

## Part B – Please use a separate sheet for each representation

Name or Organisation:

Wisloe Action Group

3. To which part of the Local Plan does this representation relate?

Paragraph  Policy  Policies Map

4. Do you consider the Local Plan is :

4.(1) Legally compliant	Yes	<input type="checkbox"/>	No	<input type="checkbox" value="X"/>
4.(2) Sound	Yes	<input type="checkbox"/>	No	<input type="checkbox" value="X"/>
4 (3) Complies with the Duty to co-operate	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

Please tick as appropriate

5. Please give details of why you consider the Local Plan is not legally compliant or is unsound or fails to comply with the duty to co-operate. Please be as precise as possible.

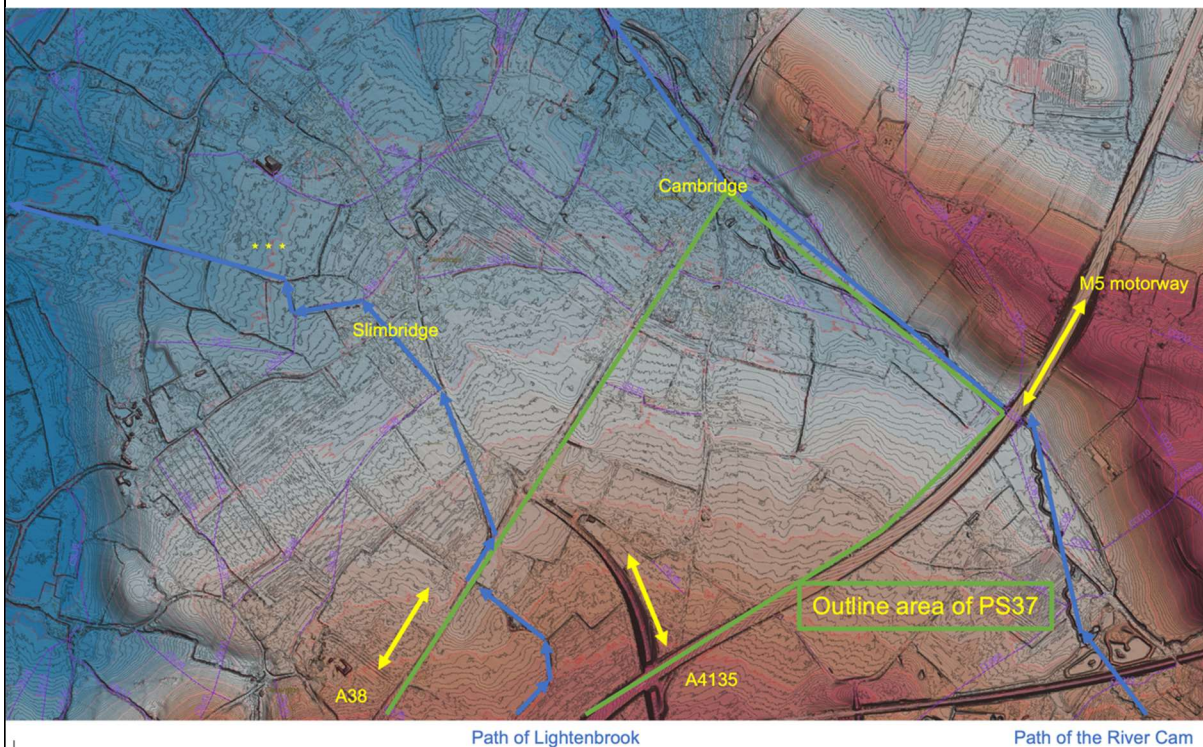
If you wish to support the legal compliance or soundness of the Local Plan or its compliance with the duty to co-operate, please also use this box to set out your comments.

### Background

1. The Stroud District Council (SDC) Local Plan proposes the development of 1,500 houses, a primary school, nursery, community facilities, shops and a café on land in Slimbridge parish. The land is jointly owned by Gloucestershire County Council (GCC) and the Ernest Cook Trust (ECT). It is high value Grade 2 agricultural land sandwiched between Cam and the villages of Slimbridge and Cambridge and the settlement at Gossington. It is bordered by the M5, which is elevated above the southerly section, and bisected by the A4135 which is positioned on an elevated bank and runs in a north, north westerly direction from Cam and Dursley to the Slimbridge roundabout.

2. In fully understanding the topography it is important to understand that all the existing villages and settlements are downhill and therefore downstream from PS37 Wisloe. Therefore, water runs from the M5 and beyond to the west, across the development. There are two critical paths for surface water, the River Cam and Lighenbrook. The River Cam forms the northerly boundary to the portion north of the A4135. Lighenbrook (or Lighen Brook) emanates from another site included in the Local Plan, PS24 West of Draycott, on the far side of the M5, and goes on to bisect the southerly portion. The A4135 forms an impenetrable raised barrier between the two portions of the proposed development and therefore, for flooding, and indeed, other purposes, the two portions should be addressed individually.

3. This is graphically illustrated on this diagram which uses Environment Agency (EA) lidar contour data. Red areas are high ground, blue areas low.



4. Historically, the low-lying land which makes up the majority of Slimbridge parish has been rich pastureland prone to regular flooding. This is the main reason why the PS37 land is Grade 2, best and most versatile. The construction in 1827 of what is now the Gloucester Sharpness Canal has effectively eliminated the direct flood threat from the waters of the River Severn which had often inundated the land. However, the threat of surface water flooding has remained. There are numerous descriptions and latterly photographs, of Slimbridge and Cambridge villages being inundated by short-lived, but devastating flash flooding. That threat remains today and there have been at least three serious floods in the last 25 years. The most recent and most serious being on 23/24 December 2020.

5. We maintain that including PS37 in the Local Plan poses an existential flooding threat to the adjoining settlements of Slimbridge and Cambridge. The Strategic Flood Risk Assessments and consultant's appraisal used by SDC had serious omissions and errors and left solutions to guesswork that is without foundation.

6. SDC were made aware of residents' concerns in the consultative phase of the draft plan. Eighty eight of the 193 individuals who responded to the consultation highlighted the threat from flooding as a major concern. In common with SDC's general response to the consultation no attempt was made to learn more about how these reservations would impact the selection of PS37. Had SDC taken the responses seriously and investigated residents concerns it would have shown that not only was PS37 unsuitable for development on this scale, but also the other alternatives of PGP1, Land at Grove End Farm Whitminster, and PGP2, Moreton Valence/Hardwicke, neither of which has similar issues, were infinitely preferable. It would also have realised that flood reporting from official sources was deficient. There is no evidence that the consultation responses were treated as anything other than a box ticking exercise.

