

HRA PLANNING
Chartered Town Planning Consultants

Submission on
Draft Limerick Development Plan 2022 - 2028



On behalf of:
Mr. Michael Gabbett



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Project:		
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1.0 INTRODUCTION & PURPOSE OF SUBMISSION

HRA PLANNING Chartered Town Planning Consultants has been retained by Mr. Michael Gabbett, Ballykeefe, C. Limerick (**‘the property owner’**) to prepare the following submission to Limerick City and County Council in respect of the Draft Limerick Development Plan 2022-2028.

This submission relates to 4 plots of land in the Mungret area of the ‘Southern Environs’ suburb of Limerick City and metropolitan area as illustrated in Figure 1 and 2 enclosed at the end.

The property owner respectfully requests that the proposed landuse zoning provisions of the draft Limerick Development Plan (**‘the Draft Plan’**) are reviewed and subsequently amended to reflect the site circumstances and opportunities of the subject lands vis-à-vis their strategic location, and, having regard to the commitment by the property owner heretofore, in facilitating the compulsory acquisition and subsequent dissection of his property for the construction of strategic national roads through its property.

The property owner respectfully submits that the proposed agricultural landuse zoning applied to portions of the subject site, are inappropriate to this location, and represents an underutilisation of serviced land within the Limerick City Metropolitan area which is planned for growth, and would contrary to the approach in the National Planning guidelines, which seeks to achieve efficiencies in the use of serviced land within cities and urban areas designated for growth.

This submission sets out the material planning reasons why the subject lands should be zoned for **‘enterprise and employment’** corresponding to that use which has been applied on some parts of the subject property in the draft plan.

This submission is accompanied by a site-specific flood risk assessment report¹, and the conclusions drawn in that assessment which have informed some aspects of this submission.

2.0 BACKGROUND

2.1 Site Location and Context

The subject property comprises a number of separate plots located between the village of Mungret and the (junction 2) intersection on/off ramps between the N18 / N69 national roads and the ‘Dock Road’ which serve as the Limerick city bypass within the western environs of the city area. The location of each plot of land is illustrated in Figure 1 and comprises Plot A (5.57ha), Plot B (4.25ha), Plot C (5.57ha) and Plot D (10.22ha).

Plot A is situated on the N69 generally opposite the Irish Cement factory. Plots B-D are situated immediately adjacent to the previously mentioned intersection and whilst subdivided by the N18 National road, they are connected to, and accessible via the Ballykeefe Boreen from the Dock Road.

¹ Flood Risk Assessment prepared by PUNCH Consulting Engineers

Figure 1 illustrates the location of each plot, and illustrates also, the extent to which the construction of the Limerick N18 bypass route has subdivided the overall landholding.

Plots B-D are currently undeveloped and of improved agricultural greenfield character.

The Dock Road (R510) accommodates several commercial and industrial landuse activities including the Blackberry Business Park situated immediately adjacent to the north of the subject lands and which accesses the Dock Road by the upgraded Ballykeefe Boreen road. The majority of the Dock Road frontage, as it extends westward from the city centre up to the N18 intersection, is developed with residual and rear lands identified for similar urban development.

Plots B-D represent an unrivalled location, positioned at a pivotal gateway intersection between the National transportation network, and the edge of city. This location offers immediate accessibility to routes to/from the city, to Ennis/Galway to the north, Dublin to the east, and to designated 'Tier 1' port installation The Shannon Foynes Port Company which has operational facilities at Foynes via the N69 and on the Dock Road.

2.2 Draft Landuse Zoning Provisions

The Draft Plan allocates a number of different zoning objectives to the subject plots. Plots B and C comprise of both 'enterprise and employment' and 'Agriculture' land use zoning objectives. Plot D is comprised predominantly of 'agriculture' and 'semi-natural open space' with a very small portion of 'enterprise and employment'. The 'semi-natural open space' on Plot D extends back for a distance of in excess of 100m from the edge of the Ballinacurra Creek.

The purpose and extent of these zoning objectives, as they apply to the subject plots of land, and their purpose within the wider city environs, and to this strategic location are unclear.

3.0 GROUNDS OF SUBMISSION

The grounds for submission are based on the following material considerations:

3.1 Inappropriateness of draft zoning objectives: '**Agriculture**' and '**Semi-Natural Open Space**'

3.1.1 *Inappropriateness of draft 'Agriculture' zoning objectives: and 'Semi-Natural Open Space'*

The preparation of the Draft Plan results in the coming together, for the first time under one plan, the combined spatial development and landuse zoning objectives for the Limerick city urban area, and the Southern Environs which previously, were set out under the Limerick City Development Plan 2010 As amended and varied), and, the Southern Environs Local Area Plan 2021-2027.

In the morphing together of these two Plans, the collective spatial development objectives and landuse zoning provisions has resulted in a mosaic of development and non-development landuse zoning objectives which extend between the Dock Road and the village of Mungret and adjacent to a strategic intersection where access to and from the city centre meets the Limerick Southern ring-road and the national road network which extends to other major urban centres and regions.

In effect, this mosaic approach to this agriculture land zoning is likely to create instances where 'enterprise and employment' will occur on backlands, behind 'agriculture' zoned land, and functionally appear piecemeal, disjointed and require greater road construction and extended provision of services to reach those 'development' areas.

Examining these differing zoning objectives in a wider metropolitan city context, presents a scenario of potential under-utilisation of serviced land located at a critical gateway access point to the urban city centre and at a location with immediate access to strategic national road network.

In considering the function and suitability of 'agriculture' zoning to this location, reference is made in the first instance to the zoning objectives set out in the draft plan Chapter 12 (Landuse Zoning Strategy) which state that the Objective of the 'Agriculture' zoning objective is to;

"To protect and improve rural amenity and provide for the development of agricultural uses".

The purpose of the zoning is stated;

"To protect rural amenity and agricultural lands from urban sprawl and ribbon development and provide a clear demarcation to the adjoining built up areas".

In the first instance, the property owner seeks to confirm that the agricultural use of the property, in the manner prescribed and provided for in the landuse zoning objective, is neither feasible nor practical. The agricultural landholding has been eroded from its original 69 hectares in its operational prime to circa 16 hectares for a variety of reasons including, land take for public road building, the consequent effects of severance by road construction, and residual effects of a mosaic of different landuse zoning types in the last local area plan including 'enterprise and employment'. Thus, in the first instance, the landholder can confirm that there is no necessity to protect and/or provide for agricultural use of the subject lands for 'agriculture' use because it is commercially unviable to do so.

Secondly, the use of an 'Agriculture' zoning objective for the purpose of protecting rural amenity, to prevent urban sprawl or to provide a clear demarcation between built up areas is incongruous to the preferential and the optimal sequential use of serviced urban land at this location. The Limerick Southern Ring Road has to an extent, been a controlling feature in preventing 'urban sprawl' and making a distinction in urban areas between the Dock Road City core area to the east, and the suburban centre of Mungret to the west. Furthermore, the provision of sporadic agricultural zoning, around a major gateway to a metropolitan city area, which is planned for significant settlement growth in Limerick is, is somewhat counterintuitive to sustainable integrated landuse and transport planning, and National and Regional spatial development objectives, when in fact other urban uses may well be appropriate on the site and developed sufficiently responsive to flood risk management requirements (discussed later).

Figure 3 and 4 illustrates the spatial location of the property within the context of strategic road network and illustrates that the potential opportunities of its immediate accessibility to the national roads network.

In effect, the proposed piecemeal nature of the agriculture zoning, provides no feasibility for agriculture use or for the purpose of controlling settlement sprawl and thus, is considered an inappropriate landuse allocation to the subject property.

3.1.2 Inappropriateness of draft 'Semi-Natural Open Space' zoning objectives

The 'semi-natural open space' designated within Plot D appears to be without logical justification other than its position adjacent to the Ballinacurra Creek. The extent of that zoning encroaches for a significant distance from the Ballinacurra Creek, into Plot D for a distance of circa 100m following and follows an arbitrary line of an internal field boundary.

The stated objective and purpose of this zoning objective (as stated in Chapter 12 of the draft plan) is to prohibit development in order to maintain the integrity of Natura 2000 sites and flood plains for wildlife habitat flora and fauna and floodwater storage. Furthermore, it is noted that Objective SCSi O18 (Protection of lands zoned for public open space) which states that It is an objective of the Council to:...."(b) *Protect semi-natural open space areas from inappropriate development in the interest of recreational enjoyment, community health and well-being, flood protection and biodiversity*".

The consideration of 'flood protection' is considered in detail, under separate section later in this submission. That aside, the property owner submits that there is no current or planned openspace, recreational enjoyment, or community health function of Plot D that requires 'protection' by way of allocation of 'semi-natural open space zoning as provided for in Objective SCSi O18. Secondly, the property owner is not aware of any scientific evidence that demonstrates how this allocation of 'semi-natural open space' is necessary, from a landuse planning perspective, to protect biodiversity as provided for in Objective SCSi O18. Furthermore, the property owner is not aware of any scientific evidence which confirms a necessity to sterilize in excess of 100m of land extending back from the creek for the purpose of prohibiting development in order to maintain the integrity of the SAC specifically, for the purpose of protecting a specific habitat type, a specific feature, or habitat of feature which is of conservation value and protected under the EU Habitats Directive.

The consequential effect of this zoning is that it sterilises a significant portion of Plot D from potentially suitable development uses that might be consistent with National, Regional and Local planning policy, and, which might have no effect to the ecological amenity of the Ballinacurra Creek or the SAC.

The provisions of 'Part XAB' of the Planning and Development Act 2000 (as amended) provides the statutory test ('appropriate assessment') for ensuring that the integrity of the SAC designation is maintained. With that statutory provision in place (which is transposed into specific policy objectives contained in the draft Plan), and, without any scientific evidence to the contrary, the applicant submits that there is no necessity for the draft Plan to apply the 'semi-natural open space' landuse zoning objective in such an extensive manner in Plot D for the purpose of protecting the SAC.

The property owner is mindful that the local authority can rely on the full provisions of the Part XAB 'appropriate assessment' mechanism and the provisions of the EU Habitats Directive for the purpose of protecting designated Natura 2000 sites, irrespective to whatever land use zoning applies.

That said, and mindful of the principles of biodiversity, the property owner submits that any such amenity buffer from the Ballinacurra Creek (if it is the Council's intention to provide an amenity buffer), could be practically and reasonably applied to a distance back from the creek of circa 20m. This could be applied by way of modified semi-natural open space landuse zoning objective restricted to that extent, or, otherwise, delivered as part of any urban development landuse activity by way of express development management policy objective without necessarily requiring to sterilize a large swath without apparent reason.

3.2 Suitability of Location for 'Enterprise and Employment Uses'

The suitability of the subject sites for urban landuse activities has been confirmed by virtue of the existing 'enterprise and employment' landuse zoning objectives which have been applied to portions of those lands by the Planning Authority.

The site is sufficiently serviced by existing road infrastructure with direct accessibility from Ballinacurra Boreen / Dock road and is situated adjacent to the Dock Road and the significant area of commercial and enterprise activities that occur there, to justify the principle of 'enterprise and employment' use of the subject site.

3.3 Suitability of Infrastructure to support enterprise and employment use

Plot A has direct access from the N69 road. Plots B-D have direct access from the Dock Road, via the Ballykeefe Boreen. The Ballykeefe Boreen has been upgraded in recent years and this has included road widening extending for some 520m in form the Dock Road including the a 'flyover' bridge over the N18 and specific road junction access points on both sides of that flyover bridge which provides dedicated future access points into the subject lands. The intersection of the Dock Road and the Ballykeefe Boreen includes a (circa) 30m splayed 'T-junction' offering clear lines of sight to oncoming traffic travelling in both directions.

The road width from the Dock Road is generally in the order of 8m in width. Whilst a narrower section does occur between 215m and 335m back from the Dock Road, that section is within the property owner's ownership and any infrastructural deficiency at that point can be addressed through the detailed development management process.

3.4 Strategic Objectives Supporting Urban Employment Growth

Strategic and local Planning for urban and employment growth is set within the context of the National Planning Framework ('NPF'), and the Southern Regional Spatial and Economic Strategy ('RSES').

and the draft plan. The following observations are considered pertinent in the context of recognises the relevance and importance of the subject site and its location.

The National Planning Framework

Section 4.4 of the NPF ('Planning for Urban Employment Growth') recommends that locations for expansion of existing enterprises should be dependent on the availability of different types of infrastructure including for example, **communications, power, water, roads ports and airports**. (emphasis added).

The Southern Regional Spatial Economic Strategy ('RSES')

The RSES acknowledges that the Limerick Shannon Metropolitan Area with its high capacity transport corridors is a global gateway with a number of dynamic relations including: international connectivity through the Ports and Airport, its connections to the Dublin, Galway, Cork and Waterford metropolitan areas, connection to Key Towns in the Mid-West and its relationship to surrounding towns, villages and rural areas.

The RSES advocates the compact sustainable growth and the development of brownfield and infill lands to achieve growth targets and Integrated transport and landuse – the target growth along high quality public transport corridors. The RSES **Limerick Shannon MASP Policy Objective 9** promotes greater collaboration between the metropolitan areas of Galway and Limerick Shannon and the Key Town of Ennis (GESL) Economic Network to drive economic growth and innovation on a sub-regional basis. This potential network is underpinned by the presence of public transport and motorway infrastructure that connects the two cities on the West coast of Ireland and promotes the effective development and excellent inter-regional transport connections.

Draft Limerick Development Plan

Section 2.2 of the draft Development Plan reinforces the strategy recognition (contained in the NPF) that Limerick City region as a key asset, that will play a major role in both driving and accommodating a significant proportion of the proposed national population growth and will act as an effective complement to the economic strength of Dublin, and, that future growth will be based on leveraging national, regional and international connectivity, higher education capacity and quality of life to secure strategic investment. In tandem, regional population projections for the Plan period suggest an additional population of circa 49,200², two-thirds of which is planned with the Limerick City and environs area which includes **Mungret** (as well as Annacotty).

The 'Core Strategy' contained in the Draft Plan, expressly states that the Limerick City Metropolitan Area, including Mungret and Annacotty is designated for significant growth under the National Planning (NPF) and Regional Planning (RSES) spatial development objectives. Section 2.6 of the Core Strategy recognises also, the obligation on planning authorities to ensure sufficiency of land identified at suitable locations for employment purposes and suggests that the such zoning should have regard to the Draft Limerick Shannon Metropolitan Area Transport Strategy (LSMATS) and the availability of infrastructure. Draft development plan objectives which support economic development are set out in Chapter 4 and which include inter-alia;

² Draft Development Plan, Chapter 2 'Core Strategy' Table 2.1 and Table 2.2

Objective ECON O13 Strategic Employment Locations City and Environs

It is an objective of the Council to:

a) Promote, facilitate and enable a diverse range of employment opportunities by facilitating appropriate development, improvement and expansion of enterprise and industry on appropriately zoned lands, accessible by public and sustainable modes of transport,

Objective ECON O19 Clustering and Innovation

It is an objective of the Council to encourage and facilitate the sustainable development and clustering of knowledge-based and high tech industries/businesses at appropriate locations in Limerick

Objective ECON O24 Data Centres

It is an objective of the Council to:

a) Facilitate the development of Data Centres on lands appropriately zoned for such purposes, subject to normal planning, development and environmental controls and the assessment of the potential impact on such development on adjacent land uses.

b) Promote co-location of data centres with renewable energy sources at appropriate locations subject to proper planning and sustainable development considerations.

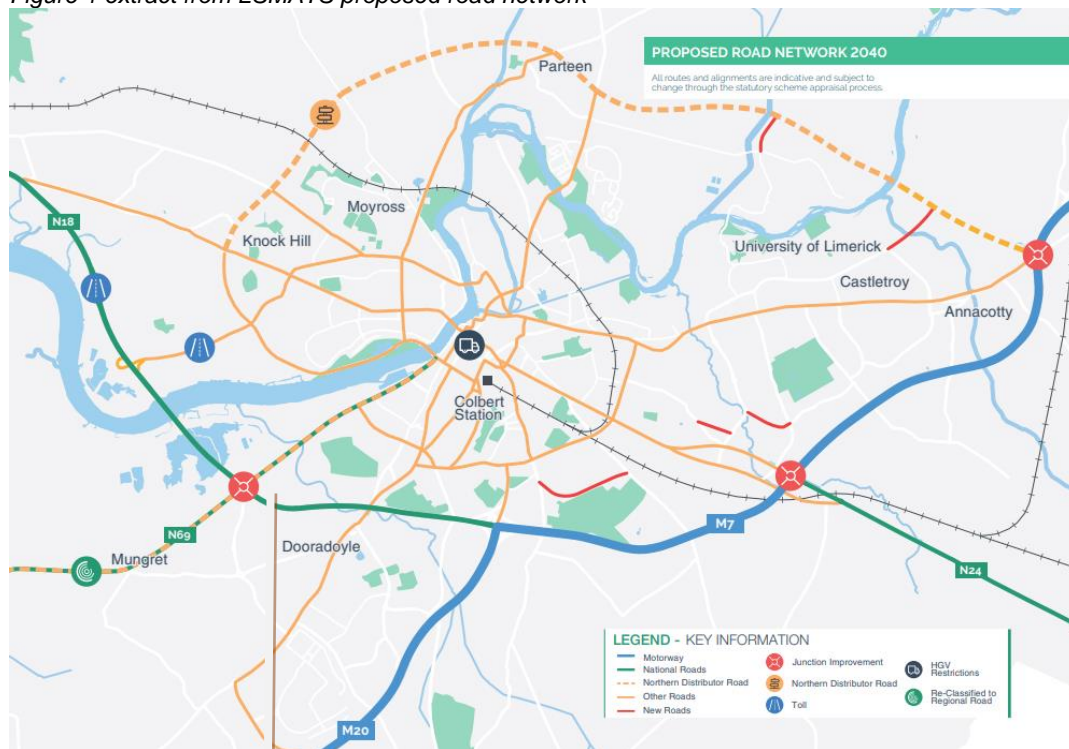
Objective ECON O35 Limerick Food Strategy

It is an objective of the Council to support Limerick's food and drink producers in accordance with the aims/goals established under the Food Strategy for Limerick 2016–2018 and any update thereto.

Limerick Shannnon Metropolitan Area Transport Strategy ('LSMATS')

The LSMATS states that “the M7/N18 Limerick City Bypass is of key strategic importance to the Strategy as it provides strategic linkage between the M7 Dublin, N24 Waterford, N/M20 Cork, N21 Tralee, N69 Port of Foynes, N18 Galway and N19 Shannon. Further to that, the LSMATS confirms that the mainline carriageway of the M7/N18 operates within capacity throughout the day, however, there is recognition of localised congestion on the grade separated junctions with this road, which includes the Dock Road Interchange. The LSMATS provides for improvements to this junction (in the immediate short-term) to ensure that this localised junction congestion does not impact on the strategic function of the M7/N18 road. The LSMATS illustrates (As per the extract below), how connected the subject site is by public road and public transport to and within the Limerick Metropolitan urban area as well as future objectives to enhance that urban mobility.

Figure 1 extract from LSMATS proposed road network



Subject lands

Policy Summary

The spatial development objectives for the Limerick City Metropolitan area therefore need to identify and allocate appropriate locations and landuse types within the urban area which can contribute to the most efficient and effective use of serviced urban land for this planned period of urban growth and development.

It is clear from collective consideration of national, regional and local planning policy objectives, that connectivity between Limerick and other large urban centres and transport nodes is critically important for the economic development of the region and the metropolitan city area. The subject plots are situated on a decisive gateway position between the city and the surrounding urban and rural hinterland, and existing transport corridor between Limerick and other major urban centres.

