



Swansea Bay Technology Centre

Flood Consequence Assessment

For Morgan Sindall

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1. INTRODUCTION

This Flood Consequence Assessment (FCA) report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of Morgan Sindall in support of a Planning Application to be submitted to Neath Port Talbot County Borough Council for Phase 2, Baglan Bay Innovation Centre.

The report aims to address the requirements of Technical Advice Note 15: Development and Flood Risk (TAN15) and Natural Resources Wales (NRW) policy, through justifying the location of the proposed development and assessing the identified flooding consequences. This report considers these requirements through:

- Assessing whether the proposed development is likely to be affected by flooding.
- Assessing whether the proposed development is appropriate in the suggested location.
- Detailing any measures necessary to mitigate any flood risk identified, to ensure that the proposed development and occupants would be safe and that flood risk would not be increased elsewhere.

2. SITE INFORMATION

2.1 Location

The site is situated within the existing Baglan Energy Park which is at the northern limit of Baglan Industrial Park and, as such, is within an area that is currently occupied by industrial/commercial units (to the south). To the immediate north of the site is a disused railway line with the M4 Motorway beyond.

The site itself is currently undeveloped and occupied by a combination of grassed and wooded areas and wraps around the existing Canolfan Arloesi Bae Innovation Centre.

The site is accessed from Central Avenue which forms the southern site boundary.

The site location is shown in Figure 1, with the full address and Ordnance Survey Grid Reference provided in Table 1.

Site Referencing Information	
Site Address	Phase 2 Baglan Energy Park, Central Avenue, Port Talbot, SA12 7AX
Grid Reference	274024, 192963 SS740929

Table 1: Site Referencing Information

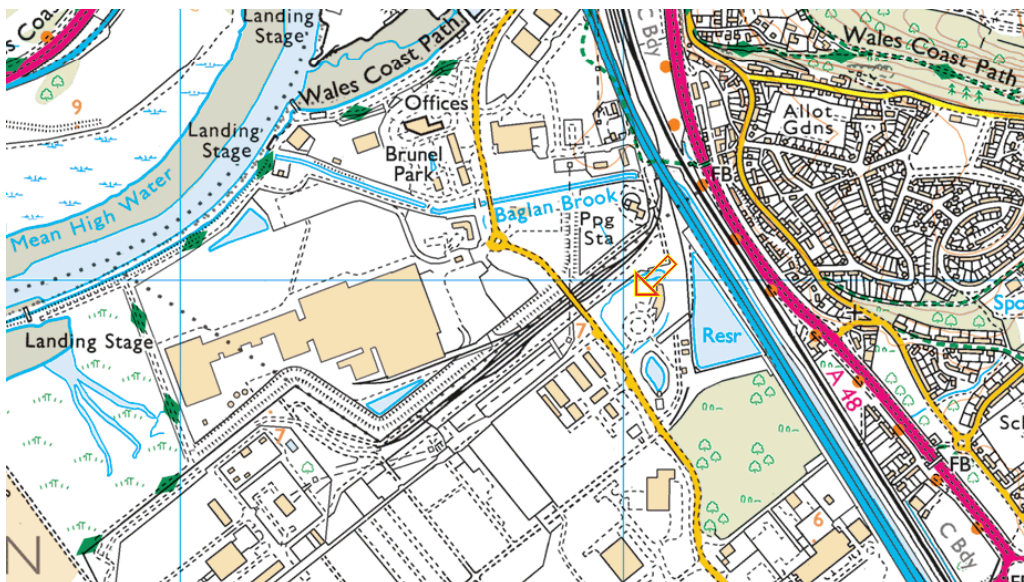


Figure 1: Site Location

Contains OS data © Crown copyright (2020) and Natural Resources Wales data under OGLv3

2.2 Topography

A topographical survey has been provided and shows that site levels typically fall to the north and away from Central Avenue. Levels fall from around 7m AOD on the southern boundary to a low of around 5.30m AOD on the northern boundary.

2.3 Proposed Development

The proposals are for the construction of a Phase 2 of Baglan Bay Innovation Centre and will comprise one commercial/industrial unit along with associated areas of car parking.

3. HISTORIC FLOODING

Natural Resources Wales mapping (Figure 2) shows the existing records of historic flood extents and the site is shown to have been flood free.



