CS CONSULTING

GROUP

DUBLIN | LONDON | LIMERICK

Site Specific Flood Risk Assessment

Strategic Housing Development

Clonattin, Gorey, Co. Wexford

Client: AXIS Construction

Job No. A091

November 2020

CS CONSULTING

GROUP

CS CONSULTING GROUP

SITE SPECIFIC FLOOD RISK ASSESSMENT

STRATEGIC HOUSING DEVELOPMENT, CLONATTIN, GOREY, CO. WEXFORD

CONTENTS

File Location: Job-A091\B_Documents\C_Civil\A_CS Reports\FRA

BS 1192 Field	**CLO-CSC-ZZ-XX-RP-C-0002_FRA_P3**

Job Ref.	Author	Reviewed By	Authorised By	Issue Date	Rev. No.
A091	FB	GL	DR	24.11.2020	P3
A091	FB	GL	DR	19.10.2020	P2
A091	GS	GL	DR	14.09.2020	P1
A091	GS	GL	DR	05.02.2020	-

CS CONSULTING

GROUP

1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by AXIS Construction to prepare a Site Specific Flood Risk Assessment to accompany a planning application for a proposed Strategic Housing Development at Clonattin, Gorey, Co. Wexford.

In preparing this report, CS Consulting has made reference to the following:

- Wexford County Development Plan 2013-2019;
  (including Strategic Flood Risk Assessment)
- Gorey Town & Environs Local Area Plan 2017-2023;
  (including Strategic Flood Risk Assessment)
- Greater Dublin regional Code of Practice for Works;
- Office of Public Works Flood Maps;
- Department of the Environment Flooding Guidelines;
- Geological Survey of Ireland Maps;
- Local Authority Drainage Records.

The Site Specific Flood Risk Assessment is to be read in conjunction with the engineering drawings and documents submitted by CS Consulting and with the various additional information submitted by the other members of the design team, as part of the Planning Submission.

2.0 SITE LOCATION AND PROPOSED DEVELOPMENT

2.1 Site Location

The site of the proposed development lies between Clonattin Road and Courtown Road (R742) in the townlands of Clonattin Upper and Goreybridge, Gorey, Co. Wexford. The application site has a total area of 15.5ha and is located within the administrative jurisdiction of Wexford County Council.

Figure 1 – Location of proposed development site
(map data & imagery: EPA, OSM Contributors, Google)

The location of the proposed development site is shown in Figure 1; the indicative extents of the development site, as well as relevant elements of the surrounding street network and transport infrastructure, are shown in more detail in Figure 2.

Figure 2 – Site extents and surrounding transport infrastructure
(*map data & imagery: NTA, OSM Contributors, Google*)

The main body of the development site is bounded to the north generally by the existing Clonattin Village access road, to the north-west by the existing Hillcrest residential development, and on all other sides by undeveloped agricultural lands. The application boundary also includes the alignment corridor of a new link road that shall connect Courtown Road (R742) to Clonattin Village and Clonattin Road. The provision of such a link is given as a roads objective in the *Gorey Local Area Plan 2017–2023*.

The internal road network of the proposed development shall tie in to the existing Clonattin Village access road at 6no. locations along the site's northern boundary. Access to the wider road network from these points shall be via the existing Clonattin Village access junction on Clonattin Road. To the south, the proposed new link road traversing the development site

shall tie in to the existing junction on Courtown Road that gives access to the existing Movies@Gorey cinema site.

2.2 Existing Land Use

The subject site is predominantly greenfield and currently generates no vehicular traffic. There are 2 no. existing derelict buildings (a dwelling and a shed) within the western part of the site, and an existing pond is located inside the site's southern boundary.

2.3 Proposed Development

The proposed strategic housing development at this site in Clonattin, Gorey will include the demolition of the existing buildings and will provide 363no. residential units, a crèche, public open space, a new access road connecting to Courtown Road. All associated site development works and services provisions including parking, bin storage, substations, landscaping and all services required to facilitate the proposed development. A full description is provided in the statutory notices and in Chapter 3 of the EIAR.

3.0 LEVEL OF SERVICE

There is an existing inherent risk of any flood event occurring during any given year. Typically, this likelihood of occurrence was traditionally expressed as a 1-in-100 chance of a 100 year storm event happening in any given year.

A less ambiguous expression of probability is the Annual Exceedance Probability (AEP), which may be defined as the probability of a flood event being exceeded in any given year. Therefore a 1-in-100-year event has a return period of 1% AEP flood event, similarly a 100% AEP can be expressed as a 1-in-1-year event.

3.1 *The Planning System and Flood Risk Management, Guidelines for Planning Authorities* set out the best practice standards for flood risk assessment in Ireland. These are summarised in Table 1 below.

Flooding Source	Drainage	River	Tidal/Coastal
Residential	1% AEP	0.1% AEP	0.1% AEP
Commercial	1% AEP	1% AEP	0.5% AEP
Water-compatible (docks, marinas)	-	>1% AEP	>0.5% AEP

Table 1 – Summary of Level of Service – Flooding Source

Under these guidelines a proposed development site has first to be assessed to determine the flood zone category it falls under.

3.2 It is a requirement of both Wexford County Council, Greater Dublin Strategic Drainage Study, (DCC 2005) & the Department of the Environment, community & Local Government flooding guidelines, The Planning System and Flood Risk Management, Guidelines for Planning

Authorities, that the predicted effects of climate change are incorporated into any proposed design. Table 2 below indicates the predicted climate change variations.

Design Category	Predicted Impact of Climate Change
Drainage	20% Increase in rainfall
Fluvial (River flows)	20% Increase in flood flow
Tidal / Coastal	N/A

Table 2 - The predicted climate change variations.

3.3 The flooding guidelines categorize the risks associated with flooding into three areas, Zone A, B & C. This categorisation is indicated below.

- **Zone A** – High Probability of Flooding. Where the average probability of flooding from rivers and sea is highest (greater than 1% annually or 1 in 100 for river flooding or 0.5% annually or 1 in 200 for coastal flooding).
- **Zone B** – Moderate Probability of Flooding. Where the average probability of flooding from rivers and sea is moderate (risk between 0.1% annually or 1 in 1000 years and 1% annually or 1 in 100 years for river flooding, and between 0.1% or 1 in 1000 years and 0.5% annually or 1 in 200 for coastal flooding).
- **Zone C** – Low Probability of Flooding. Where the probability of flooding from rivers and sea is moderate (risk is less than 0.1% annually or 1 in 1000 years for both rivers and coastal flooding).

In accordance with the *Planning Systems and Flood Risk Management Guidelines for Planning Authorities*, dwellings are classified as 'highly vulnerable developments'.

3.4 Following a review of the Wexford County Council and Gorey Town Local Area Plan flood map assessed by JBA Consulting, the subject site is located

in **Flood Zone C**. However, the Gorey Town and Environs Local Area Plan 2017 – 2023 Flood Map assessed by OPW, indicates a flood risk at the boundary of the subject site (existing watercourse). The CFRAM map indicated the water levels for 10% AEP Fluvial Risk doesn't affect the subject site. A complete mitigation shall be assessed further on the item 4.1 of this report. See **Appendix A** for an extract of the Wexford County Council Strategic Flood Risk Assessment Flood Zone Maps.

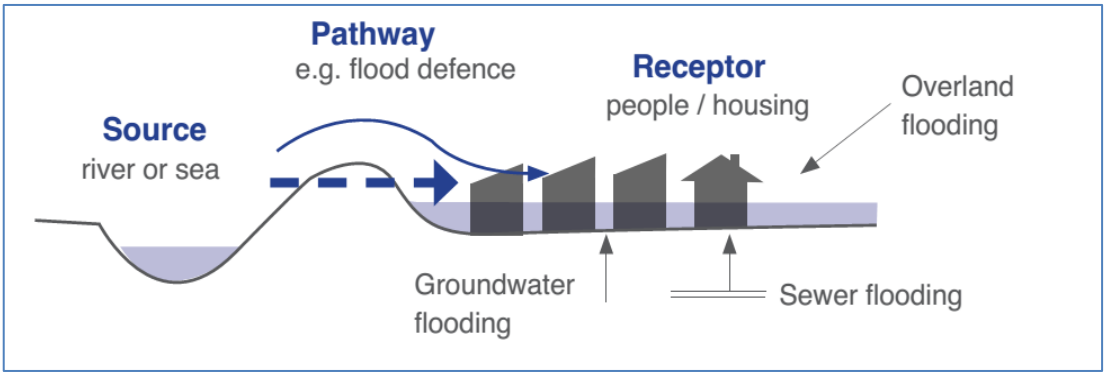


Figure 3 – Source-pathway-receptor model
(*imagery: The Planning System and Flood Risk Management Guidelines*)

3.5 The flooding guidelines have developed an 'appropriateness' matrix for various developments and their potential risk factor. The table indicates if further analysis is required in the form of a justification test. Table 3 below outlines the conditions that require a justification test.

