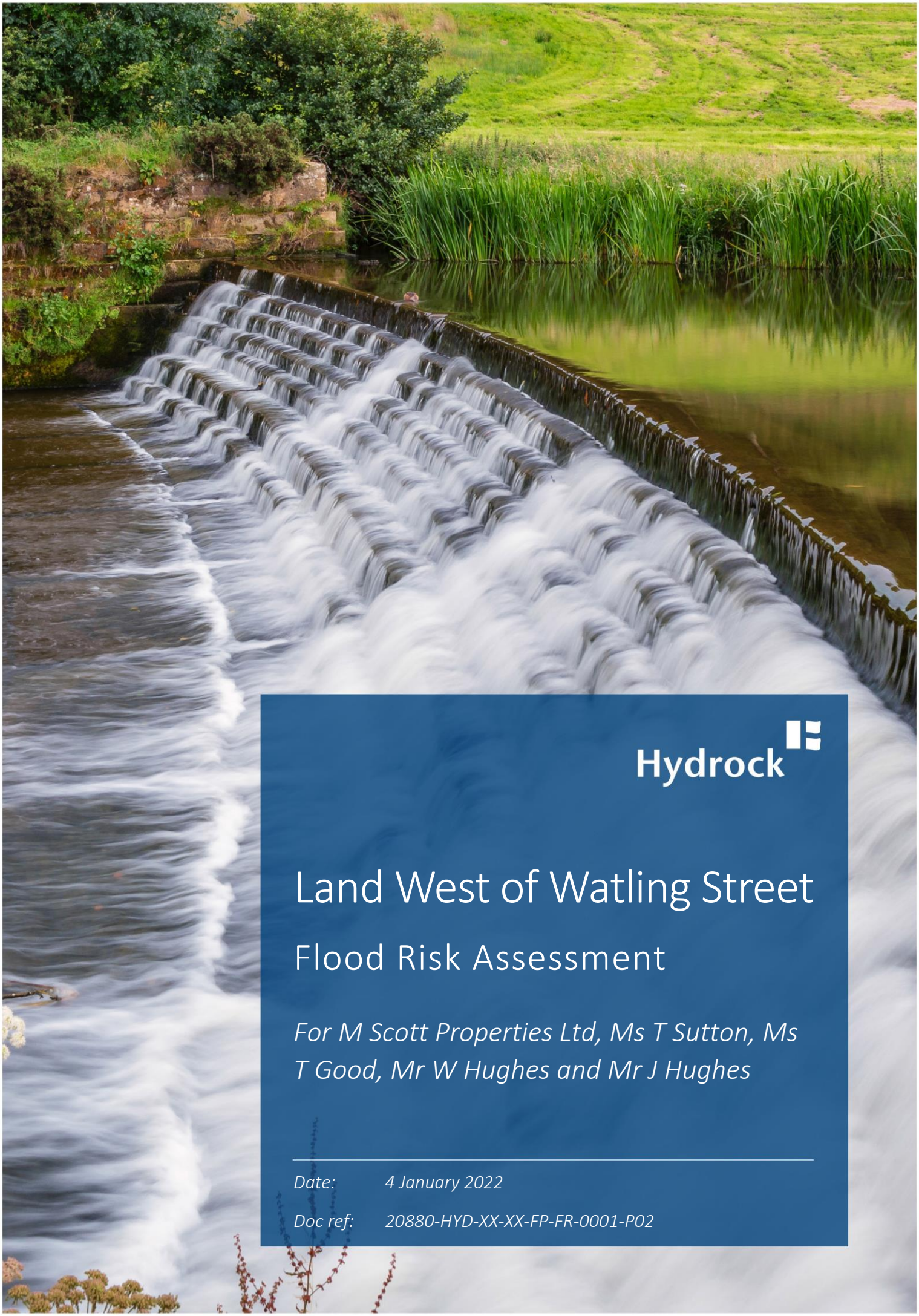

Hydrock

Land West of Watling Street

Flood Risk Assessment

For M Scott Properties Ltd, Ms T Sutton, Ms T Good, Mr W Hughes and Mr J Hughes

Date: *4 January 2022*

Doc ref: *20880-HYD-XX-XX-FP-FR-0001-P02*

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1. INTRODUCTION

This report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of our clients M Scott Properties Ltd, Ms T Sutton, Ms T Good, Mr W Hughes and Mr J Hughes, in support of a planning application for proposed development of land to the west of Watling Street, Park Street.

Whilst the site is located within Flood Zone 1, the total site area exceeds 1 hectare and therefore, under National Planning Guidance, a Flood Risk Assessment is required.

