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Cardiff Council Strategic Flood Consequences Assessment - Velindre Station (79)

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Contract

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This report describes work commissioned by Cardiff Council, by an instruction dated 23rd January 2026. The Client's representative for the contract was Stuart Williams of Cardiff Council. Polly Stradling of JBA Consulting carried out this work.

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The conclusions and recommendations contained in this Report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by JBA has not been independently verified by JBA, unless otherwise stated in the Report.

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1 Introduction

JBA Consulting has been commissioned by Cardiff Council to prepare an independent Flood Risk Appraisal as part of a Stage 2 Strategic Flood Consequences Assessment (SFCA) for sites considered for allocation in its Replacement Local Development Plan.

This assessment will evaluate the risk of flooding from all sources to 'Velindre Station', the proposed development site, as well as the appropriateness of development at the site in accordance with Welsh Government policy, as outlined in Technical Advice Note 15 (TAN15). Furthermore, recommendations will be provided, where appropriate, to mitigate the risk of flooding at the proposed development site as well as recommendations for further works.

2 Site Description

The key characteristics of the site are summarised in Table 2-1 and the location and site boundary are shown in Figure 2-1.

Table 2-1 Site Summary

Site name	Velindre Station
Site ID	79
Site area (ha)	0.1
Existing land use	Greenfield land
Purpose of development	Metro Station
OS NGR	ST 14212 80984
Access location	Access from Hollybush Estate