Figure 2: Natural Resources Wales Historic Flood Map
Contains OS data © Crown copyright (2020) and Natural Resources Wales data under OGLv3

4. SOURCES OF FLOOD RISK

This section provides an assessment of flood risk to the site from various potential sources. A summary of the findings of this assessment is provided in Table 2, with more detail in the relevant sections below.

Summary of Potential Sources of Flood Risk	
Fluvial	Low Risk
Tidal	Shown as medium risk on NRW mapping
Surface Water	Medium - increased risk along the western site boundary
Groundwater	Low
Sewer	Low
Infrastructure Failure	Low

Table 2: Summary of Potential Sources of Flood Risk

4.1 Fluvial and Tidal Flooding

The site lies approximately 150m south of the Baglan Brook which flows in a westerly direction and ultimately into the Bristol channel at Baglan Bay.

NRW Flood Mapping (Figure 3) shows the site almost entirely within Flood Zone 2 (medium risk).

The Flood Zones are defined as follows:

- Flood Zone 1 (no colour) comprises land assessed as having a $\leq 0.1\%$ Annual Exceedance Probability (AEP) of fluvial or tidal flooding in any given year, equivalent to the 1 in $\geq 1,000$ year return period event.
- Flood Zone 2 (light blue) comprises land assessed as having a 0.1-1% AEP of fluvial or 0.1-0.5% AEP of tidal flooding in any given year, equivalent to the 1 in 1,000-100 or 1 in 1,000-200 year return period event respectively.
- Flood Zone 3 (dark blue) comprises land assessed as having a $\geq 1\%$ AEP of fluvial or $\geq 0.5\%$ AEP of tidal flooding in any given year, equivalent to the 1 in ≤ 100 or ≤ 200 year return period event respectively.

Natural Resources Wales have provided modelled outputs for the defended scenario and this confirms that during all modelled events the site is free from flooding with predicted flooding being near, but not entering, the site boundary. Owing to the mechanism of flooding it is concluded that the site is outside the predicted maximum extent of fluvial flooding (from the Baglan Brook) with tidal being the key risk to the site.

This categorisation is confirmed by the Welsh Government Development Advice Mapping which identifies the site as being within Zone C1 on the Development Advice Mapping which is considered as areas 'served by significant infrastructure'. The provided modelling confirms that the site would be free from flooding during all defended events up to and including the extreme 1,000-year event.

Whilst the modelling confirms the site is defended, no climate change results have been provided. As such, a further information request has been made to the NRW to confirm the location and standard of protection from the existing defences along with a copy of the fluvial modelling in order to allow a

Natural Resources Wales surface water flood mapping (Figure 4) does not differentiate risk from overflow of surface water converging along channels, such as the Baglan Brook (which is by definition fluvial and addressed in Section 4.1).

The mapping does highlight a potential risk from this source with a flow route being generated a short distance (circa 80m) to the south and being directed by topography in a northerly direction along the western site boundary.

