

# Summary Response Note

**Project:** PR9 - Land West of Yarnton

**Subject:** CDC letter of 27<sup>th</sup> April 2023 - Flood Risk & Drainage Response Note

<b>Client:</b>	Merton College	<b>Version:</b>	P7
<b>Project No:</b>	06058	<b>Author:</b>	PR
<b>Date:</b>	16/06/2023	<b>Approved:</b>	AC

1.1.1 PJA have been appointed by Merton College ('the College') to prepare this Note responding to the comments by Linda Griffiths at Cherwell District Council ('CDC') in her letter dated 27<sup>th</sup> April 2023, under the heading 'Drainage.'

1.1.2 The Site, known as 'PR9', is currently the subject of an outline planning application submitted by the College (ref. 21/03522/OUT).

1.1.3 There are three key points raised by Linda Griffiths in her letter of 27<sup>th</sup> April 2023:

- There are now no objections from Oxfordshire County Council ('OCC') in its role of Lead Local Flood Authority ('LLFA'). However, the surface water management scheme requires significant detail and information to be submitted in due course;
- Any condition relating to the submission and approval of the detailed surface water management scheme shall be a pre-commencement condition and will be required to be submitted and agreed for the development as a whole together with the first reserved matters submission;
- It would be beneficial for PJA to provide a comprehensive written response to the responses from Yarnton Flood Defence Group and Yarnton and Begbroke Parish Councils regarding flooding issues within the area and the further impact this development could have on local flooding.

1.1.4 This Note responds to each of these bullet points.

## ***OCC Comments / Further Detail on Surface Water Management***

1.1.5 It is acknowledged in the letter that OCC has no objection to the proposals, subject to the imposition of pre-commencement conditions to any approval granted. It is also the case that the following responses have been received from other flood risk and drainage risk management authorities:

- Environment Agency (3<sup>rd</sup> April 2023) – no objection
- Thames Water (4<sup>th</sup> January 2023) - no objection, subject to conditions (to determine the detailed design of the foul water drainage and phasing)
- Cherwell District Council Drainage Engineer (9<sup>th</sup> January 2023) - no objection

1.1.6 These responses are all available on Cherwell District Council’s public planning portal and are included in Appendix A to this letter. We have also included the relevant extract concerning drainage from OCCs consultation response to CDC dated 22<sup>nd</sup> February 2023.

1.1.7 It is proposed to embed a sustainable drainage system (‘SuDS’) approach to manage surface water from the proposed development. This is outlined in Section 6 of the submitted FRA (PJA, December 2022) and is in accordance with current national and local policy. This approach is also in line with current industry best practice.

1.1.8 Given this, the flood risk and drainage aspects of application 21/03522/OUT are now considered to be appropriate and acceptable in principle, in line with National and Local Policy and Guidance, subject to the imposition of appropriate conditions.

***Surface Water Management Conditions Relating to the Submission and to be a Site-wide Pre-commencement Condition (As Requested by OCC LLFA)***

1.1.9 This request is acknowledged, and given the outline nature of the planning application, the College accepts the need for a site-wide pre-commencement condition to address the details of the surface water management scheme.

1.1.10 The College is happy to work with CDC to agree the wording of such a condition.

***Written Response to Objections from Yarnton Flood Defence Group and Yarnton and Begbroke Parish Councils***

1.1.11 We have reviewed the following consultation responses from:

- Begbroke Parish Council (posted by CDC on 7<sup>th</sup> February 2023).
- Yarnton Parish Council (posted by CDC on 2<sup>nd</sup> February 2023).
- Yarnton Flood Defence Group (posted by CDC on 31<sup>st</sup> January 2023).

1.1.12 The following overarching key points have been identified:

- The potential impact of the proposal on existing flood risk to, and existing drainage infrastructure within, the village of Yarnton;

- The potential cumulative impact of the proposal in conjunction with the proposed development at Site PR8;
- The principal contention that the hydraulic modelling does not include a sufficient representation of the village of Yarnton;
- The contention that there are limitations with the proposed surface water and foul water drainage strategies.

1.1.13 Table 1 shows how these key points have been addressed, in terms of the following three categories (as indicated in the conclusion column of Table 1):

- Comments which have already been addressed through previous correspondence;
- Where it is considered sufficient information has now been provided to support the grant of outline planning permission, subject to conditions;
- Where it is acknowledged to be an important local issue, yet one of a strategic nature which concerns a wider area than the PR9 Site alone. As required by policy, the site will not exacerbate flood risk elsewhere.

**Table 1 - Summary of Key Issues Raised, and Works Undertaken to Respond**

Key point raised in the consultation responses	Work undertaken by PJA in responding to the Issues	Conclusion
<b>The potential impact of the proposal on existing flood risk to, and existing drainage infrastructure within, the village of Yarnton;</b>	<p>PJA have undertaken site walkovers with YFDG on 12<sup>th</sup> December 2021 and 17<sup>th</sup> May 2022 and have attended multiple meetings (notably on 17<sup>th</sup> May 2022 and 15<sup>th</sup> September 2022).</p> <p>In addition, PJA provided a detailed response to YFDG via a previous document dated 30<sup>th</sup> June 2022 (doc no. 05058-T-002-A). (Please see Appendix 2 'Response to Yarnton Flood Defence Group Comments'). Following this, PJA also attended a further face to face meeting with YFDG on 15<sup>th</sup> September 2022</p> <p>The proposed development will sustainably manage surface water flows, discharging to onsite existing, ordinary watercourses, in all events, up to and including the 1 in 100 year plus 40% climate change event, to the site specific QBar rate. As such, the proposals are in accordance with National and Local Policy and Guidance, and current industry best practice.</p> <p>The FRA (PJA, Dec 2022) has been provided to, and reviewed by, OCC LLFA, CDC and the Environment Agency. All parties have confirmed a 'no objection' response to the submitted documents, with OCC LLFA recommending conditions to be applied to any approval granted.</p> <p>On the basis of the submitted information and given that there are no objections raised from the statutory consultees, there are</p>	<p>Comments addressed through previous correspondence.</p> <p>Sufficient information has been provided to support the grant of outline planning permission, subject to conditions.</p>

