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# Site Specific Flood Risk Assessment

## Proposed Amendment to a Residential Development

## Garter Lane, Saggart, County Dublin

Client: Cape Wrath ULC

Job No. T054

September 2022

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# SITE SPECIFIC FLOOD RISK ASSESSMENT

## PROPOSED AMENDMENT TO A RESIDENTIAL DEVELOPMENT, GARTER LANE, SAGGART, COUNTY DUBLIN

CONTENTS





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| **BS 1192 FIELD** | **T054-CSC-ZZ-XX-RP-C-0002_FRA** |
|---|---|

| Job Ref. | Author | Reviewed By | Authorised By | Issue Date | Rev. No. |
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## 1.0 INTRODUCTION

Cronin & Sutton Consulting Engineers (CS Consulting) have been commissioned by Cape Wrath ULC to prepare an Engineering Services Report to accompany a planning application for an amendment to previously permitted residential development (granted under An Bord Pleanala under ABP-308088-20) at Garter Lane, Saggart, County Dublin.

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

- South Dublin Development Plan 2016–2022;
  (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 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 proposed development site is located on Garter Lane, Saggart, County Dublin. The site is located in the administrative jurisdiction of South Dublin County Council and has a total area of circa 1.18 ha.

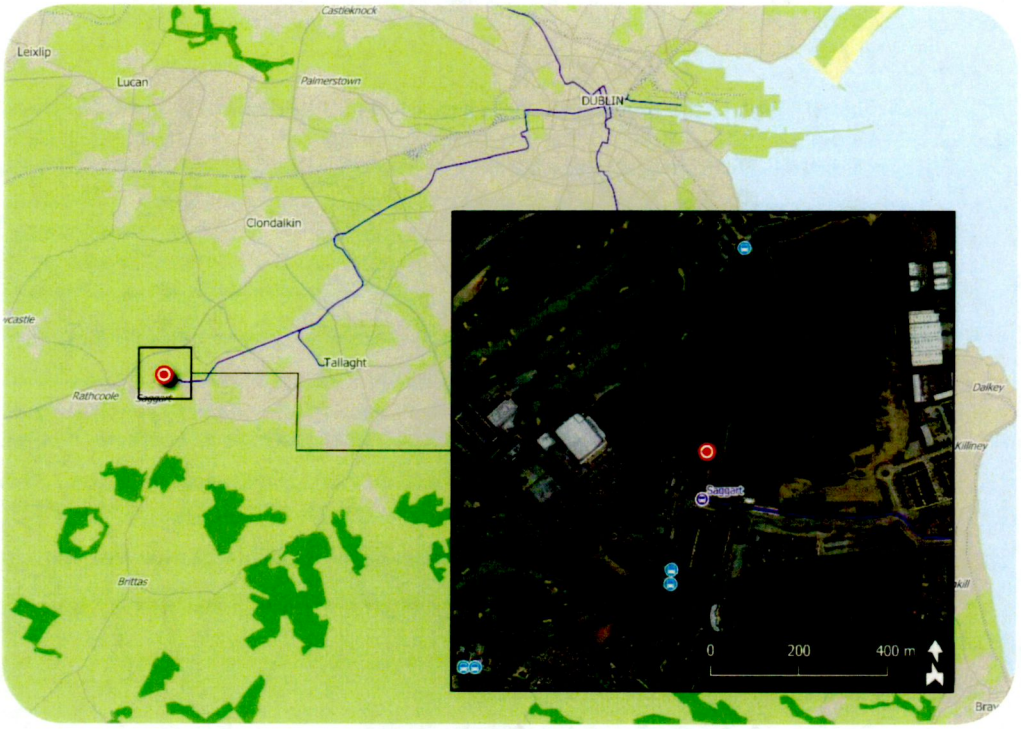


Figure 1 – Site location
(map data: EPA, NTA, OSM Contributors)

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

The site is bounded by a greenfield to the north and east, by the Garter Lane to the west, and by the Fortunestown Lane and the Saggart Luas track to the south.


Figure 2 – Elements of surrounding road network
(map data & imagery sources: NTA, OSM Contributors, Google)

## 2.2 Existing Land Use

The subject site is brownfield and currently unoccupied.

