GeoSmart Information

FloodSmart Plus

Flood Consequence Assessment

Site Address

Unit 1B
Wrexham
LL13 7TF

Grid Reference

332764, 350345

Report Prepared for

Sarah Edwards

Date

15/05/2025

Report Status

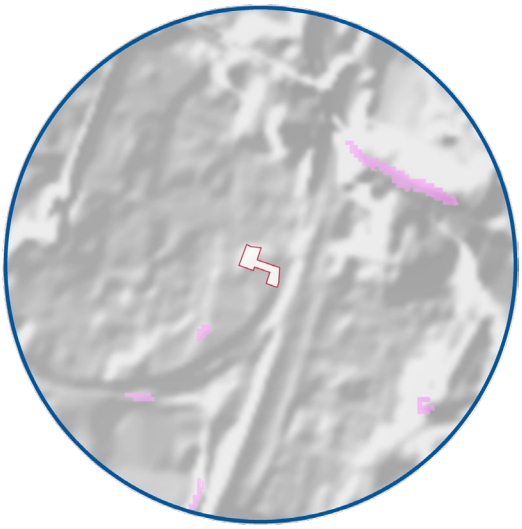
FINAL

Site Area

915 m^2

Report Reference

85860R1



RISK – Very Low to Low

The Site is partially within the NRW's fluvial Flood Zones 1 & 2 (Low to Medium probability). A Site specific analysis of flood model data confirms a Very Low to Low risk of flooding associated with the Afon Gwenfro.

Surface water (pluvial) flood risks are Very Low to Low. Groundwater flood risks are Negligible and flooding risks from artificial sources (i.e. canals, reservoirs and sewers) are Low. Mitigation measures are recommended in this report to reduce the risks to an acceptable level over the lifetime of the development.

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1. Executive summary

The Planning Policy Wales (PPW) 11th edition (2024) and Technical Advice Note 15 (TAN 15) (2025) requires Flood Consequence Assessments (FCA) to review flooding from all potential sources. A review has been undertaken of national environmental data sets to assess the potential flood risk to the Site. The review is provided within this concise interpretative report written by an experienced GeoSmart consultant.

Site analysis

Source of Flood Risk	Baseline[1]	After analysis[2]	After Mitigation[3]
River (fluvial) flooding	Very Low to Low		Very Low
Sea (coastal/tidal) flooding	Very Low		N/A
Surface water (pluvial) flooding	Very Low to Low		Very Low
Groundwater flooding	Negligible		N/A
Other flood risk factors present	Yes (culvert/bridge blockage)		N/A
Is any other further work recommended?	Yes		No (see below)

1 BASELINE risks assigned for the whole Site, using national risk maps, including the benefit of NRW flood defences.

2 AFTER ANALYSIS modification of risk assessment based on detailed site specific analysis including some or all of the following: flood model data, high resolution mapping, building location, access routes, topographic and CCTV surveys. Reasons for the change in classification are provided in the text.

3 AFTER MITIGATION risks include risks to the proposed development / asset and occupants if mitigation measures recommended in this report are implemented, including the impacts of climate change.

*N/A indicates where mitigation is not required.

Summary of existing and proposed development

The Site is currently used within a commercial capacity as a single-storey commercial warehouse unit with an attached annex to the south east providing additional office space at ground and first floor level.

Development proposals comprise the change of use of the existing building (retained commercial), with no external or internal structural works proposed. Site plans are included within Appendix A.

Summary of flood risks

The flood risks from all sources have been assessed as part of this report and are as follows:

- No reported historic flood events are understood to have previously occurred at the Site.

River (fluvial) and Sea (Estuarine/Coastal) flooding

According to NRW's Flood Map for Planning, the Site is located partially within fluvial Flood Zones 1 and 2 (Low to Medium probability).

No flood defences have been identified within the vicinity of the Site, with the only protection afforded by the capacity of the channel of the watercourse itself.

According to the NRW's Flood Risk Assessment Wales (FRAW) map, which considers the type, condition and crest height of flood defences, the Site has a variable risk of flooding ranging from Very Low to Low risk associated with the nearby watercourse, the Afon Gwenfro.

According to modelling included within the Afon Gwenfro study (JBA Consulting, 2016), the Site could potentially be at risk from flooding due to blockage or failure of the Hospital culvert located on the water course c. 380 m from the Site, with the worst-case, 0.1% AEP 100% blockage scenario resulting in potential maximum depths of up to 0.55 m.

Baseline mapping indicates a Very Low to Low risk, which has been corroborated through a review of the flood model data and local topography.

Modelled flood data obtained from the NRW has been analysed in line with the most up to date guidance on climate change to confirm a maximum "design" flood level at the Site:

- During a 1 in 100 year plus 20% (2080s Central) climate change allowance event the Site would be anticipated to remain flood free.

Emergency evacuation routes are available to the north. In the event of a flood, safe refuge can be taken on the 1st floor level; however, evacuation off-Site would be preferential.

Surface water (pluvial) flooding

According to NRW's Flood Risk Assessment Wales (FRAW) mapping, the Site has a risk of flooding from surface water and small watercourses ranging from Very Low to Low.

The Low risk is confined to the relatively low-lying parking area to the west of the existing building, with the building footprint itself anticipated to remain flood free.

Groundwater flooding

Groundwater Flood Risk screening data indicates there is a Negligible potential risk of groundwater flooding at the surface in the vicinity of the Site during a 1 in 100-year event. A review of BGS borehole data and geological mapping, as well as flood model data and local topography, would corroborate the baseline risk.

Artificial sources of flooding

The risk of flooding from artificial (man-made) sources such as reservoirs, sewers and canals has been assessed:

- The NRW's Flood Map for Planning reservoir flood risk mapping confirms the Site is not at risk of reservoir flooding.
- Ordnance Survey (OS) data confirms there are no canals near to the Site.
- No Strategic Flood Consequence Assessment has been identified for the Wrexham County Borough Council area, nor any specific information regarding historic sewer surcharge incidents within the vicinity of the Site. As such, the potential risks of flooding as a result of surcharging sewers cannot be inferred within the scope of this report.

The risk of flooding from artificial sources is considered to be Low.

Recommendations for flood mitigation are provided below, based upon the flood risk identified at the Site and TAN15 (2025) requirements for commercial 'Less Vulnerable' development:

- *Highly Vulnerable / Less Vulnerable development must be flood free in the 1 in 100-year fluvial event and 1 in 200-year tidal event, including an allowance for climate change.*
    - GeoSmart Comment: Analysis of the Site does demonstrate the development would be flood free during the 1 in 100 year fluvial present day and future climate change events.
- During an extreme 0.1% flood event including an allowance for climate change, flood depths should not exceed 600 mm at the Site. The maximum permitted velocity of flood waters is 0.15 m/s for Highly Vulnerable development and 0.3 m/s for Less Vulnerable development.
    - GeoSmart Comment: Analysis of the Site demonstrates that in a 1 in 1000 year plus 20% climate change fluvial event, the maximum flood depth at the Site would be 0.28 m (maximum flood level 87.18 mAOD), with a maximum velocity of 0.11 m/s.

Recommendations

Recommendations for flood mitigation are provided below, based upon the proposed development and the flood risk identified at the Site.

- Given the relatively shallow depths and low probability of flooding, as well as the nature of the development proposals (a change of use retaining 'Less Vulnerable' classification), no specific mitigation measures are considered to be required. Consideration of retrofitting of a water exclusion strategy during any refurbishment works is recommended as a precaution. More details regarding potential water exclusion strategies is provided within Section 7 of this report.
- A Business Continuity and Flood Warning and Evacuation Plan (BCFWEP) is recommended to reduce risks to people, property and profit.
    - Occupants should be signed up to receive NRW's Flood Alerts.

- The ongoing management and maintenance of existing and any proposed drainage networks, under the riparian ownership of the developer, should be undertaken in perpetuity with the development.

GeoSmart recommend the mitigation measures discussed within this report are considered as part of the proposed development where possible and evidence of this is provided to the Local Planning Authority as part of the planning application.

2. Introduction

Background and purpose

A site-specific flood consequence assessment has been undertaken, to assess the flood risk to and from the development Site. This assessment has been undertaken by firstly compiling information concerning the Site and the surrounding area. The information gathered was then used to construct a 'conceptual site model', including an understanding of the appropriateness of the development, as defined in the PPW (2024), and the source(s) of any flood risk present. Finally, a preliminary assessment of the steps that can be taken to manage flood risk to the development was undertaken.

This report has been prepared with reference to the Technical Advice Note (TAN) 15 (2025) which supplements the PPW (2024).

The general approach of PPW, supported by TAN15, is to advise caution in respect of new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions. The overarching aim of the precautionary framework is, in order of preference, to:

- Direct new development away from those areas which are at high risk of flooding; and
- Where development is considered to be in high-risk areas only those developments which can be justified on the basis of the tests outlined in Section 6 and Section 7 are located within such areas.

The purpose of this report is to provide clear and pragmatic advice regarding the nature and potential significance of flood hazards which may be present at the Site.

Report scope

A thorough review of a commercially available flood risk report and NRW supplied data has been undertaken, indicating potential sources of flood risk to the Site from rivers and tidal sources, surface run-off (pluvial), groundwater and reservoirs, including historical flood information and modelled flood extent. Appropriate measures are recommended to manage and mitigate the flood risk to the property.

Information obtained from NRW is used to ascertain local flooding issues and, where appropriate, identify information to support a Justification test and Assessment of Flood Consequences required as part of the PPW (2024). It is noted that a Strategic Flood Consequence Assessment (SFCA) has not been published for the Wrexham Council area. It is understood that a Wrexham County Borough Council Preliminary Flood Risk Assessment (PFRA) (2011 and its November 2017 addendum) and a Local Flood Risk Management Strategy (LFRMS) (2013) have been published however these were not readily accessible at the time of writing.

The existing and future flood risk to and from the Site from all flood sources is assessed in line with current best practice using the best available data. The risk to the development has been assessed over its expected lifetime, including appropriate allowances for the impacts of

climate change. Residual risks that remain after the flood risk management and mitigation measures are implemented, are considered with an explanation of how these risks can be managed to keep the users of the development safe over its lifetime.

An indication of whether the Site will potentially increase flood risk elsewhere is provided, including where the proposed development increases the building footprint at the Site. A drainage strategy to control runoff can be commissioned separately if identified as a requirement within this report.

Report limitations

It is noted that the findings presented in this report are based on a desk study of information supplied by third parties. Whilst we assume that all information is representative of past and present conditions, we can offer no guarantee as to its validity and a proportionate programme of site investigations would be required to fully verify these findings.

The basemap used is the OS Street View 1:10,000 scale; however, the Site boundary has been drawn using BlueSky aerial imagery to ensure the correct extent and proportion of the Site is analysed.

This report excludes consideration of potential hazards arising from any activities at the Site other than normal use and occupancy for the intended land uses. Hazards associated with any other activities have not been assessed and must be subject to a specific risk assessment by the parties responsible for those activities.

Datasets

The following table shows the sources of information that have been consulted as part of this report:

Table 1. Datasets consulted to obtain confirmation of sources of flooding and risk

Source of flooding	Datasets consulted			
	Commercial Flood Maps	Local Policy & Guidance Documents*	Natural Resources Wales (Appendix B)	OS Data
Historical	X	X	X	
River (fluvial) / Sea (tidal/coastal)	X	X	X	

Source of flooding	Datasets consulted			
	Commercial Flood Maps	Local Policy & Guidance Documents*	Natural Resources Wales (Appendix B)	OS Data
Surface water (pluvial)	X	X	X	
Groundwater	X	X		
Sewer		X		
Culvert/bridges		X		X
Reservoir		X	X	

*Local guidance and policy, referenced below, has been consulted to determine local flood conditions and requirements for flood mitigation measures.

Local policy and guidance

For this report, several documents have been consulted for local policy and guidance and relevant information is outlined below:

Wrexham Unitary Development Plan (Wrexham Council, 2005):

Policy EC12

Development (including the raising of land) within defined flood plains will only be permitted if it:-

- would not be subject to an unacceptable risk of flooding on-site; and/or
- does not result in an unacceptable risk of flooding on or off-site; and/or
- does not adversely affect flood management or maintenance schemes.

Policy EC13

Development which would result in an unacceptable adverse impact on the water environment due to additional surface water run-off will not be permitted.

Wrexham County Borough Council is preparing the Local Development Plan (LDP) which will replace the current adopted Unitary Development Plan. The LDP will be a long-term land use and development strategy focused on achieving sustainable development. The Deposit Local Development Plan (draft LDP) contains the following policy in relation to flood risk:

Wrexham Local Development Plan (2013 - 2028) - Deposit Plan Consultation (2018)

Policy SP19: Climate change

- Avoiding areas susceptible to flood risk in the first instance in accordance with the sequential approach set out in national guidance; and
- Preventing development that increases flood risk.

Policy DM1: Development Management Considerations

- Not increase the risk of flooding but makes adequate provision for sustainably dealing with foul and surface water drainage and not result in an unacceptable impact upon the water environment.

Strategic Flood Consequence Assessment:

- No Strategic Flood Consequence Assessment has been identified for the Wrexham Council area.

Guidance
Strategic Flood Consequence Assessments are carried out by local authorities, in consultation with the Natural Resources Wales, to assess the flood risk to the area from all sources both now and in the future due to climate change. They are used to inform planning decisions to ensure inappropriate development is avoided (PPW, 2024).

3. Site analysis

Site information

The Site is located within Wrexham in a setting of predominately commercial land use at National Grid Reference SJ 32764 50345.