Key point raised in the consultation responses	Work undertaken by PJA in responding to the Issues	Conclusion
	no reasons from a drainage and flood risk perspective, why CDC should not be able to grant outline planning permission.	
<b>The potential cumulative impact of the proposal in conjunction with the proposed development at Site PR8</b>	<p>The comments in relation to PR8 reiterate this important local issue, however these reiterate that the matter is wider than the PR9 Site alone. It is therefore not directly relevant to the determination of application 21/03522/OUT.</p> <p>The proposed development will sustainably manage surface water flows, discharging to onsite existing, ordinary watercourses, in all events, up to and including the 1 in 100 year plus 40% climate change event, to the site specific QBar rate. As such, the proposals are in accordance with National and Local Policy and Guidance, and current industry best practice, which are set out to mitigate any potential cumulative impact from new development.</p> <p>On the basis of the submitted information and given that there are no objections raised from the statutory consultees, there are no reasons from a drainage and flood risk perspective, why CDC should not be able to grant outline planning permission.</p>	<p>It is acknowledged to be an important local issue, yet one of strategic nature which concerns a wider area than the PR9 Site alone. As required by policy, the site will not exacerbate flood risk elsewhere.</p>
<b>The principal contention that the hydraulic modelling does not include a sufficient representation of the village of Yarnton</b>	<p>Site-specific hydraulic modelling has been undertaken as set out within Section 5.4 in the submitted FRA (PJA, Dec 2022) and in accordance with industry best practice.</p> <p>The FRA (PJA, Dec 2022) has been provided to, and reviewed by, OCC LLFA, CDC's Drainage Officer and the Environment Agency, with no objections being raised.</p>	Sufficient information has been provided to support the grant of outline planning permission, subject to condition.
<b>The contention that there are limitations with the proposed surface water and foul water drainage strategies.</b>	<p>As set out within the submitted FRA (PJA, Dec 2022), the proposed development will sustainably manage surface water flows, discharging to onsite existing, ordinary watercourses, in all events, up to and including the 1 in 100 year plus 40% climate change event, to the site specific QBar rate. As such, the proposals are in accordance with National and Local Policy and Guidance, and current industry best practice.</p> <p>Further to this, in accordance with industry best practice, discussions have been undertaken with Thames Water with regard to foul water which are set out within Section 7 of the FRA (PJA, Dec 2022) and detailed design will be undertaken of the foul drainage strategy at a later design stage, as required by condition,</p>	Sufficient information has been provided to support the grant of outline planning permission, subject to conditions.

## I.2 Conclusion

- 1.2.1 This Note sets out the response to the key points raised by CDC in their letter of 27<sup>th</sup> April 2023.
- 1.2.2 OCC LLFA, the Environment Agency, Thames Water and Cherwell District Council's Drainage Engineer have all confirmed a 'no objection' response to the submitted documents.

- 1.2.3 It is proposed to embed a SuDS approach to manage surface water from the proposed development. This is outlined in Section 6 of the submitted FRA (PJA, December 2022) and is in accordance with current national and local policy, as well as best practice guidance, and in line with current industry best practice. Given the outline nature of the planning application, it is accepted that a site-wide pre-commencement condition to address the details of the surface water management scheme will be required.
- 1.2.4 We have reviewed the responses from Begbroke Parish Council, Yarnton Parish Council and Yarnton Flood Defence Group and identified the following overarching key points:
- The potential impact of the proposal on existing flood risk to, and existing drainage infrastructure within, the village of Yarnton;
  - The potential cumulative impact of the proposal in conjunction with the proposed development at Site PR8;
  - The principal contention that the hydraulic modelling does not include a sufficient representation of the village of Yarnton;
  - The contention that there are limitations with the proposed surface water and foul water drainage strategies.
- 1.2.5 Each of these key points have been addressed, in terms of the following three categories:
- Comments which have already been addressed through previous correspondence;
  - Where sufficient information has now been provided to support the grant of outline planning permission, subject to conditions;
  - It is acknowledged to be an important local issue, yet one of strategic nature which concerns a much wider area than the PR9 Site alone. As required by policy, the site will not exacerbate flood risk elsewhere.
- 1.2.6 On the basis of the submitted information and given that there are no objections raised from the statutory consultees, there are no reasons from a drainage and flood risk perspective, why CDC should not be able to grant outline planning permission.

## **Appendix A      Responses from Risk Management Authorities**

**Application no: 21/03522/OUT**

**Location:** Os Parcel 3673 Adjoining And West Of 161, Rutten Lane, Yarnton, OX5 1LT, , Cross Parish Boundary Application: Begbroke and Yarnton Parish Councils

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## **Lead Local Flood Authority**

### **Recommendation:**

No objection subject to conditions

### **Detailed comments:**

#### **Conditions for Surface Water Drainage:**

The following information is required by the LLFA to enable a full technical assessment of the sustainable surface water drainage strategy:

1. The SuDS hierarchy for discharging surface water drainage should be followed and demonstrated with design plans, details and calculations, all to be cross-referenced;
2. Design calculations for the proposed SuDS features, for all relevant return periods (1 in 1 year, 1 in 30 year and 1 in 100 year + 40% climate change) demonstrating the critical duration used for design;
3. The undertaking of permeability tests to BRE 365 to determine the soakage potential for SuDS of the proposed development;
4. Should infiltration be found unfeasible for SuDS purposes, surface water from the site should be attenuated and discharged to Greenfield run-off rates (Qbar);
5. For open SuDS features a freeboard or 300mm should be provided above the maximum water level for the critical storm event of 1 in 100 year + 40%cc;
6. A 10% allowance for Urban Creep for all residential developments should be provided;
7. Details of the future maintenance and management of all SuDS features;
8. Information on overland flood flow paths and their maintenance should be demonstrated. An exceedance flow route plan for the entire site should be provided with levels to indicate that all surface water falls away from buildings and that exceedance flows are contained within the site boundary.
9. Measures to mitigate the risk of surface water run-off polluting waters.