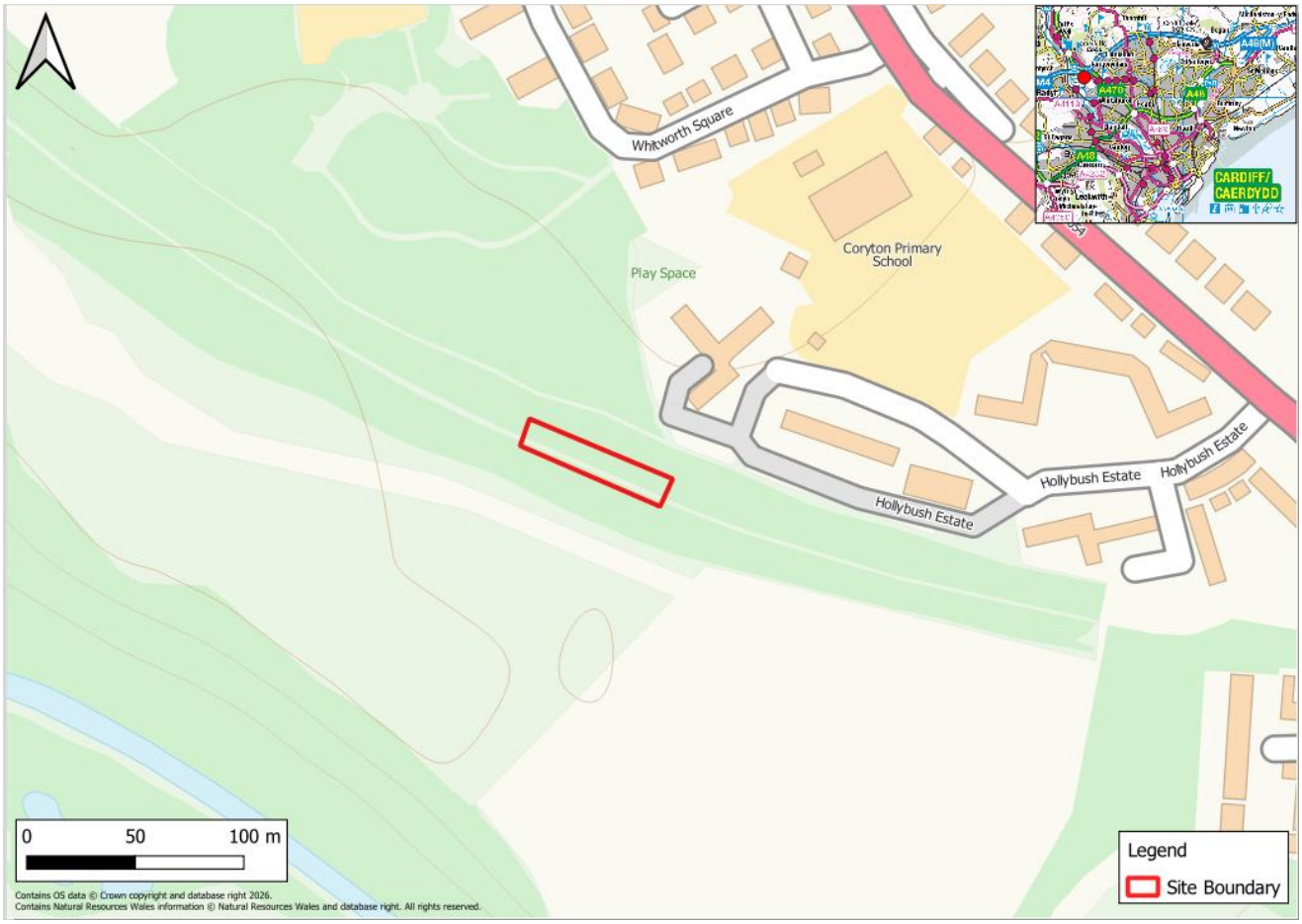

Figure 2-1 Proposed development site

2.1 Development proposals

The proposed development is for a new metro station and is classed as Less Vulnerable development.

No indicative site layout is available for this assessment.

2.2 Topography

The Natural Resources Wales (NRW) Open Source 1m Light Detection and Ranging (LiDAR) data[1] across the site has been reviewed and is shown in Figure 2-2.

Levels across the site generally fall in a south westerly direction. The highest ground levels are along the northeastern boundary of the site, peaking in the northwestern corner at around 43.1mAOD. Lowest levels are around 39.16mAOD in the southeastern corner of the site.

It is known that the site lies within a shallow linear depression that corresponds to the former Cardiff Railway track bed, which historically continued northwest beyond Coryton towards Tongwynlais and Treforest. This section of railway was progressively abandoned,

1 https://datamap.gov.wales/maps/lidar-data-download/

with passenger services withdrawn beyond Coryton in 1931 and the remaining freight-only link closing permanently in 1953.

The resulting earthworks have left a clearly defined, man-made trough parallel to the current railway corridor, reflecting the original engineered alignment. The ditch-like feature visibly represents the remnant formation and associated drainage of this disused section, explaining its uniform geometry and consistent orientation with the historic railway route.

