

Western Gateway Flood Consequence Assessment

Wrexham County Borough Council

Final

October 2014

ATKINS

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Table of contents

Chapter	Pages
1. Introduction	6
1.1. Proposal	6
1.2. National planning policy	6
1.3. Natural Resources Wales Requirements	6
2. Existing Site	7
2.1. Introduction	7
2.2. Watercourses	7
2.3. Groundwater	8
2.4. Structures Affecting Local Hydraulics	8
2.5. Flood Defence Infrastructure	8
3. Proposed Development	9
3.1. Overview	9
4. Flood Consequence Assessment	11
4.1. Introduction	11
4.2. Potential flood hazards	11
4.3. Further work	18
5. Opportunities and Constraints Plan – Housing Development East	19
5.1. Overview	19
5.2. Potential Options	19
6. Conclusions and Recommendations	22
Appendix A. Spine Road Layout	24
Appendix B. Correspondence	25

GLOSSARY OF TERMS

<i>Term</i>	<i>Meaning / Definition</i>
AEP	Annual Exceedence Probability (of a flood event expressed as a percentage)
CFMP	Catchment Flood Management Plan
CIRIA	Construction Industry Research and Information Association
DAM	Development Advice Map (published by the Welsh Assembly Government)
Development Advice Zone A	Used to indicate that justification test is not applicable and no need to consider flood risk further
Development Advice Zone B	Used as part of a precautionary approach to indicate where the site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further
Development Advice Zone C	Used to indicate that flooding issues should be considered as an integral part of a decision making by the application of the justification test including the assessment of consequence
Development Advice Zone C1	Used to indicate that development can take place subject to the application of the justification test including acceptability of consequences.
Development Advice Zone C2	Used to indicate that less vulnerable developments should be considered subject to the application of the justification test, including the acceptability of consequences. Emergency services and highly vulnerable developments should not be considered.
EA	Environment Agency
EAW	Environment Agency Wales
EFO	Extreme Flood Outline (Boundary of floodplain associated with a flood event with a probability of occurrence of 0.1%)
FCA	Flood Consequence Assessment
FFL	Finished Floor Level
LPA	Local Planning Authority
m AOD	metres above Ordnance Datum
PPS	Planning Policy Statement
PPW	Planning Policy Wales
S105	Section 105 of the Water Resources Act 1991
SFRA	Strategic Flood Risk Assessment
SMP	Shoreline Management Plan
SuDS	Sustainable Drainage Systems
TAN 15	Technical Advice Note 15: Development and Flood Risk (July 2004)

1. Introduction

1.1. Proposal

Wrexham County Borough Council (WBCB) seeks to develop an area of land (Wrexham Western Gateway) along Ruthin Road, Wrexham. The development proposals are for both residential and non residential use including the provision of:

- A new spine road
- Office development
- Housing

This report is an update to the previously developed FCA for the original proposals set out in 2010 and is to support the planning application of the development of the new spine road off Croesnewydd Road and the office development to the western portions of the overall site. The proposals for the housing developments (West and East) referenced in this report are for WBCB attention only. They do not form part of any application for planning at this stage.

1.2. National planning policy

The land use planning system regulates development and land use in the public interest, with the aim of ensuring sustainable development which balances environmental, economic and social needs of society both now and in the future. In Wales, a series of planning policy technical advice notes provide advice on a number of subjects. Technical Advice Note 15 (TAN 15) aims to reduce, or at the very least avoid increasing, flood risk by ensuring an integrated approach to land use planning and flood risk management. To achieve this, local authorities are responsible for controlling development, including that in the floodplain which may be affected by flooding, or where changes in runoff may increase flood risk elsewhere.

Developers are required to provide an assessment demonstrating the following (after TAN15):

- ♦ The consequences of flooding on the development
- ♦ The consequences (i.e. the overall impacts) of the development on flood risk elsewhere within the catchment for a range of potential flooding scenarios up to that flood having a probability of 0.1%.
- ♦ That appropriate mitigation measures can be incorporated within the design of the development to ensure that development minimises risk to life, damage to property and disruption to people living and working on the site or elsewhere in the floodplain.

1.3. Natural Resources Wales Requirements

As a statutory consultee, Natural Resource Wales (NRW) has been consulted as part of the original proposals by the Local Planning Authority (LPA) regarding the proposed development. NRW has advised that portions of the proposed development site are partially within Development Advice Zone C2 of the Development Advice Map (DAM) and that a Flood Consequence Assessment (FCA) is required for this part of the site.

NRW state that the criteria for undertaking the FCA are contained within Section 7 and Appendix 1 of TAN15.

NRW has also indicated that the proposals for the office development and the spine road should be assessed against the FCA's undertaken for the proposed developments on the WAST site (Welsh Ambulances Services NHS Trust) and the 'Brother' residential development to the north of the spine road.

The FCA should be forwarded by the LPA to NRW for further consultation.

Copies of the correspondence with EAW from the previous study in 2010 are included in Appendix C.

2. Existing Site

2.1. Introduction

The Wrexham Western Gateway development area lies immediately east the A483 at the junction with the A525. The area lies approximately 0.5km west of Wrexham.

The site is currently open fields but has recently undergone some residential development immediately south east of the development boundary as part of a Redrow Development (pre 2010).

The site location is shown in Figure 2-1.

Figure 2-1 Site Location Plan



2.2. Watercourses

There are 2 watercourses that flow through the proposed development site; the River Gwenfro north of the proposed development site and the small unnamed brook that drains into the Gwenfro in the southern portions of the proposed development site.

The River Gwenfro drains in a south east direction towards Wrexham before confluenting with the River Clywedog. The catchment is considered to be steep and is characterised by grazed pasture land. The catchment is predominately rural.

The small unnamed brook rises within an area bound by Ruthin Road, A483 and the disused railway. Another small tributary joins this unnamed watercourse along the right bank at the junction of Ruthin Road and Croesnewydd Road.

Examination of the published Environment Agency Flood Map (2014) (See Figure 4-1) suggests that the flood risk posed by this unnamed watercourse has been omitted from this map. This has been examined as part of this FCA.

2.3. Groundwater

There has been no detailed ground investigation undertaken for this FCA.

2.4. Structures Affecting Local Hydraulics

There are a number of structures along both the River Gwenfro and the unnamed watercourse which have been examined as part of this FCA. These include;

- Structure running under the dismantled railway, River Gwenfro
- Structure underneath Croesnewydd Road, River Gwenfro
- Croesnewydd Road bridge, unnamed watercourse

2.5. Flood Defence Infrastructure

Examination of the Natural Resource Wales Development Advise Map suggests that this area is not served by any formal flood defence asset.

3. Proposed Development

3.1. Overview

Wrexham County Borough Council proposed to develop the Wrexham Western Gateway site for both non residential use and residential use. Included in these proposals is the addition of a new spine road running adjacent to the site, along the disused railway embankment across the River Gwenfro and to a new road junction immediately north of the site. The proposed development conceptual designs are illustrated below.

Figure 3-1 Conceptual Design – Overall Layout

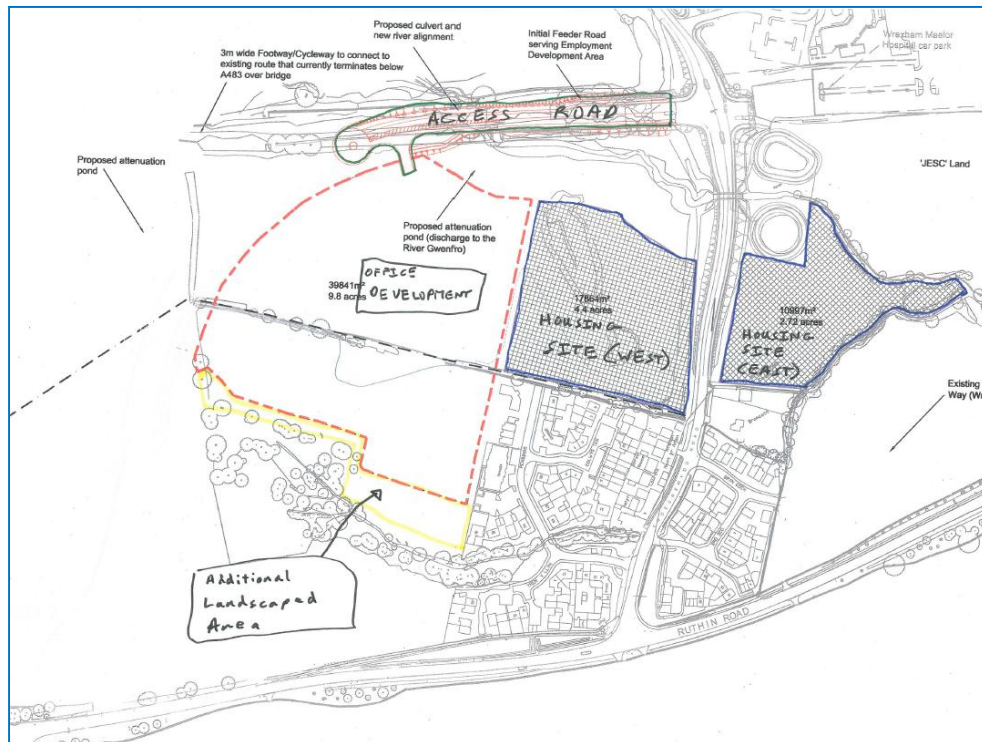


Figure 3-2 Conceptual Design – Office Development and Spine Road



The development proposals being put forward for planning include 2 elements (See Figure 3.1) which have all been discussed separately where appropriate. These elements include the following;