#### **Condition for Surface Water Management Scheme (Phases):**

Prior to the approval of any related reserved matters, a detailed Surface Water Management Scheme for each phase or sub-phase of development, shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall be in accordance with the details approved as part of the strategic scheme (Strategic Surface Water Management Scheme) and include all supporting information as listed in the Condition. The scheme shall be implemented in accordance with the approved details and timetable.

**Reason:**

To ensure development does not increase the risk of flooding elsewhere; in accordance with Paragraph 155 of the National Planning Policy Framework (NPPF) and Local and National Standards.

**Conditions for SuDS As Built and Maintenance Details:**

Prior to first occupation, a record of the installed SuDS and site wide drainage scheme shall be submitted to and approved in writing by the Local Planning Authority for deposit with the Lead Local Flood Authority Asset Register. The details shall include:

1. As built plans in both .pdf and .shp file format;
2. Photographs to document each key stage of the drainage system when installed on site;
3. Photographs to document the completed installation of the drainage structures on site;
4. The name and contact details of any appointed management company information.

**Officer's Name:** Nagina Bawar

**Officer's Title:** Senior LLFA Engineer

**Date:** 31/02/2023



Cherwell District Council  
Planning & Development Services  
Bodicote House White Post Road  
Bodicote  
Banbury  
OX15 4AA

**Our ref:** WA/2021/129424/02-L01  
**Your ref:** 21/03522/OUT  
**Date:** 03 April 2023

Dear Sir/Madam

**The erection of up to 540 dwellings (class C3), up to 9,000sqm GEA of elderly/extra care residential floorspace (class c2), a community home work hub (up to 200sqm)(class E), alongside the creation of two locally equipped areas for play, one NEAP, up to 1.8 hectares of playing pitches and amenity space for the William Fletcher Primary School, two vehicular access points, green infrastructure, areas of public open space, two community woodland areas, a local nature reserve, footpaths, tree planting, restoration of historic hedgerow, and associated works.**

**OS Parcel 3673 adjoining and west of 161, Rutten Lane, Yarnton, OX5 1LT**

Thank you for re-consulting us on the above application following the submission of amendments.

The proposed amendments and additional information submitted do not alter our previous comments. We have no objection to this application as submitted.

Yours faithfully

**Miss Sarah Green**  
**Sustainable Places - Planning Advisor**

Direct dial 0208 474 9253  
Direct e-mail [planning\\_THM@environment-agency.gov.uk](mailto:planning_THM@environment-agency.gov.uk)

# Consultee Comment for planning application 21/03522/OUT

Application Number	21/03522/OUT
Location	Os Parcel 3673 Adjoining And West Of 161 Rutten Lane Yarnton OX5 1LT Cross Parish Boundary Application: Begbroke and Yarnton Parish Councils
Proposal	The erection of up to 540 dwellings (Class C3), up to 9,000sqm GEA of elderly/extra care residential floorspace (Class C2), a Community Home Work Hub (up to 200sqm)(Class E), alongside the creation of two locally equipped areas for play, one NEAP, up to 1.8 hectares of playing pitches and amenity space for the William Fletcher Primary School, two vehicular access points, green infrastructure, areas of public open space, two community woodland areas, a local nature reserve, footpaths, tree planting, restoration of historic hedgerow, and associated works. All matters are reserved, save for the principal access points.
Case Officer	Linda Griffiths
Organisation	CDC - Land Drainage
Name	Tony Brummell
Address	Cherwell District Council Bodicote House White Post Road Bodicote Banbury OX15 4AA
Type of Comment	Comment
Type	
Comments	<p>No substantive comments. The surface water drainage strategy is accepted in principle. The LLFA will examine and comment on the detail.</p> <p>For information, although not Planning matters, Cherwell's Flood Risk team are in discussion with the applicant's representatives to secure improvements to the land drainage systems on the site which will reduce their impacts on the existing settlement. Obstructions and constrictions have also been identified in the networks that will receive the surface water and land drainage discharges from the site and investigations are proceeding into how these can be removed.</p>
Received Date	09/01/2023 09:30:14
Attachments	

Cherwell District Council Planning & Development Services Bodicote House Bodicote, Banbury Oxon OX15 4AA Our DTS Ref: 55029 Your Ref: 21/03522/OUT - UPDATED 22 DEC 22  
4 January 2023

Dear Sir/Madam

**Re: OS PARCEL 3673 & WEST OF 161, RUTTEN LANE, YARNTON, KIDLINGTON, OXFORDSHIRE, OX5 1LT**

### **Waste Comments**

Following initial investigations, Thames Water has identified an inability of the existing FOUL WATER network infrastructure to accommodate the needs of this development proposal. Thames Water has contacted the developer in an attempt to agree a position for foul water networks but has been unable to do so in the time available and as such Thames Water request that the following condition be added to any planning permission. "The development shall not be occupied until confirmation has been provided that either:- 1. All foul water network upgrades required to accommodate the additional flows from the development have been completed; or- 2. A development and infrastructure phasing plan has been agreed with the Local Authority in consultation with Thames Water to allow development to be occupied. Where a development and infrastructure phasing plan is agreed, no occupation shall take place other than in accordance with the agreed development and infrastructure phasing plan."

Reason - Network reinforcement works are likely to be required to accommodate the proposed development. Any reinforcement works identified will be necessary in order to avoid sewage flooding and/or potential pollution incidents. The developer can request information to support the discharge of this condition by visiting the Thames Water website at [thameswater.co.uk/preplanning](https://thameswater.co.uk/preplanning). Should the Local Planning Authority consider the above recommendation inappropriate or are unable to include it in the decision notice, it is important that the Local Planning Authority liaises with Thames Water Development Planning Department (telephone 0203 577 9998) prior to the planning application approval.

Thames Water recognises this catchment is subject to high infiltration flows during certain groundwater conditions. The scale of the proposed development doesn't materially affect the sewer network and as such we have no objection, however care needs to be taken when designing new networks to ensure they don't surcharge and cause flooding. In the longer term Thames Water, along with other partners, are working on a strategy to reduce groundwater entering the sewer networks.