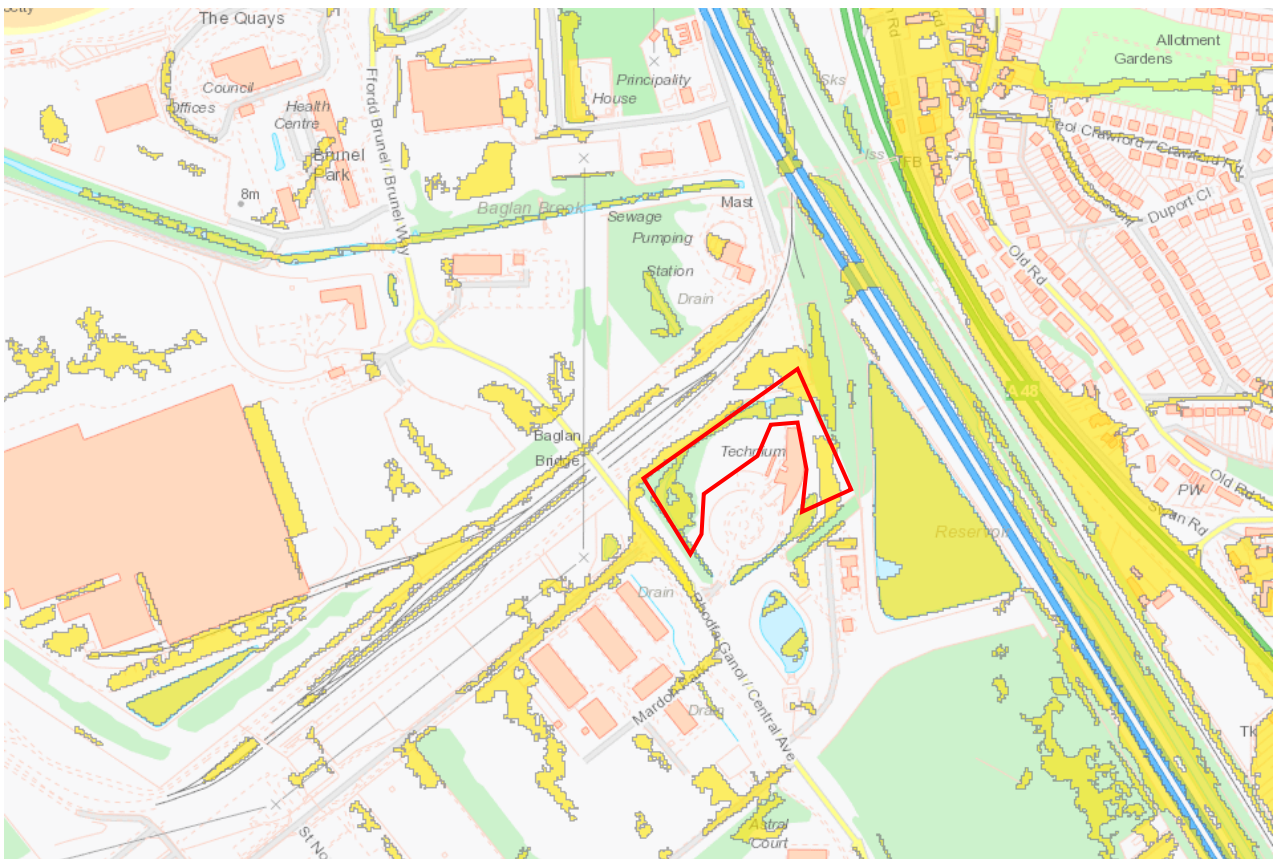


Figure 4: Natural Resources Wales Surface Water Flooding Map
Contains OS data © Crown copyright (2020) and Natural Resources Wales data under [OGLv3](#)

4.3 Groundwater Flooding

The site is on relatively level ground and is, surrounded by impermeable man-made surfaces. There is therefore considered to be a low risk of flooding from this source.

4.4 Sewer Flooding

Owing to the developed nature of the surrounding area it is considered that there will be an extensive sewer network (both surface and foul drainage systems) within the vicinity of the site. However, the SFRA1 does not record any previous incidents of sewer flooding within the vicinity of the site. As such, the risk from this source is considered as being low.

The site is concluded to be at low risk from sewer failure flooding.

4.5 Infrastructure Failure Flooding

Natural Resources Wales reservoir failure mapping shows the site as being outside all predicted flooding associated within reservoir failure. There is no known risk of flooding from canals or any other artificial source and so the site is concluded to be at low risk of flooding from infrastructure failure.