- Spine Road (Including a crossing of the River Gwenfro)
- Office Development

Planning Policy Wales Technical Advice Note 15 (TAN 15): Development and Flood Risk sets out the policy in relation to the developments and flooding. This document categorizes land use based on the consequences of flooding to a particular site. TAN 15 classifies industrial, employment and commercial development as less vulnerable and residential use as highly vulnerable.

This FCA also examines proposals for residential developments the west and east of the River Gwenfro although there are no detailed plans at this stage and they do not form part of the overall application for planning.

4. Flood Consequence Assessment

4.1. Introduction

A Flood Consequence Assessment, based on the currently available information, has been undertaken in accordance with TAN 15 which specifies a number of criteria that must be met to justify development within the floodplain.

This FCA examines each of the proposed development sites separately (Spine road and office development), assessing the justification and acceptability criteria in accordance with TAN15.

The FCA will identify:

- ◆ The flooding hazards which may affect the proposed developments or where the developments may increase flood risk elsewhere (WAST and 'Brother' sites);
- ◆ Whether the proposed developments could affect the integrity of a flood defence, or obstruct access to watercourses or flood defence assets for operation and maintenance;
- ◆ Whether the developments could increase runoff;
- ◆ Suggest appropriate mitigation measures, where appropriate, to manage any flood risk resulting from the proposed development options.

4.2. Potential flood hazards

The potential flood hazards identified within this FCA, their impact on flood risk at the site and possible mitigation measures that could be implemented to manage or reduce the flood risk is given in the sections below.

4.2.1. Fluvial Flood Risk

Inspection of the available flood risk mapping published by NRW and the Environment Agency indicates portions of the overall footprint of the proposed development site are within zone C2 and zone B (See Figure 4.1).

The extent of the 0.1% AEP outline (shown in Figure 4.2) show that portions of the site are categorised as being within flood zone 2 of the Environment Agency Flood Map, indicating that there is a 0.1% AEP of flooding in any given year. This zone is categorised as 'low' meaning that each year, this area has a chance of flooding between 1 in 1000 and 1 in 100.

In September 2005 Faber Maunsell undertook a FCA for Redrow Homes as part of a proposed residential housing development immediately south of the overall Western Gateway site. This development has since been constructed.

As part of the Faber Maunsell FCA the report examined the fluvial flood risk to the site posed by the unnamed watercourse.

In combination with the current masterplan proposals for the Western Gateway development and the conclusions of the 2005 Faber Maunsell FCA it is apparent that there is no direct fluvial flood risk to any element of the proposed development inside the development boundary from the unnamed watercourse.

The Faber Maunsell FCA suggests that any overtopping of this watercourse will occur along its left bank downstream of Croesnewydd Road and not in the upstream portions of the unnamed watercourse which lie within the overall development boundary.

Figure 4-1 NRW Development Advise Map

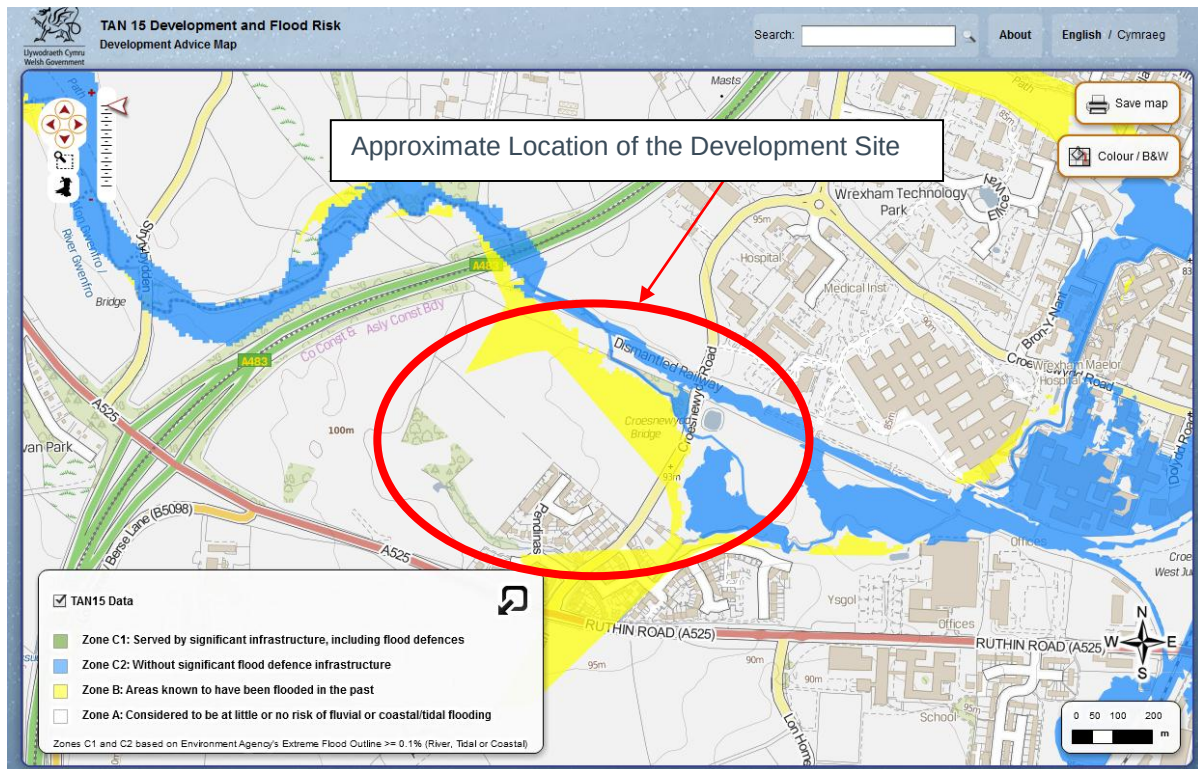
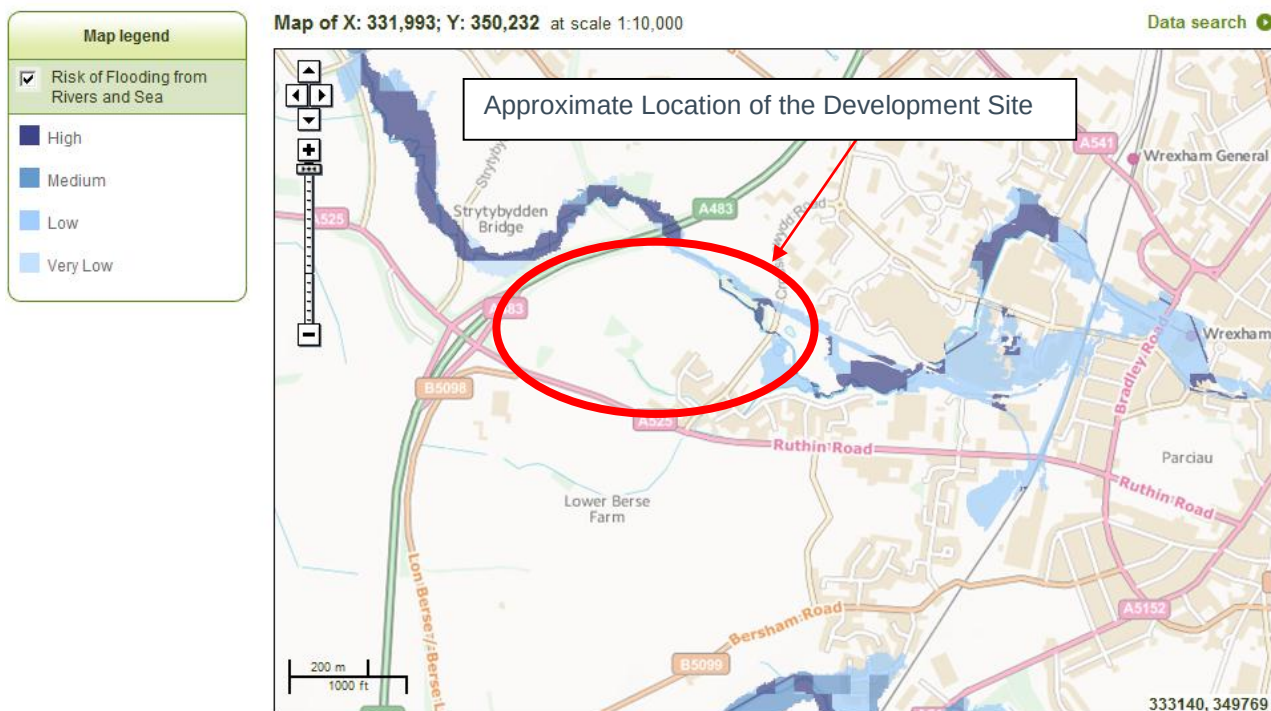


