

## **SOCIAL HOUSING BUNDLE 3**

# **PROPOSED DEVELOPMENT AT FORTBARRINGTON ROAD, ATHY, CO. KILDARE**

**Stage 1 Flood Risk Assessment**



SHB3-ATY-CS-RPS-RP-006  
Flood Risk Assessment (Stage I)  
P03  
19<sup>th</sup> November 2021

## FLOOD RISK ASSESSMENT (STAGE I)

---

### Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
S3 P01	Issue for Review	RMcL	UM	DK	01/09/2021
S3 P02	Issue for LA Review	PS	DK	DK	21/09/2021
S4 P03	Issue for Planning	RMcL	PMGB	DK	19/11/2021

### Approval for issue

DK

21/09/2021

© Copyright RPS Group Plc. All rights reserved.

The report has been prepared for the exclusive use of our client and unless otherwise agreed in writing by RPS Group Plc, any of its subsidiaries, or a related entity (collectively 'RPS'), no other party may use, make use of, or rely on the contents of this report. The report has been compiled using the resources agreed with the client and in accordance with the scope of work agreed with the client. No liability is accepted by RPS for any use of this report, other than the purpose for which it was prepared. The report does not account for any changes relating to the subject matter of the report, or any legislative or regulatory changes that have occurred since the report was produced and that may affect the report. RPS does not accept any responsibility or liability for loss whatsoever to any third party caused by, related to or arising out of any use or reliance on the report.

RPS accepts no responsibility for any documents or information supplied to RPS by others and no legal liability arising from the use by others of opinions or data contained in this report. It is expressly stated that no independent verification of any documents or information supplied by others has been made. RPS has used reasonable skill, care and diligence in compiling this report and no warranty is provided as to the report's accuracy. No part of this report may be copied or reproduced, by any means, without the prior written consent of RPS.

Prepared by:

Prepared for:

**RPS**

**Kildare County Council**

## Contents

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2</b>	<b>STAGE 1 FLOOD RISK ASSESSMENT FOR ATHY SOCIAL HOUSING DEVELOPMENT.....</b>	<b>2</b>
2.1	Existing site condition and proposed development.....	2
2.1.1	Site location & proposed development.....	2
2.1.2	Existing site topography & surface water drainage systems.....	2
2.2	Sources of information.....	3
2.2.1	Historical Six Inch Mapping (osi.ie).....	3
2.2.2	Historical Flood Maps (Floodmaps.ie and floodinfo.ie).....	3
2.2.3	Arterial Drainage Schemes / Drainage Districts & Benefitting Land Maps.....	3
2.2.4	Topographical Maps/OPW LiDAR DTM.....	4
2.2.5	OPW Preliminary Flood Risk (PFRA) Assessment Indicative Fluvial Flood Maps.....	4
2.2.6	Predictive Flood Maps produced under the CFRAM Studies.....	4
2.2.7	Flood Risk Management Plan (FRMP) and associated Reports (CFRAM Studies).....	5
2.2.8	National Coastal Protection Strategy Study and Coastal Erosion Risk Maps.....	5
2.2.9	Groundwater flooding (GSI Flood Maps, Historical Six Inch Mapping, Ground Investigations).....	5
2.2.10	Previous Flood Risk Assessments:.....	5
2.2.11	Information of Flood Defence Condition and Performance.....	6
2.2.12	Alluvial Deposit Maps.....	6
2.2.13	Consultation with the OPW.....	6
2.2.14	Consultation with the Local Authorities.....	6
<b>3</b>	<b>STAGE 1: FLOOD RISK ASSESSMENT SUMMARY.....</b>	<b>7</b>
3.1	Flood/Drainage Impacts & Proposed Measures.....	7

## 1 INTRODUCTION

RPS are the appointed Civil and Structural Engineering advisors to the National Development Finance Agency (NDFA) for the proposed residential development at Fortbarrington Road, Athy, County Kildare.

The proposed development includes construction of approx. 73 no. dwellings which will be sited over a land area of 2.45ha. Figure 1 illustrates the location of this proposed development site at Athy.

As part of this development RPS has carried out a hydrological assessment of the proposed site. This assessment is required in order to obtain a planning permission for the proposed housing development project as set out in the Government's 2009 Planning System and Flood Risk Management Regulations (hereafter referred to as the 2009 Planning Regulations). The assessment involved a desk top study. The study examines any flooding risks to the proposed site and also assesses any impacts of the proposed development on the existing flooding/hydrological regimes of the adjacent watercourses and lands.

## 2 STAGE 1 FLOOD RISK ASSESSMENT FOR ATHY SOCIAL HOUSING DEVELOPMENT

### 2.1 Existing site condition and proposed development

#### 2.1.1 Site location & proposed development

The site of the proposed Social Housing Development is a greenfield site located at Fortbarrington Road, Ardrew, Athy, Co. Kildare (Grid Reference: E 667670; N 692918). Refer to **Figure 3.1** in **Appendix A** for Site Location map.

Athy is a market town located in Co Kildare ca. 72 km south west of Dublin. The proposed site consists of c.2.45ha of greenfield land located approximately 1km to the south of Athy town centre. To the south of the site is a social housing estate and a halting site. To the west is agricultural land. Beyond this land to the west is residential housing bounded by Bennetsbridge Stream which flows east to the River Barrow. To the east is Fortbarrington Road (L8990). Along the northern boundary is a narrow strip associated with a former railway line to the rear of a house that fronts the L8990. This area of land is the location of a planned distributor road. To the north of this strip of land is residential housing. A creche and local shop is located opposite the application site.

Three electricity poles are located on close to the road frontage and there are trees along this boundary. The Council's landholding extends to include Ardrew social housing estate, the adjoining halting site and the lands to the west. The Council propose to develop a further 5 units within the adjoining halting site.

Refer to **Figure 3.2** in **Appendix A** for Proposed Development map.

#### 2.1.2 Existing site topography & surface water drainage systems

The site, which is currently in agricultural use, is relatively flat at the L8990 but rises to the west. Levels at the site vary from 61.50mOD at the north-east corner of the site to 65.00mOD to the southern corner of the site. The site falls from the western boundary towards the Fortbarrington Road (L8990) and also falls away to the west towards Corrán Ard housing estate. See **Figure 3.3** in **Appendix A** for existing topography of the site.

The surrounding lands fall towards the two main watercourses in the area, i.e., the Bennetsbridge Stream to the west and south and the River Barrow to the east. See **Figure 3.4** in **Appendix A** for surrounding topography and existing drainage layout.

There were no drains captured at the site during the topographical survey.