Whilst a portion of the subject site has been identified for 'enterprise and employment' landuse, it is considered that the pivotal position of the subject site on the southern edge of the city environment, with accessibility to the inter-regional transport network and other transport modes (air and sea), and which has been identified for infrastructural upgrade, supports greater optimisation of land use at this location to support economic development in the manner envisaged in policy objectives ECON O13, ECON O19, ECON O24, and ECON O35 for example. The location on the periphery of the city centre with access to strategic and interregional network and transport nodes is an obvious location for enterprise and urban landuse which would benefit from high levels of accessibility and connectivity.

3.5 Flood Risk is not an impediment to provision of development of the Property

Mindful that the subject property, particularly Plots B, C and D appear to be situated within areas of potential flood risk (floodzones A and B), a detailed Site-Specific Flood Risk Assessment (SSFRA) has been undertaken by Punch Consulting in order to assess potential flood risk to each plot and a copy enclosed with this submission. Each plot has been assessed for flood risk in accordance with 'The Planning System and Flood Risk Management Guidelines – DoEHLG-2009'.

Taking into account the hydrological and urban circumstances, the SSFRA establishes that part of the plots are located within Flood Zone C when flood defences are taken into consideration but, are within Floodzone A in an undefended scenario due to coastal flood risk. The extent of that predicted Floodzone A appears to match the 'Agriculture' and 'semi-natural openspace landuse zonings as they applies to each plot. Whilst this is the current situation, it must be noted also that Limerick City and County Council has appointed RPS Consulting Engineers to work on the Limerick City and Environs Flood Relief Scheme (FRS). Although the delivery of this project is unlikely to be completed in the short term, the completed FRS will offer more reliable flood defence for the site in the future.

The SSFRA suggests that, given the low probability of flooding on the Flood Zone A as it occurs to the subject plots, it is highly likely that less vulnerable uses such as 'Enterprise and Employment' could be justified subject to justification test carried out in accordance with Flood Risk Management Guidelines for Planning Authorities³ (**'the flood risk guidelines'**). The FRA suggests that the residual risk of flooding thereafter (after consideration of the justification test) can be addressed by flood mitigation measures appropriate to each site and landuse circumstance.

In the context of 'the flood risk guidelines', the property owner is mindful that the explanation of the 'Principles and Key Mechanisms' to flood risk management as set out in those guidelines, sets out various "*less vulnerable development*" uses which might be appropriate landuse activities within areas at flood risk, subject to tests and/or best practice flood protection and prevention measures. This includes *inter-alia*; buildings used for retail, leisure, warehousing, commercial, industrial and non-residential institutions; waste treatment, processing, and local transport infrastructure as expressly identified in the flood risk management guidelines.

There is nothing in the flood risk management guidelines which directs that that the only suitable landuse, within areas at potential risk to flood, must be non-development – agriculture, or semi-natural open-space or other amenity function. The less vulnerable uses referenced above from the flood risk guidelines, are commensurate with uses permissible under 'enterprise and employment' in the draft Limerick Plan.

In this regard, it is pertinent to refer to section 3.7 of the flood risk guidelines which states:

"it is recognised that the existing urban structure of the country contains many well established cities and urban centres, which will continue to be at risk of flooding. At the same time such centres may also have been targeted for growth in the National Spatial Strategy, regional planning guidelines and the various city and county development plans taking account of historical patterns of development and their national and strategic value"

³ Published by the Department of Environment Heritage and Local Government, 2009

In accordance with the flood risk management guidelines, landuse objectives which would support 'less vulnerable'⁴ development activity, can be provided within areas defined as 'Floodzone A' subject to a Development Management justification test.

In this instance, the Plan-making Justification Test (Box 4.1) is the relevant test to be used at the plan preparation and adoption stage where it is intended to zone or otherwise designate land which is at moderate or high risk of flooding. Table 1 below details why zoning must be considered on the subject lands and demonstrates why zoning of the site for 'enterprise and employment' use would be in compliance with the Justification Test and the Planning System and Flood Risk Management Guidelines.

3.6 Flood Risk (Development Management) Justification Test

Table 1	
'Box 4.1' Justification Test Criteria to be addressed	Response
1. The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended.	<p><i>Limerick has been identified in the National Planning Framework (NPF) as one of the five cities in the country which is the subject of a Metropolitan Area Strategic Plan. This emphasises the Metropolitan Area's national importance, for significant additional growth. This is echoed in the Regional Spatial and Economic Strategy for the Southern Region, which mentions that the Limerick Shannon Metropolitan area is "a key economic driver for the region and Ireland". Limerick has been identified for significant population growth in the NPF along with an objective that 50% of that future growth be located within the city and its suburbs. (NPO2a).</i></p> <p><i>Limerick City is located at a pivotal point on the Atlantic Economic Corridor. The NPF and RSES confirms that Limerick has the potential to generate and be the focus of significant employment and housing growth.</i></p>
2. The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular:	
a Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement	<p><i>Zoning of the subject would assist achieving proper planning and sustainable development of the metropolitan city centre given that the intended function of the lands – to facilitate 'enterprise and employment' at a pivotal location adjacent to the city centre, at a strategic intersection with the national road and transportation corridors will assist in consolidating urban expansion within the defined urban city core supporting economic growth and employment for the metropolitan area.</i></p>
b. Comprises significant previously developed and/or under-utilised	<p><i>The land is greenfield in nature and is significantly underutilised in that capacity. Given its strategic gateway position with</i></p>

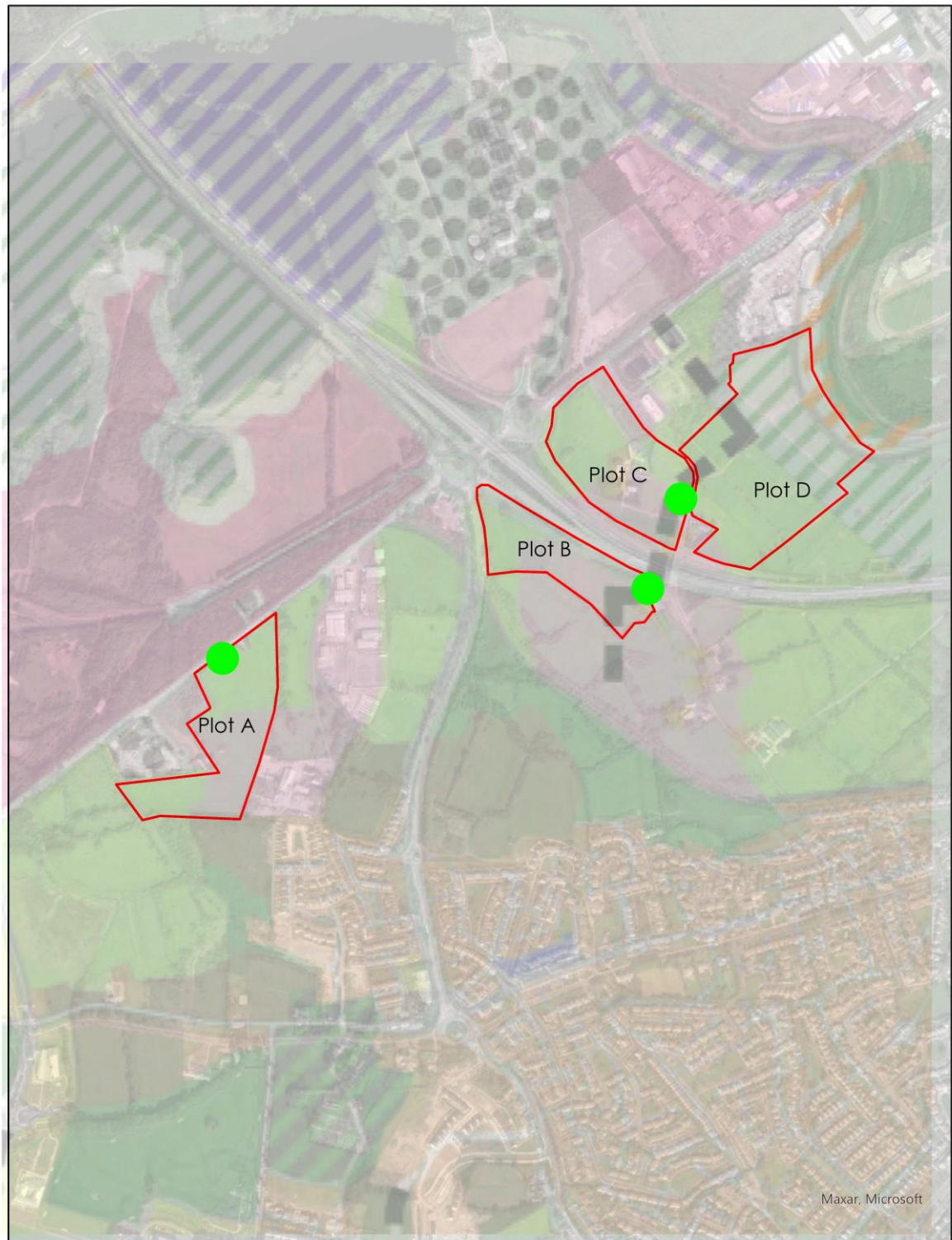
⁴ 'Less vulnerable' in the context of flood risk management

land.	<i>immediate access to both the city centre and the transport corridor accessing the western seaboard, and other major intra urban cities, zoning of the subject site for enterprise and employment would contribute to effective utilisation of serviced urban land within the settlement.</i>
c. Is within or adjoining the core of an established or designated urban settlement.	<i>The subject site is located adjacent to the core Limerick city metropolitan area – a settlement designated for growth.</i>
d. Will be essential in achieving compact and sustainable urban growth.	<i>Use of the subject site for the purpose of enterprise and employment uses can contribute to compact and sustainable growth by consolidating such uses within the built envelope of the existing city urban area and create synergies and opportunities with uses which are less suited to core centre locations, but which still need access to the city centre (which is in close proximity) and access to the national transport corridors extending north to Clare/Galway, south to Cork, East to Dublin and southwest to Kerry.</i>
e. There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement	<i>There is no other alternative site at lower risk to flooding which present an equal or better degree of location, accessibility and proximity to the city core, situated at the western gateway location and adjacent to the strategic transport corridors. Whilst the property owner's lands do have some aspects of enterprise and employment land use zoning objectives designated to them in the draft plan, they are of insufficient size and of isolated formation to warrant investment in development of those or to be marketable for such uses. It is only the collective consideration of the lands at this location which become commercially viable, and the development of areas which are at risk to flooding will still be required to undergo a development management 'justification test' pending consideration of site specific considerations, and development specific uses and development arrangements.</i>
A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment	<i>Not only has a SFRA been carried out as part of the SEA, but so too has a SSFRA which examines the specific characteristics of each plot of land and which confirms that site specific and development specific flood risk measures can be considered at detailed development management stage to ensure that development will not cause unacceptable adverse impacts elsewhere.</i>

Therefore, in principle, and subject to compliance with a managed approach to flood risk as set out in the aforementioned guidelines, there is sufficient justification to support the zoning of all of the subject properties for 'enterprise and employment' in accordance with the flood risk management guidelines, and that the potential flood risk, does not dismiss the principle of suitable development uses.

4.0 CONCLUSION

For the material reasons stated herein, including; the suitability of the subject sites and supporting infrastructure; National, Regional and local planning objectives which support settlement and employment growth in the Limerick city metropolitan area; having regard to the strategic gateway and highly accessible location; and the ability of the proposed enterprise and employment use to comply with the flood risk management guidelines, the property owner respectfully requests that the land use zoning objective in the Development Plan is amended to provide for 'enterprise and employment' landuses.



 Existing Access Points

Figure 1 Site Location with zoning (and existing access points)





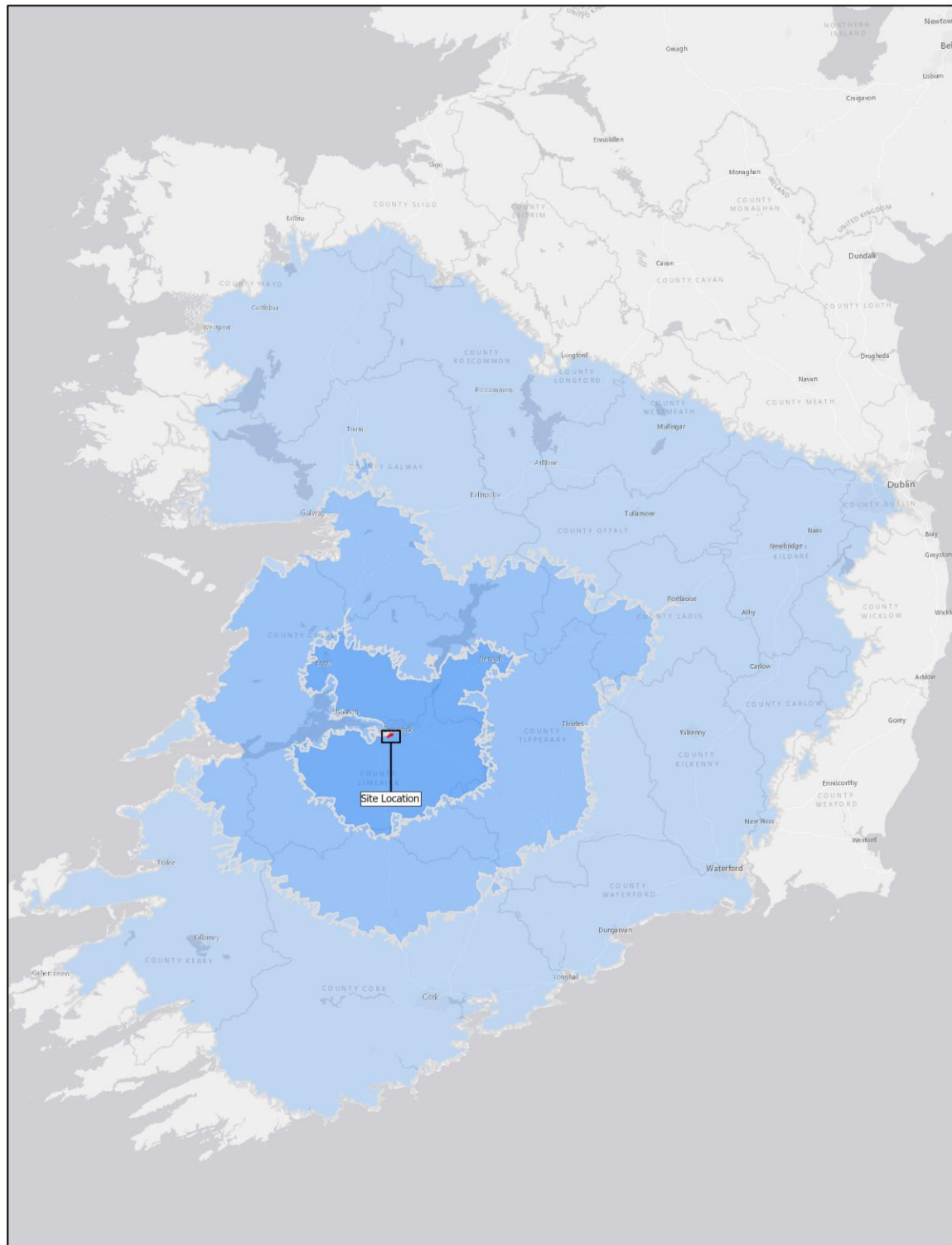
-  Site Locations
-  Special Areas of Conservation (SAC)

Figure 2 Sites within SAC context



- Site Boundaries
- National Road
- Dual Carriageway
- Motorway

Figure 3 Strategic location on the local and national road network and edge of Metropolitan City area



- Site Boundaries
- 30 Minute Drivetime from Sites
- 60 Minute Drivetime from Sites
- 120 Minute Drivetime from Sites

Figure 4 National Catchment proximity from the subject site by drivetime

Appendix: Flood Risk Assessment

**Michael Gabbett Sites, Dock Road,
Limerick**

**Site Specific Flood Risk Assessment
211262-PUNCH-XX-XX-RP-C-001**

September 2021

Document Control

Document Number: 211262-PUNCH-XX-XX-RP-C-001

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Executive Summary

PUNCH Consulting Engineers carried out a Site-Specific Flood Risk Assessment in accordance with “*The Planning System & Flood Risk Management Guidelines*” published by the Department of the Environment, Heritage and Local Government in November 2009 for three sites located on the Dock Road.

The sites have all recently had portions of their lands rezoned in the Draft Limerick Development Plan as a result of the Flood Zone A designation in the Draft Strategic Flood Risk Assessment carried out by JBA Consulting on behalf of Limerick City and County Council. The sites zoning has changed from ‘Enterprise and Employment’ or ‘Industrial’ to new designations of ‘Agriculture’.

Various potential sources of flooding specific to each site were assessed and relevant mapping and online portals were visited in order to define the flood risk at the site. The site was visited by PUNCH Consulting Engineers which verified the findings of the desktop study.

It was determined that all three sites are currently protected by existing flood defences on the River Shannon and Ballinacurra Creek to a varying degree and the actual flood risk to the site is currently low due to the protection that these flood defences currently offer.

However, the FRMG advise that flood zones ignore the presence of defences. Therefore, it must be concluded that each site has an area designated Flood Zone A for coastal flooding as per the JBA mapping presented in the Draft SFRA.

If these flood defences could be accounted for, parts of the sites could be classified as Flood Zone C and Flood Zone B but the residual risk of flooding would still need to be accounted for.

Potential development options are discussed in the report based on the relevant flood zoning designation. Given the defended Flood Zone A areas noted on part of each site, development other than ‘water compatible use’ will be subject to a Justification Test in accordance with The Planning System and Flood Risk Management Guidelines dependent.

Given the low probability of flooding on the defended Flood Zone A designated site areas, it is highly likely that a ‘less vulnerable use’ such as ‘Enterprise and Employment’ could be justified. The sites are all well serviced in regard drainage and access requirements and would therefore benefit from a ‘less vulnerable’ use zoning. Further planning advice is required for the Planning Justification (Box 4-1).

As part of each site is located in a defended flood zone, the residual risk of flooding must be addressed. Potential flood mitigation measures appropriate for the sites were discussed and based on an appropriate site development proposal they can be explored further.

Appropriately zoned development on the defended Flood Zone A portions of the site can be delivered at low risk of flooding and not increase the risk of flooding to adjacent or nearby areas through the implementation of standard flood mitigation measures and specifically engineered development flood mitigation measures.

1 Introduction

1.1 Background

PUNCH Consulting Engineers were appointed by Mr Michael Gabbett to carry out a Site-Specific Flood Risk Assessment for a number of sites in the vicinity of the Dock Road, Limerick.

The assessment is carried out in full compliance with the requirements of “The Planning System & Flood Risk Management Guidelines” published by the Department of the Environment, Heritage and Local Government in November 2009.

1.2 Existing Site

The site locations are shown in Figure 1-1 below. The land is generally low-lying flat land.

Site 1: The site is a greenfield site located furthest from the city is approximately 5.9 hectares and is bound by the N69 to the north with Mungret Civic Amenity Centre and Dog Shelter to the northwest. The OPW Arterial Drainage Maintenance office is located outside the southeast corner of the site.

Site 2: This site is a greenfield site located to the east of the Dock Road East and West Roundabouts and is divided by the N18. The portion of the site to the south of the N18 is 3.9 hectares with no existing buildings or structures located within the site boundary. The portion to the north is 5.65 hectares with a farm and dwelling located centrally on the site.

Site 3: This site appears to be used for agriculture at present. It is located closest to the city and is bounded by Ballinacurra Creek to the northeast and N18 to the south. The site is approximately 11.9 hectares with Riverside Park and Blackberry Business Park to the west. The land is generally flat.



Figure 1-1: Location of the Proposed development (site boundary indicated in red)

2 Relevant Guidance

2.1 The Planning System and Flood Risk Management Guidelines

In September 2008, “The Planning System and Flood Risk Management” Guidelines were published by the Department of the Environment, Heritage and Local Government in Draft Format. In November 2009, the adopted version of the document was published.