Figure 4-2 EA Flood Risk Map



Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) will take over the responsibilities of the Environment Agency in Wales.
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Office Development

The vulnerability classification of the development type (employment and carparks) is categorised as a 'less vulnerable' development in TAN 15. The footprint of the 'office development' site also

falls within zone B of the DAM which indicates that it is an area known to have flooded in the past evidenced by sedimentary deposits.

As part of a previous flood risk modelling study undertaken by JBA in 2014 (WAST site FCA) and the additional modelling work undertaken in the development of this FCA, the ground levels within the Office Development site are above the 0.1% AEP (See Figure 4.7) and as such is considered to be an acceptable development proposal in this zone and no further consequences of flooding is required, other than that of surface water drainage.

Housing Development West

The vulnerability classification of this development type (residential premises) is categorised as a 'highly vulnerable development' in TAN 15. The footprint of the Housing Development West site falls within zone B which indicates that it is an area known to have flooded in the past evidenced by sedimentary.

The detailed flood risk modelling undertaken for this entire Western Gateway (See Figure 4.7) site suggests the ground levels within the Housing Development West site are above the 0.1% AEP and as such is considered to be an acceptable development proposal in this zone and no further consequences of flooding is required, other than that of surface water drainage. It must be noted that the proposals for this site do not form part of an application for planning at this stage.

Housing Development East

The vulnerability classification of this development type (residential premises) is categorised as a 'highly vulnerable development' in TAN 15. The footprint of the Housing Development East site falls partially within zone C2 – Areas of floodplain without significant flood defence infrastructure and, zone B, although the detailed flood risk modelling undertaken for this entire Western Gateway (See Figure 4.7) site suggests the ground levels within the Housing Development East site within zone B are above the 0.1% AEP and as such is considered to be an acceptable development proposal in this zone. Zone C2 is used to indicate that only 'less vulnerable' development should be considered. Therefore, at present, only approximately 30% of the proposed site is available for residential development.

Opportunities for reducing flood risk to the development site area have been detailed in Section 5.

It must be noted that the proposals for this site do not form part of an application for planning at this stage.

Spine Road

As part of the overall development proposals for the site, WCBC propose to construct a new spine road linking the overall development site with Croesnewydd Road. The proposals include retention of the existing culvert beneath the disused culvert. The detailed proposals for the spine road have changed since the development of the WAST and the 'Brother' FCA. This includes the lowering of the elevations of the road alignment to allow high magnitude flow to overtop and thus reduce the levels of attenuation on the upstream face.

In November 2013 JBA Consulting was commissioned to undertake an FCA and to provide detailed hydrodynamic modelling of the River Gwenfro through the Western Gateway development site, more specifically to assess the impact on flood risk of the proposed WAST site. An update to the WAST FCA was undertaken in January 2014 which included an assessment of blockage of both the disused railway culvert and Croesnewydd Road culvert. The TUFLOW model used as part of the WAST FCA, the updated model, and its outputs, has formed the basis of this FCA assessment.

The only changes that have been made to the TUFLOW model from that detailed in the WAST model are an update to the spine road elevations and the retention of the existing culvert.

The TUFLOW model sets out to establish base line flood risk conditions of the existing flood risk to the proposed developments and the potential resultant changes made as a result of the proposed spine road to the WAST and 'Brother' proposed development sites.

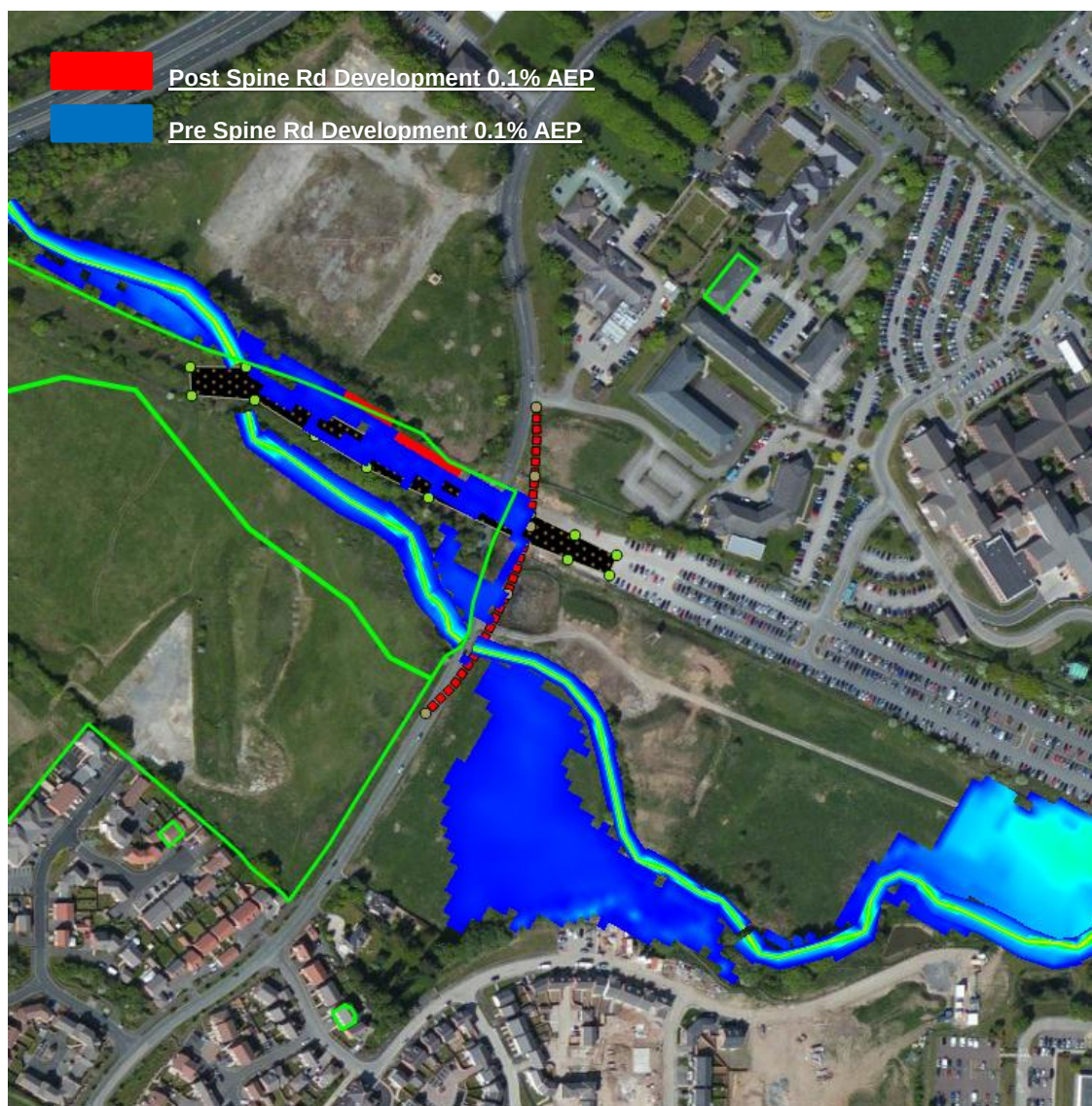
The elevations of the spine road alignment have been lowered by 600mm from those originally proposed in the WAST FCA. The lower of the road alignment elevations are from the existing junction at Croesnewydd Road to the crossing above the disused railway culvert. The lowering has been undertaken to facilitate the existing flows arrangements across the disused railway during times of extreme flood.

