

FLOOD RISK ASSESSMENT

FOR

PROPOSED REGENERATION WORKS

AT

DUCKING STOOL PUBLIC AMENITY

BELTURBET

CO. CAVAN



**Comhairle Contae
an Chabháin**
Cavan
County Council

Prepared for
Cavan County Council

Prepared by
Traynor Environmental Ltd

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Belturbet Business Park,
Creeny.
Belturbet,
Co Cavan
T: + 353 49 9522236
E: nevin@traynorenv.com
www.traynorenvironmental.ie



Issue	Date	Details	Prepared by	Checked/Approved by
1	22 nd June 2026	Final Report	Francis Mc Mahon Environmental Consultant	Nevin Traynor Environmental Scientist

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Nevin Traynor
Environmental Scientist
Date: 22 nd June 2026

Traynor Environmental
Belturbet Business Park
Creeny
Belturbet
Co. Cavan
H14AY94

Tel: 049 9522236

Email: info@traynorenvironmental.ie

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1.0 INTRODUCTION

Traynor Environmental Ltd have been appointed to carry out a site-specific flood risk assessment for the proposed development at the Ducking Stool Jetty, Belturbet, Co. Cavan. This report is intended to satisfy the requirements of Cavan County Council relating to the proposed development.

Development Description:

Notice is hereby given that Cavan County Council propose to undertake the following development at the Ducking Stool Jetty, The Lawn and lands at Willow Avenue, Belturbet, Co. Cavan.

The proposal is for the upgrade and realignment of the existing jetty and slipway at the Ducking Stool Jetty and the creation of a carpark on lands at Willow Avenue

Details of the works include:

- removal of the existing timber jetties,
- realignment and widening of the slipway providing access to the River Erne,
- reconfiguration and extension of the existing pier, including amended levels,
- installation of floating jetties and jetty access ramp,
- construction of hard landscaped, public recreational open space,
- reconfiguration and upgrade of existing gravelled area to create new carpark (7no. spaces),
- installation of public lighting and refuse storage,
- installation of bike stands
- installation of wayfinding signage
- reconfiguration and upgrading of existing drainage and all associated site development works.

The proposed works aim to increase the amenity value of the current Ducking Stool Jetty area.

1.1 Flood Risk Management Guidelines (2009)

As per the Flood Risk Management Guidelines (2009), where flood risk may be an issue for any proposed development, a flood risk assessment (FRA) should be carried out that is appropriate to the scale and nature of the development and the risks arising. The flood risk assessment outlined herein is intended to be sufficiently detailed to quantify the risks and effects of any flooding, necessary mitigation measures, together with recommendations on how to best manage any residual risks.

As per the document 'The Planning System and Flood Risk Management (2009)' the flood risk assessment will consist of the following sections:

- Site description
- Site layout
- S-P-R model; sequential approach; justification test
- Determination of flood level
- Mitigation measures
- Conclusions

Traynor Environmental carried out site inspections on 15th November 2025. The inspection consisted of a walkover and visual inspection of the site and in the vicinity of the site.

1.2 Methodology

The methodology used for the flood risk assessment is based on 'The Planning System and Flood Risk Management Guidelines for Planning Authorities' (2009)' and also incorporating the Strategic Flood Risk Assessment. The FRM Guidelines require the planning system at national, regional, and local levels to:

- Avoid development in areas at risk of flooding, particularly floodplains, unless there are proven wider sustainability grounds that justify appropriate development.
- Adopt a sequential approach if applicable to Flood Risk Management when assessing the location for new development based on avoid, substitute, justify, mitigate, and proceed; and
- Incorporate flood risk assessment into the process of making decisions on planning applications and planning appeals.

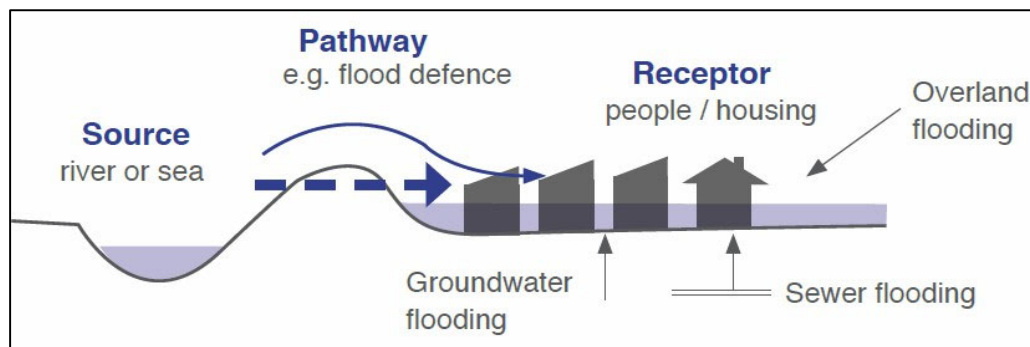
1.3 Definition of Flood Risk

Flood risk is a combination of the likelihood of a flood event occurring and the potential consequences arising from that flood event and is then normally expressed in terms of the following relationship:

Flood risk = Likelihood of flooding x Consequences of flooding.

To fully assess flood, risk an understanding of where the water comes from (i.e. the source), how and where it flows (i.e. the pathways) and the people and assets affected by it (i.e. the receptors) is required. Figure 1 below shows a source-pathway-receptor model.

Figure 1 - Source-Pathway-Receptor Model



The principal sources of flooding are rainfall or higher than normal sea levels. The principal pathways are rivers, drains, sewers, overland flow and river and coastal floodplains. The receptors can include people, their property and the environment. All three elements as well as the vulnerability and exposure of receptors must be examined to determine the potential consequences.

1.4 Stages of the Flood Risk Assessment

The detail and complexity of the study required should be appropriate to the scale and potential impact of the development. For the purposes of this study, the following have been considered:

- Available information on historical flooding in the area.
- Site level information.
- Details of structures, which may influence hydraulics of the watercourse and consideration of the effect of blockage of structures.
- Estimates of design levels when works have been completed.

1.5 Structure of the Flood Risk Assessment

The Planning System and Flood Risk Management-Guidelines for Planning Authorities (Department of the Environment & Local Government November 2009) recommend that a staged approach is adopted when undertaking a Flood Risk Assessment (FRA). The recommended stages are briefly described below: -

• Stage 1 – Flood Risk Identification

To identify whether there may be any flooding or surface water management issues that will require further investigation. This stage mainly comprises a comprehensive desk study of available information to establish whether a flood risk issue exists or whether one may exist in the future.

• Stage 2 - Initial Flood Risk Assessment

If a flood risk issue is deemed to exist arising from the Stage 1 Flood Risk Identification process, the assessment proceeds to Stage 2, which confirms the sources of flooding, appraises the adequacy of existing information, and determines the extent of additional surveys and the degree of modelling that will be required. Stage 2 must be sufficiently detailed to allow the application of the sequential approach within the flood risk zone.

• Stage 3 - Detailed Flood Risk Assessment

A detailed FRA is carried out where necessary to assess flood risk issues in sufficient detail and to provide a quantitative appraisal of potential flood risk.

1.6 Likelihood of Flooding

The Guidelines define the likelihood of flooding as the percentage probability of a flood of a given magnitude or severity occurring or being exceeded in any given year. It is generally expressed as a return period or annual exceedance probability (AEP). A 1% AEP flood indicates a flood event that will be equalled or exceeded on average once every hundred years and has a return period of 1 in 100 years. Annual Exceedance Probability is the inverse of return period as shown in Table 1 below.

Table 1 - Correlation between return period and AEP

Return Period (years)	Annual Exceedance Probability (%)
1	100
10	10
50	2
100	1
200	0.5
1000	0.1

1.7 Definition of Flood Zones

Flood zones are geographical areas within which the likelihood of flooding is in a particular range and are split into three categories in The Guidelines:

1.7.1 Flood Zone A

Flood Zone A where the probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding);

Most types of development would be considered inappropriate in this zone. Development in this zone should be avoided and/or only considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the Justification Test has been applied. Only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate in this zone.