## 2.3 Proposed Amendment

The proposed development comprises amendments to a Strategic Housing Development scheme permitted under ABP Ref. ABP-308088-20.

The development shall consist of modifications to the previously permitted development (ABP Ref. ABP-308088-20), comprising: replacement of 2 No. 1 bedroom unit with 1 No. 2 bedroom unit and an entrance lobby / concierge at ground floor level within permitted Block C; replacement of 3 No. 3 bedroom units with 3 No. 2 bedroom units and additional residential amenity spaces at first, third and fifth floor levels within permitted Block C; replacement of 2 No. 2 bedroom units with 2 No. 1 bedroom units and

additional residential amenity spaces at ground and third floor levels within permitted Block D; and the provision of an enlarged stretcher lift through all floor levels of permitted Blocks C and D. The total number of residential units proposed shall decrease from 224 No. to 223 No. as a result of the proposed amendments.

The proposed development shall also consist of:

- amendments to the permitted car parking areas at basement levels resulting in a total loss of 29 No. car parking spaces (151 No. car parking spaces are provided in total at basement level);
- the provision of c. 275 sq m of residential amenity space (incl. reception, office, staff amenities, multi-purpose spaces, meeting rooms and lobbies) at basement level of permitted Block C and D;
- minor elevation amendments to permitted Block D;
- the provision of a new external stair well to the eastern elevation of permitted Block D providing access from the ground floor level to the basement level;
- reduction of the roofed area above the basement ramp of permitted Block A and B;
- the provision of sprinkler tank rooms, landlord plants, comms room and attenuation tanks at basement level of permitted Blocks A, B, C and D;
- the provision of PV solar panel at all roof levels; amendments to hard and soft landscaping areas;
- and all associated site excavation and development works above and below ground.

## 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.

*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 1.0** 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 1.0**: 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.

It is a requirement of both South Dublin City Councils, *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 2.0** below indicates the predicated climate change variations.

| Design Category | Predicated Impact of Climate Change |
|---|---|
| Drainage | 20% Increase in rainfall |
| Fluvial (River flows) | 20% Increase in flood flow |
| Tidal / Coastal | Minimum Finished Floor Level 4.0 – 4.15m AOD |

**Table 2.0** The predicated climate change variations.

The flooding guidelines categorise 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'.

Reviewing the South Dublin County Council flood maps, the subject site is located in **Flood Zone C**. See **Appendix A**.

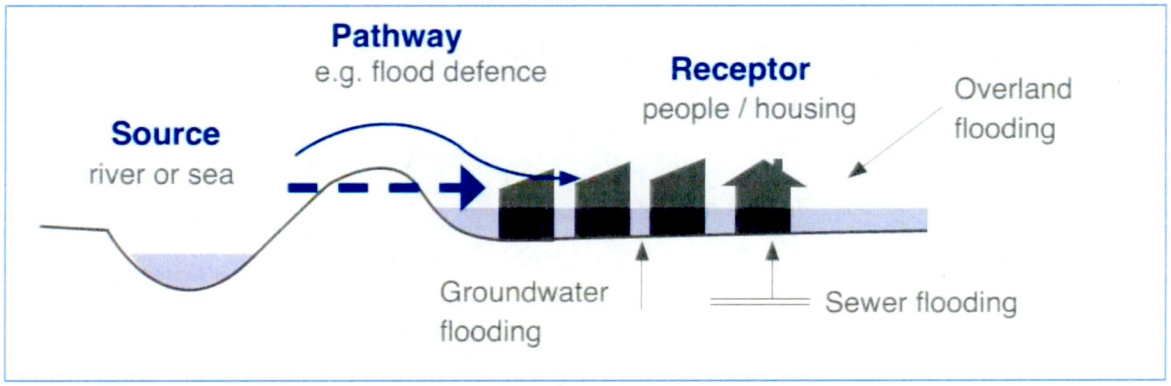


Figure 3 – Source-pathway-receptor model

*(The Planning System and Flood Risk Management Guidelines)*

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 3.0 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 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 site is located approximately 1.70km from the Whitestown Stream and 2.65km from the River Dodder, both to the south of the development. A local stream 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**.