It must be noted that the assessment undertaken as part of this FCA is in line with the assessment undertaken for the WAST development proposals and therefore brings together and assesses the proposals for the entire Western Gateway site to include the proposals for the development at the former Brother Site, the WAST site, office development site and the spine road proposals.

Figure 4.3 below shows pre and post spine road development scenarios for the 0.1%AEP flood extent. As can be seen there is a slight localised change extent associated with the spine road along the northern boundary of the spine road although the overall extent is greater under the pre spine road scenario as the road alignment does not flood under the 0.1%AEP. It can also be seen that the change in flood envelope is within the development boundary (green line) of the spine road proposals. This has been checked against 0.1% water level elevations and ground levels. The pixilated nature of the flood envelope outputs are as a result of the resolution of the underlying DTM.

It is also clear that the WAST site stays free from flooding under the post spine road scenario for the 0.1%AEP.

Figure 4-3 - 0.1%AEP pre and post spine road development



Analysis has also been undertaken to examine the possible consequences of a potential blockage of the structures at the disused railway culvert underneath the spine road and the new culvert along Croesnewydd Road.

Figure 4.4 below again shows a very localised change in flood extent under the post spine road scenario under a 67% blockage scenario of the disused railway culvert.

The change in flood risk upstream of the disused railway culvert is in line with that demonstrated within the blockage assessment undertaken for the approved WAST site proposals.

It must be noted that the risk of blockage of this structure is considered to be low due to the nature and size of the structure.

Again, the WAST site is free from flooding under this scenario.

Figure 4-4 – 0.1%+CC AEP blockage 67% disused railway culvert pre and post spine road development



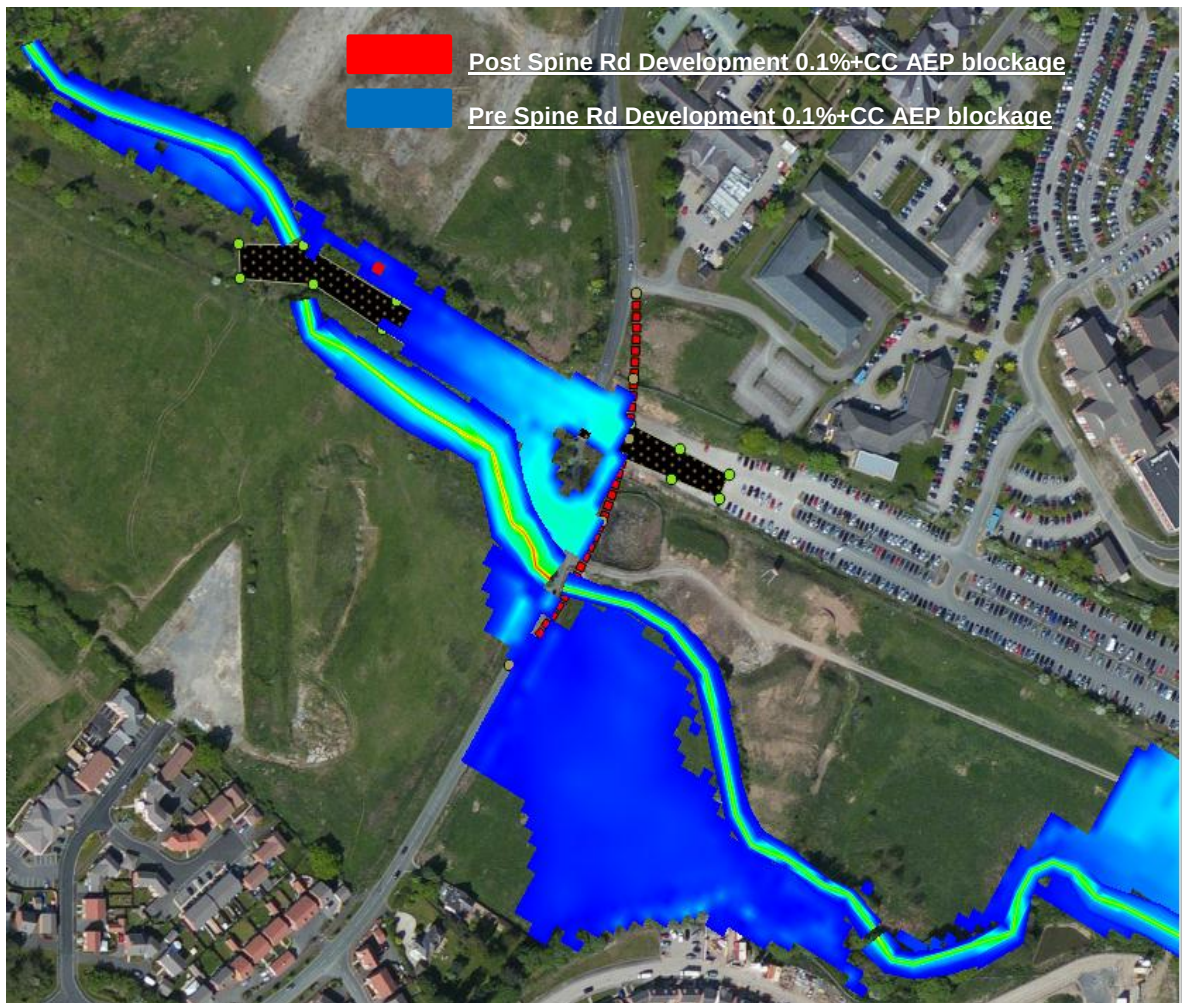
Figure 4-5 below again shows a very localised change in flood extent under the post spine road scenario (Red).

The change in flood risk along the alignment of the spine road is in line with that demonstrated within the blockage assessment undertaken for the approved WAST site proposals. Under the post spine road scenario, the spine road stays free of flooding.

It must be noted that the risk of blockage of this structure is considered to be low due to the nature and size of the structure.

Again, the WAST site is free from flooding under this scenario.

Figure 4-5 - 0.1%+CC AEP blockage 67% Croesnewydd Road culvert pre and post spine road development



In line with the assessment undertaken for the WAST FCA, the spine road, Brother site and the WAST site all stay free from flooding during a 1%+cc flood event.

Figure 4-6 – 1%+CC AEP post spine road development



As part of the design proposals and to meet NRW's ecological requirements of the spine road proposals, an otter tunnel will be installed through the alignment of the spine road set at a minimum of 150mm above the 1 in 5yrs flood levels or higher if technically possible. It is thought the installation of these tunnels will not increase flood risk downstream as the image above indicates that even at a 1% +cc AEP flood event, the WAST site is free of flooding and the river Gwenfro has capacity to accommodate the additional flow through the otter tunnel.

4.2.2. Increased runoff

There are no detailed proposals available for the surface water drainage systems for any of the development proposals that will service the proposed development sites. There are also no details available at this stage on both housing numbers for both the Housing Development Site East and Housing Development Site West so detailed calculation of post development runoff cannot be calculated. There will however be an increase in impermeable area and potential surface water runoff. The development must seek to provide storage or flow attenuation for any additional runoff associated with developments.

Spine Road

It is intended that any increase in surface water runoff above and beyond that currently experienced on the site will be attenuated before discharge into the watercourse.

The drainage strategy proposals are yet to be finalised but will be submitted as part of the overall application for planning.

Office Development

Detail design of the proposed drainage strategy has yet to be finalised but it is envisaged to discharge via an overflow and or control outlet into the un-named watercourse to the south-south west of the office development site. There are also plans for the provision of SUDs on the site in the form of a pond/wetland areas which will be utilised prior to site outfall.

Housing Development West

There are no detailed proposals available for the surface water drainage systems that will service the development. Therefore, unless infiltration systems are proposed, it can be assumed that the proposed development will drain to the adjacent watercourse.

Housing Development East

There are no detailed proposals available for the surface water drainage systems that will service the development. Therefore, unless infiltration systems are proposed, it can be assumed that the proposed development will drain to the adjacent watercourse.