This FRA report has been prepared to address the requirements of the National Planning Policy Framework (NPPF), through:

- Assessing whether the site is likely to be affected by flooding.
- Assessing whether the proposed development is appropriate in the suggested location.
- Presenting any flood risk mitigation measures necessary to ensure that the proposed development and occupants will be safe, whilst ensuring flood risk is not increased elsewhere.

2. SITE INFORMATION

2.1 Site Location

The land for the proposed development is located to the west of Watling Street, in Park Street, Hertfordshire. The site is currently occupied by undeveloped land, bound by further undeveloped land to the north and west and residential developments to the south and east. The closest 'main' river to the site is the River Ver which is around 150m to the east of the site. A review of the Ordnance Survey mapping of the site has shown that there are no watercourses running through the site.

The site address for the development, along with the nearest postcode, and Ordnance Survey Grid Reference is provided in Table 1, with site / plot boundaries and locations shown in Figure 1.

Site Referencing Information	
Site Address	Land west of Watling Street, Park Street, St Albans, Hertfordshire, AL2 2NZ
Grid Reference	514561 204496

Table 1. Site Referencing Information

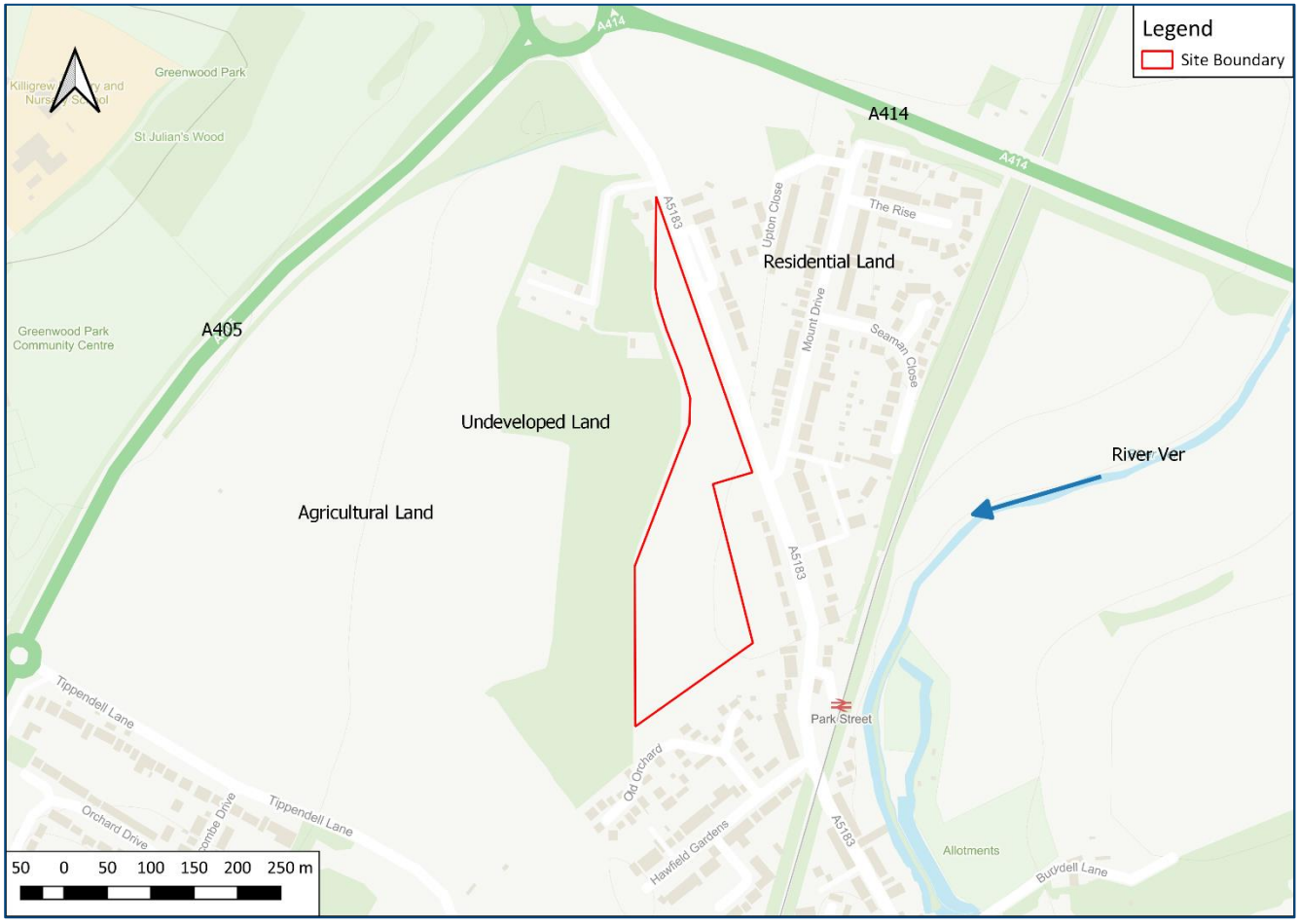

Figure 1. Site Location

2.2 Topography

A topographical survey was undertaken by BB Surveys in September 2020, and is included in the application for an outline planning permission. The survey shows the site to have a general westerly fall, with a high point of 81.8m AOD at the eastern boundary which slopes to a low point of around 73.8m AOD at the western site boundary.