	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

Table 3 - Flood Zone Vs Justification Test Matrix

As noted above the subject site is located within **Flood Zone C**, as such a justification test is not required.

4.0 FLOOD RISKS & MITIGATION MEASURES

4.1 Fluvial Flooding

The subject site is bounded to the east and southeast by a local stream (Clonattin Upper Stream), which flows south and connects to the River Banoge. A review of the Office of Public Works flood maps database, www.floodmaps.ie, for the area does not indicate historical flooding at the site. See the OPW Map-report included in **Appendix B**.

The South Eastern Catchment Flood Risk Assessment and Management Study (CFRAM) conducted by the OPW has produced maps of fluvial (river) flooding risk for the area surrounding the subject site. CFRAM maps indicate that the stream mentioned above, has a fluvial flood extent which affects the lands to east of the subject site. In addition, the CFRAM maps also inform the water levels at 10%, 0.5% and 0.1% fluvial AEP which shows that the water levels along the modelled river centreline vary between 45.50m AOD (closest node label to the subject site) to 39.16m AOD. Therefore minimum finished floor level shall be at least 500mm above the adjacent flood level. The full set of relevant CFRAM maps is provided as **Appendix C**.

Therefore, the risk of fluvial flooding is not an issue and no mitigation measures are required.

4.2 Tidal Flooding

The sites elevated location indicates that the subject lands are not going to be affected by tidal flooding, the councils flood risk map does not indicate that the site is located in a tidal flood zone.

4.3 Pluvial Flooding

Pluvial flooding is flooding which has originated from overland flow resulting from high intensity rain fall. A high-level pluvial flood map has been produced but it is of for high level use than for a specific site. Previous flood events in the area can be reviewed on the Office of Public Works web site, www.floodmaps.ie.

As part of Wexford County Council Strategic Flood Risk Assessment, a map prepared by OPW illustrates a potential risk zones within Wexford County. The map, included in **Appendix A**, indicates that the subject site is not located in a zone predicted to be at risk from pluvial flood events. However, mitigation for this potential flooding is that the site shall be fitted with an attenuation system limiting storm water run-off to 2.0 l/s/ha and on site storage provided for the 1 in 100 year extreme storm event increased by 20% for the predicted effects of climate change. By reducing the run-off from the site into the local authority network the potential risk of flooding from pluvial action is deemed to be within acceptable limits.

As part of the development works a flood route shall be designed into the road network to ensure in the rare event that excess flood water occurs (i.e. due to blockages etc) the flood water is directed towards an internal green zone where i.e. can pond and dissipate to ground after the storm event recedes.

Therefore, the risk of pluvial flooding is not an issue and no mitigation measures are required.

4.4 Potential for Site to Contribute to Off-Site Flooding

The proposed development site is currently undeveloped, however there is an existing development directly to the north (Clonattin Village). As part of the development of the Clonattin Village estate, a surface water pipe and

an attenuation pond were constructed on the development lands subject to this application (Planning reference: 2003/4476). The attenuation pond was constructed to store approximately 6050 cubic metres of storm water (7,500m^3 when you include the freeboard) which allowed for the future discharge of surface water runoff of the subject lands to discharge into. The existing pond caters in excess of the 1 in 100 year storm event across both developments.

A hydrobrake/flow control system was also installed on the outfall of the attenuation pond to the local stream. The flow rate at this outfall will remain unchanged from current flows; by restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated.

4.5 Existing Off-Site Drainage

It is the understanding of CS Consulting that at present there are no issues with the local drainage arrangements. The proposed development shall enhance the current storm water drainage as only an attenuated flow shall outfall into the system post construction.

4.6 Groundwater Flooding

According to the Geological Survey of Ireland interactive maps, the subject site is underlain with *Rhyolitic volcanics, grey & brown slates*. The area is listed as overlaying a regionally important aquifer (fissured bedrock). The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is *high*. The absence of basements within the proposed development and the general geology of the subject lands means that the potential risk from groundwater is deemed acceptable.

Refer to **Appendix D** for GSI mapping information.

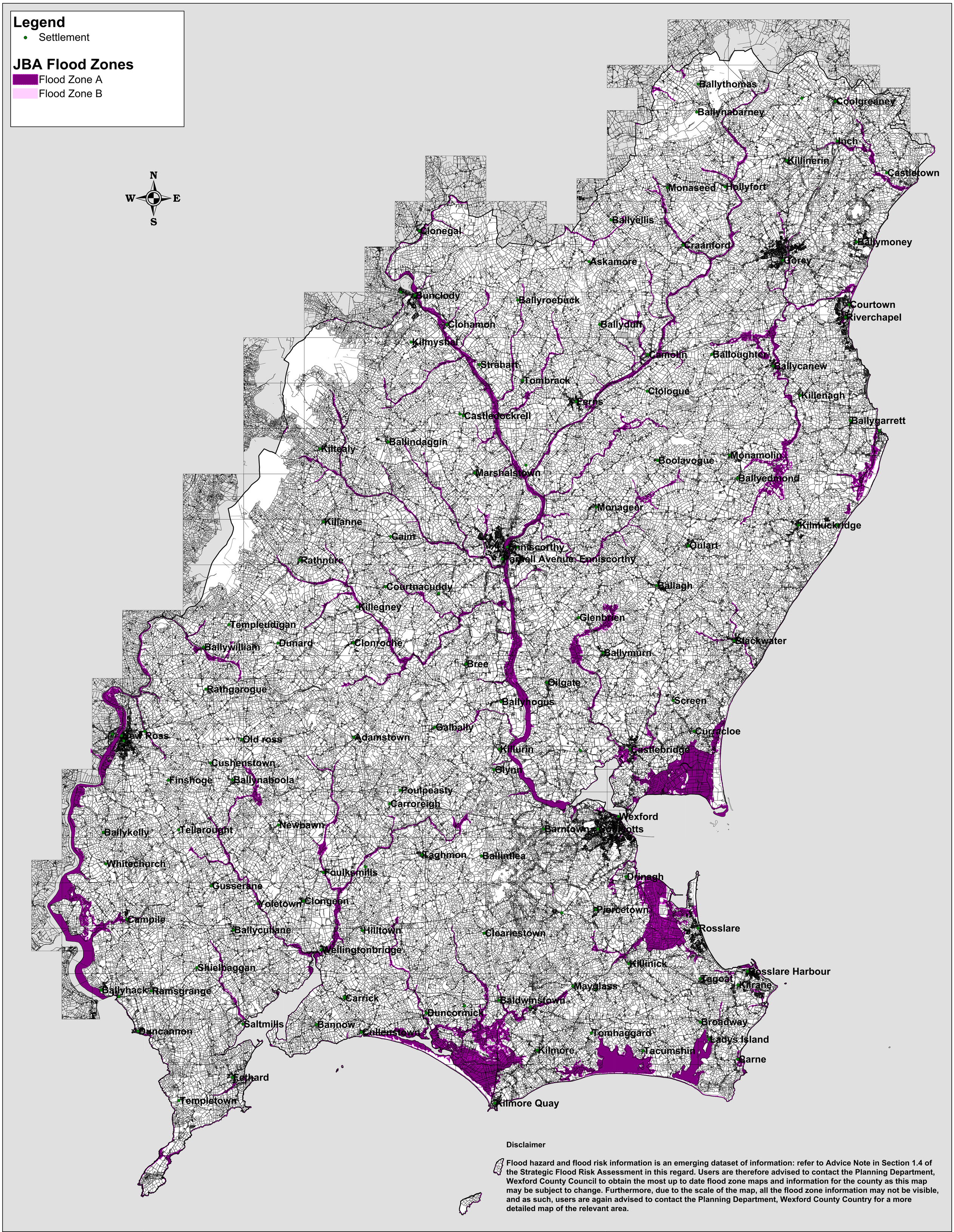
5.0 CONCLUSION

- The site historically has no recorded flood events as noted in the OPW's historical flood maps.
- Predicted flood mapping for pluvial, tidal & fluvial flood events shall not affect the subject lands.
- The permitted development shall have a storm water attenuation system to address a 1 in 100 year (plus climate change) extreme storm. This shall significantly reduce the volume of storm water leaving the site during extreme storms which in turn shall not affect the downstream existing public drainage system.
- The likelihood of onsite flooding from the hydrogeological ground conditions are deemed to be minor and within acceptable levels.

