as the site took on a strategic housing, employment and regeneration significance to the wider District. The sustainability benefits of this brownfield site to the community from careful regeneration are considered to outweigh flood risk. Any development will need to be accompanied by a site specific flood risk assessment to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and will reduce and manage flood risk in the wider River Frome catchment.

The 2011 SHLAA identified this site for potential 168 dwellings. In the Draft Local Plan the site is allocated for 100 dwellings, canal related tourism development and employment uses. The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. It will seek to conserve the historic features of the site (including listed buildings) whilst enabling the restoration of the Stroudwater Navigation and the Thames and Severn Canals. The allocation should provide wider sustainability benefits to the local community and a focus for community and canal restoration

Site Boundaries



Source SFRA2
SA1e

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1f	**Wimberley Mills**	2.60Ha B1 and B2 uses.	Brownfield	Yes	Yes	Yes	Yes	Industrial Heritage Conservation Area Potential, to relocate existing businesses, to enable re-use for housing and high quality employment space, including opportunities to de-culvert the river corridor.	Allocated for 100 dwellings and employment B1-B8 uses

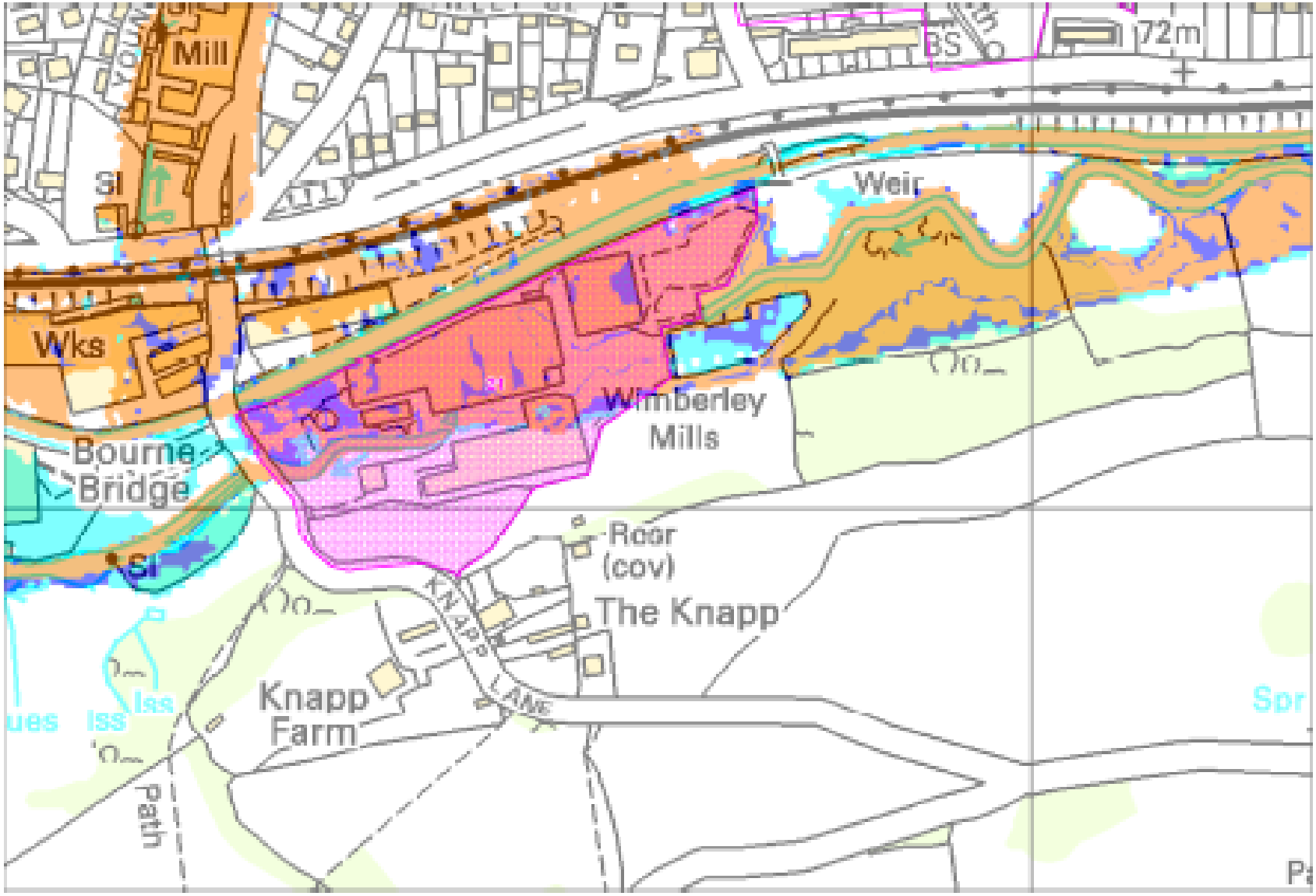
Supporting Commentary and Recommendations

This site is located in Flood Zones 3b, 3a, 2 & 1. The site comprises a variety of buildings of mixed age, some of which have employment uses. About 33% of the site is located within flood zone 1. The remaining 67% is located in Flood Zones 2, 3a & 3b. It is essential that development at this site de-culverts the River Frome to take the site out of the floodplain. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed.

The viability testing of the Local Plan did not indicate that the site was undeliverable. De-culverting of the river channel across the site will offer opportunities to enhance areas which can operate as functional floodplain and flood storage. Previously developed land adjacent to watercourses should provide opportunities to incorporate space for flood water to reduce flood risk to new and existing development. This site is within the Industrial Heritage Conservation Area and could offer positive regeneration and conservation benefits. Development here should also support the Canal restoration and functioning. Any development will need to be accompanied by a site specific flood risk assessment to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and will reduce flood risk overall.

The 2011 SHLAA identified this site for a potential 87 dwellings. In the Draft Local Plan the site is allocated for 50 dwellings and employment B1-B8 uses. The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems; relocate existing development to land in zones with a lower probability of flooding; and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. Such an approach should accord with NPPF flood risk requirements and will help ensure that new development is located in the parts of the site at least risk, and measures put in place to ensure that flood risk is reduced.

Site Boundaries



Source SFRA2

SA1f

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA1g	**Dockyard Works**	1.47Ha B2 use.	Brownfield	Yes	Yes	Yes	Yes	Industrial Heritage Conservation Area Potential to relocate existing businesses, to enable re-use for housing and high quality employment space.	Allocated for 30 dwellings and employment B1-B8 uses

Supporting Commentary and Recommendations

This site is located almost entirely within Flood Zone 3b. Flood Zones 3a, 2 and 1 are also present. The site comprises a variety of buildings of mixed age, which have employment uses. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed.

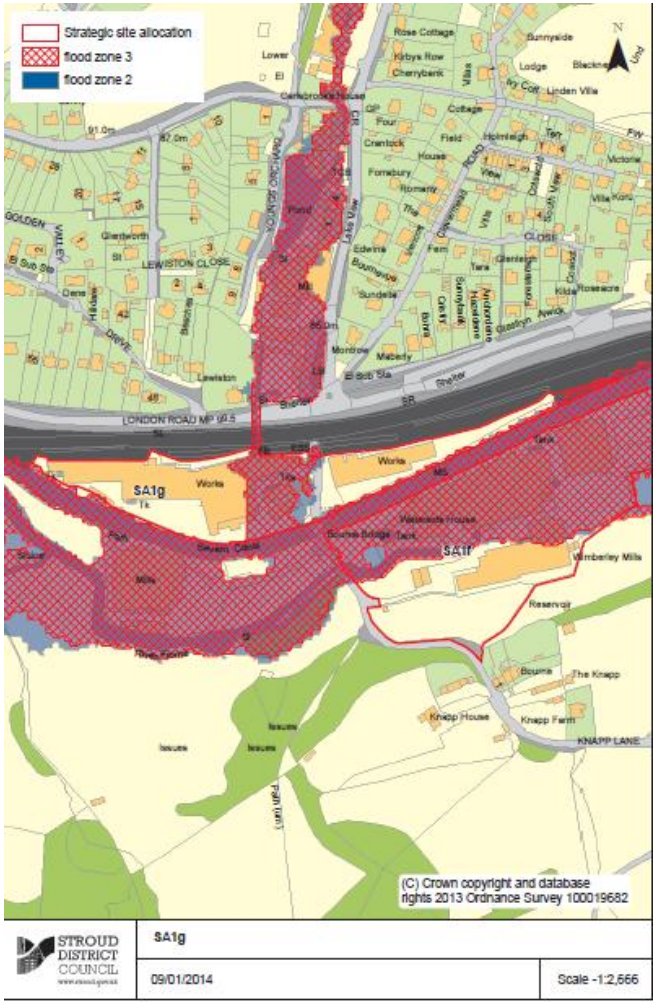
There are a number of ways development could reduce flood risk on the site to ensure development is appropriate. These are likely to include:

- Phasing the site so that it is not developed until the adjacent Wimberley Mills allocation site (SA1f) has been developed. This is because the opening up of the culvert through that site will reduce the floodplain, which will also help to ensure the Dockyards site allocation (SA1g) will have safe access and egress via Knapp Lane to the south.
- De-culverting the Toadsmoor Stream on site to reduce flood risk across the site
- Reinstatement and maintenance of the adjacent canal channel off site to reduce flood risk on site and improve river corridor functioning

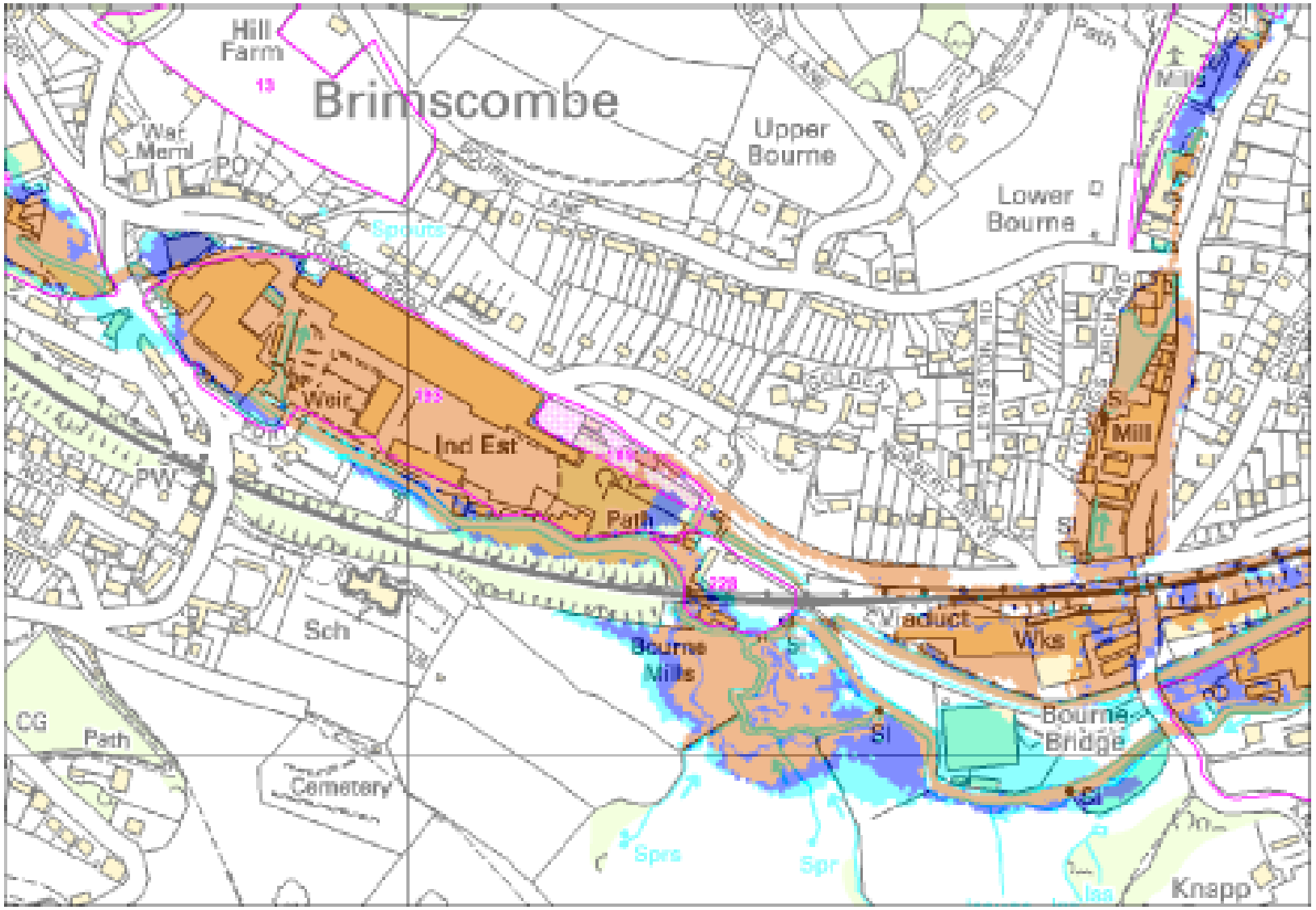
It is expected that all the above measures will be addressed through redevelopment of the site, unless a site specific Flood Risk Assessment demonstrates that the site can be safely developed without taking the above measures. Any site specific flood risk assessment must demonstrate that development will be safe without increasing flood risk on or off site in accordance with the requirements of the NPPF and NPPG.

The viability testing of the Local Plan did not indicate that the site was undeliverable. Previously developed land adjacent to watercourses will provide opportunities to incorporate space for flood water to reduce flood risk to new and existing development. This site is within the Industrial Heritage Conservation Area and should offer positive regeneration and conservation benefits. Development here should also support the local community as well as canal restoration. Accessibility will be important, particularly during flood events and this will need to be addressed. Additionally, the site layout should take a Sequential Approach and locate the more vulnerable uses (residential dwellings) in the part of the site at least risk of flooding.

The 2011 SHLAA identified this site for a potential 49 dwellings. In the Draft Local Plan the site is allocated for 30 dwellings and employment B1-B8 uses. The sustainability benefits of this brownfield site to the community from careful regeneration are considered to outweigh flood risk and should avoid more vulnerable uses in the floodplain. The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems; relocate existing development to land in zones with a lower probability of flooding; and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. Such an approach should accord with NPPF flood risk requirements and will help ensure that new development is located in the parts of the site at least risk of flooding, and measures put in place to ensure that flood risk is reduced



Site Boundaries



Source SFRA2

SA1g

SA1g (Zoomed In)

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA2	**Land West of Stonehouse**	Agricultural	Greenfield	Yes	Yes	Yes	Yes	A watercourse bisects the site. Some 92% of the 96.78 Ha site is in Flood Zone 1.	Land west of Stonehouse is identified as a sustainable mixed use urban extension to Stonehouse,. It will deliver a high quality development including housing (1350), employment (B1,B2 & B8 on 10Ha), local centre and open space that meets the day-to-day needs of its residents.

Supporting Commentary and Recommendations

Land west of Stonehouse is located north of the A419 between the Chipmans Platt roundabout and theStroudwater Industrial Estate. The site comprises two parcels of land. Land to the south and west of Nastend will be retained primarily in existing uses but offering opportunities for ecological enhancement. The remaining land to the north and east of Nastend and the Industrial Estate will be developed for residential, employment and community uses including landscaping and open space. The site could accommodate 1350 dwellings, incorporating at least 30% affordable housing unless independently scrutinised viability testing indicates otherwise, a local centre and 10 hectares of B1, B2 and B8 employment land.