The Flood Risk Management Guidelines give guidance on flood risk and development. The guidelines recommend a precautionary approach when considering flood risk management in the planning system. The core principle of the guidelines is to adopt a flood risk sequential approach to managing flood risk and to avoid development in areas that are at risk. The sequential approach is based on the identification of flood zones for river and coastal flooding. The guidelines include definitions of Flood Zones A, B and C, as noted in Table 2-1 below. It should be noted that these do not take into account the presence of flood defences, as there remain risks of overtopping and breach of the defences.

Table 2-1: Flood Zone Designation

Flood Zone	Type of Flooding	Annual Exceedance Probability (AEP)
Flood Zone A	Coastal	Less than a 1:200 (0.5% AEP) year event
	Fluvial	Less than a 1:100 (1% AEP) year event
Flood Zone B	Coastal	Greater than a 1:200 (0.5% AEP) and less than a 1:1000 (0.1% AEP) year event
	Fluvial	Greater than a 1:100 (1% AEP) and less than a 1:1000 (0.1% AEP) year event
Flood Zone C	Coastal	Greater than a 1:1000 (0.1% AEP) year event
	Fluvial	Greater than a 1:1000 (0.1% AEP) year event

Once a flood zone has been identified, the guidelines set out the different types of development appropriate to each zone. Exceptions to the restriction of development due to potential flood risks are provided for through the use of the **Justification Test**, where the planning need and the sustainable management of flood risk to an acceptable level must be demonstrated. This recognises that there will be a need for future development in existing towns and urban centres that lie within flood risk zones, and that the avoidance of all future development in these areas would be unsustainable.

A three staged approach to undertaking an FRA is recommended:

Stage 1: Flood Risk Identification - Identification of any issues relating to the site that will require further investigation through a Flood Risk Assessment;

Stage 2: Initial Flood Risk Assessment - Involves establishment of the sources of flooding, the extent of the flood risk, potential impacts of the development and possible mitigation measures;

Stage 3: Detailed Flood Risk Assessment - Assess flood risk issues in sufficient detail to provide quantitative appraisal of potential flood risk of the development, impacts of the flooding elsewhere and the effectiveness of any proposed mitigation measures.

This report addresses the requirements for Stage 2.

2.2 Local Area Plan

The proposed site is covered by the Southern Environs Local Area Plan 2011-2017 which states the following with regards to flood risk:

Objective IN 5: Flood risk assessment

It is an objective of the Council to require a comprehensive flood risk assessment for proposals in zoned areas at risk of flooding or areas adjoining same. The effects up and down stream shall be considered as should the cumulative effects of these developments. Flood risk assessment shall be carried out to the appropriate level of detail to demonstrate that flood risk to and from the development can and will be adequately managed. Such assessment will have to be guided by the contents of the The Planning Systems and Flood Risk Management (November 2009) guidelines and any subsequent guidance on the topic. Where development is permitted in areas subject to flooding, flood mitigation requirements will be required by the Council in terms of design, both internal and external and in layout and in the provision of appropriate Sustainable Urban Drainage Infrastructure (SUDS).

Objective IN 6: Flood risk and the Shannon CFRAM report

It is an objective of the Council to be guided by the measures proposed by the forthcoming Shannon CFRAM report.

2.3 DRAFT LCCC Development Plan

The Draft Limerick Development Plan dated 2022 to 2028 is now available and states the following regarding flood risk:

Policy CAF P5: Managing Flood Risk

It is a policy of the Council to protect Flood Zone A and Flood Zone B from inappropriate development and direct developments/land uses into the appropriate lands, in accordance with 'The Planning System and Flood Risk Management Guidelines for Planning Authorities 2009' (or any superseding document) and the guidance contained in Development Management Standards. Where a development/land use is proposed that is inappropriate within the Flood Zone, then the development proposal will need to be accompanied by a Development Management Justification Test and site specific Flood Risk Assessment in accordance with the criteria set out under 'The Planning System and Flood Risk Management Guidelines for Planning Authorities 2009' and Circular PL2/2014 (as updated/ superseded). In Flood Zone C, the developer should satisfy themselves that the probability of flooding is appropriate to the development being proposed and should consider the implications of climate change.

Objective CAF O20: Flood Risk Assessments

It is an objective of the Council to require a Site-specific Flood Risk Assessment (FRA) for all planning applications in areas at risk of flooding (coastal/tidal, fluvial, pluvial or groundwater), where deemed necessary. The detail of these Site-specific FRAs (or commensurate assessments of flood risk for minor developments) will depend on the level of risk and scale of development. A detailed Site-specific FRA should quantify the risks, the effects of selected mitigation and the management of any residual risks. The assessments shall consider and provide information on the implications of climate change with regard to flood risk in relevant locations.

Objective CAF O22: Cooperation with Other Agencies

It is an objective of the Council to work with other bodies and organisations, as appropriate, to help protect critical infrastructure, including water and wastewater, within Limerick, from risk of flooding. Any subsequent plans shall consider, as appropriate any new and/or emerging data, including, when

available, any relevant information contained in the CFRAM Flood Risk Management Plans and as recommended in the SFRA for the Draft Plan.

Objective CAF 023: Flood Relief Schemes

It is an objective of the Council to support and facilitate the development of Flood Relief Schemes as identified in the CFRAM 10 Year Investment Programme.

Objective CAF 024: Minor Flood and Mitigation Works and Coastal Protections Schemes

It is an objective of the Council to support and facilitate the Office of Public Works Minor Flood and Mitigation Works and Coastal Protections Schemes.

Objective CAF 025: Strategic Flood Risk Assessment

It is an objective of the Council to have regard to the recommendations set out in the Draft Strategic Flood Risk Assessment prepared to support the Draft Plan.

2.4 Land Zoning

The proposed sites are currently zoned in the Southern Environs Local Area Plan 2011-2017. See extract below in Figure 2-1 from Map 1A of the Southern Environs Local Area Plan 2011-2017.

Site 1 is predominantly 'Industrial' with the north eastern corner zoned as 'Enterprise and Employment'. The location of the new link road is proposed to run diagonally through the site, from the southern boundary to the eastern. There is also a road proposed to connect the existing N69 to the proposed link road which runs from the northern point of the site to the eastern.

Site 2 is fully zoned as 'Enterprise and Employment' with the proposed link road running along and adjacent to the southern and southeastern site boundaries.

Approximately two thirds of Site 3 is also zoned as 'Enterprise and Employment'. The remaining third on the eastern end of the site is zoned as 'Semi-natural Open Space', taking into account that Ballinacurra Creek is running along the eastern border.

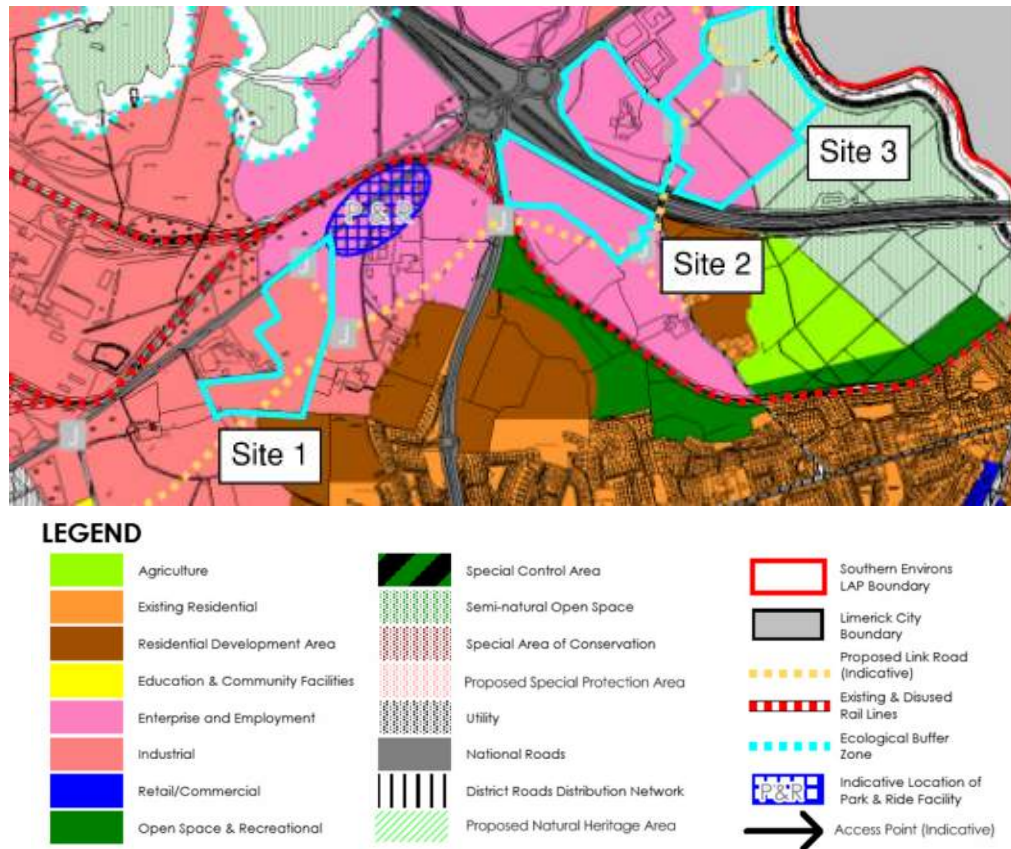


Figure 2-1: Southern Environs Zoning Map - Southern Environs Local Area Plan 2011-2017

The Draft Limerick Development Plan dated 2022-2028 is proposing to change the zoning of these sites to a mix of 'Enterprise and Employment' and 'Agriculture' with the area adjacent to Ballinacurra Creek remaining as 'Semi-natural Open Space'.

Approximately 50% of Site 1 is zoned as 'Enterprise and Employment' with the most northern and western areas zoned for 'Agriculture'. Unlike the existing Development Plan for the area, there is no proposed link road within the site boundary.

Similar to Site 1 above, approximately 50% of Site 2 is zoned as 'Enterprise and Employment' with the remaining site zoned for 'Agriculture'. There is also an 'Existing Residential' zone shown in the middle of the site to the east of the N18. The proposed link road is shown along the southern boundary of the site.

Only a small section of the southwestern corner of Site 3 remains zoned for 'Enterprise and Employment' with the remainder changing to 'Agriculture' in the draft Limerick Development Plan. The eastern area of the site, adjacent to Ballinacurra Creek, is to remain zoned as 'Semi-natural Open Space'.

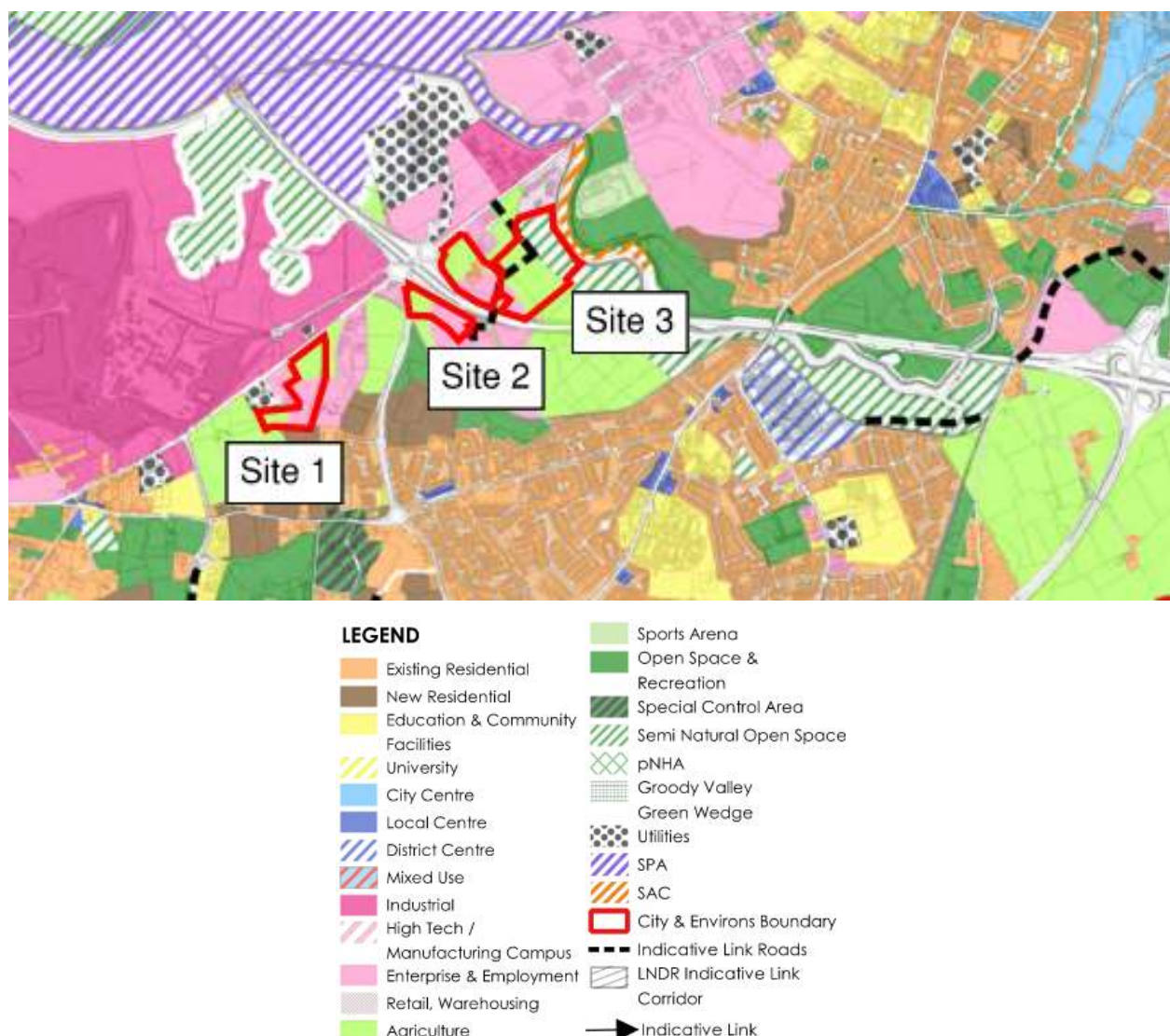


Figure 2-2: Extract from Land Use Zoning Map - Draft Limerick Development Plan 2022-2028

2.5 Flood Risk Management Plan

The OPW publish Flood Risk Management Plans detailing the feasible range of flood risk management measures proposed for their respective river basins. The Flood Risk Management Plan for the Shannon Estuary South River Basin was published by the OPW in 19/02/2018 and is valid for the period 2018-2021. The plan lists current flood management measures in place and potentially viable Flood Relief Works.

3 Flood Risk Identification

3.1 Existing Hydrogeological Environment

The existing hydrological environment is characterised primarily by the presence of the Shannon Estuary which is located approximately 1.2km north of the Dock Road.

Sites 1 & 2 are located approximately 500m south of Bunlicky Lake.

Running adjacent to the eastern boundary of Site 3 is Ballinacurra Creek which flows from southeast to northwest.

The hydrological environment around the site is shown in Figure 3-1 below.

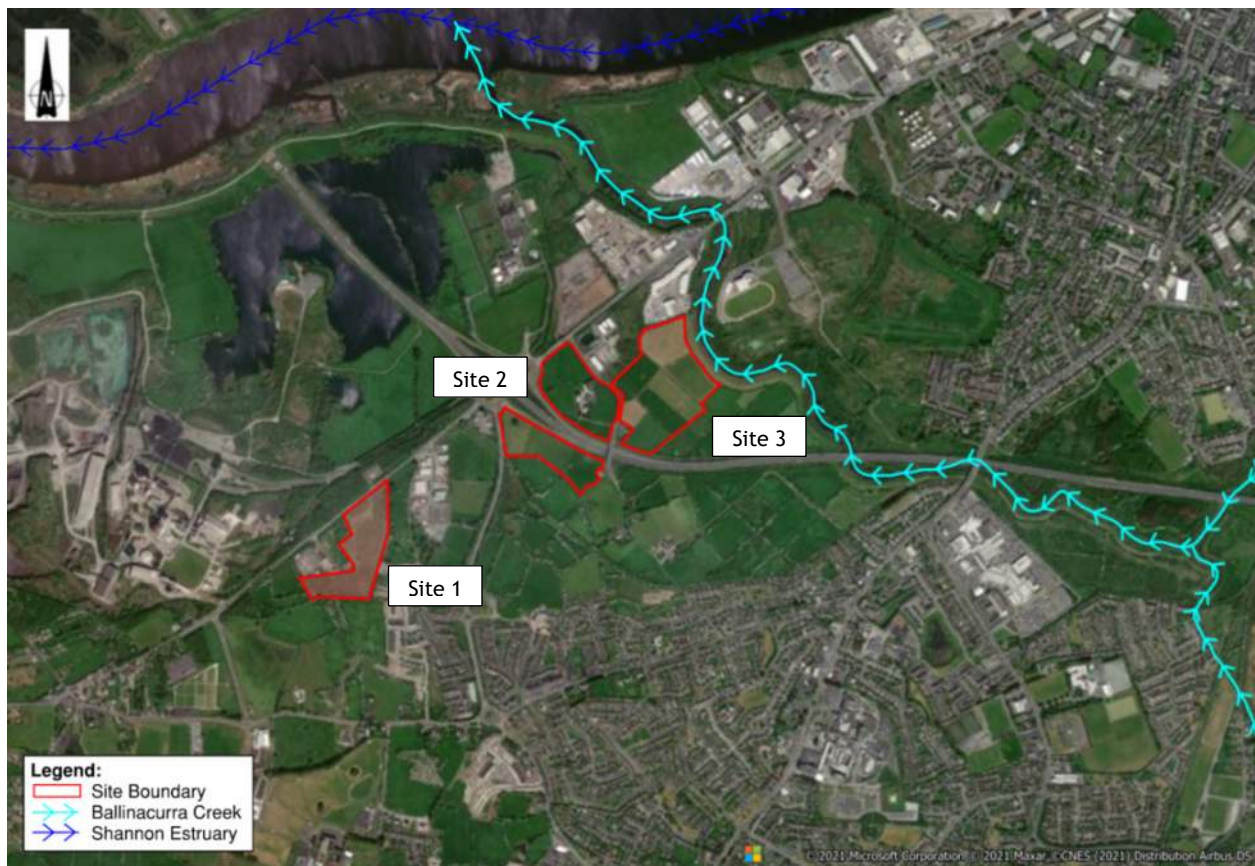


Figure 3-1: Hydrological Environment around the site

All three sites are located within the lands benefitted by the Shannon Embankments South Scheme. The land is also located within the OPW Ballynaclogh Arterial Drainage Scheme which drains into the Shannon Estuary. Refer to Figure 3-12 below.