1.7.2 Flood Zone B

Flood Zone B where the probability of flooding is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 or 0.5% or 1 in 200 for coastal flooding);

Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would generally be considered inappropriate in this zone, unless the requirements of the Justification Test can be met.

Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone. In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to and from the development can or will adequately be managed.

1.7.3 Flood Zone C

Flood Zone C where the probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 for both river and coastal flooding. Flood Zone C covers all plan areas which are not in zones A or B.

Development in this zone is appropriate from a flood risk perspective (subject to assessment of flood hazard from sources other than rivers and the coast) but would need to meet the normal range of other proper planning and sustainable development considerations.

It is important to note that when determining flood zones the presence of flood protection structures should be ignored. This is because areas protected by flood defences still carry a residual risk from overtopping or breach of defences and the fact that there is no guarantee that the defences will be maintained in perpetuity.

2.0 SITE DESCRIPTION & LOCATION

2.1 Site Description

The site in question is approximately 0.407 ha and is located within Belturbet town, approximately 155m north of the town centre. The site is accessed via Lana an Uisce just off the Main Street in Belturbet. The proposed works will take place at the ducking stool and the surrounding lands which is off the southern shore of Lough Erne. The site is zoned as 'Flood Zone A' & 'Flood Zone B' in the Cavan County Development Plan 2022-2028. Any developments within each flood zone are subject to the following: 'Undeveloped land in Flood Zone A&B that is the subject of any zoning objective shall only be developed for water compatible uses as identified in the Guidelines.' The proposed development at the Ducking Stool would be considered as water compatible in accordance with The Planning System and Flood Risk Management Guidelines (DoEHLG, 2009).

The land-use surrounding the application site is mixed. The urban/sub-urban lands of Belturbet town largely surround the wider area around the site to the south. These areas are predominantly residential, industrial and amenity and the dominant habitats associated with these areas include buildings and artificial surfaces, and amenity grasslands and gardens.

In the rural areas beyond Belturbet town, agriculture is the dominant land use and improved / semi-improved agricultural grasslands are the dominant habitats. Habitats immediately surrounding the site include the River habitats which is the transitional area where land and River Erne meet, functioning as an ecosystem that includes the water, the land (banks and shore), and the vegetation along the water's edge. It encompasses features like rocks, soil, aquatic and terrestrial plants, and various animal species. The overall topography of the surrounding area is generally flat, with the proposed marine works development situated at the edge, and within the extents of the ducking stool area.

Figure 2 - Site Location

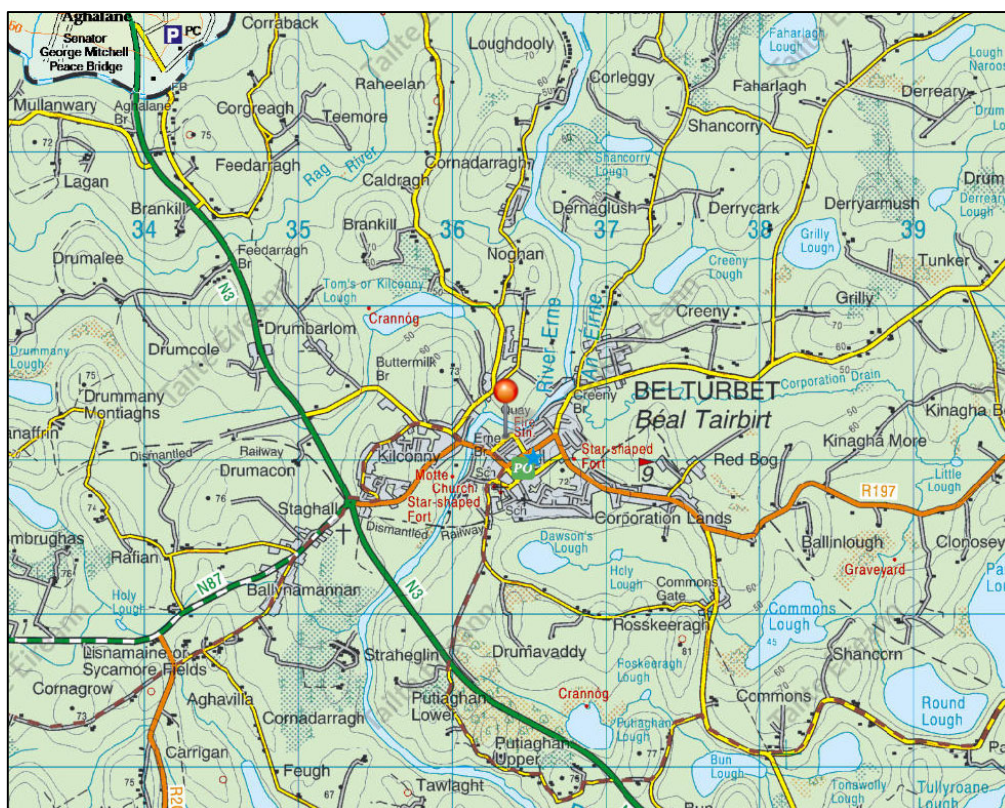
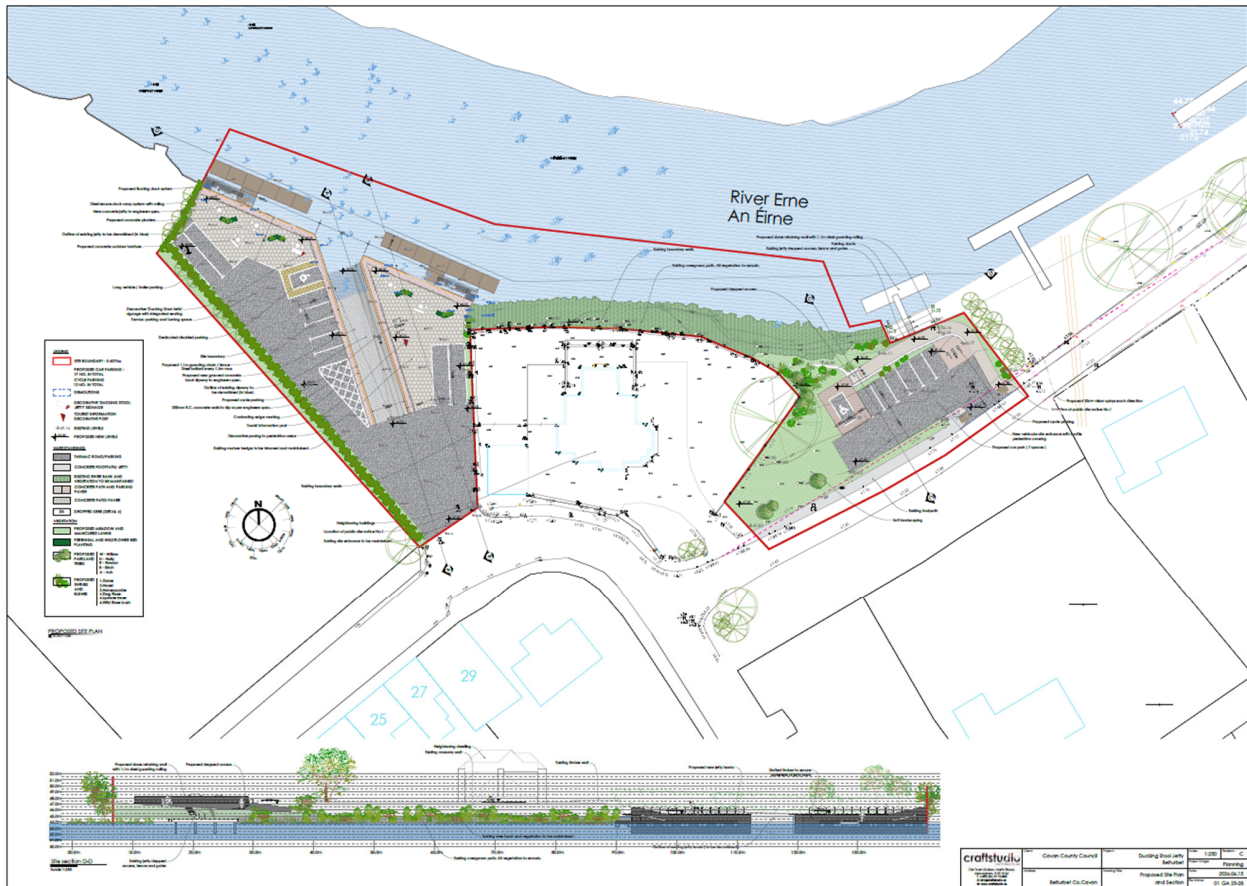


Figure 3 - Site Layout Plan



2.3 Site Levels and Topography Survey

A topographical site survey was carried out and incorporated into the site layout plan. All elevations are relative to Malin Head Datum.