Appendix A:

Gorey Town and Environs Local Area Plan 2017 – 2023 and Wexford County Council Flood Maps

CS CONSULTING
GROUP



Disclaimer

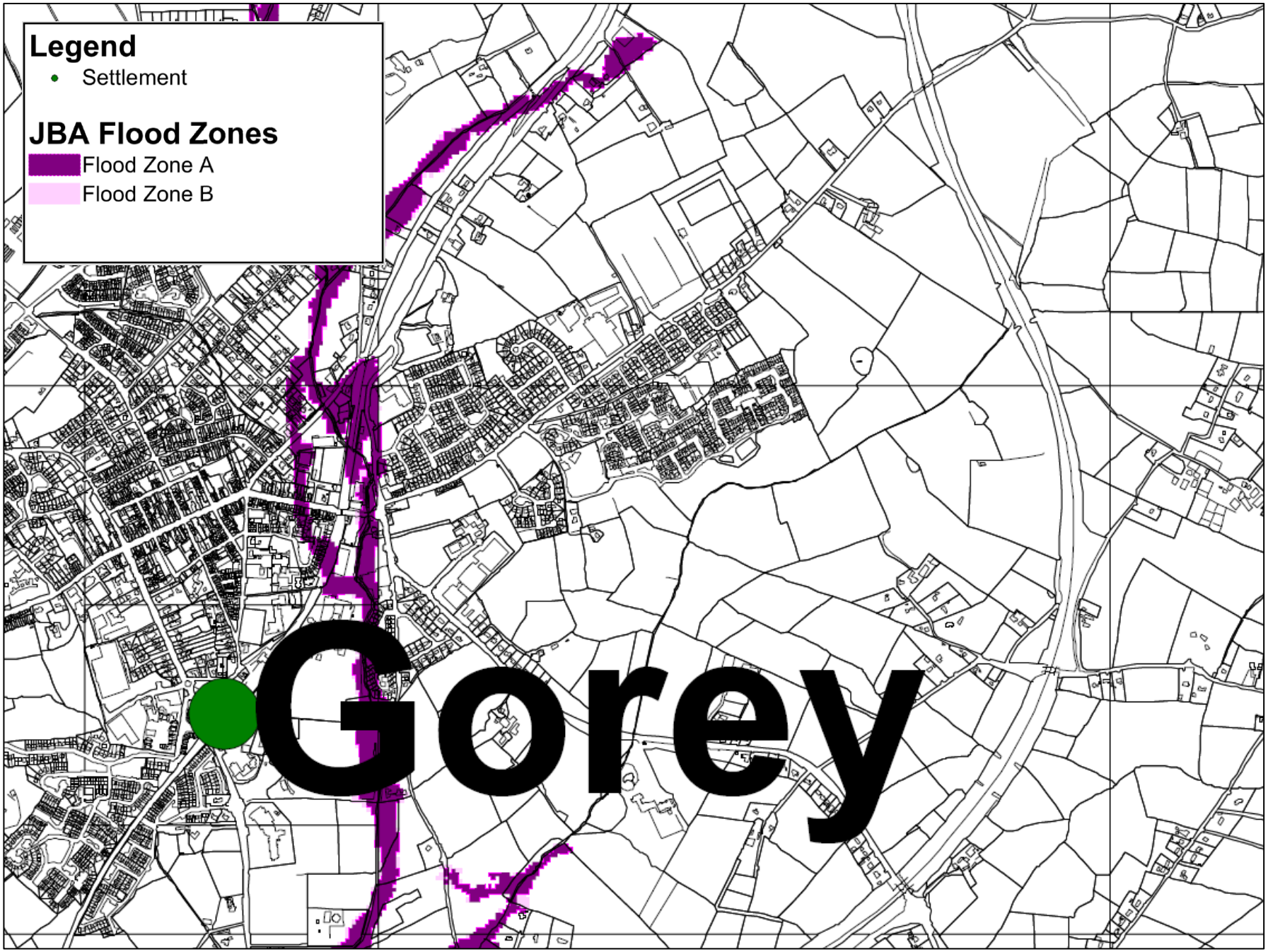
Flood hazard and flood risk information is an emerging dataset of information: refer to Advice Note in Section 1.4 of the Strategic Flood Risk Assessment in this regard. Users are therefore advised to contact the Planning Department, Wexford County Council to obtain the most up to date flood zone maps and information for the county as this map may be subject to change. Furthermore, due to the scale of the map, all the flood zone information may not be visible, and as such, users are again advised to contact the Planning Department, Wexford County Country for a more detailed map of the relevant area.

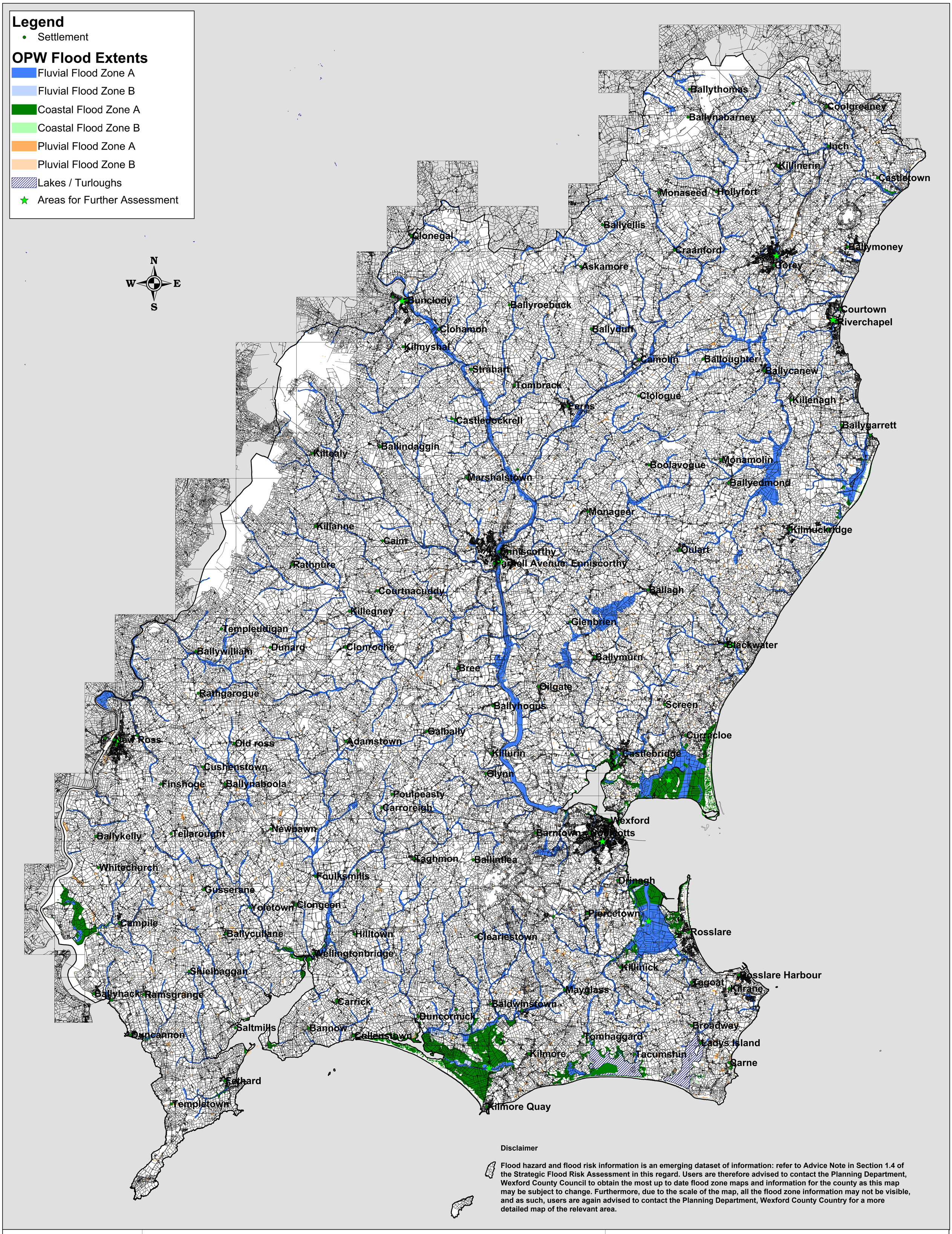
Wexford County Development Plan 2013 - 2019
Strategic Flood Risk Assessment