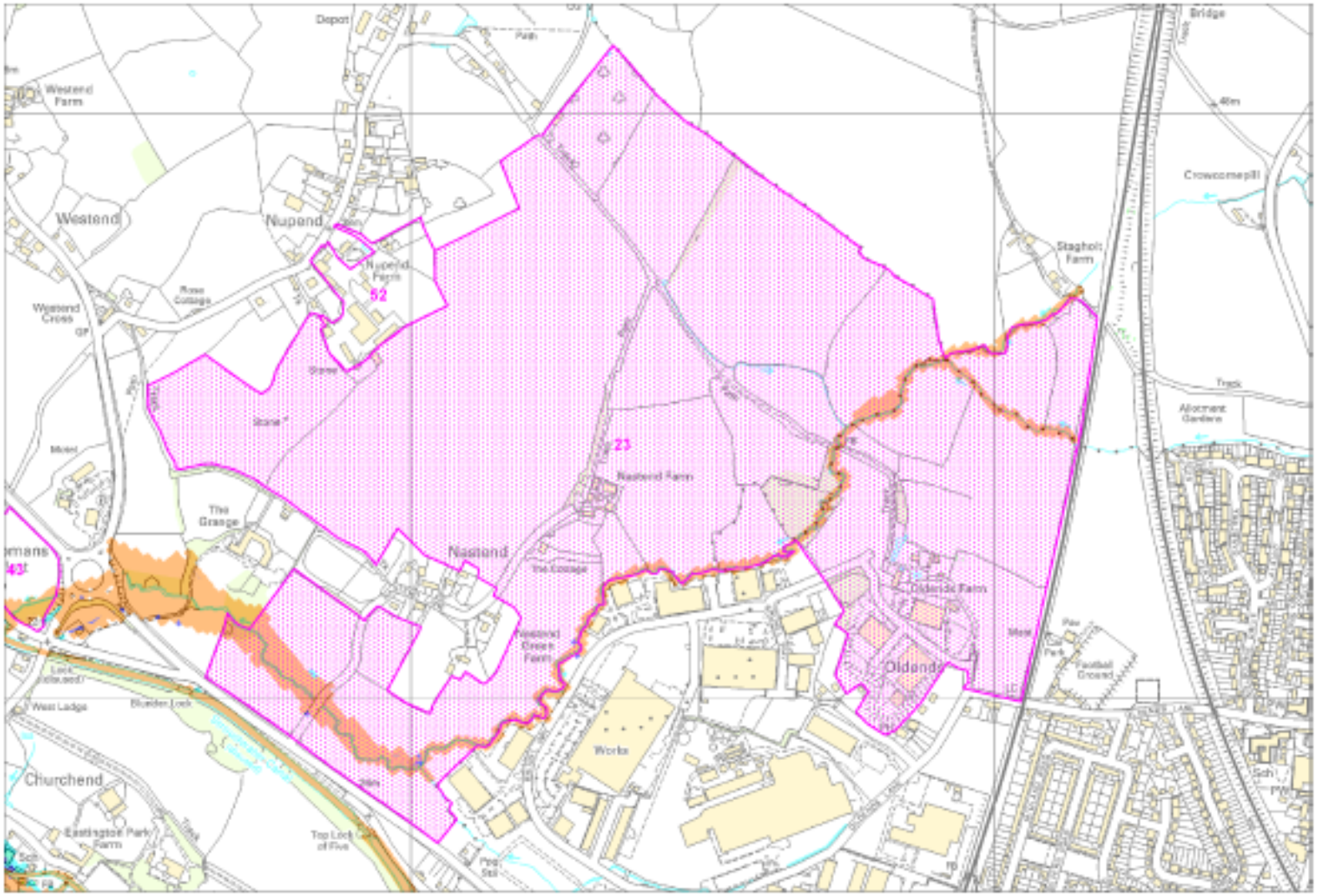
Employment land should include high quality office space and opportunities should be explored for small, incubator and grow on business units and for provision which facilitates industrial symbiosis. Phasing arrangements will be put in place to ensure that employment land is developed and completed in parallel with housing land completions. This part of site was promoted to meet employment needs identified in the 2013 Employment Review. The proposed employment area is bounded by a watercourse that was modelled in the SFRA Level 2. The site physically adjoins the existing Stroudwater Business Park which benefits from its location to the Strategic Road Network and accessibility. GCC have previously marketed the site for employment uses. The site is allocated for employment B1-B8 uses. Development here should ensure the future growth of this key employment area.

92% of the greenfield site is substantially located in Flood Zone 1 where there are no restrictions in flood risk terms on what development can occur. There is a small floodplain comprising Zones 3b, 3a & 2 along the banks of the watercourse. The sustainability benefits of this to the community from employment growth in a popular business location are considered to outweigh the limited flood risk from Oldbury/Colliers Brook . There should be no built development in the floodplain which should be left as open space alongside the watercourse for flood risk and biodiversity benefits.

The site will deliver a high quality sustainable and distinctive mixed use development accommodated in a series of interlinked neighbourhoods within an extensive landscape framework. The design vision and form and design of the main perimeter elevations will be submitted to and agreed by the Council before reserved matters applications can be considered. Subsequent applications will be required to demonstrate how they conform to the design vision and masterplan. This will ensure that design quality is maintained through the build out of the development.

Working closely with the Environment Agency in 2014 the Council considered and agreed that the flood risk update mapping was not materially different to the original mapping. This conclusion would not necessitate a full SFRA2 site review. The site incorporates all 4 flood zones. Nevertheless any application on this site will require a site specific FRA and the Council working with the Environment Agency shall continue to ensure compatibility with policies in the Local Plan, the NPPF and latest practice set out in the NPPG. It is clear from the Indicative Masterplan that all the proposed development should be located within Flood Zone 1 (Low Risk) area, which is in accordance with both the site specific policy recommendations resulting from the outputs of the Level 2 SFRA work undertaken (Site 23), and the sequential approach as advocated in Paragraph 103 of the National Planning Policy Framework (NPPF).

The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and the appropriate application of sustainable drainage systems at source and using features such as ponds , swales and create space for flooding to occur by improving functional floodplain and flood flow pathways in open channels and by identifying, allocating and safeguarding open space for flood storage. Such an approach will help ensure that new development is located in the parts of the site at leas risk of flooding, and measures put in place to ensure that wider flood risk is reduced.



Site Boundaries and SFRA2

SA2

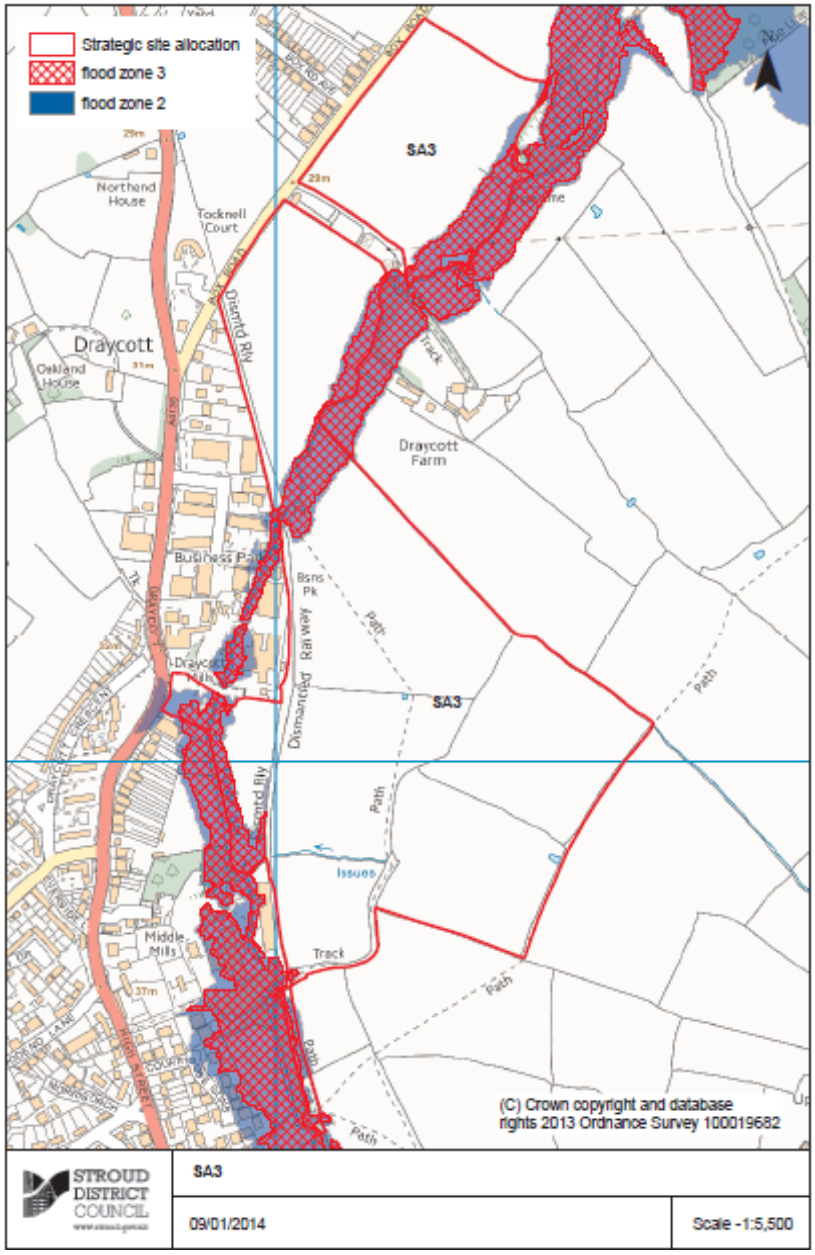
Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA3	**Land north east of Cam**	31.80Ha Agricultural land adjacent to existing employment estate.	Greenfield	Yes	Yes	Yes	Yes	The River Ewelme crosses the site.	Allocated for up to 450 homes and 11.4 hectares of B1, B2 and B8 employment land providing 1,500 new jobs

