

Project

Clonminch Residential Development

Report Title

Site Specific Flood Risk Assessment

Client

Steinfort Investments Fund

INFRASTRUCTURE



DBFL CONSULTING ENGINEERS

September 2021

Job Title: Residential Development at Clonminch,
Tullamore, Co. Offaly

Job Number: 180002

Report Title: Site Specific Flood Risk Assessment

Report Reference: 180002-REP-002

Author: Emma Daly

Approved by: Brendan Keogh

Date: September 2021

DBFL Consulting Engineers

Dublin Office

Ormond House
Ormond Quay
Dublin 7

Tel 01 4004000
Email info@dbfl.ie
Web www.dbfl.ie

Waterford Office

Suite 8b The Atrium
Maritana Gate
Canada Street, Waterford

Tel 051 309500
Email info@dbfl.ie
Web www.dbfl.ie

Cork Office

14 South Mall
Cork

Tel 021 202 4538
Email info@dbfl.ie
Web www.dbfl.ie

Revision	Issue Date	Description	Prepared	Reviewed	Approved
Draft	20.09.2019	Planning Submission	EJD	BK	
Draft	01.11.2019	Tripartite	EJD	BK	
-	21.07.2020	SHD Application	EJD	BK	
A	22.02.2021	Pre-Application	EJD	BK	
B	02.09.2021	Revised SHD Application	EJD	BK	

TABLE OF CONTENTS

1.	INTRODUCTION.....	1
1.1	Background	1
1.2	Objectives.....	2
1.3	Flood Risk Assessment Scope	2
1.4	Approach	2
1.5	Existing Site.....	3
1.6	Proposed Development.....	6
2.	PLANNING SYSTEM FLOOD RISK MANAGEMENT GUIDELINES	7
2.1	General.....	7
2.2	Sequential Approach.....	7
2.3	Flood Risk Assessment Stages	8
3.	STAGE 1 – FLOOD RISK ASSESSMENT	9
3.1	General.....	9
3.2	Information Sources	9
3.3	Source Pathway Receptor Model.....	12
4.	STAGE 2 – INITIAL FLOOD RISK ASSESSMENT	13
4.1	Initial Fluvial Flood Risk Assessment.....	13
4.2	Initial Pluvial Flood Risk Assessment.....	14
4.3	Initial Groundwater Flood Risk Assessment	14
4.4	Flood Zone Category	14
5.	STAGE 3 – DETAILED FLOOD RISK ASSESSMENT.....	15
5.1	General.....	15
5.2	Surface Water Management Measures and SuDS.....	15
5.3	Flood Risk Exceedance	17
5.4	Impact on Adjacent Areas	18
5.5	Climate Change.....	18
5.6	Access and Egress for Emergency Services During Flood Events	18
5.7	Residual Risks.....	18
5.8	Mitigation Measures	19
6.	CONCLUSIONS	20
	APPENDIX A – FLOOD HAZARD INFORMATION	21

1. INTRODUCTION

1.1 Background

DBFL Consulting Engineers have been instructed to prepare a Site-Specific Flood Risk Assessment (SSFRA) to support a planning application for a proposed residential development at Clonminch, Tullamore, Co. Offaly.

The proposed development ("the site") comprises of 349 residential dwellings, a creche and neighbourhood centre on a 14.28 ha site (approximately 2km from Tullamore Town Centre along Clonminch Road).

The development area is 10.73 Ha (omitting the proposed cycle scheme along Clonminch Road and the area required to construct the developments surface water outfall and foul pump station). The site is currently vacant and non-serviced.

The proposed development is part of an overall Master Plan to develop the Eastern Node of the Southern Environs of Tullamore as detailed in Chapter 5 – Masterplans of the Tullamore Town and Environs Development Plan 2010-2016 (extended to 2020).

Refer to Van Dijk Architects Drawing Number 1757-PA-003 for the Site Layout Plan.

This SSFRA should be read in conjunction with DBFL's Infrastructure Design Report (180002-rep-001).

1.2 Objectives

The objective of this report is to inform the planning authority in relation to flood risk associated with the site.

The report will assess the site in accordance the requirements of “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices (Office of Public Works, November 2009).

This flood risk assessment will outline the following;

- Information to allow an informed decision by the planning authority in relation to flood risk
- The site’s flood zone category
- Appropriate flood risk mitigation and management measures for any residual flood risk

1.3 Flood Risk Assessment Scope

This SSFRA relates only to the proposed development lands at Clonminch, Tullamore, Co. Offaly and its immediate surroundings.

This SSFRA uses information obtained from various sources in order to carry out an assessment of flood risk for the existing land and proposed development.

1.4 Approach

Section 2.0 of this SSFRA considers “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices as they relate to the site.

Flood risk identification is presented in Section 3.0, an initial flood risk assessment is carried out in Section 4.0, while a more detailed flood risk assessment is presented in Section 5.0. Conclusions and recommendations are outlined in Section 6.0.

1.5 Existing Site

The subject site is located east of the Clonminch Road approximately 2.0 km south of Tullamore Town Centre. Refer to Figure 1.1 below.

The site is bound to the south-west and north-west by existing residential development. The Dublin to Galway railway line is located to the north of the site. Lands to the east and south of the site are currently greenfield and fall within the Eastern Node of the Southern Environs of Tullamore as defined by the Tullamore Town and Environs Development Plan.



Figure 1.1 Site Location Map (Site Boundary Indicative)

The site generally falls from south-west towards north-east at gradients ranging from 1:20 (adjacent to the southern boundary) to 1:80 (typical surface gradient over the majority of the site). Also refer to Figure 1.2 below.

The site currently drains via a network of open drains which ultimately discharge to an open drain located adjacent to the northern portion of the site (along the Dublin to Galway railway line). Refer to Figures 1.2 and 1.3 below.

A topographic survey was carried out in May 2020 to confirm the existing surface water outfall route beyond the northern boundary. There are a number of culverts beneath the railway line which direct flow from network of open drains within the site to an existing open drain on the northern side of the railway. This open drain then directs flows towards an existing 375mm diameter surface water drain at Chancery Lane. Refer to Figure 1.3 below.