Thames Water recognises this catchment is subject to high infiltration flows during certain groundwater conditions. The developer should liaise with the LLFA to agree an appropriate sustainable surface water strategy following the sequential approach before considering connection to the public sewer network. The scale of the proposed development doesn't materially affect the sewer network and as such we have no objection, however care needs to be taken when designing new networks to ensure they don't surcharge and cause flooding. In the longer term Thames Water, along with other partners, are working on a strategy to reduce groundwater entering the sewer network.

The application indicates that SURFACE WATER will NOT be discharged to the public network and as such Thames Water has no objection, however approval should be sought from the Lead Local Flood Authority. Should the applicant subsequently seek a connection to discharge surface water into the public network in the future then we would consider this to be a material change to the proposal, which would require an amendment to the application at which point we would need to review our position.

There are public sewers crossing or close to your development. If you're planning significant work near our sewers, it's important that you minimize the risk of damage. We'll need to check that your development doesn't limit repair or maintenance activities, or inhibit the services we provide in any other way. The applicant is advised to read our guide working near or diverting our pipes. <https://www.thameswater.co.uk/developers/larger-scale-developments/planning-your-development/working-near-our-pipes>

### **Water Comments**

Following initial investigations, Thames Water has identified an inability of the existing water network infrastructure to accommodate the needs of this development proposal. Thames Water have contacted the developer in an attempt to agree a position on water networks but have been unable to do so in the time available and as such Thames Water request that the following condition be added to any planning permission. No development shall be occupied until confirmation has been provided that either:- all water network upgrades required to accommodate the additional demand to serve the development have been completed; or - a development and infrastructure phasing plan has been agreed with Thames Water to allow development to be occupied. Where a development and infrastructure phasing plan is agreed no occupation shall take place other than in accordance with the agreed development and infrastructure phasing plan. Reason - The development may lead to no / low water pressure and network reinforcement works are anticipated to be necessary to ensure that sufficient capacity is made available to accommodate additional demand anticipated from the new development. The developer can request information to support the discharge of this condition by visiting the Thames Water website at [thameswater.co.uk/preplanning](https://www.thameswater.co.uk/preplanning). Should the Local Planning Authority consider the above recommendation inappropriate or are unable to include it in the decision notice, it is important that the Local Planning Authority liaises with Thames Water Development Planning Department (telephone 0203 577 9998) prior to the planning application approval.

The proposed development is located within 5m of a strategic water main. Thames Water do NOT permit the building over or construction within 5m, of strategic water mains. Thames Water request that the following condition be added to any planning permission. No construction shall take place within 5m of the water main. Information detailing how the developer intends to divert the asset / align the development, so as to prevent the potential for damage to subsurface potable water infrastructure, must be submitted to and approved in writing by the local planning authority in consultation with Thames Water. Any construction must be undertaken in accordance with the terms of the approved information. Unrestricted access must be available at all times for the maintenance and repair of the asset during and after the construction works. Reason: The proposed works will be in close proximity to underground strategic water main, utility infrastructure. The works has the potential to impact on local underground water utility infrastructure. Please read our guide "working near our assets" to ensure your workings will be in line with the necessary processes you need to follow if you're considering working above or near our pipes or other structures. <https://www.thameswater.co.uk/developers/larger-scale-developments/planning-your-development/working-near-our-pipes> Should you require further information please contact Thames Water. Email: [developer.services@thameswater.co.uk](mailto:developer.services@thameswater.co.uk).

There are water mains crossing or close to your development. Thames Water do NOT permit the building over or construction within 3m of water mains. If you're planning significant works near our mains (within 3m) we'll need to check that your development doesn't reduce capacity, limit repair or maintenance activities during and after construction, or inhibit the services we provide in any other way. The applicant is advised to read our guide working near or diverting our pipes. <https://www.thameswater.co.uk/developers/larger-scale-developments/planning-your-development/working-near-our-pipes>

Yours faithfully

Development Planning Department

Development Planning, Thames Water, Maple Lodge STW, Denham Way, Rickmansworth, WD3 9SQ Tel:020 3577 9998 Email: [devcon.team@thameswater.co.uk](mailto:devcon.team@thameswater.co.uk)

## **Appendix B      Previous Response to YFDG**

# Technical Note

**Project:** Yarnton, Oxfordshire

**Subject:** Response to Yarnton Flood defence Group Comments

<b>Client:</b>	Merton College	<b>Version:</b>	A
<b>Project No:</b>	06058	<b>Author:</b>	Amy Evans
<b>Date:</b>	30th June 2022	<b>Approved:</b>	Alison Caldwell

## I Context

- 1.1.1 Following a face-to-face meeting between PJA and the Yarnton Flood Defence Group (YFDG) on the 17<sup>th</sup> May 2022, PJA received an email (dated 30<sup>th</sup> May 2022) from the YFDG highlighting a number of concerns that remain with regard to the proposed development, which forms part of the PR9 allocation, and its potential impact on the existing flood risk within the existing village.
- 1.1.2 PJA have prepared this Technical Note with the aim of addressing each point raised by the YFDG within their email, providing additional information where required or referencing the respective section within the updated Flood Risk Assessment (FRA 2022) which will be resubmitted as part of the planning application.

## 2 Yarnton Flood Defence Group Comments and PJA Responses

### The YFDG comment 1:

- 2.1.1 *"There are two main flood corridors into the village. One is the south corridor along the Cassington Road and the second is from PR9 via the existing surgery site. There are other flood corridors that run into the village through the existing ribbon development along the west side of Rutten Lane, but they are more dispersed and not so well documented or understood. As we stated in the meeting, the PR9 site is the only remaining undeveloped land on the west side of Rutten Lane and the A44 and probably the last opportunity to mitigate flooding at the north end of the village from the high ground overlooking the village – Spring Hill.*

### PJA Response to YFDG comment 1:

- 2.1.2 In accordance with national and local policy and guidance, the proposed development within the PR9 allocation will prioritise sustainable management of surface water, primarily through

the provision of attenuation. Through the development of the sustainable surface water management strategy, the existing overland flow routes with the PR9 allocation site have been integrated to maximise the potential for managing surface water from the proposed development. Further to this, the proposed development includes introduction of micro topographical features such as cut off ditches and low bunds, which aim to capture and 'slow the flow' of runoff from the upstream catchment. These features aim to reduce flows away from the existing community. The newly introduced sustainable surface water strategy within the proposed development captures and attenuates flows generated from the development itself.

