

Flood Consequences Assessment: Land at Port Talbot Steelworks

Revision D

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This report describes work commissioned by Natalie Young, on behalf of Tata Steel UK Ltd, by an instruction dated 7th March 2024. Charlotte Lickman and Faye Tomalin of JBA Consulting carried out this work.

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1 Introduction

1.1 Terms of Reference

JBA Consulting (JBA) were commissioned by Tata Steel UK Ltd to undertake a Flood Consequences Assessment (FCA). This FCA demonstrates the suitability of the proposed development.

1.2 FCA Requirements

This FCA follows Welsh Government guidance on development and flood risk set out in Technical Advice Note 15: Development and Flood Risk (TAN-15). Where appropriate, the following aspects of flood risk should be addressed in all planning applications over their expected lifetime:

- The likely mechanisms of flooding
- The likely source of flooding
- The depths of flooding through the site
- The speed of inundation of the site
- The rate of rise of flood water through the site
- Velocities of flood water through the site
- Overland flow routes
- The effect of access and egress and infrastructure, for example, public sewer outfalls, surface water sewers and effluent discharge pipes from wastewater treatment works
- The impacts of the development in terms of flood risk on neighbouring properties and elsewhere on the floodplain.

2 Site Description

2.1 Site Summary

The Land at Port Talbot Steelworks site is located south of Port Talbot, bound to the south-west by the Bristol Channel, and to the east by Margam and the M4. The Network Rail Swansea to London mainline generally forms the eastern boundary, with some small areas of Tata Steel owned land beyond this, as shown in Figure 2-1. The town of Port Talbot and Port Talbot Docks is located to the north of the site, with the southern boundary of the site encompassing Margam Moors. The steelworks is approximately 5.8KM from north to south and 1.9KM from east to west.

The majority of the site consists of developed areas used to support the current production of steel. These developed areas contain existing buildings and structures, hardstanding storage areas and infrastructure such as access roads and a rail corridor to the south-east.

To the south of the site is undeveloped open fields, which forms the northern part of the Margam Moors.

Table 2-1 below provides a summary of the key site details.

Table 2-1 Site summary

Site name	Land at Port Talbot Steelworks
Site area	159.6 ha
Existing land use	Brownfield industrial and open space
Purpose of development	Steelworks
Local Planning Authority	Neath Port Talbot Council
Lead Local Flood Authority	Neath Port Talbot Council



Figure 2-1 Site Location

2.2 Site Topography

Natural Resources Wales (NRW) 1m LiDAR data has been used to illustrate the topography of the site, as shown in Figure 2-2. The lowest levels within the planning boundary are located in the south-east, where the reed network exists, at approximately 4.15mAOD. The eastern side of the site is generally lower than the west, with site levels typically remaining below 10mAOD. The site slopes in a general south-easterly direction.

The west of the site is shown to have typically higher ground levels, likely due to existing material and scrap storage areas. Levels in the south-west of the site are approximately 14.95mAOD, with the highest levels shown to be in the north-west of the site at around 23.06mAOD.



Figure 2-2 1m LiDAR DTM

2.3 Soils and Geology

The site's geology has been assessed using the British Geological Survey GeoIndex¹. The majority of the site's underlying bedrock geology is South Wales Middle Coal Measures Formation comprised of mudstone, siltstone and sandstone. Superficial geology at the site is comprised of Tidal Flat deposits made up of clay, silt and sand. However, due to the site's current use, most of the site will in fact be made ground generated during the steel process, such as slag.

The soils have been assessed on the Cranfield University Soilscape² viewer and shown to be loamy and clayey soils of coastal flats with naturally high groundwater.

2.4 Nearby Watercourses

The development site has a complex existing drainage network, with several ordinary watercourses crossing the site, as shown in Figure 2-3. Along with a number of watercourses, the Tata Steel site has an extensive piped drainage network to manage surface water runoff, foul drainage, and process water. These systems interact, as detailed in Figure 2-4.

¹ <https://mapapps2.bgs.ac.uk/geoindex/home.html>

² <https://www.landis.org.uk/soilscales/>

The Arnallt drain intake is located to the north of the site and is an ordinary watercourse which is culverted through the Tata Steel site to the Abbey Pumphouse, as shown in Figure 2-4. The intake from the Arnallt drain is used in the process system, before flowing to the short sea outfall.

To the south of the development site, Margam Moors drains in a northerly direction towards the Tata Steel site. The reen network of the moors comprises a Site of Special Scientific Interest (SSSI), with the extent of the SSSI boundary Heolcae-r Bont, at the southern extent of the Tata Steel land ownership. The reen network drains in a northerly direction, through the development site, and ultimately drains to the Lower Mother Ditch.

The Lower Mother Ditch drains in a northerly direction, through a small lake, towards 'Point B', a pumping station serving the wider Tata Steel infrastructure. Point B also receives flows from the Middle Mother Ditch via 'Point A'. Point B is a Tata Steel owned structure that culverts surface water towards the Abbey Pumphouse. The Abbey Pumphouse directs surface water to the short-sea outfall into the Bristol Channel. When water levels across the moors are high, water within the Lower Mother Ditch is pumped from Point B to the pumphouse. This manages flood risk across the moors.

Several small ditches flow along the site's eastern boundary and are culverted to the Lower Mother Ditch, south of the existing lake. A ditch also runs from the western site boundary in an easterly direction to the Lower Mother Ditch. This ditch only receives flows from the site, including land drainage and groundwater from the Coke Ovens area, which is elevated some 7m above local ground levels. The ditch is partially culverted along its route to the Lower Mother Ditch.

The River Kenfig (an NRW Main River) is located approximately 1.85KM south of the proposed development site, as shown in Figure 2-3.

