technical note

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Dreamlea, Purton Stoke

Groundwater Flood Risk Technical Note

Project No.	1711
Revision	B
Date	26 April 2024
Client	James Ridgley
Prepared	B Fenton
Checked	R Leevers
Authorised	C Yalden
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1 Introduction

1.1 AWP has been commissioned by Mr James Ridgley to prepare this Technical Note covering the risk of groundwater flooding to the proposed redevelopment of land at Dreamlea, Purton Stoke, Swindon (planning reference PL/2023/05363).

1.2 This Technical Note aims to respond to concerns received on 22nd February 2024 from the planning officer at Wiltshire Council, regarding the risk of groundwater flooding at the site. The email can be found in Appendix A.

1.3 This note provides a summary of technical matters in relation to the existing conditions and the respective risks from groundwater flooding, based on data from multiple geological and hydrogeological maps and sources.

2 Groundwater Flood Risk

Site Geology and Hydrogeology

2.1 Based on British Geological Survey (BGS) 'Geology Viewer' online mapping, the site is not underlain by any superficial deposits. The bedrock is comprised of the 'Oxford clay formation' on top of the 'Kellaways Formation', consisting mainly of low-permeability Mudstone.

2.2 The BGS identify three main settings which could cause a risk of groundwater flooding. These are:

- **Unconfined major aquifers**. The BGS hydrogeological map of the UK indicates that the area around the site is comprised of 'Rocks with essentially no groundwater'. If any aquifer were present, it would be confined by the Oxford clay formation.
- **Shallow unconsolidated sedimentary aquifers**. The lack of any superficial deposits on the BGS mapping would suggest the site is not underlain by any unconsolidated sedimentary deposits and is therefore unlikely to be hydraulically connected to the watercourse approximately 300m west of the site.
- **Groundwater rebound in urban centres**. The site is not close to any of the major cities.

2.3 The absence of superficial deposits and the presence of the low-permeability Oxford clay formation on top of the Kellaways Formation indicate that there is a negligible risk of groundwater emergence.

Environment Agency (EA) Sources

2.4 The Environment Agency (EA) online resource 'Check the long term flood risk for an area in England' indicates that 'Flooding from groundwater is unlikely in this area'.

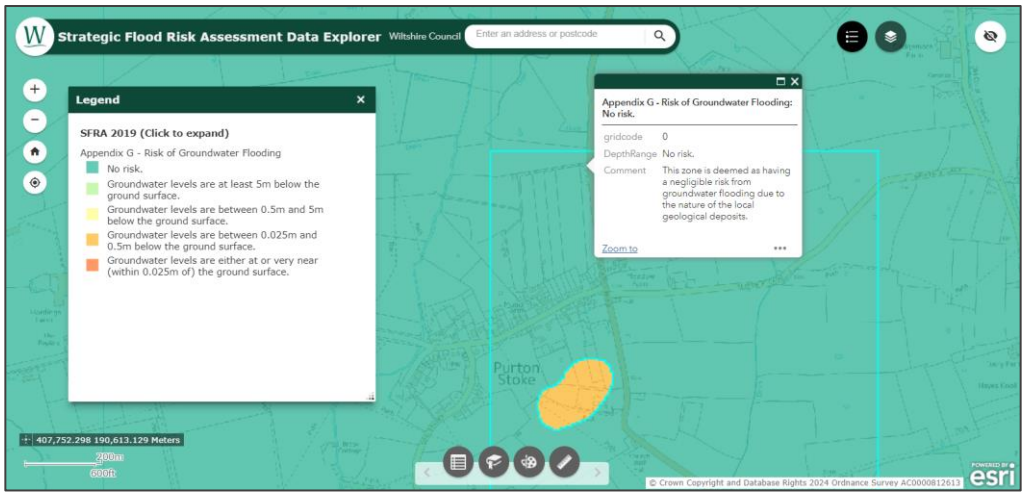
2.5 The EA 'Historic Flood Map' does not show any instances of flooding within the site.