There are also no drains illustrated in the OSI 6" Cassini historical maps. See **Figure 3.5** in **Appendix A**. The historical mapping shows that the site lays over several historical field boundaries. These fields have since been combined into one large field. The historical map also shows the location of the redundant railway line. The railway line runs along the northern boundary of the site.

There are no existing flow paths into the site from surrounding lands. In general, lands within the site boundary fall towards the Fortbarrington Road and surface water will be collected by the site stormwater network which has been designed to accommodate the critical 100-year storm event inclusive of 20%

climate change. The Fortbarrington Road is at a similar level to that of the north east corner of the proposed site. Lands along the northern boundary are at a high point so surface water will flow toward the site without causing flooding to the north. It is important to note that the northern boundary proposals are predominantly landscaped in nature which means there will be no increase in impervious surfaces in this area. Lands at the south-eastern boundaries are at similar levels to the existing levels so no flow path directly into the site is anticipated. Site drainage proposals will not direct surface water flows towards the existing Ardrew development through implementation of SuDS measures and soakaways. Site boundary walls will also provide an obstruction to any unforeseen surface water flows exiting the site and causing flooding elsewhere. Any obstructions to flow paths caused by site proposals will be provided with adequate drainage solutions where necessary. The proposals for this development include the adequate storm drainage design, attenuation, and percolation/infiltration to the groundwater aquifer.

A sensitivity analysis of the proposed network to blockage has been undertaken and is described in the Drainage and Watermain Design Report. The sensitivity analysis essentially involves reducing percolation area infiltration rates of the base of the infiltration tank by half to represent a silted/partially blocked and neglected storm system. This sensitivity analysis revealed that the stormwater network still had capacity for the 100-year+20%CC storm without causing flooding at any point in the system.

Higher lands within the vicinity of the proposed development at Ardrew Meadows are already developed and have their own stormwater collection and attenuation/percolation areas. There is no risk of rainfall runoff being directed to the proposed site from these higher lands.

According to the Irish Water online database, there is a 225mm diameter uPVC foul sewer pipe running along the eastern boundary of the site on the Fortbarrington Road. There is also a 4" cast iron watermain running along the eastern boundary of the site on the Fortbarrington Road. Refer to Figure 6 in Appendix A. See SHB3-ATY-CS-RPS-RP-001 Drainage and Watermain Planning Design Report for connection details.

## 2.2 Sources of information

Consulted in terms of flooding as recommended in the OPW Guidelines on "The Planning System and Flood Risk Management Guidance and Planning (2009)"

### 2.2.1 Historical Six Inch Mapping (osi.ie)

The historical 6" maps were consulted on the Ordnance Survey Ireland website. There was no indication of historic flooding at the proposed site. The historical mapping did not illustrate any historical drainage systems at the site. Refer to **Figure 3.5** in **Appendix A**.

### 2.2.2 Historical Flood Maps (Floodmaps.ie and floodinfo.ie)

There are no instances of flooding at the proposed site. Refer to **Figure 3.8** in **Appendix A**.

### 2.2.3 Arterial Drainage Schemes / Drainage Districts & Benefitting Land Maps

According to [www.floodinfo.ie](http://www.floodinfo.ie), both the Bennetsbridge Stream and River Barrow are identified as Drainage District Channels.

Drainage Districts were carried out by the Commissioners of Public Works under a number of drainage and navigation acts from 1842 to the 1930s to improve land for agriculture and to mitigate flooding. Channels and lakes were deepened and widened, weirs removed, embankments constructed, bridges replaced or modified, and various other work was carried out.

The purpose of the schemes was to improve land for agriculture, by lowering water levels during the growing season to reduce waterlogging on the land beside watercourses known as callows.

The proposed site is not identified as an area of land benefiting from the Drainage District works. See **Figure 3.7** in **Appendix A**.

### 2.2.4 Topographical Maps/OPW LiDAR DTM

The site, which is currently in agricultural use, is relatively flat at the L8990 but rises to the west. Levels at the site vary from 61.50mOD at the north-west corner of the site to 65.00mOD to the southern corner of the site. The site falls from the western boundary towards the Fortbarrington Road (L8990) and also fall away to the west towards Corrán Ard housing estate. See **Figure 3.3** in **Appendix A** for existing topography of the site.

The surrounding lands fall towards the two main watercourses in the area, i.e., the Bennetsbridge Stream to the west and south and the River Barrow to the east. See **Figure 3.4** in **Appendix A** for surrounding topography and existing drainage layout.

### 2.2.5 OPW Preliminary Flood Risk (PFRA) Assessment Indicative Fluvial Flood Maps

Fluvial PFRA maps were consulted and show no flooding at the proposed site. Refer to **Figure 3.9** in **Appendix A**.

### 2.2.6 Predictive Flood Maps produced under the CFRAM Studies

Floodinfo.ie was consulted and the River Barrow and the Bennetsbridge Stream were both modelled under the CFRAM programme.

The flood maps show that the site is located well above the 10%, 1%, 0.1% AEP predicted flood levels. Predicted water levels at nodes adjacent to the proposed site are summarized below. The lowest topographical level at the site is approx. 61.5mOD. Refer to **Figure 3.10** in **Appendix A** for CFRAM flood extents and node locations. It is important to note that these maps and levels are for the Current Scenario, i.e., without climate change included.

Watercourse	Node Label	Water level (mOD) 10%AEP	Water level (mOD) 0.1%AEP	Water level (mOD) 0.1%AEP
Barrow	14ABRW00108	53.46	53.79	54.15
Bennetsbridge	14BENS00137	57.23	57.59	57.80

The CFRAM flood extents for the area have also been mapped for the Mid-Range Future Scenario (MRFS) i.e., inclusion of 20% climate change. The extents are illustrated in **Figure 3.11**. The flood maps show that the site is located well above the 10%, 1%, 0.1% AEP predicted flood levels

## 2.2.7 Flood Risk Management Plan (FRMP) and associated Reports (CFRAM Studies)

Athy has been identified as requiring flood defence measures as a result of the CFRAM programme recommendations. As such, proposed measures have been outlined in the Flood Risk Management Plan for the Barrow River Basin (UOM14), OPW 2018. Refer to **Figure 3.12** in **Appendix A**.

It is important to note that the works presented in **Figure 3.12** are not the final and definitive works. Potential flood relief works set out will need to be further developed at a local, project level before Exhibition or submission for planning approval.

It is evident in **Figure 3.12** that the proposed flood defence measures will not impact upon flood risk at the site.

## 2.2.8 National Coastal Protection Strategy Study and Coastal Erosion Risk Maps

Not applicable.