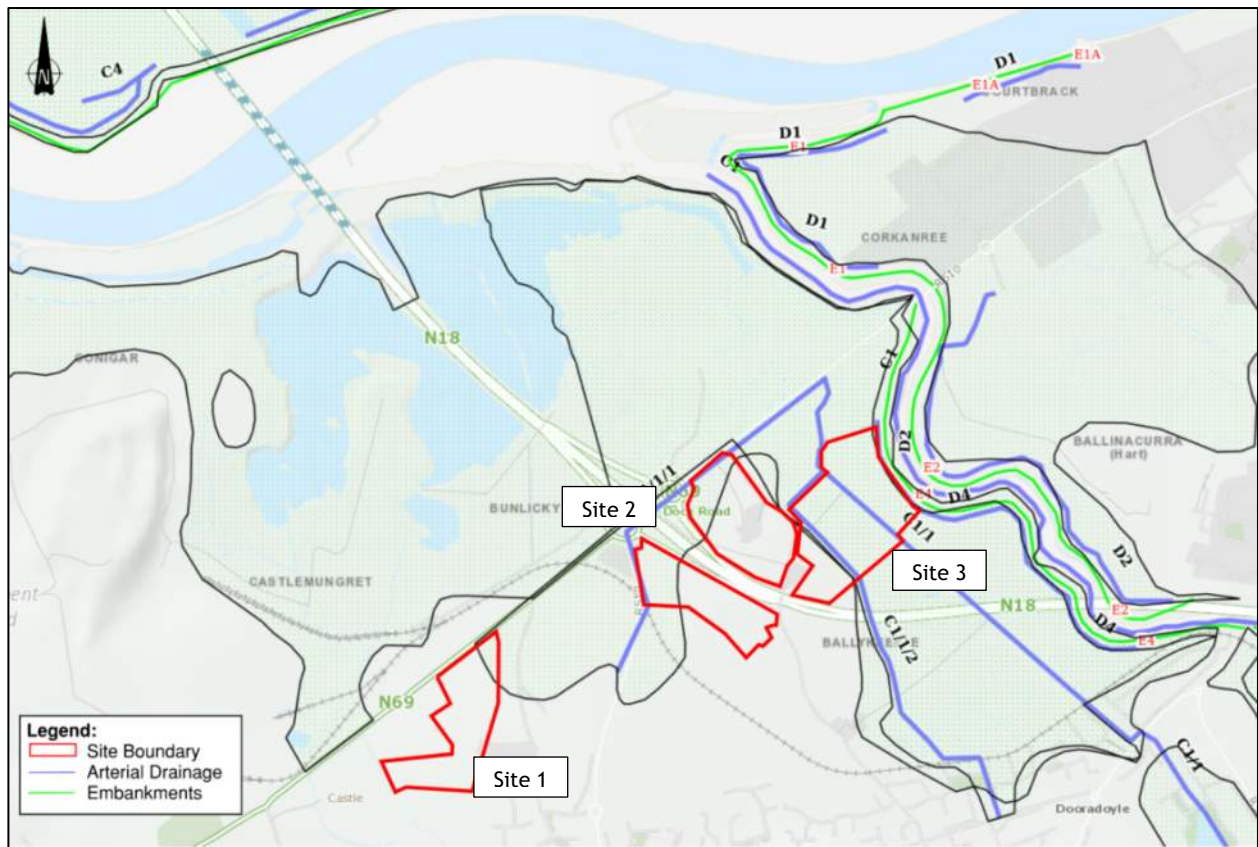


Figure 3-2: Extract from OPW Arterial Drainage Mapping

3.2 Topographical Survey

Topographical surveys of the sites and their environs were reviewed as well as available online contour mapping for each site. The information showed that Sites 1 & the western side of Site 2 are generally higher to the south and fall towards the N69. Site 3 and the eastern section of Site 2 are generally higher on the western side near the N18 and both fall eastwards.

3.3 Site Walkover

PUNCH Consulting Engineers visited the site on the 25th of August 2021 to assess the conditions and key features of the site, to establish any potential sources of flooding and to identify the likely routes of flood waters. Appendix A contains a selection of key images taken during the site visits.

The following was established from the site visit. Site 2 is split between 2 sections either side of the motorway. The comments below are therefore split into Site to east and west respectively for clarity:

- a) Site 1
 - i. Site 1 is currently accessed from the south side of the N69.
 - ii. The site is existing farmland and was recently cut for silage.
 - iii. The site is subdivided into a number of fields separated by electric fencing
 - iv. There is an existing ruined house located in the middle of the site. The house is abandoned and in a state of significant disrepair.
 - v. There was a spot of wet ground observed in the south-west corner. The ground in this area was wet with water visible in spots.
 - vi. The majority of the site was dry with good ground conditions
 - vii. The site is highest in the south with levels falling from south to north across the site
- b) Site 2 West
 - i. Site 2 West is currently accessed from a small local road to the south. The access is gated.
 - ii. The site is farmland and is used for grazing livestock.
 - iii. There is an existing drain along the southern portion of the western boundary of the site. This appears to tie in with the OPW channel noted in Section 3.1 above.
 - iv. Ground conditions on site were observed to be dry at the time of the visit
 - v. Levels on the site are highest to the south and fall away from south to north across the site.
- c) Site 2 East
 - i. There is an existing farmyard and residential property in the middle of the site with the rest of the site is farmland.
 - ii. There is an existing drainage ditch along the southern boundary of the site. The ditch was dry at the time of the visit. Ditch depth approximately 1.5m.
 - iii. Ground conditions were dry at the time of the visit.
 - iv. There are 3 no access points to the site. from the existing road to the south which lead to the farmland and farmyard respectively and a 3rd entrance from the road to the east which accesses the existing property.
 - v. The site is generally flat on the northern portion of the site with falls from the southeast towards the northwest.
- d) Site 3
 - i. The site is generally flat with a fall from the existing road to the west before levelling off across the rest of the site.
 - ii. The site is accessed from the existing road to the west.
 - iii. The site is currently used for grazing animals
 - iv. There are 3 no drainage ditches crossing the site as shown in Section 3.1. Two of the ditches cross the site from south to north and the third flows from south to north along the eastern boundary of the site.
 - v. The 3 ditches are crossed by existing culverted crossings
 - vi. All channels were observed to be approximately 2.1m deep.
 - vii. There are existing flood embankments just outside the eastern boundary of the site along Ballinacurra Creek.

3.4 Site Geology

The geology of the sites were reviewed using data from the Geological Survey of Ireland (available at www.gsi.ie). The soil type at the location of the proposed development is identified as predominately marine/ estuarine sediments and deep well drained mineral (mainly basic) as seen in Figure 3-3.

Site 1 is predominately deep well drained mineral with some areas of marine/ estuarine, mineral poorly drained, peat and shallow well drained mineral.

Site 2 is composed of marine/ estuarine with some areas of mineral poorly drained, deep well drained mineral and shallow well drained mineral.

Site 3 is mainly marine/ estuarine with some areas of made ground, mineral poorly drained and deep well drained mineral.

The surrounding areas comprise mainly of deep well drained mineral (mainly basic), marine/ estuarine and made ground.

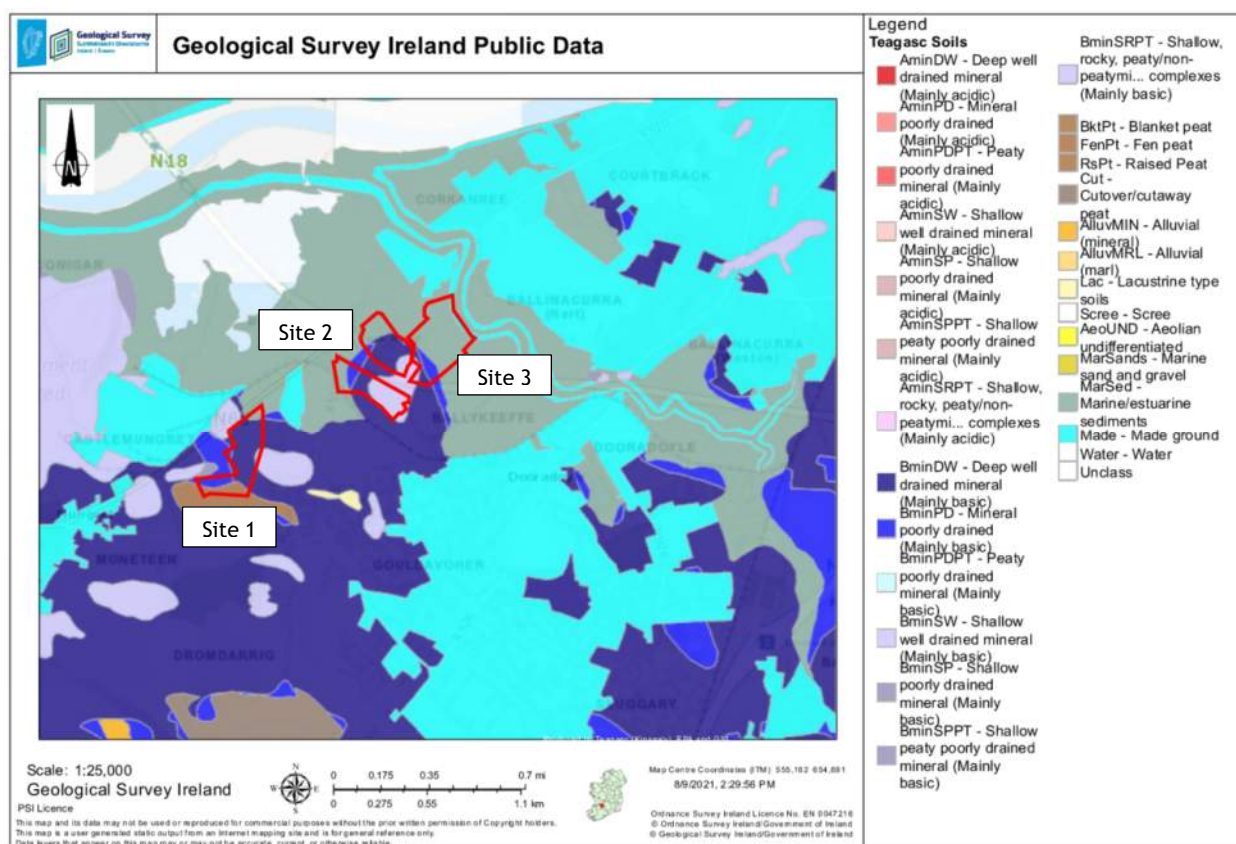


Figure 3-3: Geology of the surrounding area (source: Geological Survey of Ireland (www.gsi.ie))

3.5 Groundwater Flooding

A review of the groundwater mapping shows that there is no groundwater flooding risk in this area.

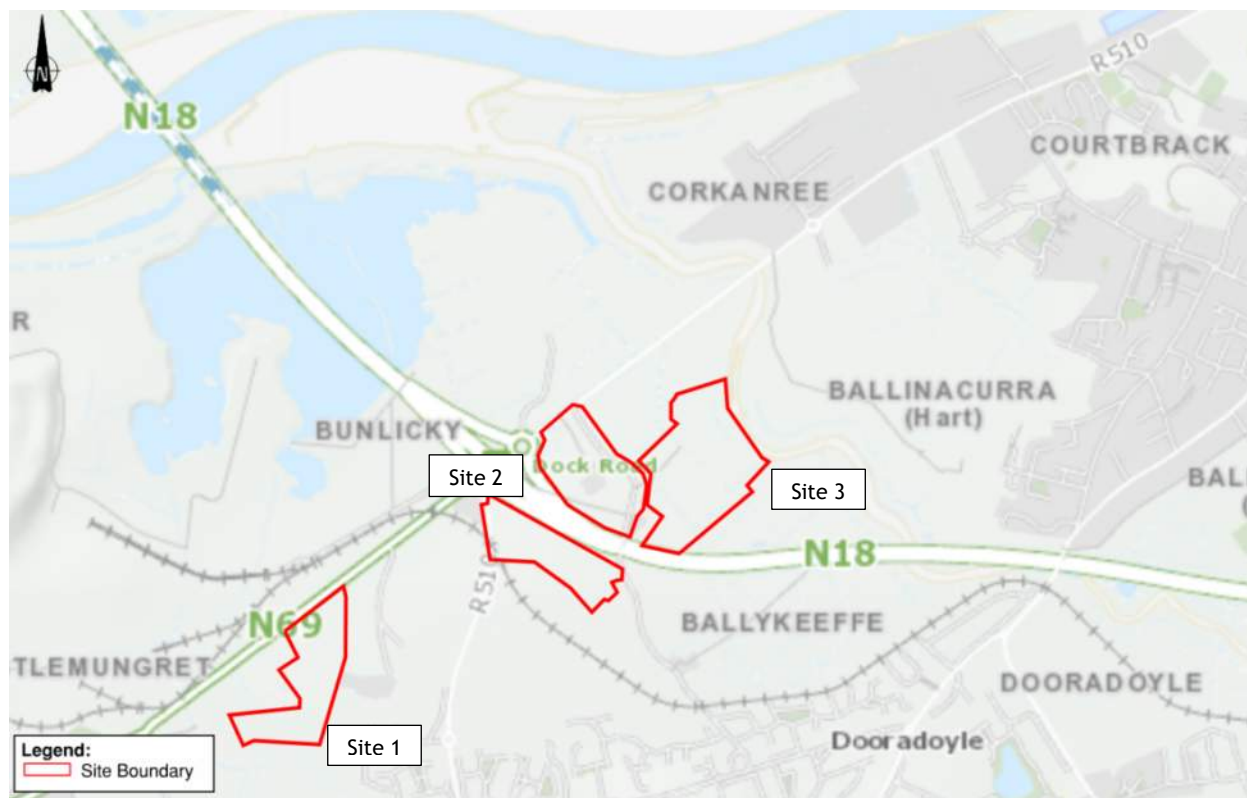


Figure 3-4: Groundwater Flooding Mapping

<https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=848f83c85799436b808652f9c735b1c>
C

3.6 Review of Historic Mapping

A review of the OSI Historical maps¹ was carried out. Figure 3-5 shows an extract from the 25-inch historic map for the site. None of the sites are indicated as “liable to flood” in the available historic OSI maps.

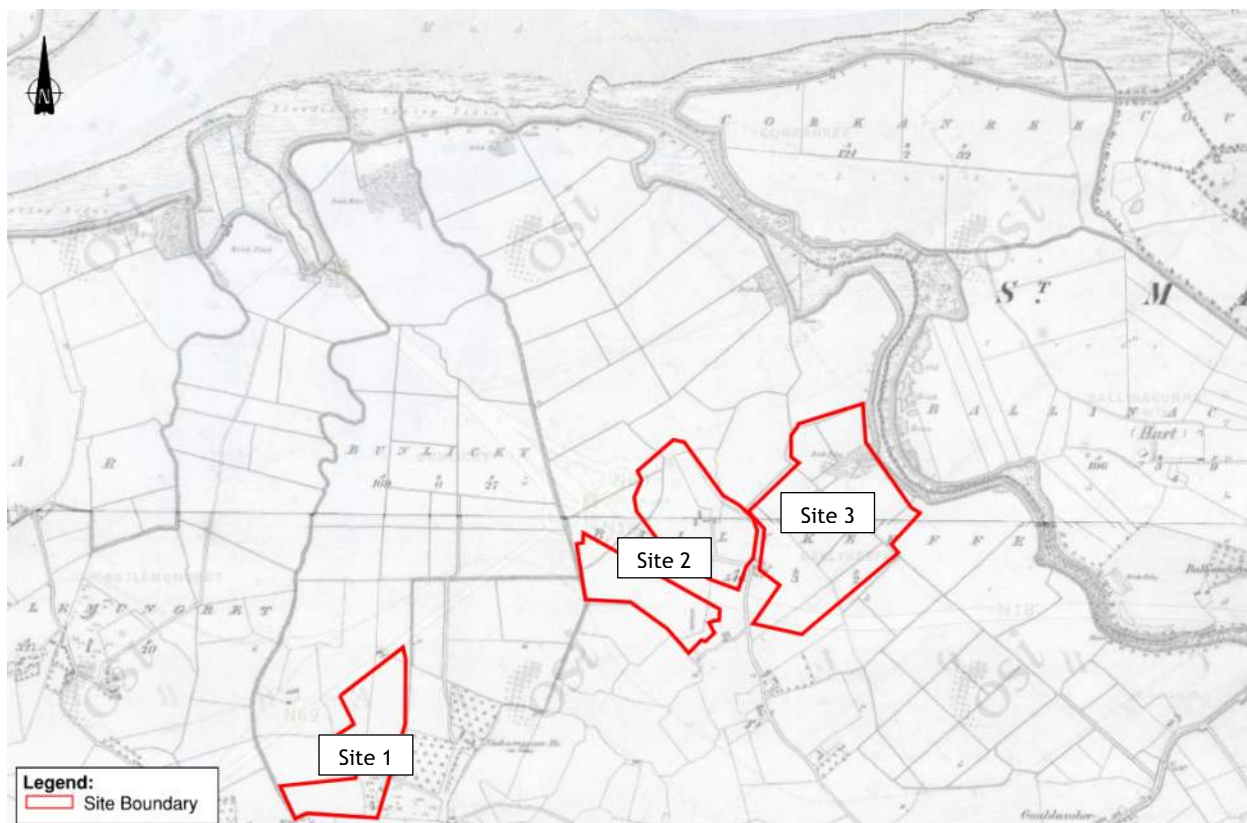


Figure 3-5: Extract from OSI historical 25-inch map

¹ Maps available: <http://map.geohive.ie/mapviewer.html>

3.7 History of Flooding

The Office of Public Works (OPW) Flood Hazard Mapping website holds a record of historic flood events. A review of the database indicated that there have been historical instances of flooding on Site 3 which is bounded by the Ballinacurra Creek, as shown in Figure 3-6 **Error! Reference source not found.**, see Appendix B for full report. Please note that this is not a guaranteed record of all flood events.

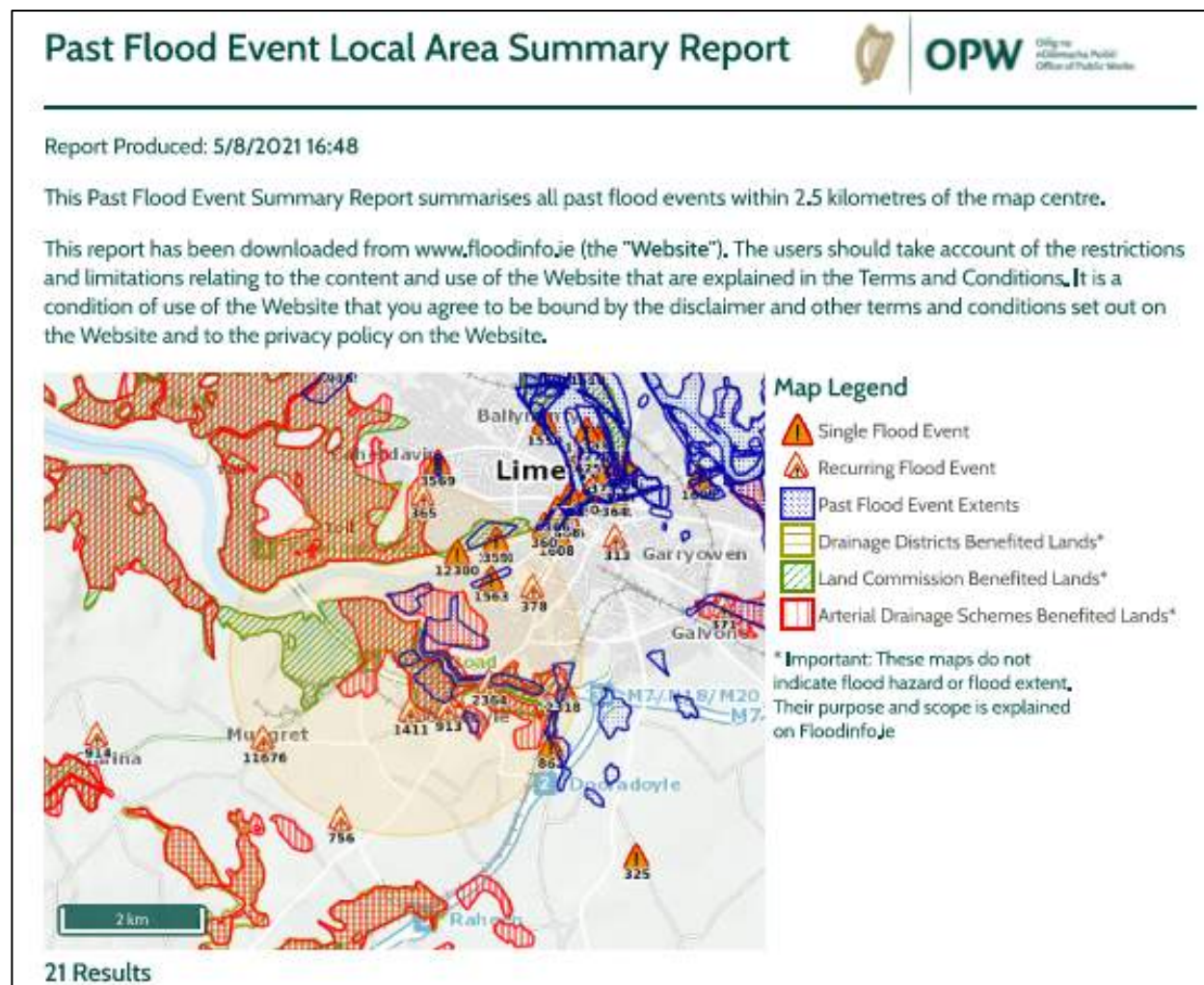


Figure 3-6: Extract from OPW Floodmaps Database Report (see Appendix B for full report)
<http://www.floodmaps.ie/index.aspx?ReturnUrl=%2fView%2fDefault.aspx>

There is only a single flooding occurrence recorded on the proposed sites relating specifically to Site 3as outlined below:

Raheen Dooradoyle, Limerick February 1990:

Flooding to some extent or other has been a fairly regular event in certain area of the catchment for a number of years. In early February 1990, following a period of extreme rainfall and high tides, widespread flooding occurred in the catchment. See Figure 3-7 below for areas affected by the event.