With an increase in impermeable area the runoff rate at all the sites is likely to increase. SUDS, for example porous car parking, dry swales and attenuation ponds can be incorporated into the surface water drainage system for the all the development proposals and these will reduce the volume of water discharged to any existing sewer system and reduce the overall flood risk in the area. The selection of appropriate techniques will depend on the soil conditions across the entire site but are likely to include one or more devices that either store runoff to reduce the rate of discharge to the sewer system or watercourse or allow infiltration into the ground to replicate the natural drainage of the existing site. Site investigations and soakaway tests should be carried out at the detailed design stage to identify the ground conditions and the most appropriate sustainable drainage technique. Soakaway tests should be carried out in accordance with BRE 365 and water treatment elements will be included in the detailed design of the site using C697 - The SUDS Manual.

If infiltration is not feasible then attenuation ponds located in public areas can be used to store and attenuate runoff, as is proposed for the Office Development site.

Based upon the information available at this time, it is likely that standard SUDs techniques, such as those identified within this section, will be appropriate for the sites and can be adopted in full or part to manage surface water runoff from the entire Western Gateway site.

4.3. Further work

The FCA is based on the information currently available. Further work is required to assess flood risk at the Housing Development sites when development proposals are confirmed.

5. Opportunities and Constraints Plan – Housing Development East

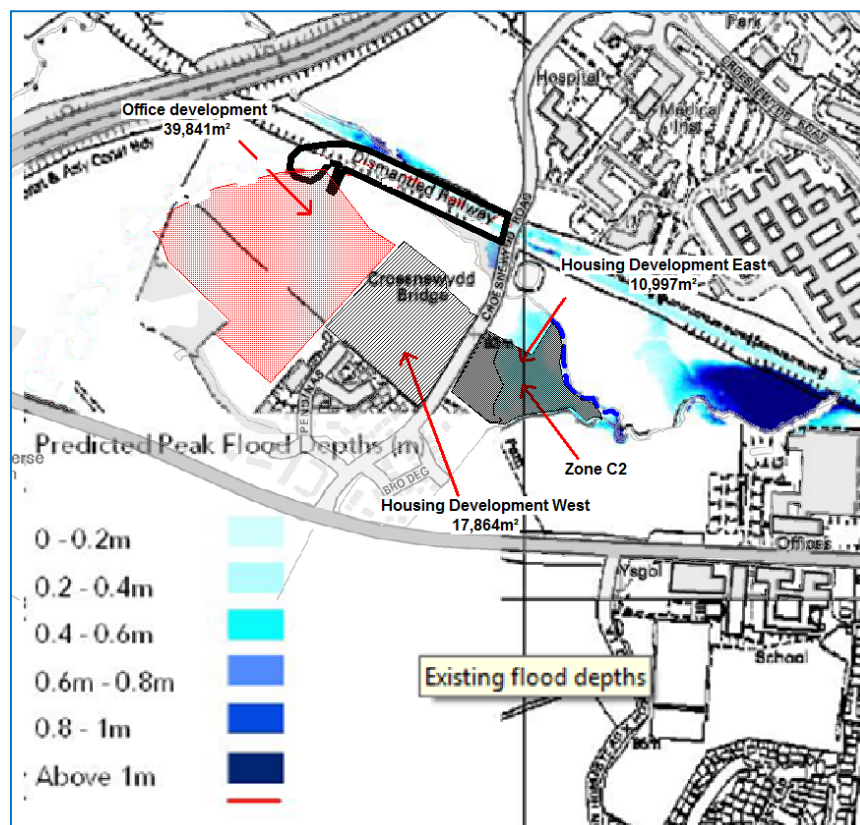
5.1. Overview

Wrexham County Borough Council is keen to reduce flood risk and flood risk prevalence throughout the Western Gateway site with the aim to increase the land available for residential accommodation.

The previous section has demonstrated that only a small portion of the area within the 'Housing Development East' is currently available for residential development due to the current level of flood risk.

Only approximately 30% of the site area of Housing Development East is available for residential development.

Figure 5-1 Proposed Development Footprint



5.2. Potential Options

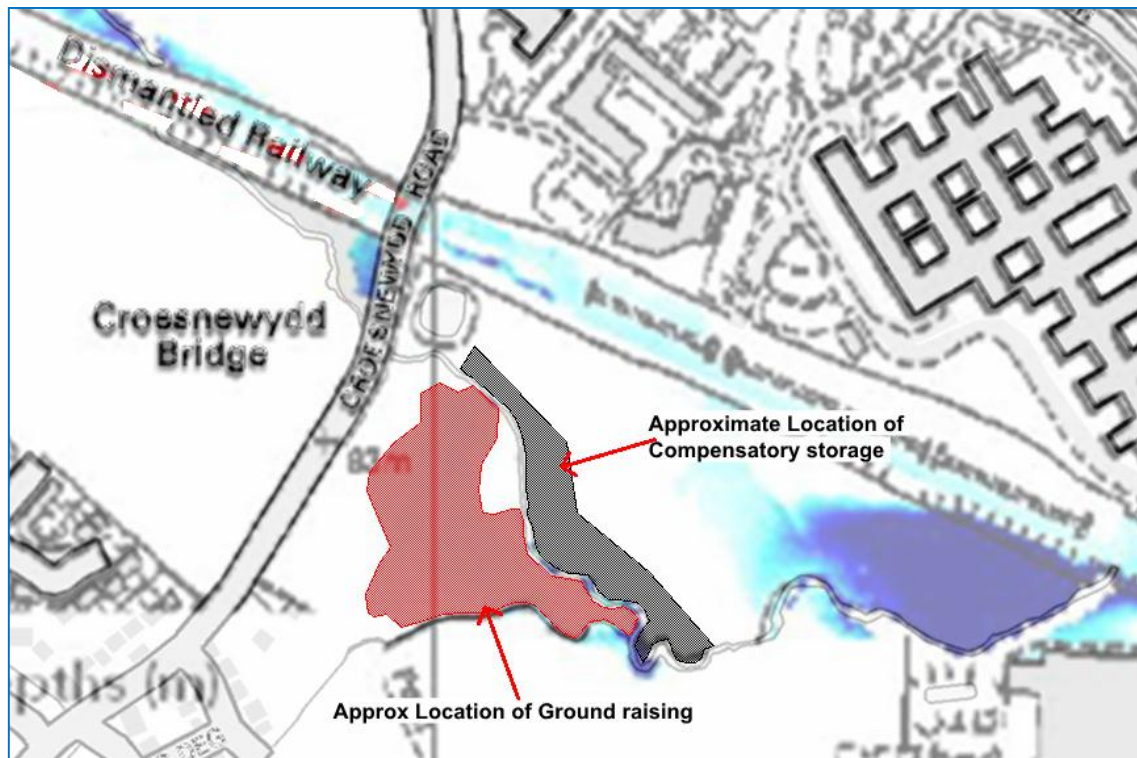
Ground Raising

This option examines raising the ground levels across the proposed development site within the area delineated by DAM zone C2. Ground levels would have to be raised above the modelled 0.1%AEP (See Figure 4.4 – Existing Case) allowing the site to stay dry during times of flood. This option would require compensatory storage to mitigate against the potential loss of flood plain storage.

The modelled flood depth map illustrated in Figure 5.1 above and Figure 1.2 of the JBA model report suggests that the average depth of flooding across the site during a 0.1%AEP is approximately 0.3m. Therefore, the raising of ground levels would require compensatory storage

volumes of approximately 2000m³. The location of the compensatory storage would have to be at a similar ground level to that which currently floods, therefore locations for compensatory storage are limited and would be confined to areas along the left bank of the River Gwenfro, opposite to the existing flood risk zone.