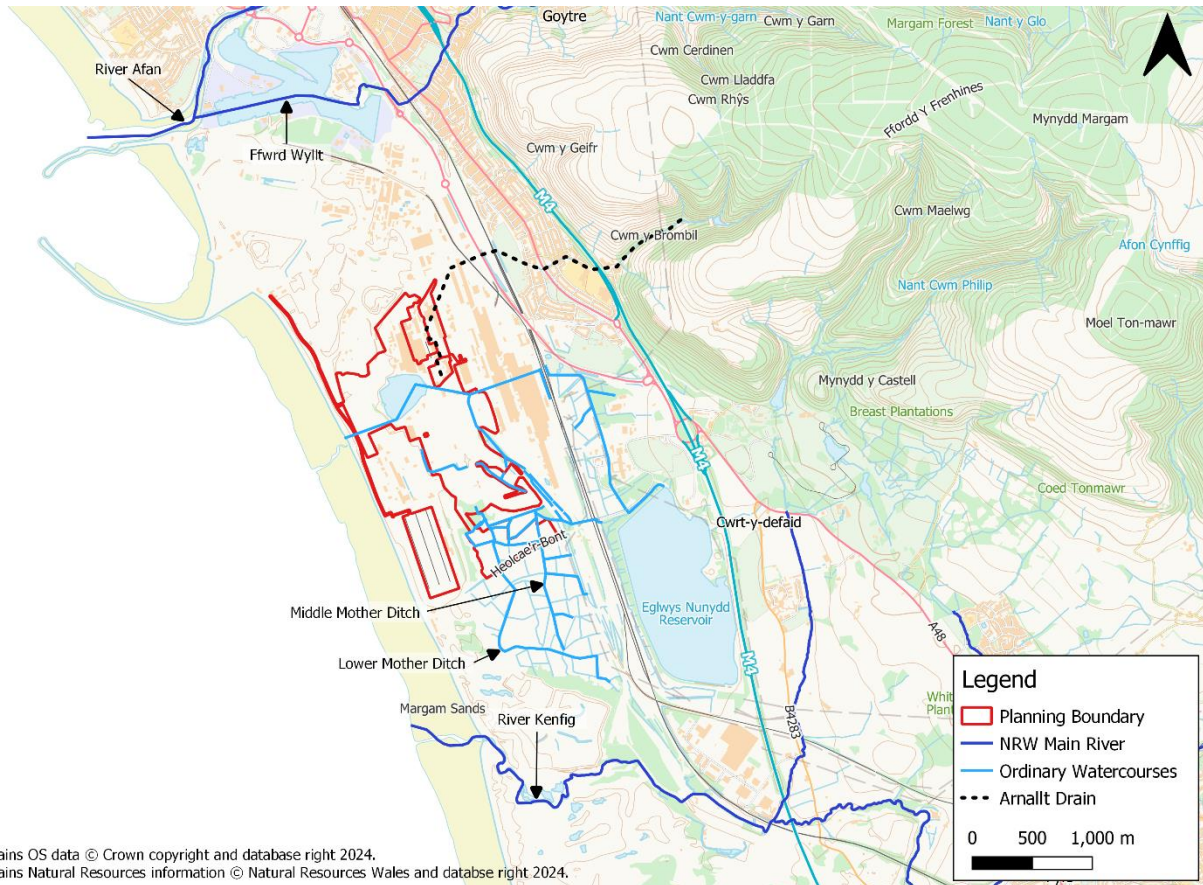


Figure 2-3 Nearby watercourses

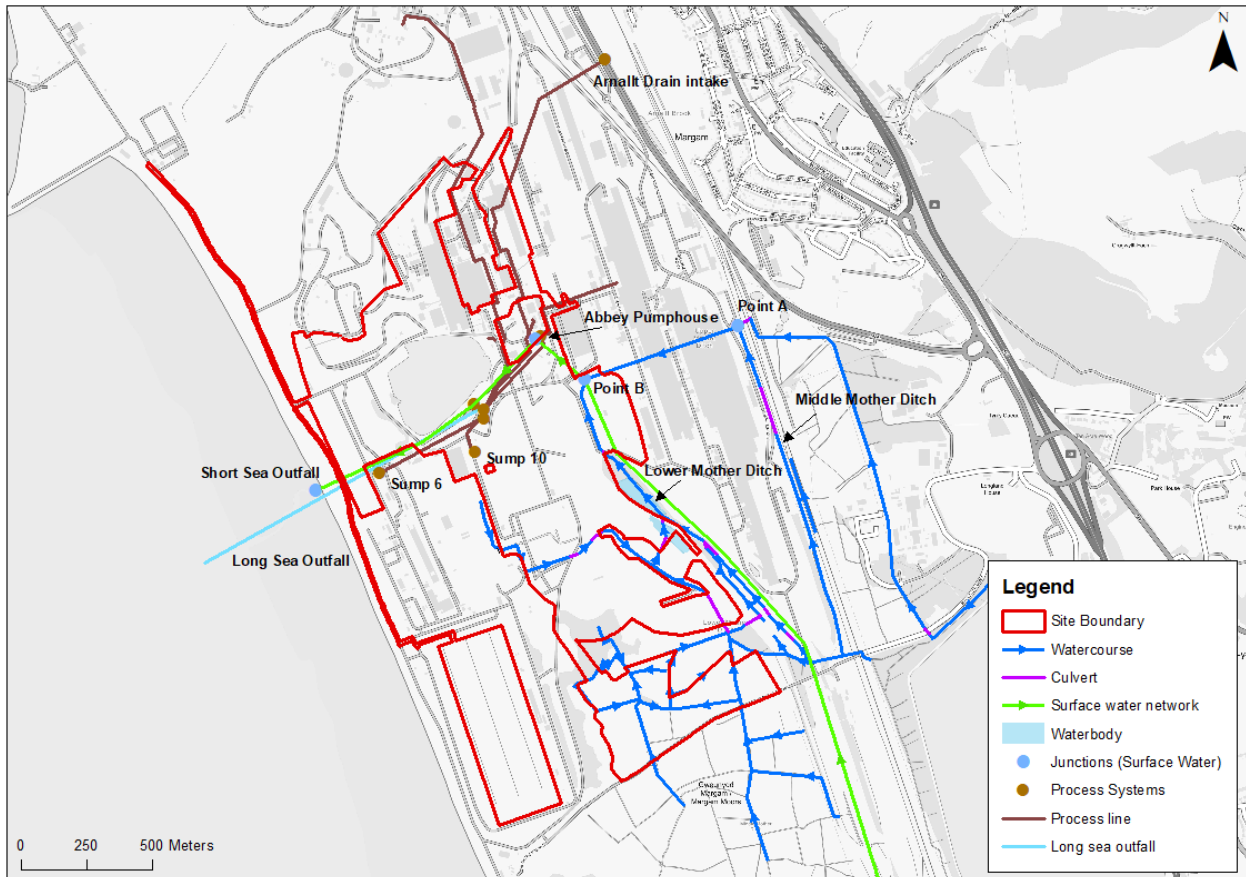


Figure 2-4 Existing drainage network

2.5 Proposed Development

Development proposals are as follows:

“Full planning permission for the demolition of existing buildings and structures, partial infill of the BOS lagoon, and construction of a new electric arc furnace-based steel production facility (1 no. arc furnace, 2 no. ladle furnaces). The development includes chemical/material storage and transfer infrastructure, pipework and cabling (above and below ground), buildings, fume and dust treatment plant, water treatment facility and material handling systems, electrical control rooms and power infrastructure, offices and ancillary facilities, together with new and amended roads and rail lines, landscaping and green infrastructure, lighting, hardstanding, CCTV, drainage and associated engineering operations.

Outline planning permission (with all matters reserved except for access and landscaping) for the construction of a scrap metal handling facility and associated scrap yards, scrap processing facility, new substation, underground and overground electrical infrastructure, and new and amended roads and rail lines, landscape and green infrastructure, lighting, hardstanding, CCTV, drainage and associated engineering operations.”

3 Planning Policy and Flood Risk

3.1 Planning Context

Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy and improve the social, economic, environmental, and cultural wellbeing of Wales as set out in the Wellbeing of Future Generations Act 2015.

Technical Advice Note 15: Development and Flood Risk (TAN-15) introduced by Welsh Government in 2004, provides technical guidance relating to development planning and flood risk in Wales. The initial requirements of TAN-15 are to identify the vulnerability classification(s) and flood zones relevant to the proposed development, and to apply this information to the application of the Justification Tests.

An update for TAN-15 was released in October 2021. However, Welsh Government subsequently suspended this, and it is not currently known when the new TAN-15 will be published in its final form and implemented. Although the new TAN-15 is not a material consideration, Welsh Government and NRW advise that some consideration is given to the Flood Map for Planning (FMfP) as best available information.

The guidance given within the Flood Risk Advice letter by NRW, states that where a site is shown to be at risk of flooding from the DAM, but not at risk on the FMfP, there would be 'no objection'. Both the DAM and FMfP should be considered; however, the FMfP constitutes best available information on flood risk and the DAM is regarded to be outdated.

As a result of the above, both the Development Advice Map (DAM) and FMfP are considered as part of this FCA, although only the policies of the current TAN-15 have been applied to the assessment.

3.2 Vulnerability Classification

TAN-15 assigns one of three vulnerability classifications to a development, as shown in Table 3-1. As the development is proposed for industrial purposes, it is classified under TAN-15 as **Less Vulnerable** development.

Table 3-1 Vulnerability classification

Development Category	Types
Emergency Services	Hospitals, ambulance stations, fire stations, police stations, coastguard stations, command centres, emergency depots and buildings used to provide emergency shelter in time of flood.
Highly Vulnerable development	All residential premises (including hotels and caravan parks), public buildings (e.g. schools, libraries, leisure centres), especially vulnerable development and waste disposal sites.
Less Vulnerable development	General industrial , employment, commercial and retail development, transport and utilities infrastructure, car parks, mineral extraction sites and associated processing facilities, excluding waste disposal sites.

3.3 Development Advice Map

The Development Advice Map (DAM) is used to trigger different planning actions based on a precautionary assessment of fluvial and tidal flood risk. Figure 3-1 indicates that the east of the site is located within Zone B. This zone is defined as areas known to have been flooded in the past evidenced by sedimentary deposits. Zone B indicates areas which are generally suitable for most forms of development and there is no requirement for the application of the Justification Test. A precautionary approach should be used for development in Zone B to check site levels against the extreme (0.1% AEP) 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.

The west of the site is shown to be within DAM Zone A (shown as a transparent layer). Development in Zone A is considered to be at little or no risk of fluvial or coastal/tidal flooding. In Zone A, the application of the Justification Test and Acceptability of Consequences is not required.

There is a small area in the south of the proposed development area which is located within DAM Zone C2. This zone is defined as areas of the floodplain without significant flood defence infrastructure. Only Less Vulnerable development should be considered in DAM Zone C2 subject to application of the Justification Test and Acceptability of Consequences.

