Cork County Council

Glashaboy (Glanmire/Sallybrook) Flood Relief Scheme

Constraints Report

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Glossary

ACA	Architectural Conservation Area
BCT	Bat Conservation Trust
CHS	Cultural Heritage Site
cSAC	candidate Special Area of Conservation
DAHG	Department of Arts, Heritage and the Gaeltacht
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
FRS	Flood Relief Scheme
GSI	Geological Survey of Ireland
Ha	Hectare
IFI	Inland Fisheries Ireland
IPPC	Integrated Pollution Prevention Control
LAP	Local Area Plan
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NMS	National Monuments Service
NPWS	National Parks and Wildlife Service
OD	Ordnance Datum
OPW	Office of Public Works
pNHA	Proposed Natural Heritage Area
PID	Public Information Day
RMP	Record of Monuments and Places
RPS	Record of Protected Structures
SAC	Special Area of Conservation
SMR	Sites and Monuments Record
SPA	Special Protection Area
WFD	Water Framework Directive
WMU	Water Management Unit

Executive Summary

This report presents the environmental constraints relating to the Glashaboy (Glanmire / Sallybrook) Flood Relief Scheme. Environmental issues that could either be affected by possible flood alleviation measures, or issues that could constrain the viability or design of these measures are described.

Constraints have been documented under the following headings:

- Human Beings
- Ecology
- Water
- Soils and Geology
- Archaeology, Architectural and Cultural Heritage
- Landscape
- Noise, Air Quality and Climate
- Material Assets

Under each heading, the methodology is described, followed by a description of the Study Area, or 'receiving environment'. Finally the key constraints and implications for the proposed scheme are summarised.

In addition to the specialist desk and field studies, an open information day was held to present the Study Area to the public and invite feedback regarding the proposed scheme. Submissions were also invited from statutory bodies, relevant organisations, and political representatives. Information gathered during this consultation process has been included in this report.

This report is one stage in the environmental assessment process, which continues through the planning and design of the project. Information gathered or alternatives suggested arising from the public information days, meetings with stakeholders and written representations is being considered with regard to engineering, environmental, community and economic issues.

Summary of Key Constraints

Human Beings

In designing the proposed scheme, the value (both cultural and economic) of any buildings close to watercourses, or likely to be adversely affected by the scheme, should be taken into account. In addition, adverse impacts on buildings or structures of conservation interest should be avoided, or minimised where possible. There is a significant number of buildings in the immediate vicinity of the watercourses which could be affected by flood relief works.

Existing bridges are important for vehicular and pedestrian traffic, and any disruption to their use should be minimised.

Impacts on public amenity areas adjacent to the river including riverside walks and parks and playgrounds should be considered. Specialist amenity areas such as sports grounds should also be given consideration.

Properties and businesses currently accessed by culverted sections or bridges over the Glashaboy River and its tributories will need to have access maintained/re-established, if works in these areas are proposed.

Impacts on especially sensitive receptors e.g. schools, crèches, nursing homes and hospitals should be considered in the flood risk assessment.

The proposed scheme should take consideration of the proposed zoning objectives and relevant specific objectives set out in the *Cork County Development Plan 2009*, the *Blarney Electoral Area Local Area Plan 2011* and the *Midleton Electoral Area Local Area Plan 2011*, and any future changes, future development, or changes in landuse in the Study Area.

Ecology

The works should include measures to avoid any damage or disturbance to designated nature conservation sites protected under the EU Habitats Directive i.e. the mouth of the Glashaboy River and Cork Harbour include two statutorily designated nature conservation sites, Cork Harbour Special Protection Area and Great Island Channel Special Area of Conservation, which are of international importance to wintering waders and wildfowl.

The works should also include measures to protect the sheltered tidal sand and mudflats and Atlantic salt meadows habitats which are protected under the EU Habitats Directive.

The scheme design should take consideration of appropriate measures to be put into place to ensure minimal disturbance to the woodland and saltmarshes of the designated Glanmire Wood proposed Natural Heritage Area, and also to ensure there are no adverse impacts on the intertidal habitats or the bird species of the designated Dunkettle Shore proposed Natural Heritage Area.

Any works should avoid or mitigate for any negative impact upon protected species in the Study Area, which are protected under the Wildlife Acts and European Law, as well as any protected species that are subsequently recorded during the field study to be undertaken in later phases of the project.

Evidence of Otter was recorded during the site survey, with footprints and possible spraints recorded at a number of bridges. The surrounding woodland also provides extensive potential habitat for resting places/holt locations. Once the exact nature and scale of the works is determined, the areas to be affected should be surveyed to determine the level of Otter activity and if any resting places/holts are present.

The mature trees and bridges along the river provide potential roosting opportunities for bats, with the valley providing good foraging and commuting routes. Once the exact nature and scale of the works is determined, the areas to be affected should be re-surveyed to identify any features with medium or high potential for roosting bats, and activity surveys conducted if necessary.

Suitable habitat for nesting birds such as Dipper and Grey Wagtail, are present in the cracks and crevices of the river walls and bridges. Any works, including vegetation clearance, and any works to existing walls and bridges, should be conducted outside of the breeding bird season (March to September inclusive, if possible), to protect nests that may be present. If this is not possible, works areas should first be searched by an experienced ecologist for the presence of nests. If found, the nests should be safeguarded until the chicks have fledged. A possible ecological opportunity, as part of these works, will be to include Dipper/Grey Wagtail nesting boxes in any new walls constructed.