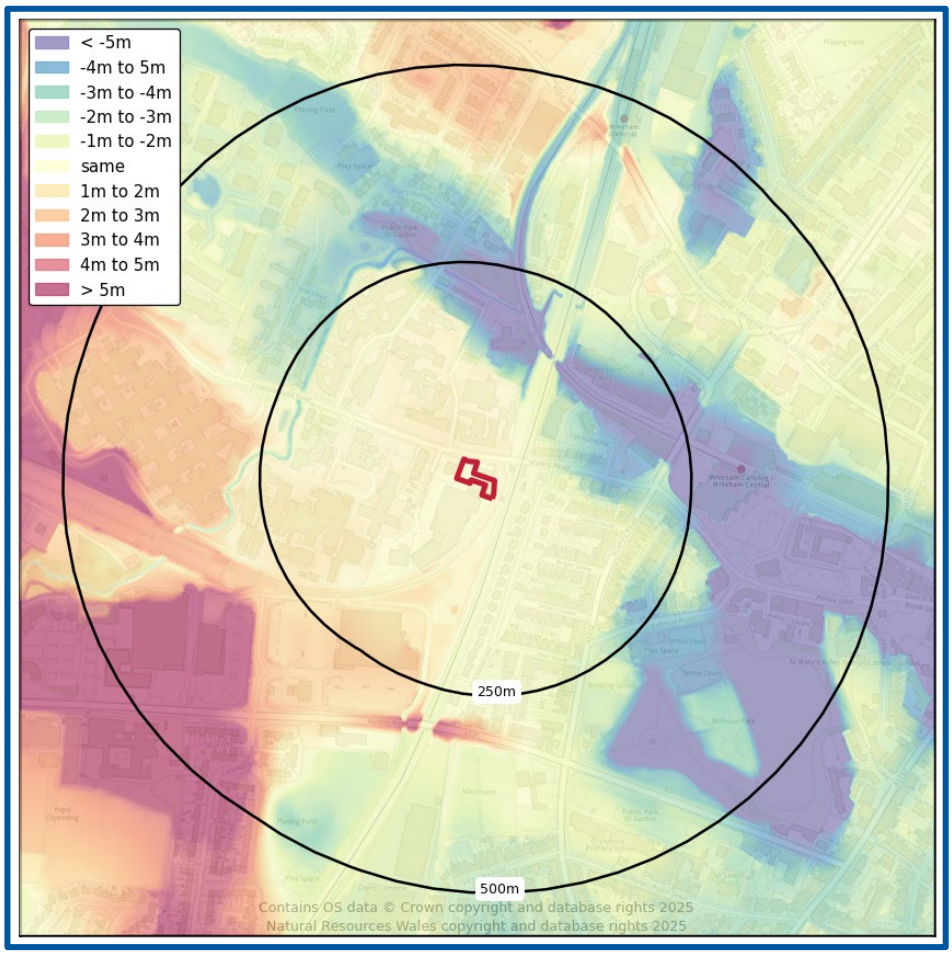
Figure 1. Aerial imagery of the Site (Bluesky, 2025)



Figure 2 (overleaf) indicates ground levels within 500m of the Site. The Site is situated upon the southern slope of a valley formation trending north west to south east.

The general ground levels on the Site are between 86.81 and 87.64 mAOD with the Site falling gradually in a southerly direction away from Watery Road to the north. This is based on NRW elevation data obtained for the Site to a 1 m resolution with a vertical accuracy of ±0.15 m (Appendix B).

Figure 2. Site Location and Relative Elevations (GeoSmart, 2025)



Development

The Site is currently used within a commercial capacity as a single-storey commercial warehouse unit with an attached annex to the south east providing additional office space at ground and first floor level.

Development proposals comprise the change of use of the existing building (retained commercial), with no external or internal structural works proposed. Site plans are included within Appendix A.

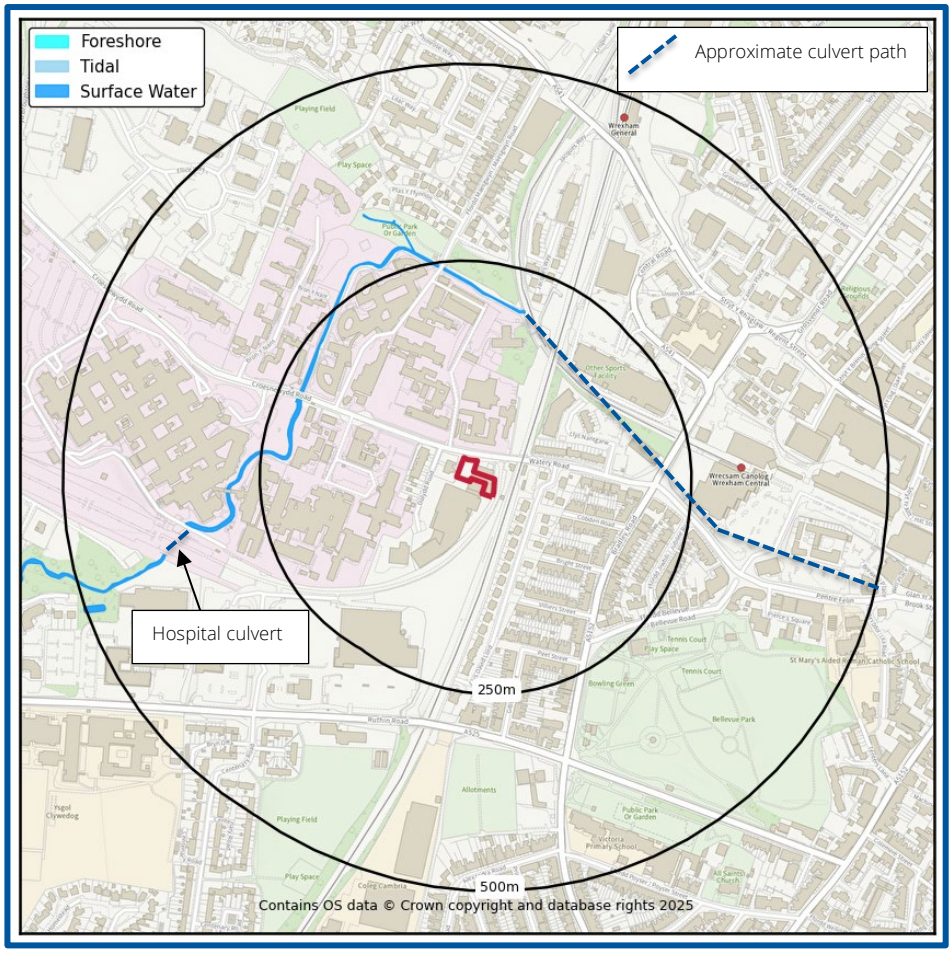
The effect of the overall development may result in an increase in the number of users of the building, and will result in the change of use, nature or times of occupation. According to Figure 4 of TAN15 (2025), the vulnerability classification of the existing development is Less Vulnerable and proposed development is Less Vulnerable. The estimated lifespan of the development is 60 years.

Hydrological features

According to Ordnance Survey (OS) mapping included in Figure 3, multiple surface water features are located within 500 m of the Site:

- The Afon Gwenfro is located c. 200 m west of the Site at its closest point, flowing northwards;
- Multiple ponds are present along the course of the Afon Gwenfro, presumed to reflect minor storage reservoirs, with the closest located c. 240 m west of the Site.

Figure 3. Surface water features (OS, 2025)



Proximity to relevant infrastructure

Infrastructure has been identified within 500 m of the Site which could influence the risks of flooding throughout the lifespan of the proposed development:

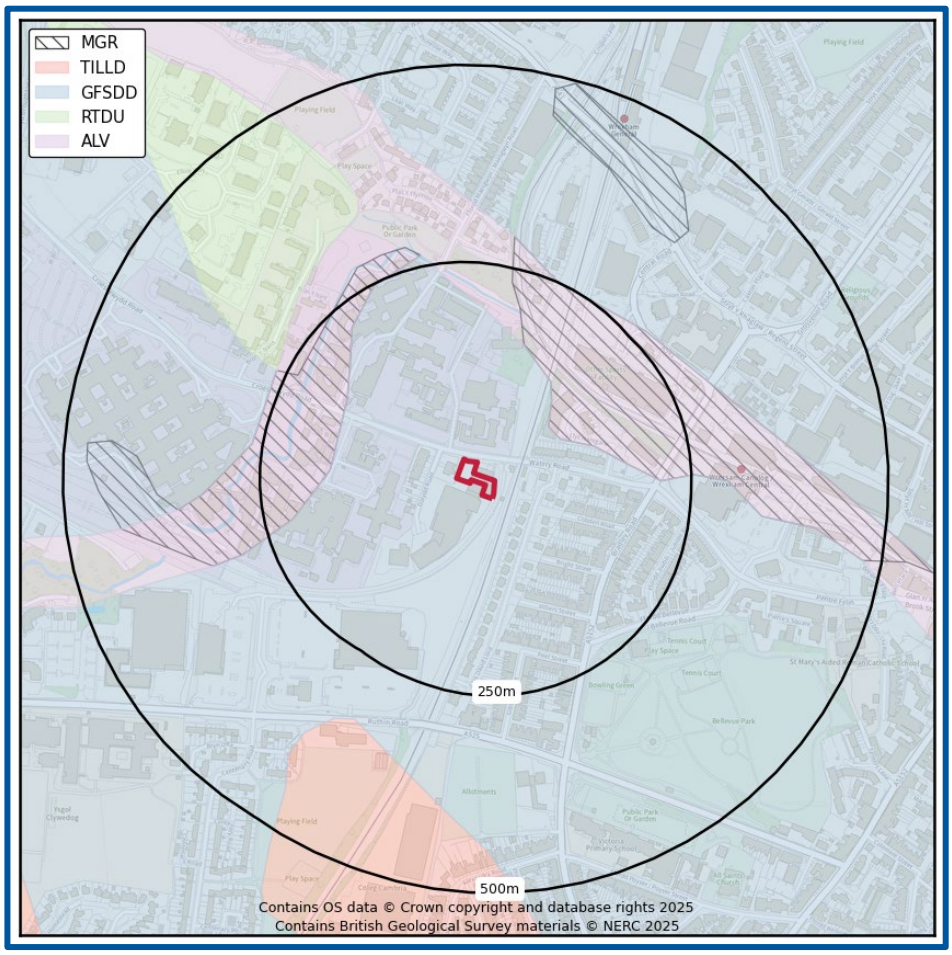
- A road bridge along Croesnewydd Road crosses the Afon Gwenfro c. 220 m west of the Site;
- A section of the Wrexham Maelor Hospital complex spans the Afon Gwenfro c. 280 m south west of the Site;

- The Afon Gwenfro is culverted multiple times, with the closest upstream culvert beneath a parking area c. 360 m south west of the Site, and the closest downstream c. 200 m north of the Site, exiting this culvert c. 380 m south east of the Site.

Hydrogeological features

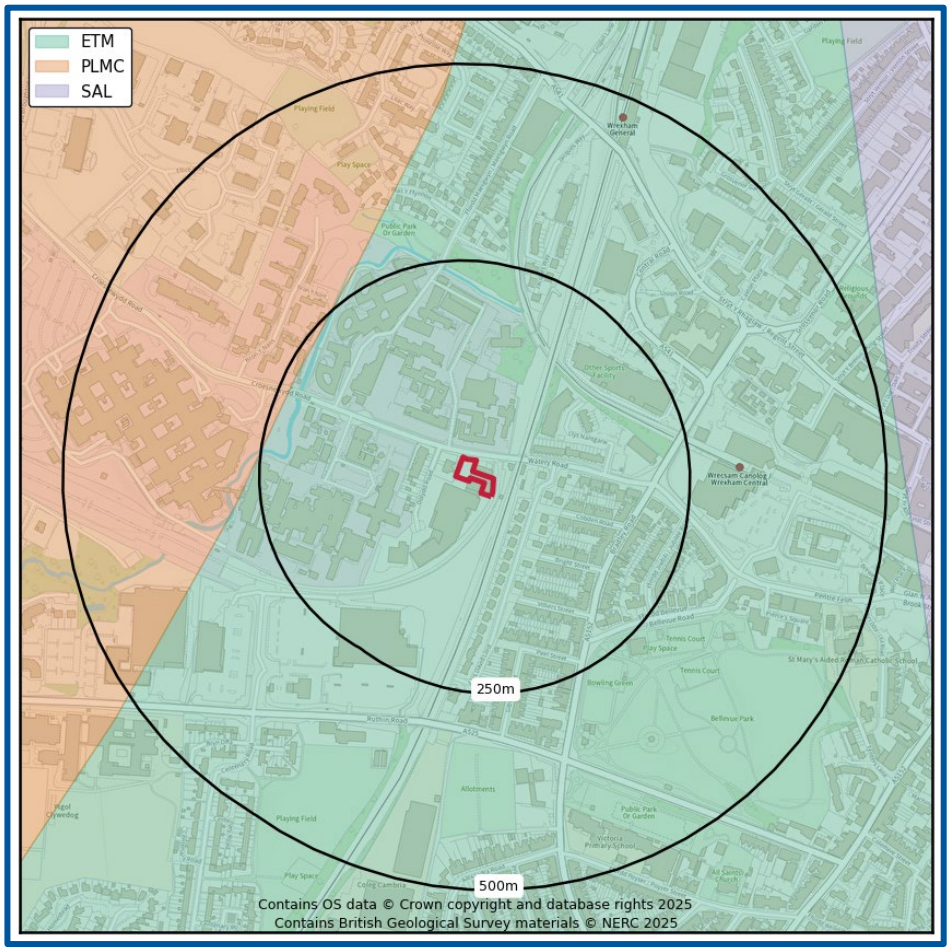
British Geological Survey (BGS) mapping indicates the underlying superficial geology (Figure 4) consists of Glaciofluvial Sheet Deposits, Devensian (GFSDD) (sand and gravel), which is classified as a Secondary (A) Aquifer (BGS, 2025).

Figure 4. Superficial Geology (BGS, 2025)



BGS mapping indicates the underlying bedrock geology (Figure 5) consists of the Etruria Formation (ETM) (mudstone), which is classified as a Secondary (A) Aquifer (BGS, 2025).

Figure 5. Bedrock Geology (BGS, 2025)



Geological conditions

A review of the BGS borehole database (BGS, 2025) indicates that the nearest publicly available borehole mapped within the same geological strata as the Site (ref: SJ35SW852) is located c. 305 m to the south west of the Site boundary at an elevation of c. 89 mAOD. It is noted that a closer borehole (ref: SJ35SW935) is located c. 80 m north east of the Site; however, the corresponding borehole record confirms that this excavation was entirely within artificial Made Ground deposits and as such does not provide any relevant detailed lithographic descriptions from which to infer the underlying conditions at the Site.

A summary of the geological strata encountered by borehole ref: SJ35SW852 is provided within the table below.

Table 2. Summary of BGS borehole information

Strata encountered	BGS borehole SJ35SW852	
	Depth to base of stratum (m bgl)	Strata composition
Topsoil	0.46	Topsoil
Glaciofluvial Sheet Deposits, Devensian	0.76	Soft sandy clay
	7.92 (base of borehole)	Sand and gravel

Groundwater

BGS borehole SJ35SW852 did not encounter groundwater within its 7.92 m depth, excavated on 18/01/1966, subject to seasonal variations.

It is noted that given the reasonable distance, this borehole record is unlikely to be representative of the hydrogeological conditions at the Site.