Wiltshire Council Level 1 Strategic Flood Risk Assessment

2.6 The Wiltshire Council Level 1 Strategic Flood Risk Assessment (May 2019) includes a Groundwater Flood Map produced by JBA Consulting. The map provides an assessment of the risk of groundwater emergence during a 1 in 100-year event, with 5m resolution.

2.7 The Wiltshire Council online resource 'Strategic Flood Risk Assessment Data Explorer' includes the JBA Groundwater Flood Map. An extract is shown below in Figure 2.1.

Figure 2.1 – Wiltshire Council Strategic Flood Risk Assessment Data Explorer



2.8 The site and surrounding area are considered at no risk of groundwater flooding, with groundwater levels expected to be far in excess of 5m below ground during a 1 in 100-year event.

BGS 'Susceptibility to groundwater flooding'

2.9 The BGS produce a 'Susceptibility to groundwater flooding' hydrogeological map of the UK, which may be relied upon to determine groundwater flooding susceptibility across the UK with a 50m grid.

2.10 The dataset has three classes of groundwater flood susceptibility:

Class A: Limited potential for groundwater flooding to occur.

Class B: Potential for groundwater flooding of property situated below ground level.

Class C: Potential for groundwater flooding to occur at surface.

Areas outside these three classes are *'Not considered to be prone to groundwater flooding: based on rock type.'*.

2.11 The BGS data indicates that the site is outside any area considered at risk of groundwater flooding, with the nearest 'Class C' area approximately 160m west of the site, associated with the River Key. A copy of the BGS data is shown in Figure 2.2.

Figure 2.2 – BGS 'Susceptibility to groundwater flooding' model



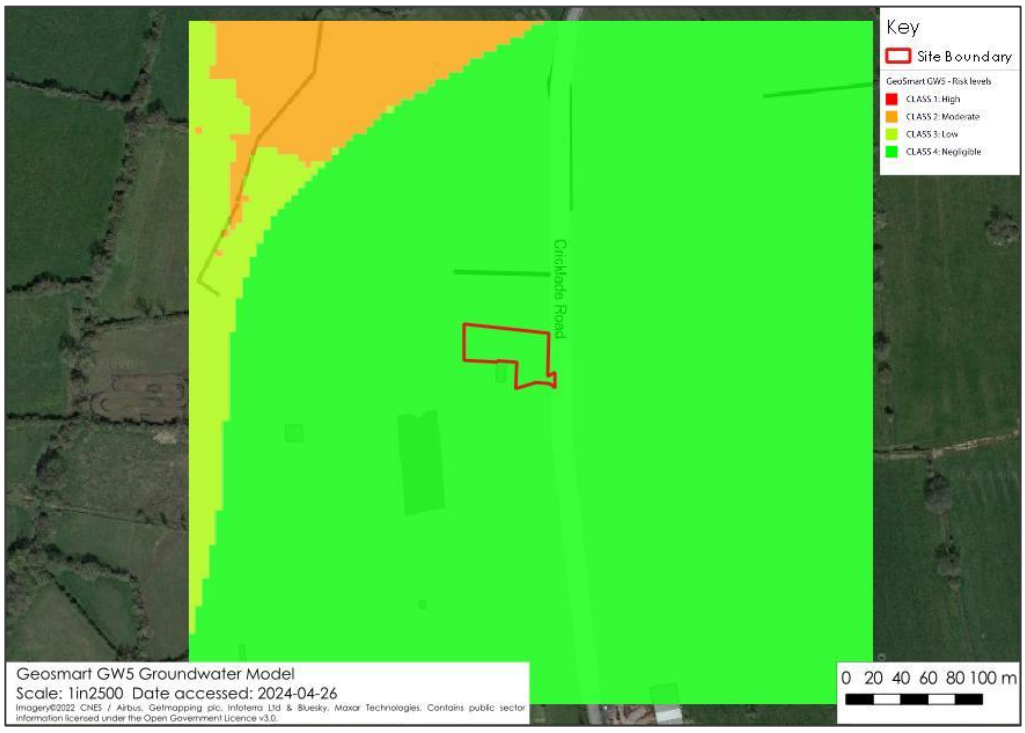
GeoSmart GW5 Groundwater Model

2.12 GeoSmart produces the 'GW5' groundwater flood risk model incorporating data from various national scale datasets as well as in-house hydrogeological and risk models. The dataset '*classifies groundwater flood risk in every cell on a 5m grid covering Great Britain into one of 4 risk categories: Negligible, Low, Moderate, and High*'.