The Glashaboy River supports salmonid populations, and any in-channel works could have an adverse impact, either directly through damage to in-channel habitats or indirectly through impacting upon water quality. The scheme design should include timing constraints for any in-channel works, to avoid the salmonid spawning season (usually from October to June, inclusive), and appropriate measures to prevent pollution incidents and silt mobilisation should also be applied.

Any proposed works should include mitigation measures so as not to result in the spread of Japanese Knotweed.

Water

The design should take into consideration the impact that any proposed flood relief scheme will have on the yields of existing groundwater abstractions from groundwater bodies in the Study Area, and take into account the vulnerability rating of the local aquifer.

The design should take into consideration the locations of abstractions from the Glashaboy and Butlerstown Rivers for drinking water supplies and ensure that that drinking water supplies are not affected by any flood relief measures.

The scheme design should take into consideration sensitive and protected areas identified in Appendix 3.1 of the South Western District River Basin Plan, including the protected ‘Drinking Water Protected Area – Groundwater’ bodies Cork City 2 and Cork City 3 to ensure that the quantity and quality of these drinking water sources are not affected.

The scheme design should take into account the main objectives of the Water Framework Directive South West River Basin District Management Plan by ensuring that any works proposed do not result in the deterioration of water quality.

The scheme design should ensure that any works proposed do not result in the deterioration of water quality in Lough Mahon Estuary.

Soils and Geology

It is recommended that a geotechnical investigation be carried out once the potential flood alleviation measures are developed in order to identify local geology and ground conditions.

Archaeology, Architectural and Cultural Heritage

Key constraints comprise sites in the Study Area which are included in the National Monuments Record of Monuments and Places (RMP), and structures which are included in the County Development Plan 2009 List of Protected Structures (RPS). These include bridges, sites and structures adjacent to the river banks in the Study Area, in particular the following sites:

Adjacent to the Glashaboy River:

- Corn Mill at Ballinglanna (RMP CO075-002001)
- Bridge at Ballinglanna, Glanmire (RMP CO075-048---, and RPS 00483)
- Mill – cloth at Poulacurry South (RMP CO075-001---)
- Bridge at Riverstown (RMP CO064-111----, and RPS 00394)
- Mill-cloth at Riverstown (RMP CO063-094----)
- Mill- paper at Riverstown (RMP CO063-069----)

Adjacent to the Butlerstown River:

- Distillery at Ballilnglanna (RMP CO075-003----)
- Lime Kiln at Riverstown (RMP CO064-142-----)

The scheme design should take into consideration that all sites of archaeological, architectural and cultural heritage interest should be avoided, if possible.

Sections of the Glashaboy, Butlerstown and Glenmore Rivers are the subject of this study and, as rivers, are considered to be Areas of Archaeological Potential and key constraints. It is likely that the rivers have been impacted in localised areas in the past when they were used as a power source for various mills and industrial activities. It is recommended that any proposed works to the rivers should be archaeologically assessed in advance of works taking place.

Landscape

The scheme design should give consideration to avoid any opening up of the riparian wooded areas along the river corridors.

Consideration should be given to protecting and retaining the amenity areas of the Study Area.

The scheme design should protect and retain large structures such as Dunkathel House and historic infrastructure such as the bridge at Riverstown.

Noise, Vibration, Air Quality and Climate

The scheme design should take into account any noise/vibration sensitive receptors such as schools and retirement homes located in proximity to works associated with the flood relief scheme.

Material Assets

It is recommended that the existing and proposed location of watermains and other underground services in the vicinity of any proposed flood relief scheme be ascertained as part of the engineering study. It is recommended that Cork County Council and other utility providers with services in the Study Area be consulted regarding the location and priority of existing and proposed services. It is further recommended that the services be protected as part of any proposed flood relief scheme.

It is recommended that the locations of abstractions from the Glashaboy and Butlerstown Rivers for drinking water supplies be ascertained as part of the engineering study and that drinking water supplies should not be affected by any flood relief measures.

It is recommended that Cork County Council and the National Roads Authority be consulted in relation to any effects on the existing and proposed roads infrastructure in the Study Area from any proposed flood relief scheme.

It is recommended that the requirements of the *Cork County Council Development Plan 2009* be observed in relation to waste management assessments.

1 Introduction

1.1 Overview of Scheme

Cork County Council in association with the Office of Public Works intends to develop a Flood Relief Scheme for the Glanmire and Sallybrook Areas. This project follows on from the Lee Catchment Flood Risk Assessment and Management (CFRAM) Study and the major flood event of June 2012.

The purpose of the Glashaboy Flood Relief Scheme is to assess and develop a viable, cost effective and sustainable Flood Relief Scheme to alleviate flooding in Glanmire and Sallybrook.

This report presents the environmental constraints relating to the Glashaboy (Glanmire / Sallybrook) Flood Relief Scheme. Environmental issues that could either be affected by possible flood alleviation measures, or issues that could constrain the viability or design of these measures are described.