Topographical survey information is shown in the background of the Road Layout Plans (DBFL Drawings 180002-2000, 180002-2001, 180002-2002) and Surface Water and Foul Sewer Layout Drawings (DBFL Drawings 180002-3001, 180002-3002).

It is proposed to discharge attenuated surface water flows from the proposed development to the existing network of open drains described above.

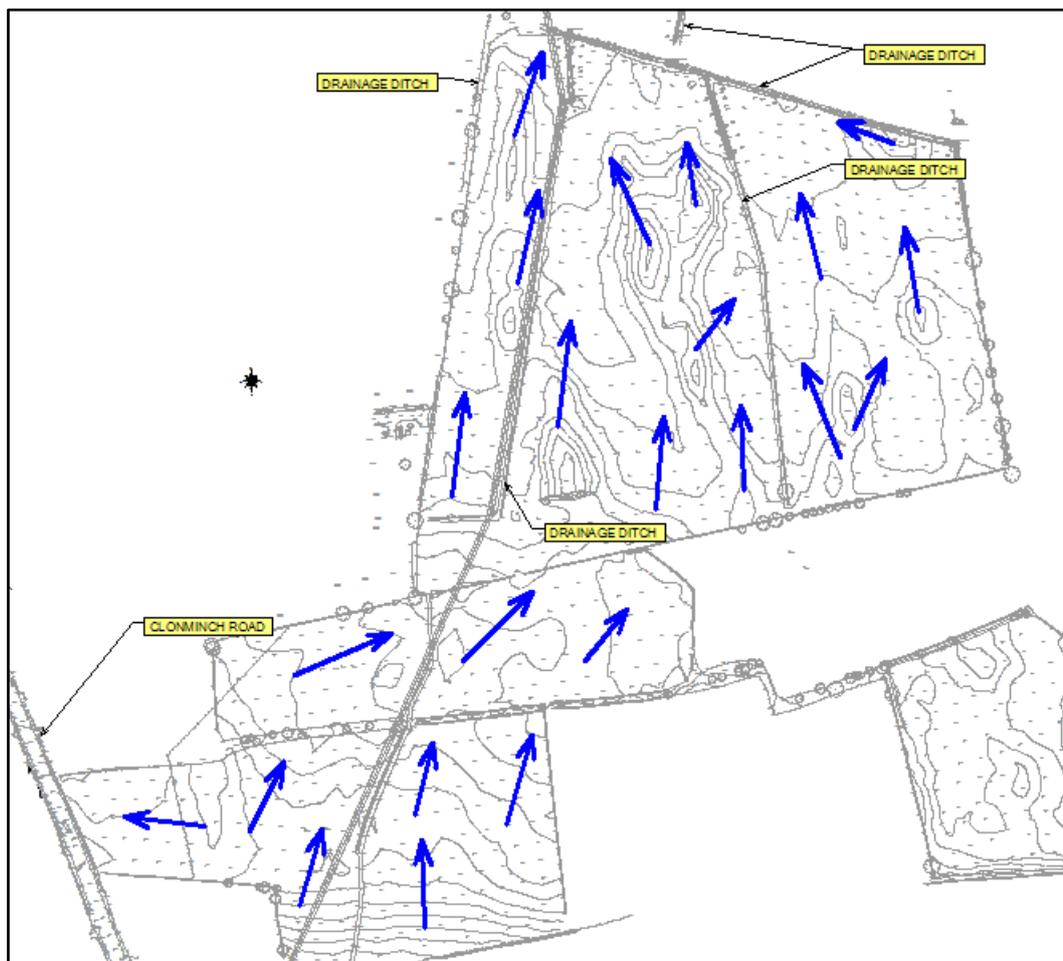


Figure 1.2 Extract from Topographical Survey

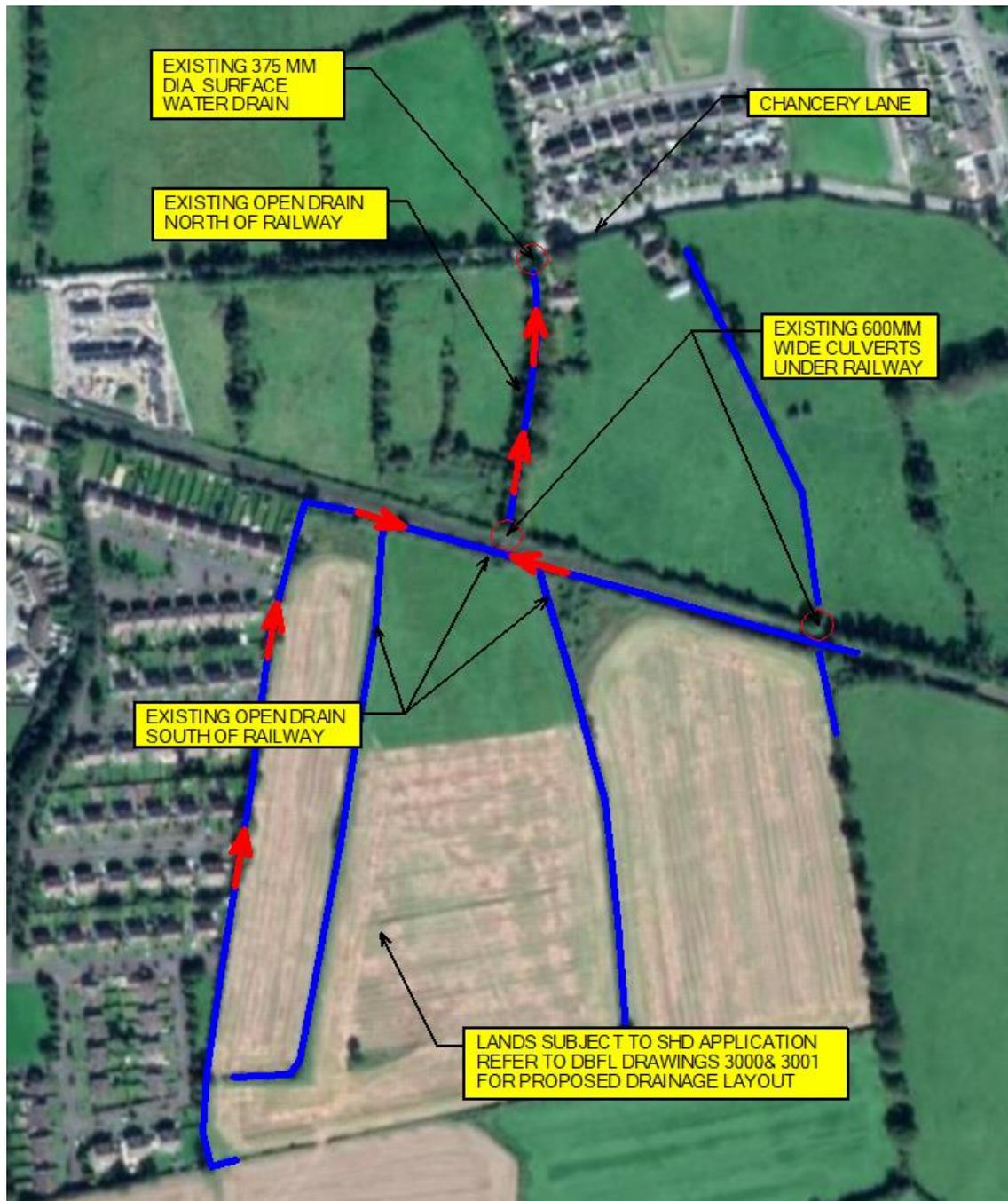


Figure 1.3 Existing Drainage Network at Northern End of the Site.

1.6 Proposed Development

The proposed development comprises of 349 residential dwellings. Refer to Van Dijk Architects Schedule of Accommodation and Site Layout Plans for further detail.

The development will also include the following associated engineering infrastructure:

- Provision of a site access point / formation of a new junction on Clonminch Road.
- Provision of improved facilities for cyclists between the proposed site access and Tullamore Town Centre.
- Delivery of a portion of the road's objective between the Clonminch Road and Chancery Lane (as shown in the Tullamore Town and Environs Development Plan) including high quality cycle infrastructure.
- Facilitation of potential future pedestrian links through adjacent lands.
- Provision of internal site road network including associated footpaths.
- Provision of surface water drainage, foul drainage and water supply infrastructure.
- Provision of a foul pumping station discharging to the existing public foul drain located on the Clonminch Road.

2. PLANNING SYSTEM FLOOD RISK MANAGEMENT GUIDELINES

2.1 General