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

### 4.2 Tidal Flooding

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

### 4.3 Pluvial Flooding

Pluvial flooding is flooding which has originated from overland flow resulting from high intensity rain fall. From a review of the OPW flood maps there are no records of flood events due to high rainfall events in the area and assessing the local topography we understand the risk of fluvial flooding to the site is negligible and the development site is deemed not to be at risk from pluvial flooding. See **Appendix B** for OPW Flood maps Report.

However, the proposed site development shall be fitted with an attenuation system limiting storm water run-off to 2 l/s per site and on site storage provided for the 1 in 100 year extreme storm event increased by 20% for the predicated effects of climate change. By reducing the run-off from the site into the local authority surface water sewer the potential risk of flooding from pluvial action is deemed to be within acceptable limits.

### 4.4 Potential For Site To Contribute To Off-Site Flooding.

The proposed development shall require attenuation to be provided. Attenuation shall be sized for a 1 in 100 year extreme storm event increased by 20% for the predicated effects of climate change. The attenuation shall release the storm water in a controlled manner after the peak storm duration has passed. By restricting the flow, the likelihood of the proposed development adversely affecting the public drainage system or contributing to downstream flooding is mitigated. Please refer to Engineering Services Report (under separate cover).

### 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 subject lands shall only discharge a restricted low flow into the public system thereby reducing the hydraulic pressure on the public network during extreme rainfall events. Notwithstanding this, the development site shall be super-elevated above to the adjacent lands to prevent the egress of off site drainage onto the site.

### 4.6 Groundwater Flooding

According to the Geological Survey of Ireland, GSI, interactive maps, the subject site is underlain with *Dark Limestone & Shale*. The area is listed as overlaying a locally important aquifer which has bedrock which is *moderately productive only in local zones*. The groundwater vulnerability assessment of the site shows that the vulnerability of groundwater in the area is *high*. The proposed alteration to the existing site shall not increase the potential for groundwater flooding as such the risk is deemed acceptable. See **Appendix C** for GSI mapping information for background groundwater & geology data for the subject lands.

## 5.0 CONCLUSION

- The site historically has no recorded flood events as noted in the OPW's flood maps. The South Dublin County Councils Strategic Flood Risk Assessment Maps has indicated that the subject lands are located outside the 0.1% AEP Zone.
- Predicted flood mapping for pluvial/tidal & fluvial flood events shall not affect the subject lands.
- The proposed development shall have a storm water attenuation system to address a 1 in 100 year extreme storm events increased by 20% for predicated climate change values. This shall significantly reduce the volume of storm water leaving the site during extreme storms which in turn shall have the effect of reducing the pressure on the 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: SDCC Flood Maps