Figure 2 shows a topographical map which uses Environment Agency LiDAR data. This has been included to show the difference in elevation between the site and the wider area, as this information was not included in the topographical survey. The river is situated in a valley to the east of the site, meaning that the lowest point of the site is elevated 10m above the river.

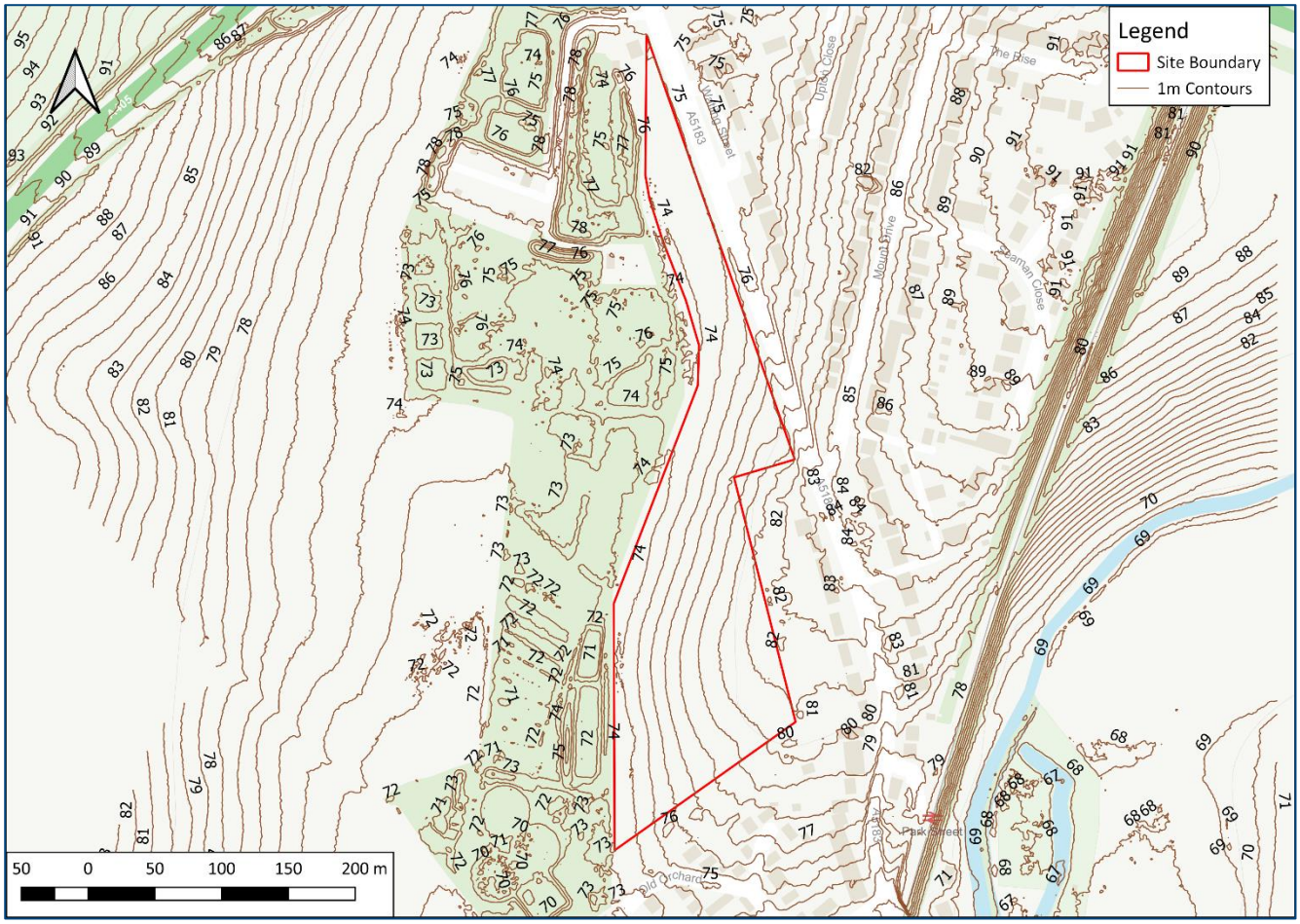

Figure 2: Topography Map

2.3 Current Site Use

The current site is approximately 4.3 ha in extent and used as agricultural land and is currently undeveloped.