Supporting Commentary and Recommendations

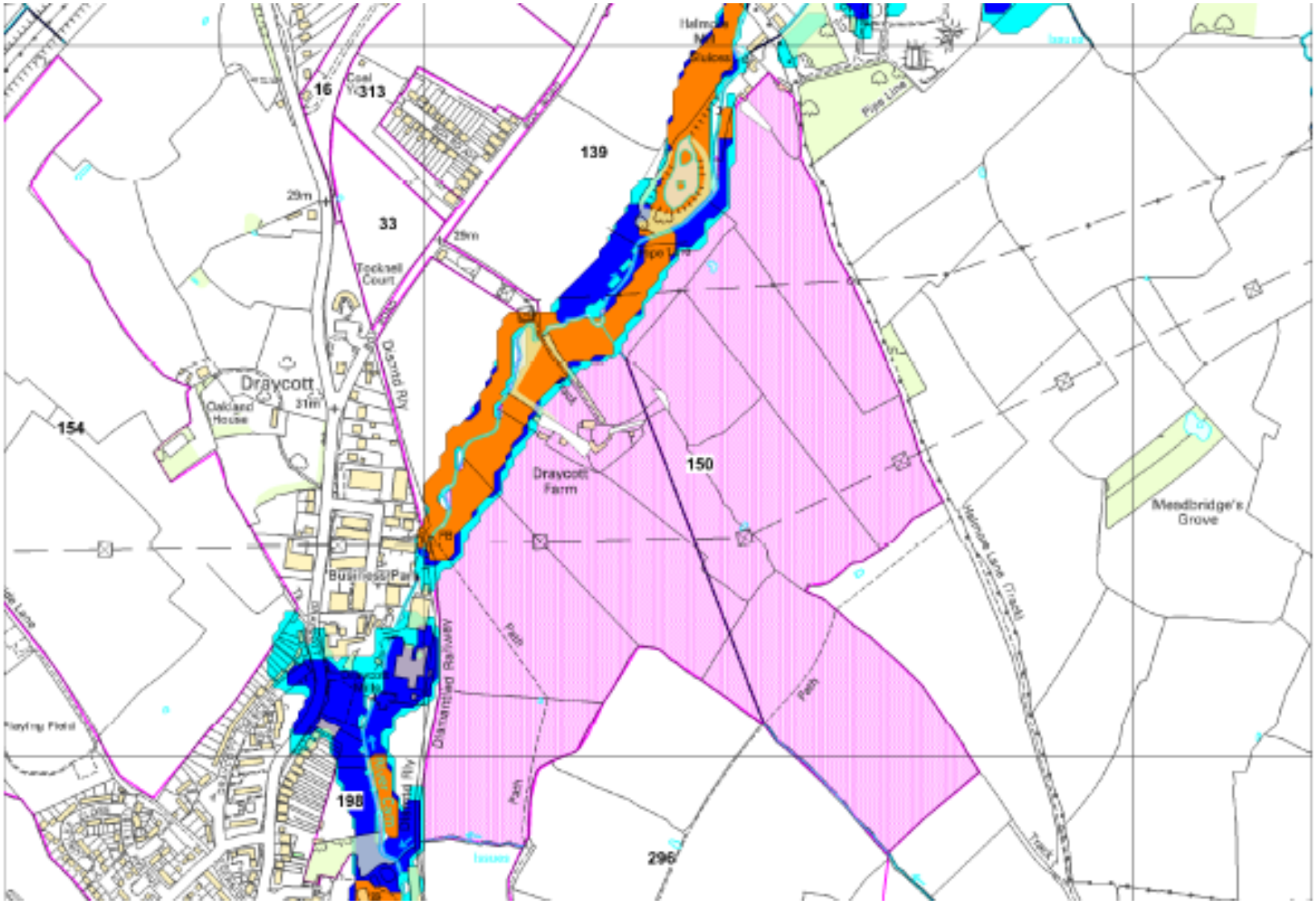
This site is located in Flood Zones 1, 2, 3a and 3b. The site adjoins the settlement of Cam. About 92% of the site is located within flood zone 1. The remaining 8% is located in Flood Zones 2, 3a and 3b.. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed.

The previous Adopted Local Plan had an employment allocation on a portion of this wider site. This indicates the importance of this area to the local community for employment. This scheme had planning permission and incorporated floodplain storage areas, SuDS, and a river wildlife corridor – references S.09/0611/OUT & S.12/1325/VAR. The delivery issue at that time was the cost of a new bridge to access the greenfield area beyond the river. Further opportunities should be sought to enhance significant areas which can operate as functional floodplain and flood storage and deliver biodiversity enhancements. The sustainability benefits of this brownfield site to the community from careful development are considered to outweigh the limited flood risk. Any development will need to be accompanied by a site specific flood risk assessment to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, should reduce and manage flood risk in the wider River Cam catchment. The viability testing of the Local Plan did not indicate that the site was undeliverable and the Sustainability Appraisal considered that the Plan allocations offered significant positive effects on the economy and employment aspects and support inward investment to the District as a whole.

The earlier iterations of the Local Plan identified this site for potential 1500 dwellings. The site comprises 29.1 hectares of land which will be developed for residential, employment and community uses including landscaping and open space. In the Draft Local Plan the site is allocated for 450 dwellings, including 135 affordable dwellings, unless viability testing indicates otherwise. The other parts of the mixed use allocation identifies 11.4 hectares of B1, B2 and B8 employment land and accessible natural green space and public outdoor playing space. This level of development should give a generous degree of flexibility to address flood risk and biodiversity management matters. Development is envisaged as a series of interlinked neighbourhoods and employment areas within an extensive landscape framework. The Local Plan identifies that the site is located adjacent to the River Cam and the disposal of surface water run-off will nevertheless require careful consideration to ensure that neither the development not areas downstream are at risk of flooding. Surface water attenuation facilities will be required to serve discrete areas of development. The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and create space for flooding to occur by restoring functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. Development should accord with the NPPF and measures put in place to ensure that flood risk is reduced.