7. In preparing the 2020 Neighbourhood Development Plan 23.3% of respondents stated they suffered from flooding and 20.5% suffered from sewage problems. 42% of parish households responded to the survey. This data was not available in time to be included in consultation responses but nevertheless emphasises that the threat from flooding is foremost in residents' minds. It must be understood that attributing flood damage to properties is an extremely sensitive subject with the owners and this information was gathered anonymously.

8. This leads to our contention that the existing plan is unsound.

#### **Personal credentials**

9. I should establish my credentials. My property is amongst a number of older properties in the parish and, like all the others of its vintage, is prone to garden and property flooding. This is to some degree inevitable as this is the Vale of Berkeley which has been flood prone through its existence. This can never be completely negated and this should be borne in mind when consider extravagant claims of flood mitigation measures provided by the proposers.

10. An example of the existing groundwater level is the well outside my back door. It is five feet deep and in the last twenty-three years, has never been dry and is frequently full to the surface in winter after prolonged periods of heavy rain. It is a key barometer of groundwater level and was an important tool when I worked with Severn Trent Water (STW) Wholesale Assets Creation - Infrastructure Modelling and Investment Planning - Waste (West) engineer, to build a surface water flooding model to investigate infiltration of the sewage system.

11. In brief, we personally experienced a number of garden flooding incidents from surface water and the sewage system from 1998 onwards culminating in my property being flooded in 2012. See appendix 1. I should add, others will have been flooded on a regular basis long before this and continue to be flooded.

12. I decided it was simply unacceptable to do nothing and have continuously worked on a constructive basis with all those agencies involved. This began with Slimbridge Parish Council and went on to include the Lower Severn Internal Drainage Board (IDB), SDC Water Resources Engineer, District and County Councillors, GCC Highways Local Highway Manager and Lead Local Flood Authority (LLFA), Berkeley Estates Manager and tenants, the Ernest Cook Trust Senior Land Agent and tenants and last, but by no means least, local residents.

13. I gave a public presentation in December 2014 to residents in conjunction with GCC and STW and hosted a meeting involving the GCC highways manager, STW lead engineer and the contractor, Amey, which led to a multiagency effort to simultaneously install a new highway drainage system and implement a sophisticated flood grouting and lining programme for the sewage system in 2016.

14. You will read later in this document how these various agencies woke up to the situation in the parish (Slimbridge village and Cambridge) and have been investing heavily over the last few years to mitigate the effects of repeated flooding events. Recent events have shown that for all the work and investment made the problems continue.

15. The most recent example is on 23/24 December 2020 when the Legion Social Club and a number of properties in Slimbridge and Cambridge were flooded, many directly by the runoff from PS37. See photographs at Appendix 2. The impact of the storm has been documented by GCC LLFA in a summary report<sup>1</sup>.

16. As mentioned in lessons learnt, the report notes that it relies purely on reported events at the time.

*Another issue raised during the debrief sessions and in subsequent reports was the need for a clearer, more consistent list of immediate flooding contacts. It was evident that some residents and local councillors were not clear on who to contact for which elements of the flooding incident.*

17. This is a very important point. Without reporting from those affected there is no official record of the effects of surface water flooding. Occupiers are very reluctant to report house and garden flooding as they feel it will impact the value of their property and ongoing insurance costs. Therefore, all the official documents used to compile the proposers' desk top assessments are inherently flawed and incomplete.

18. The mitigation work goes on with STW planning to build a new model this winter to establish why the sewage system is still not coping in high groundwater and storm conditions. I have played an integral part in this overall effort and have learnt a lot from the professionals involved and achieved a good understanding of local conditions and the prime causes of local surface and river water flooding.

19. Given all those involved, I am at a loss to explain why so few pertinent details were included in the desk based Strategic Flood Risk Assessments and the similarly desk based proposers' consultants' assessment. Undoubtedly the very limited reporting and recording of incidents plays a part but, despite being informed in the public consultation phase of the Local Plan, SDC planners made no attempt to compile a more accurate data set.

### **National Planning Policy Framework**

20. I refer to the relevant National Planning Policy Framework (2019) paragraphs shown in bold in making the following observations which would have been available to SDC had it chosen to take the consultation responses seriously.

### **Inadequate assessment**

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<sup>1</sup> December 23rd/24th 2020 flooding: Gloucestershire Lead Local Flood Authority summary report

**Para 155: “Inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.”**

21. Development of PS37 poses a serious threat to the adjacent communities of Cambridge and Slimbridge. The SDC Local Plan fails to give adequate consideration to the effects of surface flooding currently affecting both communities which will be exacerbated by large scale development of the site. Too much emphasis has been placed on the Flood Risk Zones adjoining the site which only consider river and sea flooding without adequate assessment of the existing surface water threat to the adjoining communities of Slimbridge and Cambridge.

#### **Omissions from the Strategic Flood Risk Assessments**

**Para 156: “Strategic policies should be informed by a strategic flood risk assessment and should manage flood risk from all sources. They should consider cumulative impacts in, or affecting, local areas susceptible to flooding, and take account of advice from the Environment Agency and other relevant flood risk management authorities, such as lead local flood authorities and internal drainage boards.”**

22. In arriving at the flood risk assessment SDC has depended on advice from the EA and GCC, the Lead Local Flood Authority (LLFA). Unfortunately, neither organisation compiles accurate records of surface water flooding on agricultural land and has not adequately considered adjacent existing communities. This is despite adequate evidence being made available.

23. GCC spent an estimated £600k installing a new road drainage system through the centre of Slimbridge in 2016 to attempt to mitigate repeated surface water flooding of properties. The system has only been partially effective which was dramatically demonstrated when surface flood water flowing directly from PS37 closed the A38 on 23 December 2020 and flooded St Johns Road, the local social club and a number of properties in Slimbridge and Cambridge.

24. Given the level of expenditure on this project there was clearly a reason for GCC to fund it. Why was this detailed information not made available to SDC planners when GCC LLFA had previously been involved in discussions and meetings with residents to discuss solutions? This project was also specifically mentioned in the residents’ consultation responses. GCC Highways managed the project and the council is one of the landowners and proposers for PS37. Why was no effort made to establish the outcome of the project?

25. Similarly, there is no mention of the STW £1.2 million project, also in 2016, to reduce infiltration of surface water into the parish sewage system. The simple fact that surface water flooding can cause such a devastating impact on this critical infrastructure should surely have been taken into account when selecting Wisloe, which is upstream of Slimbridge and Cambridge, rather than one of the alternatives. Incidentally, the flooding pattern in December 2020 exactly matches the EA mapping for a 1:1000-year event. If that is so, what should we expect as climate change increases the frequency and magnitude of storm events? More of this later.