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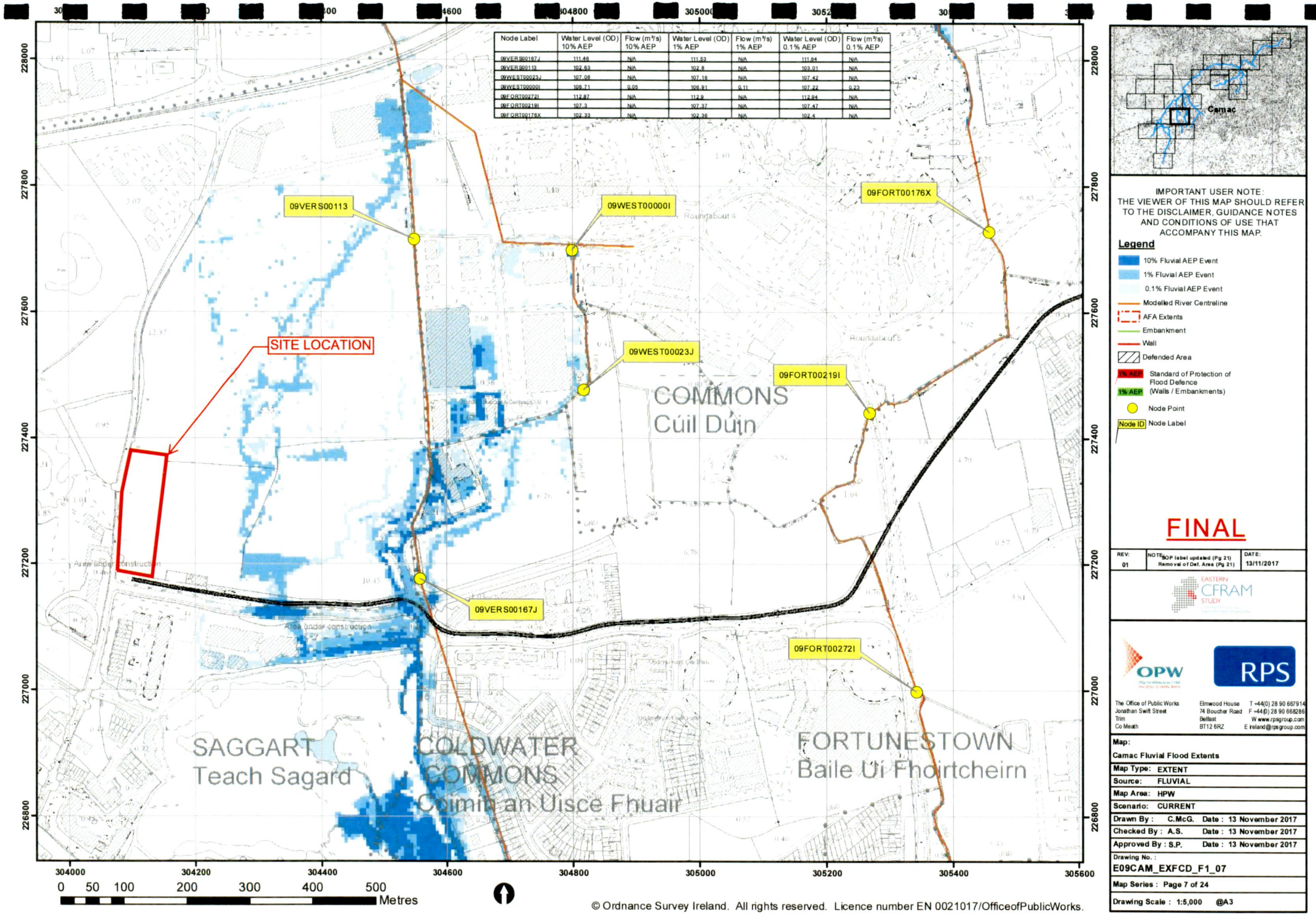


| Node Label | Water Level (OD) 10% AEP | Flow (m³/s) 10% AEP | Water Level (OD) 1% AEP | Flow (m³/s) 1% AEP | Water Level (OD) 0.1% AEP | Flow (m³/s) 0.1% AEP |
|---|---|---|---|---|---|---|
| 09VERS00167J | 111.46 | N/A | 111.53 | N/A | 111.64 | N/A |
| 09VERS00113 | 102.63 | N/A | 102.8 | N/A | 103.01 | N/A |
| 09WEST00023J | 107.08 | N/A | 107.18 | N/A | 107.42 | N/A |
| 09WEST00000I | 106.71 | 9.05 | 106.91 | 9.11 | 107.22 | 9.23 |
| 09FORT00272I | 112.87 | N/A | 112.9 | N/A | 112.94 | N/A |
| 09FORT00219I | 107.3 | N/A | 107.37 | N/A | 107.47 | N/A |
| 09FORT00176X | 102.33 | N/A | 102.38 | N/A | 102.4 | N/A |




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
- Embankment
- Wall
- Defended Area
- 1% AEP / 1% AEP — Standard of Protection of Flood Defence (Walls / Embankments)
- Node Point
- Node ID — Node Label

**FINAL**

| REV: | NOTE | DATE: |
|---|---|---|
| 01 | SOP label updated (Pg 21) Removal of Def. Area (Pg 21) | 13/11/2017 |