## 2.2.9 Groundwater flooding (GSI Flood Maps, Historical Six Inch Mapping, Ground Investigations)

No evidence of groundwater flooding at the site according to GSI flood maps. Ground Investigations carried out at the site revealed that no groundwater table was struck at a depth of 3.2m below existing ground level.

## 2.2.10 Previous Flood Risk Assessments:

### 2.2.10.1 At site or Strategic Flood Risk Assessments (SFRA)

Athy is mentioned in the SFRA for the Kildare County Development Plan 2017-2023. This document predominantly refers to the CFRAM programme and the proposed measures outlined in the FRMP. The proposed site was not identified as at risk to flooding under the CFRAM study nor the SFRA. There are no flood measures proposed in the SFRA that will impact upon flood risk at the site.

The Athy Local Area Plan (LAP) 2021-2027 Strategic Flood risk Assessment (SFRA) completed in August 2021 shows that the proposed site is in Flood Zone C. The zoning flood risk summary and proposals for Ardrew outline that "The SSFRA should address the site layout with respect to vulnerability of the proposed development type, finished floor levels should be above the 0.1% or 1% AEP level where appropriate, flood resilient construction materials and fittings should be considered and the site should not impede existing flow paths or cause flood risk impacts to the surrounding areas. An emergency evacuation plan and defined access / egress routes should be developed for extreme flood events. SSFRA should also examine climate change scenarios." These have all been taken into consideration as part of this site-specific flood risk assessment.

### 2.2.10.2 National/Regional/Local Spatial Plans

Athy is mentioned in the SFRA for the Kildare County Development Plan 2017-2023. This document predominantly refers to the CFRAM programme and the proposed measures outlined in the FRMP.

---



### **2.2.11 Information of Flood Defence Condition and Performance**

Not applicable.

### **2.2.12 Alluvial Deposit Maps**

Not applicable.

### **2.2.13 Consultation with the OPW**

Not applicable.

### **2.2.14 Consultation with the Local Authorities**

On-going under the planning process.

### **3 STAGE 1: FLOOD RISK ASSESSMENT SUMMARY**

There is no evidence to show that the proposed site is liable to flooding. The site is located outside the fluvial areas as modelled under the PFRA and CFRAM programmes. There are no identifiable flow paths directly into the site from adjoining lands that would detrimentally affect flood risk to the proposed development. The site proposals will not cause flow paths to exit the site and cause flooding elsewhere. There is also no historical or predictive evidence of groundwater flooding at the site. Ground Investigations carried out at the site revealed that no groundwater table was struck at a depth of 4.5m below existing ground level.

The Drainage and Watermain Design Report submitted with these planning application documents shows that the proposed stormwater drainage network has capacity for the critical 100-year rainfall event inclusive of 20% climate change in line with MRFS. The stormwater network simulations show that the water levels in the system do not exceed cover levels at any location and will not impose any flood risk to the site or elsewhere. The water levels in the proposed network are maintained at a minimum of 500mm freeboard to finished floor levels (FFLs) to adjacent houses.

#### **3.1 Flood/Drainage Impacts & Proposed Measures**

Surface water generated will likely be infiltrated on site in combination with the use of attenuation on site in order to ensure the risk of flooding in the vicinity of the development is not increased. Any proposed drainage as part of the development is expected to be adequately designed to prevent any increase in flood risk to the site.