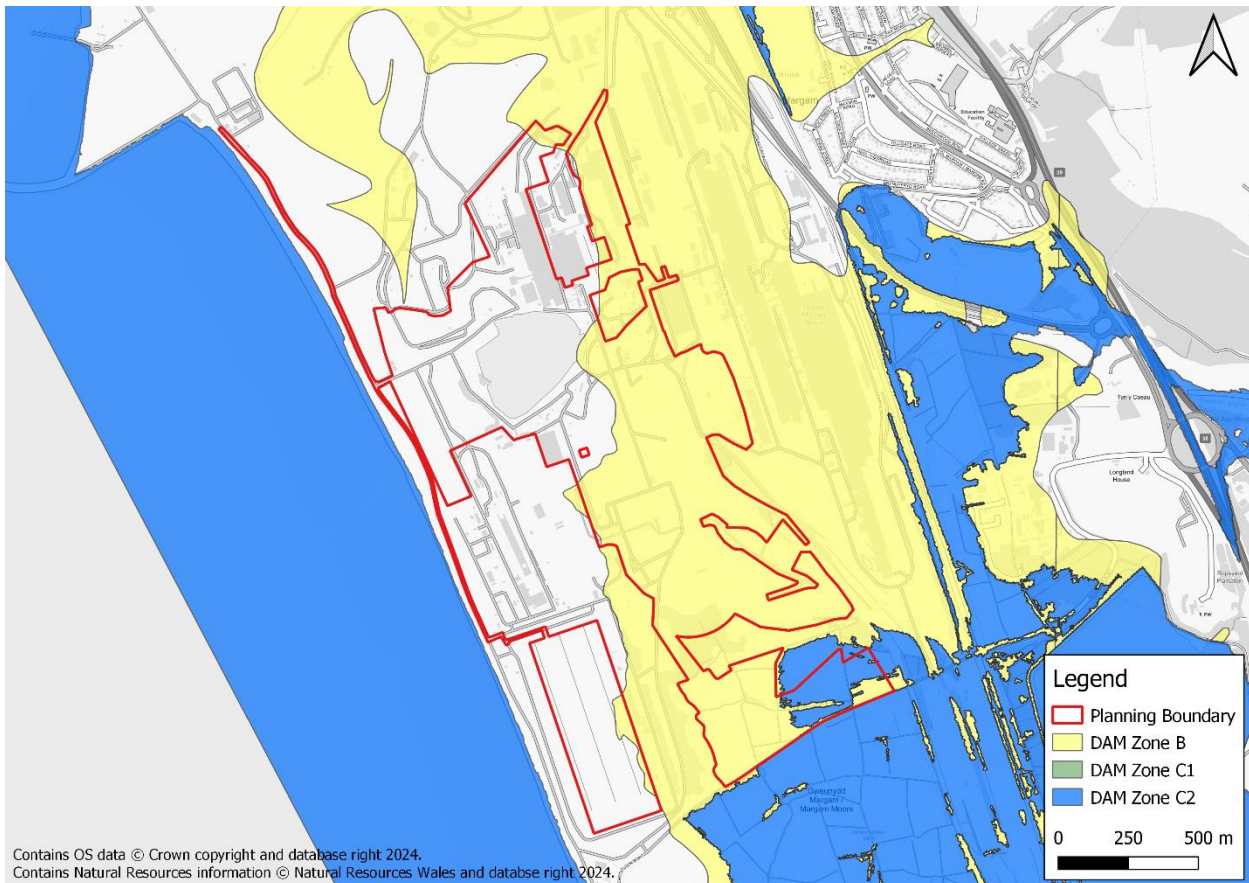


Figure 3-1 Development Advice Map

3.4 Flood Map for Planning Classification

The Flood Map for Planning (FMfP) is used to trigger different planning actions in support of the forthcoming TAN-15. The Flood map for Planning has been informed by updated detailed hydraulic modelling, undertaken by JBA Consulting, and accepted by NRW in the form of a Flood Map Challenge. The FCA, and the Flood Map for Planning therefore represent the most likely scenario for flood risk to and from the proposed development site. Although the new TAN-15 is not a material consideration, the new FMfP may be a material consideration as best available information.

3.4.1 Flood Map for Planning - Rivers

As shown in Figure 3-2 the development site is mostly located within Flood Zone 1 of the Flood Map for Planning for Rivers. Flood Zone 1 represents areas which have less than a 0.1% AEP (1 in 1000) chance of flooding in any given year, including climate change.

An area in the south of the site is located within Flood Zones 2 and 3, which are associated with the reen network. Flood Zone 2 suggests that there is between a 0.1% - 1% AEP (1 in 1000 and 1 in 100) chance of flooding from fluvial sources in any given year, including climate change. Flood Zone 3 represents areas that have a greater than 1 in 100 (1% AEP) chance of flooding in any given year, including climate change.

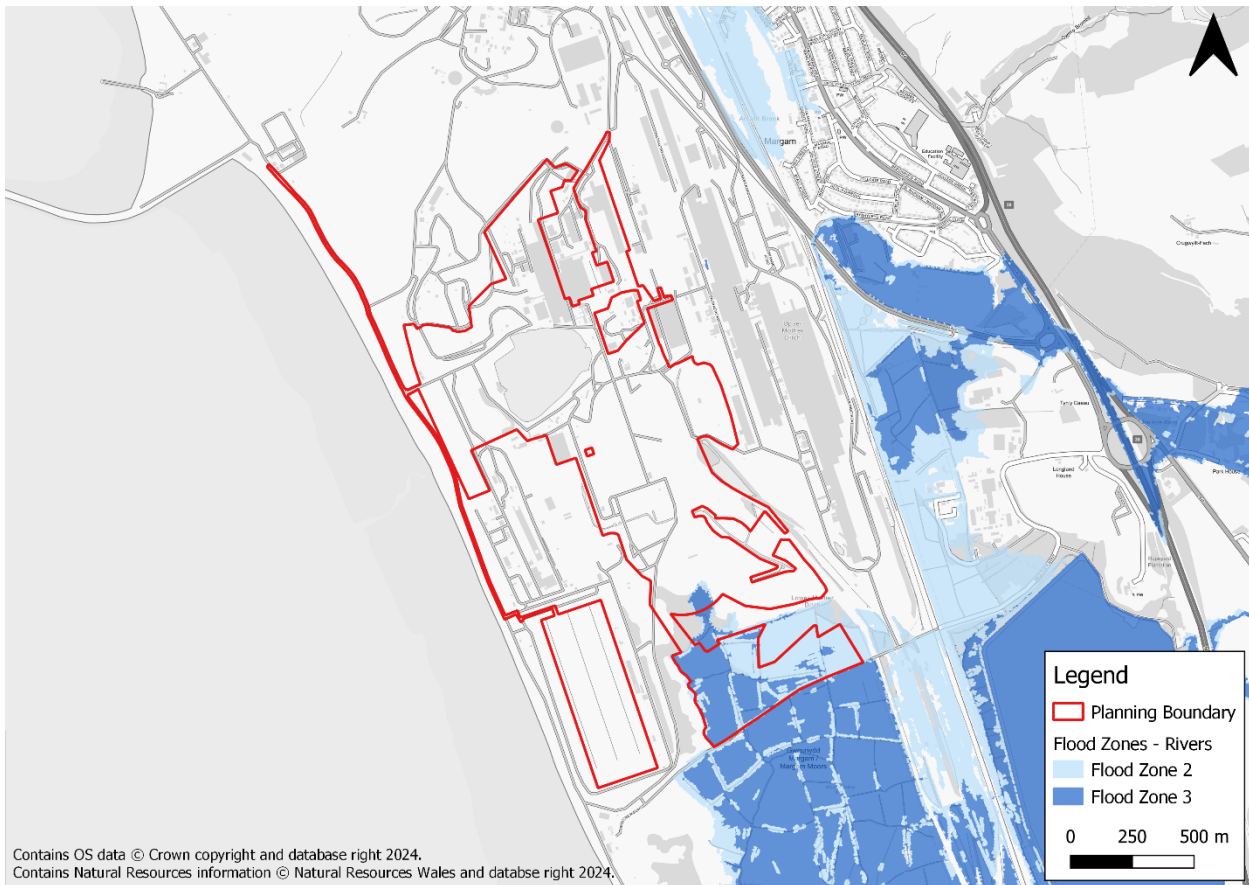


Figure 3-2 Flood Map for Planning - Rivers

3.4.2 Flood Map for Planning - Sea

The proposed development site is located in Flood Zone 1 of the Flood Map for Planning for the Sea (shown as transparent on the map), as shown in Figure 3-3. Flood Zone 1 indicates that there is a less than 0.1% AEP (1 in 1000) chance of flooding from tidal sources in any given year, including climate change.

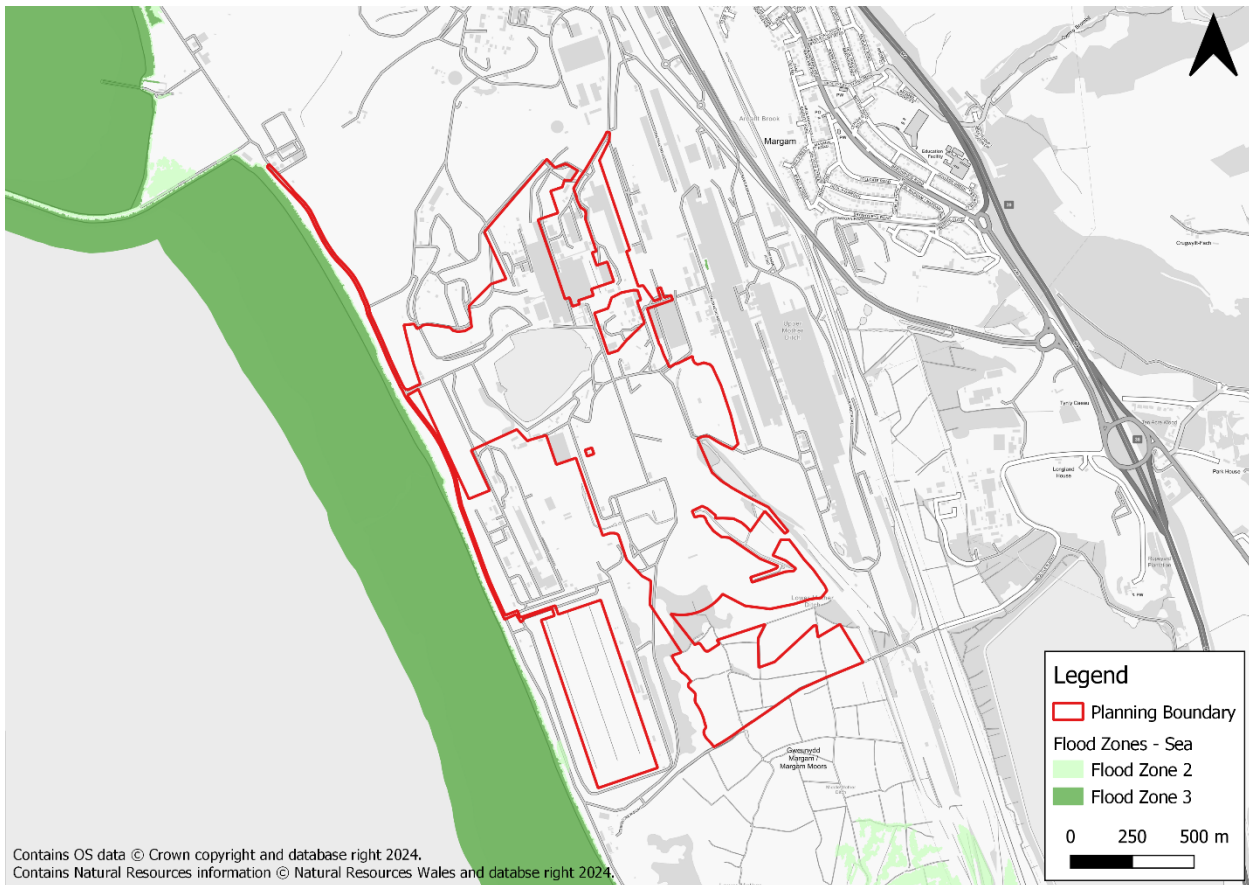


Figure 3-3 Flood Map for Planning - Sea

3.4.3 Flood Map for Planning - Surface Water and Small Watercourses

There are small areas shown to be at risk of surface water and small watercourse flooding, as shown in Figure 3-4. Flood Zone 3 shows areas which have a greater than 1% AEP (1 in 100) chance of flooding in any given year, including climate change.