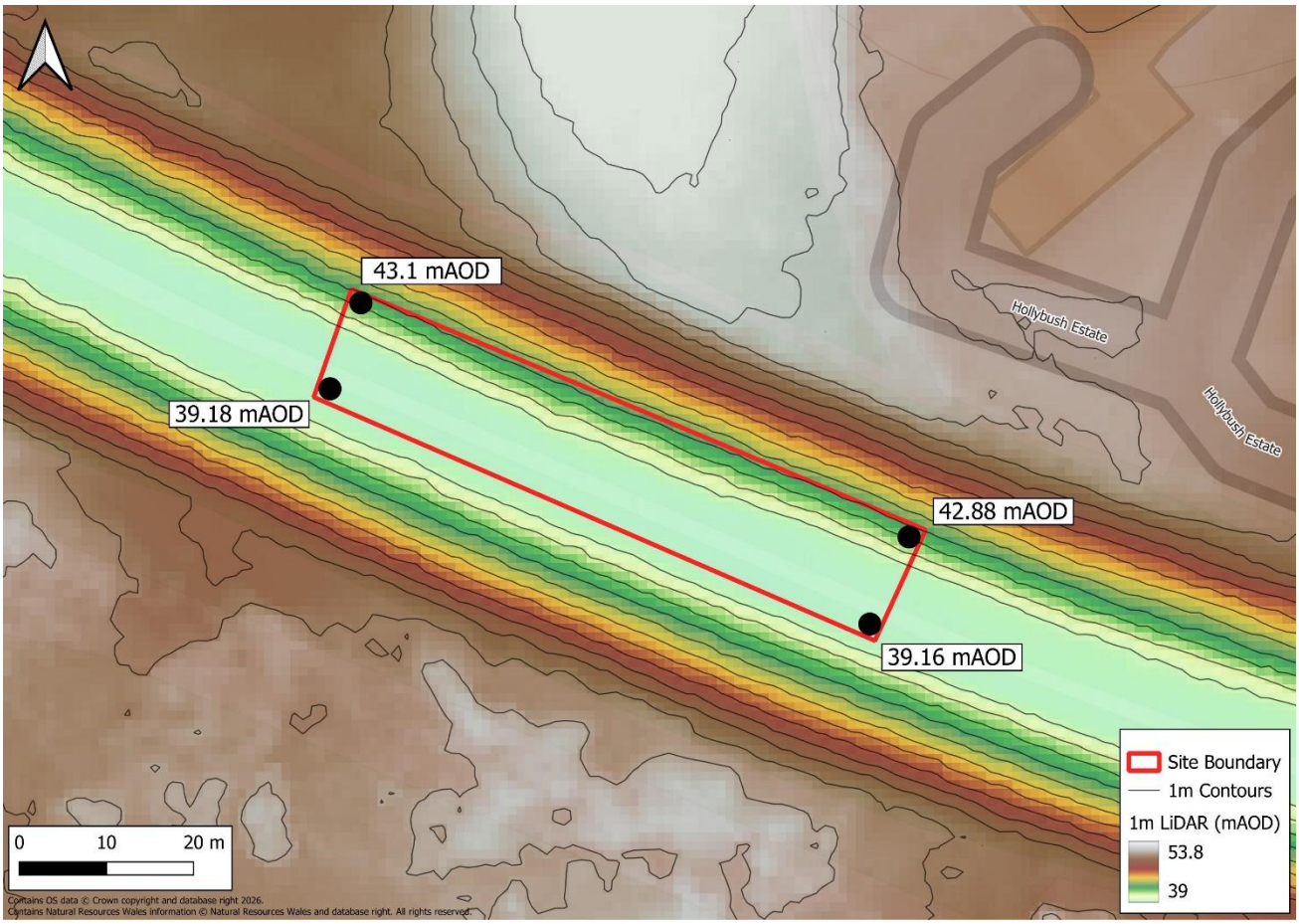

Figure 2-2 1m LiDAR

2.3 Watercourses and Flood Defences

Figure 2 4 shows the locations of the nearest waterbodies and watercourses to the site.

No watercourses cross the site. The Glamorganshire Canal is located approximately 225m from the south of the site, and the River Taff, an NRW Main River, is located approximately 280m from the south of the site.

The site is not located within an area that benefits from flood defences.