1.2 Study Area

The Study Area consists of the channel, floodplain and immediately surrounding area of the Glashaboy River, and its tributaries the Butlerstown, Glenmore Rivers and the Ballycaskin, Templemichael, South Ballinvinny, Barnetstown, Killeena, and Lisheenroe, Cloghnagashee and Black Brook).The main population centres in the Study Area are the suburban town of Glanmire / Sallybrook, and the villages of Watergrasshill, Knockraha and Carrignavar. The Study Area is indicated on the public consultation leaflet which is provided in **Appendix D3** of this report.

1.3 Stage of Process

The constraints study is the first stage in the assessment of the environmental impacts of the Glashaboy (Glanmire / Sallybrook) Flood Relief Scheme (FRS). The project will be delivered in the following stages.

Table 1.1 Project Delivery Stages

Environmental Impact Assessment			**Engineering Study**
Stage I	Part 1	Constraints Study (this stage)	Hydrology Study and Hydraulic Modelling Site Investigations Flood Risk Assessments Flood Risk Management Options Cost Benefit Analysis Selection of Preferred Option Flood Risk Management Plan Interference Notices Public Exhibition
	Part 2	Screening for Appropriate Assessment	
Stage II	Part 1	Environmental Assessment of Viable Options	
	Part 2	Natura Impact Statement (if required)	
Stage III	Environmental Impact Statement		
Stage IV	Public Exhibition		

1.4 Scope of Assessment

Information has been gathered with due regard to the likely environmental impacts of the proposed scheme, and the statutory requirements for EIA as set out in EU Directives and associated Irish legislation.

1.5 Consultation

The public's views of the proposals are being invited at a number of stages through the design and planning process. Observations received are being considered, and provision is being made to amend the scheme to reflect the public's submissions or statutory processes.

Consultation has taken place with statutory and non-statutory consultees as part of the initial scoping process. Comments and information were sought from consultees. The list of consultees is included in **Appendix D1** to this report, together with a copy of the letter and attachments issued to consultees. Copies of any written correspondence received are also provided in **Appendix D6**.

2 Scheme Context and Background

2.1 History of Flooding

There is a history of flooding in the Glashaboy River catchment. The most recent significant flood event was June 2012 which occurred following extremely heavy rainfall. Flood events are summarised in the following Table 2.1.

Table 2.1 Most Recent Flood Events in the Glashaboy River Catchment

Flood Event	Mechanism
June 2012	Fluvial
November 2009	Fluvial
October 2004	Tidal
November 2000	Fluvial
1968/1969	Fluvial
1961	Tidal

2.2 Future Changes

The risk of flooding may increase with time. Future changes which have the potential to affect the risk of flooding include:

- Climate change resulting in higher rainfall and higher tide levels.
- Geomorphological processes, such as sedimentation transport, which affects the area of conveyance of the river channel, and erosion.
- Development within the catchment of the Glashaboy River and its tributaries, which does not conform with the principles of sustainable drainage, and which adversely affect the response of the catchment to rainfall.
- Changes in land use, including forestation and land drainage.

2.3 Potential Flood Risk Management Measures

An engineering study is being carried out in parallel with the environmental assessment of the Flood Relief Scheme. The constraints identified in this report will inform the selection of the flood relief measures as part of the engineering study.

The range of engineering measures typically considered for flood alleviation schemes in an engineering study include, but are not limited to the following:

- Do nothing (i.e. implement no new flood alleviation measures).
- Non-structural measures (e.g. flood warning system or individual property protection).
- Relocation of properties and/or infrastructure.
- Reconstruction of properties and/or infrastructure to a higher level.
- Flow diversion (e.g. river diversion or flood flow bypass channel).
- Flow reduction (e.g. upstream catchment management or flood storage).

- Flood containment through construction of flood defences.
- Increase conveyance of channel (upstream and/or through and/or downstream of the town).
- Sediment deposition and possible sediment traps.
- Pump storm waters from behind flood defences.
- Measures specific to the study location.

It is not possible, at this stage, to define the number of scheme options that will require study, although a typical engineering study of this nature will identify between three and five viable options.

2.4 Topography and Mapping

The Study Area lies mainly in the catchment of the Glashaboy River and comprises mainly river valleys, open farmland, wooded areas and riparian woodland.

The settlement of Glanmire/Sallybrook is located in the steep-sided wooded valley of the Glashaboy River. The Glashaboy River is a significant feature in the Study Area.

To the east, Glanmire is partially bounded by the N8, National Road.

The following map sources were used in order to carry out this Constraints Report:

- Ordnance Survey 1:50,000 scale Discovery Series mapping is the main background mapping used in the preparation of the drawings provided with this report.

3 Environmental Constraints

3.1 Introduction

This section of the report describes the key environmental issues relating to the Glashaboy FRS Study Area which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the viability and/or design of these measures.

3.2 Methodology and Guidelines

The Constraints Study is the first stage in the Environmental Impact Assessment for the Glashaboy River FRS. The study is being carried out in accordance with the Environmental Protection Agency (EPA) guidelines *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements, 2003.*

Information has been gathered under the relevant headings in the EPA Guidelines.