2.4 Proposed Development

The proposals are for a multi-unit residential development.

3. SOURCES OF FLOOD RISK

3.1 Fluvial Flooding

The publicly available Environment Agency Flood Map for Planning (FMfP) classifies the site as being located entirely within Flood Zone 1 (Figure 3). The closest 'main' watercourse is the River Ver, approximately 150m to the west of the site and situated at a lower elevation, around 10m below the eastern levels on site, according to the LiDAR data shown in figure 2. The area around the watercourse is also the closest area of Flood Zonation to the site.

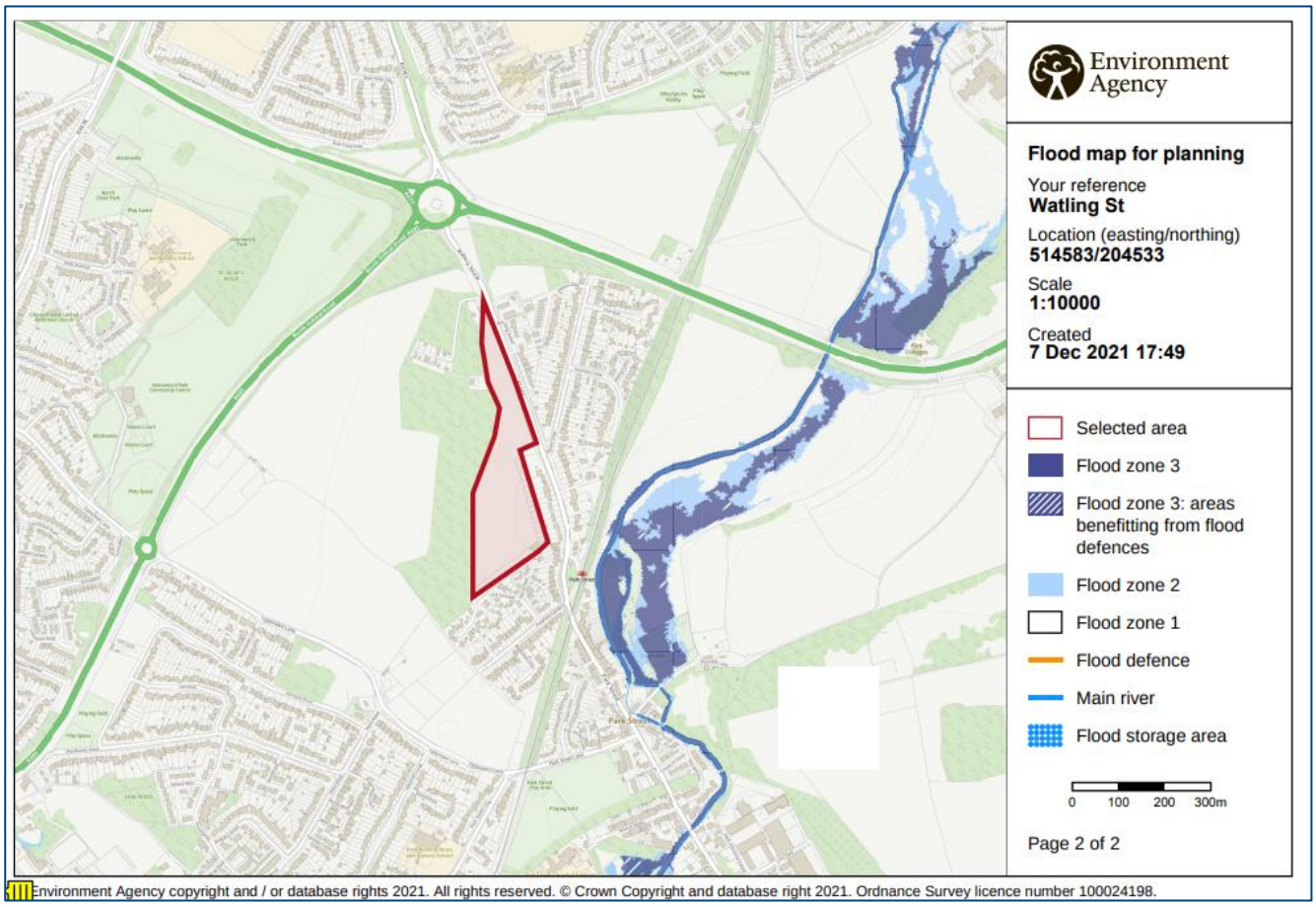

Figure 3. EA Flood Zone Mapping
Contains OS data © Crown copyright (2021) and Environment Agency data under OGLv3