Figure 5-2 Ground Raising – Compensatory Storage

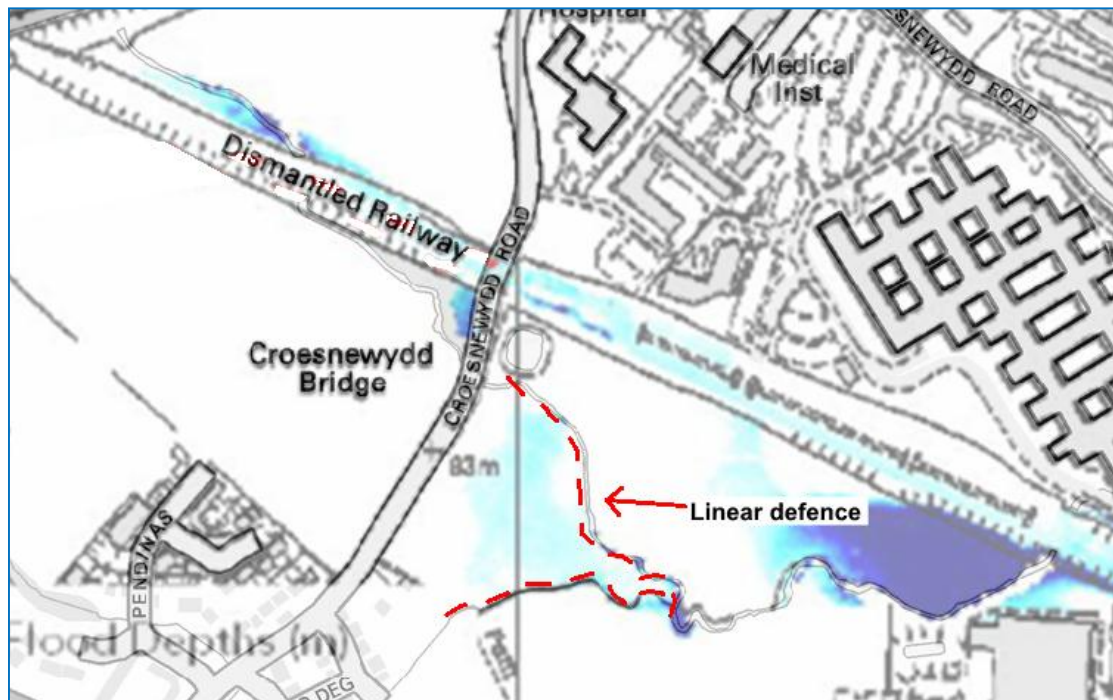


The location and areas are indicative only and will need to be confirmed during a detailed hydraulic modelling exercise to examine their effectiveness and impact on overall flood risk both upstream and downstream of the proposed development site.

Linear Raised Defence

The linear flood defence option would aim to provide a standard of protection of 0.1%AEP. The raised embankment would be located along the right bank of the River Gwenfro adjacent to the north west boundary of the development site. The effectiveness of the option would need to be confirmed during a detailed hydraulic modelling exercise to examine its effectiveness and impact on overall flood risk both upstream and downstream of the proposed development site.

Figure 5-3 Linear Defence

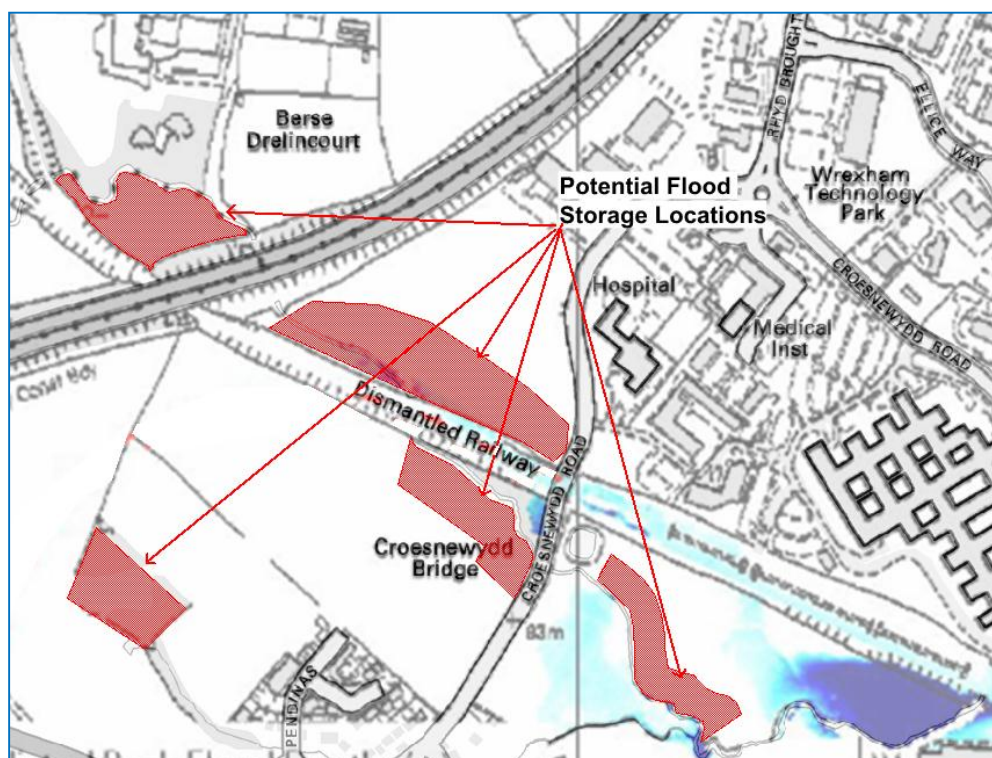


Upstream Flood Storage

There are several options available to examine upstream storage provision. These areas have been delineated in Figure 5.4 below.

The linear flood defence option would aim to provide a standard of protection of 0.1%AEP. The raised embankment would be located along the right bank of the River Gwenfro adjacent to the north west boundary of the development site. The effectiveness of the option would need to be confirmed during a detailed hydraulic modelling exercise to examine the storage required and its effectiveness and impact on overall flood risk both upstream and downstream of the proposed development site.

Figure 5-4 Potential Flood Storage Provision



6. Conclusions and Recommendations

A Flood Consequence Assessment has been carried out for the Wrexham Western Gateway site and the 2 elements detailed in Section 3, to determine the potential flood risk associated with proposals. The process has followed TAN 15, 'Development and Flood Risk'.

The following conclusions can be drawn from the work completed:

- ◆ Portions of the total development area are within Zone C2 and Zone B
- ◆ Both 'Highly Vulnerable' development and 'Less Vulnerable' developments are proposed for the wider Western Gateway site
- ◆ The TUFLOW modelling undertaken for this FCA is in line with that undertaken for the WAST FCA
- ◆ The TUFLOW modelling undertaken for the spine road proposals suggest that for the 0.1% AEP events there is no increase in flood risk to the downstream WAST site. There is a small change in flood risk north of the spine road although the flood envelope is contained within the development boundary of the spine road.
- ◆ The TUFLOW blockage analysis suggests that under all the blockage scenarios modelled, there is no increase in flood risk to the downstream WAST site.
- ◆ It is intended that any increase in surface water runoff above and beyond that currently experienced along the spine road development will attenuated before discharge into the watercourse.
- ◆ The ground levels within the Office Development site are above the 0.1% AEP and as such is considered to be an acceptable development proposal in this zone and no further consequences of flooding is required, other than that of surface water drainage.
- ◆ It is envisaged that surface water runoff from the proposed Office Development proposals are to discharge via an overflow and or control outlet into the un-named watercourse to the south-south west of the office development site. There are also plans for the provision of SUDs on the site in the form of a pond/wetland areas which will be utilised prior to site outfall.
- ◆ The vulnerability classification of this Housing Development West (residential premises) is categorised as a 'highly vulnerable development' in TAN 15. The footprint of the Housing Development West site falls within zone B.
- ◆ Ground levels within the Housing Development West site are above the 0.1% AEP and as such is considered to be an acceptable development proposal in this zone and no further consequences of flooding is required, other than that of surface water drainage.
- ◆ There are no detailed proposals available for the surface water drainage systems that will service Housing Development West. Therefore, unless infiltration systems are proposed, it can be assumed that the proposed development will drain to the adjacent watercourse.
- ◆ The vulnerability classification of the Housing Development East site is categorised as a 'highly vulnerable development' in TAN 15. The footprint of the Housing Development East site falls partially within zone C2 – Areas of floodplain without significant flood defence infrastructure and, zone B, although the detailed flood risk modelling undertaken by JBA suggests the ground levels within the Housing Development East site within zone B are above the 0.1% AEP and as such is considered to be an acceptable development proposal in this zone. Zone C2 is used to indicate that only 'less vulnerable' development should be considered. Therefore, at present, only approximately 30% of the proposed site is available for residential development.
- ◆ There are no detailed proposals available for the surface water drainage systems that will service Housing Development East. Therefore, unless infiltration systems are proposed, it can be assumed that the proposed development will drain to the adjacent watercourse.

- ◆ Opportunities for reducing flood risk to the development site area have been detailed in Section 5 although this may change on the approval of all the pending planning proposals for the Western Gateway site.