Areas shown to be at surface water and small watercourse flood risk are associated with existing waterbodies across the site, and small localised areas of ponding.

These areas of ponding shall be managed by SuDS features across the site. For further information, refer to the associated Outline Surface Water Management Strategy.

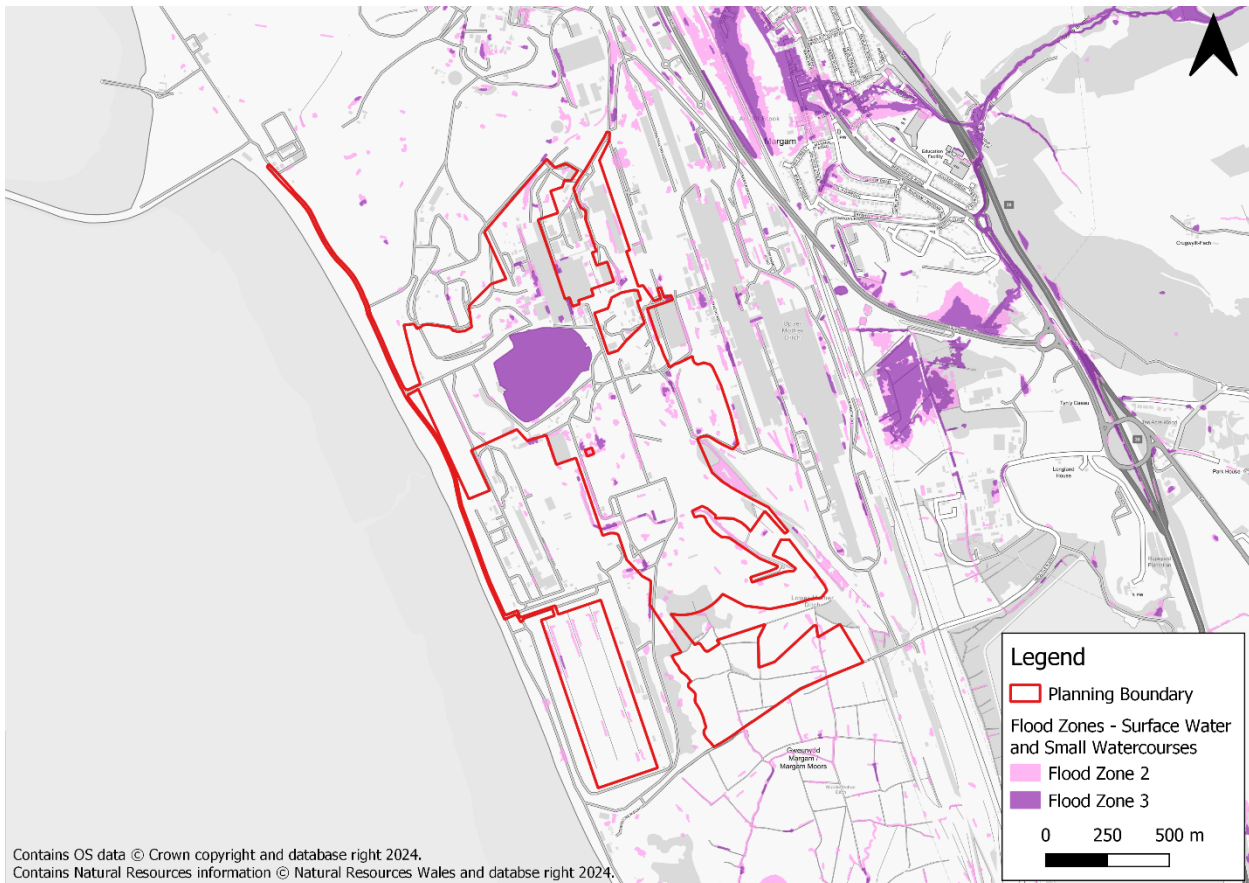


Figure 3-4 Flood Map for Planning - Surface Water and Small Watercourses

3.5 Local Development Plan (2011 to 2026)

The Local Development Plan (LDP) is a land-use document where the Council sets out its land use development over a 15-year period. Neath Port Talbot County Borough Council's Local Development Plan was adopted in January 2016 and provides a framework to guide future development, and set out where, when, and how much new development can take place within the plan period (2011-2026). A Replacement Local Development Plan (2021-2036) is currently being developed by the Council.

The LDP strategy has a focus on four key aims. The second aim of the strategy is 'Maximising the benefit of market interest along the coastal corridor and stimulating growth through the delivery of strategic employment sites and strategic regeneration areas'. The proposed development is identified as an existing employment site in Policy EC2 of the LDP. Policy EC2 states that 'In order to protect the employment function of the County Borough's employment areas, uses on the following sites will be restricted in accordance with Policy EC3.' Policy EC3 states that 'within allocated and existing employment areas, unless otherwise specified and where appropriate, uses will be restricted as follows: Uses within classes B1, B2 and B8'. As a result, the proposed development complies with Policy EC2 and EC3 as it does not propose a different use for the proposed development site and will help to sustain the site.

The proposed development would also help satisfy Strategic Policy SP11, which states that 'Existing employment uses will be supported and safeguarded, and new and expanding employment developments will be encouraged' providing that the development meets the required measures. The proposed development complies with points 1, 2, 3 and 4 of these measures as it is an existing employment site and will increase employment provision for the coastal area.

3.6 Justification Test

As part of the site is located within DAM Zone C2, the site should meet the requirements of the Justification Test. TAN-15 states that new development will be justified if it can be demonstrated that:

Its location in Zone C is necessary to assist, or be part of, a local authority regeneration initiative or local authority strategy required to sustain an existing settlement;

Or

Its location in Zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region;

And

It concurs with the aims of Planning Policy Wales and meets the definition of previously developed land;

And

The potential consequences of a flooding event for the particular type of development have been considered and found to be acceptable.

The proposed development has been assessed against the requirements of the Justification Test with the results summarised in Table 3-2.

Table 3-2 Justification Test applied to the proposed development

TAN-15 Justification Criteria	Comments	Achieved
Its location is necessary to assist a local authority regeneration initiative or strategy or contribute to key employment objectives necessary to sustain an existing settlement or region.	The proposed development will contribute to the overall aims of the Neath Port Talbot strategy by providing employment provision in an area which has been allocated for employment use in the LDP.	✓
The site meets the definition of previously developed land (i.e. it is not a Greenfield site) and concurs with the aims of Planning Policy Wales (i.e. the presumption in favour of sustainable development).	The proposed development area is currently existing buildings and storage areas, which is brownfield in nature and therefore previously developed.	✓
A Flood Consequence Assessment has been produced to demonstrate that the potential consequences of a flood event up to the extreme flood event (1 in 1000 chance of occurring in any year) have been considered and meet the Acceptability Criteria in order to be considered acceptable.	The flood consequences have been assessed and are detailed further in Section 5.	✓

4 Flood Risk Assessment

This section assesses the risk to the site from all sources of flooding, the risk of increased flood risk to others, and how flood risk can be managed. Information is taken from publicly available data sources.

4.1 Review of existing flood risk data

The latest available public information on flood risk at the site, published by NRW, is summarised in Table 4-1 below.

Table 4-1 Summary of flood risk to the site

Source of Flooding	Onsite Presence	Description
Flood Risk from Rivers	✓	A small part of the site is at low risk of flooding from rivers.
Flood Risk from the Sea	✗	The site is at very low risk of flooding from the sea.
Flood Risk from Surface Water and Small Watercourses	✓	The site predominantly has a very low risk of flooding from surface water and small watercourses. Localised areas across the site are at higher risk of surface water flooding.
Flood Risk from Groundwater	✗	The site is at low risk of groundwater flooding.
Flood Risk from Reservoirs	✓	The site is at low risk of flooding from reservoirs.
Flood Risk from Sewers	✗	The site is at very low risk from sewer flooding.

4.2 Historical Flooding

NRW's map of recorded flood extents does not show any evidence of historical flooding on the site and no other evidence of historical flooding has been identified.

4.3 Flood Risk from Rivers

The proposed development site is shown to be mostly at very low risk of flooding from rivers, according to NRW's Flood Risk Assessment Wales (FRAW) mapping, as shown in Figure 4-1. This means that there is a less than 0.1% AEP (1 in 1000) chance of fluvial flooding in any given year.

The Southern Fields are shown to be at low risk of fluvial flooding, meaning that there is between a 0.1% - 1% AEP (1 in 1000 and 1 in 100) chance of flooding in any given year. The FRAW dataset does not include an allowance for climate change. Consequently, the FMfP, shown in Figure 3-2 above, provides the most up to date representation of fluvial risk to the site.