Constraints have been documented under the following headings:

- Human Beings
- Ecology
- Water
- Soils and Geology
- Archaeology, Architectural and Cultural Heritage
- Landscape
- Noise, Air Quality and Climate
- Material Assets

Under each heading, the methodology is described, followed by a description of the Study Area, or 'receiving environment'. Finally the key constraints and implications for the proposed scheme are summarised.

Arup, has employed archaeological, ecological, and landscape specialists to carry out studies under the following headings.

Table 3.1 Environmental Specialists

Study	Specialist
Archaeology, Architectural and Cultural Heritage	Lane Purcell Archaeology
Ecology	JBA Consulting
Landscape and Visual	Brady Shipman Martin

3.3 Human Beings

This section sets out the socio-economic features of the Study Area that may impact on the selection of flood alleviation measures for the proposed scheme,

and relates to the main settlement areas near which any flood relief measures are mainly likely to be undertaken.

3.3.1 Methodology

The following source of information were used in the preparation of this section:

- Cork County Council *Cork County Development Plan 2009 2nd Edition*
- Cork City and County Councils *Cork Area Strategic Plan 2001-2020*
- Cork County Council *Blarney Electoral Area Local Area Plan 2011*
- Cork County Council *Midleton Electoral Area Local Area Plan 2011*
- Indecon, RPOS and Savills HOK (2008) *The Cork Area Strategic Plan – Strategy for Additional Economic and Population Growth – An Update*
- South West Regional Authority *Regional Planning Guidelines 2010-2022,* Censuses of Ireland 2006 and 2011
- Central Statistics Office *Quarterly National Household Survey Quarter 3 2013* (www.cso.ie)

3.3.2 Settlement and Planning Policy

Settlements, and planning policy are detailed under the following headings.

3.3.2.1 Cork County Development Plan 2009 2nd Edition

The main settlement within the Study Area is Glanmire, with smaller settlements at Riverstown, Sallybrook, Knockraha, Watergrasshill and Carrignavar. The Cork County Development Plan 2009 2nd Edition sets out the County strategy in relation to four 'Strategic Sub-areas. These sub-areas include the County 'Metropolitan Strategic Planning Area' in which Glanmire is located.

The objectives of the County Development Plan 2009 seek to prioritise the sustainable development of the main towns, including Glanmire, and to increase their capacity to attract new investment in employment, services and public transport. (SET 1-1 Chapter 3 CDP 2009).

Development Plan Objective SET 2-10 which relates to Glanmire is "*to seek co-ordinated residential development on lands that are within the development boundary"*, in line with the proposals set out in the Blarney Electoral Area Local Area Plan.

3.3.2.2 Local Area Plans

Local Area Plans set out land use zonings and other specific objectives for lands within the Electoral Areas.

The western portion of the Study Area, which includes the settlement of Glanmire, is located within the boundary of the *Blarney Electoral Area Local Area Plan 2011.*

The eastern portion of the Study Area is located with the boundary of the *Midleton Electoral Area Local Area Plan 2011.*

Blarney Electoral Area Local Area Plan 2011

Glanmire is defined in Blarney Electoral Area LAP as a main town in Metropolitan Cork. The vision for Glanmire 2020, as outlined in the LAP is:

> "*to achieve moderate population growth in tandem with incremental retail growth, high quality social and community facilities and improved transport linkages while protecting its attractive woodland setting within Metropolitan Cork.".*

Section 2.2.29 of the Blarney Electoral Area LAP states that

"*An expanded town centre designation has been provided in Glanmire in an attempt to consolidate retail uses in the area. This new designation will extend from the existing Hazelwood Shopping Centre towards Riverstown."*

LAP Zoning for Glanmire

The following LAP zoned areas in Glanmire are indicated on the Blarney LAP Zoning Map:

- *'Open Space/Sports'*
- *'Residential'*
- *'Town/Centre/Neighbourhood Centre'*
- *'Community/Utility'*
- *'Industry'*
- *'Area Susceptible to Flooding - Zone A' and*
- *'Area Susceptible to Flooding – Zone B'*
- *X-01 Special Policy Area*

Blarney LAP Objectives and Policies for Glanmire

The Blarney LAP includes a number of general objectives relating to the Glanmire area, and also objectives relating to residential, industrial, town centre and community facilities, development. In addition objectives relating to open space, agriculture and utilities are outlined.

Objectives of the LAP include, but are not limited to, the following:

Objective DB-01 – *"..to secure the development of a minimum 1889 new dwellings in Glanmire between 2010 and 2020 in order to facilitate the sustainable growth of the town's population from 8,385 to 10, 788."* The LAP states that with regard to residential development, much of the residentially zoned land was clustered at Dunkettle and Ballinglanna and that a number of sites remain undeveloped to the north of the town. These sites continue to "*represent suitable locations for the continued growth of the town".*

Objective DB-06 – *"All proposals for development with the areas identified as being at risk of flooding will need to comply with Objectives FD1-1 to FD 1-6 detailed in Section 1 of this Plan…".* (Objectives FD1-1 – FD 1-6 relate to 'Flood Risk – Overall Approach', page 8 of the Plan)

Two sites zoned 'Industry' are located in the northern portion of Glanmire. Objectives for these sites are as follows:

Objective I-01 – "*Industrial estate development suitable for small to medium sized industrial units… (approx. 12.3Ha)"* and

Objective I-02 – "*(a) Industrial estate development suitable for small to medium sized industrial units (4.6 Ha). (b) Parts of this site are at risk of flooding….".*

With regard to Glanmire town centre development, the Hazelwood centre is identified in the LAP as the focal point for retail provision in the Town. Specific town centre zoning objectives are as follows:

Objective T-01 – "(a) *It is an objective to consolidate the Hazelwood Shopping Centre and provide connectivity, both pedestrian and cycling, to the new Riverstown Town centre and town park. Particular attention to be given to public realm enhancements…."*

Objective T-02 – *"(a) It is and objective to facilitate the expansion of Glanmire Town centre by encouraging retail and office development …"(c) parts of this site are at risk of flooding…."*

With regard to development zone C-01 indicated on the Zoning Map for community facilities, the specific zoning objective is:

Objective C-01 - "*(a) Provision for community facilities and uses to support residential amenity and associated uses, with appropriate linkages to the Hazelwood Shopping centre. (b) "Parts of this site are at risk of flooding….".*

With regard to open space, the LAP states that parts of a number of open space sites are affected by flooding. Specific open space/agriculture zoning objectives include:

Objective O-01 – *"This prominent slope makes a significant contribution to the setting of Riverstown. There is a presumption against development on these lands because of the importance of the hillside to the setting of the area"(41.8 ha).*

Objective O-02 – *"(a) Open Space, to include the provision of playing pitches and amentity walk (4.5 Ha). (b) Parts of this site are at risk of flooding….(4.5 ha)."*

Objective O-03 – *"Open space with provision for amenity walk and protection of existing playing fields (10.7ha)".*

Objective O-04 – *"Open space for informal recreation including the provision of an amenity walk. This space contains the Town Park, an important community amenity (16.3ha)".*

Objective O-05 – *"(a) Riverstown House estate demesne garden, cottages and ornamental lake (3.6ha). (b) Parts of this site are at risk of flooding…."*

Objective O-06- *(a) This site contains a substantial sporting facility (2.8ha). (b) Parts of this site are at risk of flooding…."*

Objective O-07 – *Passive open space. This important hillside makes a significant contribution to the rural character of Glanmire and is a visually attractive entrance to the City. The entire area is sensitive due to its proximity to Glanmire Wood and Dunkettle Shore, which are both proposed Natural Heritage Areas. The existing land uses will remain unchanged and there is presumption against development."*

Specific utilities and infrastructure objectives for Glanmire include the following:

Objective U-01- *"Complete and maintain pedestrian walk through scenic area and open space to Glanmire Community College.*

Objective U-02 – *"Develop and maintain pedestrian walk through existing open space and extend through proposed open space (O-04) along river bank".*

Objective U-03 – *"Develop and maintain pedestrian walk through residential areas"*

Objective U-04 – "*Develop Link Road"*

Special Policy Area X-01 - The LAP contains a number of objectives for the Special Policy Area X-01 (Dunkettle and Ballinglanna) (75.6ha) (page 49 of the LAP) indicated on the Zoning Map. The LAP states that development of the site will be subject to the agreement of a masterplan (Section 3.4.26 of LAP). The LAP also states that development on the site will provide approximately 1200 units.

Table 2.8 of the Blarney LAP '*Future Education Provision in the Blarney Electoral Area'* includes the following school requirements in the Study Area:

Blarney LAP Zoning for Carrignavar

The following LAP zoned areas in Carrignavar are indicated on the Blarney LAP Zoning Map for Carignavar:

- *Open Space/sports Recreation/Amenity*
- *Walkways*
- *'Area Susceptible to Flooding - Zone A' and*
- *'Area Susceptible to Flooding – Zone B'.*
- *X-01 Special Policy Area*

LAP Policies and Objectives for Carrignavar

The Blarney LAP includes a number of general objectives relating to the Carrignavar area, and also objectives relating to residential, industrial, town centre and community facilities, development. In addition, objectives relating to open space, agriculture and utilities are outlined.

Objectives of the LAP in relation to Carrignavar include, but are not limited to, the following:

Objective O-01 – *"Open Space".*

Objective O-02 – *"Open Space – protection of existing tennis/basketball courts, playground and adjoining lands overlooking riverside walk".*

Objective U-01 *"Maintain and extend pedestrian walk along river bank. …."*

Objective X-01- *"(a) Opportunity site – Medium density residential development (23.7ha) to include the provision of three playing pitches, community facilities, a creche and an extension to the school…. "*

The Blarney LAP's vision for Carrignavar to 2020 is to ensure that it:

"Fulfils its role as the primary focus for the development of the surrounding rural areas, to encourage consolidation of the settlement, to retain and improve local services and facilities and to strengthen infrastructure and public transport connections with the larger towns and villages in the Electoral Area".

Section 6.2.4 of the Blarney LAP states that there are outstanding permissions for 382 housing units, including a single permission for a 356 unit development to the northeast of the village core.