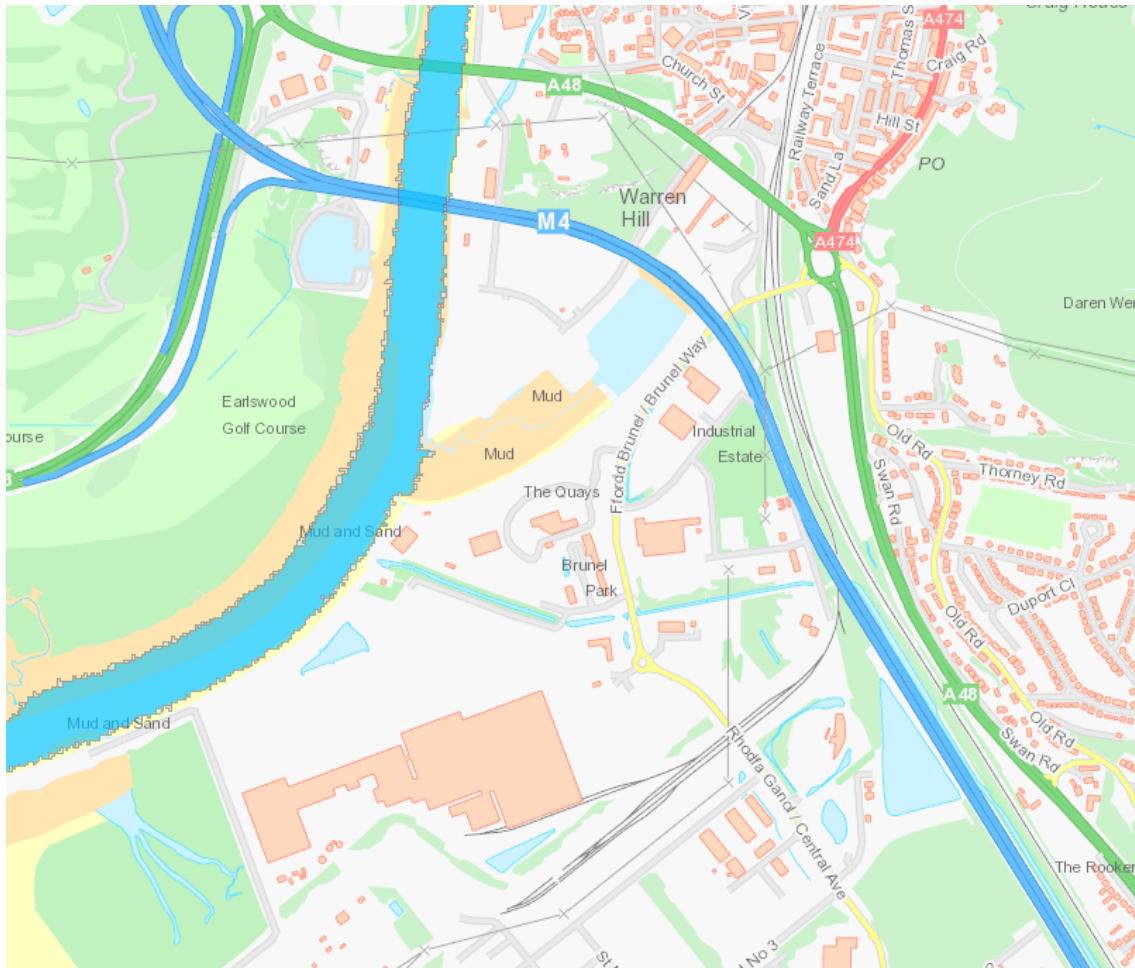


Figure 5: Natural Resources Wales Risk from Reservoirs
Contains OS data © Crown copyright (2020) and Natural Resources Wales data under OGLv3

5. TAN15 AND THE PROPOSED DEVELOPMENT

5.1 Planning Policy Requirements

The site is demonstrated as being potentially at medium risk of flooding from tidal sources but shown as benefitting from defences (confirmed both by the Development Advice Mapping and through provided modelled outputs), and at low risk from all other sources. The Welsh Government Development Advice Map (Figure 6) shows the site to be within Zone C1.

The proposed development is considered 'less vulnerable' with respect to flood risk (Welsh Government, 2004, Figure 2, p7). There is consequently a need for the proposed scheme to meet the requirements of the Justification Test as advocated within TAN15 (WG, 2004, Section 6 'Justifying the location of the development', p8).

In this instance, the proposed scheme is considered to meet the requirements of the Justification Test, including acceptability of consequences, through:

- The allocation of the Baglan Bay Industrial Estate as a protected employment site
- The site is to provide a continuation to the existing development (forms Phase 2)
- The consequences of potential flooding are also considered acceptable, subject to the application of flood resistance measures and registration with the Natural Resources Wales Flood Warning Service, discussed in Sections 5.2 and 5.3 respectively.