However, the extent of the site located within the flood risk area is the proposed route for the National Grid cable on-site, which is expected to be located underground. Therefore, the fluvial risk associated with this location shall have no impact on development proposals, and the proposed works shall have no impact on flood risk to third parties. It is therefore considered that fluvial flood risk does not need to be considered further.

The proposed cable route shall cross a number of reens across the southern extent of the site. The reen network is a system of ordinary watercourses and therefore regulation is the responsibility of the Lead Local Flood Authority (LLFA). The appropriate ordinary watercourse consents shall be gained prior to any works commencing on the cable routing.

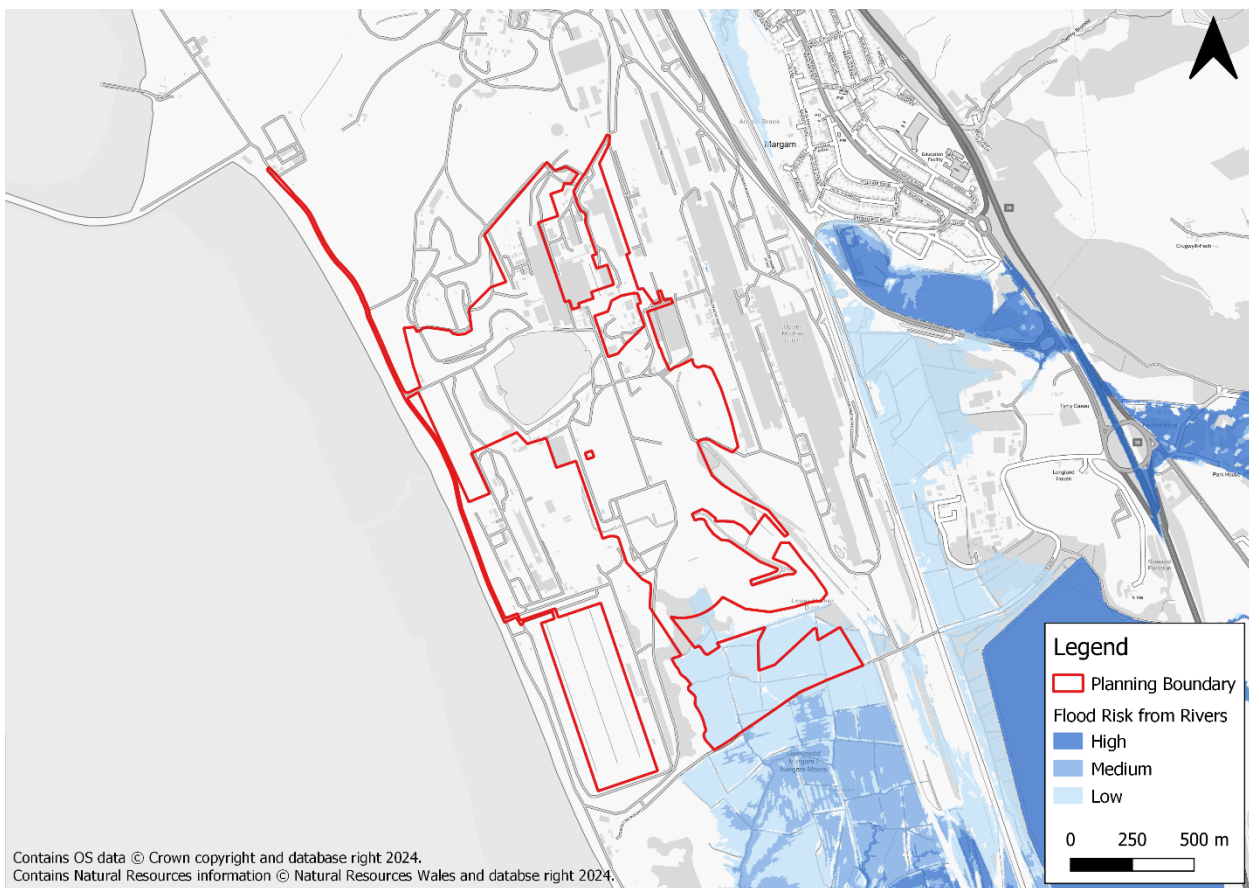


Figure 4-1 FRAW Rivers

4.4 Flood Risk from the Sea

The site is at very low risk of flooding from the sea according to NRW's FRAW Flood Risk from the Sea map, as shown in Figure 4-2. This means that there is a less than 0.1% AEP (1 in 1000) chance of flooding in any given year.

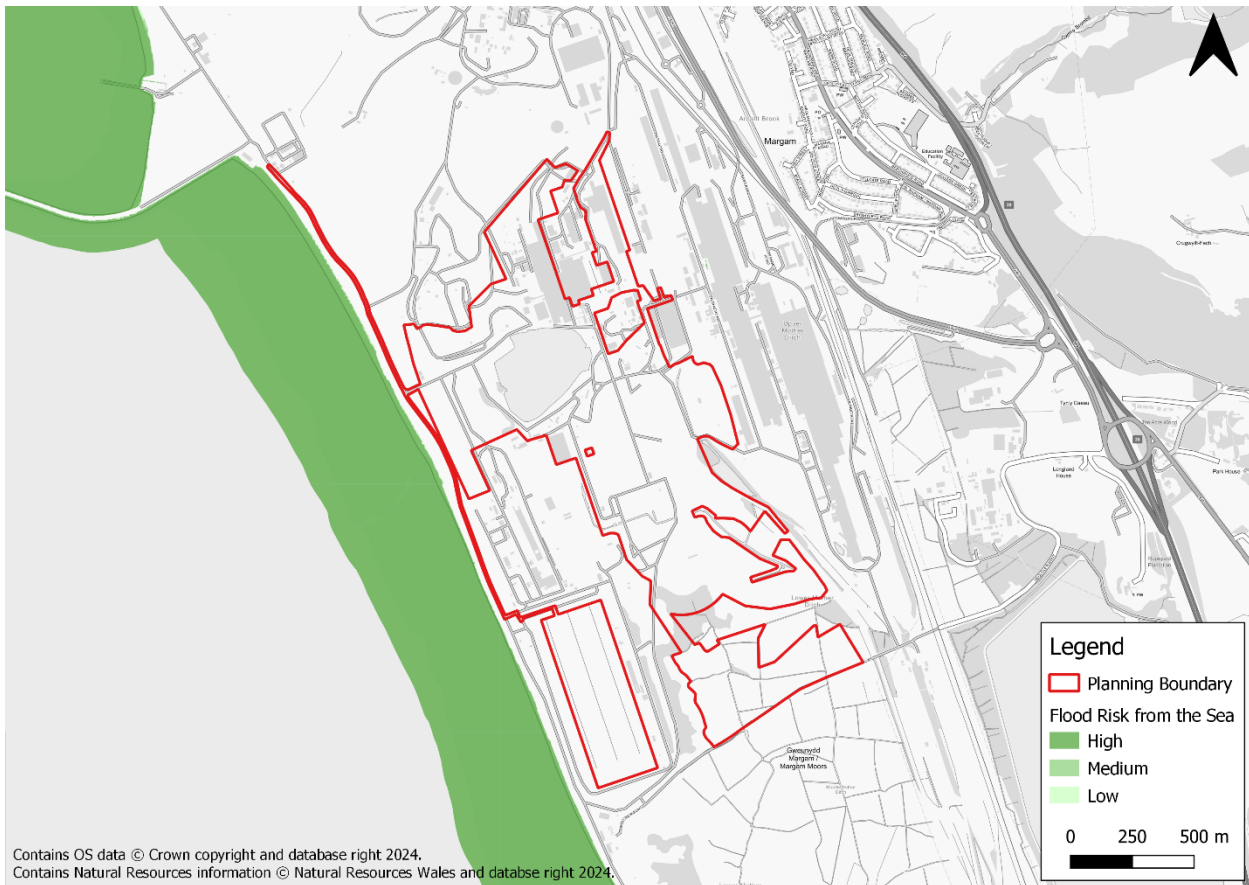


Figure 4-2 FRAW Sea

4.5 Flood Risk from Surface Water and Small Watercourses

The NRW FRAW flood risk from Surface Water and Small Watercourses mapping shows that the proposed development site is generally at very low risk, as shown in Figure 4-3.

The mapping indicates that there are some areas across the site with a low-high risk of surface water flooding. Low risk indicates between a 0.1% -1% AEP (1 in 1000 and 1 in 100) chance of flooding in any given year. High risk represents areas with a greater than 3.3% AEP (1 in 30) chance of flooding from these sources.

Areas shown to be at surface water and small watercourse flood risk are associated with existing waterbodies across the site, and small localised areas of ponding.

These areas of ponding shall be managed by SuDS features across the site. For further information, refer to the associated Outline Surface Water Management Strategy.