Based on the surveyed information and proposed layout drawing, the site levels generally range from approximately 41.0mOD at the lower areas adjacent to the river to approximately 50.6mOD at higher ground within and surrounding the site boundary. The majority of the proposed development levels fall within the range of approximately 45.00mOD to 48.00mOD, reflecting the gently varying topography across the site.

The site slopes gradually towards the River Erne to the north, with lower elevations recorded along the riverbank and higher ground located towards the southern and eastern extents of the site. Proposed finished levels for paths, parking, and hardstanding areas are generally set between circa 45.0mOD and 47.5mOD, ensuring suitable drainage and integration with existing ground levels.

No significant pluvial flood risk is identified based on the OPW National Flood Hazard Mapping, MyPlan OPW Flood Map, and CFRAM Flood Risk Mapping.

Elevations of note across the site are summarised in Table 2 below.

Table 2 - Site Elevations

Location	Proposed Elevation (mOD)
General site levels (proposed development areas)	45.00 – 47.50
Lower levels near river edge	41.00 – 45.00
Upper site areas / surrounding ground	47.50 – 50.60
Proposed paths and hardstanding	45.00 – 47.50
Existing ground level range across site	41.00 – 50.60
Level of access road into the site	47.62 – 49.16

Craft Studio Architecture have prepared a site layout drawing illustrating the proposed development, as shown in Figure 3 above. The site is located adjacent to the River Erne and is accessed via the existing road network along the southern boundary of the site, with vehicular and pedestrian access provided through the upgraded entrance arrangement shown on the layout drawing.

The topographical survey indicates that the site levels generally fall from the higher ground to the south towards the river along the northern boundary, with the lowest elevations occurring adjacent to the riverbank.

A copy of the topographical survey drawing is included in Appendix A.

3.0 GEOLOGY & HYDROGEOLOGY

The hydrogeology of the site was assessed by means of a desk study of relevant literature. This included available geological and hydrogeological information and maps from the Geological Survey of Ireland (GSI) and the EPA. Groundwater can be defined as water that is stored in, or moves through, pores and cracks in subsoils.

The potential of rock to store and transport water is governed by permeability of which there are two types, intergranular and fissure permeability. The GSI, EPA and the Department of Environment, Heritage, and Local Government (DOEHLG) have developed a Programme of Groundwater Protection Schemes (GPWS), with the aim of maintaining the quality and quantity of groundwater in Ireland, and in some cases improving groundwater quality, by applying a risk assessment approach to groundwater protection and sustainable development.

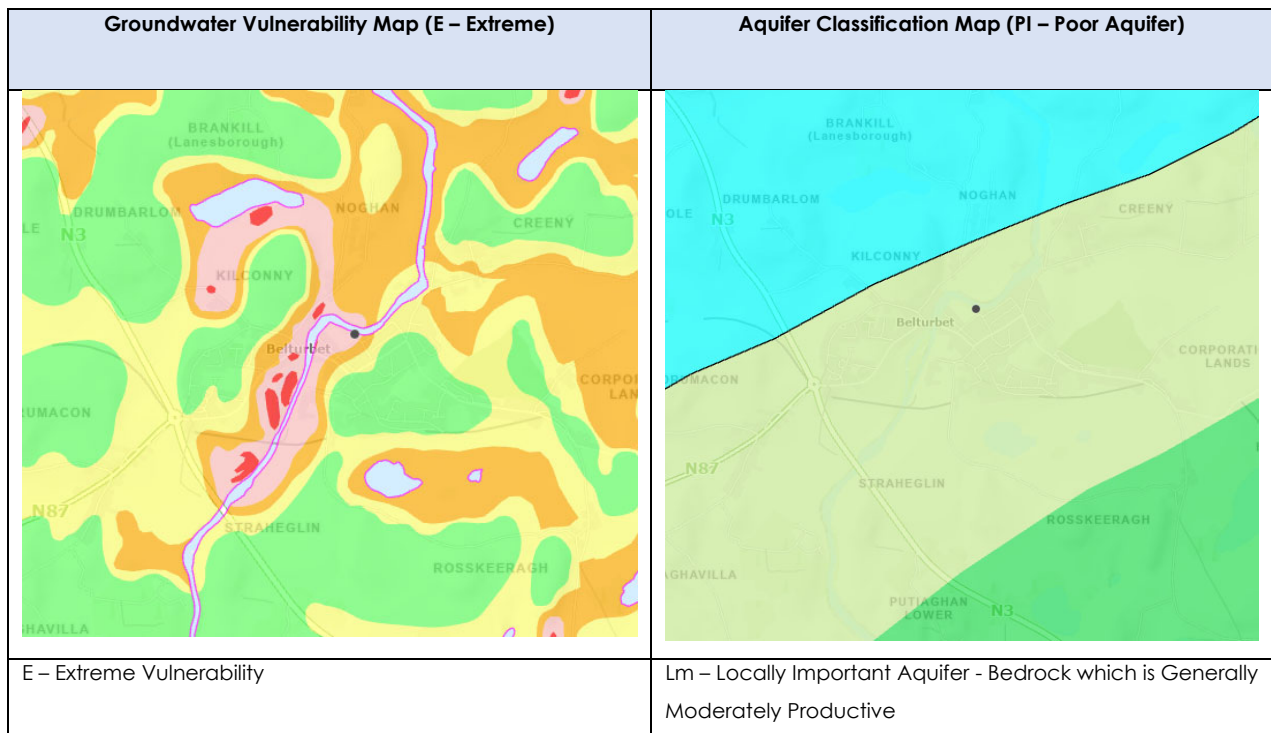
From the GSI maps for the area it can be seen that the bedrock aquifer underlying the site is located within an area of Extreme groundwater vulnerability.

3.1 Soils

The site is shown in GSI mapping is Alluvium & Made Ground.