Appendix A. Spine Road Layout



Appendix B. Correspondence

Gareth,

Thanks for this.

Please see response below (in red).

Thanks

TJ

Tony Johnson BSc (Hons) MCIWEM C.WEM
Senior Scientist, Rivers and Coastal, Water & Environment

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From: Thomas, Gareth [<mailto:Gareth.Thomas@cyfoethnaturiolcymru.gov.uk>]
Sent: 24 October 2014 10:36
To: Johnson, Tony
Cc: Peter D Jones; Gareth, Emyr; Stephenson, Lucy; Oliver, Philip; Weston, Richard
Subject: RE: P/2014/0598: Wrexham Western Gateway FCA Modelling update (NT/2014/116153)

Dear Tony,

Thank you for addressing the points raised.

- In terms of modelling approach, and in the interests of consistency, we would prefer that the modelling for the FCA followed a similar approach to that taken for the WAST site, with the same scenarios modelled **The FCA has adopted the approach undertaken for the WAST site.**
- The model limitations you refer to are noted. This will need to be addressed in more detail in the final FCA – potentially requiring a more detailed DTM and/or modelling at a greater resolution. **The resolution of the DTM used in this area is the best available and the resolution cannot be improved any further.**

Provided these points are satisfactorily addressed in a final approved FCA, we can give an 'in principle' agreement to the proposals. We remind you of our concerns regarding otter migration.

Regards,

Gareth Thomas
Swyddog Cyswllt Cynllunio / Planning Liaison Officer
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Ein diben yw sicrhau bod adnoddau naturiol Cymru yn cael eu cynnal, eu gwella a'u defnyddio yn gynaliadwy, yn awr ac yn y dyfodol.

Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future.

From: Johnson, Tony [<mailto:tony.johnson@atkinsglobal.com>]

Sent: 23 October 2014 17:09

To: Thomas, Gareth

Cc: Peter D Jones; Gareth, Emyr; Stephenson, Lucy; Oliver, Philip; Weston, Richard

Subject: RE: P/2014/0598: Wrexham Western Gateway FCA Modelling update (NT/2014/116153)

Gareth,

Please see clarification below.

Thanks

TJ

Tony Johnson BSc (Hons) MCIWEM C.WEM
Senior Scientist, Rivers and Coastal, Water & Environment

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From: Thomas, Gareth [<mailto:Gareth.Thomas@cyfoethnaturiolcymru.gov.uk>]
Sent: 23 October 2014 16:16
To: Johnson, Tony
Cc: Peter D Jones; Gareth, Emyr; Stephenson, Lucy; Oliver, Philip; Weston, Richard
Subject: P/2014/0598: Wrexham Western Gateway FCA Modelling update (NT/2014/116153)

Dear Tony,

Thank you for providing us with the Technical Note: “Western Gateway FCA spine road update”. The report considers the flood risk implications of the proposed new roadway on flood risk in the area.

The report does not provide detail of the modelling approach – we would expect more detail in any future FCA. *The approach will be detailed in the final FCA but in summary, the modelling has utilised the TuFlow model developed for the WAST FCA.* Based on the information provided, we understand that the proposals will result in lowering the road level by 600mm, but will not involve increasing the culvert capacity (please clarify if this is incorrect). – *There will be no increase in culvert capacity.* We are, however, unclear as to the meaning of the statement that “the assessment undertaken as part of the Croesnewydd Road FCA and Hydrology Update Report... seems not to be in line with the assessment undertaken for the WAST development proposals” – could you please provide more information? *The WAST FCA undertook the assessment based on 0.1% AEP plus an allowance for climate change whereas the FCA undertaken for the ‘Brother’ site undertook the assessment for a 0.1% AEP ONLY. The blockage analysis undertaken for the WAST FCA examined 0.1%AEP plus an allowance for climate change for 4 scenarios -33%, 67% blockage for the Disused railway culvert and Croesnewydd Rd culvert whereas the blockage analysis undertaken for the ‘Brother’ site examined 0.1% AEP for 1 scenario - 30% blockage of the disused railway culvert.*

Notwithstanding the above queries, based on the model outputs provided we are satisfied that proposals seems not impact on the downstream WAST site. Increased flood risk is shown to be confined to areas upstream of Croesnewydd Road and the Technical Note implies that this is all within the development boundary. We do note, however, that the red area shown in Figure 2 seems to be outside the green site boundary line – again, could you clarify? *The accuracy of the 2d flood envelope is based on the resolution of the underlying DTM. The flood envelope is there subject to ‘pixilation’ when processed. We have checked the water elevations in this area and the small portion of the red polygon that is outside the green boundary line is actually below ground level but TUFLOW has mapped the whole pixel as being ‘wet’. This is a limitation of the modelling software.*

Provided you are able to provide us with clarity on the above queries, we should be in a position to give the scheme agreement ‘in principle’. Obviously, any such agreement would be on the understanding that a satisfactory FCA is provided which will support the full planning application.

Our other concern relates to otter passage. The new road must not result in increased otter mortality. We may request a condition within any planning permission that mitigation measures are incorporated into the scheme for otter passage.

We look forward to your swift response.

Regards,

Gareth Thomas

Swyddog Cyswllt Cynllunio / Planning Liaison Officer

Cyfoeth Naturiol Cymru / Natural Resources Wales

Ffôn/Tel: (0300) 065 3786 **Siaradwr Cymraeg / Welsh Speaker**



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Our purpose is to ensure that the natural resources of Wales are sustainably maintained, enhanced and used, now and in the future.

From: Johnson, Tony [<mailto:tony.johnson@atkinsglobal.com>]

Sent: 22 October 2014 17:23

To: Thomas, Gareth

Cc: Peter D Jones

Subject: Wrexham Western Gateway FCA Modelling update

Gareth,

Please find attached a copy of the interim modelling note undertaken to address the objections to the development proposals set out in the attached correspondence.

We are under extreme pressure to obtain an 'agreement in principle' from NRW that the modelling work presented here is enough to demonstrate that flood risk to and from the development can be affectively managed as part of the overall Western Gateway proposals.

I am keen to obtain a response from you this week if possible. My client from Wrexham Council and I are therefore happy to come and meet with NRW to discuss the attached.

If you have any queries with the above then please do not hesitate to contact me.

Thanks

TJ

Tony Johnson BSc (Hons) MCIWEM C.WEM
Senior Scientist, Rivers and Coastal, Water & Environment

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Ffôn/Phone: (0300) 065 3786

Sharon Holman
Planning Control Department
Wrexham County Borough Council
16 Lord Street
Wrexham
LL11 1LG

Date: 19th September 2014

Dear Ms Holman,

CONSTRUCTION OF NEW HIGHWAY (250M LONG AND 7.3M WIDE SINGLE LANE CARRIAGEWAY) AND COMBINED WALKING AND CYCLING ROUTE (3M WIDE) VACANT SITE ON LAND WEST OF CROESNEWYDD ROAD, WREXHAM, LL11 3BQ

Thank you for referring the above application, which was received on 14th August 2014.

We **OBJECT** to the proposed development as submitted on the following flood risk grounds:-

Flood Risk

We object to this development because the submitted Flood Consequences Assessment (FCA) (Atkins, 2014) is incomplete. This is primarily because the FCA is based on modelling work from 2005 and 2010 which predates the recently approved Welsh Ambulances Service NHS Trust (WAST) development downstream of this site and, as a result, it does not consider the potential increase in flood risk to this site as a result of the proposed development, although there are also a number of other issues which should be addressed in any updated FCA.

We note that while this application is for the construction of a new highway, the FCA also refers to the overall development of the Western Gateway. Below are detailed comments on issues relating to the current application, with a summary informative regarding the overall development.

Access road: culvert

The submitted FCA indicates that no decision has been made on whether or not to retain the existing culvert under the disused railway line, or replace it with a box culvert (with a proposed greater capacity) on construction of the new access road.

Option of new road using old railway culvert

The information provided indicates that with the new road level set at a minimum of 96.05mAOD, water would pond on the northern side of the embankment. The model used railway embankment elevations which allowed flow over the crest to rejoin the Gwenfro before the river passes underneath Croesnewydd Road, and so the extent of the ponding area north of the embankment with the new road in place has not been established. As this could affect the developable area to the north of the embankment, your Authority may wish to ask the developer to establish it.