“The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices outline the requirements for a Site-Specific Flood Risk Assessment.

Table 3.1 of the guidelines classify “dwelling houses” as “highly vulnerable development”.

Table 3.2 of the guidelines indicates that “highly vulnerable developments” are classified as “appropriate” once located in Flood Zone C i.e. where probability of flooding from rivers is low (less than 0.1% AEP or 1 in 1,000 year).

If a “highly vulnerable development” is to be located in Flood Zone A or Flood Zone B a Justification Test is required.

2.2 Sequential Approach

This SSFRA will initially use existing flood risk information to determine the flood zone category of the site i.e. to determine whether the development is considered appropriate or whether a justification test is required (see Figure 2.1 below).

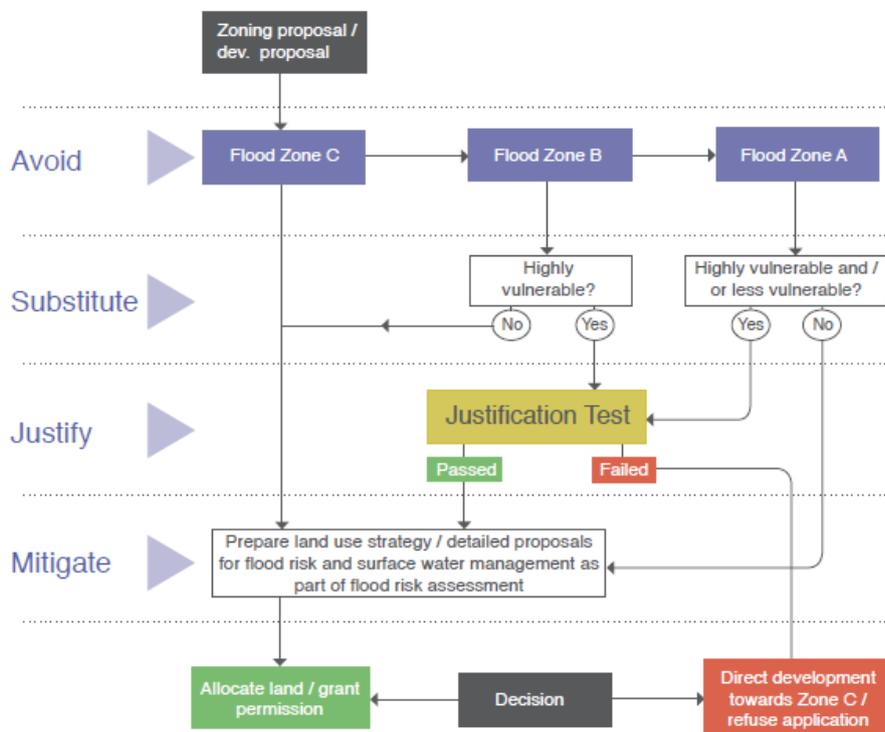


Figure 2.1 – Extract from The Planning System and Flood Risk Management Guidelines (Fig. 3.2: Sequential Approach Mechanism in the Planning Process)

2.3 Flood Risk Assessment Stages

The stages of a Flood Risk Assessment as defined by “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices are as follows:

- Stage 1 – Flood Risk Identification
- Stage 2 – Initial Flood Risk Assessment
- Stage 3 – Detailed Flood Risk Assessment

The following sections of this SSFRA follows this approach.

3. STAGE 1 – FLOOD RISK ASSESSMENT

3.1 General

The flood risk identification stage uses existing information to identify whether there may be any flooding or surface water management issues related to the site that may require further investigation.

3.2 Information Sources

Information sources consulted for the identification exercise are outlined in Table 3.1 below.