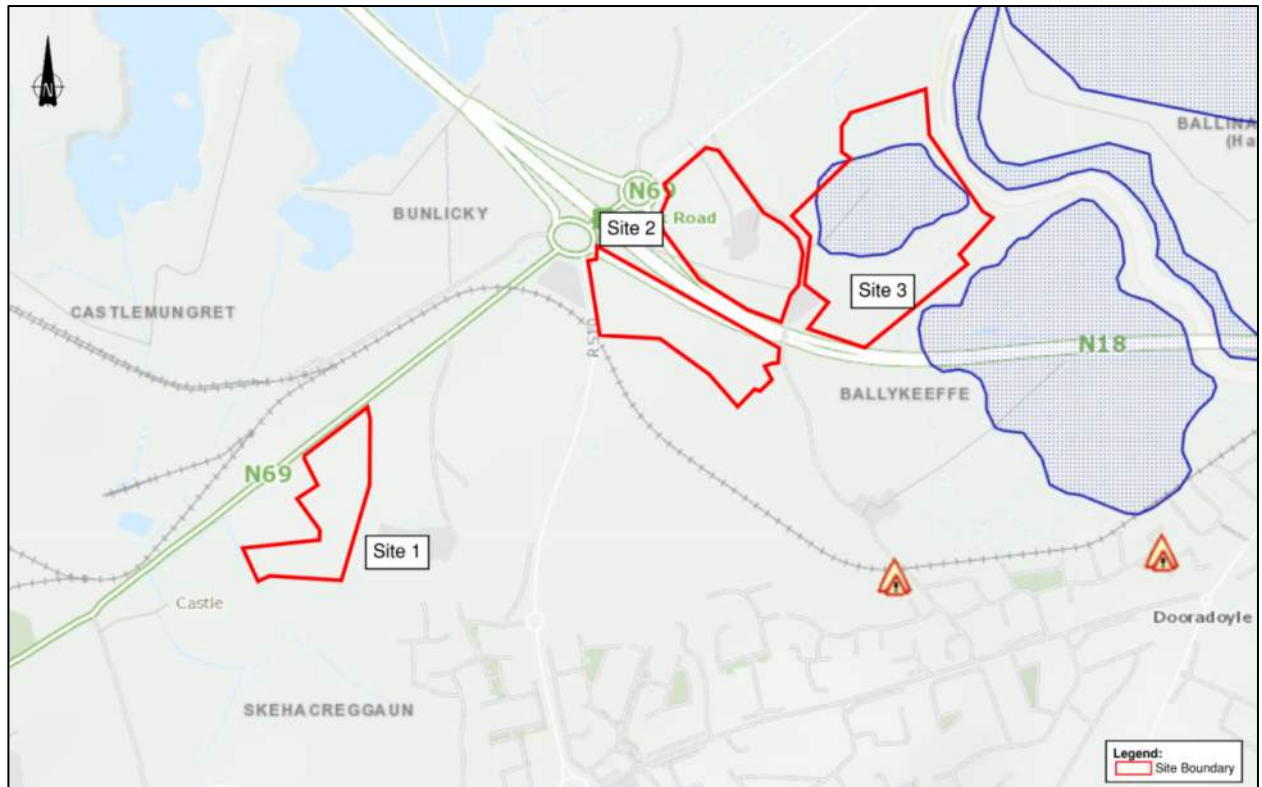


Figure 3-7: Flooding experienced in 1990

3.8 Preliminary Flood Risk Assessment Mapping

The Catchment Flood Risk Assessment and Management Study (CFRAMS) is a national programme which to date has produced both a series of Preliminary Flood Risk Assessments (PFRA) which cover the entire country, as well as more detailed flood maps in certain catchments across the country.

Prior to the publication of the detailed CFRAMS flood mapping, a series of Preliminary Flood Risk Assessment (PFRA) maps were published. The PFRA flood zones are shown in Figure 3-3 below.

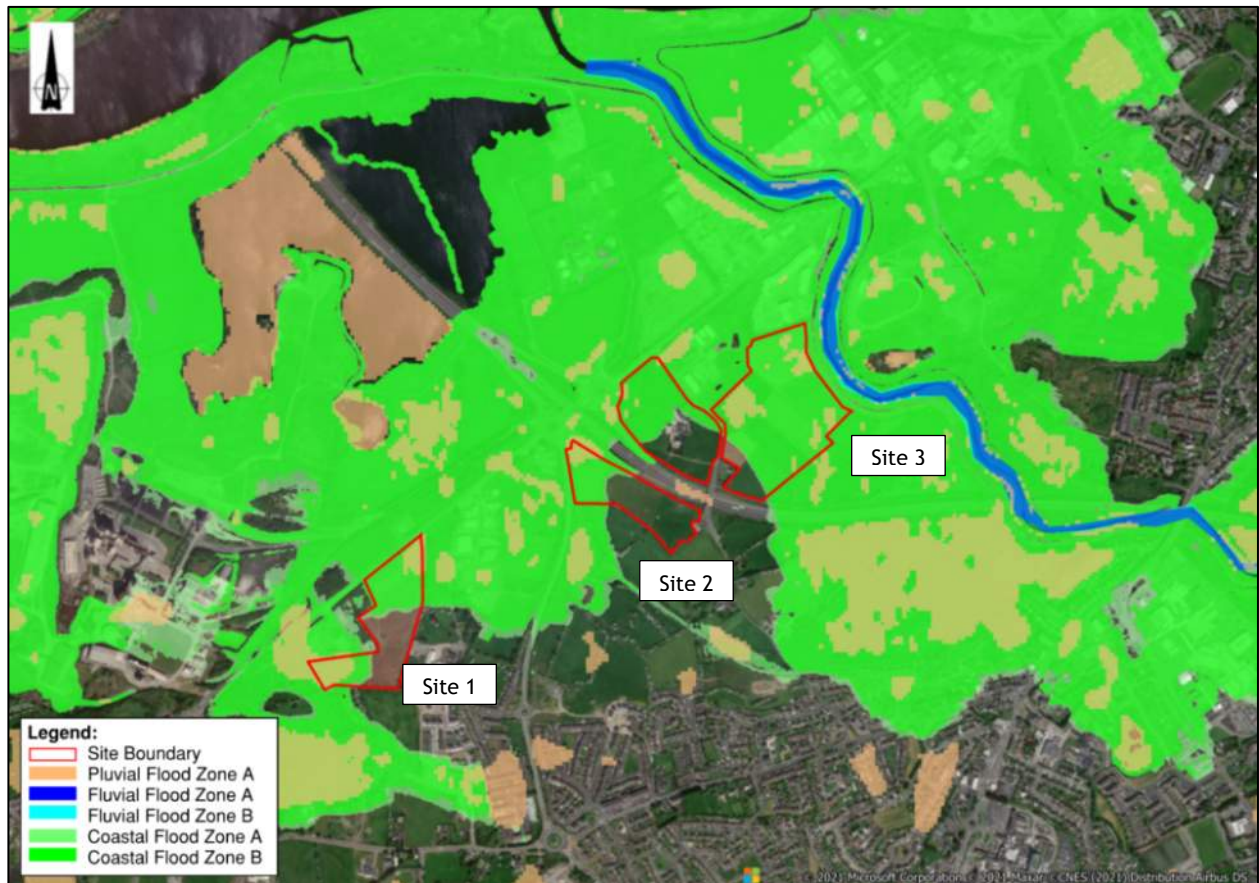


Figure 3-3: PFRA flood zone map indicating extents of preliminary flood zones

The PFRA mapping shown above indicates the sites are each partially located in Preliminary Coastal & Pluvial Flood Zone A.

It is noted that the PFRA modelling is a high-level study which uses a coarse ground to represent the topography of the country and does not take existing flood defences into account. As such PFRA fluvial, pluvial and coastal flood extents are to be utilised as an initial assessment only.

3.9 CFRAMS Mapping

As part of the CFRAMS programme, mapping is available online for public viewing, and the local area has been assessed as part of the Shannon CFRAMS. The OPW has published detailed flood hazard mapping for the area based on results from the CFRAMS. This includes flood extent and flood depth mapping for a number of return periods for fluvial and coastal flood events. The CFRAMS assessment in this area is based on hydraulic modelling of the River Shannon and its tributaries.

Figure 3-4 below is an extract from the relevant Shannon CFRAMS fluvial flood map and Figure 3-5 overleaf is an extract from the relevant Shannon CFRAMS coastal flood map for the area surrounding the proposed development site. Full CFRAMS maps for the area are included in Appendix C of this report.

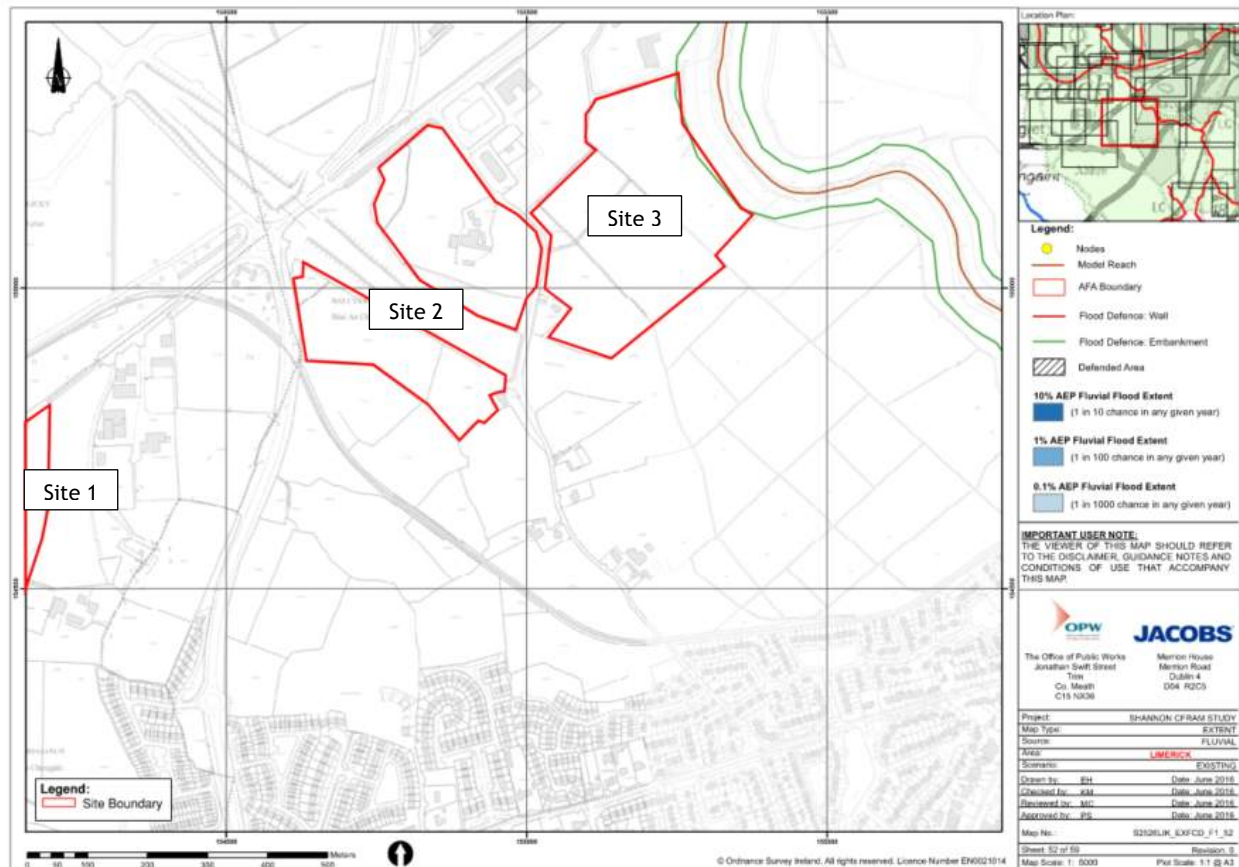


Figure 3-4: Extract from the CFRAMS fluvial map for the area (site indicated in red)

¹ Maps available: <http://www.floodinfo.ie/map/floodmaps/?X=6919597,223688143&Y=-959644.9352880842&Z=15>

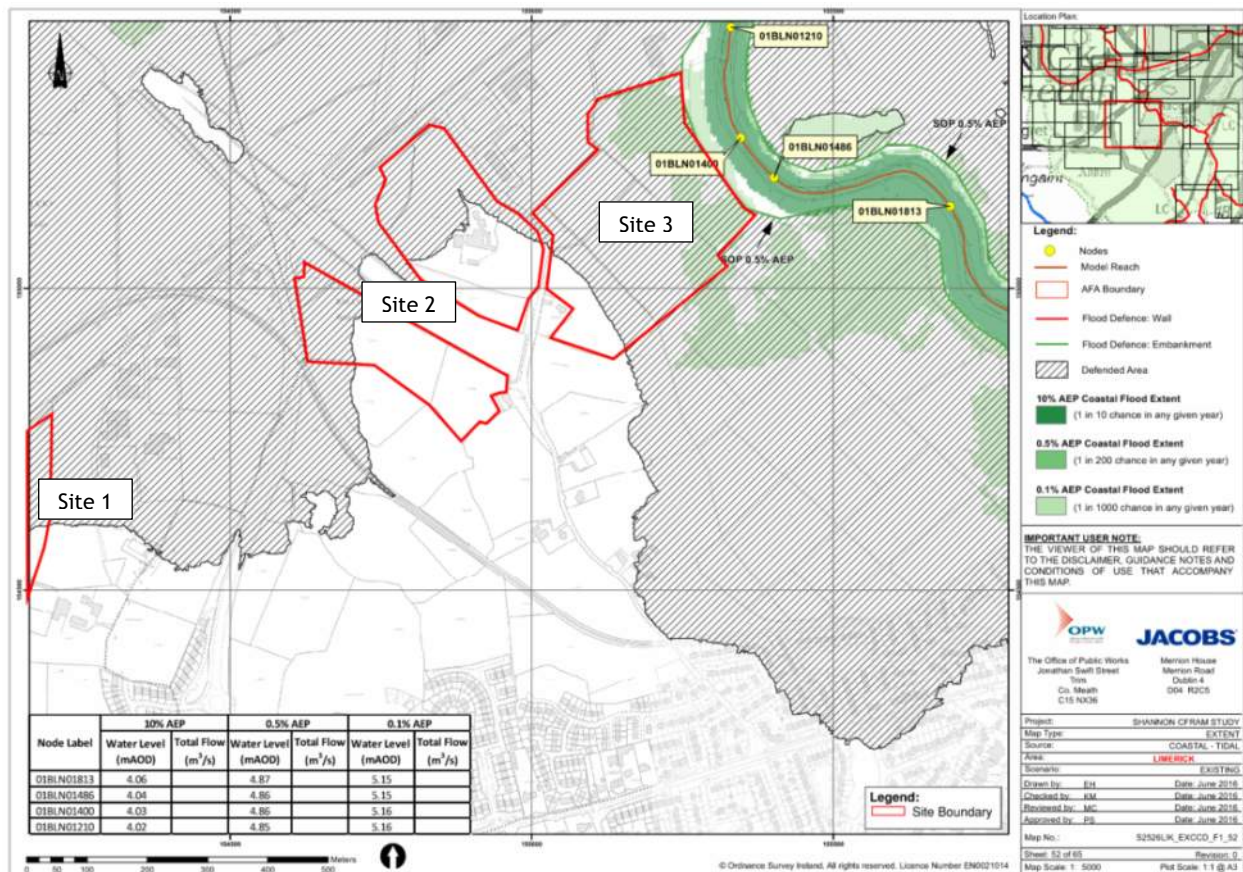


Figure 3-5: Extract from the CFRAMS coastal map for the area (site indicated in red)

The CFRAM mapping indicates that there is a 0.1% AEP Coastal Flood Extent partially noted on Site 3 (green hatch) and that each of the sites is partially noted as located in a 'Defended Area'.

LCCC has advised that the 0.1% AEP Coastal Flood Extent shown is the predicted flood level at the site during a breach of the flood defences when fully functional.

The closest node to the site notes flood levels in the Ballinacurra Creek as per Table 3-1 below. This level ignores the presence of flood defences altogether and also corresponds to the extent of the Defended Area noted on the mapping.

Table 3-1: CFRAM Coastal Predicted Flood Levels in Ballinacurra Creek in Vicinity of Site

Node	0.5% AEP (mAOD)	0.1% AEP (mAOD)
01BLN01400	4.86	5.16

3.10 Existing Flood Defences

The CFRAM maps shown in Figure 3-49 and Figure 3-5 identify a flood defence embankment located on the eastern boundary of Site 3. There are flood defence embankments located along both banks of Ballinacurra Creek in the vicinity of the site. These defences are noted as providing a standard of protection of 0.5% AEP. Flood mapping presented in the CFRAMS study ignores the presence of flood defences.

3.11 Breach Analysis

As part of the CFRAM Study, a breach analysis was carried out to assess the potential flood extents in the event of a breach failure as part of the Preliminary Options Report for the Unit of Management (UoM) 25 and 26 (2016). In May 2018 the OPW released the Flood Risk Management Plan for the Shannon Upper & Lower, River Basin 25/26. A number of locations on the tidal reaches of the Shannon and the Ballinacurra Rivers were analysed as part of this to assess the effect of a failure in flood defences on the surrounding area. Upon a review of this analysis, PUNCH identified three of these locations which impacted upon the site of the proposed development. It appeared that the embankment for the N18 National Primary Route behaved as an effective barrier to large tidal inundations from both sides. Of the three breach locations which impacted the site, one breach location is located to the west of the N18 and the two further locations that impacted the site were on the east. The locations of the breaches which impacted the study site are identified in Figure 3-6 below.