For reference, the Environment Agency Flood Zones are defined as follows:

- Flood Zone 1 (Low Risk) comprises land assessed as having a ≤0.1% AEP (Annual Exceedance Probability) of fluvial flooding in any given year, equivalent to the ≥1,000yr return period flood event.
- Flood Zone 2 (Medium Risk) comprises land assessed as having a 0.1-1% AEP of fluvial flooding in any given year, equivalent to the 1,000-100yr return period flood event.
- Flood Zone 3 (High Risk) comprises land assessed as having a ≥1% AEP of fluvial flooding in any given year, equivalent to the ≤100yr return period flood event.

The site is classified as being within Flood Zone 1 and the closest area of increased risk, Flood Zone 2 or Flood Zone 3, is some 140m to the south west of the site and associated with the River Ver.

Neither the EA nor the South West Hertfordshire Level 1 Strategic Flood Risk Assessment (SFRA) (JBA, 2019) identifies the site or surrounding area as having been impacted by any previous incidents of fluvial flooding.

Whilst the potential effects of climate change could increase frequency, depth and extent of fluvial flooding from the River Ver, given the elevation of the site in relation to the watercourse (approximately 10m higher), the impacts of climate change are deemed to not be of a magnitude so as to impact the site and therefore the site is concluded to be at 'low' risk of fluvial flooding.

3.2 Tidal Flooding

It should be noted that the EA Flood Zone Mapping does not differentiate between fluvial and tidal flood risk. The site can be considered to be at negligible risk of tidal flooding due to its inland location and significant elevation above sea level (>70m).

3.3 Surface Water Flooding

Surface water flooding occurs as the result of an inability of intense rainfall to infiltrate the ground. This often happens when the maximum soil infiltration rate or storage capacity is reached. Flows generated by such events either enter existing land drainage features or follow the general topography which can concentrate flows and lead to localised ponding/flooding.

The EA Surface Water Mapping (Figure 4) shows the vast majority of the site to be at 'very low' risk of flooding from surface water. It does however indicate some localised surface water flood risk along the western boundary. The areas at risk of surface water flooding are predominantly shown to have predicted depths below 300mm by the EA's online flood mapping, as shown in figure 5, which indicates depths of flooding for a 'low' risk scenario. These areas provide no connectivity to the wider area and are therefore considered to be representative of locally lower elevated sections of the site and occur as a result of the natural topography of the site. These small areas of low risk will be dealt with by the surface water network drainage system.