Site Boundaries



Source SFRA2

SA3

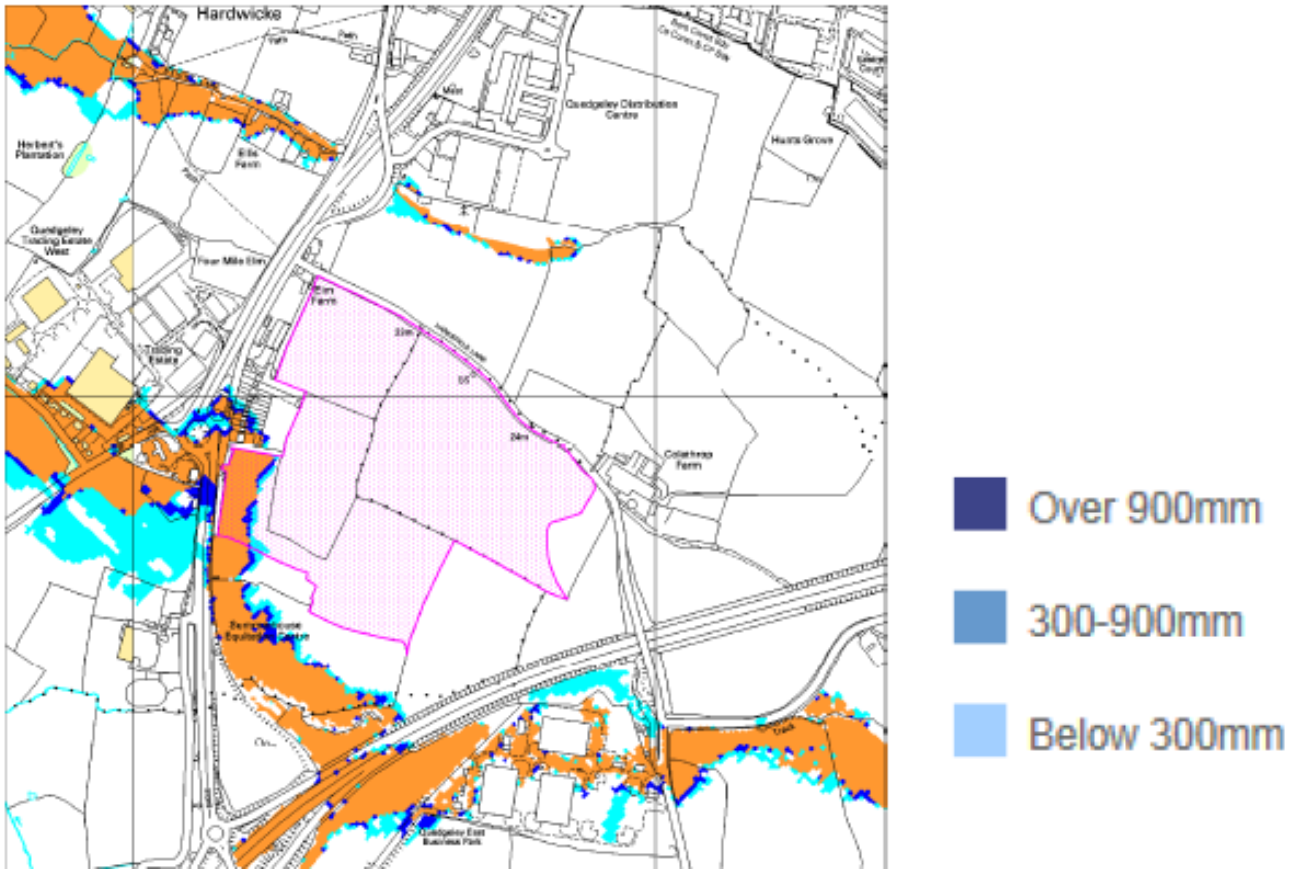
Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA4	**Hunts Grove Extension**	27.26 Ha. Agricultural land adjacent to Hunts Grove - allocated as major mixed use site in previous Local Plan (2005). Being delivered during and beyond that previous plan.	Greenfield	Yes	Yes	Yes	Yes		Allocated for 500 dwellings and when complete the community will comprise 2,250 dwellings together with necessary supporting infrastructure, employment, social, commercial & community uses.

Supporting Commentary and Recommendations

This site was reassessed with SA4a in order to determine whether there had been any changes to the modelled flood outlines within the site from the original SFRA2 2012 Study. With the updated hydraulic modelling along the Beaurepair Brook, there has been no significant change to the extent of fluvial flooding within Site SA4. The modelled flood zones show that the majority of the development site is still located within Flood Zone 1, with the south western corner of the site marginally affected by Flood Zones 2, 3a and 3b. About 95% of the site is located within flood zone 1. The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses in this Flood Zone. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed. The areas identified within Flood Zones 2, 3a and 3b will be kept as open space.

Land east of the A38 at Colethrop Farm, Hardwicke, known as Hunts Grove, was allocated as a major mixed use development site within the Stroud Local Plan (2005) to be delivered both during and beyond the plan period. Outline planning permission for 1,750 dwellings and 5.75 hectares of employment land, together with a local centre comprising community and commercial facilities and a new primary school, was granted in 2008. A masterplan for the development accompanied the outline permission and construction of the first phase of 350 dwellings commenced in 2011. The extension to Hunts Grove is intended to complete the development and support and extend the community infrastructure planned for in this location. The site comprises approximately 26 hectares of land to be developed for residential, supporting infrastructure, including landscaping and open space. There may be opportunities to re-examine some of the masterplanning principles that relate to the approved scheme, as part of the masterplanning of the proposed extension. The objective will be to create a high-quality, sustainable urban extension with a strong sense of place that meets the day-to-day needs of its residents. Indeed the allocation identifies the acceptable management and disposal of surface water including sustainable urban drainage systems (SuDS) to meet the requirements of the NPPF and NPPG.

The 2011 SHLAA identified this site for a potential 795 dwellings and earlier iterations of the Core Strategy identified up to 750 dwellings. The reduced capacity of this site enables greater flexibility to incorporate flood risk measures. Any development will need to be accompanied by a site specific flood risk assessment to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and will reduce flood risk overall. In the site specific Flood Risk Assessment further investigation should be undertaken into the residual risk to Site SA4 from a culvert blockage or collapse of the culvert beneath the B4008 at the south western corner of the site. This should include a more detailed representation of the watercourse channel and structures along the watercourse, incorporating a full survey of the Beaurepair Brooks. Areas identified as being at risk from surface water flooding generally coincide with the modelled flood zones and the depth of flooding is predominantly classified as low.



SA4 Site Boundaries & SFRA2

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA4a	**Land at Quedgeley East**	13 87Ha Agricultural land adjacent to Quedgeley East Business Park	Greenfield	Yes	Yes	Yes	Yes		Allocated for B1-B8 employment uses.

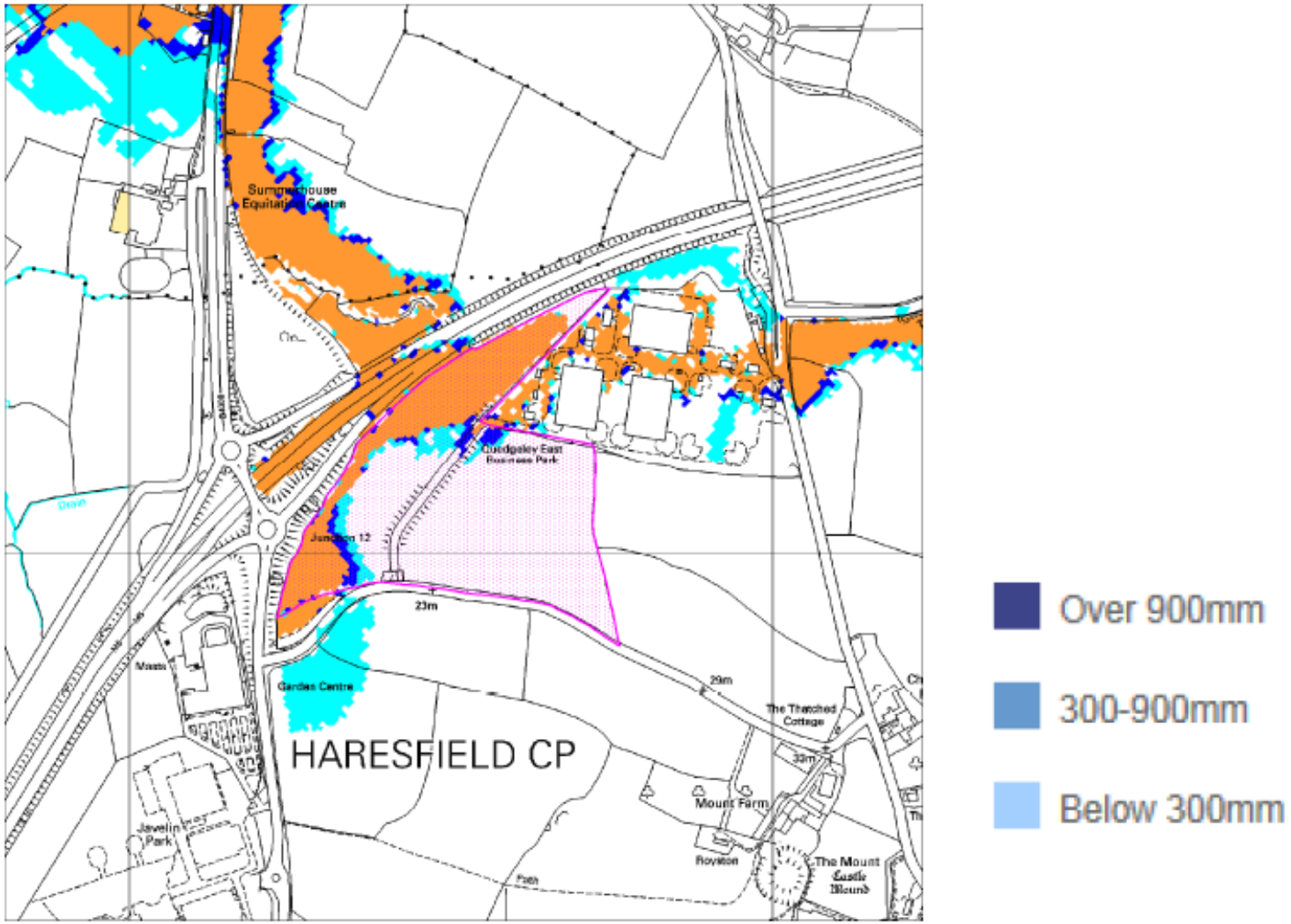
Supporting Commentary and Recommendations