Midleton Electoral Area Local Area Plan 2011

The following LAP zoned areas in Knockraha are indicated on the Midleton LAP Zoning Map:

- *Community/Utility*
- *Open Space/Sports Recreation/Amenity*
- *'Area Susceptible to Flooding - Zone A' and*
- *'Area Susceptible to Flooding – Zone B'.*
- *Walkways.*

Midleton LAP Objectives and Policies for Knockraha

The Midleton LAP includes a number of general objectives relating to the Knockraha area, and also objectives relating to residential, industrial, town centre and community facilities, development. In addition objectives relating to open space, agriculture and utilities are outlined.

3.3.3 Population and Housing

3.3.3.1 Population

The *Blarney Electoral Area LAP 2011* states that the 2006 Census recorded a population of 8,385 people in Glanmire, an increase of 22% on 2002 Population levels (LAP 2011).

Population targets set out in the County Development Plan 2009 suggest a target population of 10,788 for Glanmire in 2020, an increase of 2,403 on the 2006 population (LAP 2011).

"It is envisaged that the future population growth to 2020 for the Town will be in the region of 2,403 people, this figure being derived from growth targets for the County and having regard to CASP update proposals. This gives rise to a need to provide an additional 2,241 dwelling units in the period 2006-2020." (Blarney LAP, Section 3.2.4.

3.3.3.2 Housing

The following Table 3.2 presents the Glanmire housing requirement for 2020, as presented in the Blarney LAP.

Table 3.2 Glanmire Housing Requirement 2020 (Blarney LAP 2011)

New House Construction Target 2006 to 2020	Already Built 2006-2010 plus units which are vacant and under construction	Outstanding Plannning Permissions	Additional New Development Required to 2020
2241	352	103	1786

Between 2001 and 2010, 1,365 new dwelling units were constructed in Glanmire (LAP 2011).

The Midleton Electoral Area Local Area Plan 2011 and the Blarney Electoral Area Local Area Plan 2011 provide an overview of the housing units for each settlement in the Plans. Information regarding housing in Knockraha is provided in Table 2.5 of the Midleton LAP. This table shows that the number of existing housing units in Knockraha in 2010 was 120, with a target growth (2010-2020) of 25. Table 2.5 of the Blarney LAP shows that the number of existing housing units in Carrignavar in 2010 was178, with target growth (2010-2020) of 100.

3.3.4 Industry and Business

According to the Blarney LAP 2011(page 43), "*there were three industrial sites zoned I the 2005 LAP, none of which are developed. There are further established industrial lands east of the N20."* The LAP also states that the Glanmire Business Park is partially developed and has potential for expansion.

Retail facilities are largely provided for by the Hazelwood neighbourhood centre and there is fragmented retail elsewhere (Blarney LAP 2011).

3.3.4.1 Integrated Pollution Prevention Control (IPPC) Licensed Facilities

Large scale industrial and agricultural activities are licensed by the Environmental Protection Agency (EPA) under the Integrated Pollution Prevention Control Directive and the Industrial Emissions Directive.

The EPA online mapping indicates that there the nearest IPPC licensed facility is True Temper (P0615-01) at Whites Cross.

3.3.5 Tourism

Tourism is a major contributor to the national economy and is a significant source of full time and seasonal employment. The Study Area is located in the South West Region. The the *South West Regional Planning Guidelines* 2010-2022 state that Cork is a prime location for regional tourism in Ireland, and that the South West Region, on an annual basis, generates 1.3 billion euro in tourism revenues and has in excess of 3.6 million visitors.

Fáilte Ireland's Annual Report 2012 states that in 2012, the tourism and hospitality industry employed an estimated 185,000 people in the State, and generated an estimated €5.4bn in revenue.

The Study Area includes a number of attractions for tourists, including recreation and amenity areas, a hotel, restaurants, public houses and retail outlets.

3.3.6 Community Facilities

3.3.6.1 Education

The Primary Schools in the Study Area are:

- Scoil na nÓg
- Scoil Naomh Micheál (St. Michael's, Upper Glanmire)
- Scoil Naomh Iosaf
- Scoil Chill Ruadháin (Brooklodge Primary School)
- New Inn
- Gaelscoil Uí Drisceoil
- Scoil an Athar Tadgh, Carrignavar
- Knockraha National National School

Post primary schools in the Study Area are:

- Glanmire Community College
- Coláiste an Phiarsaigh, Glanmire
- Sacred Heart College, Carrignavar

The Blarney LAP 2011 states that in relation to education, the revised population target of 10,788 for Glanmire (refer to above **Section 3.3.3**).

"*will give rise to a new requirement for approximately 11 additional classrooms at primary school level and 204 post-primary school places".*

The Blarney LAP also states that the

"*Department of Education and Skills has indicated that two new 16-classroom primary schools (1.6 ha each) are needed for Glanmire*". The Blarney LAP states that "*a site for one of these schools will be set aside as part of the X-01 masterplan preparation process and that the second school which will provide accommodation for an existing school which is in rented accommodation, should be provided at a suitable location in Glanmire".*

3.3.6.2 Recreation and Amenities

Glanmire's wooded and riparian areas provide recreational assets for the community. Glanmire also has a town park and playground and an estate demesne garden. Other settlement areas in the Study Area also include a number of sports facilities and river walkways.

3.3.7 Key Human Beings Constraints

The scheme design should take into account the value (both cultural and economic) of any buildings (residential, retail, etc.) close to the rivers' edges or likely to be adversely affected by the scheme.