Information Source	Comments
Predictive and historic flood maps, and Benefiting Lands Maps, such as those at www.floodmaps.ie .	Information obtained (and reviewed) from www.floodmaps.ie and www.floodinfo.ie (OPW websites).
Expert advice from OPW who may be able to provide reports containing the results of detailed modelling and flood-mapping studies, including critical drainage areas, and information on historic flood events, including flooding from all sources.	Information obtained (and reviewed) from www.floodmaps.ie (OPW website).
Predictive flood maps produced by OPW	Information obtained from floodinfo.ie providing access to Tullamore CFRAM Study Flood Maps –Fluvial Flood Extent Map.
Previous Strategic Flood Risk Assessments;	Tullamore CFRAM Study consulted.
Topographical maps, in particular digital elevation models produced by aerial survey or ground survey techniques;	Site topographic survey undertaken.
Information on flood defence condition and performance;	No flood defences identified in the immediate vicinity of the site.

Maps of the Geological Survey of Ireland (which would allow the potential for the implementation of source control and infiltration techniques and for groundwater and overland flood risk to be assessed). These maps, while not providing full coverage, can indicate areas that have flooded in the past (e.g. presence of alluvium) and may be particularly useful at the early stages of the FRA process where no other information is available.	GSI maps consulted.
Sit Investigations	Preliminary Ground Investigations for the proposed development were carried out by Ground Investigations Ireland (GII) in May 2020.
National, regional & local spatial plans, such as the National Spatial Strategy, regional planning guidelines, development plans & local area plans provide key information on existing and potential future receptors.	Tullamore Town & Environs Development Plan (extended until 2020) consulted.
'Liable to flood' markings on the old '6 Inch' maps;	Historic OSI maps consulted.

Table 3.1 - Information Sources Consulted

3.2.1 OPW National Flood Hazard Mapping and Benefitting Lands Mapping

OPW's Summary Local Area Report is included in Appendix A (Flood Hazard Information). This report is sourced from the OPW website (www.floodmaps.ie) and summarises all flood events within 2.5 km of the site.

No flood events are noted in the immediate vicinity of the site.

3.2.2 Eastern CFRAM Study

Extracts from OPW's Tullamore CFRAM Study (www.floodinfo.ie) show the extent of fluvial flooding in Tullamore and are included in Appendix A (Flood Hazard Information).

No fluvial flooding is indicated in the vicinity of the site.

3.2.3 Tullamore Town & Environs Development Plan (Extended until 2020)

The Office of Public Works in conjunction with Offaly County Council and Tullamore Town Council completed the Flood Risk Assessment and Management Study (FRAM) for Tullamore in 2008. The study area for the Tullamore FRAM covered the areas of the town that are affected by flooding. The study identifies areas that are at risk of flooding, provides a series of recommendations and lists appropriate mitigation measures

Map 10.3 from the Tullamore Town & Environs Development Plan is an extract from the Tullamore FRAM identifying the “1 in 100 year flood event” and is included in Appendix A (Flood Hazard Information). No fluvial flooding is indicated in the vicinity of the site.

3.2.4 Other Sources

Other information sources were consulted to determine if there was any additional flood risk to the site including:

- Topographical surveys of the area – the site is significantly elevated above the predicated 0.1% AEP fluvial flood level as shown in the Tullamore CFRAM Study's Flood Extent Maps.
- Soils and Groundwater Data from the GSI – no alluvium deposits within the site on the GSI online mapping system.
- Site Investigation – Preliminary Ground Investigations for the proposed development were carried out by Ground Investigations Ireland (GII) in May 2020. Groundwater was observed in four of the twenty trial pits. These trial pits were located in the northern part of the site with ground water observed at depths of 1.7m to 3.0m below existing ground level.
- 6 inch OSI Map – no evidence of flooding or marsh areas shown within the site.

Review of the ‘other sources’ of information noted above do not indicate evidence of flood risk to the site.

3.3 Source Pathway Receptor Model

A Source-Pathway-Receptor model has been produced to summarize the possible sources of floodwater, the pathways by which flood water could reach receptors and the receptors that could be affected by potential flooding, see Table 3.2 below.

It outlines effects of various potential sources, the performance and response of pathways and the consequences to the receptors in the context of the proposed development.

These sources, pathways and receptors will be assessed further by the initial flood risk assessment stage.

Source	Pathway	Receptor	Likelihood	Consequence	Risk
Fluvial	Overbank from the Tullamore river approx. 1.5km from site	People and Property (the proposed development).	Low	Medium	Low
Surface Water (Pluvial)	Blockage and / or surcharging of the proposed surface water drainage network	People and Property (the proposed development).	Possible	Medium	Medium
Human / Mechanical Error (Pluvial)	Failure of proposed SuDS measures (e.g. Hydrobrake failure)	People and Property (the proposed development).	Possible	Medium	Medium
Groundwater	Rising groundwater levels within the site	People and Property (the proposed development).	Low	Medium	Low

Table 3.2 - Source-Pathway-Receptor Analysis

4. STAGE 2 – INITIAL FLOOD RISK ASSESSMENT

Flood risks identified during Stage 1 – Flood Risk Identification, are outlined in Table 3.2 (Source Pathway Receptor Analysis) and noted below. These risks are assessed further in this section of the SSFRA.

- Low risk of fluvial flooding
- Medium risk of pluvial flooding (surface water and human / mechanical error)
- Low risk of groundwater flooding

The information sources identified in Section 3.2 are considered adequate for the purpose of an Initial Flood Risk Assessment of the site and no further technical studies are proposed.

4.1 Initial Fluvial Flood Risk Assessment

The Tullamore CFRAM flood extents mapping identifies the extent of the predicated 1% AEP and 0.1% AEP fluvial flood events associated with watercourses in the Tullamore area (refer to Appendix A). No fluvial flooding is indicated in the vicinity of the site.

The closest modelled node to the site is located on the Tullamore River (Node 2850), approximately 1.5km north east of the site.

The location of this node is shown on Tullamore CFRAM Drawing S25TLM_EXFCD_F1_05 (refer to Appendix A).