**The YFDG comment 2:**

- 2.1.3 *"We feel the meeting ranged over a number of issues outside our original purpose which was to discuss flooding of the existing village and specifically the potential impact PR9 could have on the existing 1 in 30 year flood risk envelope in Aysgarth Road and other connected areas of the village."*

**PJA Response to YFDG comment 2:**

- 2.1.4 Within the meeting, a number of topics relating to the existing flood risk and the proposed development within Yarnton were discussed. The 1 in 30 year flood envelope was not specifically raised as a point of discussion.
- 2.1.5 Through our work, modelling of the 1 in 20 year, 1 in 100 year, 1 in 100 year plus climate change (40%) and 1 in 1000 year events have been reviewed and assessed within the hydraulic modelling exercise. This is expanded within Section 5.4 of the updated FRA (2022).

**The YFDG comment 3:**

- 2.1.6 *"We appreciate you have made some changes to the design since we met initially prior to Christmas 2021, however it is apparent that the drainage strategy is still partly reliant upon the continued exceedance flow at Headwall C."*

**PJA Response to YFDG comment 3:**

- 2.1.7 In accordance with national and local policy and guidance, the proposed development masterplan and supporting surface water drainage strategy have been prepared to maintain the existing pre-development surface water flow paths. Currently surface water flows from the Site in an easterly direction, captured through existing ditches before discharging through three existing culverts. This is further expanded in Section 3.4 of the updated FRA (2022).

2.1.8 While the surface water drainage strategy within the proposed development aims to maintain the existing surface water flow routes as far as reasonably practicable, it also aims to attenuate surface water within the development thereby reducing the surface water flows leaving the Site.

2.1.9 Unfortunately, due to the fundamental principles of flood risk management policy and guidance it is not possible, nor recommended, to alter the existing surface water catchments and associated natural flow routes. By directing flows outside of the existing, natural catchments and into other catchments, the potential for adverse flood risk impacts and system failure on other parties is significant.

**The YFDG comment 4:**

2.1.10 *"We were glad to hear that you have had the surface water drain between the surgery and its outfall on the A44 camera surveyed and from the results you have seen that it is generally in a very good condition with the exception of some minor root infestation. We would appreciate seeing the results at some point soon."*

**PJA Response to YFDG comment 4:**

2.1.11 The CCTV survey will be provided within Appendix C of the updated FRA (2022). In the interim, a summary map showing the outcome from the CCTV survey and the respective connection of the outfalls from the Site into the Main River connections has been provided within Appendix A.

**The YFDG comment 5:**

2.1.12 *"It is reassuring to hear that the pipe [at headwall C- southern outfall] is in good condition both structurally and free of obstructions. However, that would confirm that the exceedance flows are due to a lack of capacity. Having completed your investigation of the drain from headwall C to its outfall on the A44 corridor, I presume you now have sufficient information with regards to levels and gradient to determine the maximum capacity for the drain - the drain that part of the site will rely upon. From that you will have a better understanding of the exceedance flows of a 1 in 100 return period and the return period at which exceedance will commence onto the local road network."*

**PJA Response to YFDG comment 5:**

2.1.13 The maximum capacity of the southern culvert has been calculated as approximately 177l/s. The current greenfield peak rates of the catchment to the southern outfall (which has a catchment area of 0.267km<sup>2</sup>) is approximately 80l/s during the 1 in 20 year and approximately 179l/s during the 1 in 100 year plus climate change (40%).



2.1.14 Based on these calculations, the capacity of the culvert is largely sufficient to accommodate surface water flows from the upstream catchment , in a free flowing scenario, in all events up to the 1 in 100 year event.

2.1.15 Nonetheless, while the capacity of the culvert is largely sufficient, there is potential that the downstream receiving drainage network does not have sufficient capacity and may result in surcharged conditions within the culvert. The hydraulic modelling described in Section 5.5 of the updated FRA (2022) expands on the potential impact of the downstream drainage network.

**The YFDG comment 6:**

2.1.16 *“We were surprised to learn that the Highway Authority have determined that the piped drain under the highway is not a highway drain and remains a private drain even though it connects the Rutten Lane highway ditch/drain to the A44 outfall. We would question the wisdom of this and hoped they would take a more pragmatic view. Their decision leaves a rather unclear picture as to the ownership, rights, responsibilities and liabilities for the pipe.”*

**PJA Response to YFDG comment 6:**

2.1.17 According to the Land Drainage Act 1991<sup>1</sup>, a “watercourse” includes all rivers and streams and all ditches, drains, cuts, culverts, dikes, sluices, sewers (other than public sewers within the meaning of the Water Industry Act 1991) and passages, through which water flows.

2.1.18 The Land Drainage Act (1991) defines an "Ordinary Watercourse" as a watercourse that does not form part of a "Main River". It does not have to be recorded on a map to be an ordinary watercourse and commonly is not.

2.1.19 The existing on site ditches, outfalls and subsequent culverts taking flow from the Site are not included within Thames Water asset mapping. These outfalls are >300mm in diameter and therefore would typically be included within the mapping if they were Thames Water assets.

2.1.20 Given this, these may be classified as Ordinary Watercourses, as such the ownership and responsibility of the culverts carrying the watercourses lies with the riparian land owners who should ensure that these flow routes remains operational.

2.1.21 The riparian land owners are required to request permissions by the Lead Local Flood Authority if they would like to build anything in or around an ordinary watercourse and should not build anything which could divert water and increase flood risk to other people’s property. Failure to do so may result in fines and legal action. Any issues with Ordinary Watercourse culverts i.e.