3.2 Hydrology

Figure 4 - Groundwater Vulnerability and Aquifer Classification Map

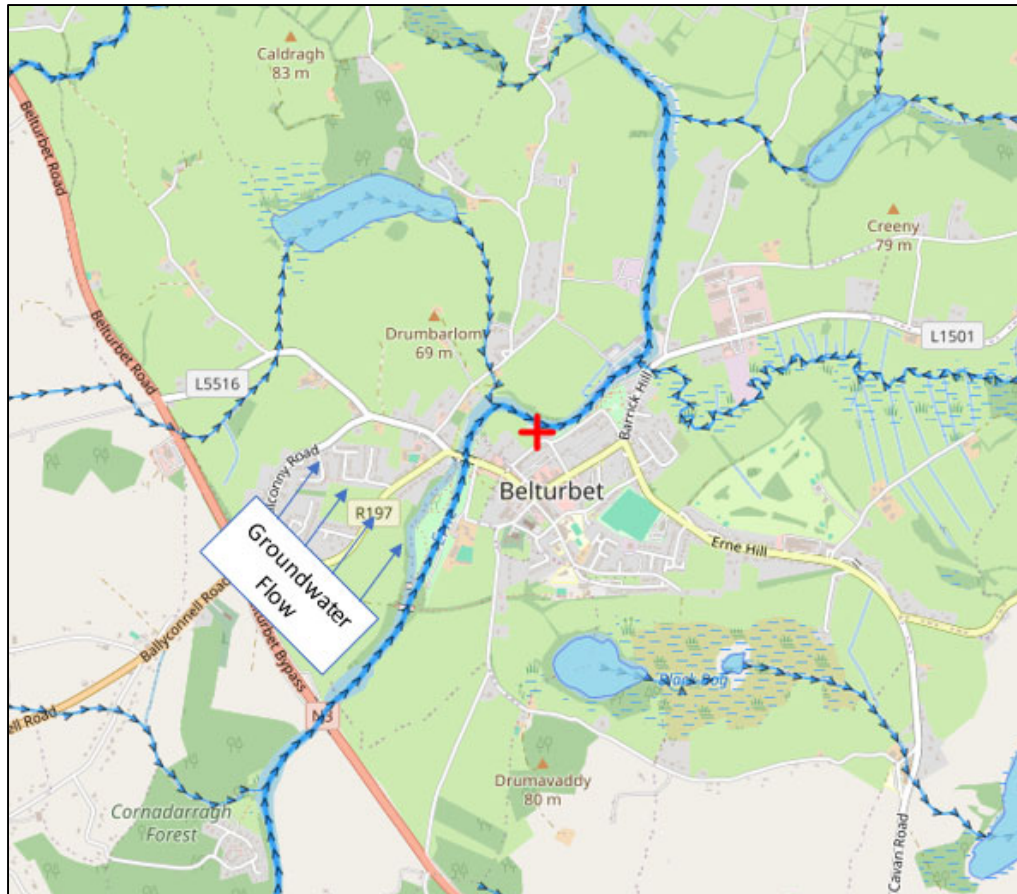


(Source GSI mapping)

3.3 Affected Water bodies

During the survey carried out by Traynor Environmental Ltd hydraulic features were noted on the proposed site. The River Erne runs adjacent the northern boundary of the site.

Figure 5 – Hydraulic Features in relation to proposed site.



4.0 FLOODING HISTORY

As part of the study data collection phase, a number of available sources of information generally as set out in the *Planning and Flood Risk Management – Guidance for Planning Authorities* were investigated in order to build an understanding of the potential risk of flooding to the site. The following review highlights the key findings of the anecdotal evidence collection exercise.

4.1 Published Information

4.1.1 OPW National Preliminary Flood Risk Assessment

The OPW is the lead agency for Flood Risk Management in Ireland and is the national competent authority for the EU Floods Directive. OPW works in close partnership with all Local Authorities in delivering the objectives of the CFRAM Programme.

4.1.2 OPW National Flood Hazard Mapping

The OPW's online National Flood Hazard Mapping Database provides information on reported floods, in the form of reports, photographs and newspaper articles. The database provides information on historic flooding events. No flooding events are recorded within the site area.

4.2 Historical OSI Maps

The historical 6" OSI maps, dated c.1830-1840, and slightly more detailed 25" OSI maps, dated later c.1900-1910, show no structures on the proposed site. There are no indicators of flooding on historical maps.

4.3 OPW National Flood Hazard Mapping

The historic flood event data map for Belturbet, Co. Cavan area obtained from the OPW flood mapping website is shown in figure 6. The map provides no evidence of any actual historical flood events occurring at or within the vicinity of the site.

Figure 6 - Historical OSI Maps

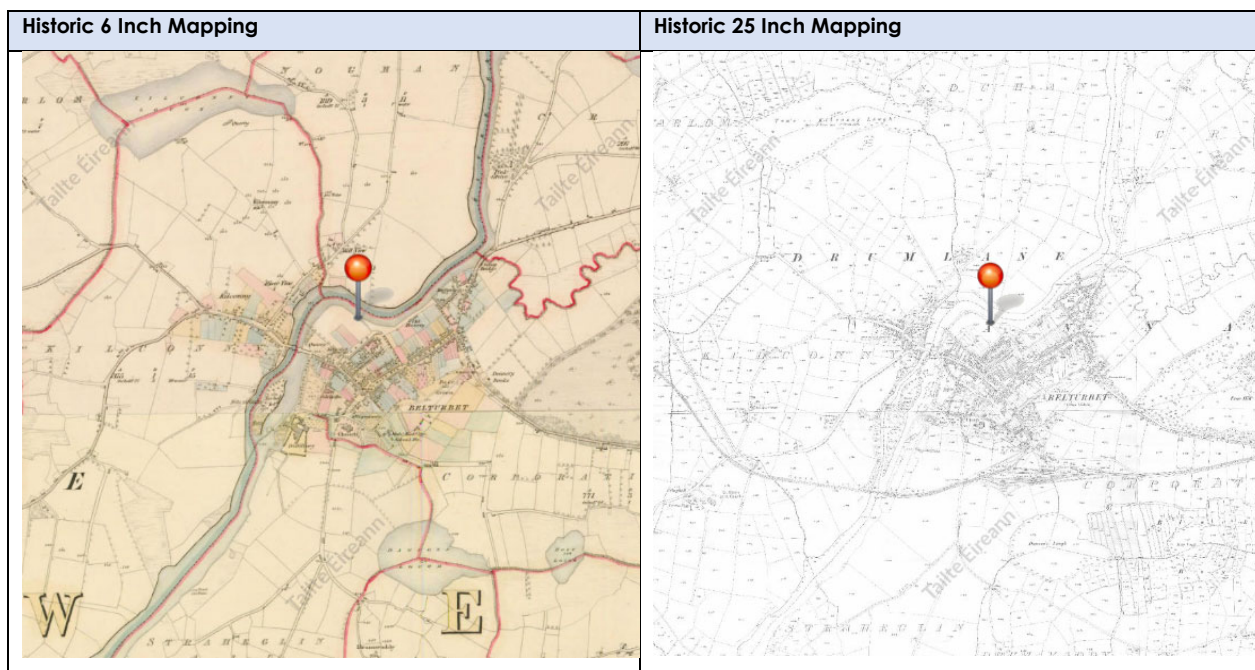
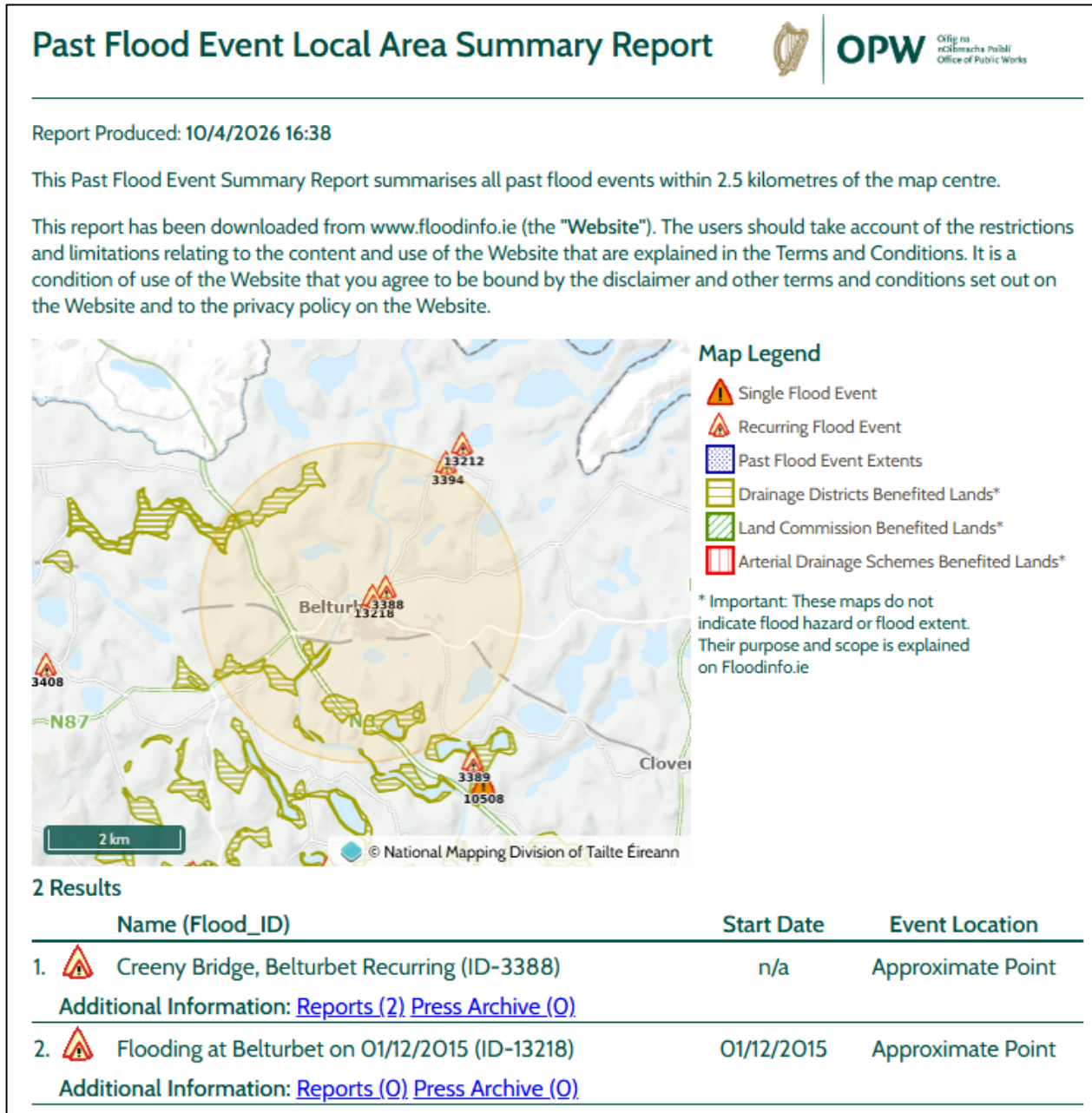