26. A summary of the project<sup>2</sup> shows that Slimbridge was ranked 21st on STW’s overall sewer flood risk database placing it in the top 1% in the whole of the authority’s area. This was a direct result of the volume and pressure exerted by surface water in flood conditions. Construction on

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<sup>2</sup> Severn Trent Slimbridge Infiltration Reduction (2019)

the scale of that proposed for the Wisloe site will inevitably increase the amount and speed of surface water runoff. It should be noted that it will also be necessary to construct a new self-contained sewage system for PS37 feeding into the already stressed Coaley sewage treatment plant. This was noted in the Infrastructure Delivery Plan 2021 (IDP 2021)<sup>3</sup> where PS37 was rated as high risk by STW should the sewage system be connected to the existing Cambridge/Slimbridge system.

27. The IDP 2021 page 42 then goes on to elaborate the situation at PS37:

*The site is in close proximity to the River Cam and there have been a number of recent sewer flooding events since 2007 affecting highways and the curtilage of properties.*

*The site is included within the Environment Agency 2007 River Cam and Wickster's Brook detailed hydraulic model, but only a minor proportion of the site (1%) is considered to be impacted by fluvial flood risk. The site is at high risk of groundwater flooding, with a greater than 75% chance of groundwater emergence within a given 1km<sup>2</sup> grid square, during a 1 in 100-year event. My emphasis*

*The Sequential Test must be satisfied. Only once the Sequential Test is satisfied should the Exception Test be applied. It is anticipated that proposed development will be sequentially located within Flood Zone 1.*

*The ordinary watercourse on the northern site will need to be surveyed and mapped as part of any application. Any proposals for drainage will have to be split into the separate catchments. The western side of the site north of the A4135 may be difficult to drain to the ordinary watercourse given the levels. My emphasis*

*A site-specific flood risk assessment will be required because the site is within Flood Zone 2 and 3 and at risk from sources of flooding other than rivers and the sea.*

28. How much clearer does it need to be that the development poses a huge risk to downstream communities!

29. In the conclusions on page 44 the IDP 2021 states:

*All major applications, and those sites in Flood Zones 2 and 3, require a flood risk assessment. It is expected that developers accord with the drainage hierarchy, creating flood storage where appropriate and implement measures to ensure that surface water is not increased onsite or elsewhere. My emphasis.*

*Any flood risk schemes should be delivered (or funded) entirely by developers, unless the scheme were to have wide-ranging benefits for other development sites or for existing properties.*

30. It is our contention that the difficulty and cost of attempting to develop an effective drainage scheme to protect Slimbridge and Cambridge from the effects of development will make PS37 unviable.

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<sup>3</sup> Local Plan Review: Infrastructure Delivery Plan 2021 - Main Report - ARUP - 1 June 2021

**Para 157: “All plans should apply a sequential, risk-based approach to the location of development – taking into account the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:**

**a) applying the sequential test and then, if necessary, the exception test as set out below;**

**b) safeguarding land from development that is required, or likely to be required, for current or future flood management;**

**c) using opportunities provided by new development to reduce the causes and impacts of flooding (where appropriate through the use of natural flood management techniques); and**

**d) 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 relocate development, including housing, to more sustainable locations.**

31. The Ministry of Housing, Communities & Local Government guidance on flood risk and coastal change advises how to take account of and address the risks associated with flooding and coastal change in the planning process.<sup>4</sup> The guidance explains in detail the application of the sequential and exception tests in relation to EA Flood Zones 1-3 and the impact on sustainability.

32. A thorough sequential test using accurate and reliable data would have shown that PS37 was the most at risk of flooding of all the alternative sites and should not have been included in the Local Plan for this reason alone.

33. PS37 borders the River Cam which is a river susceptible to river flooding and attracts both Zones 2 and 3 bordering the site and encompassing large parts of the existing settlement of Cambridge. What the sustainability assessment fails to take account of is the impact of surface water flooding. The SDC SFRA detailed site summary<sup>5</sup> alludes to, but does nothing to properly explore, the implications of going ahead with the development. Therefore, the sustainability assessment for PS37 is fatally flawed.

34. The SFRA notes that Lightenbrook, which is an ordinary watercourse, bisects the southerly section of the site. The fluvial section of the SFRA notes the lack of any detailed hydraulic modelling for this watercourse. Given the importance of Lightenbrook, which flows from another site in the Local Plan, PS24, West of Draycott, under the M5 and then directly through the centre of Slimbridge village, this is a major omission and should have been assessed before PS37 was considered for inclusion in the Local Plan. Nowhere in any of the assessments is there any reference to the impact of developing PS24 and its likely impact on PS37, Lightenbrook and Slimbridge village. This when flash flooding from the brook is the prime cause for flooding in the village and this risk was clearly mentioned in the IDP.

35. The site is largely prime agricultural land and therefore there is no direct record of surface water flood incidents. The SFRA states that the record of sewer flooding incidents is incomplete.

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<sup>4</sup> Ministry of Housing, Communities & Local Government - Flood risk and coastal change published 6 March 2014

<sup>5</sup> SDC Level 2 Strategic Flood Risk Assessment Detailed Site Summary Tables - Draft Document - JBA Consulting undated

This is despite the forementioned expenditure of £1.8 million by GCC and STW in attempting to counter surface water flooding incidents in both Cambridge and Slimbridge.

### **Wisloe Green Flood Risk & Surface Water Site Appraisal**

36. The Stantec report commissioned by the proposers<sup>6</sup>, GCC and the ECT in 2019, on which SDC depended for the reliability of the sustainability assessment is riddled with fundamental errors and omissions. It states at 2.7.1. that requests for information have been sent to statutory consultees: GCC LLFA, SDC, STW, Lower Severn IDB and the EA. No response had been received from STW, Lower Severn IDB and SDC when the report was concluded. Responses had been received from the GCC LLFA and the EA. We already know the EA do not keep records of surface water flooding on agricultural land, simply a predicted map based on topography.

37. GCC LLFA says it is aware of a known downstream flood risk and that discharge rates should preferably be limited to existing present-day rates up to the 1:100-year event. This is incorrect. It is not preferable, nor should it be reference to the 1:100-year event rate. Flooding is already being experienced from the site at the 1:1,000-year event rate. Reference 3 states that 'Developers must seek opportunities to reduce overall level of flood risk both on and off-site, for example by reducing volume and rate of runoff and creating space for flooding'. See also NPPF para 155 given earlier which makes protection of surrounding settlements mandatory.