This site was promoted to meet employment needs identified in the 2013 Employment Review. The site is bounded by and bisected by watercourses that were originally modelled in the SFRA Level 2 in relation to Hunts Grove. Site SA4a 'Land at Quedgeley East' covers approximately 13.87ha. Working closely with the Environment Agency, it was agreed that both this site and the Hunts Grove site (SA4) to the north required additional modelling in order to extend the existing Level 2 SFRA model approximately 1200m upstream along the Beaurepair Brook to enable a more comprehensive assessment of fluvial flood risk to the site. A residual risk of flooding from blockage at three structures along the Beaurepair Brook has been identified and hydraulic modelling has been undertaken to determine the residual risk to both sites SA4 and SA4a. The greenfield site is partly located in Flood Zone 1 (76%) where a variety of employment uses could potentially be carried out. The rest of the site is located within flood zones 3b, 3a and 2. The watercourses modelled have been represented using a Digital Terrain Model (DTM) as opposed to a detailed river channel survey and as such, the flow paths may be overestimated as the capacity of the river channel may be greater than that contained within the DTM.

The site is allocated for employment B1-B8 uses, benefitting from its location by the Strategic Road Network. Given the extent of the modelled Flood Zone 3b within the site, and the moderate to significant flood hazard classification, the development must help to reduce flood risk to the adjacent M5 motorway by providing floodplain storage on site and keeping the floodplain and flow paths as open space. There will be no built development in flood zones 3b, 3a and 2. If car parking cannot be avoided in flood risk locations it should only be allowed if appropriate management plans are in place and people and property can be made safe in the event of a flood.

The sustainability benefits of this to the community from employment growth in a popular business location are considered to outweigh flood risk and should avoid built development in the floodplain. The Sustainability Appraisal considered that the Plan allocations offered significant positive effects on the economy and employment aspects. The Council will seek opportunities to reduce the overall level of flood risk in the area, including flooding to the M5 motorway, through the layout and form of the development and the appropriate application of sustainable drainage systems and create space for flooding to occur by improving functional floodplain and flood flow pathways and by identifying, allocating and safeguarding open space for flood storage. A site-specific flood risk assessment will need to accompany any planning application to ensure that new development is safe, located in the locations at least risk, and measures put in place to ensure that wider flood risk is reduced. It is recommended that development is directed away from the identified surface water risk areas, and the identified surface water flow routes are kept as open space. It is recommended that the flood risk assessment includes a more detailed representation of the watercourse channel and structures along the watercourse, incorporating a full survey of the Beaurepair Brook. It must be

ensured that safe access and egress to any development is achievable for the 1 in 100 year plus climate change flood event. This scenario indicates that parts of the road into the site from Quedgeley East Business Park are affected. In general the flood hazard classification is significant. Access to the site will therefore need to be from the B4008 to the south. The flood risk assessment should confirm safe access and egress to the site can be achieved during the 1 in 100 year plus climate change event.



SA4a Site Boundaries and SFRA2

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA5	**Sharpness Docks**	96.23Ha Development within the Sharpness Docks Estate.B1- B8 uses and ancillary Port related uses.	Brownfield/ Greenfield	Yes	Yes	Yes	Yes	A vision for the Sharpness Docks Estate has been prepared by the owners, the Canal and River Trust, a charitable trust.	Allocated for dock related uses, dock related industrial and distribution uses and the extension to the north to include up to 300 dwellings to support a mix of tourism, leisure and recreational uses

Supporting Commentary and Recommendations

Following the submission of the original Level 2 SFRA, the boundary of Site 321(known as ***Site SA5***) was revised and the current site allocation being brought forward in Stroud District Council's Local Plan Submission Draft differed significantly in size and extent to the boundary assessed as part of the original Level 2 SFRA. In addition, the Environment Agency's (EA's) Flood Map for Planning (Rivers and Sea) were updated. It was therefore agreed that the site should be re-assessed to produce a new modeled outline for the area within the vicinity of the site.

The assessment has shown that Site SA5 lies predominantly in Flood Zone 1. When using the latest EA Map for Planning (Rivers and Sea), approximately 70% of the site is located within Flood Zone 1 and the remaining 30% is located in Flood Zones 2 and 3. However, the latest Flood Map for Planning (Rivers and Sea) incorporates the historic flood outline for the River Severn, which extends into the north western part of the site. The evidence presented as part of this site assessment has demonstrated that the topography of the site at this location is significantly higher (10-25m) than the eastern parts of the site; and as such, will not flood to the extend shown in the historic flood outline. The flood outlines created as part of the 2007 River Severn Tidal model have therefore been used to determine the fluvial and tidal flood risk to the site. These have shown that for both the fluvial and tidal events, flood risk areas, Flood Zones 2 and 3 are mainly confined to the Old Basin Arm area within the northern part of the site, a small area to the south of the Tidal Basin and along the western boundary of the site.

It is therefore recommended that the Sequential Approach is applied to the site, with development directed towards the parts of the site at least risk. It is also recommended that car parking in the northern part of the site is avoided; however if car parking is necessary within the identified risk areas, it should only be allowed if appropriate management plans are in place and people and property can be made safe in the event of a flood. It must also be ensured that safe access and egress can be achieved for the 1 in 100 year climate change event and that appropriate signage indicating evacuation routes from the camping area is provided as the Old Arm Basin and the area along the northern most boundary of the site are shown to be located within Flood Zone 2 and 3.

Where isolated pockets of shallow surface water flooding have been identified within the site, it is recommended that where possible they are kept as open space. However, it may be possible to mitigate the risk in these areas through the use of appropriate SUDS techniques. In all instances, opportunities to improve runoff rates from a site and reduce flood risk should be sought.
The tables given in Appendix 1 set out the vulnerability of different land uses and the appropriateness of different uses. New development should be designed and constructed such that the health, safety and welfare of people are appropriately managed and any development will need to be accompanied by a site specific flood risk assessment to demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere.

The site was a protected key strategic employment site in the last Local Plan, comprising of listed wharf buildings and other ancillary port buildings of mixed ages. Designation of this brownfield site as a key employment site indicates the importance of this area to the local community for employment in an accessible location. The viability testing of the Local Plan did not indicate that the site was undeliverable. Sites outside the locality for port related activities would not be reasonable alternatives for this community. Previously developed land adjacent to water courses may provide opportunities to incorporate space for flood water to reduce flood risk to new and existing development.

A vision for the Sharpness Docks Estate has been prepared by the owners, the Canal and River Trust. Whilst land to the south of the Docks is envisaged to remain a consolidated dock operation with opportunities to expand onto adjoining allocated land, the vision for the north of the Docks envisages a tourism-led mixed use development, benefiting existing communities and taking advantage of the marina, canal, heritage, natural environment and undeveloped land. The site comprises a number of parcels reflecting existing resources and historic activities, including the marina and land for new housing, a new camp and area for tourism development and amenity grounds.