Figure 7 - OPW National Flood Hazard Map



In Summary the OPW Flood Mapping indicates that:

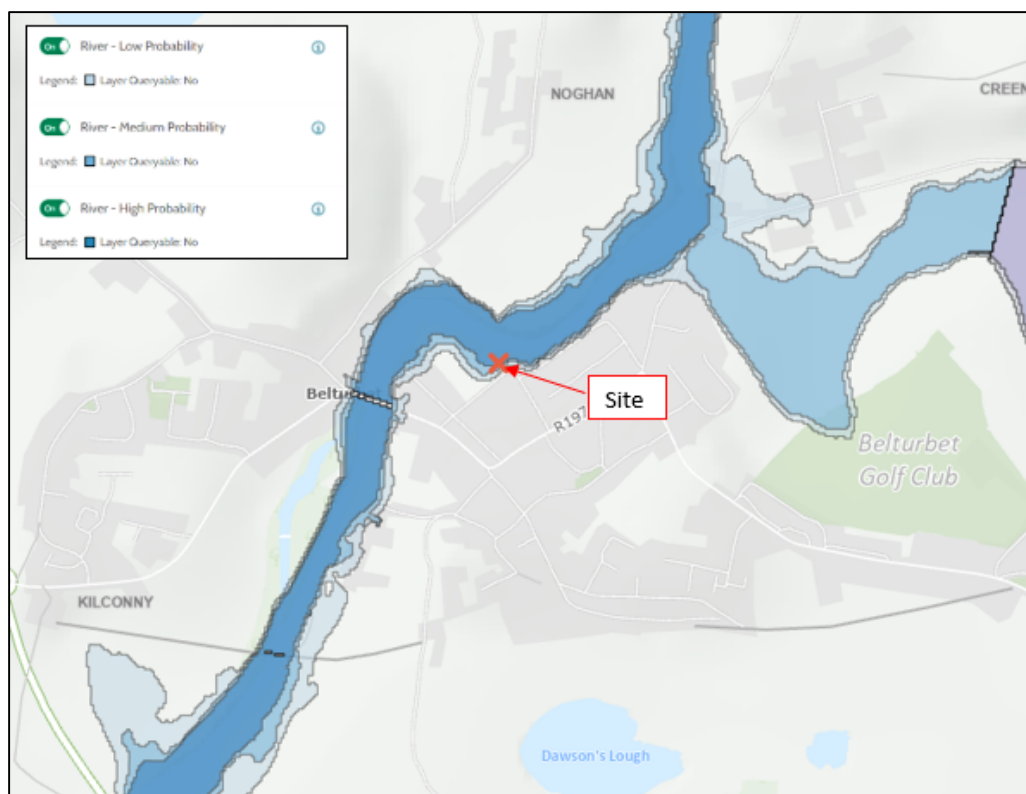
- No flooding events occurred within the site of the proposed development, flooding events occurred 145m downstream.

4.4 OPW Flood Mapping

Figure 8 indicates that the application site is located within Flood Zone A and Flood Zone B and is therefore subject to potential fluvial flood risk associated with the River Erne. Areas surrounding the site also show susceptibility to flooding, particularly in low-lying lands adjacent to the river channel. The proposed development has been designed in accordance with the Planning

System and Flood Risk Management Guidelines (DoEHLG, 2009) and is considered a water-compatible development within these flood zones.

Figure 8 - My Plan OPW Flood Map



4.5 CFRAM Fluvial Flood Risk Map

The proposed site is not located within an area covered by detailed CFRAM flood risk mapping undertaken by the OPW. As such, no site-specific fluvial flood extents are available from the CFRAM Programme for this location.

The CFRAM Programme, where applicable, utilises hydraulic modelling to predict flood levels under a range of flow scenarios at key points along river channels. However, in the absence of such mapping for this site, reliance is placed on available OPW Flood Hazard Mapping and a review of local topography to inform the flood risk assessment.

4.6 River Levels and Hydrometric Data

A review of hydrometric data from the OPW monitoring station at Belturbet (Station No. 36019) indicates a range of river levels under varying flow conditions. Recorded levels range from approximately 0.423 m at the 95th percentile (low flow conditions) to 1.930 m at the 10th percentile (high flow conditions), with a median level of approximately 1.279 m. Flood conditions are represented by higher recorded levels, with a median flood level of approximately 2.231 m and a maximum recorded level of 3.050 m. These data demonstrate the variability in water levels within the River Erne and confirm that the site is influenced by fluvial processes associated with the river system.

5.0 Assessment of Flooding Mechanisms

5.1 Preamble

The Irish government, as part of its development control procedures, advises against inappropriate development in areas at risk of flooding and the avoidance of new developments increasing flood risk elsewhere in accordance with their Planning Policy Document. The following assessment determines the flood hazards to the life and property at the site in order to subsequently assess the site and proposed development relative to the Flood Risk Framework contained within the Planning Policy Document.

5.2 Initial Assessment

The following is a record of the screening assessment of the development site for potential flooding mechanisms requiring subsequent detailed assessment, based on the information obtained from the background information review and consultations.

Table 3 - Possible Flooding Mechanisms

Source/Pathway	Significant	Comment/Reason
Fluvial Flooding		
Flood Plain	Yes	The site is located within the floodplain of the River Erne (Flood Zone A and B)
Structure Blockage	No	No possible downstream structural blockages downstream.
Flood Defence Failure	N/A	There is no flood defences located in the vicinity of the site.
Coastal Flooding		
Tidal/Coastal	N/A	Site is not at affected by tidal/coastal flooding.
Other		
Urban drainage	No	Urban drainage will not be affected.
Groundwater	N/A	Groundwater flooding not deemed to be an issue.
Pluvial Flooding	No	None of the site is affected by Pluvial Flooding.
Infrastructure failure	No	Infrastructure failure not expected to be an issue on the site.
Rainfall Ponding	No	Rain fall ponding is not expected to be an issue on the site.
Reservoirs /Canals/ Artificial Sources	N/A	There are no impoundments or reservoirs in close proximity, or which drain to the site.

5.3 Flood Mechanisms

Flooding is a natural process and can happen at any time in a wide variety of locations. Flooding can come from rivers and the sea, directly from rainfall on the ground surface and from rising groundwater, surcharging sewers, and drainage systems.