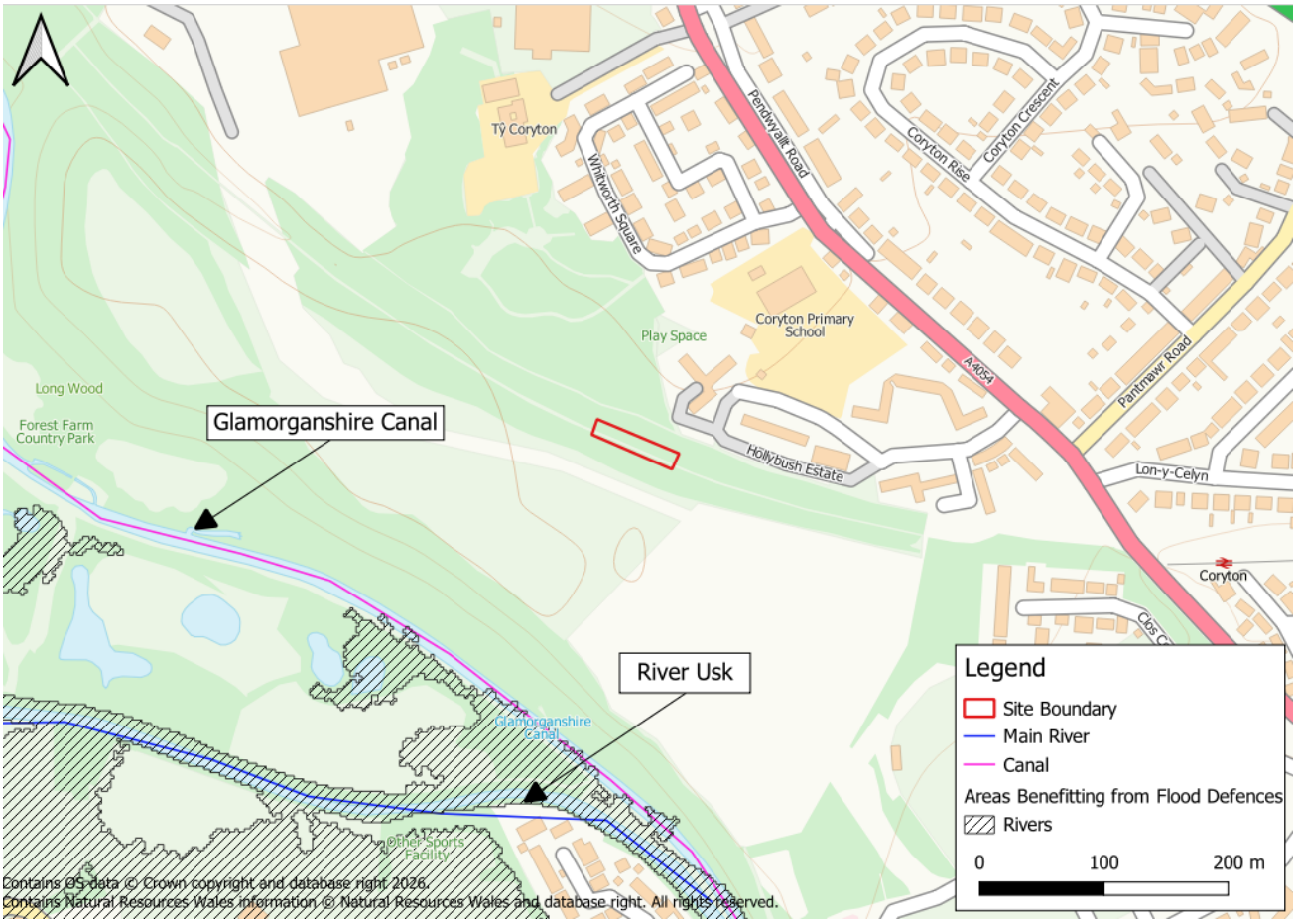

Figure 2-3 Watercourses and Flood Defences

3 Planning Policy and Flood Risk

TAN-15 provides a framework within which flood risk arising from rivers, the sea, and surface water, as well as the risk of coastal erosion, can be assessed. TAN-15 adopts a risk-based approach, which emphasises the ability to avoid or minimise risk depending on the type of development proposed.

The following table identifies the form of development, vulnerability classification and Flood Map for Planning (FMfP) classification (as defined in TAN-15) for the proposed development site.

Table 3-1 TAN-15 Development classification summary

TAN-15 classification	Classification
Development Proposal	Metro Station
Form of Development	Redevelopment
Vulnerability Classification	Less Vulnerable Development
Flood Map for Planning - Rivers	Flood Zone 1
Flood Map for Planning - Sea	Flood Zone 1
Flood Map for Planning - Surface Water and Small Watercourses	Flood Zone 2 - shown in Figure 3-1. .