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<sup>1</sup> Land Drainage Act 1991. <https://www.legislation.gov.uk/ukpga/1991/59>

they need needs clearing or repairing should be reported to the Lead Local Flood Authority, which in this case is Oxfordshire County Council.

- 2.1.22 Landowners have a right to discharge flows into an ordinary watercourse at the greenfield rate. Therefore, permission does not need to be sought from the downstream riparian owners.

**The YFDG comment 7:**

- 2.1.23 *“As you know, while there is a right to discharge to a public sewer we don’t think there is the equivalent right to discharge to a private drain. That would be subject to an agreement with the land owner.”*

**PJA Response to YFDG comment 7:**

- 2.1.24 Within the proposed surface water drainage strategy, it is proposed to discharge surface water from the proposed development into the existing ditch network within the Site boundary, as in existing pre-development conditions. It is understood that the existing ditch network and downstream culvert network are classified as Ordinary Watercourse.
- 2.1.25 Wallingford HydroSolutions state that “if an existing outfall to culvert has been used for more than 20 years, it is accepted that prescriptive rights will be available to drain into the culvert, provided existing flow rates are maintained.
- 2.1.26 Furthermore, it should be noted that the proposed surface water drainage strategy demonstrates that surface water flows will be reduced to the existing culvert as a result of the proposed development.

**The YFDG comment 8:**

- 2.1.27 *“The Highway Authority certainly would not allow a private landowner to discharge to a highway drain without an agreement. It also casts doubts on who the private owners are, of which there is likely to be more than one. Part of the drain is under highway and part is under private land.*
- 2.1.28 *The normal presumption is that in the absence of evidence to the contrary the landowner is presumed to own pipework under their land. We presume that Aysgarth Road became highway via an adoption agreement between the developer and the Highway Authority thus conferring land ownership on the Highway Authority. Perhaps one could start by getting sight of the original agreement to determine if or what it says about drainage responsibilities. Those sections under private land could be even more problematic.*
- 2.1.29 *Should there not be a wayleave agreement in place to access the pipe from the surface, it would be entirely at the discretion of the landowners and on their terms. It’s not clear to us whether*

*the owner of a private drain couldn't therefore levy charges on surface water discharges to their pipe. There would also be a question about controlling rights to build over the pipe in the future."*

**PJA Response to YFDG comment 8:**

- 2.1.30 As noted previously, surface water flows from the proposed development will discharge into the existing ditch network within the Site. This ditch and the subsequent culvert is understood to be classified as Ordinary Watercourse. It is therefore such that the proposed development Site has prescriptive rights to drain into the Ordinary Watercourse within the land ownership boundary, provided existing flow rates are maintained (or reduced). Riparian owners have a duty to pass on flow without obstruction, pollution or diversion affecting the rights of others and must accept flood flows through your land. There is no duty in common law for any landowner to increase the drainage capacity of a watercourse on their land.

**The YFDG comment 9:**

- 2.1.31 *"As you said at the meeting the pipe is in good condition and ownership might not be an issue in the medium term. We believe However, that might change in the longer term - 100 years plus. If the Highway Authority were to find that replacing the pipe with one of larger diameter were the only alternative remedy available to tackle the existing flooding from PR9, then ownership could very well prove to be a problem."*

**PJA Response to YFDG comment 9:**

- 2.1.32 As noted previously this culvert is understood to be defined as Ordinary Watercourse and therefore the responsibility for ensuring its continued operation rests with the riparian landowners and the Lead Local Flood Authority.
- 2.1.33 The Lead Local Flood Authorities also have powers to undertake works subject to the application to the appropriate enforcement powers under the Flood and Water Management Act 2010 and the second-tier local authorities have powers to carry out works on Ordinary Watercourse.
- 2.1.34 The hydraulic modelling and capacity calculations undertaken to date have demonstrated that the capacity of the existing culverts are such that, in a free-flowing situation, the 1 in 100 year plus climate change (40%) event could be received. Given the criticality of the receiving downstream drainage network, enlarging the culverts locally is unlikely to mitigate flood risk within the village, while it may resolve flood risk locally, it is likely this risk will be transferred downstream.

**The YFDG comment 10:**

- 2.1.35 *“The Highway Authority seems to be determining the status of linear drainage assets based up “riparian right and responsibilities” which are rooted in ancient common law. This generally only holds true where there is no evidence to the contrary. We believe that the ditch on the west side of Rutten Lane was originally dug for the benefit of the roadway, by those responsible for maintaining the highway at that time. The name Rutten Lane would suggest it was often very rutted and impassible in winter – being located within the clay band just above the old marsh. The typical high bank cross-sectional profile would also support this argument. The ditch would have been dug to intercept the surface water runoff from Spring Hill in order to dry the road surface and enable it to be paved to create an all-weather roadway. That would determine it as part of the highway. We consider this is important because headwall C connects to the now piped section of the old highway ditch.”*

**PJA Response to YFDG comment 10:**

- 2.1.36 As noted previously, the culverts leaving the Site are understood to be Ordinary Watercourses, conveying surface water flows which emerge on Spring Hill and through Yarnton to enter the downstream Main River network. As noted above, the proposed development does not propose to increase the surface water flows entering the ordinary watercourse network.

**The YFDG comment 11:**

- 2.1.37 *“You similarly may want to consider the Highway Authority’s response to you (copy submitted with the planning application) regarding the ditch on the PR9 and A44 site boundary and the Inlet works at A and B. The A44 was originally the 1718 turnpike road and the ditch on the west side would have, similar to Rutten Lane, been dug to intercept surface water from higher ground.*
- 2.1.38 *The land for the ditch would have been purchased by or donated to the Turnpike Trust. Since then the road has been duelled and additional space would have been acquired by compulsory purchase order.*
- 2.1.39 *You may want to make enquires about the original order as it doesn’t seem likely that the landowners would have wanted to retain ownership as it was an excavation that principally benefited the highway. The line of the ditch would have been moved sideways to accommodate the extra carriageway, the cycleway and the verges.”*

**PJA Response to YFDG comment 11:**

- 2.1.40 Ditches that run alongside, or within, a highway do not necessarily form part of the highway drainage network and may remain the responsibility of the adjacent landowner or occupier. The owners of land next to a highway have a legal responsibility to maintain ditches to prevent them

causing a nuisance to road users. The Highway Authority may have a prescriptive right of discharge into these ditches in order to take the water runoff from the highway. However, where the ditches have been dedicated as forming part of the highway only, or where the ditch was constructed for the purpose of draining the highway, then the ditch will form part of the highway and will be the responsibility of the Highway Authority.