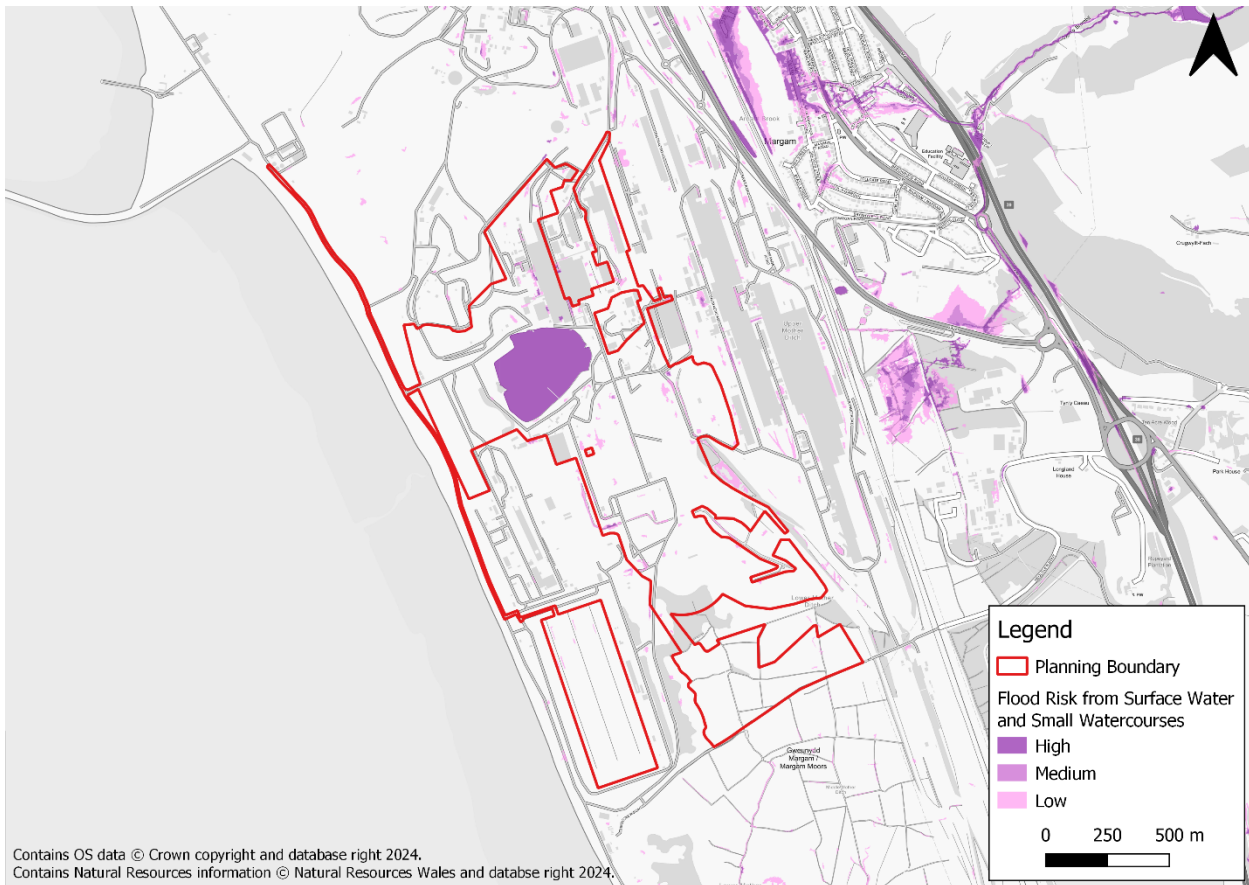


Figure 4-3 FRAW Surface Water and Small Watercourses

4.6 Flood Risk from Reservoirs

The site is considered to be at potential risk of flooding from a failure of the Eglwys Nynydd reservoir, as shown in Figure 4-4. A high-level assessment of the risk of flooding from reservoirs has therefore been undertaken and is included in Appendix A.

This assessment concluded that the flood level from the reservoir is estimated to be approximately 6.1mAOD. The proposed ground levels for the proposed development are likely to be raised and levelled to facilitate the new development.

As the Margam Moors, which cover an area of approximately 1.3KM², are therefore likely to receive and store the vast majority of flood water from any failure of Eglwys Nynydd reservoir, the maximum predicted flood depth across the development site is 600mm.

The risk of flooding to the development site shall be managed through an on-site emergency flood plan, already held by Tata Steel.

The reservoir failure flood risk to the proposed development is concluded to be low. Further assessment of the reservoir flood risk is not necessary.

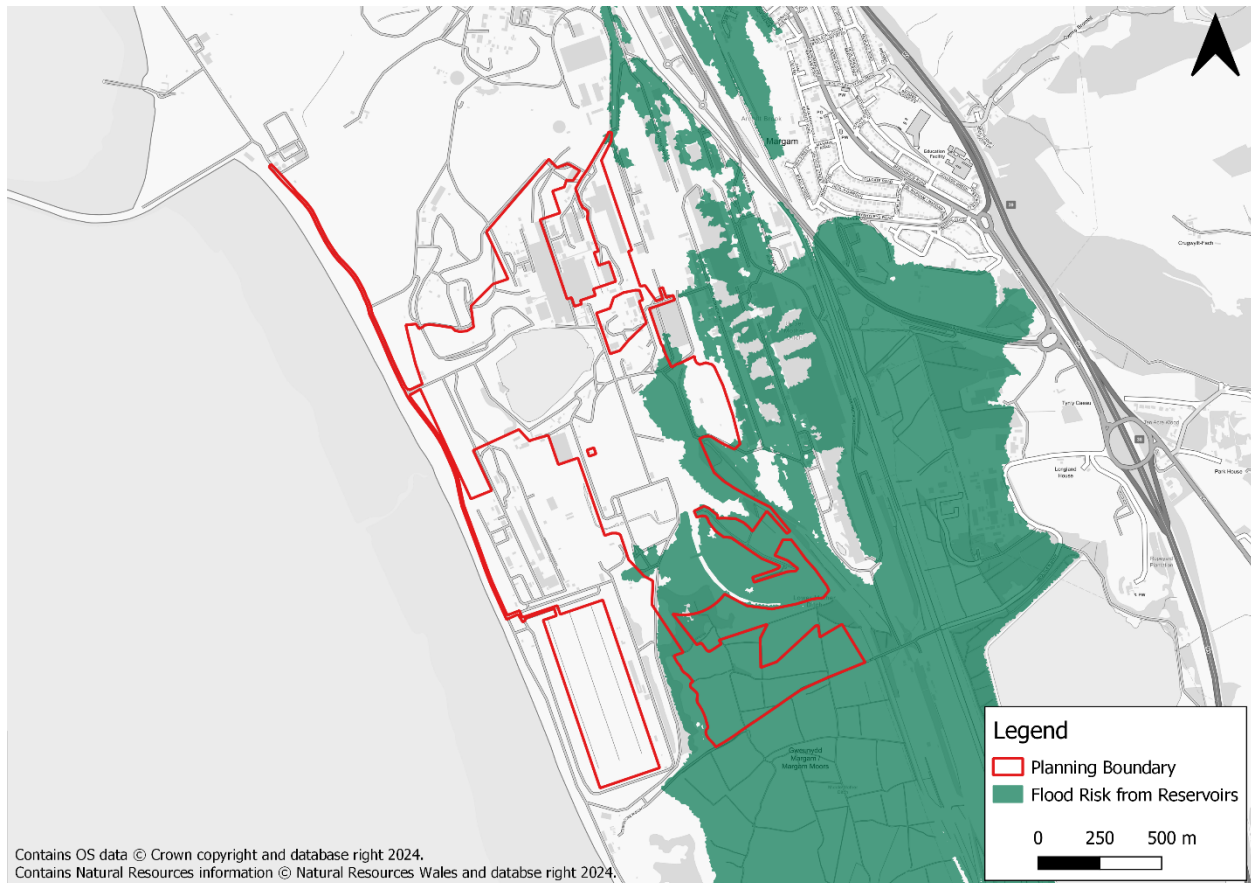


Figure 4-4 FRAW Reservoirs

4.7 Flood Risk from Groundwater

Groundwater flooding is caused by unusually high groundwater levels. It occurs as excess water emerges at the ground surface or within manmade structures such as basements. Groundwater flooding tends to be more persistent than surface water flooding, in some cases lasting for weeks or months, and can result in damage to property. The risk of groundwater flooding depends on the nature of the geological strata underlying the site and the local topography.

The Neath Port Talbot County Borough Council Flood Risk Management Plan, states that 'there are no specific areas of historical groundwater flooding recorded in the Neath and Port Talbot area'. It can therefore be concluded that the risk of groundwater flooding at the site is very low.

4.8 Flood Risk from Sewers

There is no evidence of historic sewer flooding on or close to the site. The onsite drainage system is controlled by a pumping system. The potential for the proposals on site to affect sewer flood risk is very low. It can therefore be concluded that the risk of sewer flooding at the site is very low.

5 Assessment of Acceptability Criteria

Table 5-1 assesses the proposed development against the acceptability requirements by TAN-15 to be met. For Less Vulnerable development to be considered in Zone C, the proposals must meet the requirements set out within the Acceptability Criteria.