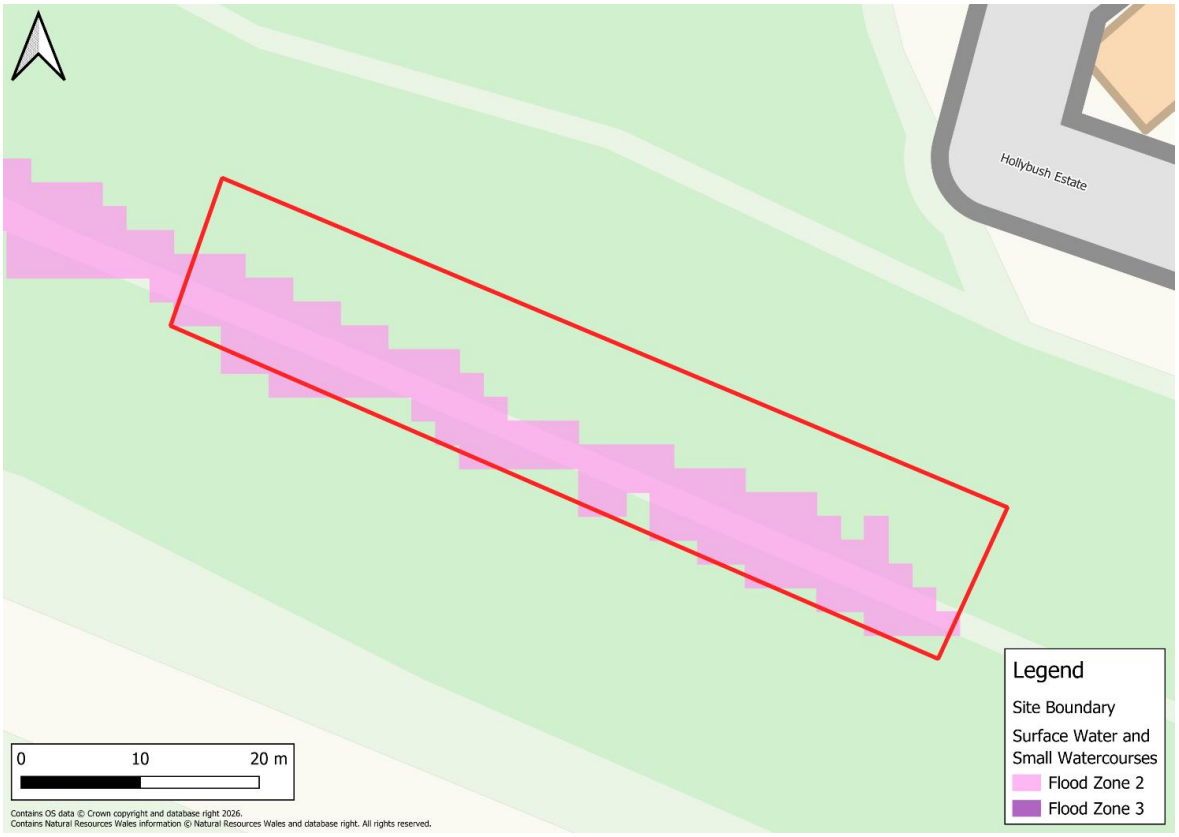

Figure 3-1 Flood Map for Planning - Surface Water and Small Watercourses

4 Assessment of Flood Risk

The latest available information on flood risk at the site, published by Natural Resources Wales (NRW) and datasets used in the SFCA are summarised in Table 4-1.