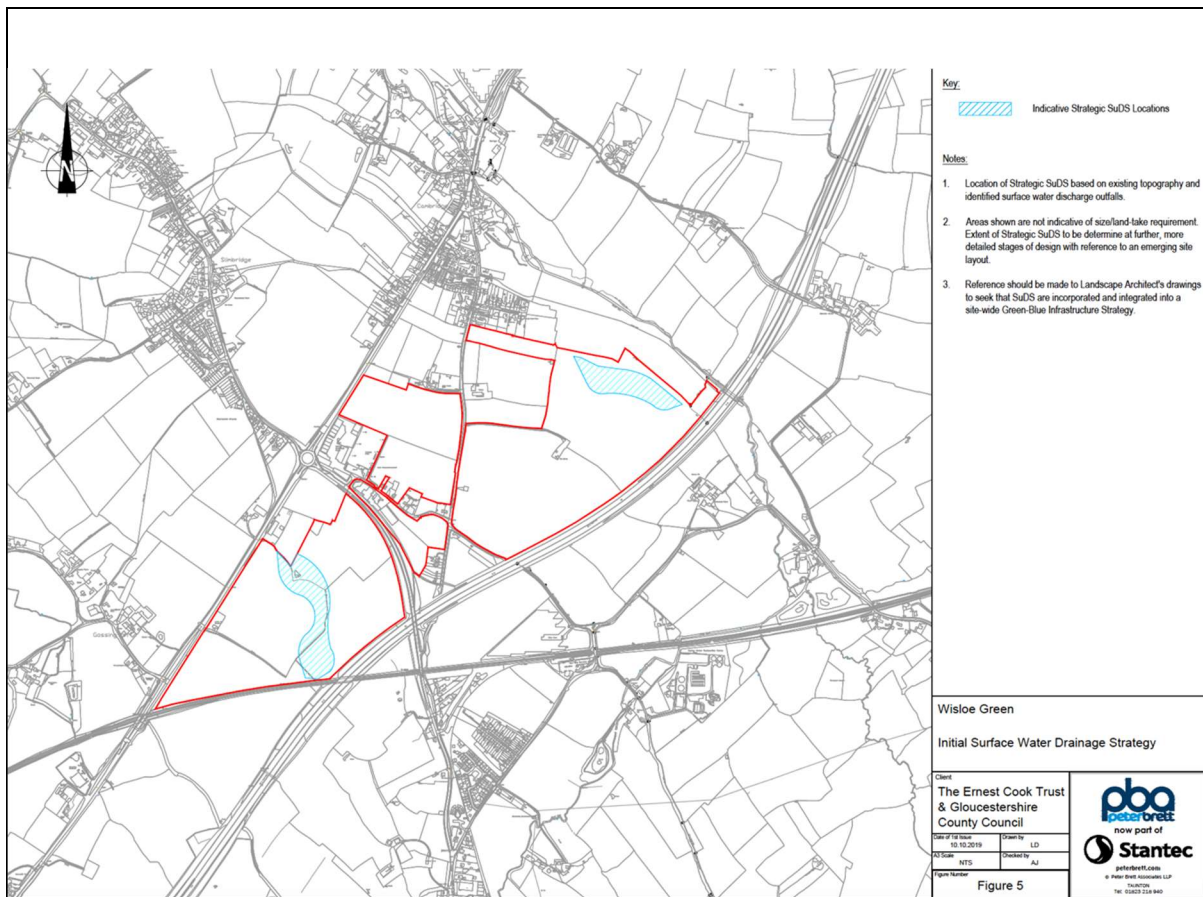
38. The Stantec report suggests this can be achieved by constructing two vast storage attenuation areas, one in each section of the development. It calculates the need to accommodate between 771 and 967m<sup>3</sup> of attenuation storage per hectare of impermeable development. As the report states, the whole 82 hectares of the site is underlain with a bedrock of Blue Lia Formation and Charmouth Mudstone Formation Mudstone and therefore all of it is considered impermeable. This then equates to a requirement for between 63,222 and 79,294m<sup>3</sup> of attenuation storage. The map below shows the likely extent of the required storage. While Note 2 states that the areas are not indicative of size/land-take requirements. Earlier incomplete information on the nature of Lightenbrook suggests that the area shown is an underestimation. This is further explained later.

39. What the report also fails to consider is the effect of the high ground water level. Had they been asked; any local farmer or landowner would have told them these storage areas will already be lakes when needed to accommodate flash flooding from a storm following a prolonged period of rainfall. If you dig a hole anywhere on this land it will fill with water. This plan has zero credibility and will be totally ineffective in preventing serious flooding in Slimbridge and Cambridge. Credible alternatives for disposal of this volume of flood water in these conditions simply don't exist. Should development of PS37 be included in the Local Plan these measures will be assessed and found wanting, leading to the refusal of planning permission. It should also be noted that these ponds require regular maintenance and if SDC are not going to funds this then residents are going to be saddled with payments to a management company.

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<sup>6</sup> Wisloe Green Flood Risk & Surface Water Site Appraisal - Peter Brett part of Stantec - 11 October 2019 on behalf of ECT and GCC





40. As an aside, there is no reference in the Stantec report to the requirement given in the Level 1 SFRA 11.8.4 for an allowance of 8m development easement from the top of the bank on either side of a watercourse. Fencing will be required around the attenuation storage areas and Lightenbrook in the south, and alongside the River Cam in the north, to prevent access and reduce the risk to human life at all times. This is particularly so for children who will naturally be drawn to rivers and lakes. Application of this easement along the course of Lightenbrook and around the contiguous attenuation lake effectively cuts the southerly site in two.

41. Lightenbrook is not a gentle stream for the new residents to stroll along as portrayed in the proposer's literature. It is an essential element of land drainage at all times of the year and a dangerous water course in storm conditions which will need to be adequately maintained and protected from access at all times. It most certainly should not be straightened and profiled to speed up flood water as suggested in the report. This is quite possibly the worst proposal in an already deficient report and would create havoc in Slimbridge, overwhelming the banks of the brook in the built-up areas through which Lightenbrook flows. This includes the primary school, social club and numerous residential properties.

42. In summary, the Stantec report is packed with basic errors and false assumptions. Any sort of rigorous review by SDC based on the responses to the consultation would have revealed these as misleading and likely to result in a flawed sustainability assessment. It seems the report was taken at face value.