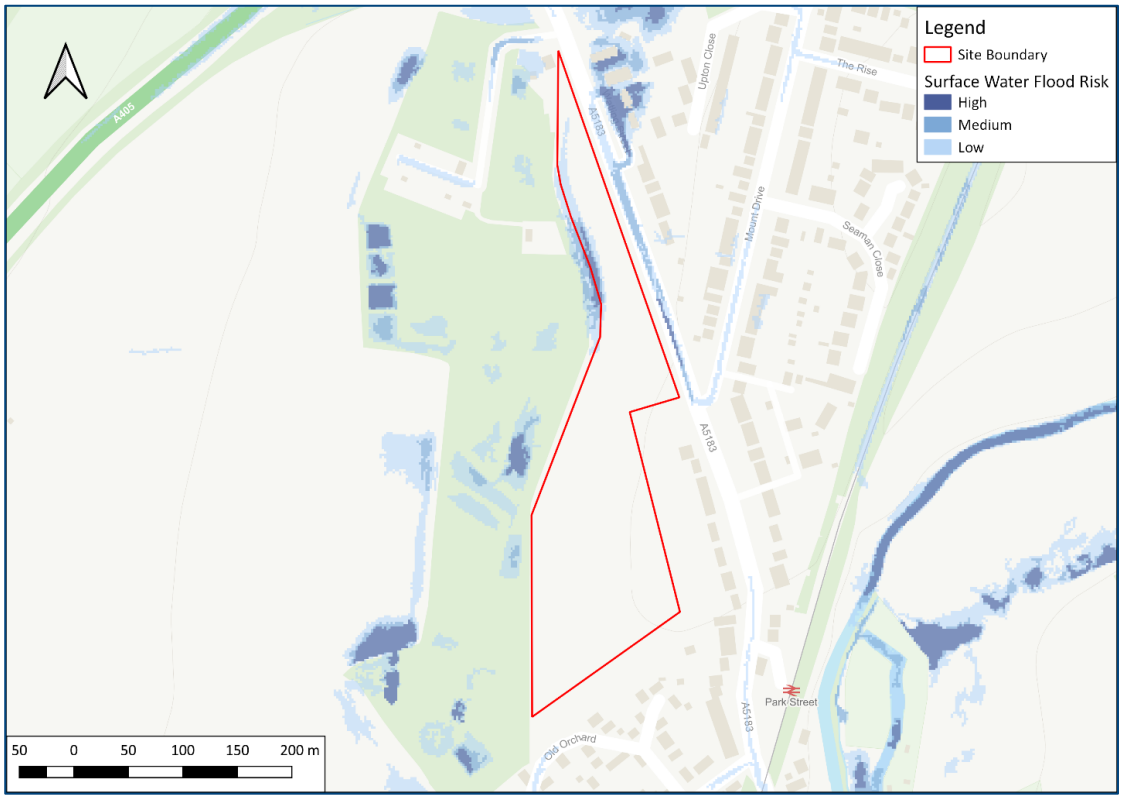

Figure 4: EA Surface Water Flood Mapping
Contains OS data © Crown copyright (2020) and Environment Agency data under OGLv3

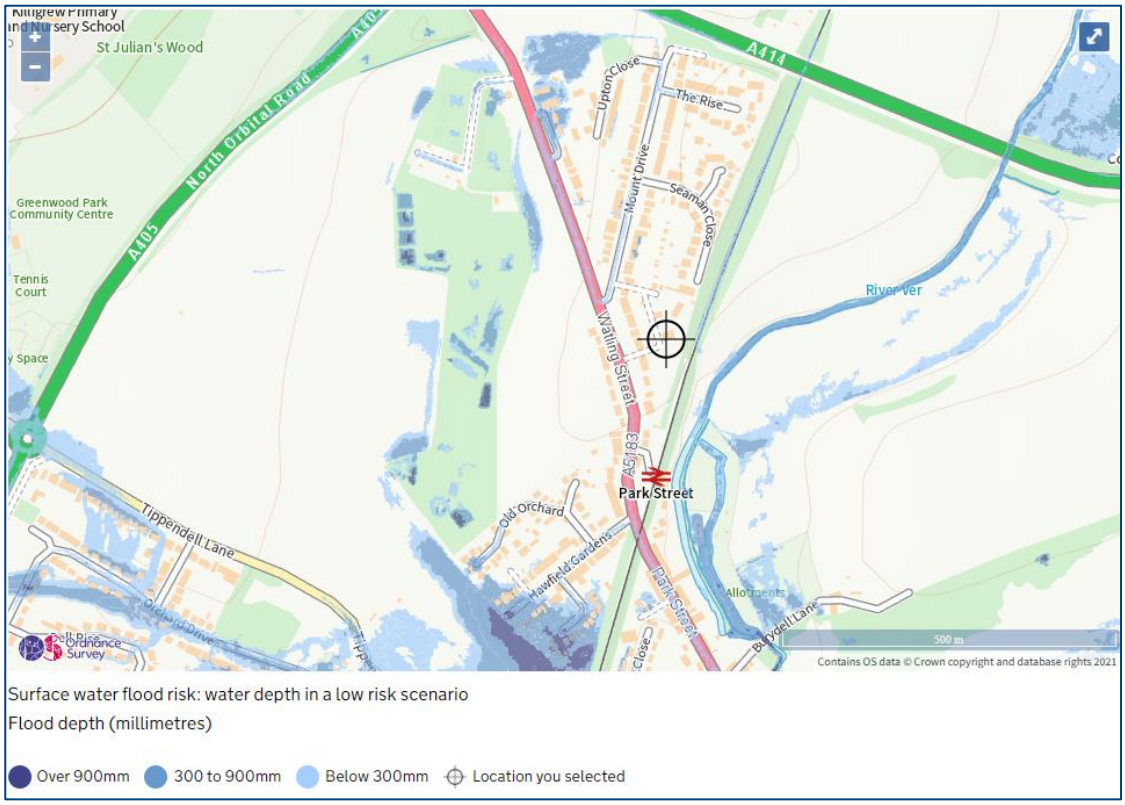

Figure 5: Surface Water Flood Depths

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Whilst the potential effects of climate change could increase the frequency, depth and extent of on-site surface water flooding, given the sloping topographies, any increase in flood risk is considered unlikely to be of a magnitude which would result in a significant increase in the risk of on-site surface water flooding, as any surface water run-off will likely continue to be directed overland as shallow 'sheet-flow' with the prevailing topography from east to west. Therefore, the risk of surface water flooding can be considered 'low'.

3.4 Groundwater Flooding

British Geological Survey (BGS) Mapping (Figure 6) shows the site to be entirely underlain by undifferentiated chalk composed of two different formations, including Lewes Nodular chalk formation and Seaford chalk formation. Overlying the bedrock in the northern portion of the site are superficial River Terrace Deposits consisting of sand and gravel, and to the south (outside of the site boundary) are deposits of Alluvium consisting of clay, silt, sand and gravel.