EASTERN CFRAM STUDY

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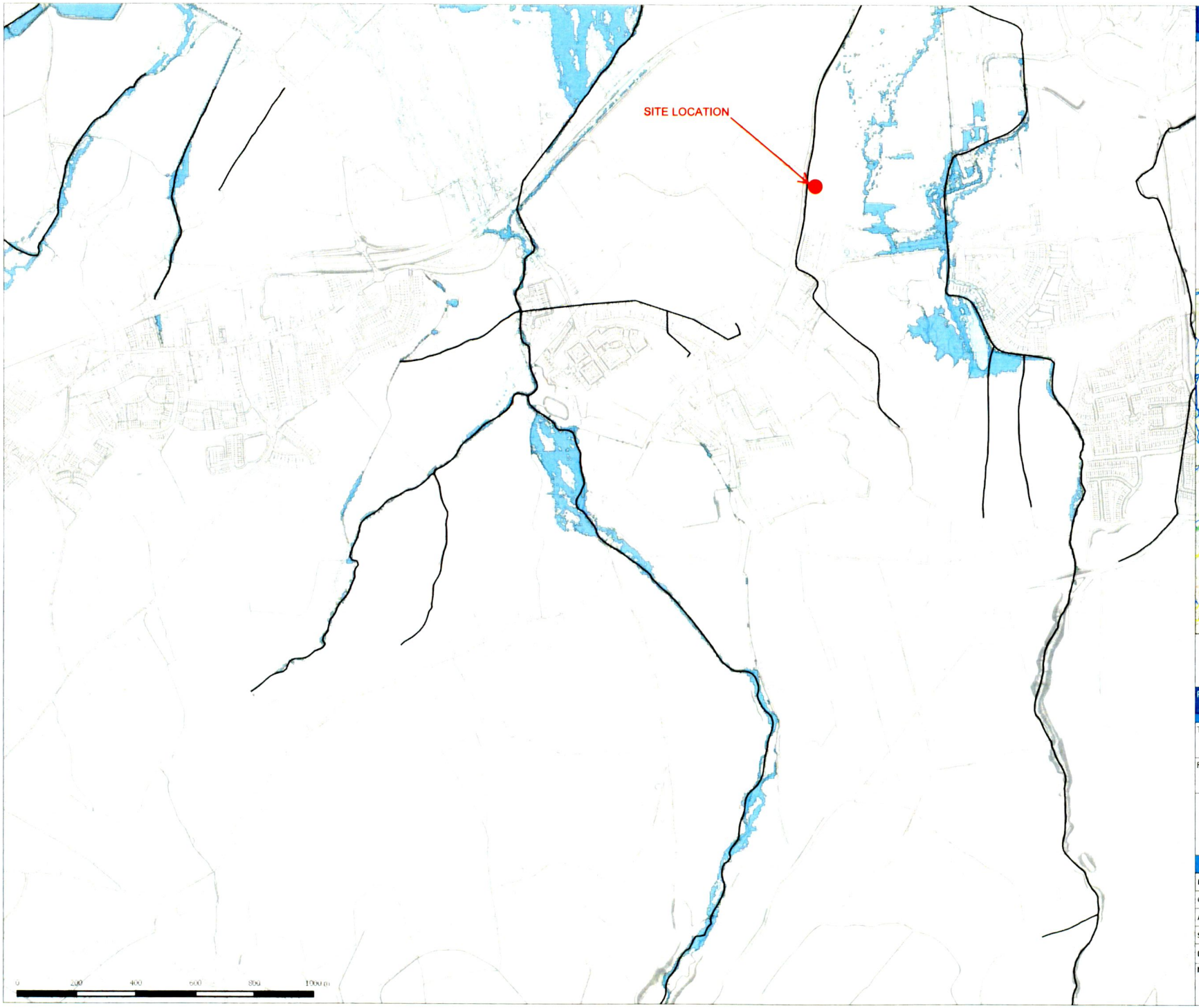
**Map:** Camac Fluvial Flood Extents