**Para 67: "...planning policies should identify a sufficient supply and mix of sites, taking into account their availability, suitability and likely economic viability."**

**Para 158. The aim of the sequential test is to steer new development to areas with the lowest risk 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 risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.**

43. The process for the application of the sequential test for local plan preparation clearly states:

*A local planning authority should demonstrate through evidence that it has considered a range of options in the site allocation process, using the Strategic Flood Risk Assessment to apply the Sequential Test and the Exception Test where necessary. This can be undertaken directly or, ideally, as part of the sustainability appraisal. Where other sustainability criteria outweigh flood risk issues, the decision making process should be transparent with reasoned justifications for any decision to allocate land in areas at high flood risk in the sustainability appraisal report. The Sequential Test can also be demonstrated in a free-standing document, or as part of strategic housing land or employment land availability assessments.*

44. Reference 3, the Ministry of Housing, Communities & Local Government guidance on flood risk and coastal change, details an extensive list of recommendations for Local Plan policy that must be complied with under the sequential test and should have been applied to PS37. It then goes on to list an extensive range of guidance measures which will need to be considered by any developer. These include many of the measures that make PS37 unsuitable in the way that it impacts the local settlements. Postponing consideration of the implications of failure to achieve the desired outcome at any early stage by SDC has led to a situation where it is most likely that planning permission will subsequently be refused. The Flood Risk Sequential Test for the Local Plan (2014) does not include PS37, PGP 1 or PGP 2.

45. Development of PS37 is unnecessary in order to fulfil the housing requirement as better, less flood prone, alternatives are available at PGP 1 and PGP 2 which were considered as alternatives and then not included in the final Local Plan. A sequential test using accurate data should have been used to assess the relative merits of PS37, PGP 1 and PGP 2.

46. In the Stroud Level 2 SFRA<sup>7</sup> used in the Local Plan the table on page 23 shows a flow chart 'Flood risk and preparation of Local Plans' which at step 4 offers an option to bypass the sequential test if the developments under consideration are located entirely within areas with low probability of flooding. It appears SDC chose to assume that the area around PS37 was in a low probability of flooding area thereby bypassing the next step which would have required a sequential test of all sites under consideration. PS37 is not within an area with a low probability of flooding and therefore a sequential test between alternative sites should have been undertaken.

47. Indeed, paragraph 4.5 of the reference specifically refers to Slimbridge as being susceptible to substantial surface water accumulation and ponding. The photograph at appendix 3 was taken as I write this report on 4 July 2021. This is mid-summer. Things will be far worse in the winter. Unless this situation has been reported to GCC LLFA it will not feature in official statistics. There is

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<sup>7</sup> Stroud Level 2 Strategic Flood Risk Assessment - Draft Report - November 2019

no excuse for SDC and GCC not being aware of the situation and looking more closely at the implications for PS37 before including it in the Local Plan:

*4.5 - Surface water accumulation and ponding is substantial around the towns of Arlington, Berkeley, Sharpness and Slimbridge during the 1 in 30-year rainfall event and greater return periods.*

*The recorded surface water flooding history correlates with the modelled surface water flood risk. Of the surface water flooding incidents reported by Gloucestershire County Council, the majority occurred in July 2007, a further seven occurred in November 2012 and one occurred in 2018. Many of the incidents occurred in the south-western area of Stroud District, which is susceptible to large areas of surface water ponding, and the internal flooding of properties.*

48. Surface, sewer and river water flooding is common in Cambridge:

#### *4.6.1 - Gloucester and Sharpness Canal*

*The Gloucester and Sharpness Canal is found in the north-western area of the district. The raised canal embankments act as an informal line of defence. Many watercourses discharge into, and interact with, the canal and consequently, flooding of the canal has the potential to cause waters to back up, causing flooding further upstream.*

*For the River Cam and Wickster's Brook, a series of flood defences have been constructed whereby the watercourse discharges into the canal (detailed in Section 4.2.6). Along the canal, several overtopping and breach events have occurred, in particular during 2007 and 2008. The flood events are clustered along four locations along the canal: near Parkend, between Upper Framilode and Whitminster (where the River Frome passes below the canal), near Slimbridge, and in the north along the district border near Quedgeley. All of these flood events have occurred as a result of high-water levels in the canal and heavy rainfall.*

49. This system of flood defence (Severn Trent Water Authority River Cam and Wicksters Brook Improvement Scheme 1980) failed in December 2020 causing flooding to farms and properties on Ryalls Lane near the junction of the River Cam and the canal. We can find no evidence that the scheme has been reviewed or the river dredged in the last 40 years despite extensive house building along the course of the River Cam. This demonstrates how vulnerable the river is to neglect and forced over capacity.

#### *6.3.5 Groundwater Mitigation*

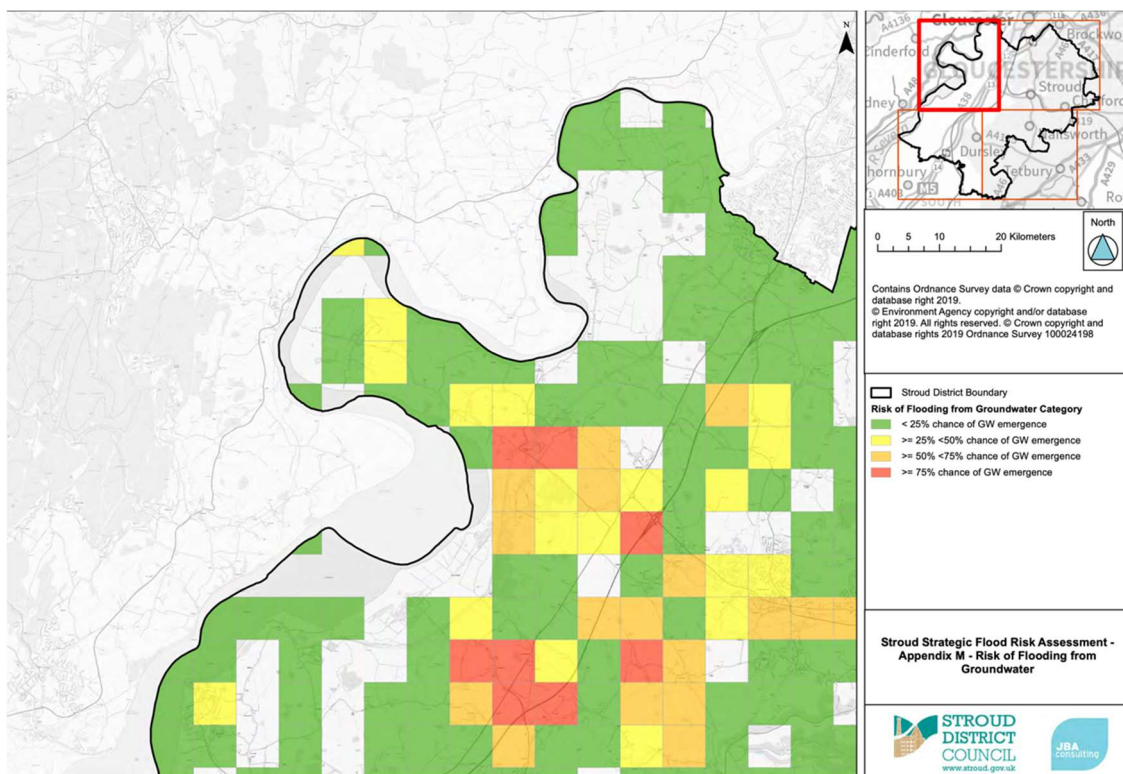
*Groundwater flooding has a complex, and very different flood mechanism to any other and for this reason many conventional flood defence and mitigation methods are not suitable. An available option to manage groundwater flood risk would be through building design (development form), ensuring Finished Floor Levels are raised 300mm above the water levels caused by a 1 in 100-year plus climate change event. Site design would also need to preserve any flow routes followed by the groundwater overland to ensure flood risk is not increased downstream. Obstruction of sub-surface flows by buried services and basements should be avoided.*