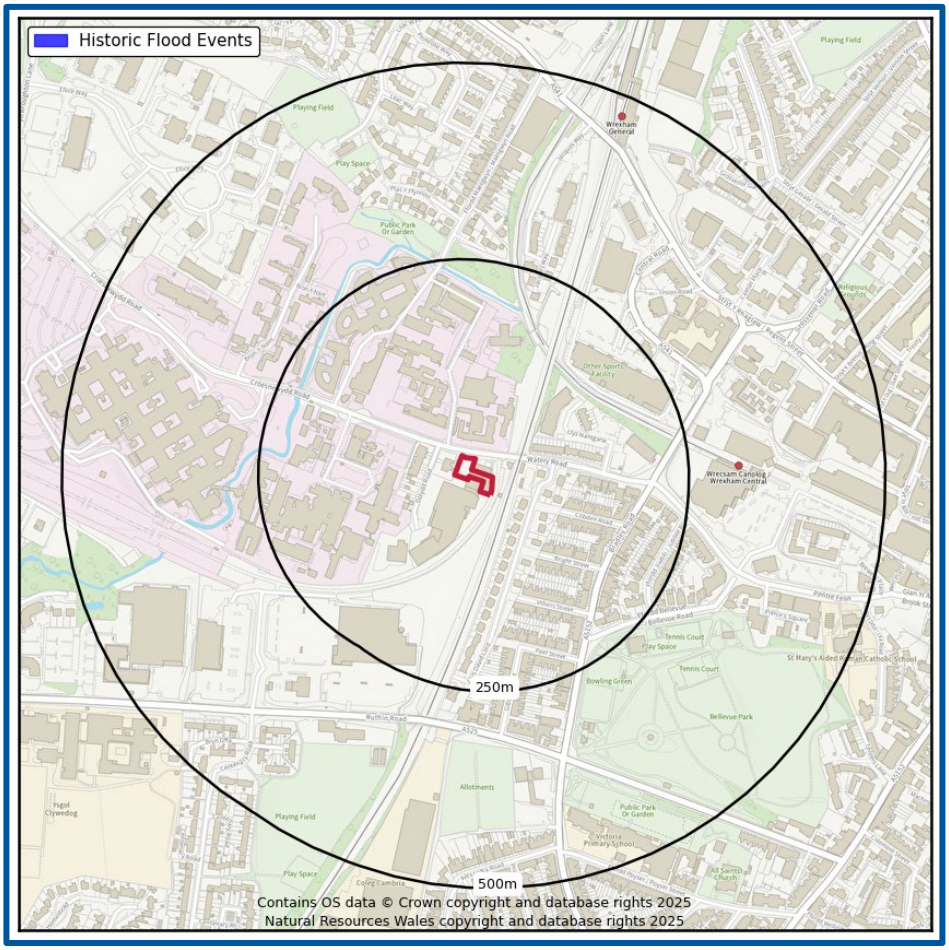
4. Flood risk to the development

Historical flood events

According to the NRW's Recorded Flood Extents Map (Figure 6), no historical flood events have been recorded at the Site (NRW, 2025).

The purpose of historical flood data is to provide information on where and why flooding may have occurred in the past. The absence of any recorded events does not mean flooding has never occurred on-Site or that flooding will never occur at the Site.

Figure 6. Historic Flood Event Outline (NRW, 2025)



Rivers (fluvial) / Sea (coastal) / Estuarine (tidal) flooding

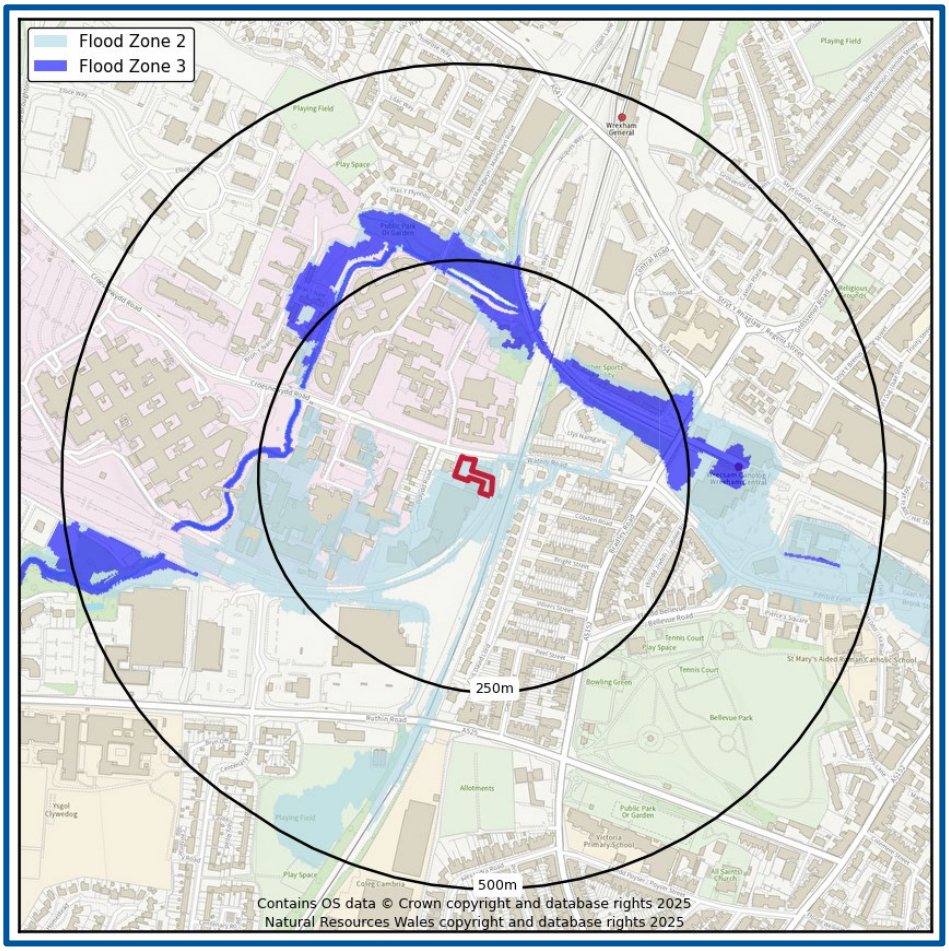
The predominant risk at the Site is from flooding from rivers, termed as fluvial flooding. The Site is located in an inland location and the risk of flooding from coastal and tidal processes are therefore considered to be Very Low.

River (fluvial) flooding occurs during times of heavy rainfall or snow melt when watercourses' capacity can be exceeded, over topping the banks and flood defences.

Flood Zones Map

According to the NRW's Flood Map for Planning (Figure 7), the Site is located partially within fluvial Flood Zones 1 & 2 and is therefore classified as having a Low to Medium probability of fluvial flooding from the Afon Gwenfro. Approximately 94% of the Site area is mapped within Flood Zone 2, with the remaining 6% along the northern boundary of the Site mapped within Flood Zone 1.

Figure 7. NRW Flood Zone mapping (NRW, 2025)



Flood defences

Guidance

Sites that are located close to flood defences are likely to be zones where rapid inundation will occur in the event of the flood defences being overtopped or breached. A Site located close to flood defences (within 250 m) may require a more detailed FCA subject to local topography.

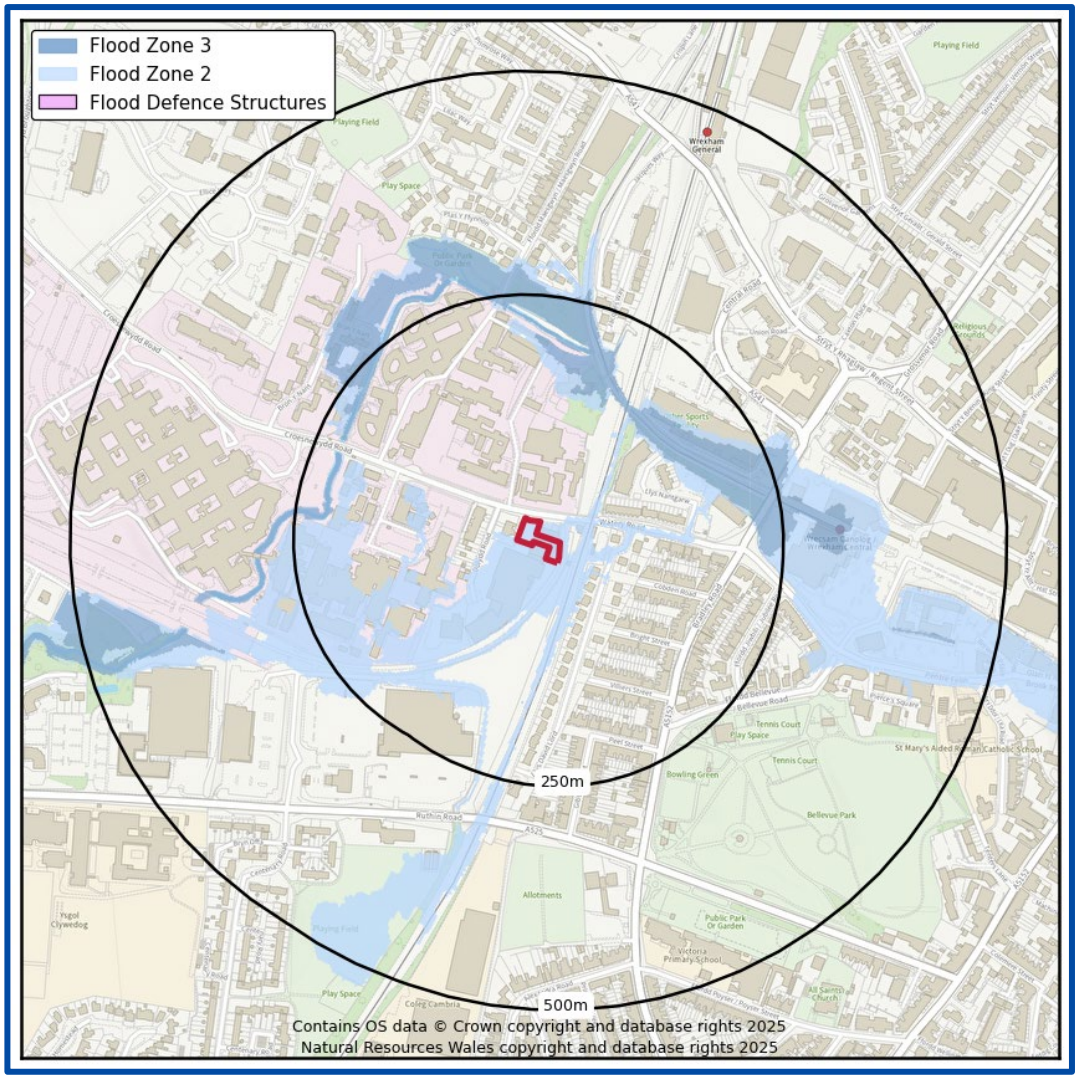
Existing flood defences

According to NRW's Flood Map for Planning (Figure 7), the Site is not located within a TAN15 Defended Zone, with no formal or informal flood defences reported within 1 km of the Site.

Future flood defences

No information regarding any proposed flood defences has been identified through a review of the available information and local policy documentation.

Figure 8. Location of flood defences mapping (NRW, 2025)



Flood Risk including the benefit of defences

The Flood Risk Assessment Wales (FRAW) maps were published in the Summer of 2020.

The FRAW mapping includes consideration of flood defences that have been built to protect against flooding from rivers and the sea. The defences shown provide different levels of flood protection and this is recognised in the risk classification shown in the Flood Risk Assessment Wales (FRAW) map.

The FRAW maps indicate:

- The risk from Rivers is Very Low to Low (Figure 9).
- The risk from the Sea is Very Low (Figure 10).
- The risk from Surface Water and Small Watercourses is Very Low to Low (Figure 11).

Figure 9. Rivers – FRAW Risk Map (NRW 2025)

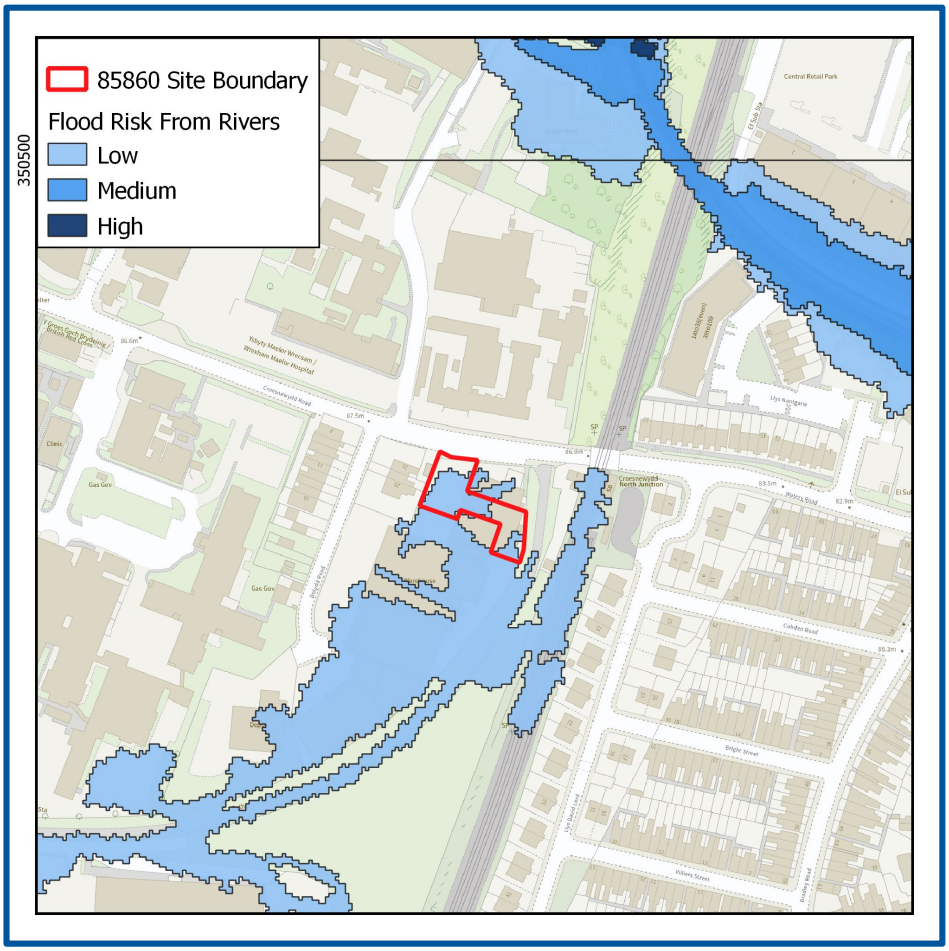


Figure 10. Sea – FRAW Risk Map (NRW 2025)