5.3.1 Fluvial Flooding

Fluvial flooding occurs when rivers and streams exceed their channel capacity and water flows onto adjacent low-lying areas, commonly referred to as floodplains. This typically arises during periods of prolonged or intense rainfall, where runoff exceeds the capacity of the river channel. Flooding can be exacerbated by factors such as channel constrictions, blockages, or high downstream water levels which restrict flow.

The response of a river to rainfall events varies depending on several factors, including catchment size and slope, soil permeability, underlying geology, land use, and the presence of upstream storage such as lakes. In the case of the River Erne, the hydrological regime is influenced by upstream loughs, which can moderate flow conditions but also contribute to sustained high water levels during prolonged rainfall events.

A review of available OPW National Flood Hazard Mapping indicates that no specific historical flood events have been recorded at the application site. However, flood mapping (including MyPlan and OPW datasets) confirms that the site is located within Flood Zone A and Flood Zone B and is therefore subject to fluvial flood risk associated with the River Erne. Flooding has also been identified in nearby low-lying areas along the river corridor, reflecting the natural extent of the floodplain in this location.

5.3.2 Pluvial flooding:

This type of flooding is defined as flooding from rainfall-generated overland flow before the runoff enters any watercourse or sewer. This mainly occurs when intense rainfall, often of short duration, that is unable to soak into the ground or enter drainage systems, can run quickly off land and result in local flooding. It can also result when the drainage system is overwhelmed by heavy rainfall, becomes blocked or is of inadequate capacity. Flood risk from pluvial flooding exists in all areas. Provision of adequate storm water drainage systems will minimise the risk of pluvial flooding sources.

There is no area inside the site boundary being at risk of pluvial flooding according to the My Plan OPW Flood Map, National Flood Hazard Map and Geological Survey of Ireland Groundwater Flood Mapping. There is no evidence of seasonal flooding within the site boundary. Figure 3 includes the topographical map for the site. The topographical map show that any accumulation of surface water is likely to drain naturally towards the eastern boundary.

5.3.3 Groundwater flooding:

Groundwater flooding occurs when water levels in the ground rise above surface elevation following prolonged and heavy rainfall. It is most likely to occur in low-lying areas underlain by permeable rocks. Groundwater flooding may take weeks or months to dissipate because groundwater flow is much slower than surface flow and water levels thus take much longer to fall. There is no history of groundwater flooding at the site.

5.3.4 Tidal Flooding

The site location is such that It is not affected by tidal water bodies and as such tidal flooding is negligible.

6.0 JUSTIFICATION TEST

In the context of the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' three flood zones are designated in consideration of flood risk to a particular development site.

Flood Zone A – where the probability of flooding from rivers and watercourses is the highest (greater than 1% or 1 in 100 years for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone B – where the probability of flooding from rivers and watercourses is moderate (between 0.1% or 1 in 1000 year for river and watercourse flooding and 0.5% or 1 on 200 for coastal or tidal flooding).

Flood Zone C – where the probability of flooding from rivers and watercourses is low or negligible (less than 0.1% of 1 in 1000 year for both river and watercourse and coastal flooding). Flood Zone C covers all areas that are not in Zones A or B.

The 'Planning System and Flood Risk Management Guidelines' list the planning implications for each flood zone, as summarised below.

6.1 Zone A – High Probability of Flooding

Most types of development would not be considered in this zone. Development in this zone should only be considered in exceptional circumstances, such as in city and town centres, or in the case of essential infrastructure that cannot be located elsewhere, and where the 'Planning System and Flood Risk Management Guidelines' justification test has been applied.

6.2 Zone B – Moderate Probability of Flooding.

Highly vulnerable development such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses, strategic transport, and essential utilities infrastructure would generally be considered inappropriate in this zone, unless the requirements of the justification test can be met. Less vulnerable development such as retail, commercial and industrial uses and recreational facilities might be considered appropriate in this zone. In general, however, less vulnerable development should only be considered in this zone if adequate lands or sites are not available in Zone C and subject to a flood risk assessment to the appropriate level of detail to demonstrate that flood risk to the development can be adequately managed and that development in this zone will not adversely affect adjacent lands and properties.

6.3 Zone C – Low to Negligible Probability of Flooding

Development in this zone is appropriate from a flood risk perspective. Developments in this zone are generally not considered at risk of fluvial flooding and would not adversely affect adjacent lands and properties from a flood risk perspective.

6.4 Flood Risk Zone

The PSAFRM Guidelines classify potential development in terms of its vulnerability to flooding. The types of development falling within each vulnerability class are described in Table 3.1 of the PSAFRM Guidelines, which is reproduced in Table 4.

Table 4 - Development Vulnerability Class

Vulnerability Class	Land use and types of development which include
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding. Hospitals. Emergency access and egress points. Schools. Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes, and social services homes. Caravans and mobile home parks. Dwelling houses designed, constructed, or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial, and non-residential institutions. Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans. Land and buildings used for agriculture and forestry. Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.
Water-compatible development	Flood control infrastructure. Docks, marinas and wharves. Navigation facilities. Ship building, repairing, and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation). Lifeguard and coastguard stations. Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).

The Guidelines define the zones in which each class of development is appropriate – this is summarised in Table 5. The PSAFRM Guidelines recognise that flood risks should not be the only deciding factor in zoning for development; the PSAFRM Guidelines recognise that circumstances will exist where development of a site in a floodplain is desirable in order to achieve compact and sustainable development of the core of urban settlements. In order to allow consideration of such development, the PSAFRM Guidelines provide a Justification Test, which establishes the criteria under which desirable development of a site in a floodplain may be warranted.

Table 5 - "Appropriateness" Matrix

	Flood Zone A	Flood Zone B	Flood Zone C
Highly Vulnerable Development	Justification Test	Justification Test	Appropriate
Less Vulnerable Development	Justification Test	Appropriate	Appropriate
Water – compatible Development	Appropriate	Appropriate	Appropriate

The Planning System and Flood Risk Management Guidelines (DoEHLG, 2009) provide vulnerability categories based on the type of development. The proposed development is classified as water-compatible development, comprising the upgrade of existing jetty infrastructure, slipway improvements, and associated public amenity works.

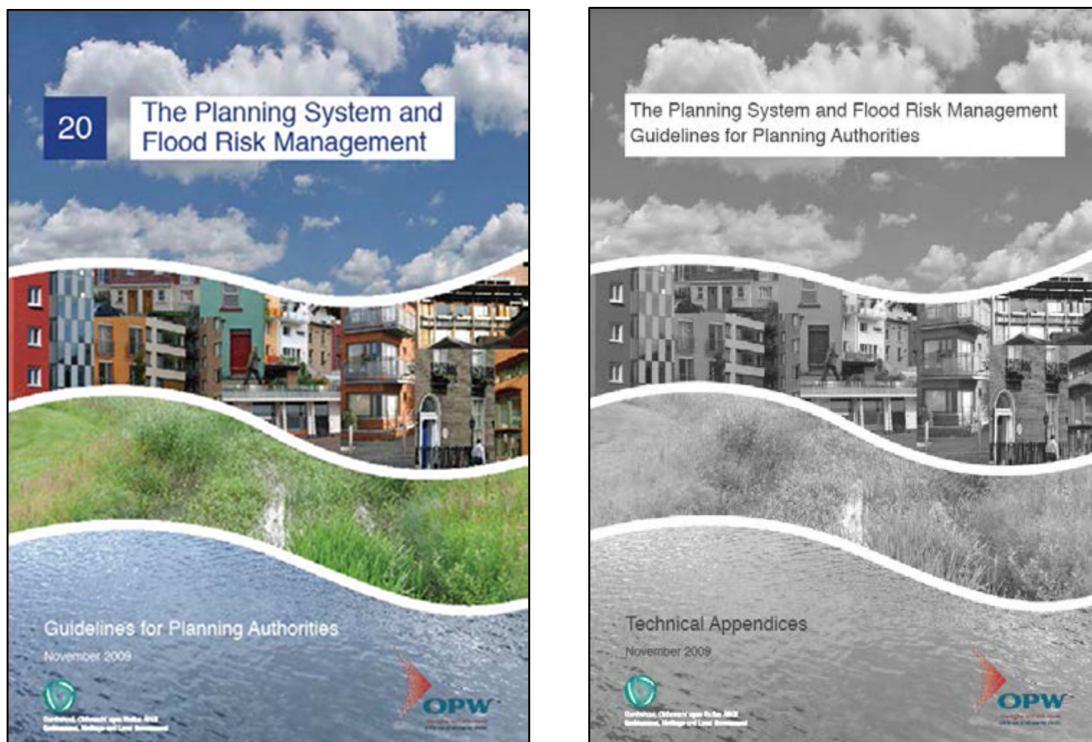
Water-compatible development, including docks, marinas, and waterside recreational uses, is considered appropriate within Flood Zone A and Flood Zone B. As such, the proposed development is acceptable in the context of flood risk, subject to appropriate assessment and mitigation.