## Appendix A

### Figures

KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT

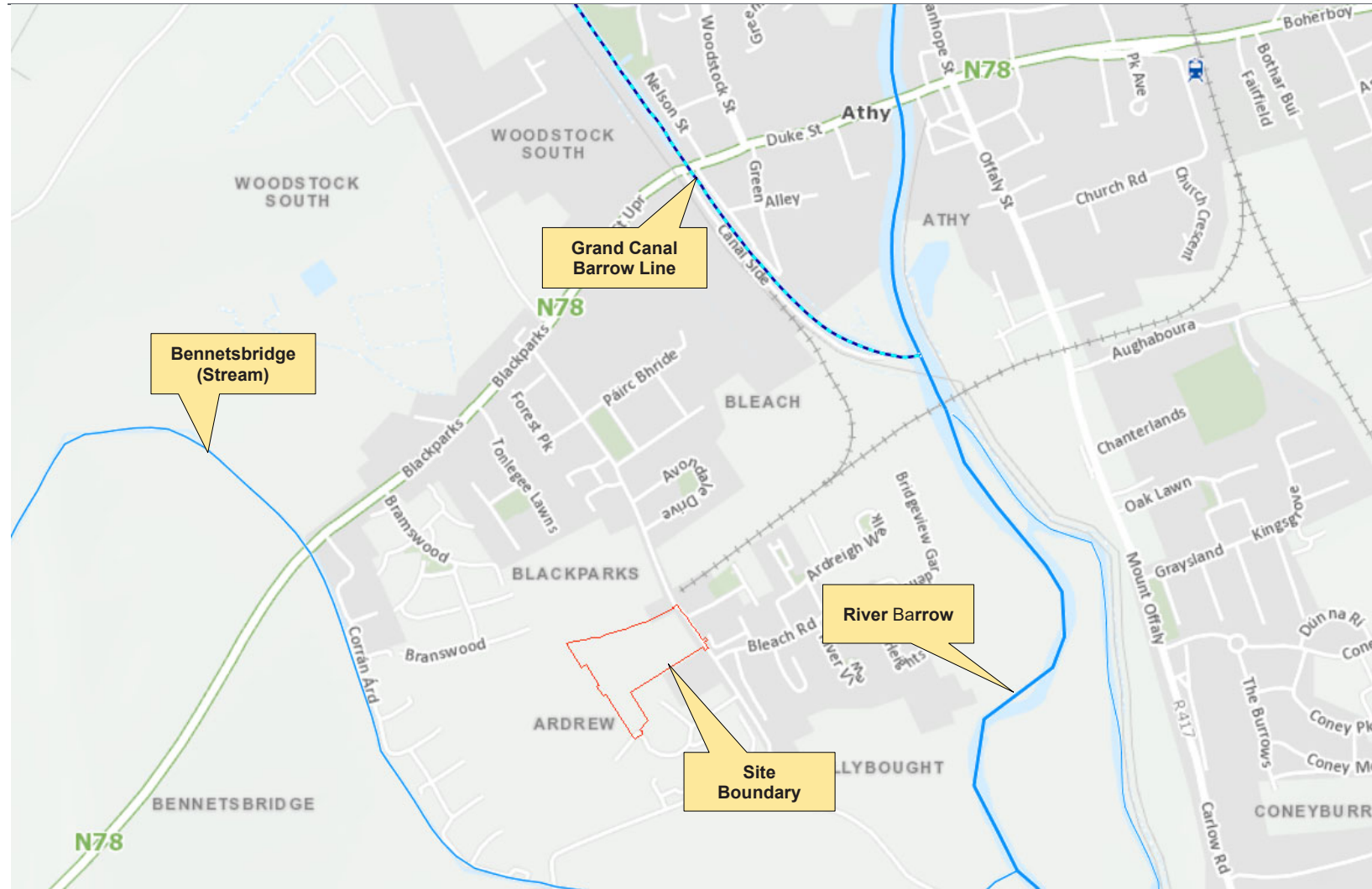
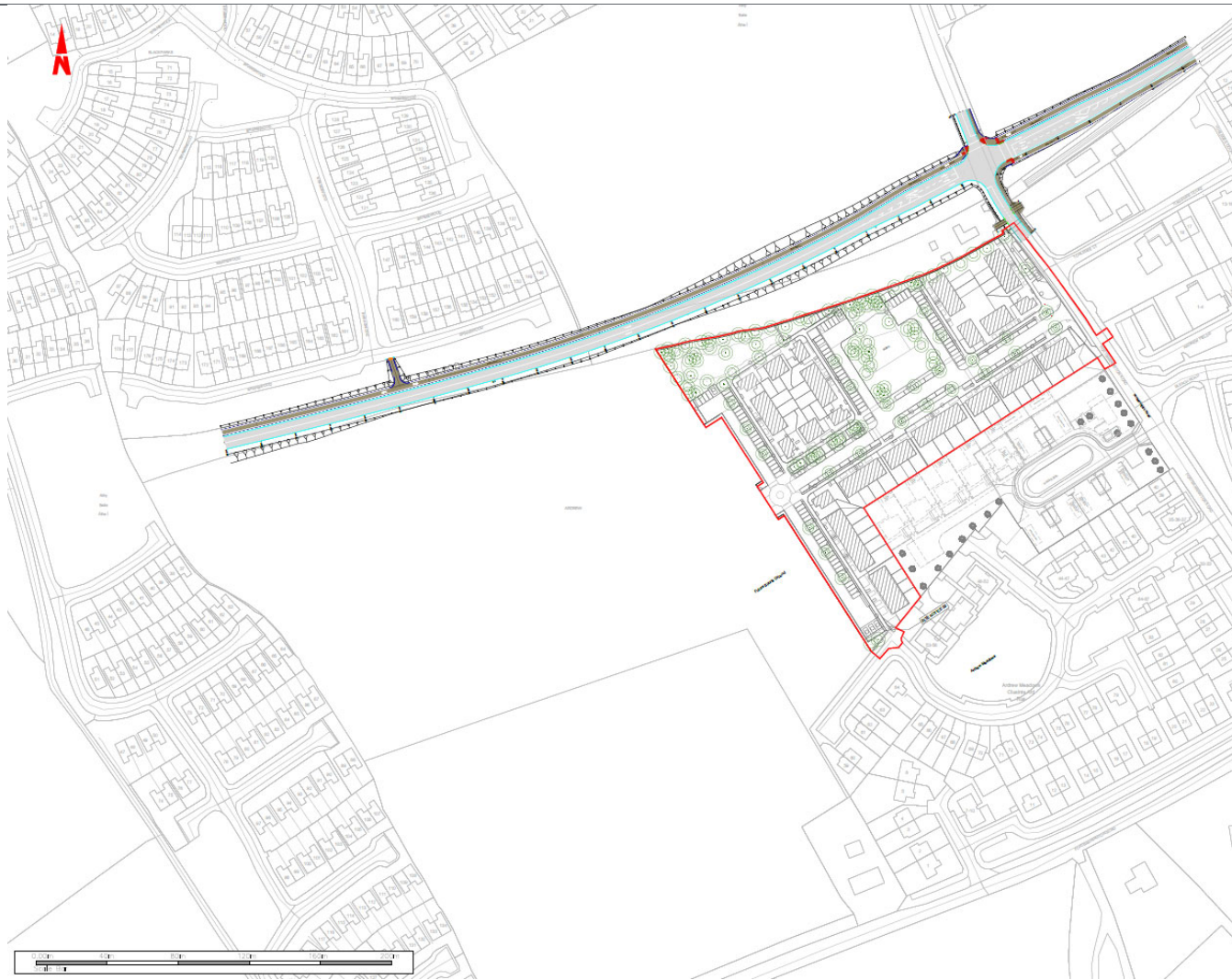


Figure 3.1 Site Location (red line boundary)

**KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT**



**Figure 3.2 Proposed development including proposed distributor road**

**KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT**



**Figure 3.3 Existing topography of the site (from NCW Surveys topographical survey, April 2021)**

KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT

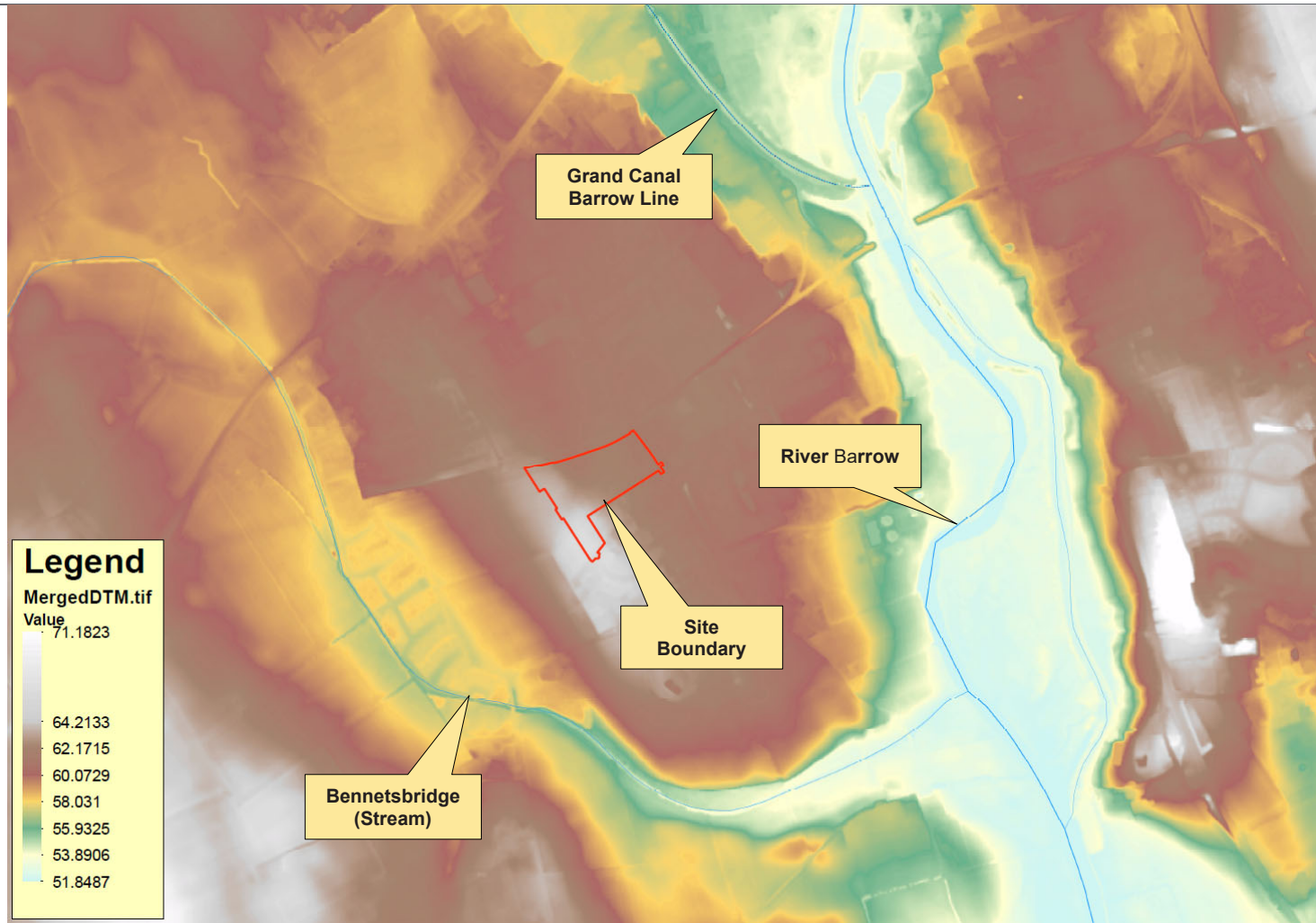


Figure 3.4 Surrounding topography and existing drainage layout (OPW 2m DTM, 2011)

KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT

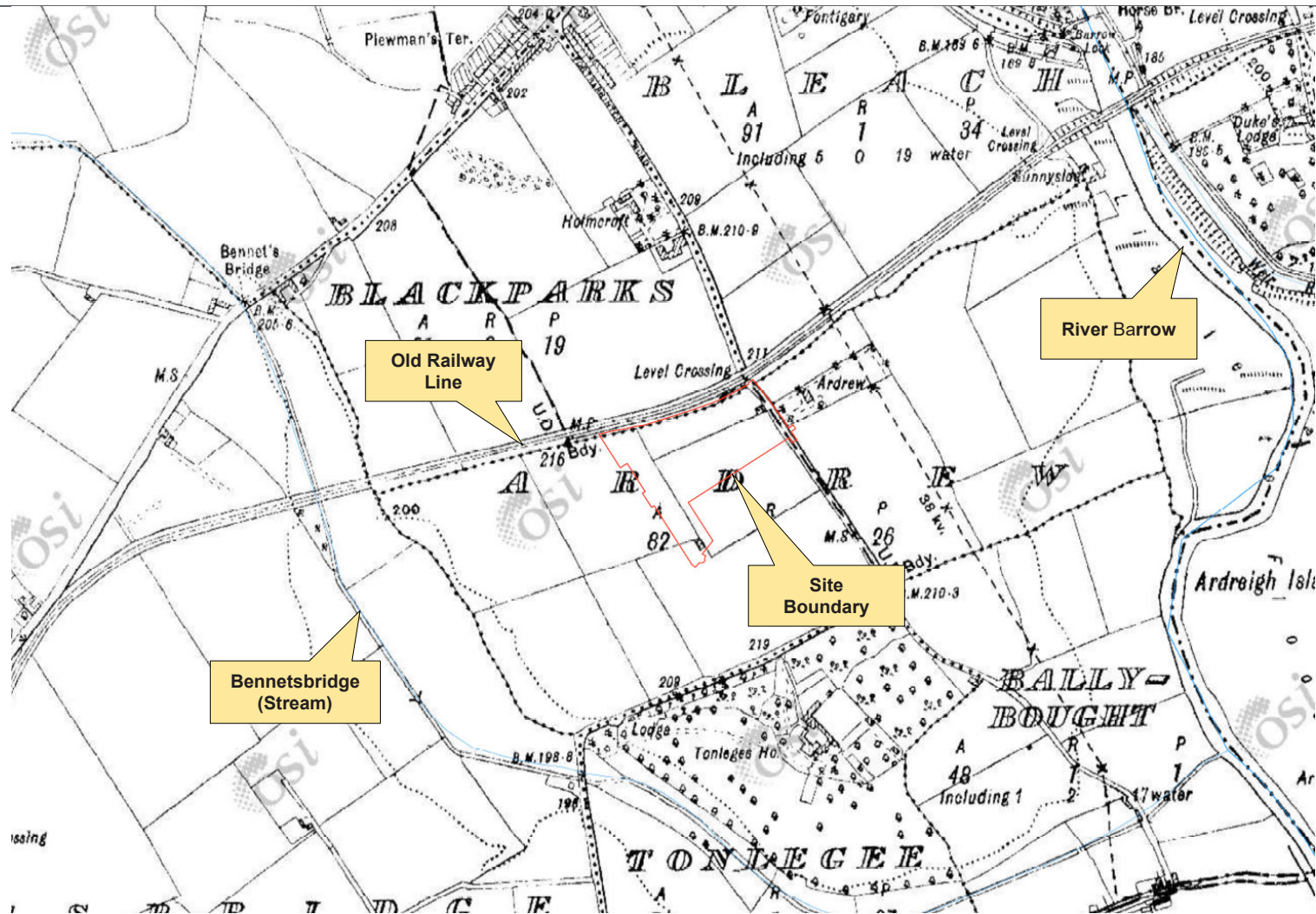


Figure 3.5 OSI 6" Cassini Mapping with site boundary in red outline



KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT



Figure 3.6 Existing Watermain, Foul & Surface Water Network

KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT

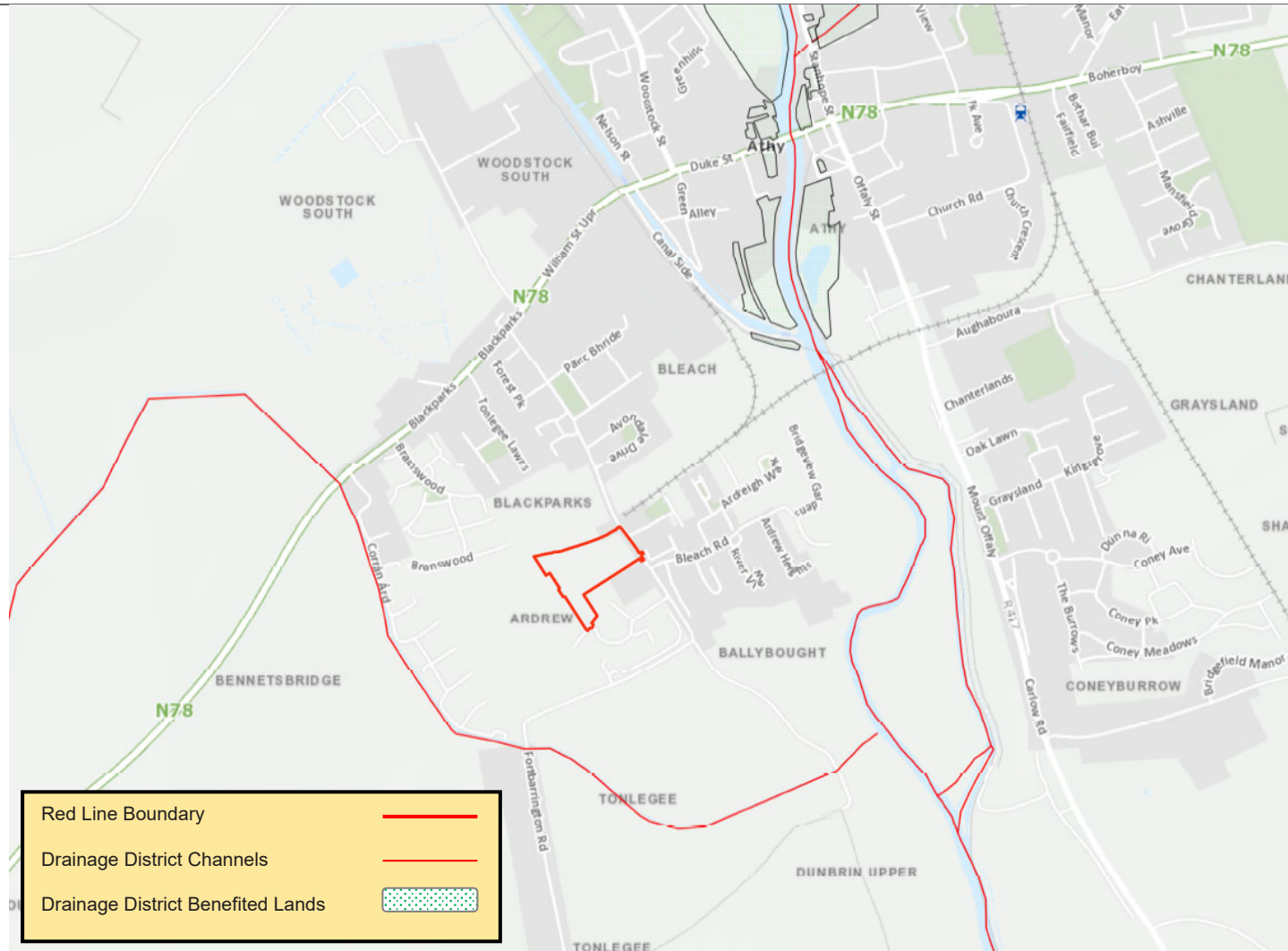
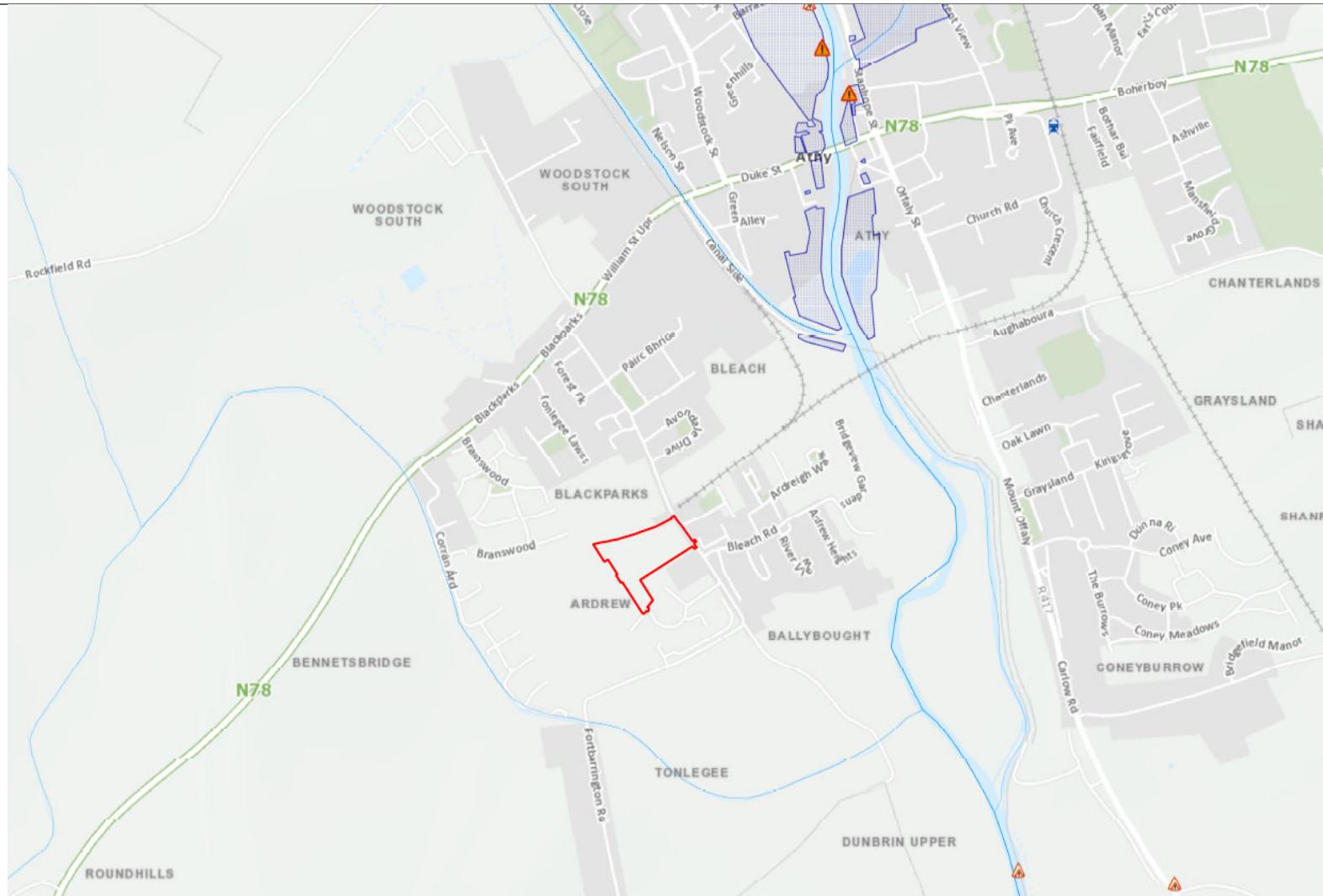