Option of new road with new culvert

Section 3.3 of the 2010 JBA FCA concluded that a new, larger culvert would lead to greater conveyance underneath the new access road, with flows greater by up to 1.8m³/s causing additional flooding upstream of the Croesnewydd Road crossing. It also concluded that because floodwater would rejoin the Gwenfro upstream of the hospital site, there would be no impact on the hospital site. However, since the 2010 FCA was produced, the area between 'Housing Site East' and the hospital site has planning permission to become the new Welsh Ambulances Service NHS Trust site. Any replacement culvert under the new access road should not increase flood risk downstream outside of the Western Gateway development site.

Access road and Croesnewydd Road culvert blockages

The impact of blockage to the access road culvert (whichever final design is chosen) has not been assessed, however, given that blockage could affect flood risk to the north of the road and/or to the road itself, blockage assessment should be undertaken.

Access road: Surface water drainage

The Foul and Storm Water Drainage Layout (Drawing 61033427-H-500-01 Rev D) shows surface water runoff from the western half of the road draining into the attenuation basin and discharging to the River Gwenfro in a controlled manner at a rate of 2.05l/s. We would query whether this rate could render the outfall prone to blockage as the usual practical minimum discharge rate is 5 l/s. The drawing shows the eastern half of the road draining to an undescribed 'existing' system, however no evidence is presented to show what flows will be limited to, or that the system can handle the extra flows. Calculations should be submitted demonstrating that the proposed runoff rates will be limited to no greater than existing for all events from the 1 in 1 year to the 1 in 100 year plus climate change event.

Informative: overall development

This application is for the access road only, but the FCA also refers to the overall conceptual plans for the Western Gateway development.

The FCA for this application refers to modelling work undertaken in 2005 and does not take account of the new WAST development, so any planning application to develop the Western Gateway site should be accompanied by an updated FCA. This FCA should include an assessment of flood risk in the event of blockage of the Croesnewydd Road culvert. The FCA should also provide information to demonstrate that the surface water drainage proposal is feasible. Tests should be carried out to determine whether disposal to soakaway is possible. The FCA should show that any surface water attenuation system will be appropriately sized and can be accommodated within the overall development plan.

Housing Site East

The Conceptual Design shown in Figure 3-2 of the FCA (Atkins, 2014) shows an area to the east of the Croesnewydd Road marked as 'Housing Site (East)'. This is in an undefended area at risk of flooding in the 0.1% AEP event i.e. Zone C2 as defined in TAN 15 Development & Flood Risk and shown on the Welsh Government's Development Advice Map, and as such, we would point out to your Authority that highly vulnerable development should not be considered in this area.

The FCA suggests that land levels in this area could be raised and that compensatory storage could be provided to the north of the River Gwenfro, however, this site will not be available because it is to be developed as the new WAST site. The FCA also suggests a raised defence along the right bank of the Gwenfro in this area; but as this could increase flood risk to the WAST

site, any effects of a new defence on flood extents should be investigated as part of an updated FCA.

The FCA provided by Atkins (2014) references the findings of the FCA conducted by Faber Maunsell for the housing development to the south of the Western Gateway site in 2005, which concluded that there was no risk to the development from the unnamed tributary of the River Gwenfro passing through the Housing Site East area. The 2005 FCA has not been provided with this application, however, given that it was undertaken almost a decade ago, we would recommend that hydrology and modelling be updated to inform the FCA for this proposal.

Ecology

The supporting information with the planning application provides mixed messages regarding whether the River Gwenfro culvert underneath the disused railway will be retained or replaced. Whilst the above flood risk issues may be introduced if a new culvert were to be installed, the existing culvert would not be able to accommodate a mammal ledge to allow safe passage of otter and other wildlife past the new road during high river flows. A new oversized box culvert would potentially offer some mitigation with regard to degraded connectivity of bat and bird habitat along the river corridor caused by loss of tree cover, new artificial lighting and road traffic. We request clarification on this matter.

The documentation supplied in support of this planning application includes ecological reports for the broader development adjacent to the proposed link road and it is not clear which habitats within the development envelope for the access roads itself would be retained. We would expect to see the wooded river corridor and relatively natural condition of the River Gwenfro's channel (fluvial geomorphology) retained, with artificial revetment kept to the absolute minimum and, where revetment is needed, hard revetment techniques (e.g. gabion baskets) avoided. We request clarification on this matter.

Additional mitigation we would like to see considered, to offset the impact of increased risk of disturbance to the river corridor following construction of the road, would be for the River Gwenfro culvert under the A483 just upstream of the development to be retro fitted with a mammal ledge like that installed within the new Croesnewydd Road culvert downstream of the site. The combined effect of three road culverts along the River Gwenfro in such close proximity is another driver for this, with the inherent risk of otter, and other mammal, road casualties increased.

The relevant recommendation made in the supporting ecological; and arboricultural assessments/reports should be adopted to protect and monitor the local ecology.

Bats

Bats are protected under the Wildlife and Countryside act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2010 (as amended).

NRW notes that a Transect survey (TEP 19/06/14, 24/07/14, & 03/08/14) has been carried out of the site. The report states that the site is being used by a number of bat species for foraging and commuting. The mature tree lines on the Northern and south west boundaries as well as the tree line bisecting the site are being used by various bat species and should be retained.

We note the loss of a small number of trees identified as being limited to moderate potential value for roosting bats. The recommendations proposed within sections: 4.6.1 of the Ecological Mitigation

Strategy should be adhered to so as to avoid adverse impacts on bats. The applicant should be advised that should bats be discovered at any stage during the works, all work should stop immediately and NRW contacted for further advice.

Care should be taken in the type and location of any external lighting within the new development, to ensure that the hedgerows and trees identified on the site are not illuminated. We advise that a light spillage scheme from the development should be agreed to the satisfaction of the local authority.

Otters

The Otter is protected under the provisions of the Wildlife and Countryside Act 1981 (as amended); the EC Habitats and Species Directive (as implemented by the Conservation of Habitats and Species Regulations 2010 (as amended)). The proposal has the potential to cause disturbance to otters, during and post construction.

The recommendations proposed within sections: **4.6. Otters** of the **Ecological Mitigation Strategy** should be adhered to so as to avoid adverse impacts on otters. Also, the authority should ensure that there is sufficient scope within any planning permission issued to allow the mitigation recommended in the report, to be implemented. The proposed mitigation should be marked on the submitted plans to the satisfaction of the Local Authority.

Where a European protected species is present, a development may only proceed under a licence issued by Natural Resources Wales having satisfied the three requirements set out in the legislation. One of these requires that there should be no detriment to the 'favourable conservation status' of the species concerned.

The implementation of the section 4.6 of the Ecological Mitigation Strategy (Marches Ecology November 2012) will be necessary in order to secure a NRW licence to permit works that will affect Otters and their resting places or Holts. The applicant should be advised to contact:

Species Protection Team
Natural Resources Wales
Maes-y-Ffynnon
Penrhosgarnedd
Bangor
Gwynedd
LL57 2DW
Tel: 0300 065 3000

Email: specieslicence@naturalresourceswales.gov.uk

The licence application will need to be accompanied by a Method Statement containing details of mitigation and compensation for minimising short and long term impacts on the otters. For your information, a NRW licence is only issued once planning permission has been granted.

Please note that we have not considered possible effects on all species and habitats (including nesting birds) listed in section 42 of the Natural Environment and Rural Communities (NERC) Act 2006, or on the Local Biodiversity Action Plan or other local natural heritage interests. To comply with your authority's duty under section 40 of the NERC Act, to have regard to conserving biodiversity, your decision should take account of possible adverse effects on such interests.

We recommend that you seek further advice from your authority's internal ecological adviser and/or nature conservation organisations such as the local Wildlife Trust, RSPB, etc. The Wales Biodiversity Partnership's web site has guidance for assessing proposals that have implications for section 42 habitats and species (www.biodiversitywales.org.uk).

We are required to report to the Welsh Government those instances in which recommendations for refusal on grounds of flood risk have not been accepted by Local Planning Authorities. Therefore, if planning permission is granted contrary to our recommendation, we would be grateful if you would provide us with a copy of the Committee report, relevant Committee minutes and the decision notice.

Yn gywir / Yours' faithfully,



Mr. GARETH THOMAS

Swyddog Cyswllt Cynllunio / Planning Liaison Officer

Ebost/Email: Gareth.Thomas@cyfoethnaturiolcymru.gov.uk

Deialu uniongyrchol/Direct dial: (0300) 065 3786

cc: David Hesketh, Environment Dept, WCBC
Charlotte Beattie, Flooding, WCBC



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