6.5 Justification Test

As per the outcome of the vulnerability matrix discussed above the proposed development does not require a Justification Test. However, as part of a conservative approach, it is deemed appropriate to consider the implications of a Justification Test on any aspects of the proposed works.

In November 2009, new planning guidelines on the planning system and Flood Risk Management were published by the department of the environment, heritage and local Government (DOEHLG).

Figure 9 - The Planning System and Flood Risk Management



6.6 Part 1 of the Justification Test

The Justification Test is an assessment of whether a development proposal within an area at risk of flooding meets specific criteria for proper planning and sustainable development and demonstrates that it will not be subject to unacceptable risk nor increase flood risk elsewhere. The justification test should be applied only where development is within flood risk areas that would be defined as inappropriate under the screening test of the sequential risk-based approach adopted by this guidance.

Table 6 – Requirements of Part 1 of the Justification Test

JUSTIFICATION TEST CRITERIA
Requirement No.1 - The area is within or adjoining the centre* of a city or town designated for growth in key policy documents such as the National Development Plan, the National Spatial Strategy, any Regional Planning Guidelines in force, planning guidelines/directives under Sections 28/29 of the Planning and Development Act 2000 and/ or an operative City/County development plan which has been adopted taking adequate account of these guidelines. Site Specific Response Yes - the site is located within the administrative area of the Cavan County Development Plan 2022–2028.
Requirement No. 2 - The area comprises significant previously developed and/or underutilised lands within the urban envelope. Site Specific Response The area comprises significant previously developed and/or underutilised lands.
Requirement No. 3 - Development of the area is essential to facilitate regeneration or town and city centre expansion, as demonstrated in city and county development plans that have been assessed in accordance with these guidelines. Site Specific Response The site is located within Belturbet and forms part of the Cavan County Development Plan 2022–2028. The proposed development supports the regeneration and enhancement of the existing marina and public amenity area, in line with the objectives of the Development Plan.
Requirement No. 4 - Strategic Environmental Assessment has been undertaken, where applicable, taking full account of flood risk. Site Specific Response A Strategic Flood Risk Assessment (SFRA) has been carried out as part of the Cavan County Development Plan 2022–2028, which incorporates consideration of flood risk in zoning and development objectives.
Requirement No. 5 - There are no reasonable and available alternative development areas or sites that meet the wider strategic policy requirements as outlined at 1 above, within low or lower flood probability areas. Site Specific Response The proposed development is site-specific in nature, relating to the upgrade and enhancement of existing jetty and marina infrastructure along the River Erne. As such, there are no reasonable alternative locations outside of the identified site that would meet the functional and strategic requirements of the development.
Requirement No. 6 - A flood risk assessment to an appropriate level of detail has been carried out. Site Specific Response Yes – a Site-Specific Flood Risk Assessment (SSFRA) has been undertaken for the proposed development. The assessment identifies potential sources of flood risk and outlines appropriate mitigation measures, confirming that the development can be carried out without increasing flood risk elsewhere.

6.7 Part 2 of the Justification Test

The site and site activities satisfy all of the criteria outlined in Table 6, and therefore Part 1 of the Justification Test is deemed to have been passed. Hence the Justification Test can proceed to Part 2.

A Justification Test is not strictly required for water-compatible development but has been considered as a conservative approach.

In line with the Guidelines (DoEHLG, 2009), the flood risk assessment should demonstrate:

Table 7 – Requirements of Part 2 of the Justification Test

JUSTIFICATION TEST FOR DEVELOPMENT MANAGEMENT
1. The subject lands have been zoned for the particular use. Yes: The site is located within Belturbet and falls under the Cavan County Development Plan 2022–2028. The proposed development is considered a water-compatible use, comprising the upgrade of existing marina infrastructure and public amenity space, which aligns with the zoning objectives for the area and supports the sustainable development and regeneration of the town.
2. The proposal has been subject to an appropriate flood risk assessment that demonstrates Yes: This report comprises a Site-Specific Flood Risk Assessment (SSFRA) for the proposed development – see preceding sections.
(i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk. Yes: The assessment demonstrates that the proposed development will not increase flood risk elsewhere. The works are localised, do not alter floodplain storage or conveyance, and maintain the existing hydraulic regime of the River Erne. (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible. Yes: The design incorporates appropriate levels and drainage measures, including the management of surface water runoff via a controlled drainage network. The development is water-compatible in nature and includes no vulnerable structures, thereby minimising risk to people and property. (iii) The development proposed includes measures to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures and provisions for emergency services access; and Yes: Residual flood risks are considered low and manageable. The development does not impede flood flows or reduce floodplain storage, and access arrangements will remain available during flood events where practicable. (iv) The development proposed addresses the above in a manner that is also compatible with the achievement of wider planning objectives in relation to development of good urban design and vibrant and active streetscapes. Yes: The proposed development enhances the existing marina and public amenity area, contributing positively to the public realm and recreational use of the area. The design is compatible with the surrounding environment and supports wider planning objectives for sustainable development and town centre enhancement in Belturbet. Conclusion: The site is deemed to have passed the Justification Test for Development Management (Part 2)

7.0 DESIGN FLOOD LEVELS

The Planning System and Flood Risk Management Guidelines (DoEHLG, 2009) recommend that, where appropriate, finished levels are set above potential flood levels with an allowance for freeboard. However, in the absence of detailed hydraulic modelling or CFRAM flood level data for the site, no site-specific design flood levels have been derived for the River Erne at this location.

A review of OPW Flood Mapping indicates that the application site is located within Flood Zone A and Flood Zone B and is therefore subject to fluvial flood risk associated with the River Erne. As such, the site forms part of the natural floodplain.

The proposed development comprises water-compatible uses, including the upgrade of existing jetty and slipway infrastructure, installation of floating jetties, and associated public realm works. No habitable buildings or vulnerable receptors are proposed as part of the development.

The works are localised in nature and will not result in any loss of floodplain storage, obstruction to flood flows, or alteration of the existing hydraulic regime. Existing access arrangements will be maintained, and the nature of the development does not require dry access during flood events.

No hazardous materials will be stored on site, and the development will not impede access to the watercourse, floodplain, or any Flood Risk Management infrastructure.

Accordingly, while the site is located within an area at risk of flooding, the proposed development is considered appropriate having regard to its water-compatible nature and compliance with the Planning System and Flood Risk Management Guidelines.

7.1 Potential for the project to contribute to off-site flooding

The proposed development is localised in nature and will not result in any increase in flood risk elsewhere. The works do not involve any encroachment into the river channel, loss of floodplain storage, or obstruction of overland or fluvial flow paths. Surface water runoff from the limited hardstanding areas will be managed appropriately, ensuring no increase in runoff rates or downstream flood risk.

7.2 Residual Risk

Residual flood risk refers to the risk that remains following the implementation of all reasonably practicable mitigation measures, including risks associated with extreme events exceeding the design standard.

Given the location of the site within Flood Zone A and Flood Zone B, some residual risk of flooding remains associated with extreme fluvial events. However, the proposed development comprises water-compatible uses and does not include any vulnerable receptors or habitable structures.

The development will not impede flood flows, reduce floodplain storage, or alter the existing hydraulic regime of the River Erne. In the event of extreme flooding, any impacts would be limited to temporary inundation of hardstanding and amenity areas, which are considered acceptable given the nature of the development.