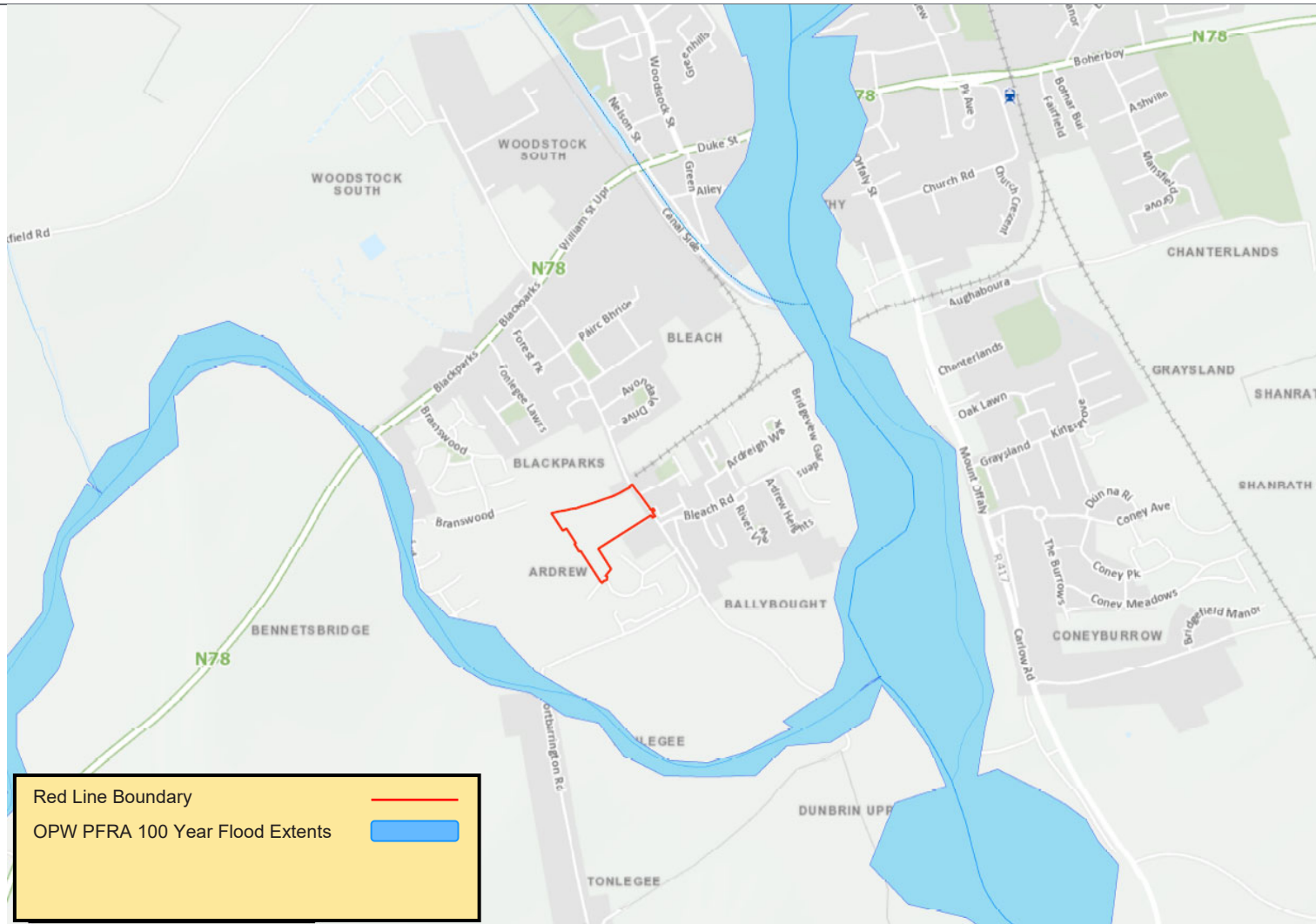
Figure 3.7 Arterial Drainage / Drainage District & Benefited Lands

**KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT**



**Figure 3.8 OPW Historical Flood Events**

**KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT**



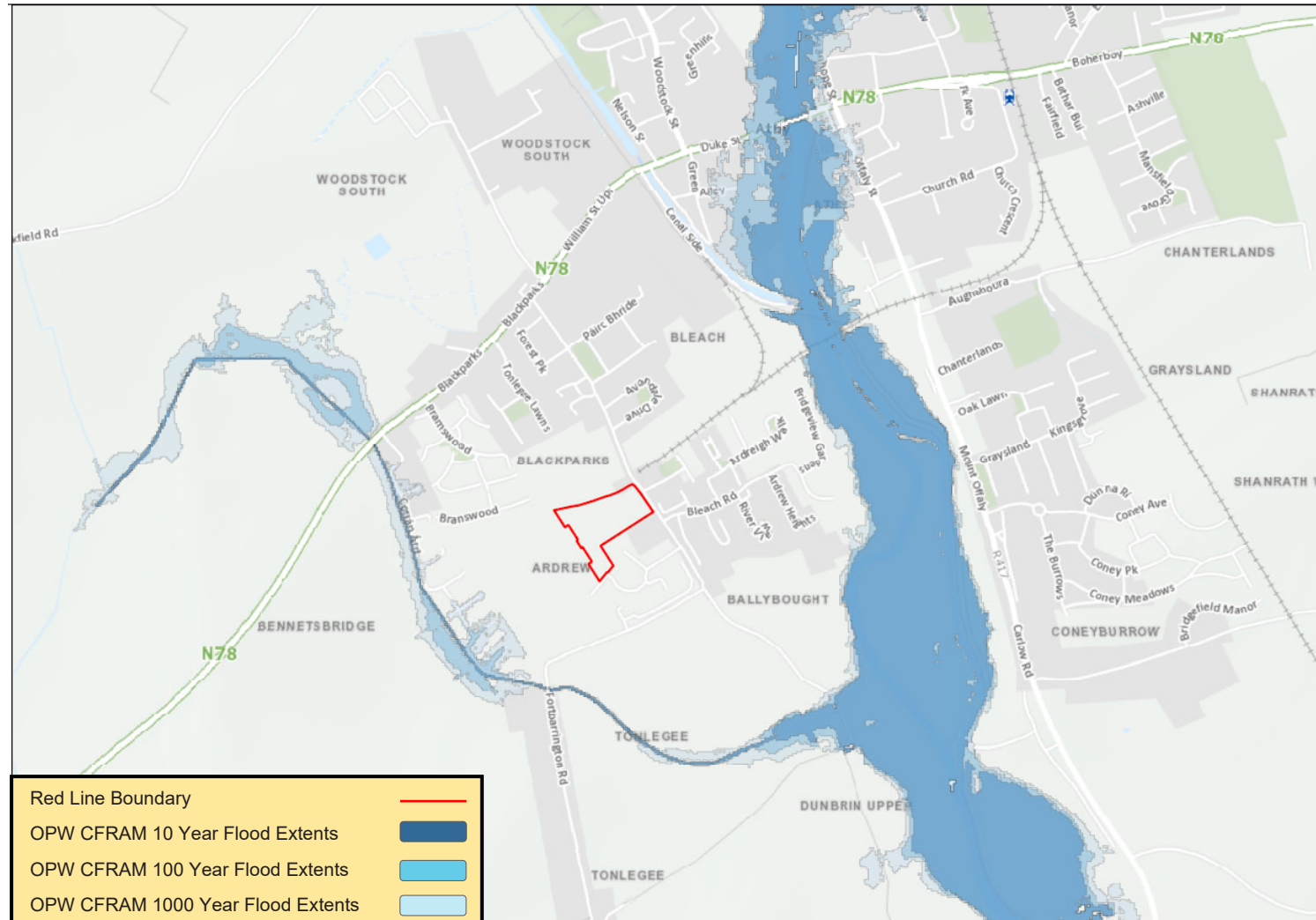
**Figure 3.9 OPW PFRA 100-Year Flood Extents**

**KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT**



**Figure 3.10 OPW CFRAM Flood Extents (Current Scenario)**

**KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT**



**Figure 3.11 OPW CFRAM Flood Extents (MRFs)**

KEERAUN SOCIAL HOUSING STAGE 1 FLOOD RISK ASSESSMENT

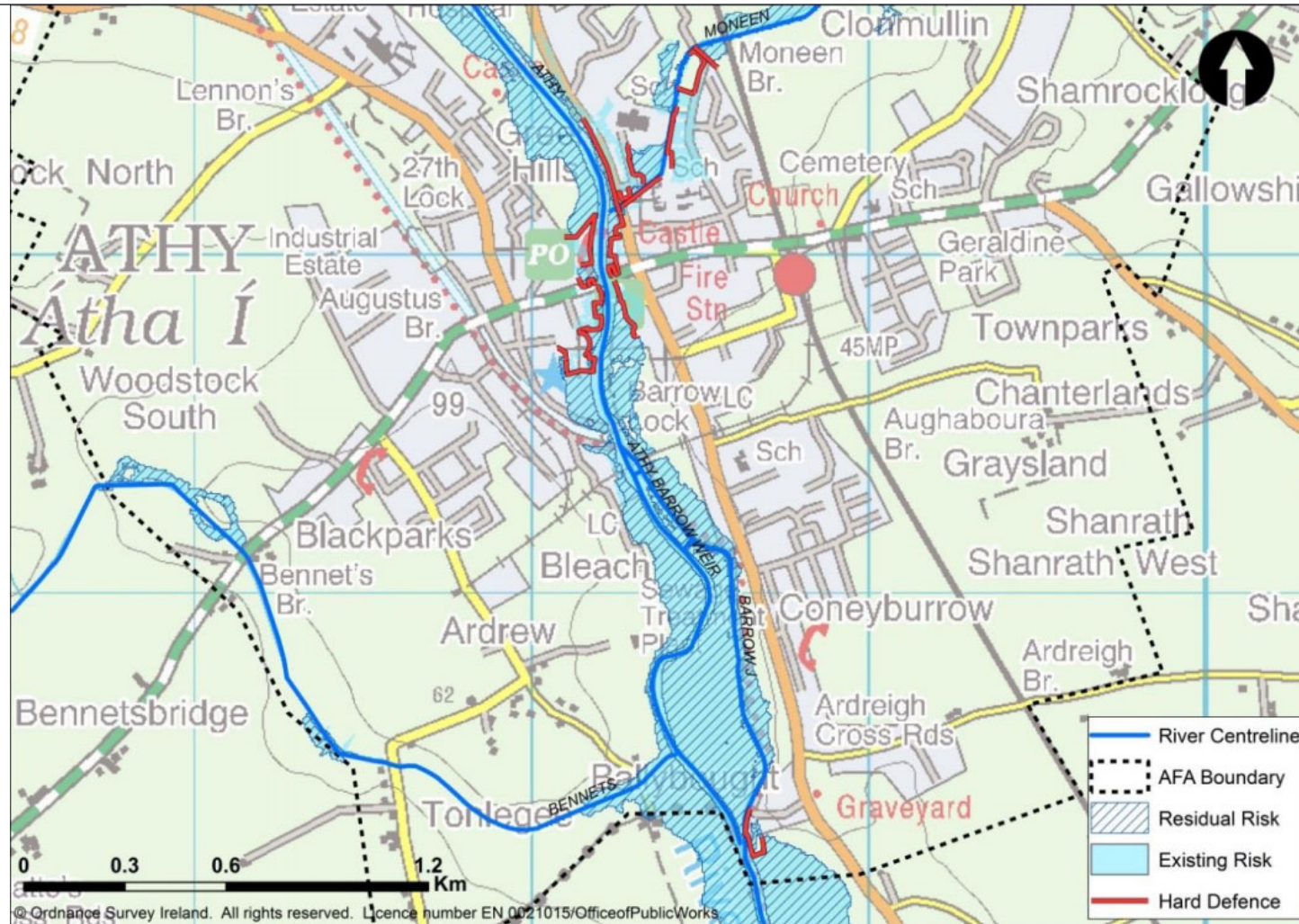


Figure 3.12 Proposed flood defence measures outlined in the Flood Risk Management Plan for the Barrow River Basin (UOM14) (OPW, 2018)