Table 5-1 Acceptability Criteria for TAN-15

TAN-15 Justification Criteria	Comments	Achieved?
Developer is required to demonstrate that the site is designed to be flood free for the lifetime [Ref: TAN-15 A1.5] of development for a 1% AEP (1 in 100) chance (fluvial) or a 0.5% AEP (1 in 200) chance (tidal) flood event including an allowance for climate change in accordance with TAN-15 Table A1.14.	Fluvial Most of the site is located outside of the 1% AEP plus climate change fluvial flood extent and is therefore predicted to be flood free. An area in the south of site, where the reen network is located, is shown to be located within Flood Zone 2 of the Flood Map for Planning. The extent of the site located within this flood zone is the proposed route for the National Grid cable on-site, which is expected to be located underground. Therefore, the fluvial risk associated with this location shall have no impact on development proposals. Tidal The proposed site is predicted to be flood free during the 0.5% AEP plus climate change event.	✓

TAN-15 Justification Criteria	Comments	Achieved?
The development should be designed so that in an extreme (1 in 1000) event there would be less than 600mm of water on access roads and within the property.	Fluvial The site is mostly shown to be flood free during the 0.1% AEP event. An area in the south of the site is shown to be located within Flood Zone 3 of the Flood Map for Planning. The extent of the site located within this flood zone is the proposed route for the National Grid cable on-site, which is expected to be located underground. Therefore, the fluvial risk associated with this location shall have no impact on development proposals. Tidal The proposed development site is not predicted to flood from tidal sources.	✓
No flooding elsewhere.	Most of the site is predicted to be flood free. No built development is proposed in the southern area of the site which is shown to be at fluvial flood risk. Therefore, there shall be no third party impacts.	✓
Flood defences must be shown by the developer to be structurally adequate particularly under extreme overtopping conditions (i.e. that flood with a 1 in 1000 chance of occurring in any given year).	N/A - The site is not protected by formal flood defences.	N/A
The developer must ensure that future occupiers of	The majority of the proposed development is	✓

TAN-15 Justification Criteria	Comments	Achieved?
development are aware of the flooding risks and consequences.	predicted to be flood free during all events. Areas in the south of the site that are at risk of flooding are not proposed for built development. However, during works related to the laying and maintenance of the cable, the site managers should sign up to the NRW Flood Warning Service to ensure no works is carried out during the event of an extreme flood.	
Effective flood warnings are provided at the site.	The south of the proposed development site is located in the 'Rivers in the Afan and Kenfig catchments' flood alert area.	✓
Escape / evacuation routes are shown by the developer to be operational under all conditions.	Flood free emergency vehicle access and pedestrian routes will be available under all conditions.	✓
The development is designed by the developer to allow the occupier of the facility for rapid movement of goods / possessions to areas away from flood waters.	N/A - The main development proposals are located in areas which are predicted to be flood free during all design events.	✓
Development is designed to minimise structural damage during a flooding event and is flood proofed to enable it to be returned to its prime use quickly in the aftermath of the flood.	N/A - The main development proposals are located in areas which are predicted to be flood free during all design events.	✓

6 Conclusions and Recommendations

JBA Consulting (JBA) were commissioned by Tata Steel UK Ltd to undertake a Flood Consequences Assessment (FCA).

The Land at Port Talbot Steelworks site is approximately 159.6 ha in size and is located south of Port Talbot, bound to the south-west by the Bristol Channel, and to the east by Margam and the M4. The Network Rail Swansea to London mainline generally forms the eastern boundary, with some small areas of Tata Steel owned land extending beyond this.

Development proposals for the site consist of: “Full planning permission for the demolition of existing buildings and structures, partial infill of the BOS lagoon, and construction of a new electric arc furnace-based steel production facility (1 no. arc furnace, 2 no. ladle furnaces). The development includes chemical/material storage and transfer infrastructure, pipework and cabling (above and below ground), buildings, fume and dust treatment plant, water treatment facility and material handling systems, electrical control rooms and power infrastructure, offices and ancillary facilities, together with new and amended roads and rail lines, landscaping and green infrastructure, lighting, hardstanding, CCTV, drainage and associated engineering operations.

Outline planning permission (with all matters reserved except for access and landscaping) for the construction of a scrap metal handling facility and associated scrap yards, scrap processing facility, new substation, underground and overground electrical infrastructure, and new and amended roads and rail lines, landscape and green infrastructure, lighting, hardstanding, CCTV, drainage and associated engineering operations.”

The proposed development is classed as less vulnerable development by TAN-15 due to its industrial nature.

The west of the site is located within Zone A of the Development Advice Map. The east of the site is located within Zone B, and an area in the south of the site is shown to be within DAM Zone C2.

The proposed development site is mostly located in Flood Zone 1 of the Flood Map for planning for Rivers. An area in the south of the site is located within Flood Zones 2 and 3. No built development is proposed within the flood risk extent.

The Flood Map for Planning for Surface Water and Small watercourses indicates that there are localised areas of surface water flooding within the site boundary, represented by Flood Zones 2 and 3. It is envisaged that these areas located within Flood Zones 2 and 3 of the Flood Map for Planning shall be managed by SuDS features across the site.

The site is at little or no risk of tidal, groundwater, sewer, or reservoir flooding.

The requirements within the Justification Test and Acceptability Criteria have been considered and are found to be acceptable. It is therefore concluded that on the grounds of flood risk, the proposed development meets the principles and requirements set out in TAN-15 and the aims of Planning Policy Wales.

A Reservoir Flood Risk Assessment

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Contract	EAF Project
Client	Tata Steel UK Ltd
Date	August 2024 – Version 4
Author	Alister Trendell BEng MCIWEM C.WEM
Reviewer	George Baker BEng AIEMA CEnv IEng MCIWEM C.WEM
Subject	Reservoir Flood Risk Assessment
Revisions	Updated to EAF Project and revised ground levels. Faye Tomalin BSc (Hons) MSc C.WEM MCIWEM

1 Risk of flooding from reservoir failure

1.1 Introduction

This technical note assesses the flood risk to the development site, from a potential failure of the Eglwys Nunydd reservoir.

The location of the reservoir and the proposed development site are shown in Figure 1-1, together with the predicted reservoir flood risk extent.

The predicted reservoir flood risk extent minorly encroaches into the proposed development site, extending to:

- Scrap storage and processing yards
- scanning facilities and railway weighbridge

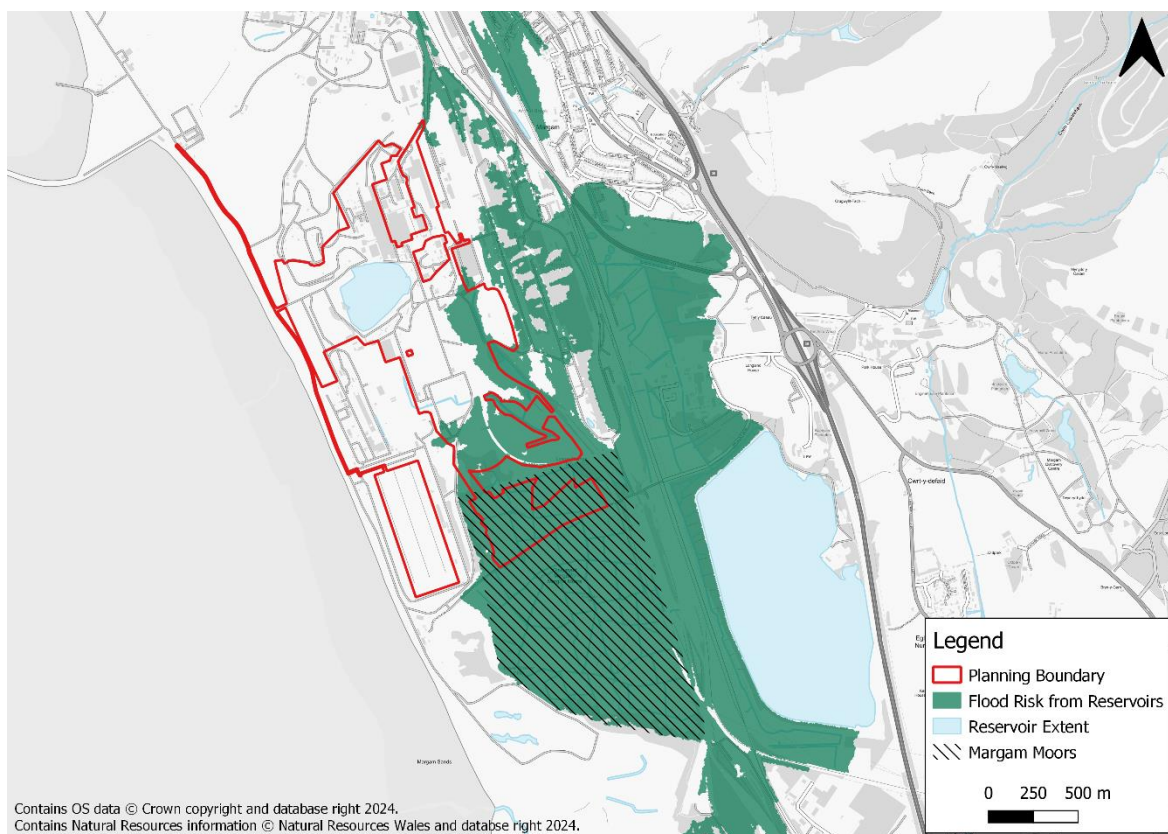


Figure 1-1: Reservoir and proposed development site locations

1.2 Planning policy

The extant TAN-15 says little about how reservoir flood risk should be considered, other than to recognise that they present a residual flood risk and that "A

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precautionary approach should be adopted at vulnerable locations and the precautionary methodology applied in consultation with the canal operator or dam/reservoir owner.”¹

The draft consultation version of TAN-15 (2021) of which it is not known when it will come into force, contains the same advice as quoted above, but also offers a little more guidance:

5.3 The Flood Map for Planning also allows users to view areas at potential risk of inundation from reservoirs. Reservoirs are maintained to very high standards in Wales and therefore the location of homes and businesses in reservoir inundation areas should not raise alarm. This information is presented to ensure open and constructive dialogue between planning authorities and reservoir operators or owners should Development Plans have implications for the risk categorisation of the reservoir. Further details are outlined in section 7.