Accordingly, residual flood risks are considered to be low and acceptable.

Table 8 – Residual Flood Risks

Description of Risk	Hazard	Residual Impact
Underestimation of fluvial flood levels	Extreme flood events exceeding anticipated levels or future updates to OPW/CFRAM mapping	The site is located within Flood Zone A and B and therefore subject to fluvial flood risk. In extreme events, temporary inundation of the site may occur. However, the development comprises water-compatible uses with no vulnerable receptors, and impacts are considered acceptable.
Access and egress routes to and from the site during a 1%/0.1% AEP flood event	Flooding of surrounding low-lying areas and access routes	Access to the site may be temporarily affected during extreme flood events. However, given the nature of the development (non-residential, water-compatible), this is considered acceptable and does not pose a significant risk to life or property.
Surface water drainage / stormwater system	Localised blockage or exceedance of drainage infrastructure	In the event of drainage exceedance, overland flow will follow natural gradients towards the River Erne. Given the small scale of the development and absence of significant impermeable areas, the residual risk is low.

8.0 CLIMATE CHANGE

The Planning System and Flood Risk Management Guidelines (DoEHLG, 2009) recommend that the potential impacts of climate change on flood risk are considered in all flood risk assessments. Climate change is expected to result in increased rainfall intensity and frequency, which may lead to an increase in fluvial flood extents over time.

In the absence of detailed hydraulic modelling for the site, a precautionary approach has been adopted. Given that the application site is already located within Flood Zone A and Flood Zone B, it is recognised that the extent and frequency of flooding may increase under future climate change scenarios.

However, the proposed development comprises water-compatible uses, including jetty infrastructure and associated public amenity works, which are appropriate within flood risk areas. The development does not include vulnerable receptors and will not result in any loss of floodplain storage, obstruction of flood flows, or increase in flood risk elsewhere.

Accordingly, the proposed development is considered to be resilient to the potential impacts of climate change and remains compliant with the Planning System and Flood Risk Management Guidelines.

8.1 Assessing flood risk in the context of climate change

The proposed development has been designed having regard to its location within a fluvial flood risk area. Given the nature of the works, which are water-compatible and do not involve habitable structures, the potential impacts of increased flood levels under climate change scenarios are considered acceptable.

Surface water drainage associated with the development will be managed through appropriate measures to ensure that runoff is controlled and does not contribute to increased flood risk elsewhere. The scale and nature of the development are such that it will not significantly alter the existing hydrological regime of the River Erne.

Overall, the residual flood risk under climate change scenarios is considered to be low and acceptable.

9.0 CONCLUSION

Based on the examination of the development site, its location, and the nature of the proposed works, this Flood Risk Assessment has been carried out in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities (DoEHLG, 2009).

A review of available flood mapping confirms that the application site is located within Flood Zone A and Flood Zone B and is therefore subject to fluvial flood risk associated with the River Erne. This reflects the site's location within the natural floodplain of the river.

The proposed development comprises water-compatible uses, including the upgrade of existing jetty and slipway infrastructure, installation of floating jetties, and associated public amenity works. Such development is considered appropriate within Flood Zone A and Flood Zone B in accordance with the Guidelines.

The proposed works are localised in nature and will not result in any loss of floodplain storage, obstruction of flood flows, or alteration of the existing hydraulic regime. No vulnerable receptors are proposed, and the development will not increase flood risk elsewhere.

While a degree of flood risk exists due to the site's location, this is considered acceptable having regard to the nature of the development. Accordingly, the proposed development is not expected to be adversely affected by flooding, nor will it give rise to increased flood risk elsewhere.

Signed:

A handwritten signature in blue ink, appearing to read 'Nevin Traynor'.

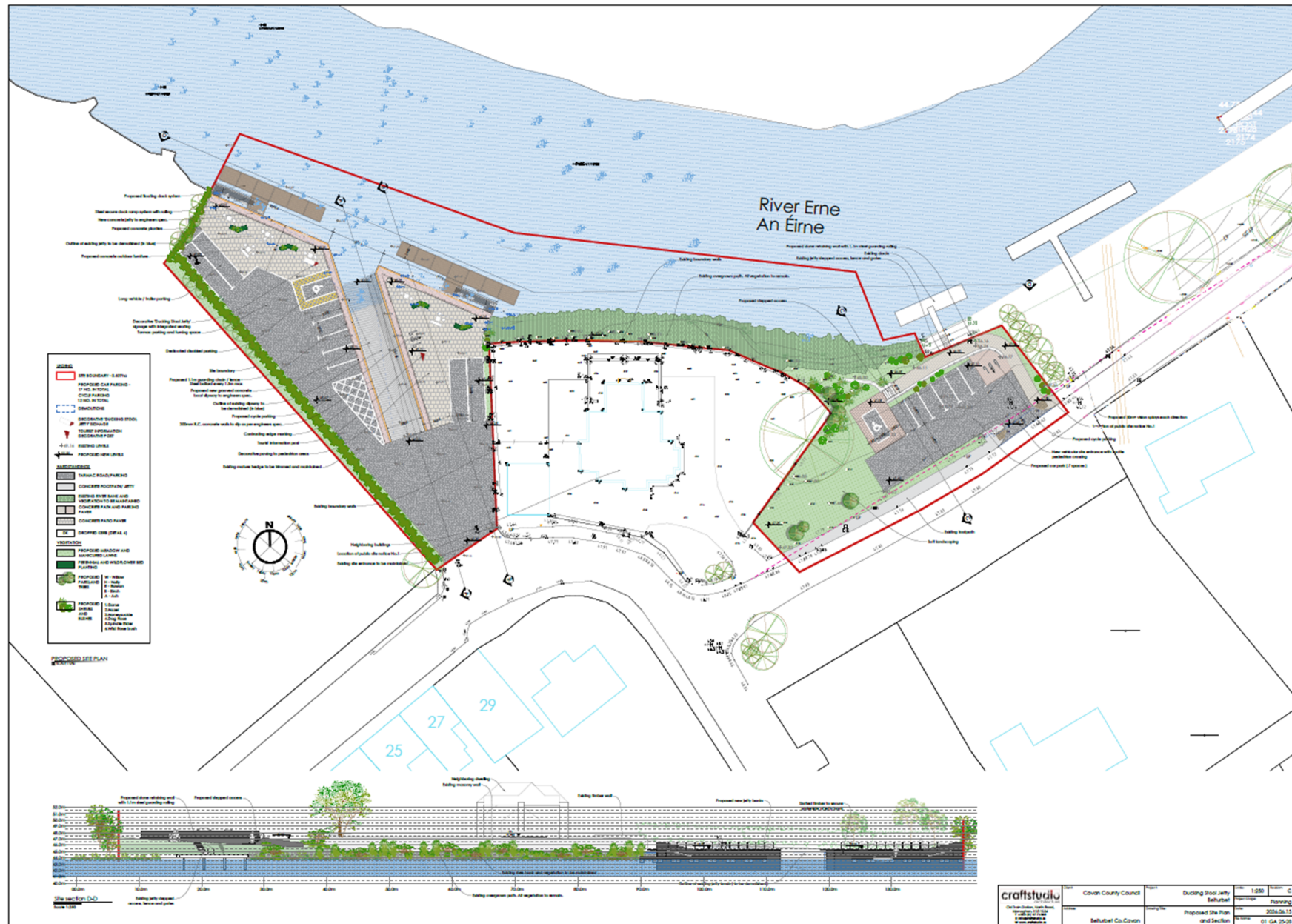
Nevin Traynor

BSc. Env, H. Dip I.T, Cert SHWW.

For Traynor Environmental Ltd

**SITE SPECIFIC FLOOD RISK ASSESSMENT
COMPLETED BY
TRAYNOR ENVIRONMENTAL LTD**

APPENDIX A – TOPOGRAPHICAL SURVEY



SITE SPECIFIC FLOOD RISK ASSESSMENT

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APPENDIX B – OPW FLOOD MAP