*When redeveloping existing buildings, it may be acceptable to install pumps in basements as a resilience measure. However, for new development this is not considered an acceptable solution and basements should be avoided in high groundwater zones.*

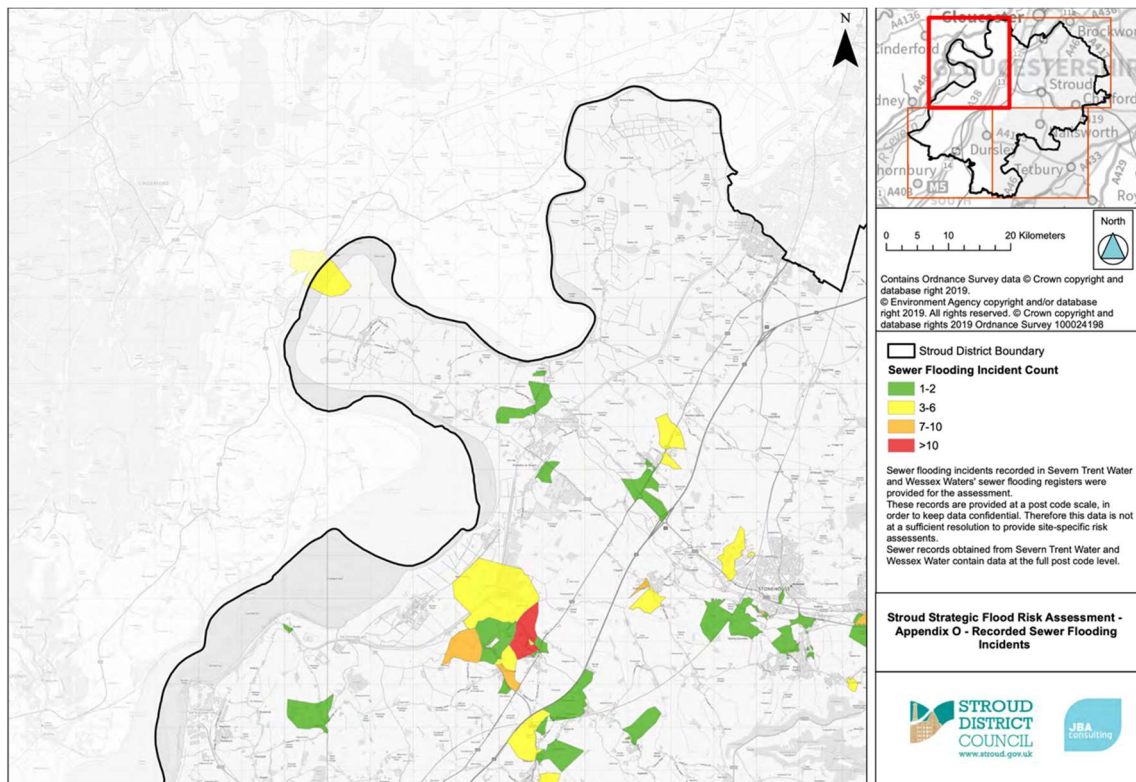
*The management of groundwater also requires consideration during the construction process, as there is a risk that groundworks can lead to releases of groundwater, and/or provide a pathway for the contamination of groundwater. Consultation with the Environment Agency is recommended.*

50. This paragraph is relevant for two reasons. The Wisloe site has a near surface groundwater level and, while new build houses can be raised to alleviate the effects of flooding, existing buildings in Slimbridge and Cambridge cannot. Secondly, the option of directing flood water from the site to the River Cam will introduce domestic and industrial polluted water to the river which feeds the canal, the Bristol Water treatment plant at Purton and, by siphon, the Wildfowl & Wetlands Trust freshwater lakes. This area is a Ramsar site, a Site of Special Scientific Interest, and a Special Area of Conservation under the EU Habitats Directive. The implications of contaminating an internationally acclaimed site and Gloucestershire's number one tourist attraction, the nature reserve wetlands, with domestic and industrial pollution, don't bear thinking about.

51. Appendix M to the SFRA highlights the risk of groundwater flooding ( $\geq 75\%$ ) in the southerly section (Lightenbrook) of the site.



52. Appendix O to the SFRA gives a reasonable picture of the sewer flooding incidents downstream of the site.



**Precautions and warnings are being ignored**

**Para 160. The application of the exception test should be informed by a strategic or site-specific flood risk assessment, depending on whether it is being applied during plan production or at the application stage. For the exception test to be passed it should be demonstrated that:**

- a) the development would provide wider sustainability benefits to the community that outweigh the flood risk; and**
- b) 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.**

**Para 161. Both elements of the exception test should be satisfied for development to be allocated.**

53. There was ample evidence both from the respective SFRAs, the IDP 2021 and the information provided by residents to the consultation phase, to alert SDC to the dangers of extensive development in the Slimbridge and Cambridge area, which is prone to and, with the effects of climate change, will become increasingly prone to, surface water and river flooding.

54. The newly built estates on the banks of the River Cam in Cam are already contributing to increased domestic and industrial run off and further development is foolhardy when more sustainable alternatives had been assessed.