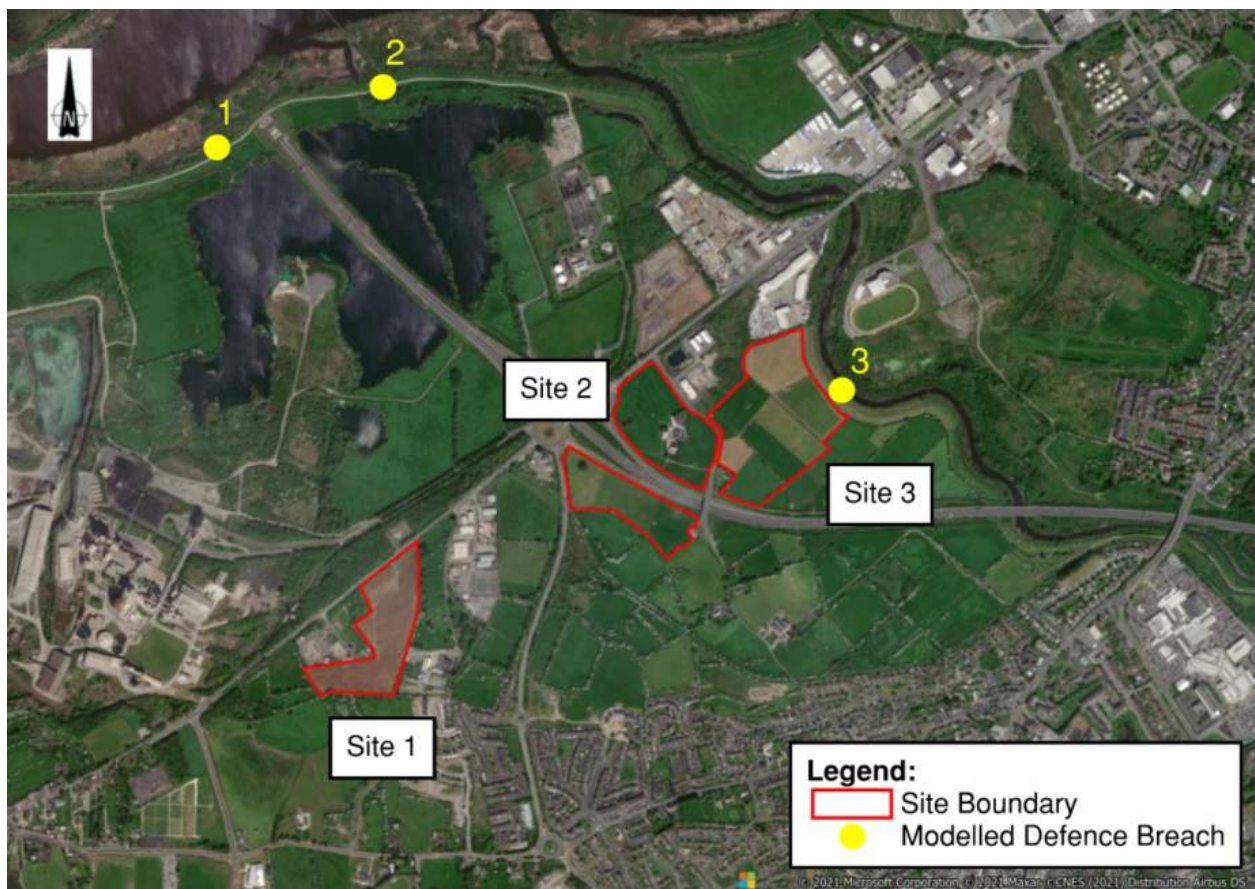


Figure 3-6: Locations of modelled CFRAMS defence breaches which impacted upon the site

The modelled breach which had the largest impact on the sites were location 2 for Site 2 and 3 for Site 3 as shown in Figure 3-6 above.

An extract from these maps, with the site boundary overlain, shows the flood extents and the flood depths at the site.

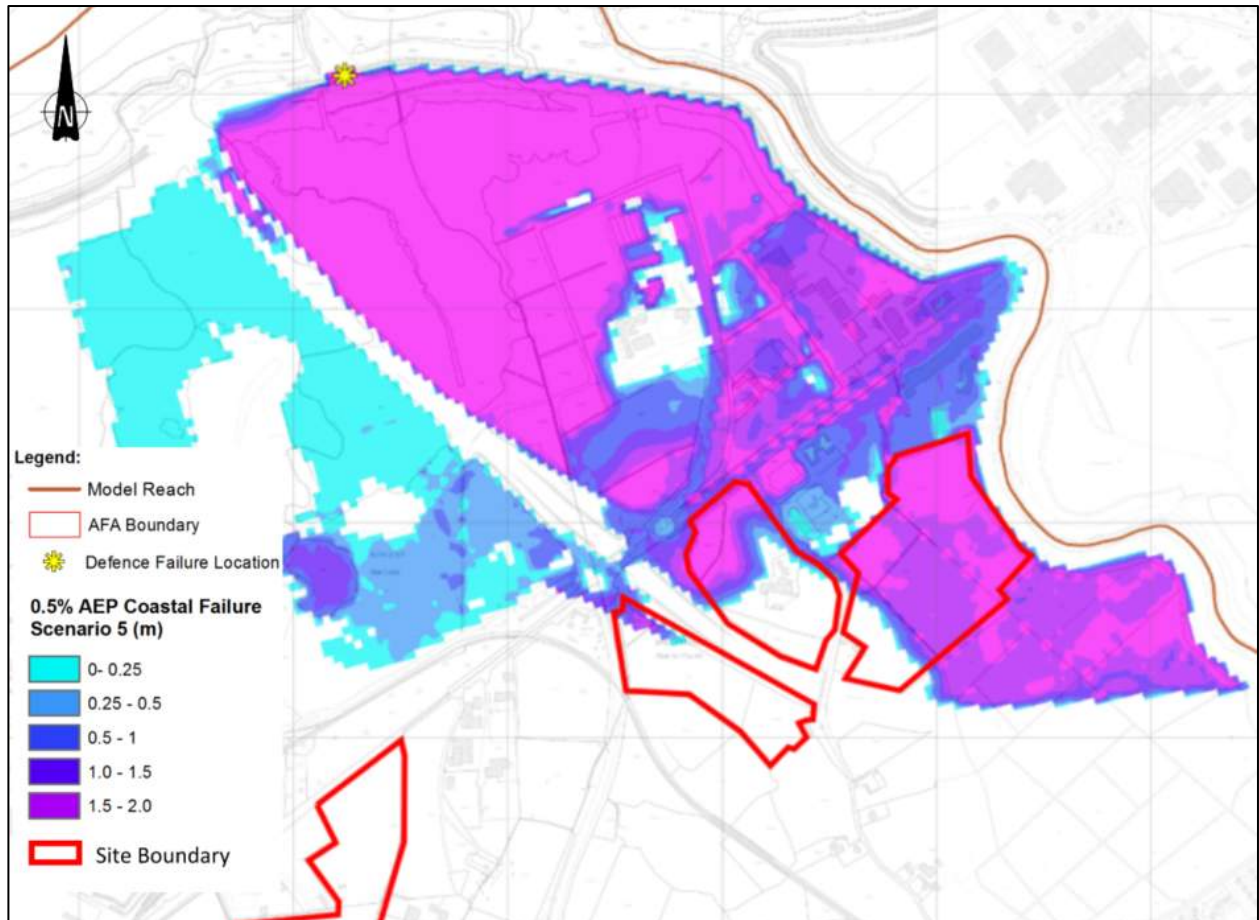


Figure 3-7: Point 2 0.5% AEP Flood extents from breach on River Shannon flood embankments

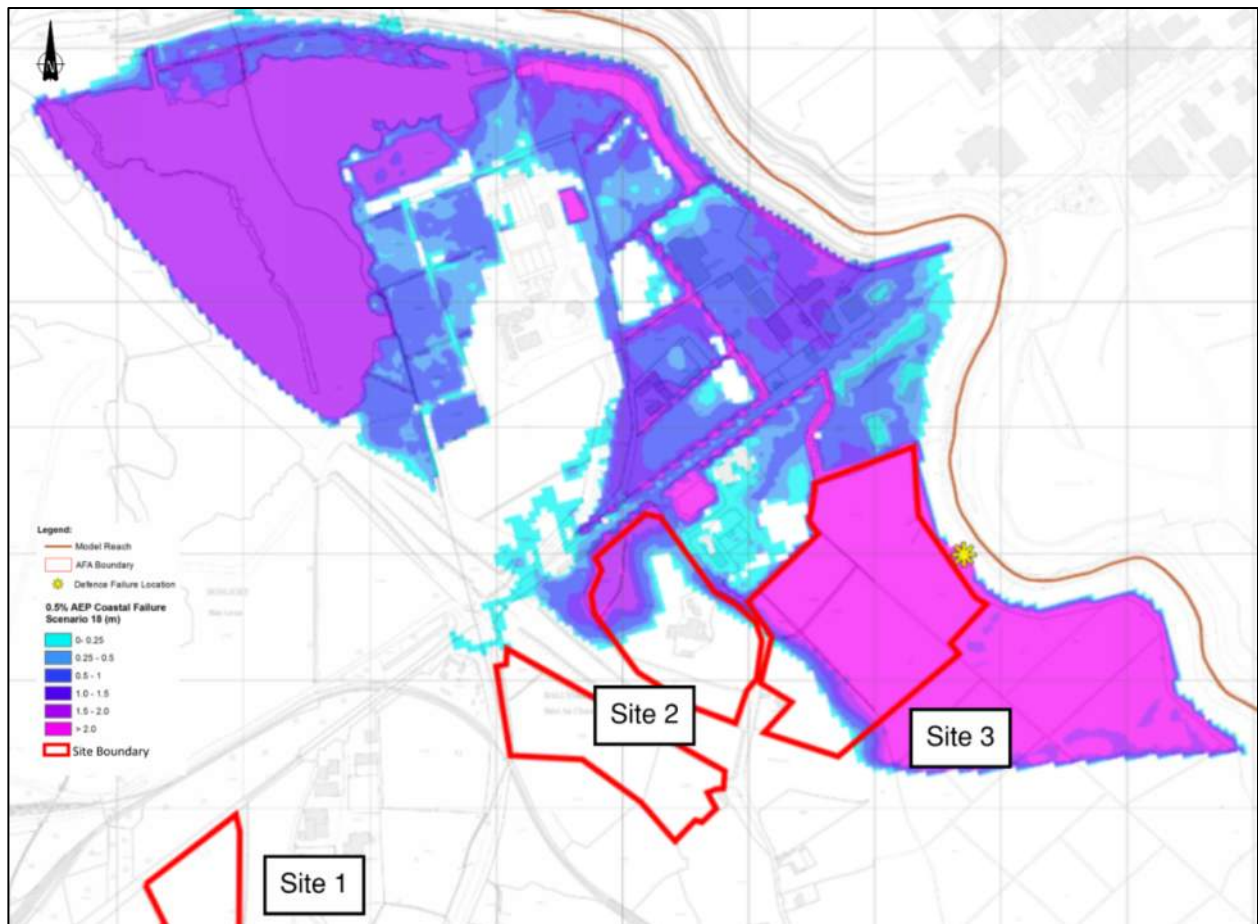


Figure 3-8: Point 3 0.5% AEP Flood extents from breach on River Shannon flood embankments

Based on the analysis carried out, Site 1 and the western side of Site 2 experienced no flooding for all three defence breach points.

Site 2, as shown in Figure 3-7, is expected to experience flooding of 2m or greater in approximately a third of the eastern side of the site. This area of the site is proposed to be rezoned to 'Agriculture' in the Draft Limerick Development Plan.

The results of the analysis from point 3 show flooding of 2m or greater for the majority of Site 3, as shown in Figure 3-82 & Figure 3-13 above. Similar to Site 2 this land is predominately zoned for 'Agriculture' with approximately a third of the site to the east zoned for 'Semi-Natural Open Space'.

3.12 Draft Strategic Flood Risk Assessment

The Draft Strategic Flood Risk Assessment dated 26th June 2021 and prepared by JBA Consulting as a part of the Draft Limerick Development Plan 2022-2028 provides guidance for the integration of flood risk management into the development strategy for Limerick City and County.

In the report, flooding maps are provided for Limerick City and other settlements in Limerick County as shown below in Figure 3-9.

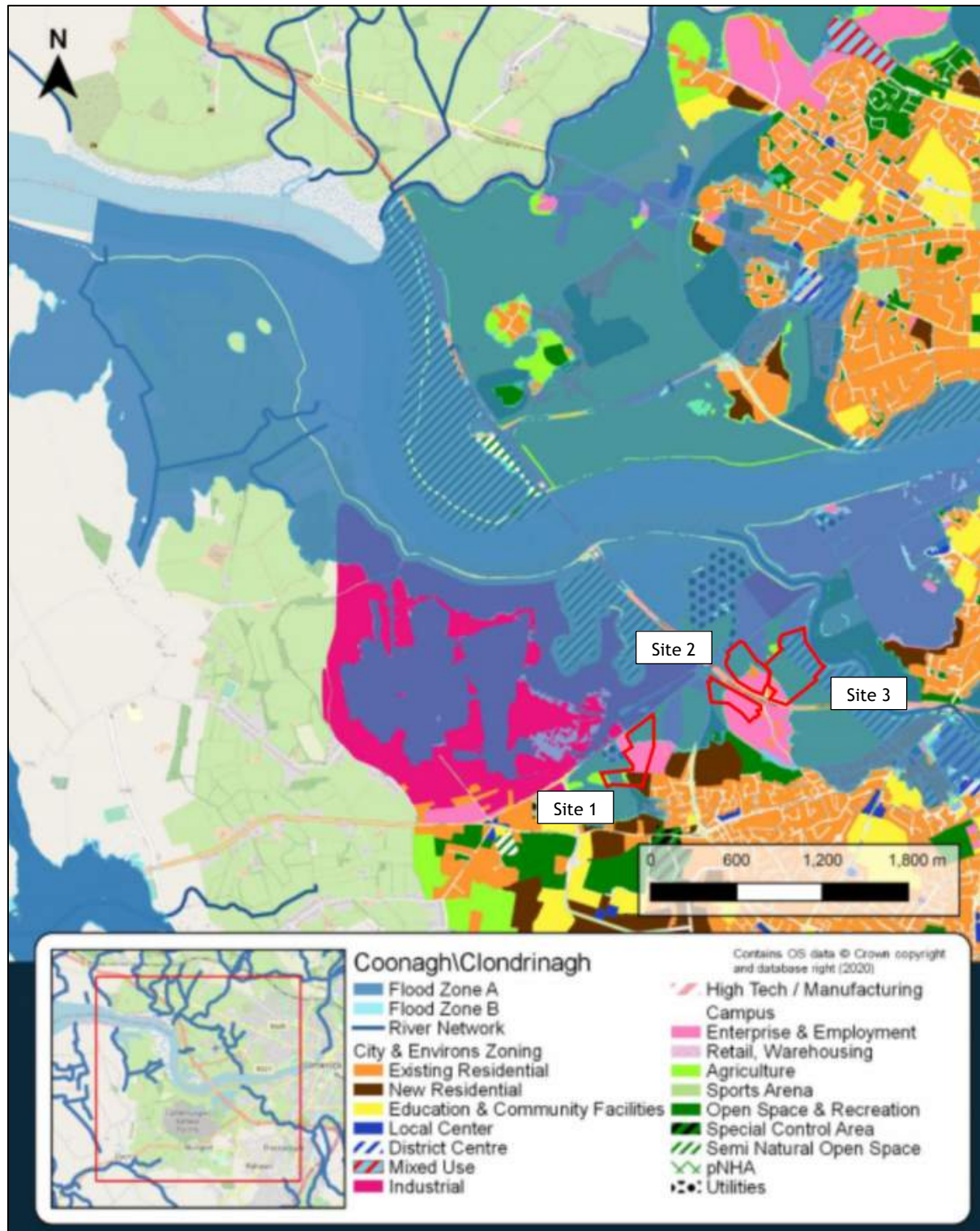


Figure 3-9: JBA Draft Strategic Flood Risk Assessment

According to the SFRA mapping in Figure 3-9, the sites are all partially located in Flood Zone A which approximately corresponds to the defended area noted in the CFRAM mapping. We can confirm from our site visit that the flood extents shown match the gradients observed on site.

JBA mapping is a preliminary set of mapping prepared for Limerick City and County Council. As per section 2.3 of the SFRA, the definition of the Flood Zone is based on an undefended scenario and does not take into account the presence of flood protection structures such as flood walls or embankments.

Hence, the flood extents shown are a worst-case scenario based on all flood defences in Limerick not being operational and ignored entirely.

3.13 Estimate of Flood Zone

PUNCH Consulting Engineers have reviewed the available information as outlined in the above sections. The site is not indicated as being at risk of fluvial flooding

The breach analysis carried out by the OPW for the Flood Risk Management Plan relating to the area did not show any flooding affecting Site 1 or the western portion of Site 2 therefore the risk to those sites is currently low.

The existing flood defences are no doubt providing protection to the three sites from coastal flooding to varying degrees. If these flood defences could be accounted for Sites 1 & 2 would be classified as Flood Zone C but the residual risk of flooding would still need to be accounted for.

Again, if these flood defences could be accounted for, the eastern portion of Site 3 would be classified as Flood Zone B.

However, the FRMG advise that food zones ignore the presence of flood defences. Therefore we must conclude that the Flood Zone Areas for coastal floodplain noted in the JBA mapping and presented in the Draft SFRA is the correct zoning for each site in accordance with the FRMG.

4 Flood Risk Assessment

4.1 Sources of Flooding

When carrying out a Flood Risk Assessment, one should consider all potential risk and sources of flood water at the site. In general, the relevant flood sources are:

Fluvial Flooding

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain. The proposed sites are located approximately 1km from Ballinacurra Creek and 1km from the River Shannon. From a review of the available information, and given the site levels, it is considered that the site is not at risk of fluvial flooding.

Coastal Flooding

Coastal flooding is the result of sea levels which are higher than normal and result in sea water overflowing onto the land during high tides or storm surges. The proposed sites are located 1km from the coast. From a review of the available information, the site it is considered to have a low residual risk of coastal flooding due to the existing flood embankment defences located on the River Shannon and Ballinacurra Creek.

Pluvial Flooding

Pluvial Flooding is the result of rainfall-generated overland flows which arise before run-off can enter any watercourse or sewer. It is usually associated with high-intensity rainfall. There are some areas within the site which may be subject to pluvial flooding due to their naturally low depressions. However, the provision of a suitable surface water drainage system for any proposed development on the site will mitigate against this risk.

Groundwater Flooding

Groundwater flooding occurs when the level of the water stored in the ground rises as a result of prolonged rainfall. From a review of the available information, there is no risk of groundwater flooding at the site.

4.2 Site Vulnerability

The Planning System and Flood Risk Management Guidelines gives definitions for the type of developments that can take place in each Flood Zone. Table 4 defines the classifications of vulnerability of different types of development as detailed in the Flood Risk Management Guideline. Table 4-2 shows the types of development appropriate for each Flood Zone.

The choice of appropriate development proposals at this site will be dependent on these tables within each of the flood zone designations. This is explored further in Section 4.4.

Table 4-1: Classification of vulnerability of different types of development

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	<p>Garda, ambulance and fire stations and command centres required to be operational during flooding;</p> <p>Hospitals;</p> <p>Emergency access and egress points;</p> <p>Schools;</p> <p>Dwelling houses, student halls of residence and hostels;</p> <p>Residential institutions such as residential care homes, children's homes and social services homes;</p> <p>Caravans and mobile home parks;</p> <p>Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and</p> <p>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.</p>
Less vulnerable development	<p>Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions;</p> <p>Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans;</p> <p>Land and buildings used for agriculture and forestry;</p> <p>Waste treatment (except landfill and hazardous waste);</p> <p>Mineral working and processing; and</p> <p>Local transport infrastructure.</p>
Water-compatible development	<p>Flood control infrastructure;</p> <p>Docks, marinas and wharves;</p> <p>Navigation facilities;</p> <p>Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location;</p> <p>Water-based recreation and tourism (excluding sleeping accommodation);</p> <p>Lifeguard and coastguard stations;</p> <p>Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and</p> <p>Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).</p>
*Uses not listed here should be considered on their own merits	

Table 4-2: Matrix of Vulnerability versus Flood Zone to indicate Justification Requirement

	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

Where the Justification Test must be applied, Box 4.1 and Box 5.1 requirements must be met as reproduced and set out in Figure 10.