- | | |
|--|---------|
| • Node 2850, 1% Fluvial AEP Event | +57.89 |
| • Node 2850, 0.1% Fluvial AEP Event | +58.087 |
| • Lowest Proposed FFL (see DBFL Drawing 180002-2000) | +66.50 |
| • Freeboard from 1% AEP Flood Level | 8.61 m |

Note: Min. freeboard from 1% AEP required by GSDSDS – 500mm.

4.2 Initial Pluvial Flood Risk Assessment

The Source-Pathway-Receptor model identified a medium risk of pluvial flooding relating to the proposed surface water drainage network and human / mechanical error. This risk can be mitigated by designing the surface water network in accordance with the Greater Dublin Strategic Drainage Study (GDSDS) including attenuation of the 1% AEP storm event and implementation of SuDS methodologies.

Proper operation and maintenance of the drainage system should also be implemented to reduce the risk of human or mechanical error causing pluvial flood risk from blockages, fuel / oil interceptor operation problems, Hydrobrake failure etc.

4.3 Initial Groundwater Flood Risk Assessment

Preliminary Ground Investigations for the proposed development were carried out by Ground Investigations Ireland (GII) in May 2020. Groundwater was observed in four of the twenty trial pits. These trial pits were located in the northern part of the site with ground water observed at depths of 1.7m to 3.0m below existing ground level. As such, the risk of ground water flooding is considered negligible.

4.4 Flood Zone Category

On completion of Stage 2 – Initial Flood Risk Assessment, the site is considered to be located in Flood Zone C as defined by the requirements of “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices.

The proposed development (“dwelling houses”) is therefore considered appropriate.

5. STAGE 3 – DETAILED FLOOD RISK ASSESSMENT

5.1 General

As the Initial Flood Risk Assessment considers the site to be located in Flood Zone C and the proposed development is considered appropriate the Detailed Flood Risk Assessment Stage will only consider pluvial flood risk in relation to the following;

- Proposed Surface Water Management Measures and SuDS.
- Flood Exceedance.
- Impact on Adjacent Areas.
- Climate Change.
- Access and Egress for Emergency Services during Flood Events.
- Residual Risks.
- Effectiveness of Flood Mitigation Measures.

5.2 Surface Water Management Measures and SuDS

The site generally falls from south-west towards north-east at gradients ranging from 1:20 (adjacent to the southern boundary) to 1:80 (typical surface gradient over the majority of the site). The site currently drains via a network of open drains which ultimately discharge to an open drain located adjacent to the northern portion of the site (along the Dublin to Galway railway line). There are a number of culverts beneath the railway line which direct flow from network of open drains within the site to an existing open drain on the northern side of the railway. This open drain then directs flows towards an existing 375mm diameter surface water drain at Chancery Lane.

It is proposed to discharge attenuated surface water flows from the proposed development to the existing network of open drains described above.

The proposed developments surface water drainage network is shown on DBFL Drawings 180002-3001 and 180002-3002.

Above ground detention basins are sized to attenuate a 1 in 100 year storm event. Surface water discharge rates from the proposed surface water drainage network will be controlled by a vortex flow control device (Hydrobrake or equivalent) and associated attenuation. Surface water discharge will also pass via a full retention fuel / oil separator (sized in accordance with permitted discharge from the site).

The proposed surface water drainage network will collect surface water runoff from the site via a piped network prior to discharging off site via a flow control device, detention basin and separator arrangement as noted above.

Surface water runoff from the site's road network will be directed to tree pits via conventional road gullies (with high level overflow to the piped surface water network). Surface water runoff from driveways will be captured by permeable paving.

Surface water runoff from house roofs will be routed to the proposed surface water pipe network via the porous aggregates beneath permeable paved driveways (providing an additional element of attenuation). Surface water runoff from apartment roofs will be captured by green roofs (sedum blanket) prior to being routed to the piped surface water drainage network.

5.2.1 SuDS Methodologies

The following methodologies are being implemented as part of a SuDS treatment train approach:

- Permeable paving in driveway areas
- Typically, road gullies discharge to tree pits (with high level overflow to the piped surface water network).
- Surface water runoff from roofs of houses will be routed to the proposed surface water pipe network via the stone reservoirs beneath permeable paved driveways. Note, this detail does not rely on infiltration, the stone reservoir is intended to provide an additional element of attenuation storage
- Surface water runoff from apartments, neighbour centres and creche will be captured by green roofs (sedum blanket) prior to being routed to the piped surface water drainage network.
- Attenuation of the 1 in 100 year storm event in above ground in detention basins.
- Installation of a vortex flow control device (Hydrobrake or equivalent), limiting surface water discharge from the site to 2.38 l/sec/ha.
- Surface water discharge will also pass via a Class 1 full retention fuel / oil separator (sized in accordance with permitted discharge from the site).

5.2.2 Surface Water Attenuation and Storage

Attenuation volumes have been calculated based on an allowable outflow / greenfield runoff rate of 2.38 l/sec/ha which has been calculated in accordance with GDSDS requirements (refer to DBFL Infrastructure Design Report, 180002-001, Section 3.2.5).

5.3 Flood Risk Exceedance

During storms greater than the 1% AEP pluvial event, the development's drainage network design will be exceeded and areas with low ground levels will begin to flood.

Proposed site levels fall towards the site's eastern and northern boundaries. Overland flow is directed towards open space areas and public roads (refer to Figure 5.1).



Figure 5.1 – Flood Exceedance (>1%AEP) Overland Flow Routes

5.4 Impact on Adjacent Areas

Adjacent areas will not be impacted by the development up to the 1% AEP flood event.

Storms greater than the 1% AEP (exceeding the design capacity of the site's drainage system) will result in overland flow being directed towards open space areas.

5.5 Climate Change

The potential impact of climate change has been allowed for as follows;

- Pluvial flood risk - attenuation storage design allows for a 20% increase in rainfall intensities.
- Pluvial flood risk - drainage system design allows for a 20% increase in flows, as recommended by the GDSDS.

5.6 Access and Egress for Emergency Services During Flood Events

Vehicular access and egress to the proposed development is provided from Clonminch Road by way of the proposed link street which will transverse the site.

The proposed link street is located in Flood Zone C as defined by the OPW guidelines therefore, it is expected that the site can be safely accessed during storm events up to 1% AEP event.