Table 4-1 Summary of flood risk

Source of Flooding	Onsite Presence	Description
Flood Risk from Rivers	×	The site's location within Flood Zone 1 of the FMfP for Rivers indicates that the site is at **very low** risk of fluvial flooding.
Flood Risk from the Sea	×	The site's location within Flood Zone 1 of the FMfP for the Sea indicates that the site is at **very low** risk of tidal flooding.
Flood Risk from Surface Water and Small Watercourses	✓	The site is predominantly at **low** risk of surface water flooding. See Section 4.1 for further assessment.
Flood Risk from Groundwater	×	The Cardiff SFCA includes JBA's Groundwater risk of emergence map as part of the assessment. The groundwater depth map showed the site to be of very low risk, and there are no nearby groundwater incidents. Therefore, it is concluded that the risk of flooding is **very low.**
Flood Risk from Reservoirs	×	The NRW Flood Map for Planning shows that the site is not located in an area at risk of reservoir flooding. Therefore, it is concluded that the risk of flooding is **very low.**
Flood Risk from Sewers	×	The Cardiff SFCA has identified 45 sewer incidents within the Whitchurch and Tongwynlais Electoral District. However, there is no site-specific mention of sewer incidents occurring on the site boundary. Therefore, it is concluded that the risk of flooding is **very low.**

4.1 Flood Risk from Surface Water and Small Watercourses

Surface water flooding occurs when rain falling on saturated ground flows overland, following the local topography. Surface water flooding and subsequent overland flow can therefore pose a risk to both the development site and the surrounding land. Overland flow may originate from the site itself or adjoining land at a higher elevation, from which flow migrates onto the development.

As shown in Figure 3-1, the FMfP for Surface Water and Small Watercourses indicates that the north-eastern proportion of the site is located within Flood Zone 1 for this flood source, associated with a very low risk of flooding. However, the south western area is located

within Flood Zone 2, which is associated with the topographic depression resulting from previous railway activity, as outlined in Section 2.2. Flood Zone 2 is associated with the 0.1% AEP plus climate change event. Consequently, the 1% AEP plus climate change event has not been considered further.

In the absence of detailed modelling, the National Flood Hazard Mapping (NFHM) has been used to provide a further assessment of flood risk.

As shown in Figure 4-1, during the 0.1% AEP plus climate change event, the north-eastern proportion of the site remains flood free. Flood depths in the south west of the site are shown to remain confined within the previously used railway corridor, typically remaining shallow and reaching up to 0.33m in the south. Ponding results from surface water being unable to escape from the artificial depression created by the railway, and extends to the north of the site. It is likely, that any such risk can be managed through the implementation of an effective surface water management strategy.

Due to the broadscale nature of the NFHM dataset, channels, culverts, and other hydraulic structures are often omitted or inaccurately represented in the modelling. This can often result in an overestimation of risk. Consequently, further analysis could be undertaken to establish surface water flood risk associated with topographic depressions associated with the historic railway corridor, to refine the predicted flood extent.