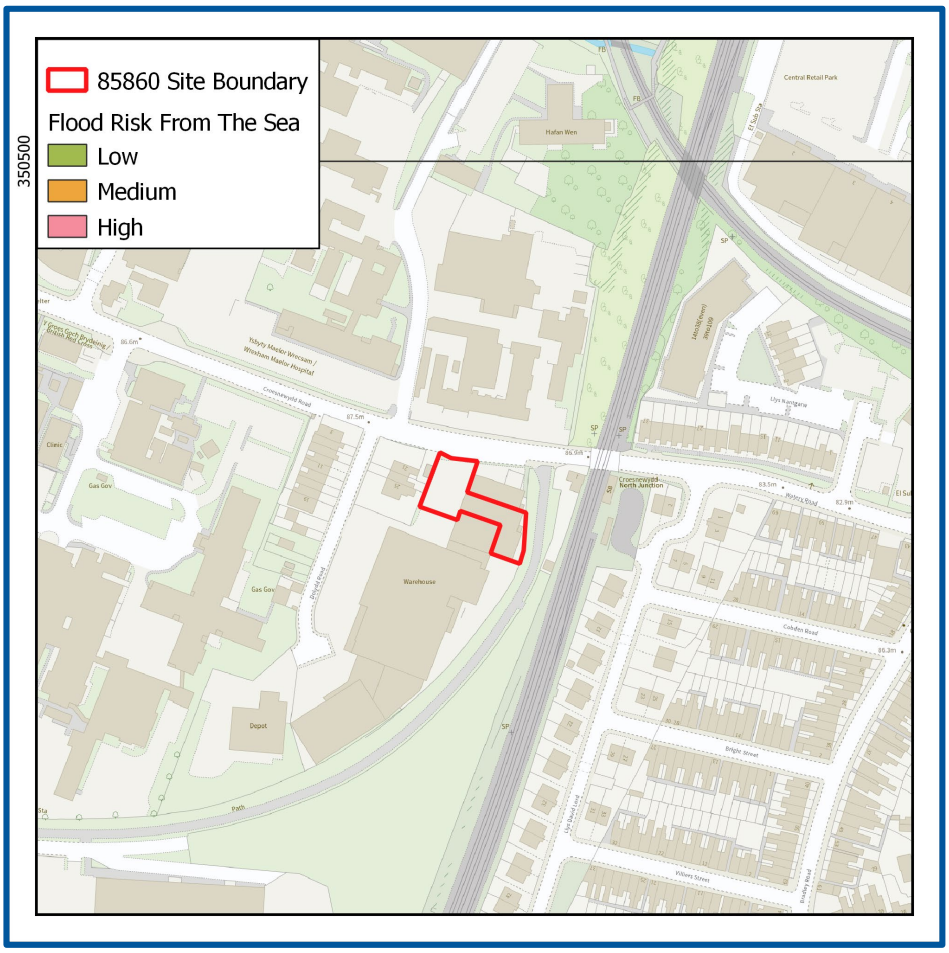
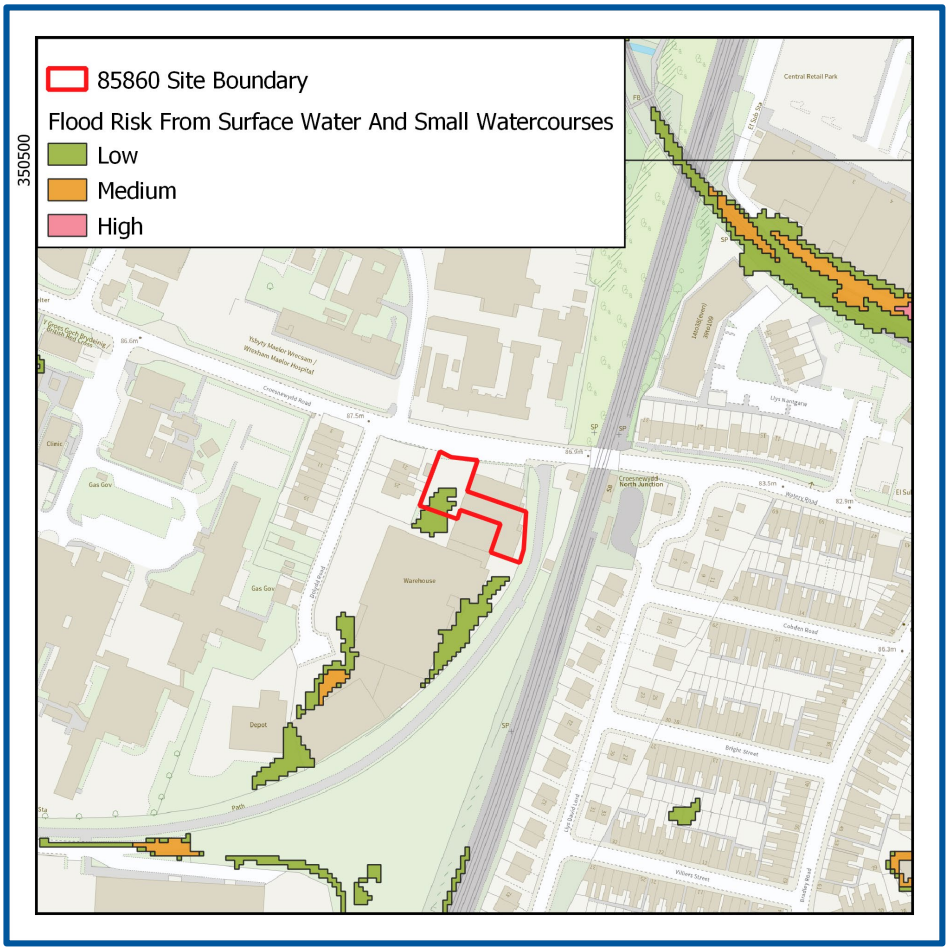


Figure 11. Surface Water and Small Watercourses – FRAW Risk Map (NRW 2025)



Model data

As the Site is located within the NRW's fluvial floodplain, modelled flood elevation data was obtained from NRW and has been used to assess flood risk and to provide recommendations for mitigation for the proposed development.

Modelled data from the Afon Gwenfro Modelling Study (JBA Consulting, 2016) has been extracted from the 2D floodplain data provided at the Site.[1]. It is noted that whilst the model provides defended and undefended scenarios, the associated extents at the Site are identical due to the absence of flood defences within the prevailing area. The data is provided within Table 3.

[1] The accuracy of the modelled flood levels are not known. These are dependent on the accuracy of input datasets such as LiDAR data, used to model the impacts of flooding within the 2D domain. Confirmation of the accuracy of the modelled flood data can be obtained separately from Natural Resources Wales.

Table 3. EA present day modelled flood data

Ground levels on-Site (mAOD)	Modelled Flood Levels (mAOD)			
	1 in 30 year	1 in 100 year	1 in 200 year	1 in 1000 year
86.81 to 87.64*	85.58 (in-channel)	85.65 (in-channel)	85.71 (in-channel)	86.98
Flood depths (m)	No flooding anticipated			Up to 0.17 (overall Site)
				Up to 0.08 (building footprint)**

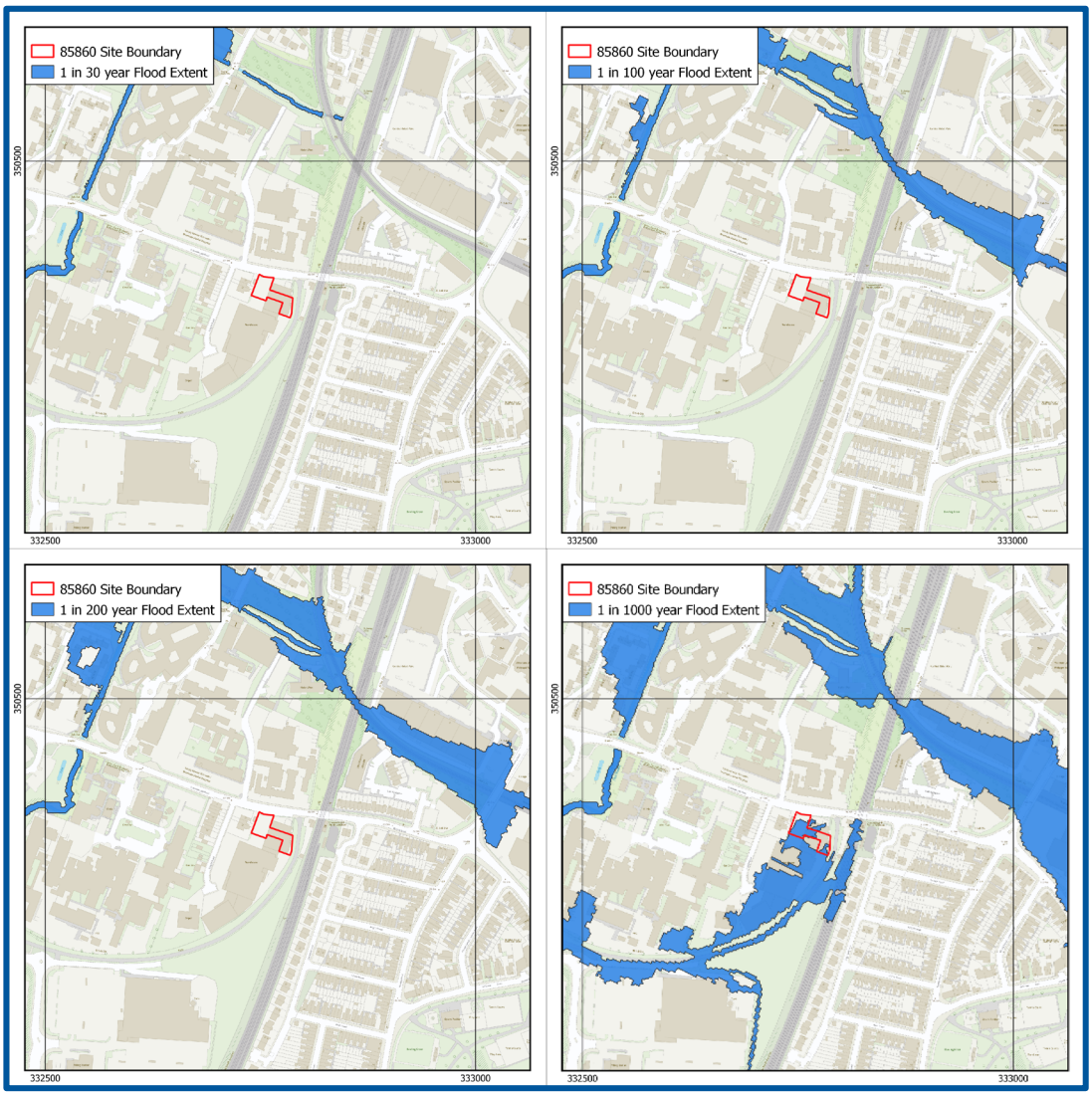
*Ground levels as provided by the LiDAR DTM data obtained for the Site with a resolution of 1 m and a vertical accuracy of ±0.15 m.

**Based upon the ground levels of the building footprint of 86.90 to 87.13 mAOD as provided by the LiDAR DTM data. Whilst it is considered likely that the threshold level of the existing building would exceed the 1 in 1000 year flood level, as no surveyed threshold levels have been provided, this cannot be confirmed within the scope of this report.

Figure 12 confirms the flood extent associated with the present-day flooding scenarios. The Site is only anticipated to receive flooding in the 1 in 1000 year event, with no flooding within 100 m of the Site in the other modelled present-day events. In the 1 in 1000 year event, approximately 50% of the Site, typically comprising the majority of the car park and areas of the building footprint in the centre and south east of the Site, is mapped as receiving flooding of up to 0.17 m depth.

On balance, the present day fluvial risks at the Site are considered to be Very Low to Low.

Figure 12. Modelled present day flooding scenarios (NRW, 2025)



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Climate change factors

In accordance with the Welsh Government's Climate Flood Consequences Assessments: Climate change allowances guidance (2021), allowances should be made for the impact of increased river and sea levels and flows to the proposed development.

As the Site is located within the Dee River Basin and the proposed development is classed as Less Vulnerable, where the proposed lifespan is 60 years, the Central (20%) allowance hasbeen used to determine a suitable climate change factor to apply to river data.

The Upper End (45%) allowance has also been included for comparison; however, the Central allowance is considered most appropriate for considering the impacts of climate change at the Site.

Modelled level data has been provided including the relevant allowances, and the associated flood levels are indicated within Table 4.

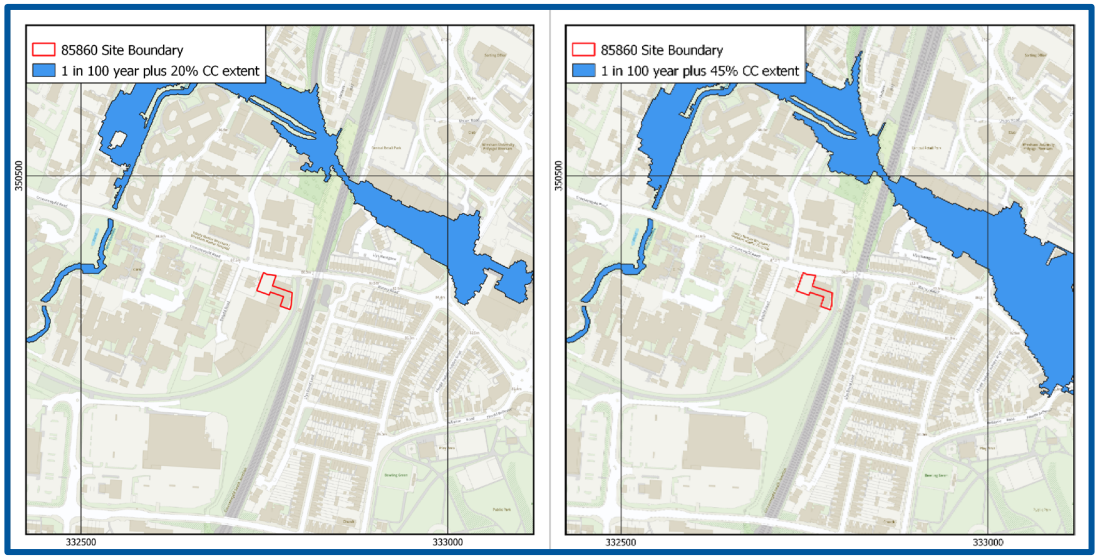
Table 4. Flood levels plus climate change allowances

Ground levels on-Site (mAOD)	Modelled Flood Levels (mAOD)	
	1 in 100 year plus 20% 2080 Central allowance for climate change flood level	1 in 100 year plus 45% 2080 Upper End allowance for climate change flood level
86.81 to 87.64*	85.72	85.84
Flood depths (m)	No flooding anticipated	

*Ground levels as provided by the LiDAR DTM data obtained for the Site with a resolution of 1 m and a vertical accuracy of ±0.15 m.

Figure 13 confirms that no flooding would be anticipated to impact the Site in the 1 in 100 year plus climate change scenarios (for both the Central and Upper End allowances); as such, the fluvial risk ratings to the Site are considered to remain Very Low to Low in the future climate change scenarios.