2.13 The GW5 data was obtained for the proposed development site and surrounding area and showed that all 5m cells within the site and surrounding area are considered to have of 'Negligible' risk, defined as having an annual probability of groundwater flooding of less than 1%.

2.14 A copy of the GW5 data is shown in Figure 2.3.

Figure 2.3 – GeoSmart GW5 Groundwater flood risk model



3 Conclusion

3.1 A comprehensive review of the ground conditions and data relating to groundwater flood risk has been conducted for the proposed redevelopment site at Dreamlea, Purton Stoke, Swindon.

3.2 The geology and hydrogeology of the site indicates that the site is unlikely to be at risk from any of the three main sources of groundwater flooding outlined by the BGS.

3.3 The Wiltshire Council Strategic Flood Risk Assessment Data Explorer, as well as data obtained from the EA, BGS, and GeoSmart, consistently show the site as being at negligible or no risk of groundwater flooding.

3.4 Based on the above, this assessment concludes that the site is suitable for the proposed redevelopment from a groundwater flood risk perspective. No flood resilience measures are recommended. It is therefore recommended that the Lead Local Flood Authority advise the local planning authority that they have no objections to the proposed development on flood risk grounds.

AWP

Appendix A Wiltshire Council correspondence

E: hannah@hcplanning.co.uk
M: 07817516943
W: www.hcplanning.co.uk

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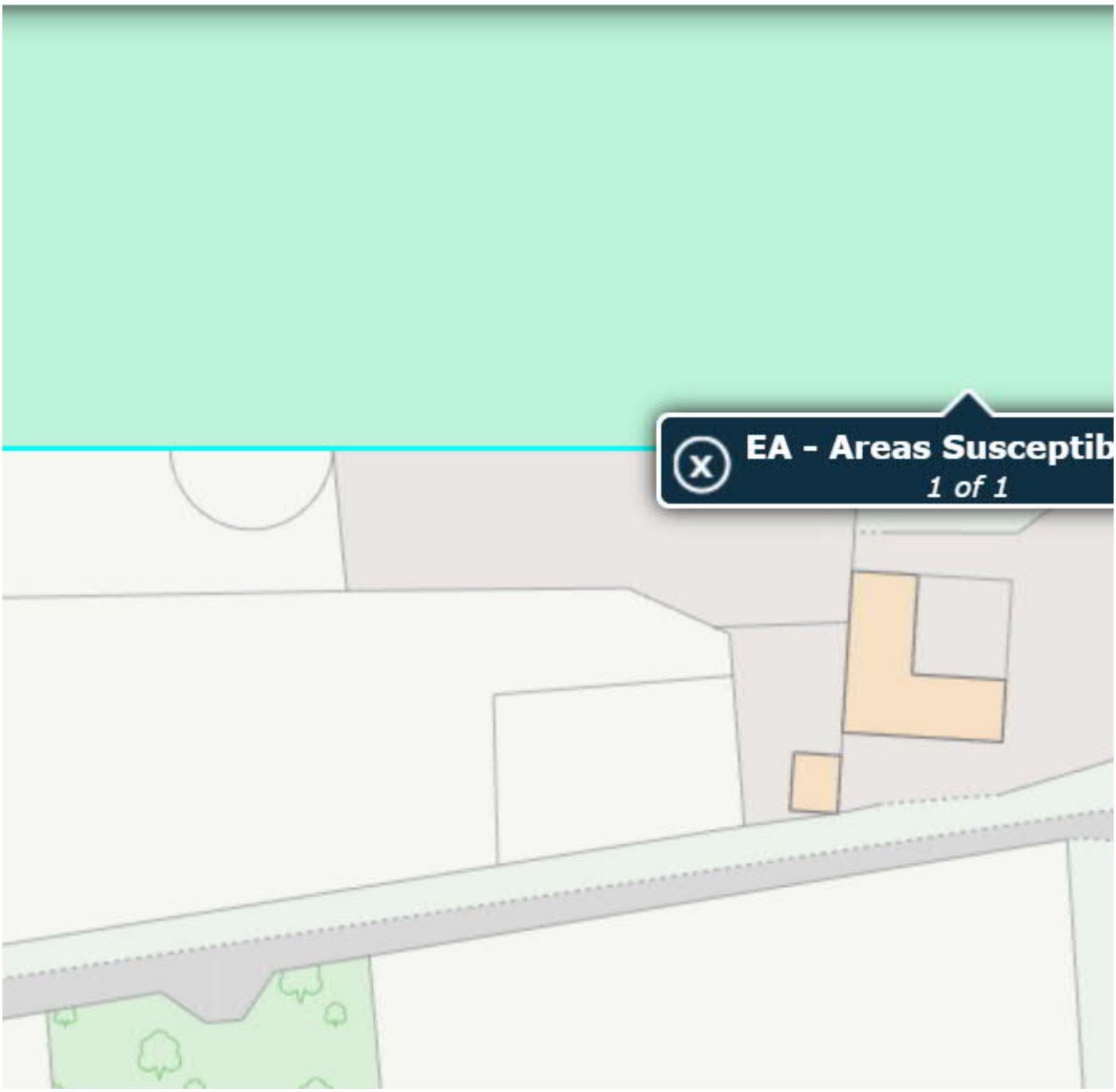
From: Walker, Adrian <Adrian.Walker@wiltshire.gov.uk>
Date: Thursday, 22 February 2024 at 17:46
To: Hannah Cameron <hannah@hcplanning.co.uk>
Subject: RE: PL/2023/05363