Adverse impacts on buildings or structures of conservation interest should be minimised or avoided where possible. Refer to **Section 3.7** of this report.

Any design proposals should ensure that any bridges over watercourses are maintained where possible so that temporary or permanent disruption on local transport links and access to homes and businesses in the Study Area are minimised.

Any design proposals should ensure that there is no impact on any stretches of river that are sources of drinking water supplies, for example reaches of the Butlerstown River, a tributary, and the Glashaboy River. Refer also to **Section 3.5.2.1** of this report.

The scheme design should ensure that the public amenity value of the Study Area is not diminished. Impacts on public amenity areas adjacent to the rivers such as riverside walks, parks and playgrounds should be considered, with replacement mitigation proposed if necessary.

Impacts on sensitive receptors e.g. schools and crèches should be considered.

The proposed scheme should take consideration of the zoning objectives, and relevant specific objectives set out in the *Cork County Development Plan 2009 2nd Edition*, the *Blarney Electoral Local Area Plan 2011* and the *Midleton Electoral Area Local Area Plan 2011*.

3.4 Ecology

This section assesses data on flora, fauna, habitats and fisheries within the Study Area in order to identify receptors potentially sensitive to flood risk management operations, or which may constrain the implementation of measures.

3.4.1 Methodology

3.4.1.1 Desk-based Assessment

A desk-based assessment was carried out to collate information regarding protected/notable species and statutorily designated nature conservation sites in, or within 2km of, the Study Area.

A data search for protected and notable species, including non-native invasive species, was conducted using the National Biodiversity Data Centre mapping

System (National Biodiversity Data Centre, 2014). Species records for the Study Area were extracted from the maps at a 2km grid scale.

Information for statutorily designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Ramsar Sites, Natural Heritage Areas (NHAs) and proposed NHAs in, and within 2km of, the Study Area was collected from the online resources provided by the National Parks and Wildlife Service (NPWS) (NPWS, 2014). These protected sites were then mapped.

A data request was also submitted to Inland Fisheries Ireland (IFI) with regards to fish populations and stocks. Other available sources of data were also reviewed, including the Lee Catchment-based Flood Risk Assessment and Management (CFRAM) study.

3.4.1.2 Ecological Walkover Survey

An ecological walkover survey was conducted on the 14th March 2014. The survey encompassed the length of the River Glashaboy from Knocknahorgan at the upstream end, to Dunkettle Bridge at the downstream end, where it discharges into Lough Mahon (part of Cork Harbour). The tributaries of Butlerstown River and Glenmore River were also assessed just upstream of where they discharge into the Glashaboy. The survey focussed on areas which had previously flooded, and therefore where flood risk management works are most likely to be conducted, along with intervening sections where accessible. Development and buildings along the banks of the river limited access to some areas.

Whilst on site the following surveys/assessments were conducted:

- Mapping of habitats present within and alongside the river in accordance with Fossitt's Guide to Habitats in Ireland (Fossitt, 2000) and Best Practice Guidance for Habitat Survey and Mapping (Smith *et al*, 2011). Within each general habitat type the dominant flora was recorded in order to determine general species composition and distribution. However, it should be noted that March is a sub-optimal period for conducting botanical surveys, with many species not yet evident, although it is still possible to record the dominant component species present.
- Recording of any bird species noted during the habitat survey and the presence of any potential nesting habitat (i.e. Kingfisher burrows, cracks in brickwork, woodland and scrub areas).
- Recording of any evidence of Otter, based on the standard works of the RSPB (1994) and Chanin (2003). This involved surveying the accessible stretches of river, examining banks and prominent features for spraints (droppings) and footprints. A search was also made for possible holt and couch (resting) sites. Otters are extremely difficult to observe, and this method provides the most effective and efficient means of investigating presence or absence.
- Recording of any evidence of Badger. The accessible stretches of river, and surrounding areas, were searched for signs of the presence of Badgers. In addition to the presence of active setts, the following signs of activity were also searched for: latrines, footprints, evidence of feeding activity and well-worn paths through vegetation. Badgers will use a number of setts throughout their territory at different times of year; any large holes with the potential to be

used by Badgers, but not showing obvious signs of recent activity, were therefore also recorded.

- Any features (e.g. bridges, culverts, mature trees) with suitability for roosting bats were also identified and mapped, as specified in the Bat Conservation Trust (BCT) Bat Surveys - Good Practice Guidelines (BCT, 2007). This includes looking for cracks, crevices, loose bark, holes and splits and for evidence indicating bat presence including dark stains running below holes or cracks, bat droppings, odours, or scratch marks
- Recording and mapping of any evidence of non-native invasive species, such as Japanese Knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum*, and Himalayan Balsam *Impatiens glandulifera*. However, it should be noted that March is a sub-optimal time for recording annual non-native invasive plant species, such as Himalayan Balsam, as growth may not be evident at this time of year.

3.4.2 Desk-based Assessment Results

Details of the locations of nature conservation sites are given in **Appendix B**. There are a variety of habitats found within the Study Area, including terrestrial, wetland, freshwater coastal and estuarine areas. These are increasingly under threat in the area from inappropriate land management practices and urban development (Halcrow, 2007).