55. PS37 offers no sustainability benefit to the adjoining settlements that could possibly offset the increased flood risk. As mentioned earlier, suggestions that floor levels could be elevated on the site is not an option to those downstream who live in existing properties already at risk.

56. Steadily increasing numbers of flooding incidents in Slimbridge and Cambridge, despite extensive mitigating projects from STW and GCC, indicate the early signs of what climate change will bring.

### **Conclusion**

57. SDC planners had ample opportunity to gather important flood data from the local communities, GCC and STW which would have supplemented the inadequate official sources. This was pointed out in the initial consultation and ignored. The consultants relied entirely on GCC LLFA and EA data which is incomplete as it relies entirely on reported and, in some cases, outdated information. This is graphically illustrated in the difference between actual events and reported events on 23/24 December 2020. There is no mention of the flooding in Slimbridge and the closure of the A38 in the GCC LLFA report. The actual situation is shown in appendix 2. It could be argued that the same lack of reporting applies to both the alternative sites at Whitminster and Morton Valence/ Hardwick, however, those sites do not have the same documented historic flooding problems that Wisloe/Slimbridge regularly experiences. We feel the independent inspector has the opportunity to review the flooding data from the three alternatives - which were available - PS37, PGP 1 and PGP 2 which we believe will demonstrate that PS37 was the least sustainable option.

58. If PS37 remains in the Local Plan, then the serious omissions mentioned above will manifest themselves when advanced planning takes place, and the potential for development will then be fatally compromised both economically and practically. This is particularly true when looking at the calculated attenuation rates which relied on underestimated figures. The lakes on the Wisloe site required to hold back surface water will need to be far larger than indicated if the legal restricted flow requirements are to be met. Importantly, residents of Slimbridge parish will know who is responsible if this reckless plan is approved.

59. It is worth closing on two quotes from the GCC LLFA 23/24 December 2020 report which was compiled after the proposers' consultant's report as they illustrate the level of miscalculation in the available data at the time:

*The event was characterised by a short period of intense rainfall that fell on saturated ground and elevated river levels. From the morning of the 23rd until midnight, the county saw nearly 16 hours of rainfall, with some locations reaching nearly 60mm. The rivers responded quickly with levels on some reaching their highest recorded peaks. Over 450 properties were affected, with over 300 internally. Drawing comparisons with historical flooding events can be misleading as critical monitoring infrastructure is now much more widely spread, but based on data collected thus far, it is safe to say that December 2020 was the most severe flood event since July 2007. With the accelerating impacts of climate change, short, intense, geographically diverse rainfall events such as these will become the norm as opposed to the exception, and valuable lessons must be learnt and acted upon to increase the county's readiness and resilience.*

*The return period for a rainfall or flood event is a way of calculating the likelihood, and therefore the size, of the event. The underlying principle is that the larger the storm, the less likely it is and therefore the less frequently it will be seen. The return period can be written in two ways; 1 in x years or x% AEP (Annual Exceedance Probability). They mean the same thing so a 1 in 100 year storm will have a 1% chance of happening each year (AEP).*

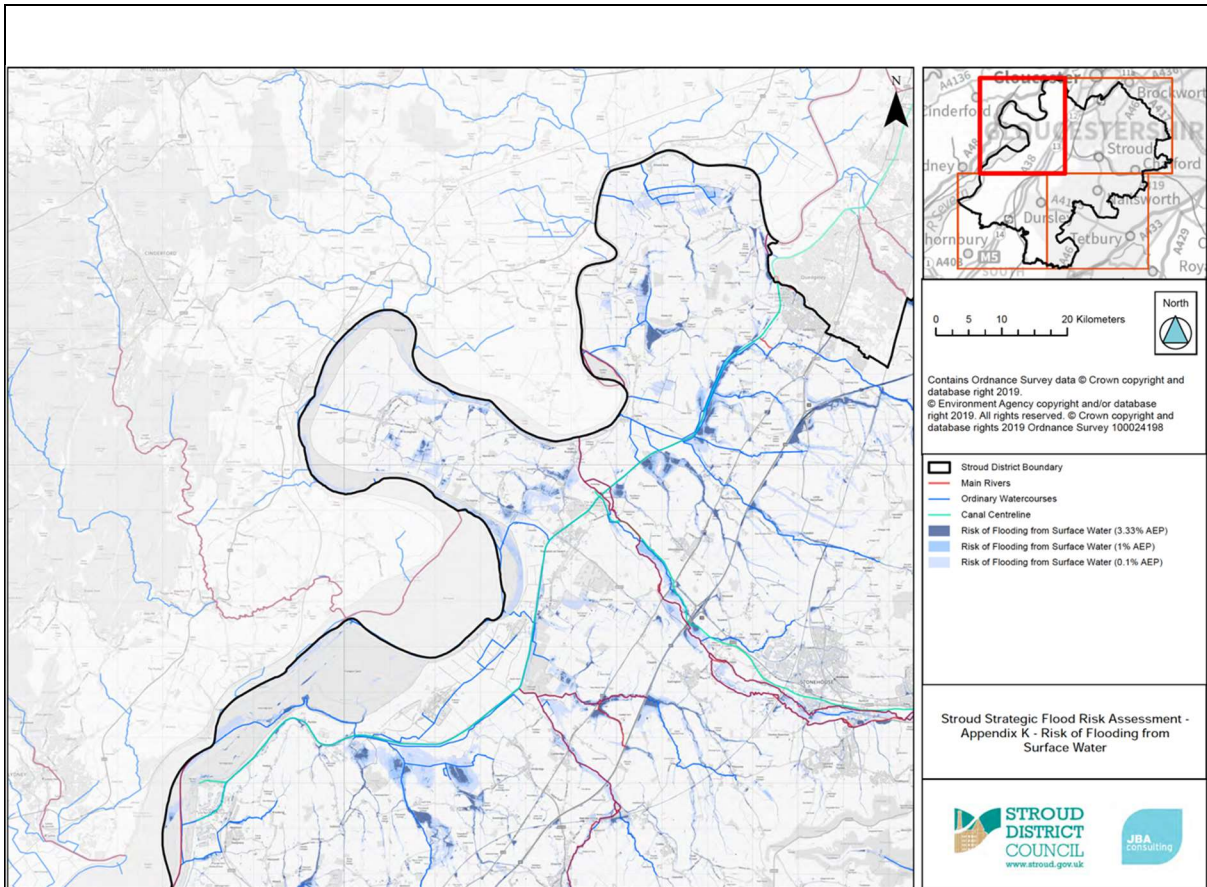
*According to the radar data in Meniscus Map Rain (not the rain gauges, which in some cases exceeded the radar rainfall), the return period for the event was relatively low at less than 1 in 5 years (20% AEP) for most areas. The return period at Tewkesbury was 1 in 8 years (12.5% AEP) and 1 in 7 years (14% AEP) for Bishop's Cleeve.*

60. The SFRA<sup>8</sup> data used by the proposers in making their calculations in 2019 is shown on the map below. The conditions experienced and witnessed by residents in December 2020 exactly match the light blue, 0.1 AEP area on the map. As stated in the GCC report, that AEP is now 20% not 0.1%. Therefore, it is 200 times more likely to be experienced. Now it is once every 5 years, not once every 1,000 years. As I write this, guess what? The cataclysmic flooding in Germany, Belgium and the Netherlands was forecast on a 1:1,000-year basis! Not any more!