- 2.1.41 By this definition and by the duration of which it has been a conduit of flow from Spring Hill, it is understood that the existing ditches are classified as Ordinary Watercourse.

**The YFDG comment 12:**

- 2.1.42 *“During our meeting there were different views expressed as to the definition of green field runoff. We understand that you have calculated a runoff based upon a simple calculation using the general topography which falls towards headwall C and a rainfall hydrograph as prescribed in National guidance. However, we maintain that this does not adequately represent the nature of the real greenfield runoff specific to the site.”*

**PJA Response to YFDG comment 12:**

- 2.1.43 Fluid flow within watercourses, floodplains and over surfaces are governed by a set of complex physical processes. Hydraulic modelling and associated hydrological assessment requires the necessary simplification of these processes into mathematical models, thereby it may only be considered to be a simplified representation of a single flood event.
- 2.1.44 The Greenfield Runoff rates and rainfall hydrographs have been calculated following current best practice as described in the updated FRA (2022). The Greenfield Runoff calculations used to determine the surface water drainage strategy include FEH rainfall data with the critical storm duration of 3 hours 45 minutes and a maximum rainfall rate of ~50mm/hour. Flows for the hydraulic modelling were determined using the ReFH method in line with best practice and a precautionary approach.

**The YFDG comment 13:**

- 2.1.45 *The underlying premise of riparian rights and duties is that water running off higher land should be in its natural state and quality. The ribbon development has already altered that state by obstructing and altering the runoff pattern from the field behind it. This could have the effect of directing more surface water and groundwater towards headwall C and reducing the volume that would have been naturally intercepted by the highway drain in front of the existing ribbon development. In this case we think it's unreasonable to rely on the greenfield formula given in National planning guidelines.*

**PJA Response to YFDG comment 13:**

- 2.1.46 As noted previously, the proposed surface water drainage strategy aims to sustainably manage surface water within the proposed development in accordance with national and local policy and guidance.
- 2.1.47 In addition to these requirements, hydraulic modelling to represent the existing, current movement of water from the Site and assess the potential impact of the proposed development has been undertaken . This is expanded within the updated FRA (2022).

**The YFDG comment 14:**

- 2.1.48 *“After review, we consider the best way for the University to overcome many of the hurdles is to mitigate down to the capacity of the existing outfall – figures for which we believe you now have - and not to a greenfield runoff volume which we don’t think fairly reflect the specific local circumstances.*
- 2.1.49 *This may require an increase in the volume of the on-site attenuation tanks and a corresponding reduction in the number of new houses to make space - the application does say up to 540 units. However, as the development is very likely to get permission, tailoring the development to the existing available off-site drainage capacity seems both logical, simple and fair to the greater village.”*

**PJA Response to YFDG comment 14:**

- 2.1.50 The capacity of the receiving, existing culverts have been calculated to be 446l/s, 80l/s and 177l/s for the northern, central and southern outfalls respectively using the Colebrook White equation as shown below. Greenfield flows for the 1 in 100 year are 194l/s, 137l/s, and 118l/s respectively.

**2.1.51 *Colebrook White equation***

$$v = -2 \cdot \sqrt{(2 \cdot g \cdot D \cdot J_E)} \cdot \log_{10} \left( \frac{k_s}{3.71 \cdot D} + \frac{2.51 \cdot \nu_k}{D \cdot \sqrt{(2 \cdot g \cdot D \cdot J_E)}} \right)$$

Where:

Gravitational Constant (g) (m/s<sup>2</sup>)

*This is the acceleration due to gravity, typically taken as 9.81m/s<sup>2</sup> at sea level.*

Internal Pipe Diameter (D)

*This is the internal diameter of the pipe being considered.*

Hydraulic Gradient (JE)

*This is effectively the slope of pipe in m/m.*

Kinematic Viscosity of Water ( $\nu_k$ ) (1.139mm<sup>2</sup>/s)

Roughness Coefficient ( $k_s$ ) (m)

*This coefficient relates to the energy lost by the water due to the friction caused by the internal roughness of the pipe.*

- 2.1.52 Given this, as the proposed development proposes to maintain existing QBAR greenfield rates the capacity of these culverts is not exceeded due to runoff from the Site and the respective upstream catchment. As noted previously, it is likely to be the capacity or surcharging of the downstream receiving drainage network that is exacerbating flood risk within the village.

**The YFDG comment 15:**

- 2.1.53 *Should the development get permission there seems to be very little opportunity for the Flood Authorities to mitigate off-site. During the meeting Amy said it would not be desirable to upsize the pipe running out to the A44. It does not fit with the principles underpinning flood attenuation and might only serve to move the problem downstream onto the A44. Should the development be approved as it stands we consider it necessary for the Flood Authorities to have a plan in place to mitigate the existing flooding.*

**PJA Response to YFDG comment 15:**

- 2.1.54 The hydraulic modelling undertaken to date, and summarised within the updated FRA (2022), assesses the potential impact of the proposed development. The proposed development will provide attenuation of surface water flows and aims to offer some mitigation of runoff from the upstream catchment, although due to the nature of the existing flooding within the village it is not proposed, nor reasonable, to remove all risk of flooding.

**The YFDG comment 16:**

- 2.1.55 *Based on the drawing you brought to the meeting we understand the cutoff drain and associated attenuation pond seems to be mainly aimed at reducing risk to the new housing and directing the attenuated flow to headwall C at the surgery. Some of that greenfield flow currently finds a natural path to the southern part of the A44 site boundary. This again, could put more pressure on headwall C. This part of the scheme currently seems to be based on best estimations and on little field data.*

**PJA Response to YFDG comment 16:**

- 2.1.56 The hydraulic modelling undertaken has implemented a precautionary approach to assess current and future risk. The cut off ditches will provide a function to slow down, attenuate and direct flow around areas of high vulnerability. Natural Flood Management measures and check

dams may be used to further slow the flow. Due to the topographic nature of the upstream catchment, it is not possible to accommodate large scale attenuation features.