Hi Hannah,

Apologies for the confusion. As discussed on the phone it is in the EA - Areas Susceptible to Ground Water Flooding - < 25% on our Development Management Portal Map.



I will give you a call tomorrow after I have discussed it with Andrew.

Many thanks,

Adrian

Adrian Walker MRTPI
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From: Hannah Cameron <hannah@hcplanning.co.uk>
Sent: Thursday, February 22, 2024 5:25 PM
To: Walker, Adrian <Adrian.Walker@wiltshire.gov.uk>
Subject: Re: PL/2023/05363
Importance: High

> You don't often get email from hannah@hcplanning.co.uk. Learn why this is important

Dear Adrian,

Thank you for your email.

Are you able to provide clarification on what you consider to be the risk of flooding from surface water, as I note the proposed development site is in Flood Zone 1 and is not shown on the EA mapping as at risk of surface water flooding. I appreciate that the wider land ownership is at risk of flooding, but this land is not proposed for development.

In terms of surface water management, I am unsure if you have been to site, but the entire development site is currently hard surfaced and we are not proposing to increase or change the hard surfacing. Surface water from the caravan roofs will be managed using a rainwater harvesting system and any excess runoff will soakaway through the existing permeable surfacing, as per the existing situation.

Given the existing site context and very limited change, a detailed drainage strategy has not been provided at this stage and I hope the above information is sufficient to alleviate any concerns you may have. If you need any further information, please do let me know.

Kind regards,

Hannah Cameron MRTPI
Director
HC Planning Ltd

E: hannah@hcplanning.co.uk
M: 07817516943
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From: Walker, Adrian <Adrian.Walker@wiltshire.gov.uk>
Date: Wednesday, 21 February 2024 at 11:30
To: Hannah Cameron <hannah@hcplanning.co.uk>
Subject: RE: PL/2023/05363

Hi Hannah,

I am currently working through the application with the aim of March's committee. My major concern is drainage. The site is within an area at risk of surface water flooding and objectors have highlighted that the site has flooded recently. Policy CS47 states that development should be resisted where there is poor drainage. I have nothing on record of any response to this or any drainage strategy.

Did you provide any response to this?

Kind regards,

Adrian

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