Figure 13. Modelled climate change scenarios



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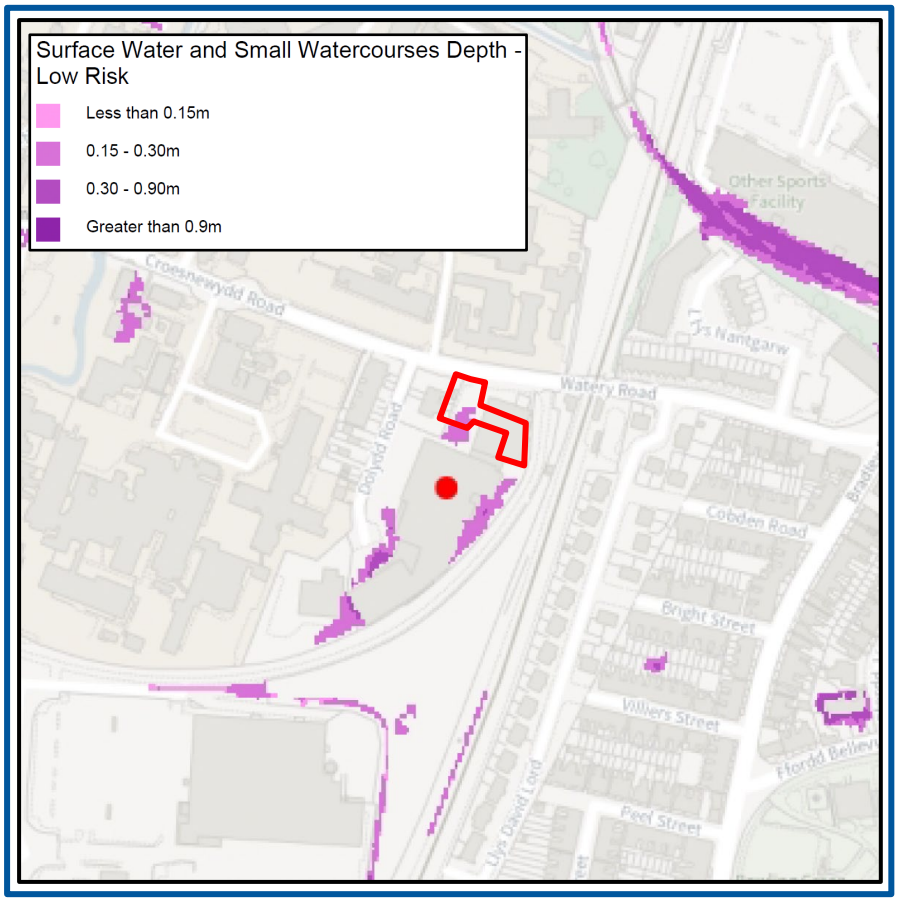
Surface water (pluvial) flooding

Surface water flooding occurs when intense rainfall exceeds the infiltration capacity of the ground and overwhelms the drainage systems. It can occur in most locations even at higher elevations and at significant distances from river and tidal floodplains.

According to the National Flood Hazard's Flood Risk from Surface Water and Small Watercourses mapping (Figure 13), the Site is at a variable risk of pluvial flooding ranging from Very Low to Low:

- In the High and Medium risk scenarios, the Site would be anticipated to remain flood free.
- In the Low risk scenario, flood depths of between 0.15 and 0.30 m are mapped upon areas of the car park at the west of the Site. The building footprint itself is anticipated to remain flood free.

Figure 14. NRW Low surface water risk Hazard map (NRW, 2025)



Guidance

According to NRW's surface water flood risk map the Site is at:

- Very Low risk - chance of flooding of less than 1 in 1000 (0.1%).
- Low risk - chance of flooding of between a 1 in 1000 & 1 in 100 (0.1% and 1%).

According to NRW's surface water flood risk mapping the following advisory guidance applies to the Site:

Flood Depth:

- 0.15 to 0.3 m - Flooding would: typically exceed kerb height, likely exceed the level of a damp-proof course, cause property flooding in some areas.

Climate change may lead to an increase in rainfall intensity which affects river levels, land and urban drainage systems. Rainfall intensity for small and urban catchments may increase from 5 to 20% (central estimate) or 10 to 40% (upper estimate) over the period to 2115 (NRW, 2024).

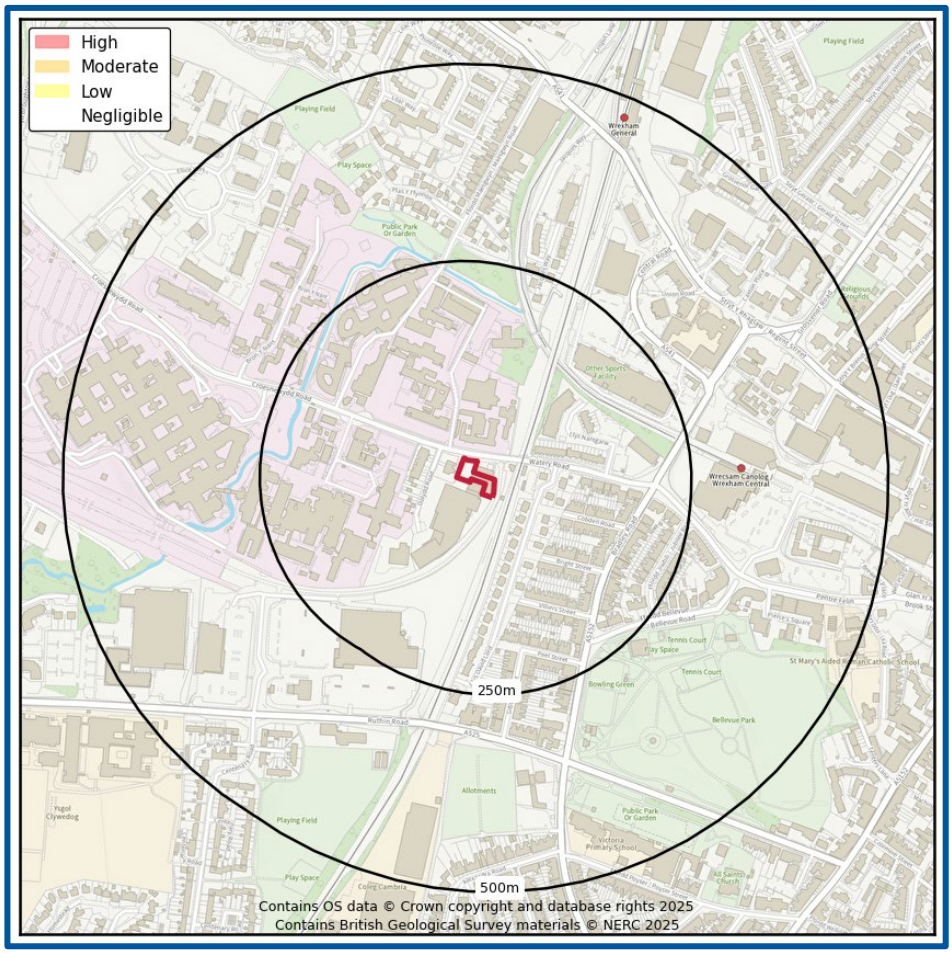
Any existing and proposed on-Site surface water drainage systems should be designed and maintained appropriately to manage the run-off over the lifetime of the proposed development.

Groundwater flooding

Groundwater flooding occurs when sub-surface water emerges from the ground at the surface or into Made Ground and structures. This may be as a result of persistent rainfall that recharges aquifers until they are full; or may be as a result of high river levels, or tides, driving water through near-surface deposits. Flooding may last a long time compared to surface water flooding, from weeks to months. Hence the amount of damage that is caused to property may be substantially higher.

Groundwater Flood Risk screening data (Figure 12) indicates there is a Negligible risk of groundwater flooding at surface in the vicinity from anticipated permeable bedrock and superficial deposits during a 1 in 100 year event.

Figure 15. GeoSmart GW5 Groundwater Flood Risk Map (GeoSmart, 2025)



Mapped classes within the screening map combine likelihood, possible severity and the uncertainty associated with predicting the subsurface system. The map is a national scale screening tool to prompt site-specific assessment where the impact of groundwater flooding would have significant adverse consequences. Mapping limitations and a number of local factors may reduce groundwater flood risk to land and property even where it lies within mapped groundwater flood risk zones, which do not mean that groundwater floods will occur across the whole of the risk area.

A site-specific assessment has been undertaken to refine the groundwater risk screening information on the basis of site-specific datasets (see Section 3) including BGS borehole data, and the NRW's fluvial and tidal floodplain data (where available) to develop a conceptual groundwater model. The risk rating is refined further using the vulnerability of receptors including occupants and the existing and proposed Site layout, including the presence of basements and buried infrastructure. The presence of any nearby or on-Site surface water features such as drainage ditches, which could intercept groundwater have also been considered.

It is understood there are no existing basements and a basement is not proposed as part of the development. (NB: The risks are higher for basements, buried infrastructure and soakaway systems which may be affected by high groundwater levels).

According to a review of the hydrogeology (Section 3), the Site is underlain by permeable superficial deposits above permeable bedrock; although it is noted that limited information regarding the composition of the mudstone bedrock is available to infer its permeability. Groundwater levels may rise in the bedrock and superficial aquifers in a seasonal response to prolonged rainfall recharge which may cause an unusually high peak in groundwater levels during some years.

According to a review of the hydrogeology (Section 3), the Site is underlain by permeable bedrock. Groundwater levels may rise in the bedrock and superficial aquifers in a seasonal response to prolonged rainfall recharge which may cause an unusually high peak in groundwater levels during some years.

Groundwater levels may also rise in the bedrock and superficial aquifer in response to high river events due to the potential hydraulic continuity with the nearby Afon Gwenfro.

Despite the presence of an aquifer the Site would only be at risk of groundwater flooding if the water table reaches the base of the Site development or the ground surface when groundwater seepage could lead to overland flow and ponding.

According to a review of the hydrogeology (Section 3), the nearby borehole (ref: SJ35SW852) did not encounter groundwater during the excavation of its 7.92 m depth on 18/01/1966.

The groundwater level may be influenced by the nearby river levels with the 1 in 100 level estimated to be 85.65 mAOD at a distance of c. 200 m from the Site at the nearest point, compared with Site levels of between 86.81 and 87.64 mAOD. It is noted that given the reasonable distance between the river and the Site (with the flooding anticipated to remain within the river channel in the 1 in 100 year event), the impacts of this flooding upon the groundwater system beneath the Site would be diminished.

Spring lines have not been identified in close proximity to the Site.

The local topography and drainage is such that the development threshold is likely to be higher than the area where groundwater emerges in adjacent low points.

The hydrogeological characteristics suggest there is unlikely to be a shallow groundwater table beneath the Site.

The baseline groundwater flood risk rating is Negligible. On the basis of the site-specific assessment the groundwater flood risk is considered to remain at the baseline risk.

Guidance

Negligible Risk - There will be a remote possibility that incidence of groundwater flooding could lead to damage to property or harm to other sensitive receptors at, or near, this location.

Climate change predictions suggest an increase in the frequency and intensity of extremes in groundwater levels.

- Rainfall recharge patterns will vary regionally resulting in changes to average groundwater levels.
- A rise in peak river levels will lead to a response of increased groundwater levels in adjacent aquifers subject to the predicted climate change increases in peak river level for the local catchment

The impact of climate change on groundwater levels beneath the Site is linked to the predicted rise in peak river levels and also the variation in rainfall recharge, which is uncertain.

Flooding from artificial sources

Artificial sources of flood risk include waterbodies or watercourses that have been amended by means of human intervention rather than natural processes. Examples include reservoirs (and associated water supply infrastructure), docks, sewers and canals. The flooding mechanism associated with flood risk from artificial sources is primarily related to breach or failure of structures (reservoir, lake, sewer, canal, flood storage areas, etc.)

Sewer flooding

No information regarding historic flooding events from sewers has been made available, with no SFCA identified for the Wrexham County Borough Council area. As such, the risk of sewer flooding cannot be quantified within the scope of this report.

Guidance

Properties classified as “at risk” are those that have suffered, or are likely to suffer, internal flooding from public foul, combined or surface water sewers due to overloading of the sewerage system either once or twice in the ten year reference period. Records held by the sewage utility company provide information relating to reported incidents, the absence of any records does not mean that the Site is not at risk of flooding.

Canal failure

According to Ordnance Survey (OS) mapping, there are no canals within 500 m of the Site.

Water supply infrastructure

Water supply infrastructure is comprised of a piped network to distribute water to private houses or industrial, commercial or institution establishments and other usage points. In urban areas, this represents a particular risk of flooding due to the large amount of water

supply infrastructure, its condition and the density of buildings. The risks of flooding to properties from burst water mains cannot be readily assessed.

If more information regarding the condition and history of the water supply infrastructure within the vicinity of the Site is required, then it is advisable to contact the local water supplier; Dŵr Cymru / Welsh Water.

Culverts and bridges

The blockage of watercourses or structures by debris (that is, any material moved by a flowing stream including vegetation, sediment and man-made materials or refuse) reduces flow capacity and raises water levels, potentially increasing the risk of flooding. High water levels can cause saturation, seepage and percolation leading to failure of earth embankments or other structures. Debris accumulations can change flow patterns, leading to scour, sedimentation or structural failure.

Several culverted sections of the Afon Gwenfro and bridges across the watercourse have been identified within c. 250 m of the Site that could pose a flood risk to the Site should they become blocked or damaged.

Culverts range in size and capacity and require appropriate maintenance to function. Screens may be installed across openings to prevent entry and reduce the risk of blockage inside the culvert. However, they can cause of flooding when they are poorly maintained or trap large amounts of debris in times of high flow.

The Afon Gwenfro modelling study (JBA Consulting, 2016) includes blockage scenarios for eight key structures within the model extent. Low (30%), medium (67%) and high (100%) culvert blockage scenarios have been modelled at six of the eight structures, with two additional structures beneath Croesnewydd Road (ref: BLK1 and BLK2) modelled only for the 1 in 1000 year events with 100% blockage.

From a review of the blockage scenarios, the most relevant culverts to the flood risks at the Site are considered to be the Pendinas culvert (ref: BLK2; c. 950 m south west) and Hospital culvert (ref: BLK3; c. 380 m south west). Whilst other scenarios alter the prevailing flood extents within the vicinity of the Site, the flood extents on-Site do not appear to increase in response.

Table 5 (overleaf) indicates the modelled flood levels in the 1 in 1000-year (0.1% AEP) blockage scenarios (BLK2 and BLK3). As only the 1 in 1000 year event has been modelled for the BLK2 model, the worst-case 1 in 1000 year blockage scenarios have been used for assessment of the maximum potential residual risk.

