

## NOTE TO FILE

JBA Project Code 2018s0080  
Contract Kilbriittain Flood Mapping  
Client Cork County Council  
Day, Date and Time 26 June 2018  
Author Fiona Byrne  
Subject Kilbriittain Flood Mapping

## 1 Introduction

JBA Consulting was commissioned by Cork County Council to provide a review and update of the Flood Zones for the settlement of Kilbriittain.

JBA Consulting undertook a hydraulic modelling analysis for the Kilbriittain River. An ESTRY-TUFLOW model was built for the reach. The purpose of this document is to describe the modelling and hydrological estimation process.

## 2 Hydrology estimations

The river flows in a south easterly direction through the town. The Kilbriittain River rises approximately 18km north west of the site. The river flows in a southerly direction into Courtmacsherry Bay, c 3.3km south, and has a catchment area of 18.29km<sup>2</sup>.

### 2.1 Catchment

AREA (km <sup>2</sup> )	18.29031
SAAR (mm)	1250.78
FARL	1
S1085 (m/km)	14.52787
BFIs <sub>soil</sub>	0.6910202
ARTDRAIN	0.0248
ARTDRAIN2	0
DRAIND (km/km <sup>2</sup> )	0.776
ALLUV	0.0115
URBEXT	0

### 2.2 Fluvial Flow Estimates

A hydrological assessment for this commission was undertaken by JBA Consulting. Flows were calculated using several different methods. FSR RR flows were chosen for use in the model, these represented the most conservative estimates in a comparison between FSR Statistical, FSR Rainfall Runoff and IH124. The results for FSR RR method for the Kilbriittain River are presented in Table 2-1 below. The FSR RR method Hydrographs can be seen in Figure 2-1 below.

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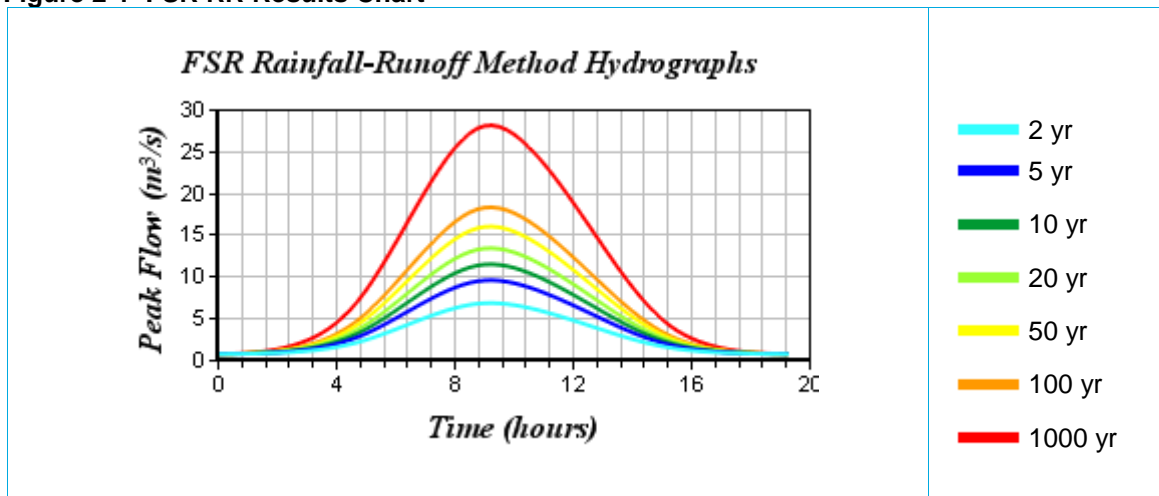
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**Table 2-1 FSR RR Results table**

Flow return period (years)	Rainfall return period (years)	Rainfall Depth (including ARF) (mm)	Peak Flow (m <sup>3</sup> /s)	Volume (000m <sup>3</sup> )	Specific Discharge (l/s/ha)	Growth Factor
2	2	28.687	6.78	203	3.71	1
5	8	40.403	9.51	272	5.2	1.4
10	17	47.077	11.42	321	6.24	1.68
20	35	53.779	13.35	370	7.3	1.97
50	81	62.577	15.95	436	8.72	2.35
100	140	70.133	18.24	494	9.97	2.69
1000	1000	100.347	28.05	743	15.34	4.14

**Figure 2-1 FSR RR Results Chart**



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### 3 Hydraulic model

An ESTRY -TUFLOW model has been developed for this study and is in line with CFRAM standard.

#### 3.1 Survey

A channel survey was undertaken by Apex Surveys Ltd. in April 2018. The open channel and single structure were surveyed for Kilbriittain river. The total length of the surveyed watercourse was approximately 1.4km. This was used to build the 1D model.

A topographic survey was also undertaken by Apex Surveys Ltd between April and June 2018. This was used to build the elevation dataset used in the model and to measure levels relating to the channel banks.

A survey was taken for the single flow structure on the channel, this was used to refine the model geometry of the Kilbriittain river reaches.

#### 3.2 Structures

There is a triple arch masonry bridge at Kilbriittain village. The survey and previous reports indicate one of the arches to be almost entirely blocked on one side.

#### 3.3 Baseline scenario

The total length of watercourse modelled in the 1D domain is approximately 1.4km. The total area modelled in the 2D domain is 0.182km<sup>2</sup>. The baseline scenario was simulated for the 1% AEP event. In order to assess channel and flow structure capacity, the model was simulated for the peak design flow and critical duration of 19.25 hours. A grid size of 2m has been used to represent the 2D domain in the model. The domain is oriented from NW to SE.

#### 3.4 Deliverables

The resulting flood outlines for combined 1% AEP event and 0.1% AEP events, 1% AEP + climate change and 1% AEP + 2/3 blockage can be seen below respectively.

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