5.7 Residual Risks

Remaining residual flood risks, following the detailed assessment include the following;

1. Pluvial flooding from the private drainage system related to pipe blockage, flood exceedance or mechanical failure.
2. Pluvial flooding from the development's drainage system for storms in excess of the 1% AEP storm event.

5.8 Mitigation Measures

Proposed mitigation measures to address residual flood risks are summarized below;

- M1. Proposed drainage system to be maintained on a regular basis to reduce the risk of a blockage.
- M2. In the event of storms exceeding the 1% AEP design capacity of the attenuation system, overland flow routes indicated by figure 5.1 will not be blocked.

5.2.1 Effectiveness of Mitigation Measures

It is considered that the flood risk mitigation measures if implemented are sufficient to provide a suitable level of protection to the proposed development. A regularly maintained drainage system will ensure that it remains effective and in good working order should a large pluvial storm occur.

Should extreme pluvial flooding occur that is in excess of the development's attenuation capacity (i.e. greater than 1%AEP), then overland flow routes directed towards open space areas are provided in order to protect the proposed development.

6. CONCLUSIONS

The Site Specific Flood Risk Assessment for proposed development at Clonminch Tullamore was undertaken in accordance with the requirements of “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices.

Following the Flood Risk Assessment, it has been determined that the site is located in Flood Zone C as defined by the Guidelines.

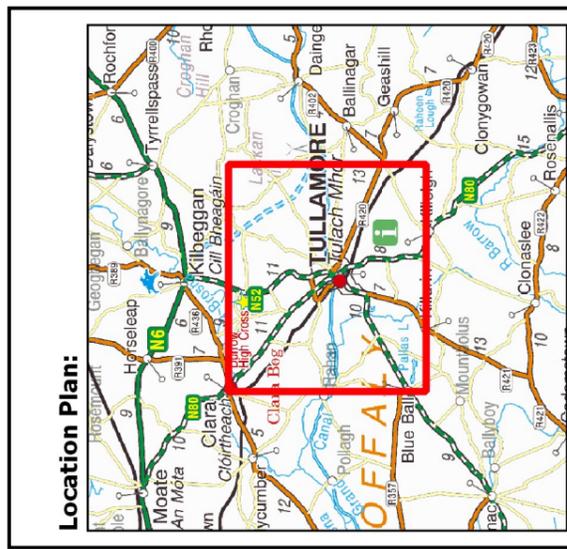
It is concluded that the;

- Proposed residential development is appropriate for the site’s flood zone category.
- The sequential approach outlined in Planning System and Flood Risk Management Guidelines has been adhered to and that the ‘Avoid’ principal has been achieved.

In conclusion, the proposed development is considered to have the required level of flood protection up to and including the 1% AEP flood event.

Overland flow paths have been identified for pluvial flooding exceeding the capacity of the surface water drainage network.

APPENDIX A – FLOOD HAZARD INFORMATION



LEGEND

- AFA Boundary
- ◆ IED Sites
- Designated for Drinking Water Abstraction
- Designated for Drinking Water Abstraction
- Recreational Waters
- SAC Water Dependent
- SAC Water Dependent
- SAC Water Dependent
- SPA Water Dependent
- Modelled River Centreline
- 10% AEP Fluvial
- 1% AEP Fluvial
- 0.1% AEP Fluvial