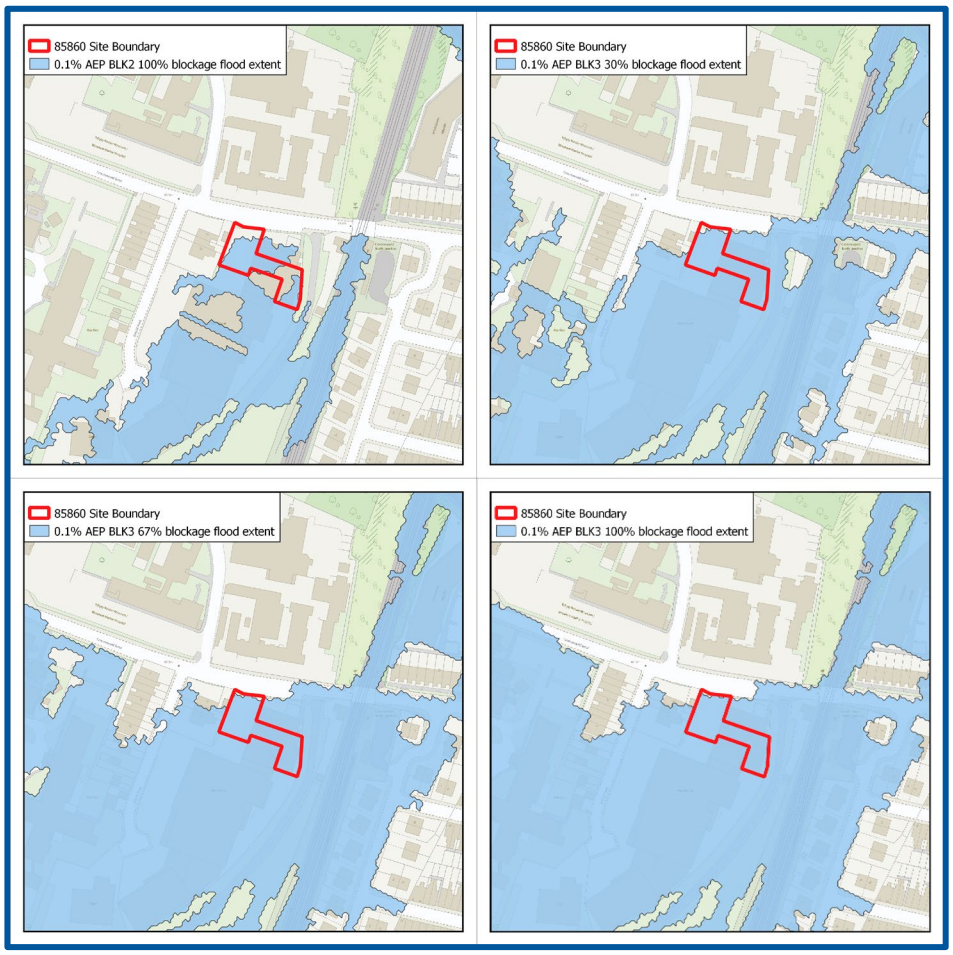
Table 5. NRW modelled culvert blockage scenarios and maximum on-Site flood levels

Ground levels on-Site (mAOD)	Modelled 0.1% AEP flood levels (mAOD)			
	BLK2	BLK3		
	100% Blockage	30% Blockage	67% Blockage	100% Blockage
86.81 to 87.64*	86.99	87.23	87.31	87.33
Flood depths (m)	Up to 0.18 (overall Site)	Up to 0.42 (overall Site)	Up to 0.50 (overall Site)	Up to 0.52 (overall Site)
	Up to 0.09 (building footprint)**	Up to 0.33 (building footprint)**	Up to 0.41 (building footprint)**	Up to 0.43 (building footprint)**

*Ground levels as provided by the LiDAR DTM data obtained for the Site with a resolution of 1 m and a vertical accuracy of ±0.15 m.

**Based upon the ground levels of the building footprint of 86.90 to 87.13 mAOD as provided by the LiDAR DTM data. It is noted that no surveyed threshold levels have been provided.

Figure 16. Modelled 0.1% AEP blockage scenarios (ref: BLK2 & BLK3)



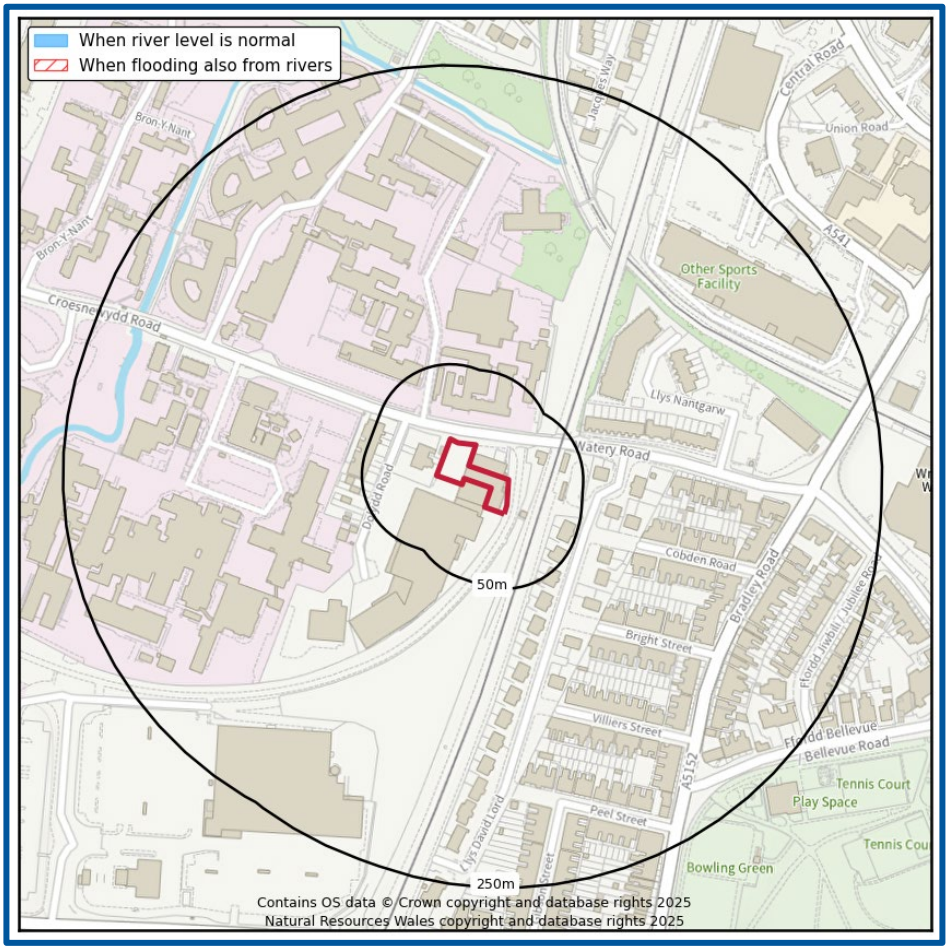
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Table 5 indicates that during a worst case scenario, 0.1% AEP 100% blockage at the Hospital culvert (BK3), flooding could be up to 0.52 m in depth, impacting the majority of the Site area.

Reservoir flooding

According to the NRW's Flood Risk from Reservoirs mapping the Site is not at risk of flooding from reservoirs (Figure 16) (NRW, 2025).

Figure 17. NRW Flood Risk from Reservoirs Flooding (NRW, 2025)



Guidance

The risk of reservoir flooding is related to the failure of a large reservoir (holding over 25,000 m^3 of water) and is based on the worst-case scenario. Reservoir flooding is extremely unlikely to occur (NRW, 2025).

5. Flood risk from the development

Floodplain storage

Where flood storage from any source of flooding is to be lost as a result of development, on-site level-for-level compensatory storage, accounting for the predicted impacts of climate change over the lifetime of the development, should be provided. Where it is not possible to provide compensatory storage on site, it may be acceptable to provide it off-site if it is hydraulically and hydrologically linked.

The loss of floodplain storage is less likely to be a concern in areas benefitting from appropriate flood risk management infrastructure or where the source of flood risk is solely tidal.

The development is located partially within fluvial Flood Zone 2 but does not involve an increase in building footprint. Therefore, there would be no displacement of flood water and compensatory flood storage is not required.

Drainage and run-off

Based on the topography and low surface water flood risk in the vicinity, interference or interaction with overland flow paths and inflows from offsite is considered unlikely. The mapped surface water flooding in the Low-risk event appears to reflect ponding within a local topographic low in the western car parking area, rather than a significant overland flow.

Additionally, as the development proposals are for a change of use and will not involve the alteration of any external features (or any changes to existing impermeable and permeable areas), an estimation of surface water runoff is not considered to be required.

Any changes to the existing drainage system will be undertaken in accordance with best practice and care will be taken to ensure the new development does not overload/block any existing drainage or flow pathways to/from the Site.

6. Suitability of the proposed development

The information below outlines the suitability of proposed development in relation to national and local planning policy.

National policy and guidance

The aims of the national planning policies TAN15 (2025) and PPW (2024) are achieved through application of the Justification Test and by assessing Flood Consequences. The key requirements of these are outlined below:

	Guidance
Acceptability criteria for flooding consequences: All developments should be designed to be flood free during the 1% river flood and 0.5% flood from the sea, plus an allowance for climate change over the lifetime of development. **Tolerable conditions**: During an extreme 0.1% flood event, flood depths should not exceed 600 mm at the Site. The maximum permitted velocity of flood waters is 0.15 m/s for Highly Vulnerable development and 0.3 m/s for Less Vulnerable development.	

The proposed Site use is commercial and is classified as "Less Vulnerable" development. The Site is located partially within Flood Zones 1 & 2.

Table 6. Flood risk vulnerability and flood zone compatibility (taken from TAN15, 2025)

Flood risk vulnerability classification	Highly vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓
Defended Zone	Must satisfy acceptability criteria and tolerable conditions	✓	✓
Zone 2	Must satisfy acceptability criteria and tolerable conditions	Must satisfy acceptability criteria	✓
Zone 3	X (greenfield land) / brownfield land must satisfy	Must satisfy acceptability criteria	✓

Flood risk vulnerability classification	Highly vulnerable	Less vulnerable	Water compatible
	acceptability criteria and tolerable conditions		

Acceptability criteria for flooding consequences:

Highly Vulnerable development must be flood free in the 1 in 100-year fluvial event and 1 in 200-year tidal event, including an allowance for climate change.

- GeoSmart Comment. Analysis of the Site does demonstrate that the development would be flood free during a 1 in 100-year fluvial event and a 1 in 200-year (tidal) event with appropriate allowance for climate change. The Site is only affected in the 1 in 1000 year present day fluvial event.

Tolerable conditions:

During an extreme 0.1% flood event including an allowance for climate change, flood depths should not exceed 600 mm at the Site. The maximum permitted velocity of flood waters is 0.15 m/s for Highly Vulnerable development and 0.3 m/s for Less Vulnerable development.

- GeoSmart Comment. Analysis of the Site demonstrates that in a 1 in 1000 year plus 20% climate change fluvial event, the maximum flood depth at the Site would be 0.28 m (maximum flood level 87.18 mAOD), with a maximum velocity of 0.11 m/s.

Natural Resources Wales Flood Risk Standing Advice for Sites located in Flood Zones 2 or 3

For all relevant vulnerable developments (i.e. more vulnerable, less vulnerable and water compatible), advice on the points should be followed:

- Surface water management;
- Access and evacuation; and
- Floor levels.

Surface water management

Plans for the management of surface water need to meet the requirements set out in either the local authority's:

- Surface water management plan where available; OR
- Strategic flood consequence assessment.

They also need to meet the requirements of the approved building regulations Part H: drainage and water disposal. Read section H3 rainwater drainage.

Planning permission is required to use a material that can't absorb water (e.g. impermeable concrete) in a front garden larger than 5 square metres.

Access and evacuation

Details of emergency escape plans should be provided for any parts of a building that are below the estimated flood level:

Plans should show:

- Single storey buildings or ground floors that don't have access to higher floors can access a space above the estimated flood level, e.g. higher ground nearby;
- Basement rooms have clear internal access to an upper level, e.g. a staircase; and
- Occupants can leave the building if there's a flood and there's enough time for them to leave after flood warnings.

Floor levels

The following should be provided:

- Average ground level of the building; and
- Finished floor level of the lowest habitable room in the building.

Ground floor levels should be a minimum of whichever is higher of:

- 300 millimetres (mm) above the general ground level of the site; OR

At least 600 mm above the estimated river or sea flood level.

7. Resilience and mitigation

Based on the flood risk identified at the Site, the national and local policies and guidance and proposed development, the mitigation measures outlined within this section of the report are likely to help protect the development from flooding.

Sea (coastal/tidal) flood mitigation measures

As the Site is not identified as being at risk of flooding from the sea, mitigation measures are not required.

Rivers (fluvial) flood mitigation measures

The Site is located within an area which is affected by flooding from rivers; Table 7 confirms the flood depths associated with the area proposed for development.

Table 7. Flood levels compared to ground levels on-Site

Ground levels in area proposed for development (mAOD)	Modelled Flood Levels (mAOD)		
	1 in 100 year plus 20% Central climate change allowance	1 in 100 year plus 45% Upper End climate change allowance	1 in 1000 year present day
86.81 to 87.64*	85.72 (in-channel)	85.84 (in-channel)	86.98
Flood depths (m)	No flooding anticipated		Up to 0.17 (overall Site)
			Up to 0.08 (building footprint)**

*Ground levels as provided by the LiDAR DTM data obtained for the Site with a resolution of 1 m and a vertical accuracy of ±0.15 m.

**Based upon the ground levels of the building footprint of 86.90 to 87.13 mAOD as provided by the LiDAR DTM data. Whilst it is considered likely that the threshold level of the existing building would exceed the 1 in 1000 year flood level, as no surveyed threshold levels have been provided, this cannot be confirmed within the scope of this report.

The vulnerability classification of the Site and the Flood Zone means proposals for the Site fall under the EA's Flood Risk Standing Advice (FRSA) for more vulnerable developments.

As the proposed development is for a change of use, and as the 1 in 100 year plus 20% climate change 'design' flood event would not impact the Site, the raising of finished floor levels is not considered to be appropriate for the development. Given the relatively shallow depths and low probability of flooding, specific flood mitigation measures are not considered to be required for the development.

It may, however, be prudent to consider the adoption of a water exclusion strategy during any refurbishment works for flood depths up to 0.3 m as a precaution to further reduce potential flood risks.

A water exclusion strategy, using avoidance and resistance measures, is appropriate where floods are expected to last for short durations. Potential water exclusion strategies include:

- Passive flood door systems;
- Temporary flood barriers;
- Air brick covers (manual or automatic closing);
- Non-return flap valves on sewer outfalls.

Avoidance and resistance measures are unlikely to completely prevent floodwater entering a property, particularly during longer duration flood events. Therefore, it is recommended that the following flood resilience measures are also considered as a precaution:

- Flood resilient materials and designs:
    - Use of low permeability building materials up to 0.3 m such as engineering bricks (Classes A and B) or facing bricks;
    - Hard flooring and flood resilient metal staircases;
    - The use of internal lime plaster/render or where plasterboards are used these should be fitted horizontally instead of vertically and/or using moisture resistant plasterboard at lower levels;
    - Water, electricity and gas meters and electrical sockets should be located above the predicted flood level;
    - Communications wiring: wiring for telephone, TV, Internet and other services should be protected by suitable insulation in the distribution ducts to prevent damage.

If these mitigation measures are implemented this could reduce the flood risk to the development from Very Low to Low to Very Low.

Surface water (pluvial) flood mitigation measures

The mitigation measures detailed above for fluvial flood risk are likely to be suitable for the relatively shallow flood depths which could be experienced in a 1 in 1000 year pluvial flood event, given that the mapped flooding in this event would be confined within low-lying areas of the car park upon the west of the Site.

As part of best practice, the regular maintenance of any drains and culverts surrounding/on the Site should be undertaken to further reduce the flood risk.

If these mitigation measures are implemented this would reduce the flood risk to the development from Very Low to Low to Very Low.

Groundwater flood mitigation measures

As the Site is not identified as being at risk of groundwater flooding, mitigation measures are not required.

Reservoir flood mitigation measures

According to NRW data, the Site is not at risk of flooding from reservoirs; therefore, mitigation measures are not required.