7.27 Reservoirs in Wales are categorised according to the risk they pose to the public and environment in the unlikely event of a breach. The amount of development in the inundation catchment is an important factor in determining a reservoir’s risk category.

7.28 Land use planning can inadvertently lead to a reclassification of risk if new development is located within the inundation area of a reservoir. This brings additional maintenance and insurance implications for owners and operators of reservoirs. The reservoir inundation maps on the Flood Map for Planning should be consulted when preparing Development Plans. Any potential implications for reservoir owners or operators, such as allocating development in inundation areas, should be raised by the planning authorities openly and constructively.

1.3 The Eglwys Nunydd reservoir

From the last Section 10 inspection report undertaken by Atkins (2015) we understand the following:

- The Eglwys Nunydd reservoir is owned and managed by Tata Steel.
- Eglwys Nunydd is an offline storage reservoir formed by a low embankment that rises 5m above the coastal plain.
- The embankment stretches 2.5km around the north, west and south sides of the reservoir. The M4 Motorway runs along and generally above the eastern side.
- The spillway has a weir level of 8.077m AOD. At this level, the reservoir has a capacity of 3.8M m³, and a surface area of 1.03 km².
- The reservoir supplies raw water to the steel works in the main but is also used for recreational purposes. Very limited public access is allowed around the reservoir.
- The embankment was originally constructed to a nominal crest level of 8.38m AOD
- The reservoir was raised by 900mm in the early 1970’s from 6.06m AOD to the current level of 8.077m AOD. At this time, the crest level became 9.3m AOD.

¹ TAN15 (2004) para 11.25

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- The reservoir has a High-Risk classification.

1.4 Risk assessment

The consideration of risk is a factor of two functions; probability and consequence.

It is generally impossible to meaningfully assess the probability of catastrophic reservoir failure, as the UK has exceptionally rigorous safety standards² that make the probability of failure extremely low. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in Wales, Natural Resources Wales (NRW), is responsible for ensure that reservoirs are inspected regularly, and essential safety work is carried out.

However, given the potentially extreme consequences of a reservoir failure it is appropriate to give due consideration to the consequences as identified in TAN-15.

1.5 Consequence assessment

NRW publish online flood extent maps³ for reservoir flood risk. These maps are based on hydraulic modelling of worst-case reservoir breach scenarios. However, due to national security concerns only the flood extents are publicly available. NRW have also undertaken more recent and detailed flood modelling of reservoir flood risk, but they have informed us that this information is not presently available for review.

National security concerns, whilst understandable, make a detailed assessment of the flood hazards challenging. However, as far as practical, in the following section a high-level assessment of the flood risk to the proposed development has been undertaken.

- The reservoir failure flood levels have been estimated by analysing the LiDAR ground levels at the extents of the flood extents. From this, the reservoir failure flood level is estimated to be approximately 6.1mAOD. The flood level estimation analysis is shown in Figure 1-2.
- At this stage of the design, the proposed ground levels have not been firmly set (with the area within the reservoir flood extent forming part of the outline application area). However, it is highly likely that areas of built development will have differing ground levels to those currently present across the site as a consequence of natural build up of material, and ground levelling to facilitate new development.
 - Across Block 25, ground levels currently range from 5.2mAOD to 7.2mAOD. In levelling this area to form the scrap storage and processing yard, it is likely that ground levels shall be revised to levels ranging between 5.5mAOD and 6.5mAOD. Maximum flood depths of 600mm are therefore likely across this area.
 - Block 37 currently has a variable ground level ranging from between 4.8mAOD and 6.5mAOD, with stockpiles raised higher to levels greater than 10mAOD. In levelling this area, it is likely that ground levels shall be revised to

² Reservoirs Act 1975

³ Flood Risk Assessment Wales <https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk1/?lang=en>

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approximately 5.8mAOD. This would result in maximum flood depths of 300mm in the event of reservoir failure.

- Blocks 29 and 30 have an existing ground level of 5.41mAOD. It is anticipated that there shall be no change in ground level to the proposed scanning facility and ground level due to its proposed location on the existing railway. However, it is likely that due to the nature of equipment, the majority of the new structures will be located above the estimate flood level.
- By comparison ground levels in Margam Moors, immediately to the south of the development, has a typical ground level of 4.0mAOD.
- Therefore, whilst ground levels are proposed to be amended across the Tata Steel site, the flood extent is unlikely to change to any great extent. Whilst not strictly a requirement, predicted flood depths across the site in the event of reservoir failure are within the tolerable limits (1000mm) set out within A1.15 of TAN-15. Whilst this is normally only applicable to tidal and fluvial flood risk, it provides an indication of tolerable flood depths in all flood eventualities.
- Should ground raising result in a change in flood extent as a result of the development proposals, a negligible increase in flood depths is likely to be seen across Margam Moors. The proposed ground levels are higher than the adjacent Margam Moors. The Margam Moors, which cover an area of approximately 1.3km², are therefore likely to receive and store the vast majority of flood water from any failure of Eglwys Nunydd reservoir. The Moors therefore provide a significant low risk area/volume for the reservoir to relatively safely drain to with minimum consequence for the Tata works.
- Furthermore, as a requirement under the Reservoirs Act 1975, Tata Steel are required to ensure that the Eglwys Nunydd Reservoir is regularly inspected with essential maintenance work undertaken. An on-site emergency flood plan is required to be prepared, reviewed, updated and tested to manage flood risk across the site. Tata Steel, as landowners, have this plan in place. Consequently, Tata Steel are well placed to manage the risks of reservoir flooding across the new development.

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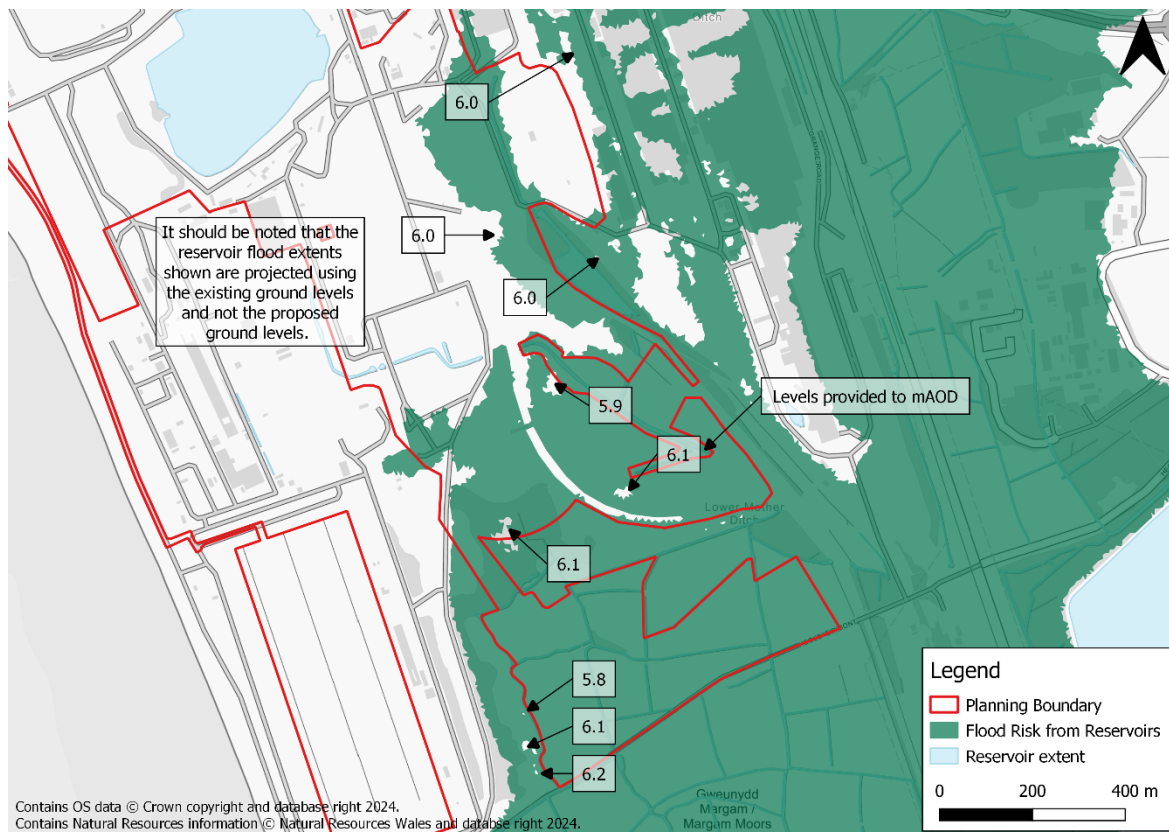


Figure 1-2: Reservoir failure flood depth estimation

1.6 Conclusions

In consideration of the reservoir risks to the proposed Tata Steel development, the following conclusions are made:

- The probability of a catastrophic reservoir failure is extremely low given the exceptionally rigorous UK reservoir safety standards.
- The estimated reservoir failure flood level is 6.1m AOD.
- The likely proposed ground levels of the built development within the predicted reservoir flood extent result in a maximum predicted flood depth of 600mm.
- The risk of flooding to the development site shall be managed through an on-site emergency flood plan, already held by Tata Steel.
- The reservoir failure flood risk to the proposed development is concluded to be **low**.
- Further assessment of the reservoir flood risk is not necessary.

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