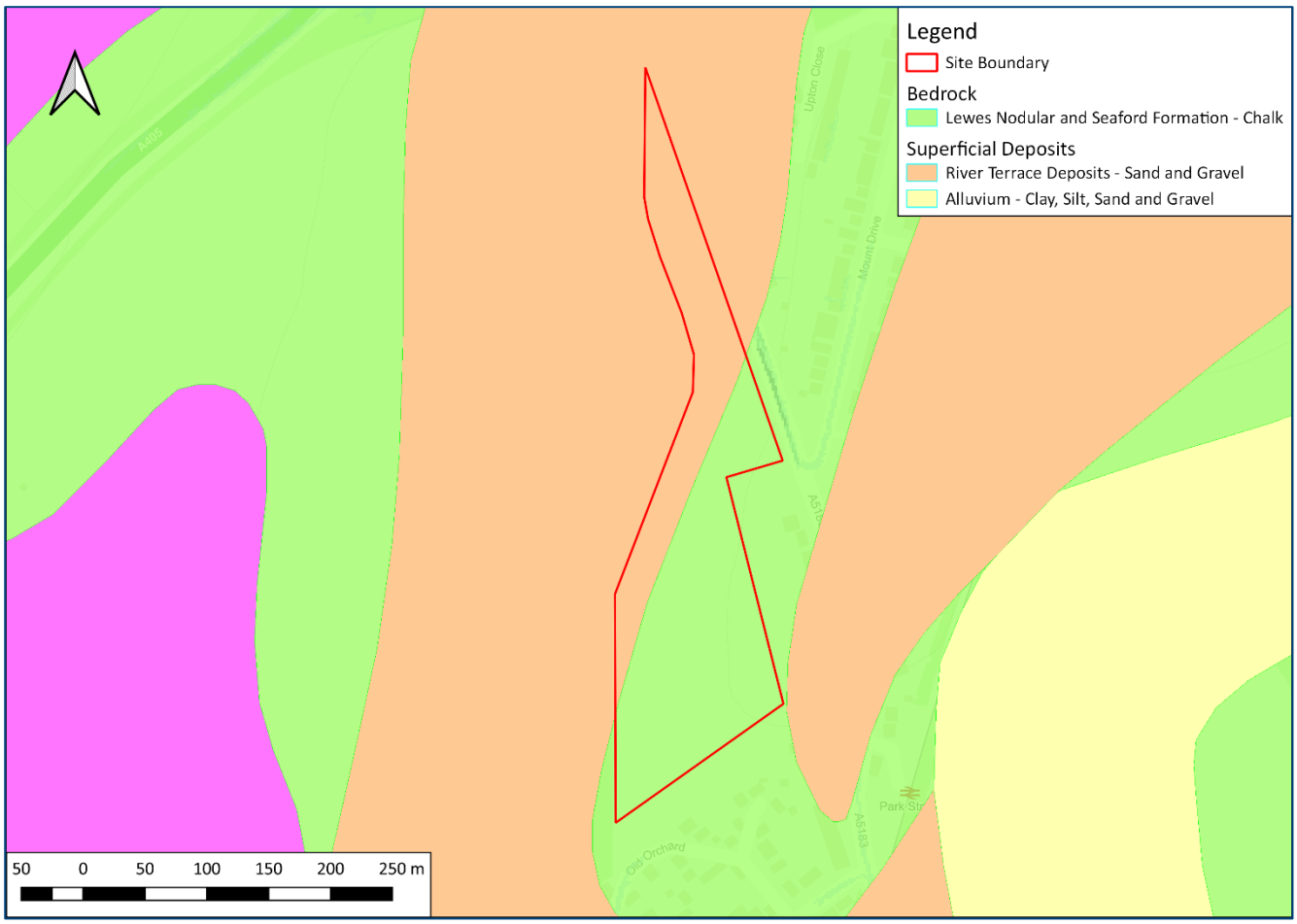

Figure 6. BGS Geological Map
Contains OS data © Crown copyright (2020) and BGS data under OGLv3

The SFRA produced for South West Hertfordshire (JBA, 2015), suggests that the groundwater flood risk is high in the chalk valleys of the River Ver, as chalk, with its increased permeability does have the potential for groundwater emergence.

In the instance of this site, any groundwater emergence is likely limited to locally lower lying areas around the site, and pose little risk to the site. This is due to the River Ver, which is groundwater fed and

expected to act as a hydraulic control and potential draw down for the groundwater. This is corroborated by the nearest borehole record, taken from a borehole around 400m to the north east of the site, which was 7.6m deep and did not strike water.