Title: JBA Flood Zones

Drawn by: NK	Checked by: PD
Date: 12/03/2013	Map No: 1

Extract from Wexford County Development Plan 2013 – 2019 Strategic Flood Risk Assessment – Volume 7 Page 30





Disclaimer

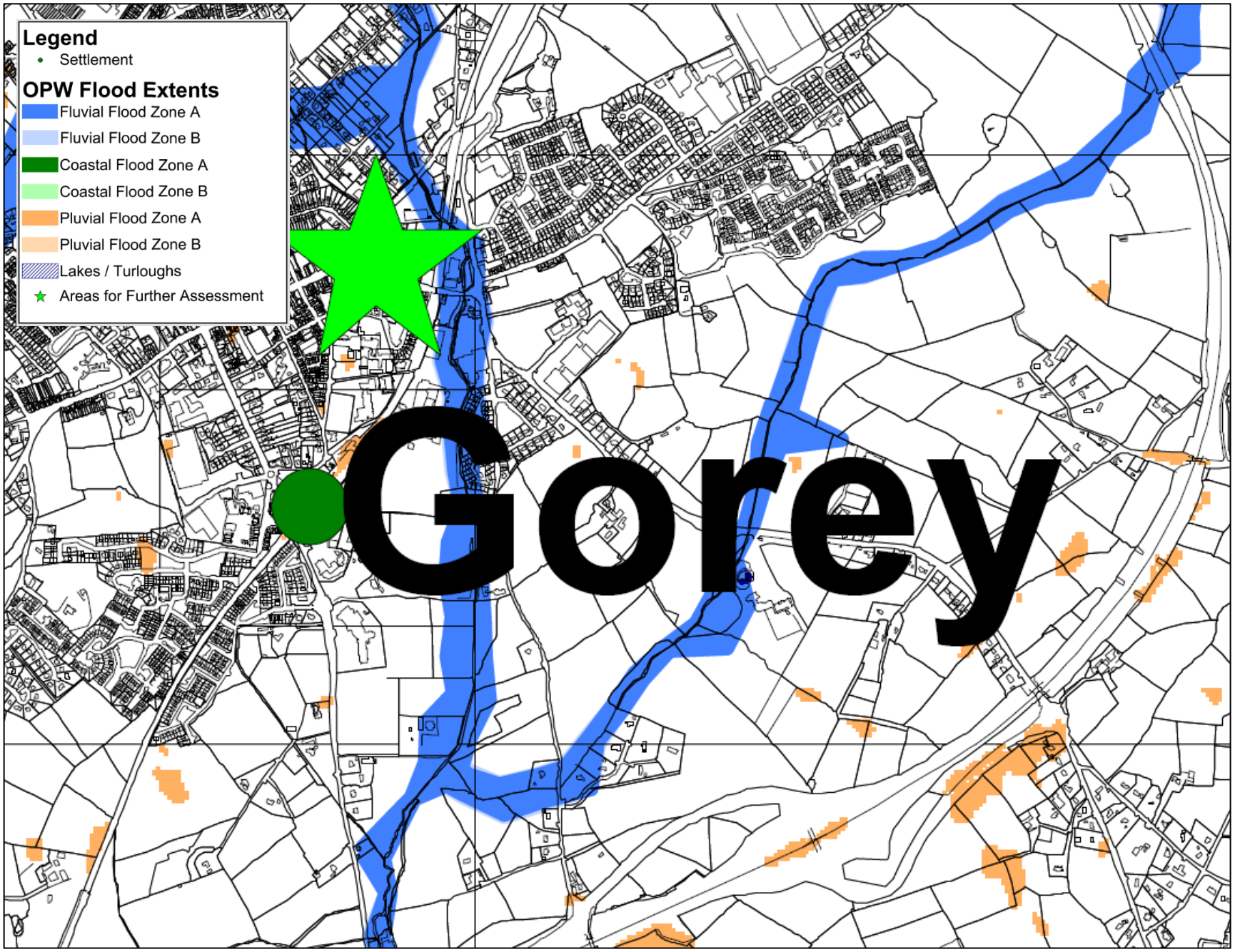
Flood hazard and flood risk information is an emerging dataset of information: refer to Advice Note in Section 1.4 of the Strategic Flood Risk Assessment in this regard. Users are therefore advised to contact the Planning Department, Wexford County Council to obtain the most up to date flood zone maps and information for the county as this map may be subject to change. Furthermore, due to the scale of the map, all the flood zone information may not be visible, and as such, users are again advised to contact the Planning Department, Wexford County Country for a more detailed map of the relevant area.

Wexford County Development Plan 2013 - 2019
Strategic Flood Risk Assessment

Title: OPW Flood Extents

Drawn by: NK	Checked by: PD
Date: 12/03/2013	Map No: 2

Extract from Wexford County Development Plan 2013 – 2019 Strategic Flood Risk Assessment – Volume 7 Page 31



Appendix B:

OPW Historic Flood Records

CS CONSULTING
GROUP

OPW *National Flood Hazard Mapping*

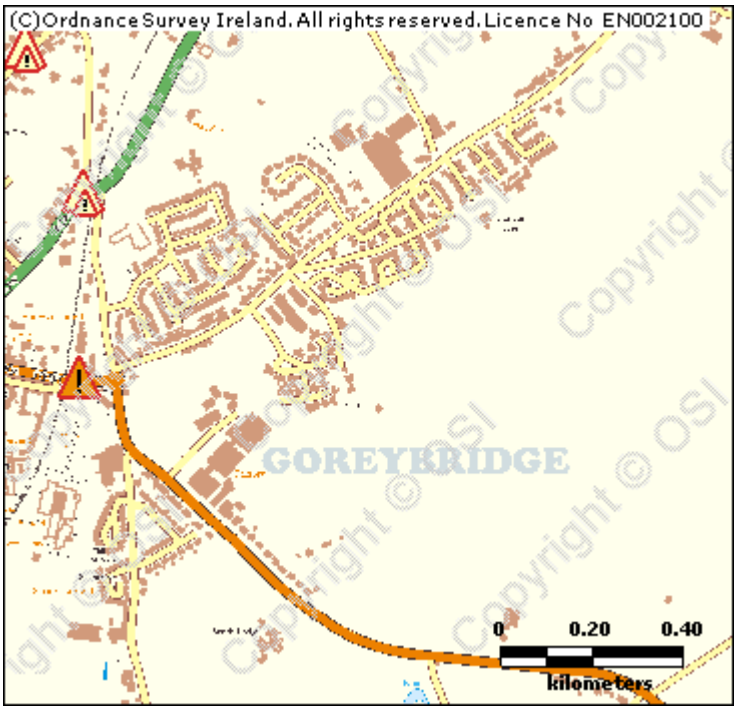
Summary Local Area Report

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

The map centre is in:

County: Wexford

NGR: T 165 597



Map Scale 1:16,771

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. Thier purpose and scope is explained in the Glossary.