The sustainability benefits of this brownfield sub regional important port site to the community from careful regeneration are considered to outweigh flood risk, but the Council will seek opportunities through the layout and form of the development to manage flood risks. The 2013 The Sustainability Appraisal identified that housing here had negative implications from a flood risk perspective, but it was recognised that it should be possible to locate development away from identified flood risk areas with some minor trade-offs. Overall it concluded the Plan offered significant positive effects.

SA5 Site Boundaries & SFRA2

Site Ref	Address / Location	Site Size (ha) and Existing Use	Brown / Green Field	Flood Zone 1	Flood Zone 2	Flood Zone 3a	Flood Zone 3b	Comments	Potential Dwelling Capacity
SA5a	**Land south of Severn Distribution Park.**	9.77Ha Agricultural land adjacent to Severn Distribution Park.	Greenfield	Yes	Yes	Yes	Yes		Allocated for B2 - B8 uses as an extension to the existing park.

Supporting Commentary and Recommendations

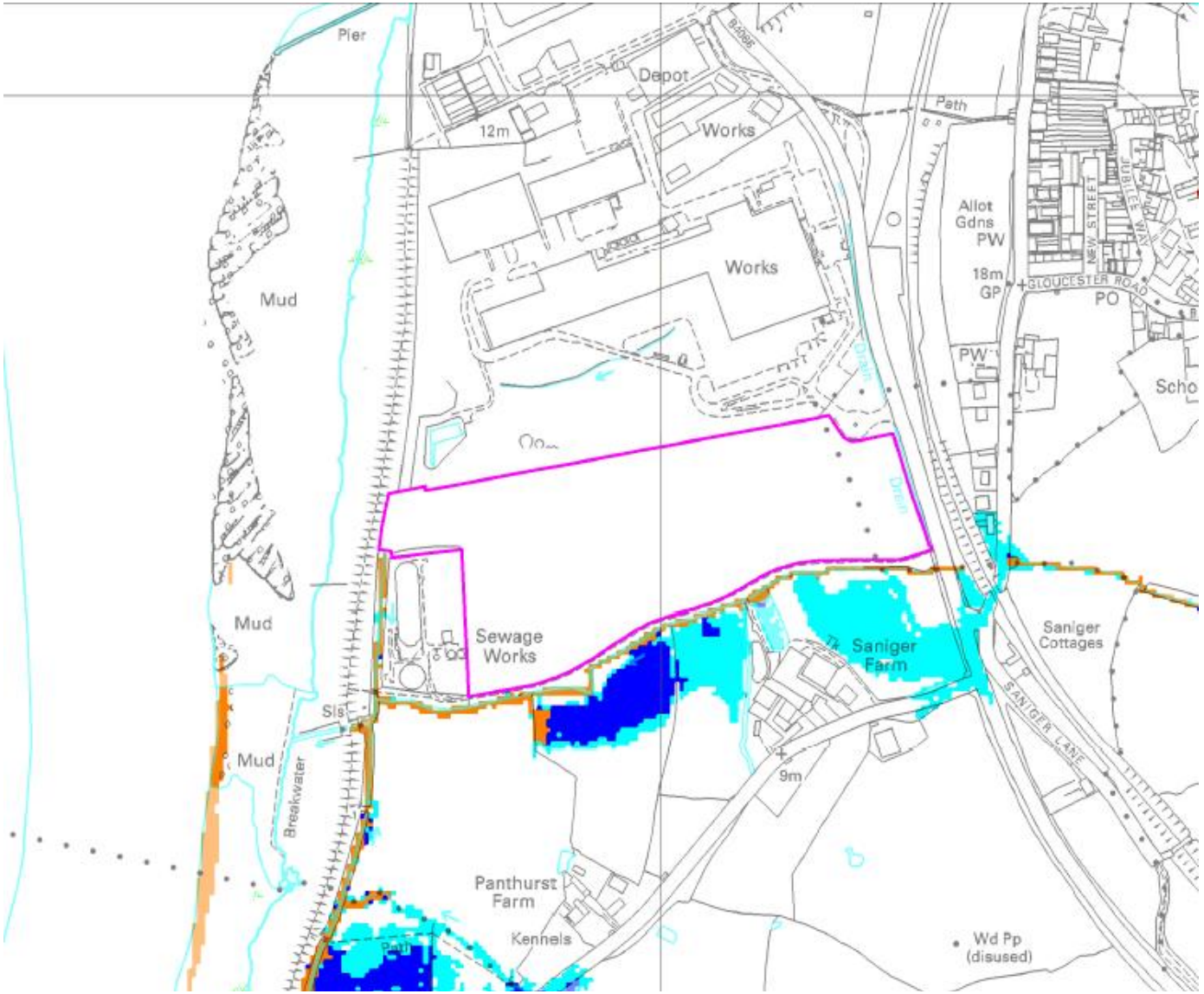
The SFRA2 Addendum Report identified that Site SA5a covers an area of approximately 9.8ha. The B4066 forms the eastern boundary of the site. There are no watercourses within the site itself; however, there are three watercourses and a drain within the vicinity of the site. The River Severn is located about 80m to the west of the site. A series of raised defences are located along the left bank of the watercourse within the area adjacent to the potential development site. The main aim of the Level 2 SFRA update is to reassess the risk of flooding from all sources to Site SA5a, incorporating the updated flood zone maps released by the Environment Agency in March 2014.

This site was promoted to meet employment needs identified in the 2013 Employment Review. The greenfield site is located substantially (60%) within flood zones 3b, 3a & 2, and these areas also correspond with the hazard mapping (the SFRA2 Update identified a high flood hazard classification for the breach scenario, particularly in the western part of the site). The rest of the site (40%) is located in Flood Zone 1 where port related business uses could potentially be carried out. Development must be located towards the part of the site at lowest risk in the north eastern extent of the site (Flood Zone 1). Wherever possible, the identified hazard risk area should be kept as open space, or the type of development should be compatible with the risk areas. For example, where areas of higher flood hazard have been identified, these should be set aside for 'Water Compatible' uses such as open space. It must also be ensured that safe access and egress to the site can be achieved for the 1 in 200 year climate change scenario. For the unnamed drain on the eastern boundary of the site, a development easement should be applied. The exact distance from the top of the banks of the drain should be negotiated with the Lead Local Flood Authority and the Lower Severn Drainage Board. .