According to the SFRA, groundwater flooding which occurs in permeable surface deposits, such as sand and gravel deposits (as seen in figure 6), is likely to increase in response to increases in fluvial flooding. However, due to the elevation of the river below the site, this increase is not expected to influence the site. Therefore, the risk of any groundwater flooding can be concluded as 'low'.

3.5 Infrastructure Failure Flooding

The South West Hertfordshire SFRA does not indicate that the site or any of the surrounding area is particularly susceptible to sewer flooding. Therefore, given that the risk of sewer flooding is likely only in the event of failure or blockage, this is considered to be a 'residual' risk, and as such the risk of potential flooding from sewers is concluded to be 'low'.

The EA Reservoir Failure Extent mapping (EA, 2021)[1] does not show the site to lie within the extent of potential reservoir flooding and, given there is no known risk of flooding from canals or any other artificial sources at the site, it can be concluded that the risk of flooding from infrastructure failure is 'low'.

[1] EA Long Term Flood Risk Maps - https://flood-warning-information.service.gov.uk/long-term-flood-risk/map

4. NATIONAL PLANNING POLICY FRAMEWORK

4.1 Sequential & Exception Tests

This assessment has demonstrated that the site is on land designated as Flood Zone 1 by the EA's Flood Zone Mapping, and is at low or negligible risk of flooding from all other potential sources.

Paragraph 033 of the Flood Risk and Coastal Change National Planning Practice Guidance (NPPG) states that "*Nor should it normally be necessary to apply the Sequential Test to development proposals in Flood Zone 1".*

The NPPG Flood Risk Vulnerability and Flood Zone Compatibility matrix (Table 3 of the NPPG) also indicates that all forms of development are "appropriate" in Flood Zone 1 without application of the Exception Test.

Accordingly, the application of the Sequential and Exception Tests is concluded to not be required in this instance.

4.2 Mitigation Measures

Whilst an Exception Test is not explicitly required under the NPPG, the following section details any measures recommended to mitigate any 'residual' flood risks and to ensure that the proposed development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, akin to the requirements of section 'b' of the Exception Test as outlined in the NPPF.

4.2.1 Finished Floor Levels.

Given the low risk of surface water flooding identified in across the site, it is recommended best practice for the finished floor levels of the site to be elevated above surrounding ground levels by a minimum of 150mm where practicable to address any residual risk of surface water flooding, adopting a design for exceedance approach. However, due to the post-developed nature of the site, it is likely that a drainage system will address the on-site surface water flood risk.

4.2.2 Safe Access and Egress

Access to the site is provided on the eastern boundary of the site off Watling Street which is indicated to be at low or negligible risk of flooding from all assessed sources and as such safe access and egress is concluded to be possible.

4.2.3 Floodplain Storage

On the basis that the site has been demonstrated to be at low risk of flooding, and therefore outside a functioning floodplain, the proposed development is not considered to increase flood risk within the catchment through a loss of floodplain storage, and accordingly no further mitigation measures are required in this respect.

5. SUMMARY

This Flood Risk Assessment (FRA) report has been prepared by Hydrock on behalf of M Scott Properties Ltd, Ms T Sutton, Ms T Good, Mr W Hughes and Mr J Hughes, in support of an outline planning application for proposed development on land to the west of Watling Street.

A detailed assessment of flood risk has identified that the site is located within Flood Zone 1 (Low Risk) regarding fluvial flood risk, and is at 'low' or 'negligible' risk of flooding from all other potential sources.

In accordance with the NPPF and NPPG, the application of the Sequential and Exception Tests is concluded to not be required in this instance.

In order to address any residual risk from surface water flooding, it has been recommended that the finished floor levels are raised by 150mm.

It has also been demonstrated that a means of safe access and egress is possible to and from the site via an entrance on Watling Street, and that the proposed development is also not considered to increase flood risk within the catchment through a loss of floodplain storage.

This report therefore demonstrates that, in respect of flood risk, the proposed development of the site:

- Is suitable in the location proposed.
- Will be adequately flood resistant and resilient.
- Will not place additional persons at risk of flooding, and will offer a safe means of access and egress.
- Will not increase flood risk elsewhere as a result of the proposed development through the loss of floodplain storage or impedance of flood flows.

As such, the application is concluded to meet the flood risk requirements of the NPPF.

Hydrock Consultants Limited

6. REFERENCES

References			
	Author	Date	Description
A	JBA	April 2021	South West Hertfordshire Level Strategic Flood Risk Assessment https://www.threerivers.gov.uk/egcl-page/strategic-flood-risk-assessment