3 Results

1. Gorey Esmonde St Aug 1986 — Start Date: 26/Aug/1986
County: Wexford — Flood Quality Code: 4
Additional Information: Reports (2) Press Archive (1) More Mapped Information

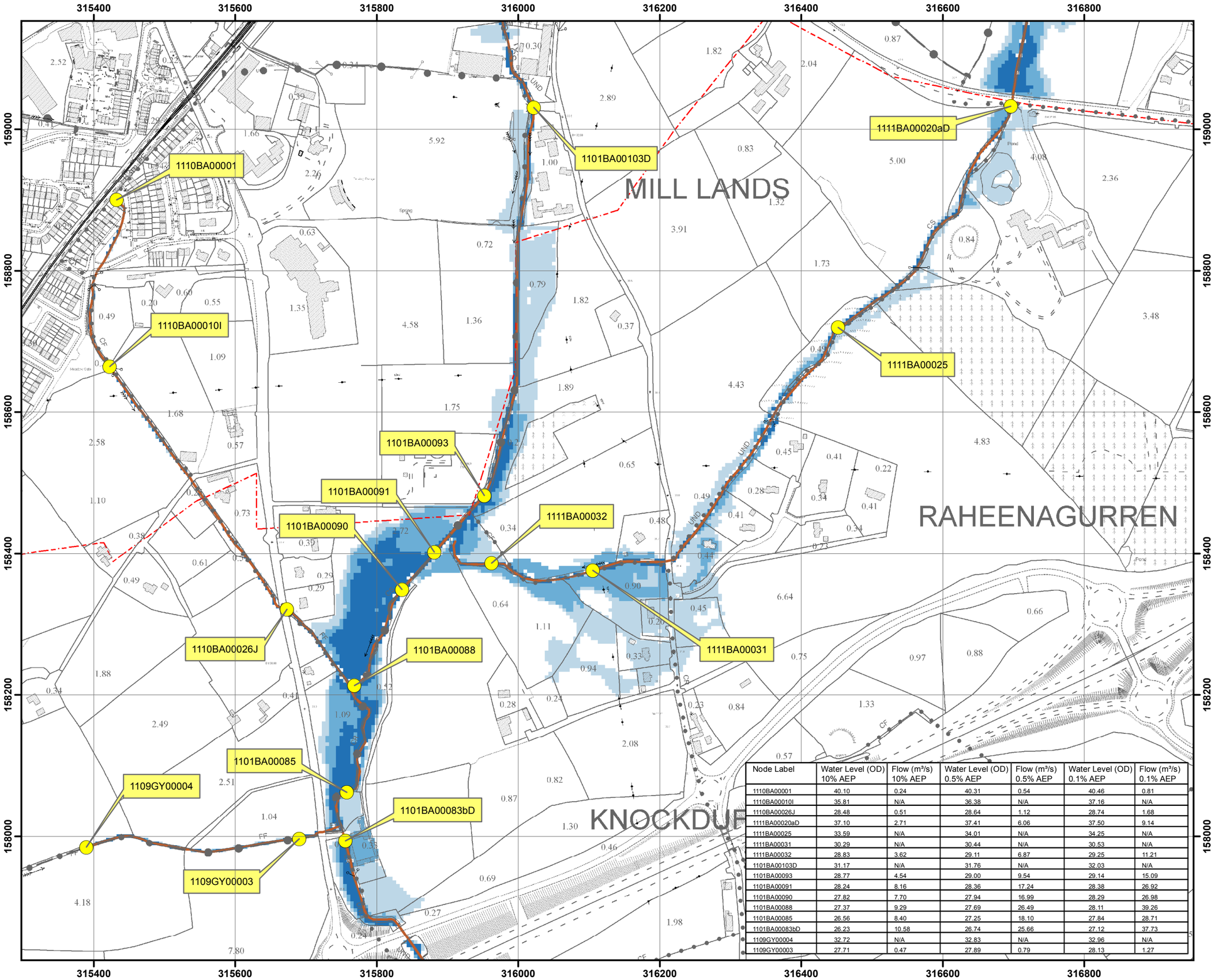
2. Gorey Arklow Road railway bridge recurring — Start Date:
County: Wexford — Flood Quality Code: 4
Additional Information: Reports (2) Press Archive (3) More Mapped Information

3. Gorey Garden City recurring — Start Date:
County: Wexford — Flood Quality Code: 4
Additional Information: Reports (2) Press Archive (4) More Mapped Information

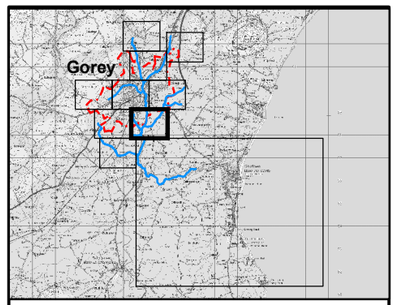
Appendix C:

South Eastern Catchment Flood Risk Assessment and Management Study (CFRAM) Flood Maps

CS CONSULTING
GROUP



Node Label	Water Level (OD) 10% AEP	Flow (m³/s) 10% AEP	Water Level (OD) 0.5% AEP	Flow (m³/s) 0.5% AEP	Water Level (OD) 0.1% AEP	Flow (m³/s) 0.1% AEP
1110BA00001	40.10	0.24	40.31	0.54	40.46	0.81
1110BA00010I	35.81	N/A	36.38	N/A	37.16	N/A
1110BA00026J	28.48	0.51	28.64	1.12	28.74	1.68
1111BA00020aD	37.10	2.71	37.41	6.06	37.50	9.14
1111BA00025	33.59	N/A	34.01	N/A	34.25	N/A
1111BA00031	30.29	N/A	30.44	N/A	30.53	N/A
1111BA00032	28.83	3.62	29.11	6.87	29.25	11.21
1101BA00103D	31.17	N/A	31.76	N/A	32.03	N/A
1101BA00093	28.77	4.54	29.00	9.54	29.14	15.09
1101BA00091	28.24	8.16	28.36	17.24	28.38	26.92
1101BA00090	27.82	7.70	27.94	16.99	28.29	26.98
1101BA00088	27.37	9.29	27.69	26.49	28.11	39.26
1101BA00085	26.56	8.40	27.25	18.10	27.84	28.71
1101BA00083bD	26.23	10.58	26.74	25.66	27.12	37.73
1109GY00004	32.72	N/A	32.83	N/A	32.96	N/A
1109GY00003	27.71	0.47	27.89	0.79	28.13	1.27



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

Legend

- 10% Fluvial AEP Event
- 1% Fluvial AEP Event
- 0.1% Fluvial AEP Event
- Modelled River Centreline
- AFA Extents
- Node Point
- Node ID Node Label

FINAL

REV:	NOTE:	DATE:

SOUTH EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

RPS

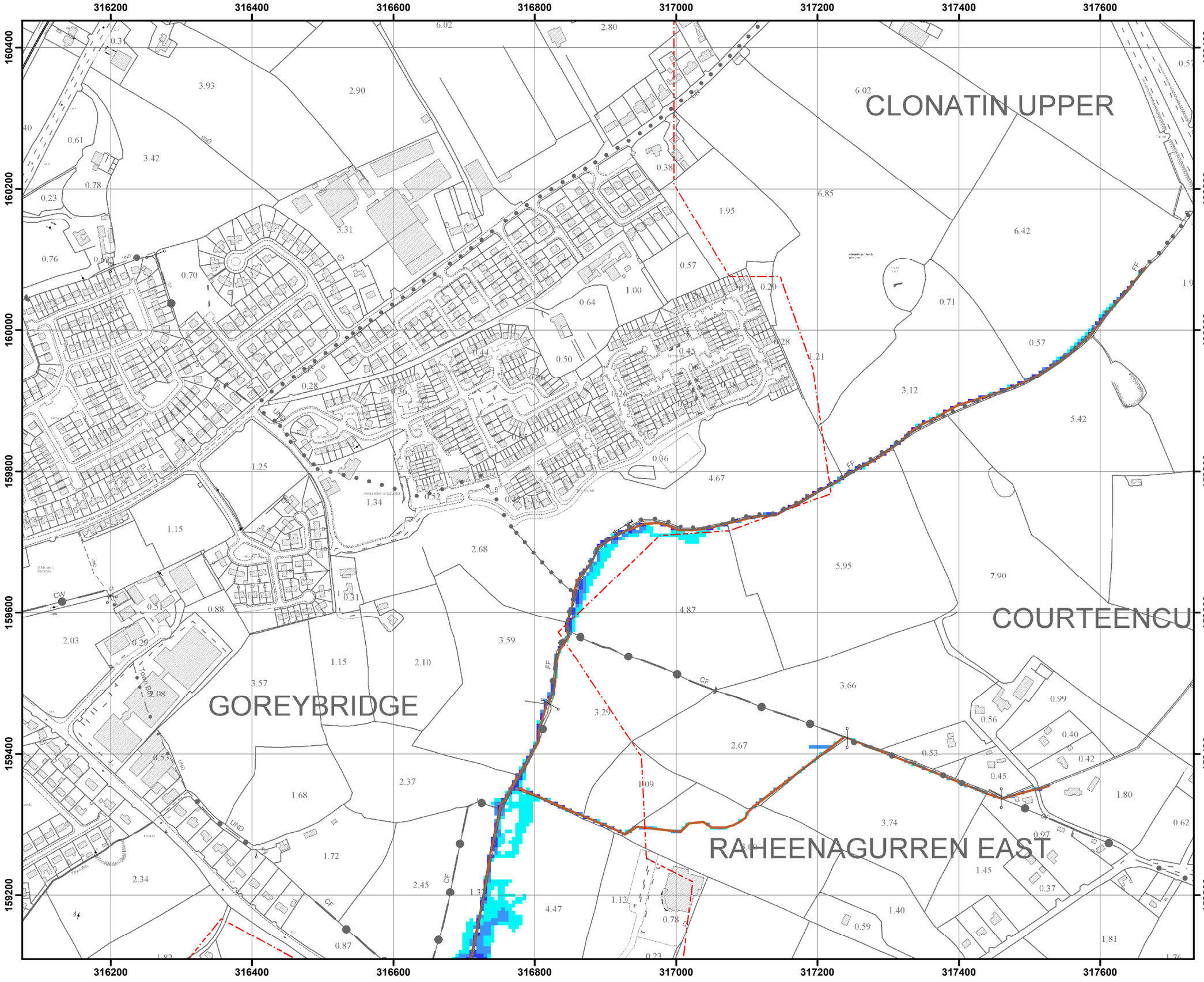
The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

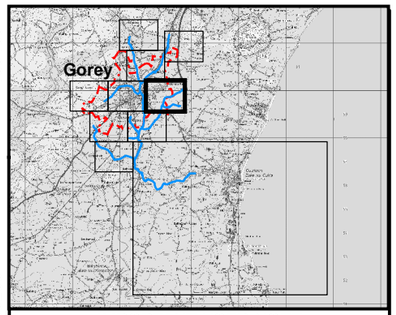
Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map:
Gorey Fluvial Flood Extents

Map Type: EXTENT
Source: FLUVIAL
Map Area: HPW
Scenario: CURRENT
Drawn By : F.M.C. **Date :** 15 July 2016
Checked By : E.H. **Date :** 15 July 2016
Approved By : S.P. **Date :** 15 July 2016
Drawing No. :
O11GOR_EXFCD_F0_07
Map Series : Page 7 of 10
Drawing Scale : 1:5,000 @A3





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

Legend

1% Fluvial AEP Flood Depth

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

Modelled River Centreline

AFA Extents

FINAL

REV:	NOTE:	DATE:

SOUTH EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

RPS

The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map:
Gorey Fluvial Flood Depths

Map Type: DEPTH

Source: FLUVIAL

Map Area: HPW

Scenario: CURRENT

Drawn By : C.McG. **Date :** 15 July 2016

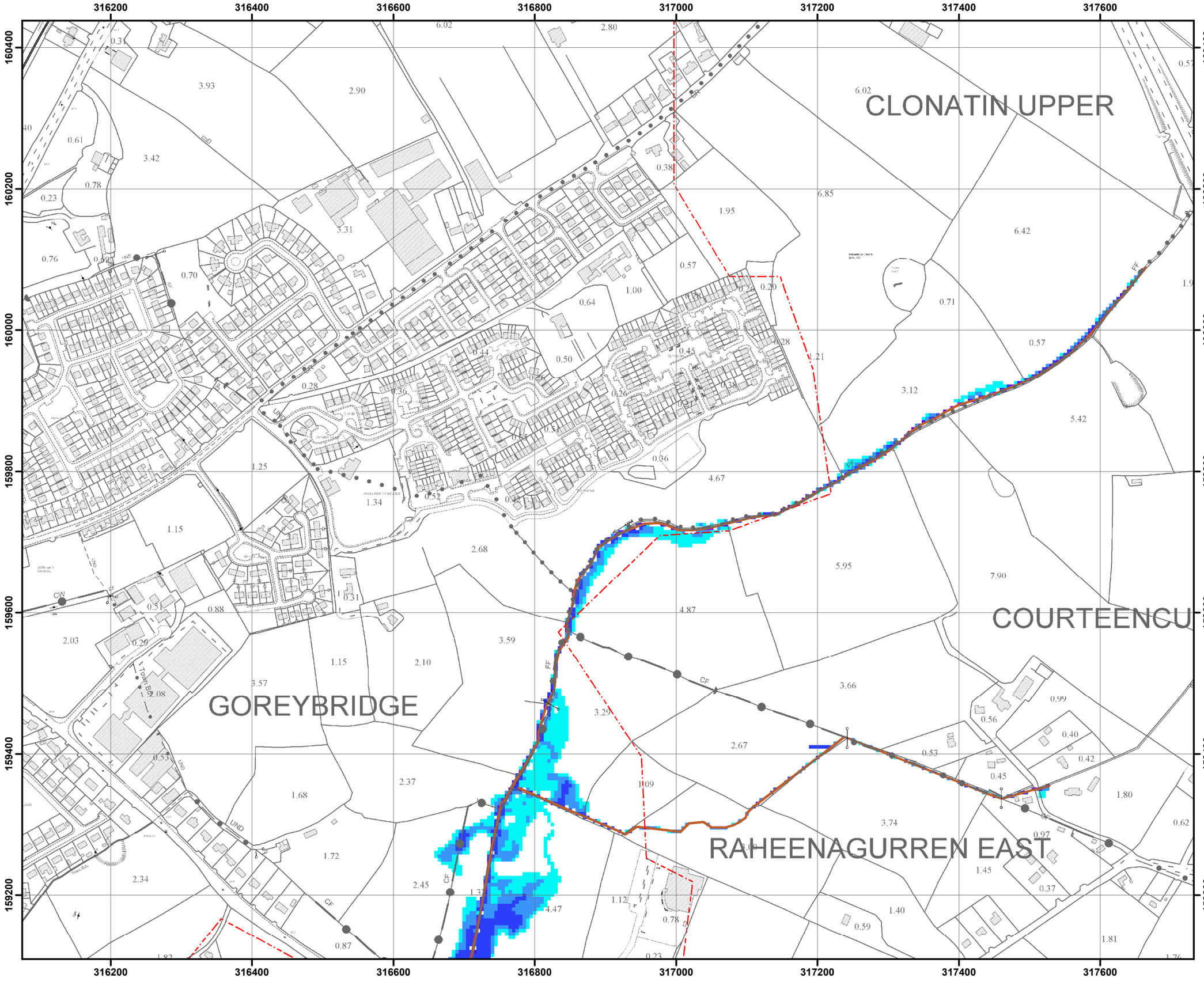
Checked By : E.H. **Date :** 15 July 2016

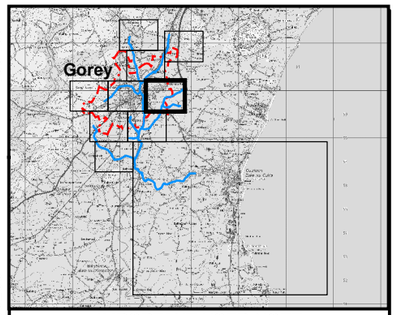
Approved By : S.P. **Date :** 15 July 2016

Drawing No. :
O11GOR_DPFCD010_F0_06

Map Series : Page 6 of 10

Drawing Scale : 1:5,000 @A3





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

Legend

0.1% Fluvial AEP Flood Depth

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

Modelled River Centreline

AFA Extents

FINAL

REV:	NOTE:	DATE:

SOUTH EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW
Oifig na nOibreacha Poiblí
The Office of Public Works

RPS

The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map:
Gorey Fluvial Flood Depths

Map Type: DEPTH

Source: FLUVIAL

Map Area: HPW

Scenario: CURRENT

Drawn By : C.McG. **Date :** 15 July 2016

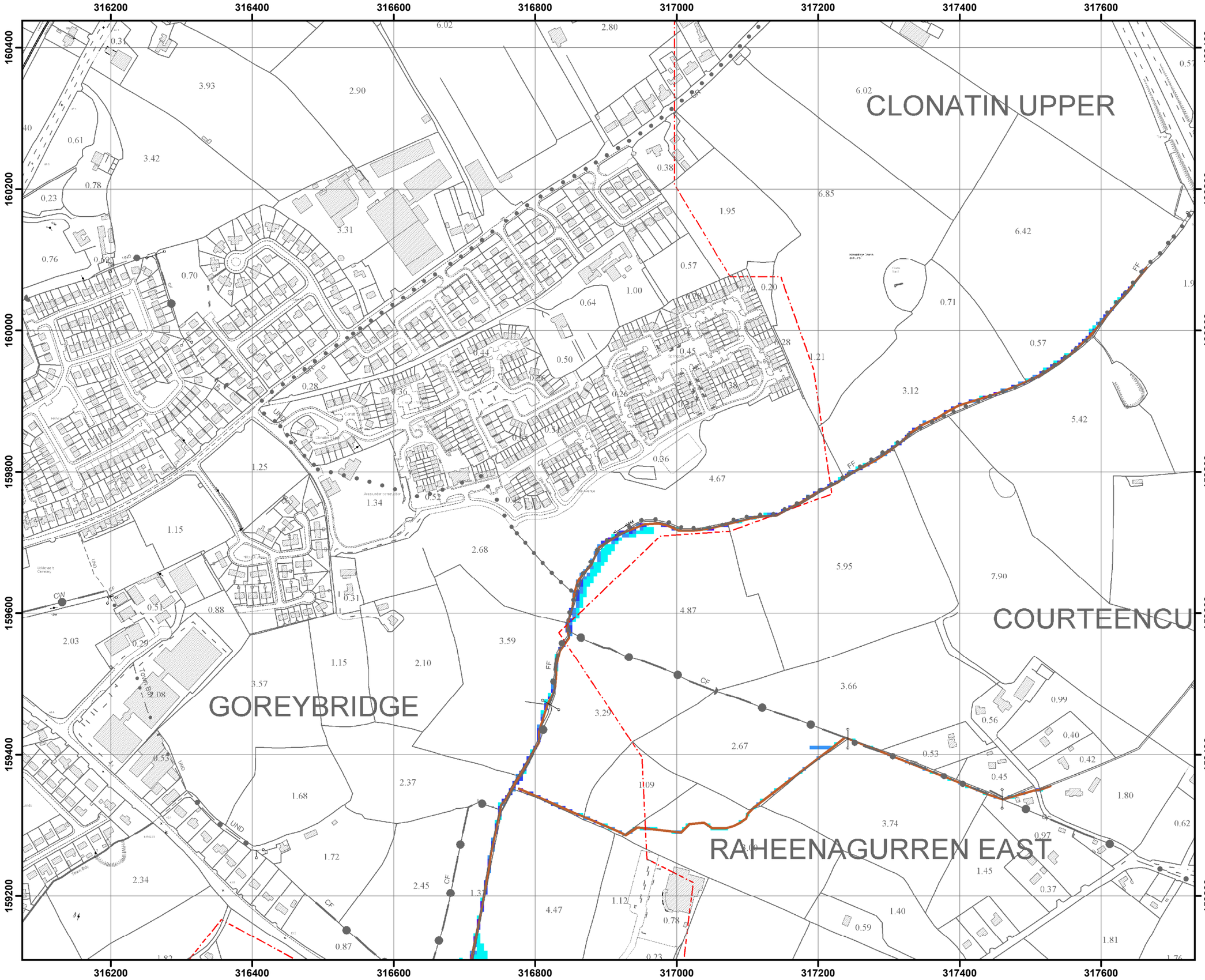
Checked By : E.H. **Date :** 15 July 2016

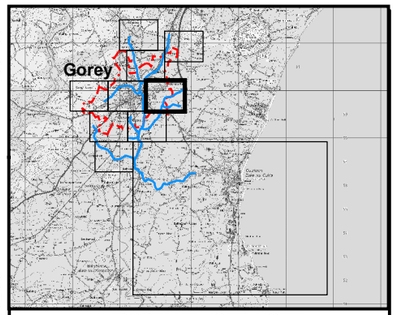
Approved By : S.P. **Date :** 15 July 2016

Drawing No. :
O11GOR_DPFCD001_F0_06

Map Series : Page 6 of 10

Drawing Scale : 1:5,000 @A3





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

Legend

10% Fluvial AEP Flood Depth

- 0 - 0.25m
- 0.25 - 0.5m
- 0.5 - 1m
- 1.0 - 1.5m
- 1.5 - 2m
- >2m

Modelled River Centreline

AFA Extents

FINAL

REV:	NOTE:	DATE:

SOUTH EASTERN CFRAM STUDY
CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT

OPW Oifig na nOibreacha Poiblí The Office of Public Works

RPS

The Office of Public Works
Jonathan Swift Street
Trim
Co Meath

Elmwood House
74 Boucher Road
Belfast
BT12 6RZ

T +44(0) 28 90 667914
F +44(0) 28 90 668286
W www.rpsgroup.com
E ireland@rpsgroup.com