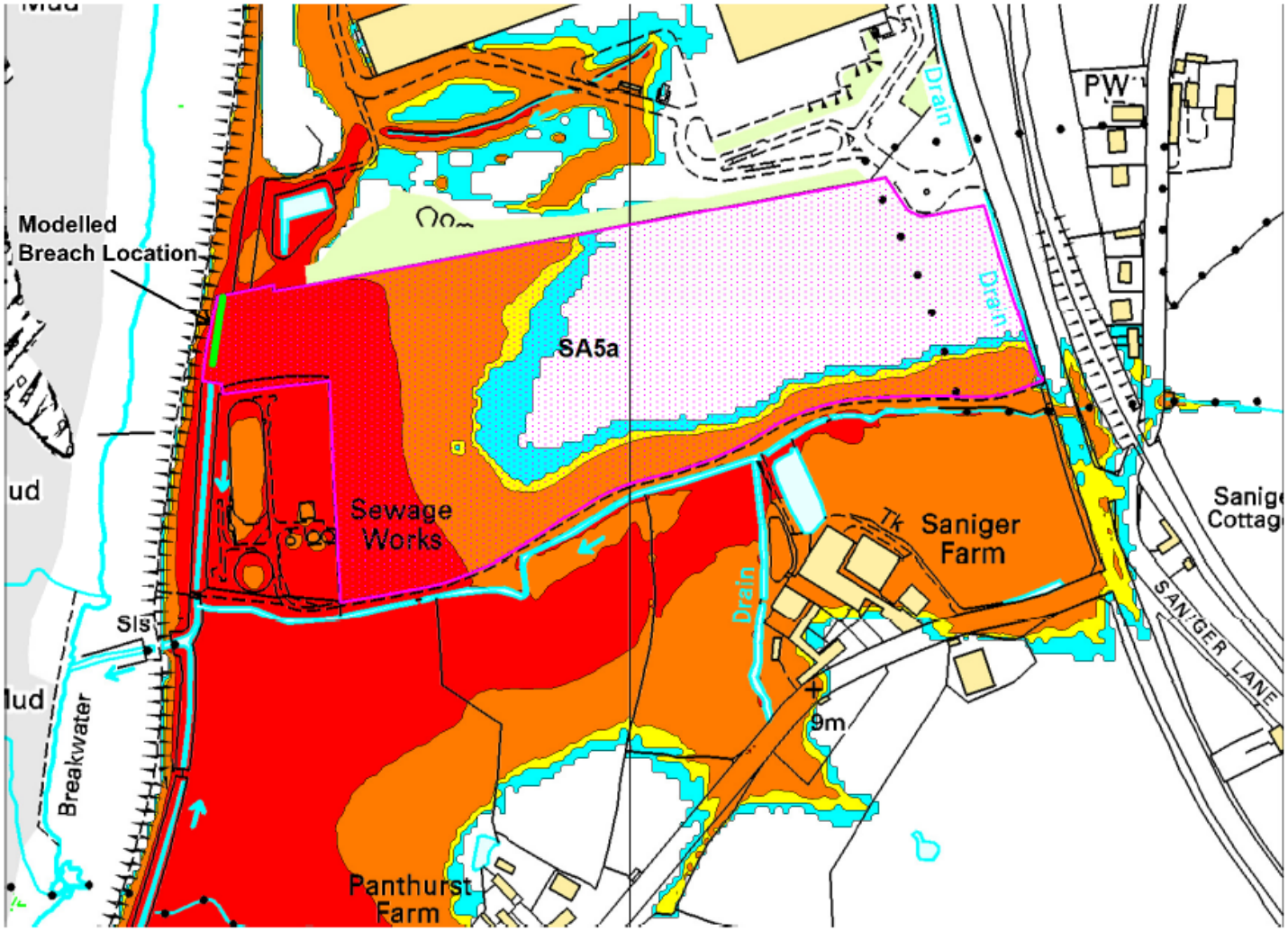
Land south of Severn Distribution Park is allocated for B2 or B8 uses as an extension to the existing park and should ensure the future growth of this key sub-regional employment area. There is demand for industrial and logistics premises focussed here at Severn Distribution Park. The viability testing of the Local Plan did not indicate that the site was undeliverable and the Sustainability Appraisal considered that the Plan allocations offered significant positive effects on the economy and employment aspects. The sustainability benefits of this to the community from employment growth are considered to outweigh flood risk and it will be necessary for a site specific flood risk assessment to demonstrate development will be safe.

The Council will seek opportunities to reduce the overall level of flood risk in the area through the layout and form of the development and financial contributions towards the flood defences and their maintenance where appropriate.. Development here will need to comply with habitat regulations

assessment recommendations and should include the appropriate application of sustainable drainage systems and create space for flooding to occur by improving flood flow pathways.



SA5a Site Boundaries and SFRA2



Defence Breach Scenario Flood Hazard Classification for Site SA5a (Light blue represents 'low' hazard, yellow moderate hazard, orange significant hazard and red 'extreme'hazard).

This map is included as it shows the modelled flood extent and flood hazard to the site based on the breach analysis undertaken. This map is a material consideration for this site as approximately 60% of the site is at risk from rapid inundation in a defence breach scenario..

8.0 Conclusions for site selection in the Local Plan

8.1 The Local Plan allocations play an important role in contributing to meeting housing and employment needs. In addition to housing land supply, there are other reasons why the Council is promoting significant residential development within and adjacent to the development limits, in some areas with flood risk. The Stroud Valley sites are located within the most accessible location within the District, where residents will have access to a range of services, jobs and facilities. They will also have a choice of modes of travel conveniently available to them, promoting sustainable travel patterns.

8.2 Residential is an important element of mixed-use development, which helps to make best use of urban land and create sustainable communities. Residential development is also important to bring additional residents into local communities, adding to their vitality and viability. In some of the cases such as Brimscombe Port and Brimscombe Mills the inclusion of some residential development on parts will assist with the overall viability of development proposals that will be brought forward and in turn facilitate development that has a positive impact on deliverability, accessibility, townscape, including the river, canal and heritage environments.

8.3 The Council's Local Plan Sustainability Appraisal demonstrates that the Council has attempted to balance the competing priorities of regenerating brownfield accessible sites within higher status settlements in the hierarchy and the risk of flooding that exists in those locations. Where possible the allocations have sought to direct development to areas at least risk of flooding and have reduced development capacities to take account of flood risk. Sites that are substantially located in higher flood risk zones such as Brimscombe Port are all previously developed sites where it is considered that they provide real regeneration potential, economic benefits and opportunities to incorporate space for flood water to reduce flood risk to new and existing development and deliver biodiversity improvements. Furthermore, a number of these sites already benefit from planning permission which has ensured that flood risk has been fully considered such as part of the land at NE Cam, Cheapside and Hunts Grove. The sites SA2 – Land West of Stonehouse, SA5a – Land south of Severn Distribution Centre and SA1f Wimberley Mills are currently the subject of planning applications and the Council is working with the Environment Agency to resolve any flood risk matters in the light of the SFRA2 and subsequent Addendum Reports recommendations.

8.4 The Council has no reason from the evidence base information available such as the Sustainability Appraisal and Plan Viability reports to identify that development cannot occur in a safe and sustainable manner, taking into account the flood risk that exists within these locations and the policy framework provided in the emerging Local Plan.

Appendix One

Table 1a: Flood risk vulnerability classification taken from NPPG

Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water-compatible development
• 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.	• 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").	• 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, subject to a specific warning and evacuation plan.	• 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).	• 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, subject to a specific warning and evacuation plan.

Footnotes to Table

- For any proposal involving a change of use of land to a caravan, camping or chalet site, or to a mobile home site or park home site, the Sequential and Exception Tests will be applied.
- Installations requiring hazardous substances consent -See Circular 04/00: *Planning controls for hazardous substances* (paragraph 18) at: www.communities.gov.uk/publications/planningandbuilding/circularplanningcontrols
- Landfill is as defined in Schedule 10 to the Environmental Permitting (England and Wales) Regulations 2010.

a) This classification table is based partly on Department for Environment, Food and Rural Affairs and Environment Agency research on *Flood Risks to People* (*FD2321/TR2*) at www.defra.gov.uk/science/Project_Data/DocumentLibrary/FD2320_3364_TRP.pdf and also on the need of some uses to keep functioning during flooding.

b) Buildings that combine a mixture of uses should be placed into the higher of the relevant classes of flood risk sensitivity. Developments that allow uses to be distributed over the site may fall within several classes of flood risk sensitivity.

c) The impact of a flood on the particular uses identified within this flood risk vulnerability classification will vary within each vulnerability class. Therefore, the flood risk management infrastructure and other risk mitigation measures needed to ensure the development is safe may differ between uses within a particular vulnerability classification.

Table 1b: Flood risk vulnerability and flood zone 'compatibility'

Flood risk vulnerability classification	Essential infrastructure	Water compatible	Highly vulnerable	More vulnerable	Less vulnerable
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	✓	***Exception Test required***	✓	✓
Zone 3a	***Exception Test required***	✓	✗	***Exception Test required***	✓
Zone 3b functional floodplain	***Exception Test required***	✓	✗	✗	✗

Key: ✓ **Development is appropriate.** ✗ **Development should not be permitted.**

IMPORTANT NOTE: For those sites where there are 3b outlines it was considered when formulating the Local Plan that redevelopment was required to maintain the sustainability of the local community, and the Council has considered flood risk in formulating its redevelopment strategy. However, such risks WILL still need to be fully addressed in the detailed assessment and design of proposals for planning applications. This is because the table identifies certain vulnerabilities of development that would not normally be appropriate in Flood Zone 3b**. Latest advice regarding Table 1b can be viewed at:** http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/flood-zone-and-flood-risk-tables/table-3-flood-risk-vulnerability-and-flood-zone-compatibility/