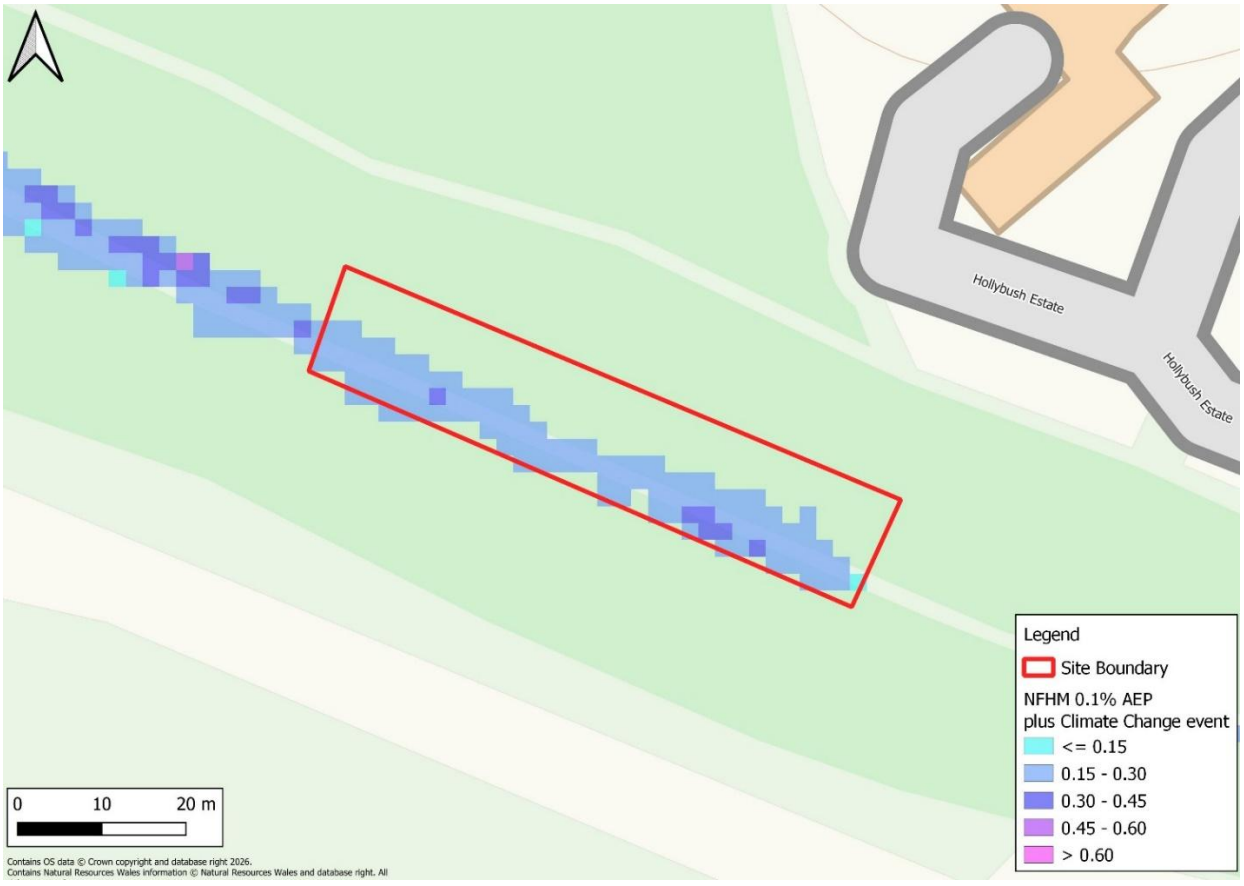

Figure 4-1 Flood Risk from Surface Water and Small Watercourses - 0.1% AEP + Climate Change - Flood depths

5 Application of Flood Zones to Development Management Decisions

The site is located within Flood Zone 1 for river and sea flooding. Within Flood Zone 1 all forms of development are acceptable in principle and further assessment or justification is not typically required.

The north eastern proportion of the site is located within Flood Zone 1 for surface water and small watercourses. However, the south western area of the site is shown to be located within Flood Zone 2, associated with a decrease in ground levels linked with historic railway activity, resulting in localised surface water ponding.

When considering a site for development, Sections 10 and 11 of TAN-15 outline the requirements for the type of development permitted in any given flood zone. However, these sections do not strictly apply to the surface water and small watercourse zones in which this proposed development site lies. Instead, it is for the applicant to demonstrate alignment with the risk-based principles of TAN-15 and the general acceptability criteria of Section 11.4 to ensure the following conditions are met:

- No increase in flooding elsewhere
- Occupiers aware of flood risk
- Escape / evacuation routes present
- Flood emergency plans and procedures agreed and in place
- Flood resistant and resilient design
- Acceptable consequences for type of use (see guidance below)

The existing ditch associated with the former railway works is subject to surface water flooding and is unlikely to be suitable for retention. Alternative on site surface water management solutions should be explored, incorporating blue green infrastructure and opportunities for biodiversity enhancement, as appropriate.

Access and egress via Hollybush Estate to the north shall remain flood free under all conditions.

Given the presence of the site within Flood Zone 2 for surface water and small watercourses, and the nature of the development proposals for a metro station, it is considered that a full FCA may not be required. Instead, flood risk can be appropriately addressed through a comprehensive Flood Risk and Surface Water Drainage Strategy to support the planning application.

6 Summary and recommendations

The site is located within Flood Zone 1 for river and sea flooding.

