DATE:	12 June 2025	STATUS:	For Planning Approval
SUBJECT:	Review of Flood Risk Assessment ref. 5026537-RDG-XX-XX-T-C-309950 REV. P02 (application ref.: 25/01247/OUT)		
DOC REF.:	JOF0134-TN-FR-001	CLIENT:	Parish Council of Aston, Cote, Shifford and Chimney
AUTHOR:	Joao Gil	Revision:	01

Technical Note – Review of Flood Risk Assessment (ref.: 5026537-RDG-XX-XX-T-C-309950 REV. P02)

1 CONTEXT AND PURPOSE

1.1 Joflows was commissioned by Parish Council of Aston, Cote, Shifford and Chimney (hereafter referred to as 'the Parish Council') to undertake a review of Flood Risk Assessment ref. 5026537-RDG-XX-XX-T-C-309950 REV. P02 (by Ridge, May 2025), hereafter referred to as 'Flood Risk Assessment' or 'FRA', produced to inform a development of up to 40 no. residential dwellings at a land parcel south of Kingsway Cottages and Bampton Road, in Aston (Oxfordshire), OX18 2BT. The application and supporting documentation can be consulted at West Oxfordshire District Council's planning portal, under ref. 25/01247/OUT.

1.2 Upon reviewing the FRA, it became clear that the assessment is incomplete and lacks evidence pertaining some of its underlying assumptions. This evidence is essential to ensure that the development is safe from flooding throughout its lifetime and does not increase flood risk elsewhere.

1.3 This technical note should be read in conjunction with the following elements:

- Flood Risk Assessment ref. 5026537-RDG-XX-XX-T-C-309950 REV. P02 (by Ridge, May 2025)
- Flood Risk Review ref. JOF0134-RP-FRA-001 REV 01 (by joflows, December 2024)

1.4 The Flood Risk Review ref. JOF0134-RP-FRA-001 REV 01 (by joflows, December 2024) is hereafter referred to as 'Flood Risk Review'.

2 COMMENTS TO FLOOD RISK ASSESSMENT

2.1 Albeit section 3.3 of the FRA refers to historic flood records in the West Oxfordshire District, the assessment does not address the significant flood events at the site specifically. Photographic evidence is available in the Flood Risk Review showing various flood events at the site, which are also known to have affected Kingsway Cottages and St Josephs Court. This suggests the site works as a floodplain for surface and fluvial flood waters.

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2.2 Section 3.4 of the FRA states that the Environment agency mapping shows the application site to be affected by Flood Zone 2 and presents the flood extents as shown in the Flood Map for Planning. However, this section fails to assess the hydraulic model used by the Environment Agency to generate such flood extents. As stated in the Flood Risk Review, the 1D model provided by the Environment Agency shows the absence of Aston Ditch. This means that there is no current model that integrates flood-lock conditions caused by River Thames, when modelling Aston Ditch. Before 2008, the Flood Map for Planning incorporated smaller watercourses and showed the site to be wholly affected by Flood Zone 3.

2.3 Section 3.4 of the FRA states that the FRA shows the site to be at a susceptibility to groundwater flooding of >=75%. However, the FRA fails to link the groundwater flooding susceptibility with site-specific groundwater monitoring, which shows groundwater raising to the surface in two of the window samples (in January 2025). It is worth noting that the site-specific groundwater monitoring programme did not comprise a full hydrological year and the lowest groundwater level was found to be 0.95m BGL, recorded in February 2025. This is consistent with the groundwater monitoring undertaken by the Parish Council and presented in the Flood Risk Review. Albeit the Flood Risk Assessment fails to review the local geology of the area, the BGS *webviewer* shows the surroundings of the site to be underlain by Sands and Gravels, thus suggesting that groundwater flows patterns could be linked throughout Aston. This in turn reveals that the displacement of groundwater at the site could lead to an increase in flood risk off-site, putting other residents at risk of flooding in Aston.

2.4 Section 3.4 of the FRA presents the FMfP surface water flood extents for the present-day 1%AEP storm event. However, the FRA does not include reference to the surface water flood extents under a climate-change scenario. Upon consultation of the Environment Agency's *wms* datasets, the inclusion of climate change allowances is shown to exacerbate the surface water flood extents within the site for the 1%AEPCC.

2.5 Furthermore, Figure 6 of the FRA shows the Environment Agency's mapping for a flood depth of up to 300mm. However, it is unclear as to why a minimum depth of 300mm was set in detriment of 200mm, which would have revealed further areas at a higher risk of flooding.

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2.6 Albeit Section 3.4 (page 16) of the FRA states that the site is at high risk of surface water flooding, the table on page 17 states that the risk of flooding from surface water flooding is medium.

2.7 Section 5.1 of the FRA states that the primary approach was to steer development away from Aston Ditch, towards east to avoid the overland flow route. However, the Environment Agency's Risk of Flooding from Surface Water shows the eastern part of the site to be at high-risk of flooding for the 1%AEPCC, which affects the developable area of the development, including dwellings and access roads. Therefore, given the extents of surface water for the design flood event, a sequential approach is not deemed achievable, and the development should be subject to the sequential test, as set out in paragraph 175 of the National Planning Policy Framework. Furthermore, Appendix F of the FRA includes a ground level section under baseline and post-development conditions, showing land raising in areas at risk of surface water flooding for the 1%AEPCC. It is also worth noting that the whole site is also deemed to be at risk of groundwater flooding, thus prompting the requirement for the sequential test.