Other flood risk mitigation measures

Culvert blockage modelling undertaken as part of the Afon Gwenfro modelling study (JBA Consulting, 2016) indicates that in a worst-case, 0.1% AEP, 100% blockage at the Hospital culvert (ref: BLK3), flood depths of up to 0.52 m are mapped across the majority of the Site area. It is noted that this scenario would be extremely unlikely to occur, and would reflect a residual risk to the development.

Residual flood risk mitigation measures

The risk to the Site has been assessed from all sources of flooding and appropriate mitigation and management measures proposed to keep the users of the development safe over its lifetime. There is however a residual risk of flooding associated with the potential for failure of mitigation measures if regular maintenance and upkeep isn't undertaken. If mitigation measures are not implemented or maintained, the risk to the development will remain as the baseline risk.

Further flood mitigation information

More information on flood resistance, resilience and water entry can be found here: http://www.planningportal.gov.uk/uploads/br/flood_performance.pdf

www.knowyourfloodrisk.co.uk

Emergency evacuation - safe access / egress and safe refuge

Emergency evacuation to land outside of the floodplain should be provided if feasible. Where this is not possible, 'more vulnerable' developments and, where possible, development in general (including basements), should have internal stair access to an area of safe refuge within the building to a level higher than the maximum likely water level. An area of safe refuge should be sufficient in size for all potential users and be reasonably accessible to the emergency services.

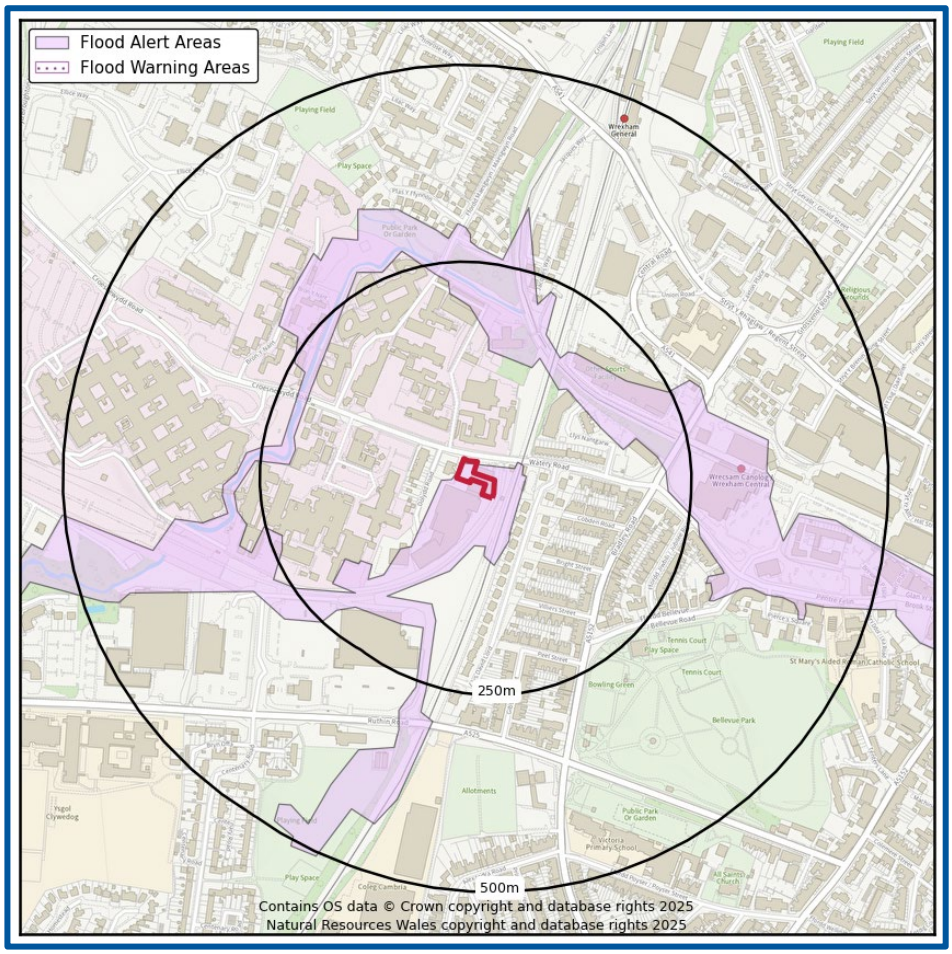
Emergency evacuation from the development and the Site should only be undertaken in strict accordance with any evacuation plans produced for the Site, with an understanding of the flood risks at the Site including available mitigation, the vulnerability of occupants and preferred evacuation routes.

Flood warnings

The NRW operates a flood warning service in all areas at risk of flooding; this is available on their website: https://www.gov.uk/check-flood-risk. The Site is located within an NRW Flood Alerts area (ref: 101WAFLD10) so is able to receive alerts (Figure 17). All warnings are also available through the NRW's 24 hour Floodline Service 0345 988 1188.

The NRW aims to issue Flood Warnings 2 hours in advance of a flood event. Flood Warnings can provide adequate time to enable protection of property and evacuation from a Site, reducing risk to life and property.

Figure 18. NRW Flood Warning Coverage for the local area (NRW, 2025).



Emergency evacuation

Where possible, a safe access and egress route with a 'very low' hazard rating from areas within the floodplain to an area wholly outside the 1 in 100 year flood event including an allowance for climate change should be demonstrated.

Based on the EA's Flood Zone Map the closest dry evacuation area within Flood Zone 1 is on the north of the Site adjacent to Croesnewydd Road. It is advised that evacuation from the premises would be the preferred option in a flood event if safe to do so. It is recommended that residents prepare to evacuate as soon as an NRW Flood Warning is issued in order to completely avoid flood waters.

On-Site refuge

Site closure should be the primary action in the event of a flooding event. In a worst-case scenario evacuation and the seeking of safe refuge at a first floor should be considered where possible.

Other relevant information

A Business Continuity and Flood Warning and Evacuation Plan (BCFWEP) is recommended to reduce risks to people, property and profit.

Occupants should be signed up to receive NRW's Flood Alerts.

Registration to the Natural Resource Wales flood warning scheme can be done by following this link: https://www.gov.uk/sign-up-for-flood-warnings.

It is recommended that main communication lines required for contacting the emergency services, electricity sockets/meters, water supply and first aid stations and supplies are not compromised by flood waters. Where possible these should all be raised above the extreme flood level.

8. Conclusions and recommendations

Table 8. Risk ratings following Site analysis

Source of Flood Risk	Baseline[1]	After analysis[2]	After Mitigation[3]
River (fluvial) flooding	Very Low to Low		Very Low
Sea (coastal/tidal) flooding	Very Low		N/A
Surface water (pluvial) flooding	Very Low to Low		Very Low
Groundwater flooding	Negligible		N/A
Other flood risk factors present	Yes (culvert/bridge blockage)		N/A
Is any other further work recommended?	Yes		No (see below)

1 BASELINE risks assigned for the whole Site, using national risk maps, including the benefit of NRW flood defences.

2 AFTER ANALYSIS modification of risk assessment based on detailed site specific analysis including some or all of the following: flood model data, high resolution mapping, building location, access routes, topographic and CCTV surveys. Reasons for the change in classification are provided in the text.

3 AFTER MITIGATION risks include risks to the proposed development / asset and occupants if mitigation measures recommended in this report are implemented, including the impacts of climate change.

*N/A indicates where mitigation is not required.

The table below provides a summary of where the responses to key questions are discussed in this report.

Less vulnerable developments in fluvial Flood Zone 2 are acceptable according to TAN15 (2025) and providing the recommended mitigation measures are put in place (see previous sections) it is likely that flood risk to this Site will be reduced to an acceptable level.

Table 9. Summary of responses to key questions in the report

Key sources of flood risks identified	Rivers, surface water (see Section 4).
Are standard mitigation measures likely to provide protection from flooding to/from the Site?	Yes (see Section 7).
Is any further work recommended?	Yes (see exec summary and Section 7)

9. References and glossary

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GeoSmart Information

Glossary

General terms

BGS	British Geological Survey
NRW	National Resource Wales
GeoSmart groundwater flood risk model	GeoSmart's national groundwater flood risk model takes advantage of all the available data and provides a preliminary indication of groundwater flood risk on a 50m grid covering England and Wales. The model indicates the risk of the water table coming within 1 m of the ground surface for an indicative 1 in 100 year return period scenario.
Dry-Island	An area considered at low risk of flooding (e.g. In a Flood Zone 1) that is entirely surrounded by areas at higher risk of flooding (e.g. Flood Zone 2 and 3)
Flood resilience	Flood resilience or wet-proofing accepts that water will enter the building, but through careful design will minimise damage and allow the re-occupancy of the building quickly. Mitigation measures that reduce the damage to a property caused by flooding can include water entry strategies, raising electrical sockets off the floor, hard flooring.
Flood resistance	Flood resistance, or dry-proofing, stops water entering a building. Mitigation measures that prevent or reduce the likelihood of water entering a property can include raising flood levels or installation of sandbags.
Flood Zone 1	This zone has less than a 0.1% annual probability of river flooding
Flood Zone 2	This zone has between 0.1 and 1% annual probability of river flooding and between 0.1% and 0.5 % annual probability sea flooding
Flood Zone 3	This zone has more than a 1% annual probability of river flooding and 0.5% annual probability of sea flooding
Functional Flood Plain	An area of land where water has to flow or be stored in times of flood.
Hydrologic model	A computer model that simulates surface run-off or fluvial flow. The typical accuracy of hydrologic models such as this is ±0.25m for estimating flood levels at particular locations.
OS	Ordnance Survey
Residual Flood Risk	The flood risk remaining after taking mitigating actions.
SFCA	Strategic Flood Consequence Assessment. This is a brief flood risk assessment provided by the local council

SuDS	A Sustainable drainage system (SuDS) is designed to replicate, as closely as possible, the natural drainage from the Site (before development) to ensure that the flood risk downstream of the Site does not increase as a result of the land being developed. SuDS also significantly improve the quality of water leaving the Site and can also improve the amenity and biodiversity that a Site has to offer. There are a range of SuDS options available to provide effective surface water management that intercept and store excess run-off. Sites over 1 Ha will usually require a sustainable drainage assessment if planning permission is required. The current proposal is that from April 2014 for more than a single dwelling the drainage system will require approval from the SuDS Approval Board (SABs).

Aquifer Types

Principal aquifer	These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
Secondary A aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
Secondary B aquifer	Predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
Secondary undifferentiated	Has been assigned in cases where it has not been possible to attribute either category A or B to a rock type due to the variable characteristics of the rock type.
Unproductive Strata	These are rock layers or drift deposits with low permeability that has negligible significance for water supply or river base flow.

Data Sources

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Bedrock & Superficial Geology	Contains British Geological Survey materials © NERC 2025 Ordnance Survey data © Crown copyright and database right 2025
Flood Risk (Flood Zone/RoFRS/Historic Flooding/Pluvial/Surface Water	Natural Resource Wales copyright and database rights 2025

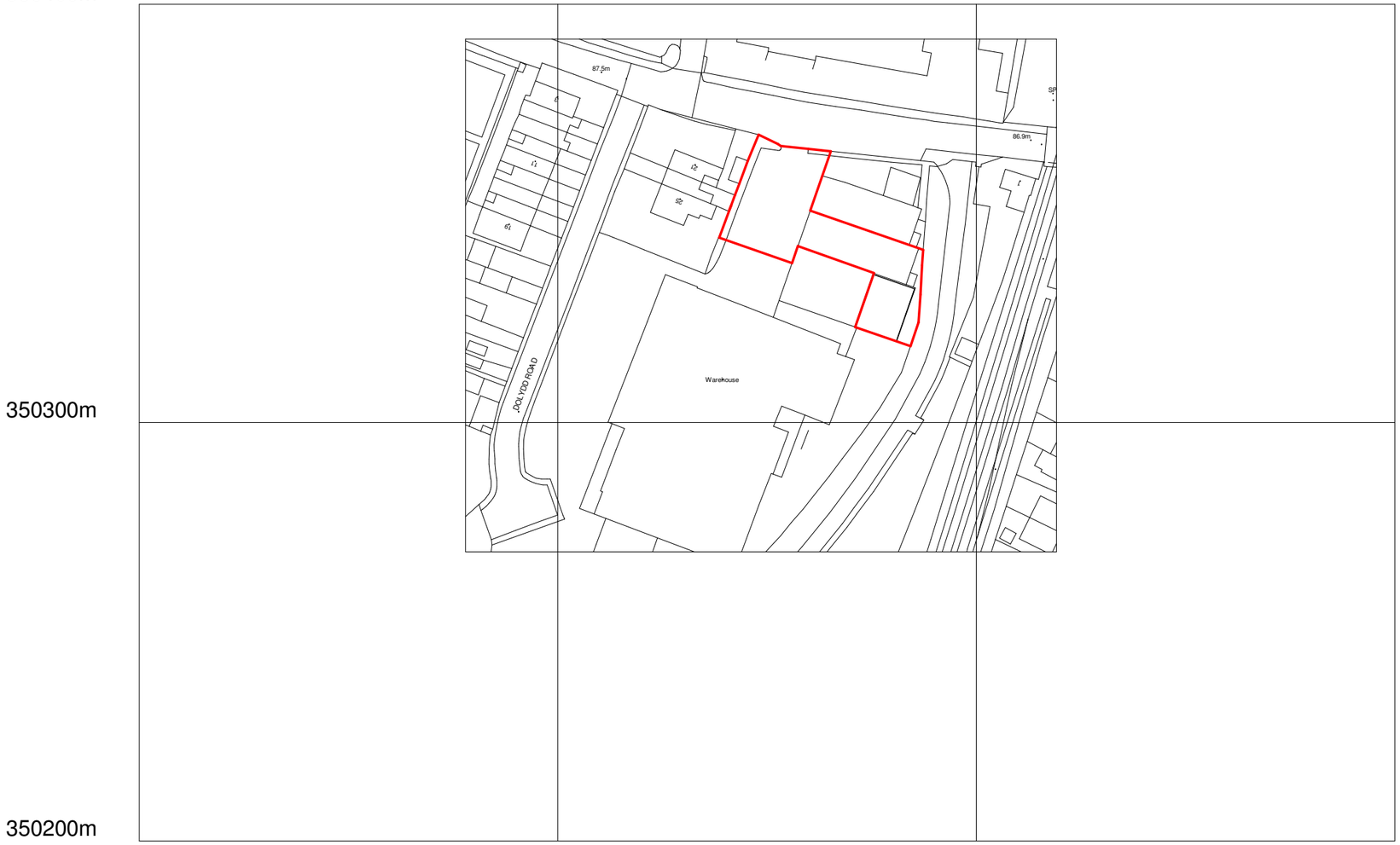
Features/Reservoir/ Flood Alert & Warning)	Ordnance Survey data © Crown copyright and database right 2025
Flood Risk (Groundwater)	GeoSmart, BGS & OS GW5 (v2.4) Map (GeoSmart, 2025) Contains British Geological Survey materials © NERC 2025 Ordnance Survey data © Crown copyright and database right 2025
Location Plan	Contains Ordnance Survey data © Crown copyright and database right 2025
Topographic Data	OS LiDAR/EA Contains Ordnance Survey data © Crown copyright and database right 2025 Natural Resource Wales copyright and database rights 2025