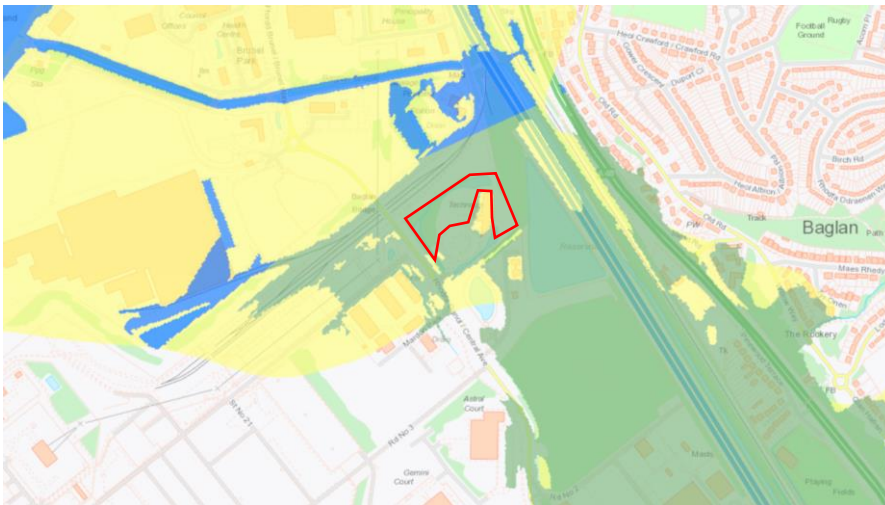


Figure 6: Development Advice Map (Approx. Site Boundary in Red Outline)
Source: Welsh Government

Natural Resources Wales Flood Zones		
Description	Zone	
Considered to be at little or no risk of fluvial or tidal/coastal flooding	A	Used to indicate that justification test is not applicable and no need to consider flood risk further
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where 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
Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

Table 3: Natural Resources Wales Flood Zones
Source: TAN 15 (WA, 2004, p5)

5.2 Flood Resistance

It is recommended that all new building FFLs are set at a minimum of 150mm above immediately surrounding ground levels to ensure any design exceedance flows, should they occur, are directed away from any buildings (in line with best practice). This recommendation is made based on information

provided at the time of writing and remains subject to confirmation once defence and climate change information is provided by NRW.

5.3 Natural Resources Wales Flood Warning Service

NRW operates a free Flood Warning Service that can be accessed and registered for by phone, text or email alerts online at: <https://naturalresources.wales/flooding/sign-up-to-receive-flood-warnings/>. The site is along a reach of the Rhymney River included within the Natural Resources Wales Flood Alert and Flood Warning service. It is recommended that the site manager signs up to this warning service and is evacuated if in use at a Flood Warning and not returned to until emergency services have confirmed that it is safe to do so in the unlikely case that flooding does occur.

Current flood warnings can be viewed directly at: <https://naturalresources.wales/flooding/check-flood-warnings/>.

6. SUMMARY

This Flood Consequence Assessment (FCA) report has been prepared by Hydrock Consultants Limited (Hydrock) on behalf of Morgan Sindall in support of a Planning Application to be submitted to Neath Port Talbot Borough Council for the construction of Phase 2, Baglan Bay Innovation centre. The main findings are as follows:

- NRW Flood Mapping shows the site almost entirely within Flood Zone 2 (medium risk). The site is at a low risk of flooding from all other sources.
- Whilst tidal climate change allowances can be applied using the incremental values within the sea level rise guidance, detailed modelling of the fluvial watercourse will need to be undertaken to confirm the impact on predicted flood levels. In the absence of this information having been provided by the NRW, this report has been prepared using nominal increases to maximum flood levels to make account for climate change. In this instance, maximum fluvial flood levels have been increased by 600mm as this is considered as being representative, and if anything, a conservative approach. When adopting this approach the site (and proposed development) is considered to remain at low risk. At the time of writing this is subject to confirmation and agreement with NRW.
- Provided information has confirmed that the site within an area benefitting from defences. Information has been requested on the standard or protection from the defences to ensure protection covers the proposed design life (impact of climate change). At the time of writing this information remains outstanding.
- The proposed 'less vulnerable' development within Development Advice Map Zone C1 is considered acceptable subject to the justification test, including acceptability of consequences. The development is considered justifiable as the site forms a continuation of existing development (forms a phase 2) within an area allocated as a protected employment site.
- Based on the information provided to date it is recommended that all new building FFLs are set at a minimum of 150mm above immediately surrounding ground levels to ensure any design exceedance flows, should they occur, are directed away from any buildings (in line with best practice). This remains subject to confirmation following receipt of additional information from the NRW.
- The site is included within the Natural Resources Wales Flood Alert and Flood Warning service. It is recommended that the site manager signs up to this warning service and is evacuated if in use at a Flood Warning and not returned to until emergency services have confirmed that it is safe to do so in the unlikely case that flooding does occur.

Provided an appropriate SUDs drainage design is implemented to the satisfaction of the SUDs approval Body (SABs), the application is considered to meet the requirements of the TAN15.