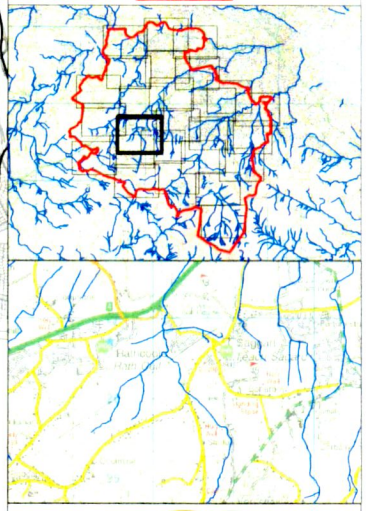
| | |
|---|---|
| Map Type: | EXTENT |
| Source: | FLUVIAL |
| Map Area: | HPW |
| Scenario: | CURRENT |
| Drawn By : | C.McG. Date : 13 November 2017 |
| Checked By : | A.S. Date : 13 November 2017 |
| Approved By : | S.P. Date : 13 November 2017 |
| Drawing No. : | E09CAM_EXFCD_F1_07 |
| Map Series : | Page 7 of 24 |
| Drawing Scale : | 1:5,000 @A3 |




## Legend

- Flood Zone A - 1% AEP Flood Extent (1 in 100 chance in any given year)
- Flood Zone B - 1% AEP Flood Extent (1 in 1000 chance in any given year)
- Defended Area
- Watercourse Centreline
- Indicative Flood Extents
- County Boundary

DRAFT



Comhairle Contae
Átha Cliath Theas
South Dublin County Council

**Project** Strategic Flood Risk Assessment

**Title** Fluvial Flood Zone Mapping

**Figure** MDW657_0014

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### Issue Details

| | | | |
|---|---|---|---|
| Drawn: | BT | Project No. | MDW0657 |
| Checked: | JH | File Ref | MDW0657Q0014F02 |
| Approved: | JH | | |
| Scale: | 1:6000 @ A1 | Drawing No. | Projection |
| Date: | 14/01/2016 | 14 of 26 | IG |

**Notes**

1. The viewer of this map should refer to the SFRA Report and Disclaimer

## Appendix B: OPW Historic Flood Maps

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**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: Dublin

NGR: O 040 272




Map Scale 1:5,229

| 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.

## 9 Results

1. Flooding at Mill Road, Saggart, Co. Dublin on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code: 3
Additional Information: Reports (1) More Mapped Information

2. Flooding at Garter Lane, Saggart, Co. Dublin on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code: 3
Additional Information: Reports (1) More Mapped Information

3. Flooding at Fortunestown Lane, Citywest, Co. Dublin on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code: 3
Additional Information: Reports (1) More Mapped Information

4. Flooding at Avoca Road, Saggart on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code: 2
Additional Information: Reports (1) More Mapped Information

5. Flooding at Belfry Drive/De Selby Park, Dublin 24on 24th Oct 2011
County: Dublin
Start Date: 24/Oct/2011
Flood Quality Code: 2

Additional Information: Reports (1) More Mapped Information

---

6. Fortunestown Lane Nov 2000 — Start Date: 06/Nov/2000

County: Dublin — Flood Quality Code: 3

Additional Information: Reports (1) More Mapped Information

---

7. Jobstown N81 Nov 2000 — Start Date: 05/Nov/2000

County: Dublin — Flood Quality Code: 3

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

---

8. Baldonnell Barneys Lane Recurring — Start Date:

County: Dublin — Flood Quality Code: 4

Additional Information: Reports (1) More Mapped Information

---

9. Rathcoole Bridge recurring — Start Date:

County: Dublin — Flood Quality Code: 4

Additional Information: Reports (1) Press Archive (4) More Mapped Information

## Appendix C: GSI Maps

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# Geological Survey Ireland Public Data