10. Appendices

GeoSmart Information

Appendix A

Site plans



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Location Plan

1 : 1250

0m 25m 50m 75m 100m 125m

ARKIFY LTD.
36 Plas Tirion, Nant Parc,
Johnstown, Wrexham LL14 1UR
07543968690
geraint@arkify.uk
www.arkify.uk

Project:	Unit 2, Croesnewydd Rd, Wrexham			
Title:	Location Plan			
Scale @ A3:	1 : 1250	Author: GE	Date:	16/04/25
Project Ref:	25-25	Drawing No: A001	Rev.	-



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Existing Site Plan

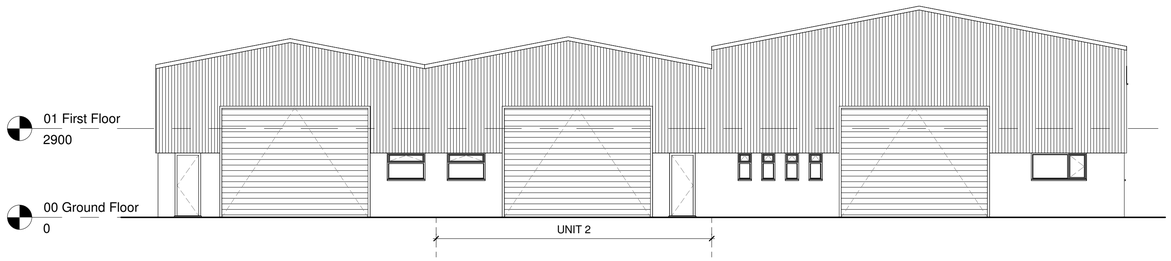
1 : 200

0m 4m 8m 12m 16m 20m

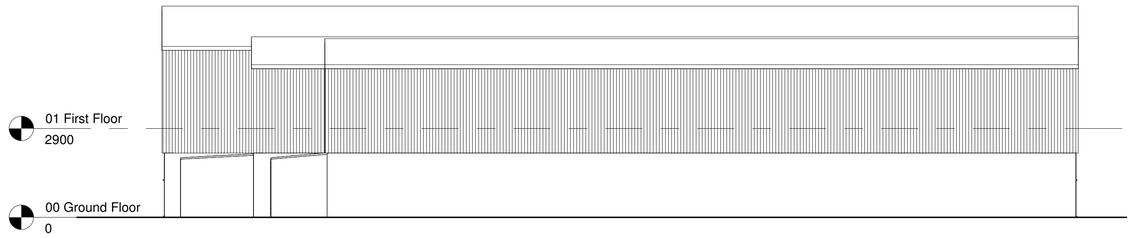
ARKIFY

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36 Pas Tirion, Nant Parc,
Wrexham, LL14 1UR
07543906990
geraint@arkify.co.uk
www.arkify.co.uk

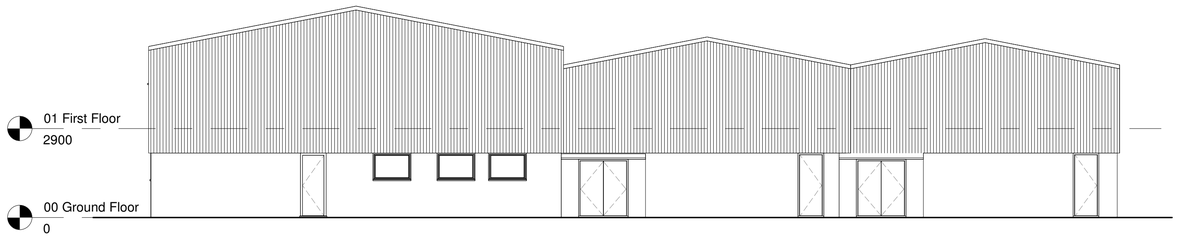
Project:	Unit 2, Croesnewydd Rd, Wrexham						
Title:	Existing Site Plan						
Scale @ A1:	1 : 200	Scale @ A3:	1:400	Author:	GE	Date:	16/04/25
Project Ref:	25-25			Drawing No:	A002	Rev.	-



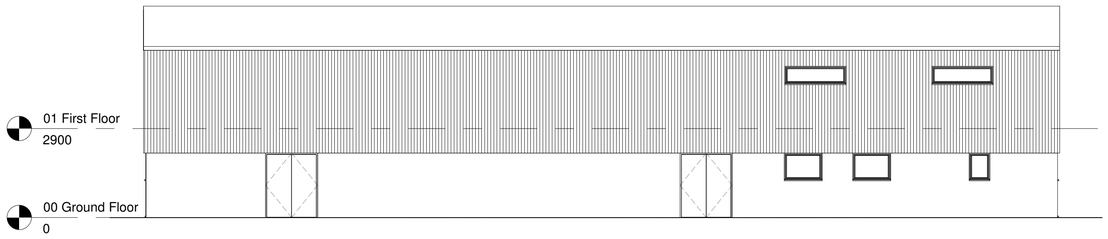
Existing West Elevation
1 : 100



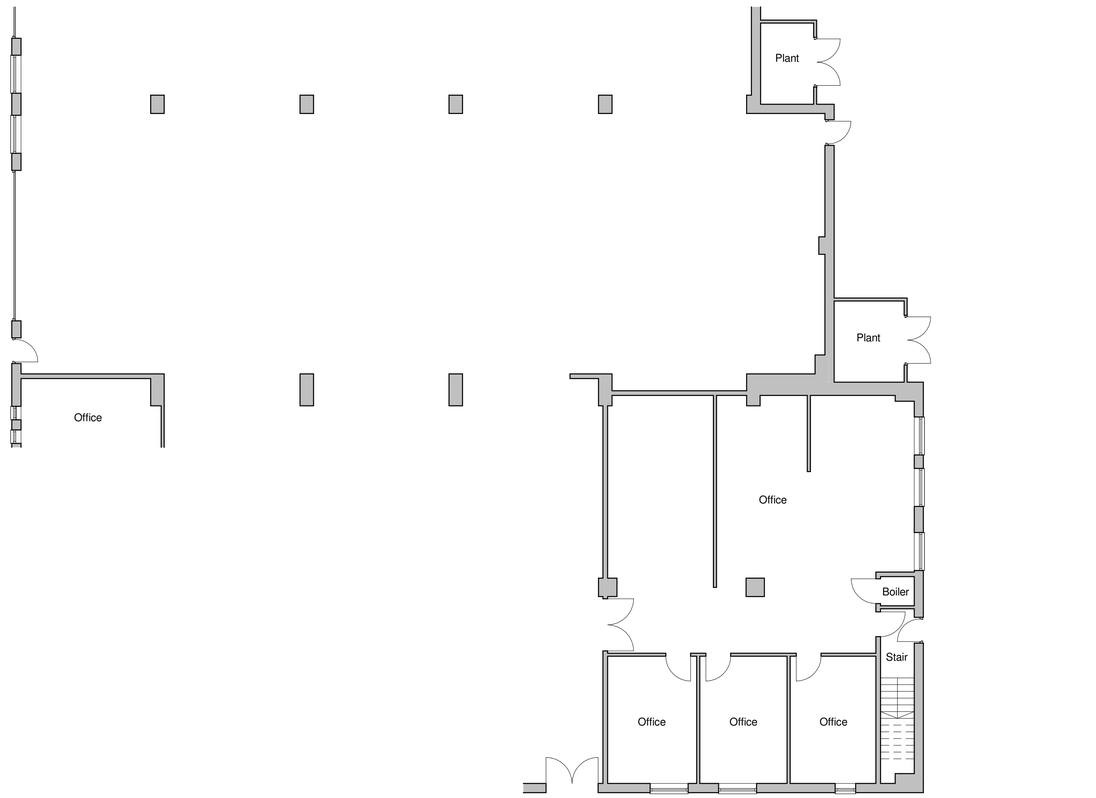
Existing North Elevation
1 : 100



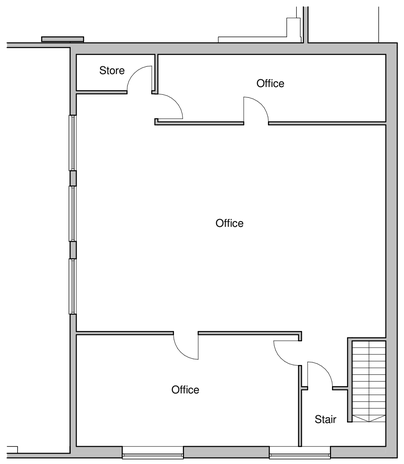
Existing East Elevation
1 : 100



Existing South Elevation
1 : 100



Existing Ground Floor Plan
1 : 100



Existing First Floor Plan
1 : 100

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Wrexham, LL14 1UR
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Project:	Unit 2, Croesnewydd Rd, Wrexham				
Title:	Existing Floor Plans & Elevations				
Scale @ A1:	1 : 100	Scale @ A3:	1:200	Author: GE	Date: 16/04/25
Project Ref:	25-25	Drawing No:	A003	Rev.	-



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Existing Site Plan

1 : 200

0m 4m 8m 12m 16m 20m

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Project:	Unit 2, Croesnewydd Rd, Wrexham				
Title:	Proposed Site Plan				
Scale @ A1:	1 : 200	Scale @ A3:	1:400	Author: GE	Date: 16/04/25
Project Ref:	25-25		Drawing No: A101		Rev. -



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Proposed Site Plan

1 : 200

0m 4m 8m 12m 16m 20m

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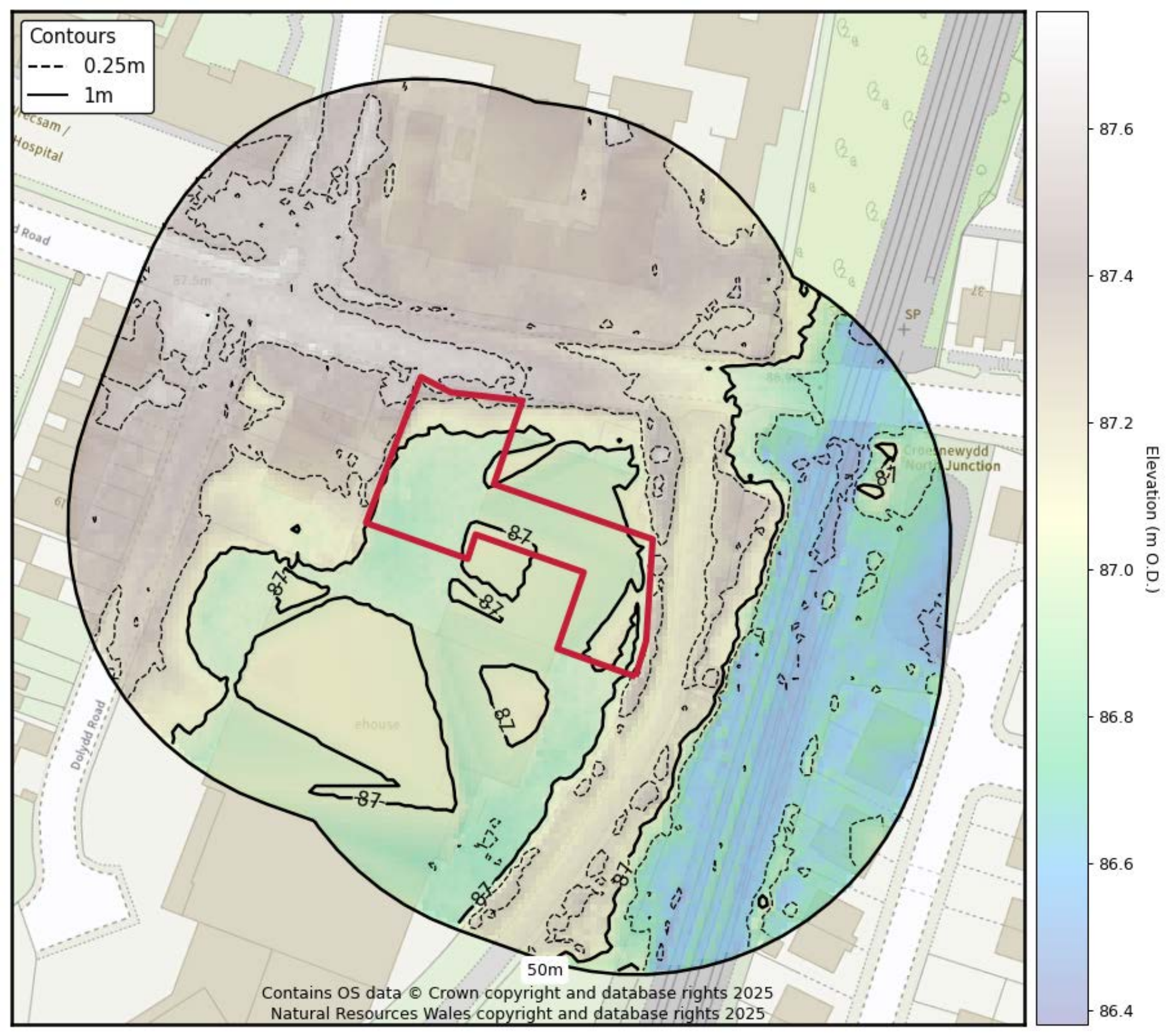
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gerairt@arkify.co.uk
www.arkify.co.uk

Project:	Unit 2, Croesnewydd Rd, Wrexham				
Title:	Proposed Site Plan				
Scale @ A1:	1 : 200	Scale @ A3:	1:400	Author: GE	Date: 16/04/25
Project Ref:	25-25	Drawing No:	A101	Rev.	A

GeoSmart Information

Appendix B

Natural Resource Wales LiDAR ground elevation data


Contours
0.25m
1m
87
50m
Elevation (m O.D.)
87.6
87.4
87.2
87.0
86.8
86.6
86.4
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Tel: 01743 298 100

Email: info@geosmartinfo.co.uk

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TPOs contact details:

The Property Ombudsman scheme

Milford House

43-55 Milford Street

Salisbury

Wiltshire SP1 2BP

Tel: 01722 333306

Fax: 01722 332296

Email: admin@tpos.co.uk

You can get more information about the PCCB from www.propertycodes.org.uk. Please ask your search provider if you would like a copy of the search code

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- Normally deal with it fully and provide a final response, in writing, within 20 working days of receipt.
- Keep you informed by letter, telephone or e-mail, as you prefer, if we need more time.
- Provide a final response, in writing, at the latest within 40 working days of receipt.
- Liaise, at your request, with anyone acting formally on your behalf.

If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk.

We will co-operate fully with the Ombudsman during an investigation and comply with his final decision. Complaints should be sent to:

Liz Lloyd

Finance Manager

GeoSmart Information Limited

Suite 9-11, 1st Floor,

Old Bank Buildings,

Bellstone, Shrewsbury, SY1 1HU

Tel: 01743 298 100

support@geosmartinfo.co.uk

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