2.8 Section 5.1 of the FRA suggests that the west part of the site will be lowered to create a more defined flow path for the flow route. However, it is unclear whether the flow route affects the attenuation basins, as no 2D pluvial model was undertaken to confirm this measure delivers the benefit envisaged.

2.9 Section 5.1 of the FRA states that '(…) with onsite mitigation, all sources of flood risk on site have been catered for, hence the need for the sequential test is not triggered'. The guidance from the Environment Agency clearly states that a "development is not exempt from the sequential test just because a FRA shows it can be made safe throughout its lifetime without increasing flood risk elsewhere".

2.10 Section 5.1 of the FRA states that "groundwater levels on the site could be high". However, site-specific groundwater monitoring presented in Appendix C shows this assumption to be a fact, with boreholes recording groundwater levels between surface and 950mm BGL.

2.11 The ground level sections shown in Appendix F of the FRA do not clarify which parts of the site will be used to promote flood storage compensation, to offset the loss of surface water storage as a result of the development.

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2.12 Section 5.5 of the FRA states that adequate area is available within the application boundary to mitigate the loss of flood storage. However, no evidence is provided to justify the conclusion. Quantification of the amount of compensation required is needed.

2.13 Section 5.5 of the FRA states that adequate area is available within the site to mitigate any loss of flood storage or flood conveyance. However, the FRA does not calculate the loss of storage arising as a result of the development, including the volume displaced by i) new buildings, ii) land raising and iii) compaction of soils that decreases the volume available to store groundwater. Only site-specific catchment hydraulic modelling, which takes in account the coupling between groundwater and surface water can fully assess mitigation measures to offset the loss of storage volume.

2.14 Section 5.6 of the FRA states acknowledges that B449 (Bampton Road) would be the safe access and egress to the site. It is worth noting that Bampton Road is the only dry access that allows the evacuation out of Aston. No evidence is however provided in the FRA to demonstrate that Bampton Road is not put at risk of flooding as a result of the displacement of surface water and groundwater.

2.15 As previously stated, section 6.5 of the FRA acknowledges the displacement of surface water as a result of the development. However, the FRA fails to undertake a quantitative assessment of the loss in storage and associated mitigation measures. No clear evidence is provided as to whether the offset for this loss of volume can actually be provided within the site. Only a catchment-scale surface water and groundwater hydraulic model can confirm this question.

2.16 Section 6.6 of the FRA highlights the requirement to preserve the north-to-south flood route through the site. Whilst this premise is welcome, the FRA fails to identify the true extent of the overland flow route, by suggesting that this element is limited to the western part of the site, when the eastern part of the site is also shown to be at risk of surface water flooding. It is worth noting that Risk of Flooding from Surface Water dataset filters outputs by a threshold flood hazard. This means that some parts of the site may not show flood extents, whilst still being ‘wet’ cells and conveying surface water runoff. Only a catchment-scale 2D pluvial hydraulic modelling could clarify this matter.

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2.17 Section 7.1.5 of the FRA establishes greenfield runoff rates, estimated via IH124. It is worth noting that CIRIA C753 highlights more appropriate methods to estimate greenfield runoff rates, including FEH statistical and ReFH2. Furthermore, it appears that the total area of the site (2.89ha) was adopted to estimate greenfield runoff rates. However, this approach leads to a duplication in runoff released into the local network of ditches, as permeable areas within the site will not contribute towards the drainage system.

2.18 Section 9.1 of the FRA highlights the Bampton Treatment Works is in the process of being upgraded. Various flood records were reported as a result of the lack of capacity in the public foul network. The FRA fails to provide liaison with Thames Water to confirm that the upgrade works will deliver sufficient capacity to accommodate foul flows arising as a result of the 40 no. new dwelling houses.

3 CONCLUSIONS

3.1 The review of the FRA shows an incomplete assessment of flood risk, which lacks a joint assessment of the multiple flood risk sources contributing to the site.

3.2 The FRA acknowledges the potential for the development to displace flood waters and to increase flood risk off-site. However, the assessment fails to quantify the amount of flood waters displaced and no specific mitigation measures are detailed in the report.

3.3 The FRA should be accompanied by a hydraulic modelling study to assess the joint effect of the multiple flood risk sources at the site. This study should incorporate flood storage compensation measures to demonstrate the viability of mitigation measures to prevent an increase in flood risk off-site.

3.4 The FRA does not provide a plausible justification as to why the development is exempt from the sequential test. It becomes evident that the vast majority of the site is affected by surface water flooding and groundwater flooding, which prompts the need for the sequential test to be applied.

The FRA appears to assume that upon conclusion of the upgrade works to Bampton Treatment Works, there will be sufficient capacity to accommodate flows the additional 40 no. dwellings. However, there appears to be no correspondence with Thames Water to confirm this assumption.

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