Box 4.1: Justification Test for development plans	Box 5.1 Justification Test for development management (to be submitted by the applicant)
<p>Where, as part of the preparation and adoption or variation and amendment of a development/local area plan¹, a planning authority is considering the future development of areas in an urban settlement that are at moderate or high risk of flooding, for uses or development vulnerable to flooding that would generally be inappropriate as set out in Table 3.2, all of the following criteria must be satisfied:</p> <ol style="list-style-type: none"> 1 The urban settlement is targeted for growth under the National Spatial Strategy, regional planning guidelines, statutory plans as defined above or under the Planning Guidelines or Planning Directives provisions of the Planning and Development Act, 2000, as amended. 2 The zoning or designation of the lands for the particular use or development type is required to achieve the proper planning and sustainable development of the urban settlement and, in particular: <ol style="list-style-type: none"> (i) Is essential to facilitate regeneration and/or expansion of the centre of the urban settlement²; (ii) Comprises significant previously developed and/or under-utilised lands; (iii) Is within or adjoining the core³ of an established or designated urban settlement; (iv) Will be essential in achieving compact and sustainable urban growth; and (v) There are no suitable alternative lands for the particular use or development type, in areas at lower risk of flooding within or adjoining the core of the urban settlement. 3 A flood risk assessment to an appropriate level of detail has been carried out as part of the Strategic Environmental Assessment as part of the development plan preparation process, which demonstrates that flood risk to the development can be adequately managed and the use or development of the lands will not cause unacceptable adverse impacts elsewhere. <p>N.B. The acceptability or otherwise of levels of any residual risk should be made with consideration for the proposed development and the local context and should be described in the relevant flood risk assessment.</p>	<p>When considering proposals for development, which may be vulnerable to flooding, and that would generally be inappropriate as set out in Table 3.2, the following criteria must be satisfied:</p> <ol style="list-style-type: none"> 1. The subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines. 2. The proposal has been subject to an appropriate flood risk assessment that demonstrates: <ol style="list-style-type: none"> (i) The development proposed will not increase flood risk elsewhere and, if practicable, will reduce overall flood risk; (ii) The development proposal includes measures to minimise flood risk to people, property, the economy and the environment as far as reasonably possible; (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 (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. <p>The acceptability or otherwise of levels of residual risk should be made with consideration of the type and foreseen use of the development and the local development context.</p> <p>Note: See section 5.27 in relation to major development on zoned lands where sequential approach has not been applied in the operative development plan.</p> <p>Refer to section 5.28 in relation to minor and infill developments.</p>

Figure 4-1: Extracts from FRM Guidelines Justification Test Requirements

4.3 Climate Change

To mitigate against the residual risk of flooding to the site any proposed building should be set so that the finished floor levels of the development are above the flood level with an allowance for climate change. Table 4-3 below replicates Table 5-3 of the LCCC DRAFT SFRA which gives guidance on the recommended finished floor levels for new developments. The site is located in a tidal, defended area. As the flood defence embankment along the River Shannon north bank is a legacy structure it cannot be confirmed whether climate change was accounted for and therefore a climate change allowance will need to be included in setting development floor levels.

Table 4-3: LCCC DRAFT SFRA Table 5-3: Recommended minimum finished floor levels.

Scenario	Finished floor level to be based on
Fluvial, undefended	1% AEP flood + climate change (as Table 5-2) + 300mm freeboard.
Tidal, undefended	0.5% AEP flood + climate change (as Table 5-2) + 300mm freeboard (or 500mm where there is a risk of storm surge and wave action).
Fluvial, defended	1% AEP flood + 300mm freeboard. Climate change does not need to be included, provided it is included in the defence height or adaption plan for the scheme. Where a breach model has been developed to further understand risks, FFL may be set based on model outputs.
Tidal, defended	0.5% AEP flood + 300mm freeboard (or 500mm where there is a risk of storm surge and wave action). Climate change does not need to be included, provided it is included in the defence height or adaption plan for the scheme. Where a breach model has been developed to further understand risks, FFL may be set based on model outputs.

Based on the information above, any proposed development on the site will require finished floor levels to be set above the 0.5% AEP flood level + freeboard + climate change. The proposed site is located nearly 1km from the Shannon and as such there is no risk of storm surge or wave action at the site. Therefore, the 300mm value for freeboard will be used. The minimum Finished Floor level for any development at this site should therefore be 5.66mAOD.

4.4 Potential Site Development

With reference to Tables 4-1 & 4-2 and the current and proposed Development Plan zoning, the following development options are available on each site:

4.4.1 Site 1

Figure 4-2 below shows extracts from the Draft Limerick Development Plan Zoning alongside the estimated coastal flood zones in the site:

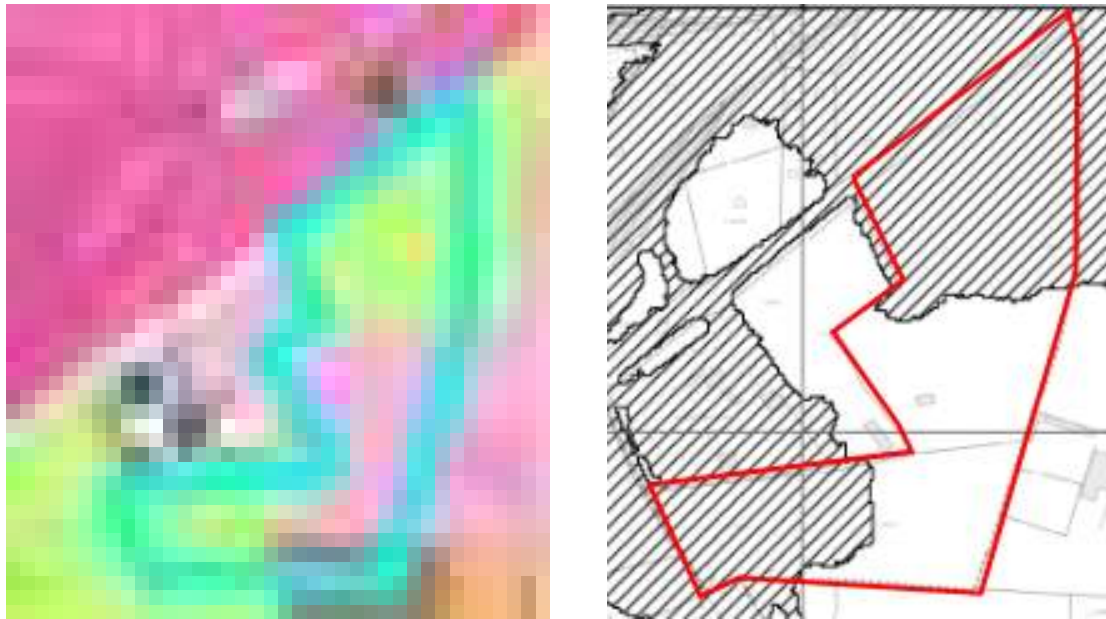


Figure 4-2: Extracts from Draft Development Zoning alongside Flood Map Zoning for Site 1

1. The unhatched area to the southeast of the site is located within Flood Zone C. All development is deemed appropriate in accordance with the FRMG subject to planning designation (current zoning: Industrial; proposed zoning: Enterprise and Employment are both deemed appropriate).
2. The western and northern portions of the site are located within defended Flood Zone A (current zoning: Industrial in the west and Enterprise and Employment/Industrial in the north; proposed zoning: Agriculture).
3. Flood Zone A is the most restrictive in terms of allowable development. It is possible to propose other type of less vulnerable development on this land from an engineering perspective however it will need to pass the Justification Test as set out in the FRMG and also noted in Figure 4.1 above. Please seek separate planning advice on this.
4. Given the low probability of flooding on the site based on various breach assessments in the area, it is highly likely that a less vulnerable use such as 'Enterprise and Employment' could be justified over the entirety of the site boundary. The site is also well serviced in regard drainage and access requirements and would therefore benefit from a 'less vulnerable' use zoning. Please seek separate planning advice on this.
5. Provided the Planning Justification (Box 4-1) is satisfied for the proposed use on the FZA portions of the site, development could proceed for the use deemed appropriate by a planning consultant, provided appropriate engineering flood mitigation measures (see further details set out in Section 4.5) could be included in the site development design proposals.

4.4.2 Site 2

Figure 4-3 below shows extracts from the Draft Limerick Development Plan Zoning alongside the estimated coastal flood zones in the site:

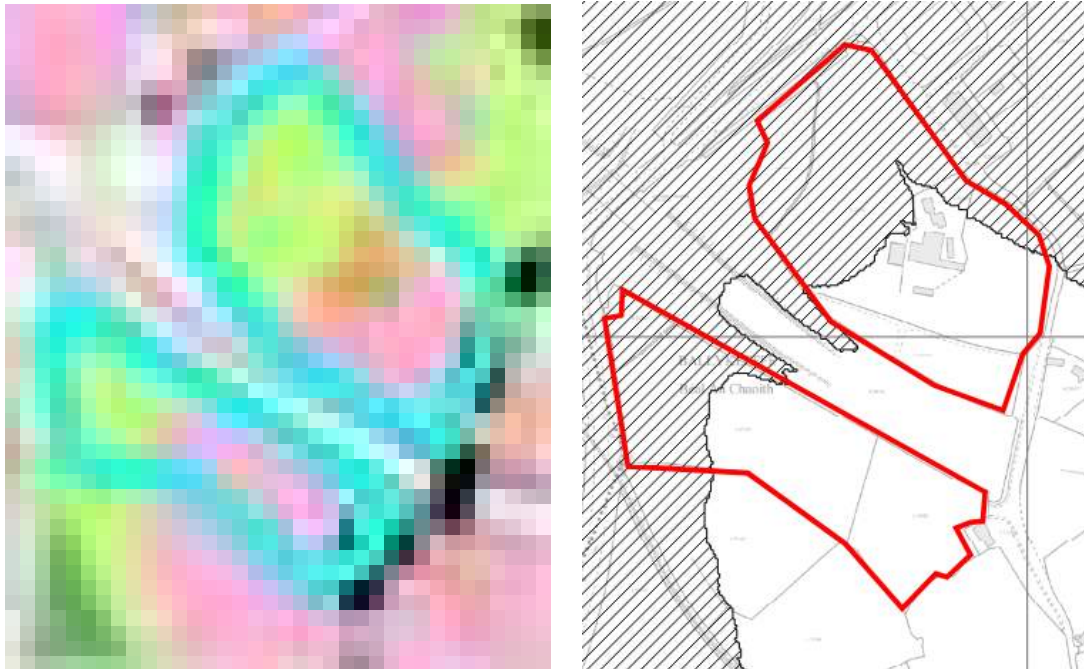


Figure 4-3: Extracts from Development Zoning alongside Flood Map Zoning for Site 2

1. The unhatched area to the southeast of the site is located within Flood Zone C. All development is deemed appropriate in accordance with the FRMG subject to planning designation (current zoning: Industrial; proposed zoning: Enterprise and Employment are both deemed appropriate).
2. The western and northern portions of the site are located within defended Flood Zone A (current zoning: Industrial in the west and Enterprise and Employment/Industrial in the north; proposed zoning: Agriculture).
3. Flood Zone A is the most restrictive in terms of allowable development. It is possible to propose other type of less vulnerable development on this land from an engineering perspective however it will need to pass the Justification Test as set out in the FRMG and also noted in Figure 4.1 above. Please seek separate planning advice on this.
4. Given the low probability of flooding on the western portion of the site based on various breach assessments in the area, it is highly likely that a less vulnerable use such as 'Enterprise and Employment' could be justified. The breach assessment showing flooding on the eastern portion of the site is also a low probability event and as such the site should be suitable for a less vulnerable development proposal such as Enterprise and Employment. The site is also well serviced in regard drainage and access requirements and would therefore benefit from a 'less vulnerable' use zoning. Please seek separate planning advice on this.
5. Provided the Planning Justification (Box 4-1) is satisfied for the proposed use on the FZA portions of the site, development could proceed for the use deemed appropriate by a planning consultant, provided appropriate engineering flood mitigation measures (see further details set out in Section 4.5) could be included in the site development design proposals.

4.4.3 Site 3

Figure 4-4 below shows extracts from the Draft Limerick Development Plan Zoning alongside the estimated coastal flood zones in the site:

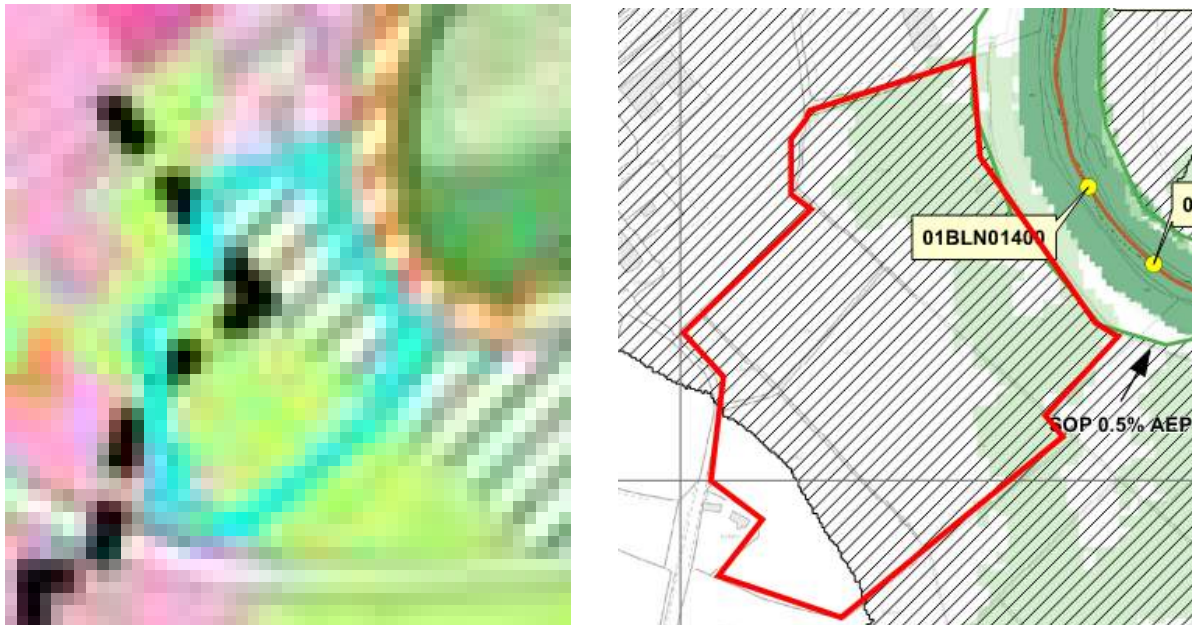


Figure 4-4: Extracts from Development Zoning alongside Flood Map Zoning for Site 3

1. The unhatched area to the southwest of the site is located within Flood Zone C. All development is deemed appropriate in accordance with the FRMG subject to planning designation (current/proposed zoning: Enterprise and Employment are both deemed appropriate).
2. The central portion of the site are located within defended Flood Zone A (current zoning: Enterprise and Employment; proposed zoning: Agriculture).
3. The western portion of the site is located within defended Flood Zone A. The green hatch refers to the Flood Zone B designation if the defences were considered (current/proposed zoning: Semi-Natural Open Space).
4. Flood Zone A is the most restrictive in terms of allowable development. It is possible to propose other type of less vulnerable development on this land from an engineering perspective however it will need to pass the Justification Test as set out in the FRMG and also noted in Figure 4.1 above. Please seek separate planning advice on this.
5. Given the low probability of flooding on the central portion of the site based on various breach assessments in the area, it is highly likely that a less vulnerable use such as 'Enterprise and Employment' could be justified. The breach assessment showing flooding on the eastern portion of the site is also a low probability event and as such the site should be suitable for a less vulnerable development proposal such as Enterprise and Employment. The site is also well serviced in regard drainage and access requirements and would therefore benefit from a 'less vulnerable' use zoning. Please seek separate planning advice on this as there may be reasons other than flooding for zoning the area Semi-Natural Open Space.
6. Provided the Planning Justification (Box 4-1) is satisfied for the proposed use on the FZA portions of the site, development could proceed for the use deemed appropriate by a planning consultant, provided appropriate engineering flood mitigation measures (see further details set out in Section 4.5) could be included in the site development design proposals.

4.5 Standard Mitigation Measures

Parts of the sites are located in a defended Flood Zone A. As such the risk of flooding to the site is lessened and the key consideration from an engineering perspective when assessing flood risk for a particular development is to ensure that the residual risk of flooding at the site is addressed.

Every site proposal is different where the topography and constraints will be unique to that particular site proposal. However, there are a number of flood mitigation engineering options that are common to all sites that when implemented, can assist in reducing the flood risk to properties constructed. The following engineering options can be considered at these sites:

1. The finished floor level for any proposed development within the sites should be set to a minimum level as noted in Section 4.3. Given the existing site levels, consideration to raising any proposed buildings on stilts could be explored.
2. Due to the coastal nature of flooding predicted on the sites, earthwork compensation should not be required from a volumetric perspective if filling of land is proposed in order to raise buildings above the flood level. The disturbance of flow paths caused by the filling will however need to be addressed.
3. All surface water flows generated within any development will be captured by a dedicated surface water drainage network which will be designed for a 1 in 100-year storm event allowance for climate change. The proposed surface water drainage system will mitigate against any pluvial flood risk at the development.
4. Any development proposed for the lands should include water compatible construction where relevant. This will include features such as hard floors at ground level and sockets set at high level along walls.
5. Emergency access to any proposed development on the sites will need to be considered.
6. As part of any proposed site maintenance plan, all future proprietors should inspect all road gullies in the vicinity and report any blockages to the Local Authority and/or Irish Water. The proprietor should also inspect all surface water drainage within the site, in particular following periods of inclement weather, which may cause debris to obstruct stormwater inlets.

Additional engineered mitigation measures can also be implemented to further assist in reducing the flood risk of properties on any proposed development. These are usually specific to and, incorporated into any proposed development site layout and detailed design of the proposed structures. Other than recommending that FFL's are above the residual flood risk level of 5.66m AOD and in the absence of any proposal for the lands, no additional specific engineered mitigation measures can be recommended at this time.

5 Conclusions

PUNCH Consulting Engineers were appointed by Mr Michael Gabbett to carry out a Site-Specific Flood Risk Assessment for three sites located on the Dock Road.

This Site-Specific Flood Risk Assessment has been carried out in accordance with “*The Planning System & Flood Risk Management Guidelines*” published by the Department of the Environment, Heritage and Local Government in November 2009 and the Limerick City Local Area Plan.

A review of the flood risk in the area was carried out as the site is located near the River Shannon and Ballinacurra Creek.

Flood Maps produced as part of the CFRAMS were consulted to establish the Flood Zone. It was determined that all three sites are currently protected by existing flood defences on the River Shannon and Ballinacurra Creek to a varying degree and the actual flood risk to the site is currently low. However, the FRMG advise that food zones ignore the presence of defences. Therefore, we must conclude that each site has an area designated Flood Zone A as per the JBA mapping presented in the Draft SFRA.

Potential development options are discussed in the report based on the relevant flood zoning designation. The type of development proposed on the Flood Zone A areas may be subject to a Justification Test in accordance with The Planning System and Flood Risk Management Guidelines dependent on the site development proposals put forward. Given the low probability of flooding on the Flood Zone A designated site areas, it is highly likely that a ‘less vulnerable use’ such as ‘Enterprise and Employment’ could be justified. The sites are all well serviced in regard drainage and access requirements and would therefore benefit from a ‘less vulnerable’ use zoning. Further planning advice is required for the Planning Justification (Box 4-1).

The residual risk of flooding must be addressed. Potential flood mitigation measures appropriate for the sites were discussed and based on an appropriate site development proposal they can be explored further.

Appropriately zoned development on the Flood Zone A portions of the site can be delivered at low risk of flooding and not increase the risk of flooding to adjacent or nearby areas through the implementation of standard flood mitigation measures and specifically engineered development flood mitigation measures.