Scale: 1:10,000

Geological Survey Ireland

PSI Licence

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 704,113 727,445

3/26/2020, 6:08:17 PM



## Legend

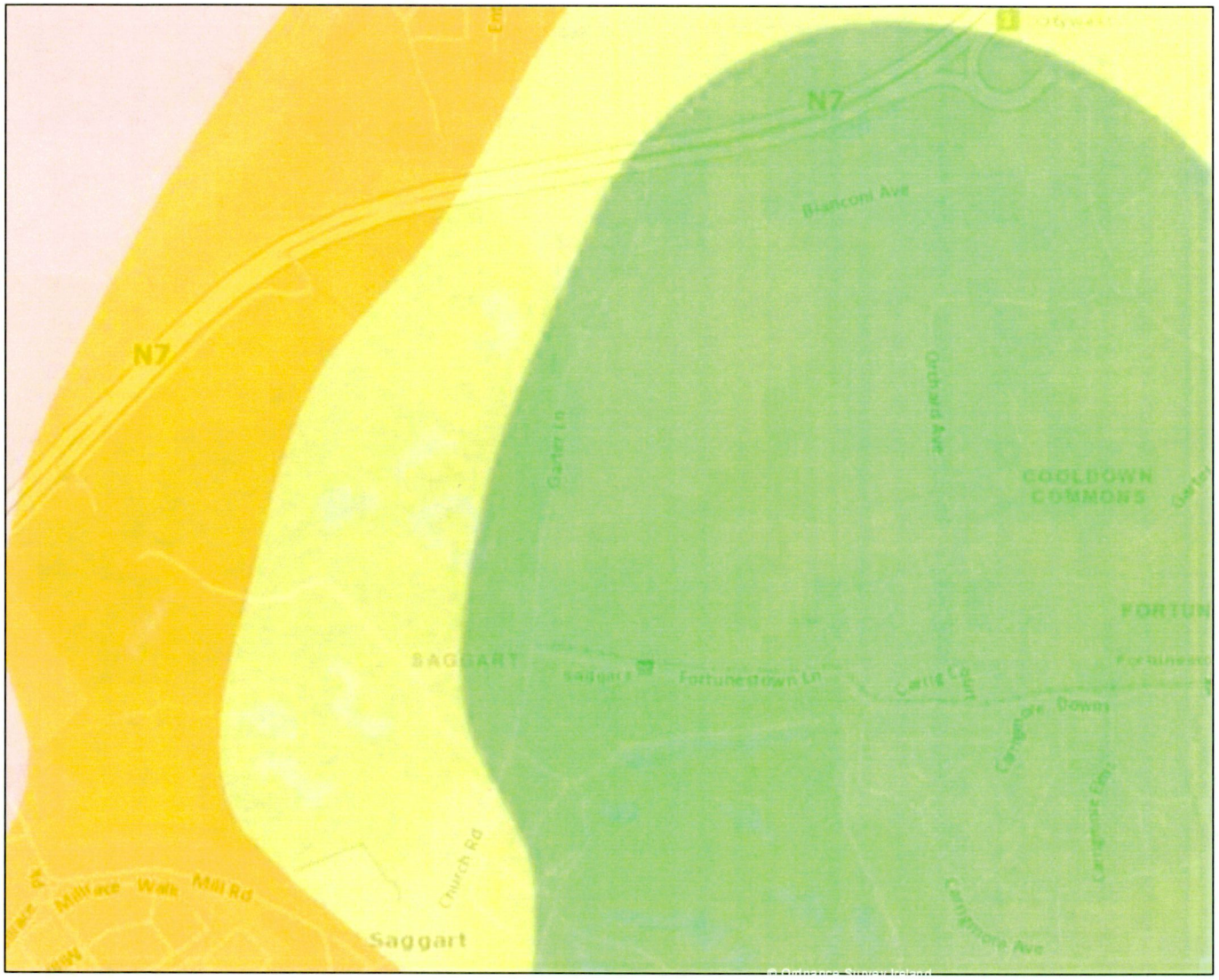
**Structural Symbols 100K ITM 2018**

- <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




Legend

Group Scheme Preliminary Source Protection Areas

**Gravel Aquifer**

- Locally important gravel aquifer
- Regionally important gravel aquifer

**National Groundwater Vulnerability Ireland**

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

Scale: 1:10,000

Geological Survey Ireland

PSI Licence

0 0.05 0.1 0.2 mi

0 0.1 0.2 0.4 km

Map Centre Coordinates (ITM) 704,113 727,445

3/26/2020, 6:09:49 PM

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