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

Project:
TULLAMORE CFRAM STUDY

Map: TULLAMORE
FLUVIAL GENERAL RISK - ENVIRONMENT

Map Type: GENERAL RISK ENVIRONMENT

Source: FLUVIAL
HPW

Map Area: CURRENT

Drawn by: IH Date: Jul - 2016

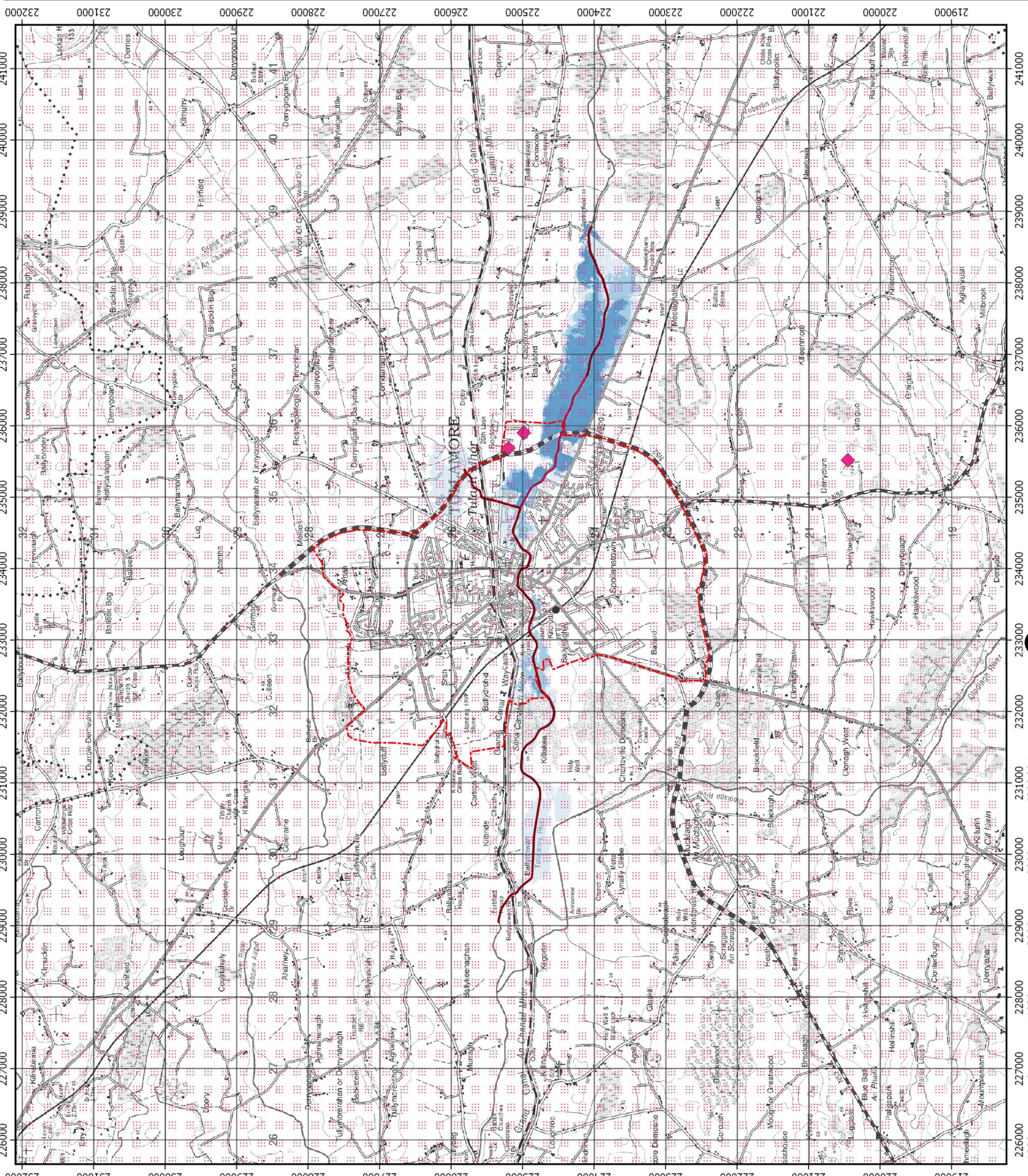
Checked by: DD Date: Jul - 2016

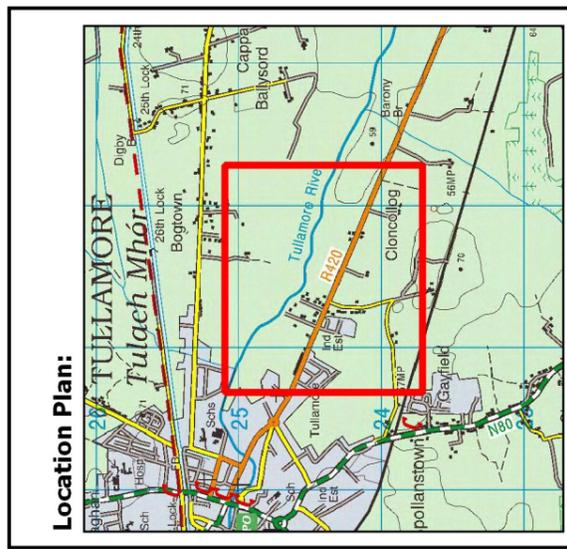
Approved by: JGM Date: Jul - 2016

Map No.: S25TLM_RVFCDF1_01

Revision: F1

Map Scale: 1:50,000 Plot Scale: 1:1 @ A3





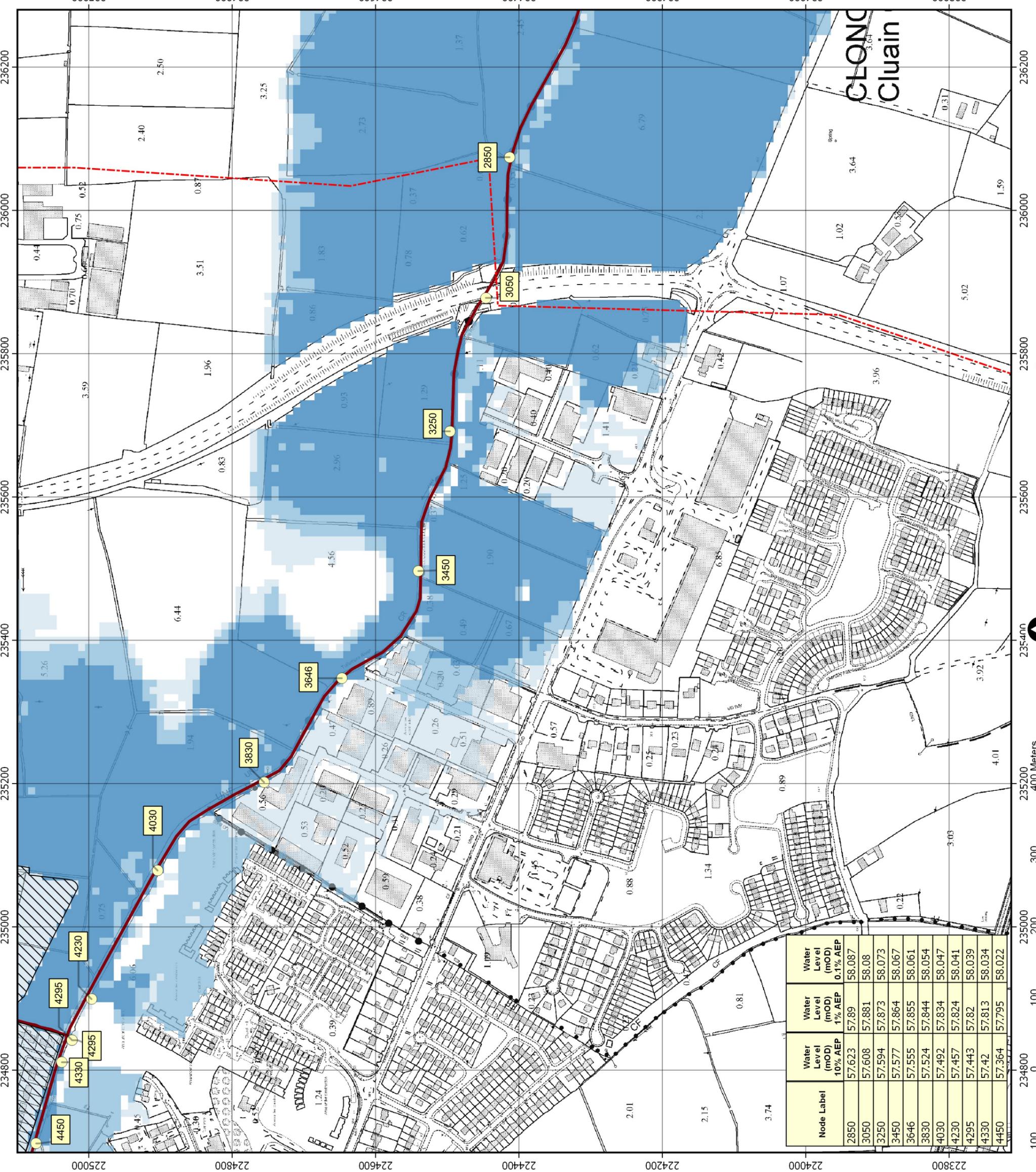
- LEGEND**
- AFA Boundary
 - Defended Area
 - Modelled River Centreline
 - Node Point
 - 10% AEP Fluvial Extent (High Risk)
 - 1% AEP Fluvial Extent (Medium Risk)
 - 0.1% AEP Fluvial Extent (Low Risk)
 - Flood Defence - Embankment
 - Flood Defence - Wall
 - Gate
 - Node Label
 - Standard of Protection of Flood Defence