Appendix A Site Visit Images



Image 1: Existing entrance to site 3



Image 2: Existing OPW channels crossing Site 3



Image 3: Existing flood defence bordering Ballincurra Creek to the east of site 3



Image 4: Site 2 (west)



Image 5: Existing farmyard in site 2 (east)



Image 6: Existing OPW channel crossing southern boundary of Site 2 (east)



Image 7: Entrance to site 2 (east)



Image 8: Site 1



Image 9: Abandoned house in middle of site 1



Image 10: Wet ground observed at south-west corner of site 1

Appendix B OPW Historic Flood Events Record

Past Flood Event Local Area Summary Report

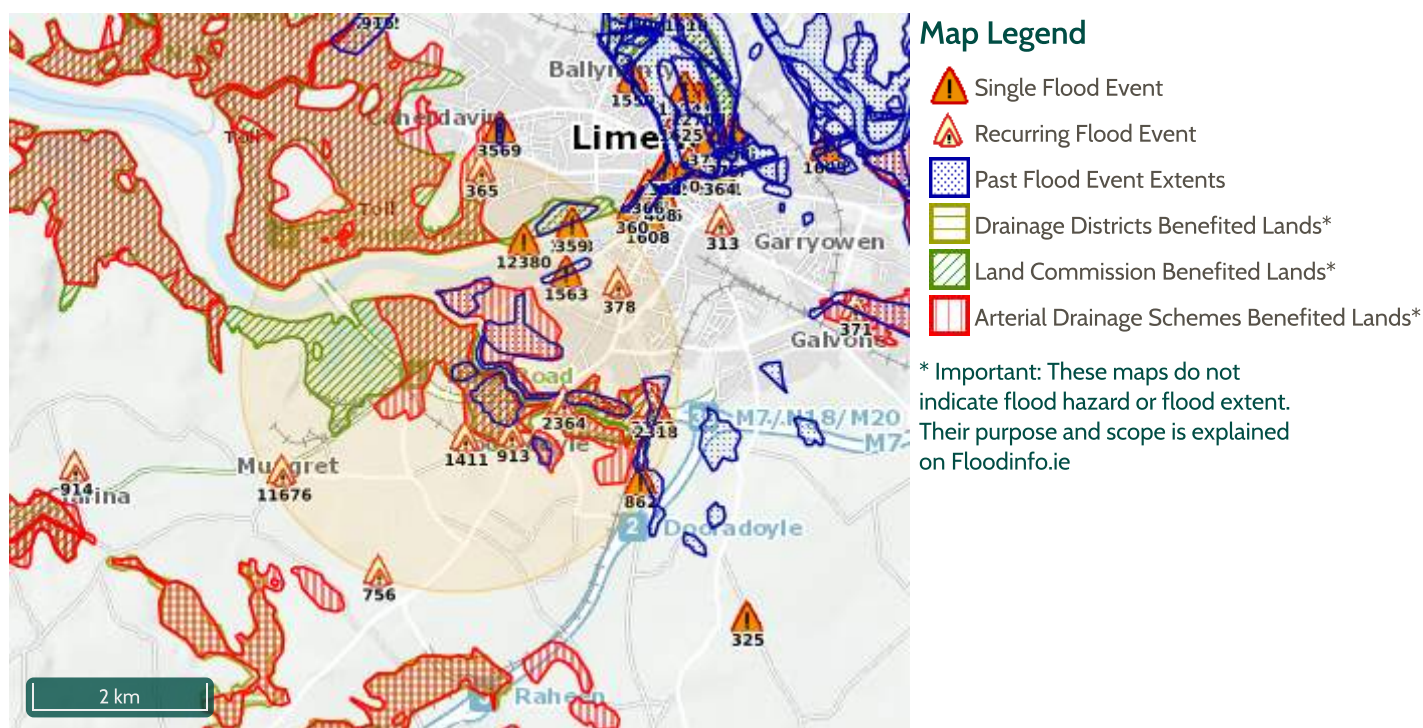


OPW Oifig na nOibreacha Poiblí
Office of Public Works

Report Produced: 5/8/2021 16:48









This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "Website"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.

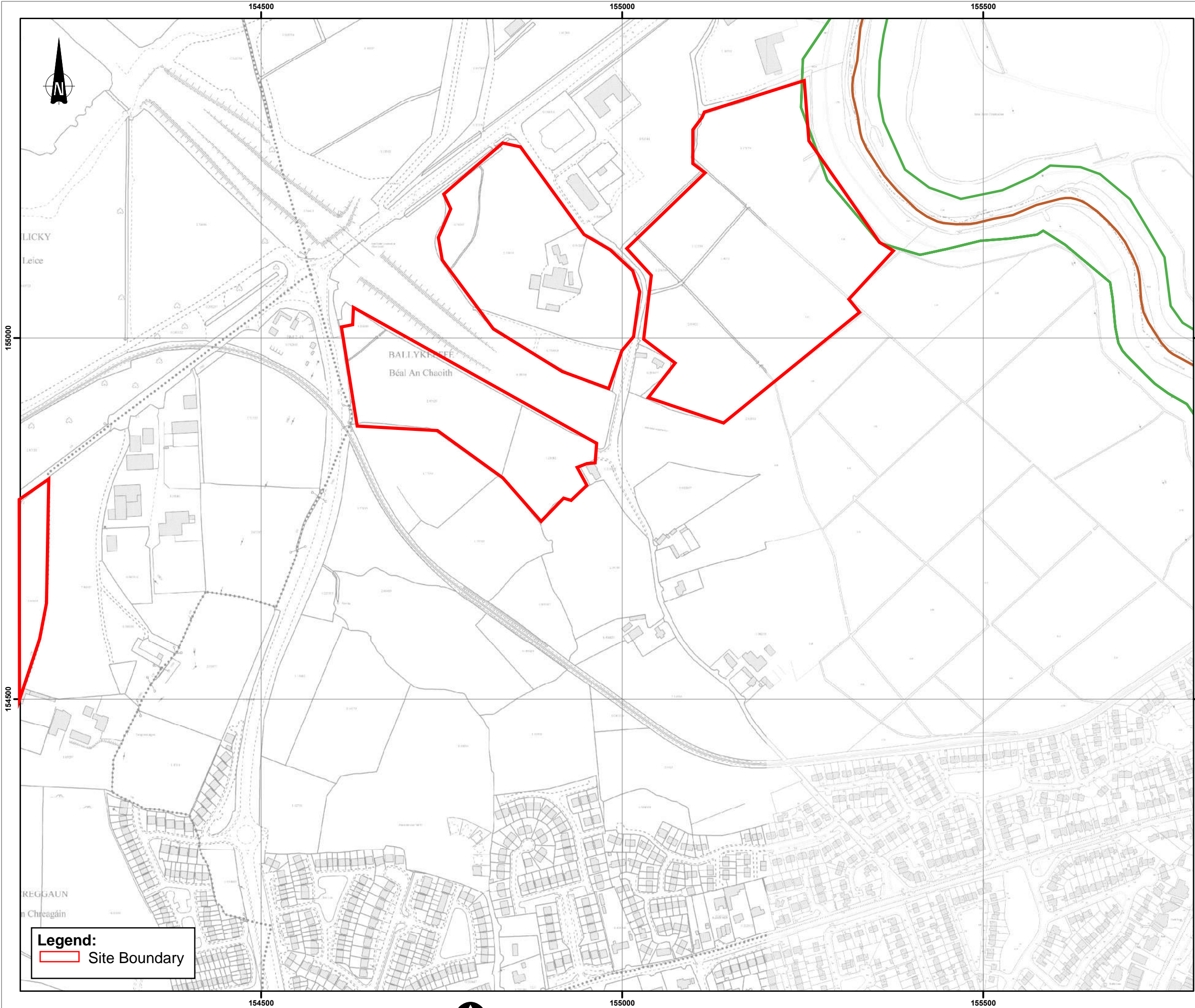


21 Results

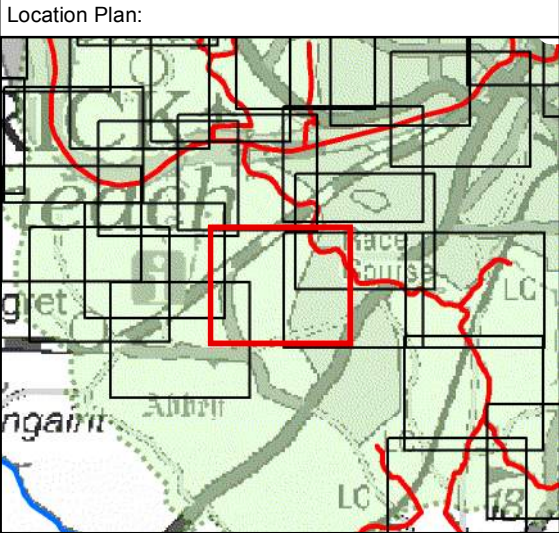
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1.	Shannon Dock Road Limerick Dec 1999 (ID-301) Additional Information: Reports (5) Press Archive (1)	25/12/1999	Area
2.	Ballynaclough River Limerick Dec 1999 (ID-1986) Additional Information: Reports (3) Press Archive (0)	25/12/1999	Area
3.	Greenfield Road Rossbrien Dec 1999 (ID-304) Additional Information: Reports (3) Press Archive (1)	25/12/1999	Area
4.	Raheen Dooradoyle, Limerick Feb 1990 (ID-541) Additional Information: Reports (1) Press Archive (0)	01/02/1990	Area
5.	Ashbrook Gardens Limerick Recurring (ID-365) Additional Information: Reports (1) Press Archive (0)	n/a	Approximate Point
6.	Shannon Condell Road Limerick Feb 2002 (ID-359) Additional Information: Reports (3) Press Archive (0)	11/02/2002	Approximate Point

	Name (Flood_ID)	Start Date	Event Location
7.	 South Circular Road St Mary's Limerick Recurring (ID-378) Additional Information: Reports (1) Press Archive (0)	n/a	Exact Point
8.	 Turlough - Loughmore Common Limerick (ID-756) Additional Information: Reports (3) Press Archive (0)	n/a	Approximate Point
9.	 Ballyclogh River Rossbrien Limerick Feb 1995 (ID-862) Additional Information: Reports (1) Press Archive (0)	07/02/1995	Exact Point
10.	 Dooradoyle-St Nessans/Fr Russell recurring (ID-913) Additional Information: Reports (2) Press Archive (0)	n/a	Approximate Point
11.	 Dooradoyle Limerick recurring (ID-1411) Additional Information: Reports (1) Press Archive (0)	n/a	Approximate Point
12.	 Limerick Dock Rd Jan 1995 (ID-1563) Additional Information: Reports (1) Press Archive (0)	25/01/1995	Approximate Point
13.	 Limerick Condell Road Feb 1990 (ID-1603) Additional Information: Reports (2) Press Archive (0)	01/02/1990	Approximate Point
14.	 Condell Road Limerick Feb 1997 (ID-1607) Additional Information: Reports (2) Press Archive (0)	10/02/1997	Approximate Point
15.	 Ballynaclogh Rosbrien August 1986 (ID-2318) Additional Information: Reports (1) Press Archive (0)	05/08/1986	Approximate Point
16.	 Ballynaclogh Rosbrien Recurring (ID-2363) Additional Information: Reports (1) Press Archive (0)	n/a	Approximate Point
17.	 Ballynaclogh Ballinacurra Recurring (ID-2364) Additional Information: Reports (2) Press Archive (0)	n/a	Approximate Point
18.	 Shannon Westfields Limerick Dec 1999 (ID-299) Additional Information: Reports (3) Press Archive (2)	25/12/1999	Area
19.	 Shannon Adjacent Dock Road Limerick Dec 1999 (ID-302) Additional Information: Reports (3) Press Archive (1)	25/12/1999	Area
20.	 Limerick City 3rd January 2014 (ID-12380) Additional Information: Reports (1) Press Archive (0)	03/01/2014	Approximate Point
21.	 Mungret Village, Co. Limerick (ID-11676) Additional Information: Reports (1) Press Archive (0)	n/a	Approximate Point

Appendix C CFRAMS Mapping



Legend:
Site Boundary



Legend:


- Nodes
- Model Reach
- AFA Boundary
- Flood Defence: Wall
- Flood Defence: Embankment
- Defended Area

10% AEP Fluvial Flood Extent
(1 in 10 chance in any given year)


1% AEP Fluvial Flood Extent
(1 in 100 chance in any given year)

0.1% AEP Fluvial Flood Extent
(1 in 1000 chance in any given year)

IMPORTANT USER NOTE:
THE VIEWER OF THIS MAP SHOULD REFER TO THE DISCLAIMER, GUIDANCE NOTES AND CONDITIONS OF USE THAT ACCOMPANY THIS MAP.

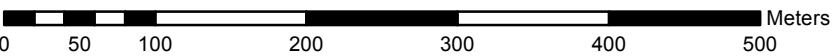


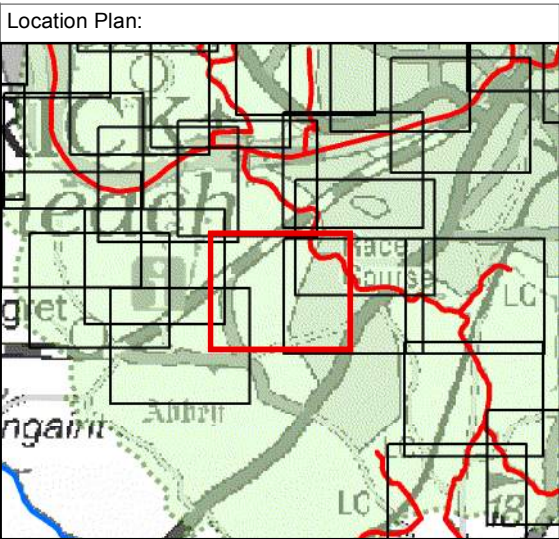
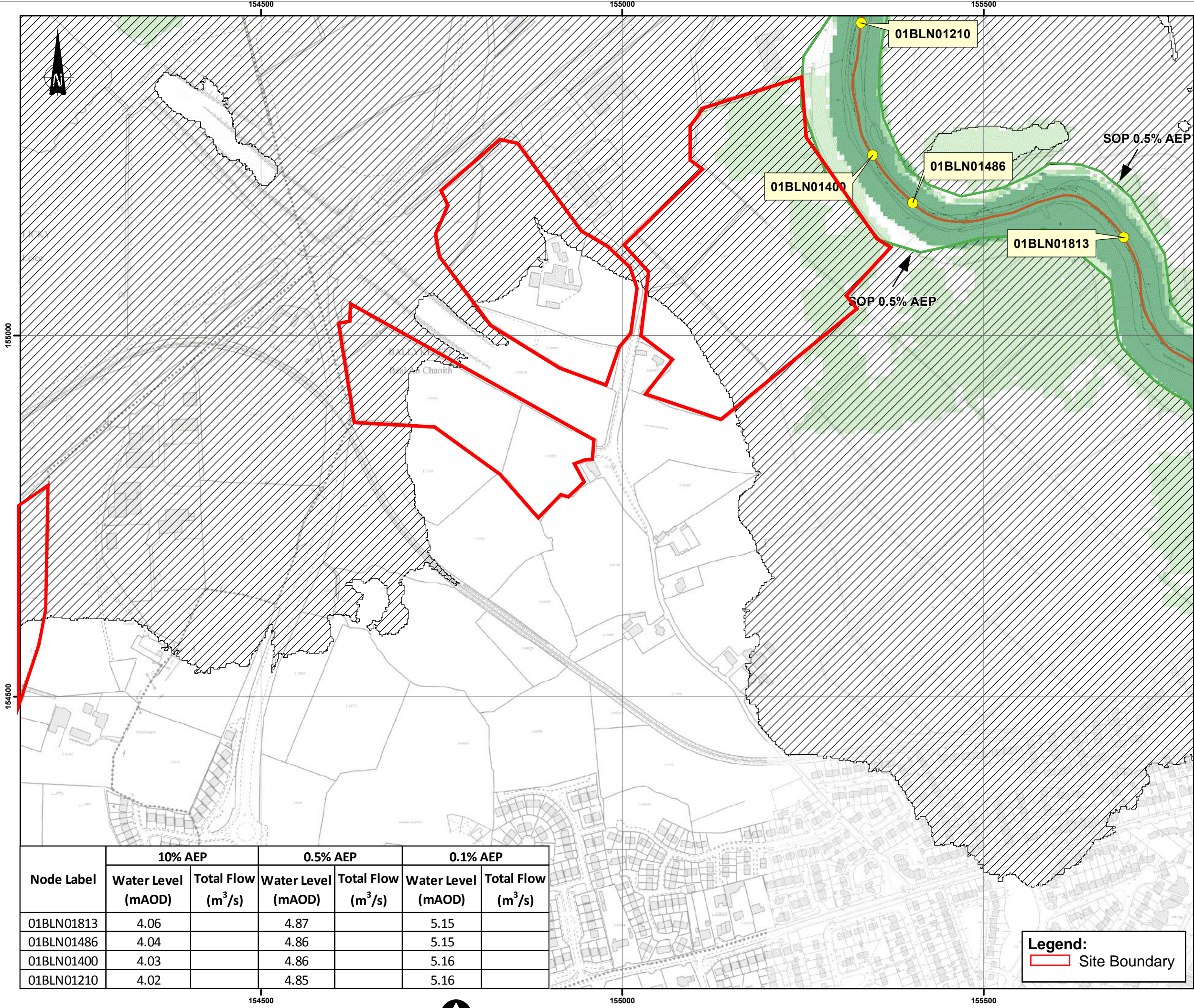
The Office of Public Works
Jonathan Swift Street
Trim
Co. Meath
C15 NX36



Merrion House
Merrion Road
Dublin 4
D04 R2C5

Project:	SHANNON CFRAM STUDY		
Map Type:	EXTENT		
Source:	FLUVIAL		
Area:	LIMERICK		
Scenario:	EXISTING		
Drawn by:	EH	Date:	June 2016
Checked by:	KM	Date:	June 2016
Reviewed by:	MC	Date:	June 2016
Approved by:	PS	Date:	June 2016
Map No.:	S2526LIK_EXFCD_F1_52		
Sheet:	52 of 59	Revision:	0
Map Scale:	1: 5000	Plot Scale:	1:1 @ A3





Legend:


- Nodes
- Model Reach
- AFA Boundary
- Flood Defence: Wall
- Flood Defence: Embankment
- Defended Area

10% AEP Coastal Flood Extent
(1 in 10 chance in any given year)


0.5% AEP Coastal Flood Extent
(1 in 200 chance in any given year)

0.1% AEP Coastal Flood Extent
(1 in 1000 chance in any given year)

IMPORTANT USER NOTE:
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C15 NX36



Merrion House
Merrion Road
Dublin 4
D04 R2C5

Project:	SHANNON CFRAM STUDY		
Map Type:	EXTENT		
Source:	COASTAL - TIDAL		
Area:	LIMERICK		
Scenario:	EXISTING		
Drawn by:	EH	Date:	June 2016
Checked by:	KM	Date:	June 2016
Reviewed by:	MC	Date:	June 2016
Approved by:	PS	Date:	June 2016
Map No.:	S2526LIK_EXCCD_F1_52		
Sheet:	52 of 65	Revision:	0
Map Scale:	1: 5000	Plot Scale:	1:1 @ A3

Node Label	10% AEP		0.5% AEP		0.1% AEP	
	Water Level (mAOD)	Total Flow (m³/s)	Water Level (mAOD)	Total Flow (m³/s)	Water Level (mAOD)	Total Flow (m³/s)
01BLN01813	4.06		4.87		5.15	
01BLN01486	4.04		4.86		5.15	
01BLN01400	4.03		4.86		5.16	
01BLN01210	4.02		4.85		5.16	

Legend:

- Site Boundary