The site is located within Flood Zones 1 and 2 for surface water and small watercourses. In accordance with TAN-15, this triggers the requirement for an FCA to be completed to support a planning application. However, given the nature and scale of flood risk at the site, it is considered that flood risk can be appropriately addressed through a comprehensive Flood Risk and Surface Water Drainage Strategy.

It is therefore considered that this site is likely to satisfy the requirements of TAN-15, subject to the following recommendations:

- Any planning application for the site should be accompanied by a comprehensive Flood Risk and Surface Water Drainage Strategy.
- The surface water drainage strategy should demonstrate how surface water shall be managed on site, in line with the Statutory Standards for SuDS in Wales, and TAN-15
- The existing ditch associated with the former railway works is unlikely to be suitable for retention. Opportunities to enhance the site through blue–green infrastructure and biodiversity enhancements should be explored.

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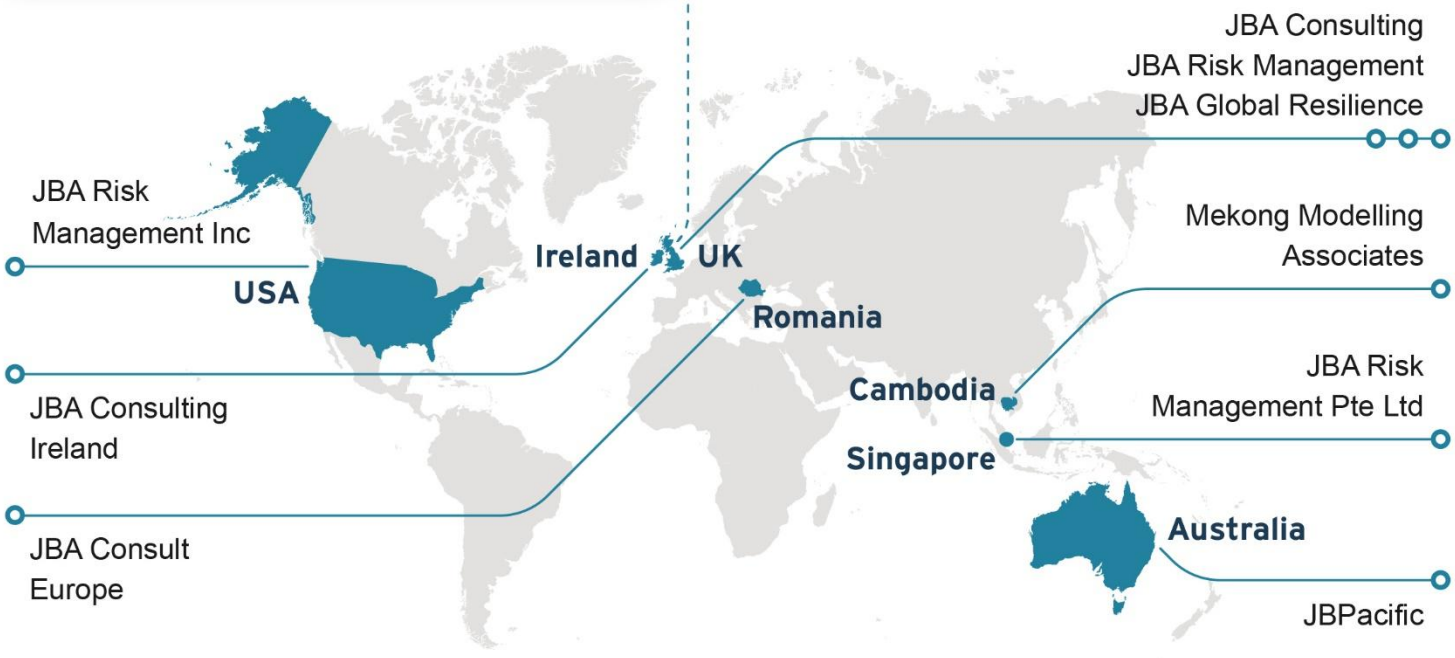

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