61. The frequency and severity of surface water flooding at Wisloe is far higher than the proposers have allowed for and for this, and all the other reasons above, show the proposed surface water flooding mitigation measures are inadequate and cast the deliverability of the whole development in considerable doubt. The proposed size of the attenuation ponds is a clear underestimation. The revised size which will be required at the planning stage, should the development be allowed to proceed, will be far larger and harder to manage than envisaged in the confined space of the development.

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<sup>8</sup> Stroud L2 SFRA - Stage 1 Draft Report v2.0 (Nov 2019) Appendix J



It has been very inconvenient for the SDC planning officers to have to consider contradictory evidence from residents which disprove their 'official' assessments and therefore they have chosen to ignore our consultation responses.

**The plan is therefore not legally compliant and the ramifications of proceeding with PS37 are reckless and irresponsible making the plan unsound.**

Appendix 1.

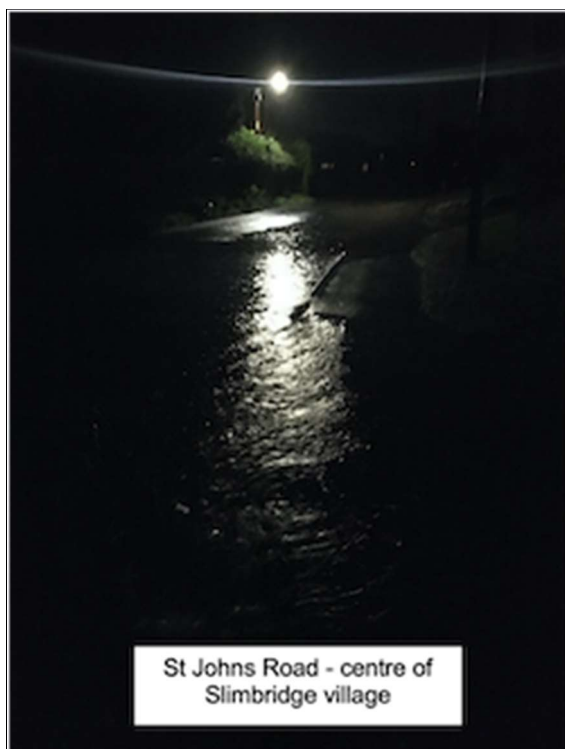
Flooding pictures November 2012



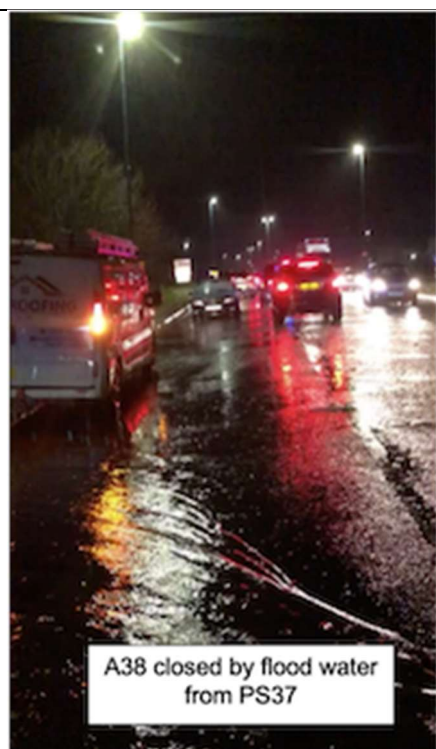


Appendix 2.

Flooding from PS37 23 December 2020



St Johns Road - centre of Slimbridge village



A38 closed by flood water from PS37



Fields around the village still flooded days later. The church can be seen in the distance

Appendix 3

Flooding on St Johns Road at Rectory Farm in Slimbridge village - 4 July 2021



(Continue on a separate sheet /expand box if necessary)

6. Please set out the modification(s) you consider necessary to make the Local Plan legally compliant and sound, in respect of any legal compliance or soundness matters you have identified at 5 above. (Please note that non-compliance with the duty to cooperate is incapable of modification at examination). You will need to say why each modification will make the Local Plan legally compliant or sound. It will be helpful if you are able to put forward your suggested revised wording of any policy or text. Please be as precise as possible.

Remove PS37 from the plan

(Continue on a separate sheet /expand box if necessary)

**Please note** In your representation you should provide succinctly all the evidence and supporting information necessary to support your representation and your suggested modification(s). You should not assume that you will have a further opportunity to make submissions.

**After this stage, further submissions may only be made if invited by the Inspector, based on the matters and issues he or she identifies for examination.**

7. If your representation is seeking a modification to the plan, do you consider it necessary to participate in examination hearing session(s)?

**No**, I do not wish to participate in hearing session(s)

**Yes**, I wish to participate in hearing session(s)

Please note that while this will provide an initial indication of your wish to participate in hearing session(s), you may be asked at a later point to confirm your request to participate.

8. If you wish to participate in the hearing session(s), please outline why you consider this to be necessary:

I feel that SDC has not taken into account all the responses from concerned residents.

Local knowledge and evidence disproves the various flooding related desktop assessments. Despite being made aware of discrepancies, SDC failed to follow up and investigate further. The result of including Wisloe in the local plan constitutes a serious threat to neighbouring communities which already face flood related threats.

Recent events here and on the continent show that Environment Agency forecasts are seriously in error and cannot be relied on. Consultants relied on this data to determine the extent of the flood threat. They were wrong.

**Please note** the Inspector will determine the most appropriate procedure to adopt to hear those who have indicated that they wish to participate in hearing session(s). You may be asked to confirm your wish to participate when the Inspector has identified the matters and issues for examination.