**The YFDG comment 17:**

- 2.1.57 *The current WSP report available on the Cherwell planning portal refers to groundwater being absent based on a single trial-hole dug in the Oxford Clay. Yet during the on-site archeological phase we understand the archeologists had difficulty keeping their excavations dry. We also note that there still seem to be no integration of the groundwater and surface runoff to headwall C.*
- 2.1.58 *With the above in mind, how will you arrive at a workable design for the cutoff drain and pond, and what contingency will there be if it should prove insufficient?*

**PJA Response to YFDG comment 17:**

- 2.1.59 Further groundwater trial pits have been undertaken by Ian Farmer Associates on the 19th November 2021 at four locations across the Site. The trial pits were dug to depths of between 2.2m and 2.35mbgl and identified Made Ground described as sandy, gravelly silt or clay with flint, sandstone and possible asphalt and coal, underlain by natural ground comprising sandy gravelly clay. Groundwater was not identified in any of the trial pits.
- 2.1.60 Further detailed groundwater monitoring will be completed as part of a more detailed Site Investigation as the detailed design is developed. Due course will be taken on the interaction of groundwater and surface water to determine a workable design whilst providing the same downstream benefits.

**The YFDG comment 18:**

- 2.1.61 *We also have concerns that this pond and the other SuDS ponds will simply serve as stilling ponds for silt eroded from the upper slopes and become a constant problem for the management company. Eroded soils being brought down into the village in significant quantities has been a feature of previous floods.*

**PJA Response to YFDG comment 18:**

- 2.1.62 The proposed SuDS features will be maintained by a private management company in perpetuity, most likely facilitated by funding from a management fee as part of household owner agreements. The functioning of these features will be continually monitored to ensure that the assets maintain the function for which they were designed.

**The YFDG comment 19:**

- 2.1.63 *As you know, employing the services of a management company has become typical for new development sites as local authorities and Thames Water have declined to take on these new assets. Management companies, of which there are now many, are like any private company –*



*some good and some incompetent. How will they be regulated and by whom? What would happen if the company went into liquidation?*

**PJA Response to YFDG comment 19:**

- 2.1.64 The onsite Management Company will likely be responsible and liable for the management of all of the hard and soft, surface water management assets from the final development.
- 2.1.65 Residents in the new development may be legally obligated to pay into a maintenance fund as part of the individual house sale agreements and therefore the onsite Management Company may be able to draw from a management fund to complete the maintenance of certain assets on behalf of the Governors of the maintenance company, who will ultimately be residents themselves. The private maintenance company may complete the following maintenance tasks:
- Inspections of all assets serving the wider development
  - Gully clearance,
  - Vegetation management across all drainage assets and public open space,
  - Repairs and replacements of all drainage and public open space assets where required.
- 2.1.66 The Management Company is intended to exist in perpetuity, with an income stream to feed into the maintenance fund and that the Management Company will be accountable by the people paying into the fund. This provides a robust mechanism for assurance of sufficient and effective maintenance obligations

**The YFDG comment 20:**

- 2.1.67 *We would like to know with whom would the residual risk in the design ultimately sit and would it be insurable – not just risk on site but also off-site. During the construction phase the developer would normally acquire third party all-risk cover. Will that third party all-risk cover be continued for the life of the development?*

**PJA Response to YFDG comment 20:**

- 2.1.68 During construction, the developer will acquire third party all-risk cover. Once operational the Management Company will be responsible and liable for maintaining the assets to the standard that they were designed to and ensuring the full operational functioning of these assets.

**The YFDG comment 21:**

- 2.1.69 *At close of the meeting a question about what would YFDG do if the University were to pull out of the development at this stage was raised. Certainly the village would not benefit in term of flood risk reduction if they were to withdraw, but as the scheme currently stands, for the greater part neither would the village benefit.*

2.1.70 *As the outcome of having/not having the proposed development would therefore be more or less neutral the flood risk to the village would remain at risk either way – however the site would still be open for a more sympathetic development proposal. If the current development were to proceed as it stands, it would finally block the opportunity for a positive flood risk mitigation outcome for the village.*

**PJA Response to YFDG comment 21:**

2.1.71 As stated above and described within the updated FRA (2022), the village would likely benefit from the more formal approach to surface water management proposed as part of the development. In addition, the proposed development proposes to attenuate surface water flows from the Site and manage exceedance flow routing from the upstream catchment through small topographic features.

**The YFDG comment 22:**

2.1.72 *During the meeting we noted that there were items missing from your drawings, and questions were raised that you told us you would respond to with accurate information.*

2.1.73 *We would be grateful if you can send us complete copies of your drawings, including:*

- *The proposed cutoff drain and pond adjacent to the Sanctuary care home, showing the outfall connection and exceedance route in your design for this area.*
- *Drawings of your planned foul connection locations to the Thames Water system.*
- *Follow up concerning the investigation of the 2' diameter cast iron pipe running under the railway that could be used to divert flows around Yarnton rather than through it.*

**PJA Response to YFDG comment 22:**

2.1.74 All drawings and supporting text will be included within the updated FRA (2022). Specifically, for the comments above:

- The proposed cut-off drain and pond adjacent to the Sanctuary care home, showing the outfall connection and exceedance route in your design for this area. – addressed in section 5.4.20- 5.4.27 of FRA.
- Drawings of your planned foul connection locations to the Thames Water system. – addressed in Section 7 and Appendix G of the FRA.
- Follow up concerning the investigation of the 2' diameter cast iron pipe running under the railway that could be used to divert flows around Yarnton rather than through it. - addressed in Section 6.3.2 of the FRA.

## **Appendix A      Outfalls from the Site into the Main River connections**