Map:
Gorey Fluvial Flood Depths

Map Type: DEPTH

Source: FLUVIAL

Map Area: HPW

Scenario: CURRENT

Drawn By : C.McG. **Date :** 15 July 2016

Checked By : E.H. **Date :** 15 July 2016

Approved By : S.P. **Date :** 15 July 2016

Drawing No. :
O11GOR_DPFCD100_F0_06

Map Series : Page 6 of 10

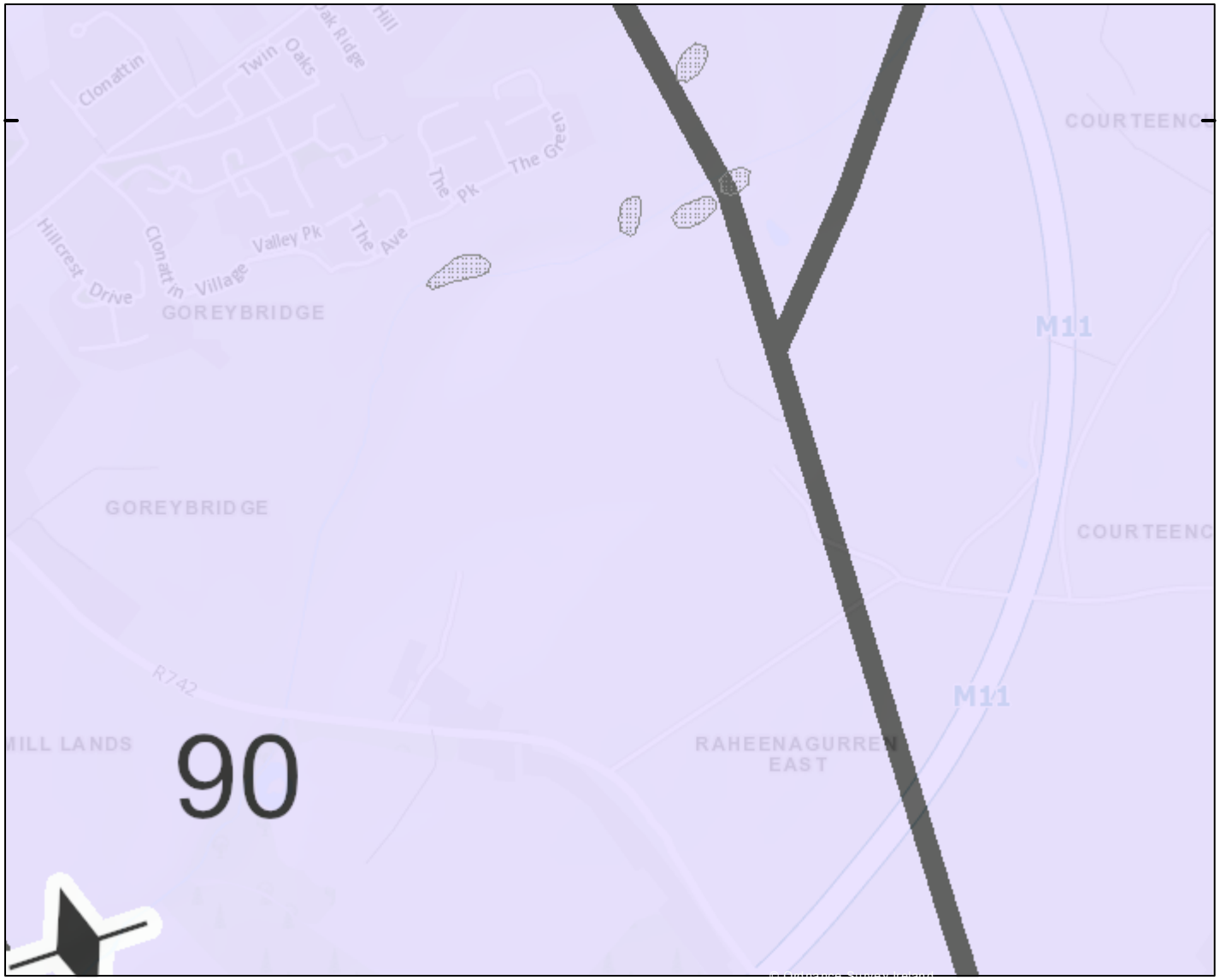
Drawing Scale : 1:5,000 @A3

Appendix D:

GSI Mapping

CS CONSULTING
GROUP

Geological Survey Ireland Public Data



Scale: 1:10,000

Geological Survey Ireland

PSI Licence

N W E S

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 717,125 659,430

1/7/2020, 2:47:22 PM

Legend

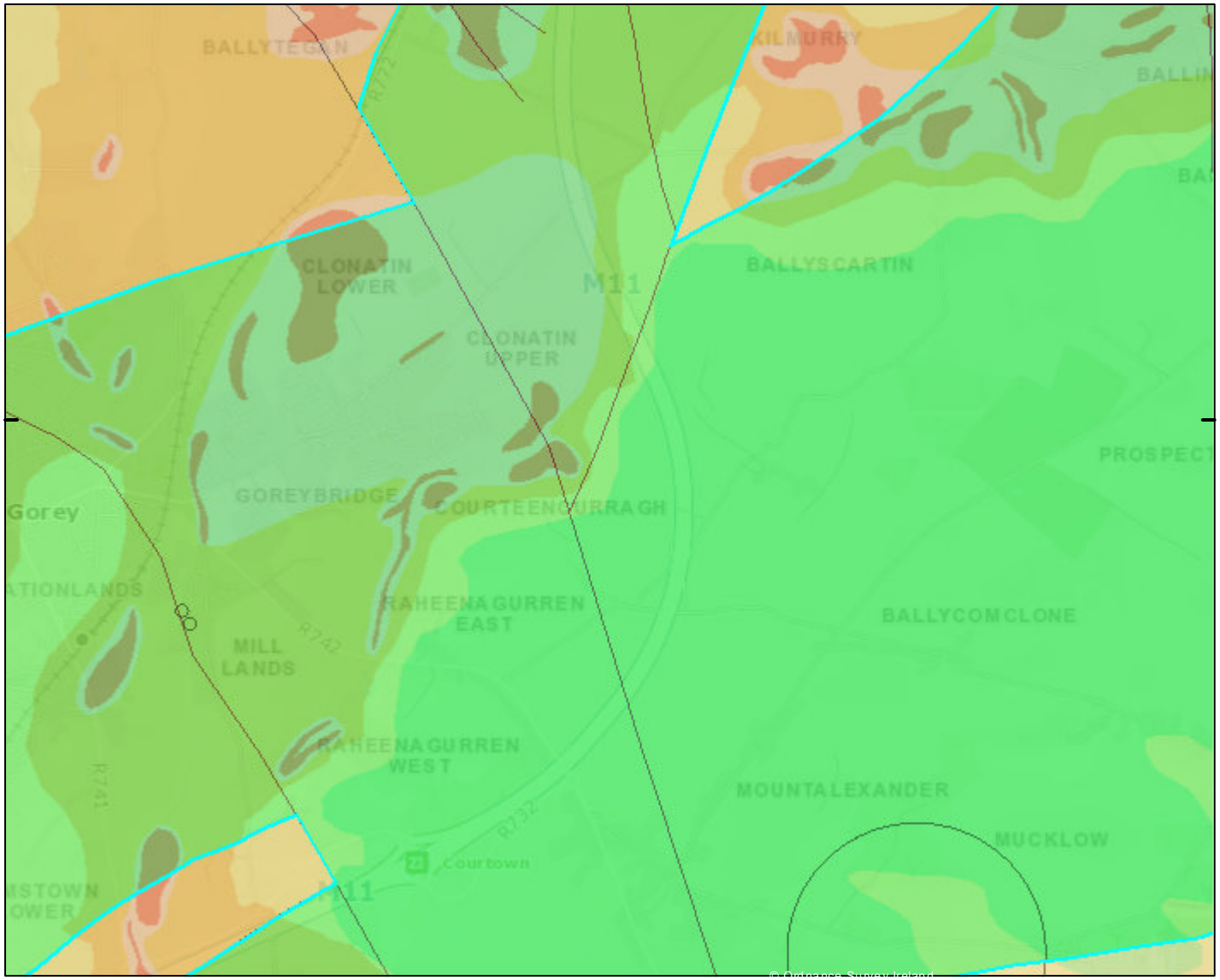
Structural Symbols 100K ITM 2018

- <all other values>
- Dip of bedding or main foliation, old GSI data
- First foliation parallel to bedding
- Foliation trend, Thorr and Rosses Granites
- Horizontal Bedding
- Strike and dip of bedding, right way up
- Strike and dip of bedding, way up unknown
- Strike and dip of first foliation
- Strike and dip of overturned bedding
- Strike and dip of second foliation
- Strike and dip of third foliation
- Strike and plunge of first generation fold axis
- Strike and plunge of second generation fold axis
- Strike and plunge of third generation fold axis
- Strike of vertical bedding/foliation
- Strike of vertical first foliation
- Bedrock Outcrops 100 ITM 2018

Bedrock Linework 100k ITM 2018

- Anticlinal Axis
- Antiformal axis
- Aquifer Boundary
- Area
- Coal seam
- Dyke
- Fault
- Ghost Line
- Goniatite marine band (R1-R4)
- Lithological boundary offshore
- Metadolerite sheet, mainly sills
- Paleogene/ Tertiary Dyke
- Synclinal Axis
- Synformal axis
- Tectonic Slide, barbs on hanging-wall
- Thin stratigraphical unit, diagrammatic
- Thrust, barbs on hanging-wall side
- Tuff band
- Unconformity, dots on younger side
- X-Section

Geological Survey Ireland Public Data



Scale: 1:25,000

Geological Survey Ireland

PSI Licence

N W E S

0 0.175 0.35 0.7 mi

0 0.275 0.55 1.1 km

Map Centre Coordinates (ITM) 717,540 659,728

1/7/2020, 2:55:41 PM

Legend

Groundwater Wells and Springs

Gravel Aquifer

- Locally important gravel aquifer
- Regionally important gravel aquifer

Bedrock Aquifer Faults

Bedrock Aquifer

- Rkc - Regionally Important Aquifer - Karstified (conduit)
- Rkd - Regionally Important Aquifer - Karstified (diffuse)
- RK - Regionally Important Aquifer - Karstified
- Rf - Regionally Important Aquifer - Fissured bedrock
- Lm - Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Lk - Locally Important Aquifer - Karstified
- Ll - Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Pl - Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Pu - Poor Aquifer - Bedrock which is Generally Unproductive
- Lake

National Groundwater Vulnerability Ireland

- Rock at or near Surface or Karst
- Extreme
- High
- Moderate
- Low
- Water