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

Project:		TULLAMORE CFRAM STUDY
Map:	TULLAMORE FLUVIAL FLOOD EXTENT MAP	
Map Type:	EXTENT	
Source:	FLUVIAL	
Map Area:	HPW	
Scenario:	CURRENT	
Drawn by:	IH	Date: Jul - 2016
Checked by:	DD	Date: Jul - 2016
Approved by:	JGM	Date: Jul - 2016
Map No.:	S25TLM_EXFCD_F1_05	
Revision:	F1	
Map Scale:	1:5,000	
Plot Scale:	1:1 @ A3	



Node Label	Water Level (mOD) 10% AEP	Water Level (mOD) 1% AEP	Water Level (mOD) 0.1% AEP
2850	57.623	57.89	58.087
3050	57.608	57.881	58.08
3250	57.594	57.873	58.073
3450	57.577	57.864	58.067
3646	57.555	57.855	58.061
3830	57.524	57.844	58.054
4030	57.492	57.834	58.047
4230	57.457	57.824	58.041
4295	57.443	57.82	58.039
4330	57.42	57.813	58.034
4450	57.364	57.795	58.022

Summary Local Area Report

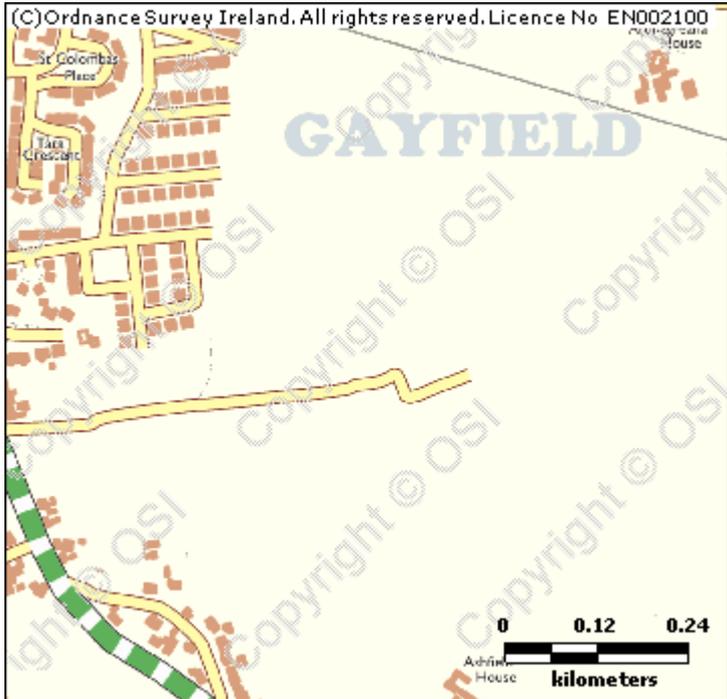
This Flood Report summarises all flood events within 2.5 kilometres of the map centre.

The map centre is in:

County: Offaly

NGR: N 350 232

This Flood Report has been downloaded from the Web site www.floodmaps.ie. The users should take account of the restrictions and limitations relating to the content and use of this Web site that are explained in the Disclaimer box when entering the site. It is a condition of use of the Web site that you accept the User Declaration and the Disclaimer.



Map Scale 1:10,112

Map Legend	
	Flood Points
	Multiple / Recurring Flood Points
	Areas Flooded
	Hydrometric Stations
	Rivers
	Lakes
	River Catchment Areas
	Land Commission *
	Drainage Districts *
	Benefiting Lands *

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained in the Glossary.

10 Results

	1. Tullamore Tullamore town August 2008 County: Offaly Additional Information: Reports (4) More Mapped Information	Start Date: 17/Aug/2008 Flood Quality Code:2
	2. Cloncollog Tullamore Nov 2000 County: Offaly Additional Information: Reports (1) More Mapped Information	Start Date: 06/Nov/2000 Flood Quality Code:2
	3. Tullamore Nov 2000 County: Offaly Additional Information: Reports (1) More Mapped Information	Start Date: 06/Nov/2000 Flood Quality Code:3
	4. Tullamore Jan 1993 County: Offaly Additional Information: Reports (1) More Mapped Information	Start Date: 27/Jan/1993 Flood Quality Code:2
	5. Tullamore Tullamore February 1990 County: Offaly	Start Date: 01/Feb/1990 Flood Quality Code:3

Additional Information: Reports (1) Press Archive (1) More Mapped Information



6. Tullamore Cloncollog Tullamore recurring

Start Date:

County: Offaly

Flood Quality Code:2

Additional Information: Reports (2) Press Archive (1) More Mapped Information



7. Tullamore Kilcruddin Tullamore Recurring

Start Date:

County: Offaly

Flood Quality Code:3

Additional Information: Reports (1) Press Archive (1) More Mapped Information



8. Tullamore Main Street Tullamore Recurring

Start Date:

County: Offaly

Flood Quality Code:3

Additional Information: Reports (1) Press Archive (1) More Mapped Information



9. Tullamore Bogtown Tullamore Recurring

Start Date:

County: Offaly

Flood Quality Code:3

Additional Information: Reports (1) Press Archive (15) More Mapped Information



10. Spollanstown Lane, Tullamore Recurring

Start Date:

County: Offaly

Flood Quality Code:4

Additional Information: Reports (1) Press Archive (1) More Mapped Information