Statutory Nature Conservation Sites

European Designated Sites

Two statutorily designated nature conservation sites are located in, or within 2km of, the Study Area:

- Cork Harbour SPA (Code 004030)
- Great Island Channel cSAC (within 2km to the east of the Study Area) (Code 001058).

Cork Harbour SPA is an internationally important wetland site. It consists of a large sheltered bay system containing several river estuaries, including that of the Glashaboy River which discharges into Lough Mahon on the River Lee. The site is designated an SPA for supporting an assemblage of more than 20,000 wintering waterbirds and 23 bird species of special conservation interest such as Great Crested Grebe *Podiceps cristatu*, Golden Plover *Pluvialis apricaria* and Black-tailed Godwit *Limosa lapponica*. The intertidal flats also sustain a range of macro-invertebrates and green algae species (NPWS, 2008). Cork Harbour is also designated as a Ramsar Site. The harbour is also home to several fish species which are harvested on a commercial and recreational basis, including crabs, prawns, mussels, herring and whitefish (Halcrow, 2007).

Great Island Channel cSAC is designated for its sheltered tidal sand and mudflats and Atlantic salt meadows, both of which are listed under Annex I of the EU Habitats Directive. The site is part of Cork Harbour, located immediately downstream of the Glashaboy River, and is internationally important for supporting birds including wintering waders and wildfowl. Approximately 50% of the wintering wildfowl found within Cork Harbour are supported on this site (Halcrow, 2010).The mudflats support a good invertebrate community, including

species such as the Baltic Macoma *Macoma balthica*, Peppery Furrow Shell *Scrobicularia plana* and the crustacean *Corophium volutator*. Flora found in the salt marshes include Sea Purslane *Halimione portulacoides*, Sea Aster *Aster tripolium,* Thrift *Armeria maritima*, Common Saltmarsh-grass *Puccinellia maritima* and Sea Plantain *Plantago maritime* (NPWS, 2001).

Natural Heritage Areas

There are no Natural Heritage Areas in, or within 2km of, the Study Area.

Four proposed (non-statutory) Natural Heritage Sites (pNHAs) are located in, or within 2km of, the Study Area:

- Glanmire Wood pNHA (Code 1054)
- Dunkettle Shore pNHA (Code 1082)
- Douglas River Estuary pNHA (Code 1046)
- Great Island Channel pNHA (Code 1058)

Glanmire Wood pNHA consists of mixed broad-leaved woodland with patches of saltmarsh fed by the tidal Glashaboy River below the wood. The wood itself is dominated by Oak *Quercus* spp., Beech *Fagus sylvatica* and Sycamore *Acer pseudoplatanus*, with a rich ground flora including the ancient woodland indicators Wood Fescue *Festuca altissima* and Wood Millet *Milium effusum*. This type of woodland is rare in East Cork and parts of it also fall within the Cork Harbour SPA (NPWS, 2009).

Dunkettle Shore pNHA is located north of the River Lee at Dunkettle and at the mouth of the River Glashaboy. This pHNA also forms part of Cork Harbour SPA.

Douglas River Estuary pNHA is located on the South Bank of the River Lee at the Mouth of the Douglas River, this is another stretch of pNHA which also forms part of the Cork Harbour SPA.

Great Island Channel pNHA is part of the Cork Bay complex, and is also designated as a SAC. It is located to the east of the Glashaboy River and is important for its intertidal habitats and bird populations.

Both the Dunkettle Shore pNHA and Douglas River Estuary pNHA are designated for the same wetland habitats and species that make the Cork Harbour SPA internationally important.

Protected and Notable Species

Table 3.3 lists the most recent records and locations of protected and notable species received from the National Biodiversity Data Centre at a 2km grid scale.

The following European Protected Species have been recorded within the Study Area:

- Otter
- Daubenton’s Bat
- Natterer’s Bat

- Myotis Bat species
- Lesser Noctule Bat
- Soprano Pipistrelle Bat
- Pipistrelle Bat
- Brown Long-eared Bat

The following EU Birds Directive Annex I species have been recorded within the Study Area:

- Common Kingfisher
- Little Egret
- Whooper Swan

The following Red list Birds of Conservation Concern (Birdwatch Ireland, 2013) have also been recorded in the Study Area:

- Northern Shoveler
- Yellow Hammer
- Eurasian Curlew
- Black Headed Gull
- Barn Owl

Table 3.3 European Protected and Notable Species

Species	Common Name	Locations (2km OS grid reference)	Year of Most Recent Record
Birds			
Alcedo atthis	Common Kingfisher	W77G	1991
Anas clypeata	Northern Shoveler	W77C	2001
Cygnus cygnus	Whooper Swan	W77C	2001
Egretta garzetta	Little Egret	W77G	2011
Emberiza citrinella	Yellowhammer	W77E, W77X, W78A, W78G, W78Q, W78R	1991
Larus ridibundus	Black-headed Gull	W77G	2010
Numenius arquata	Eurasian Curlew	W77C, W77G	2012
Tyto alba	Barn Owl	W77G	2012
Mammals			
Erinaceus europaeus	West European Hedgehog	W77G, W77H, W77J, W77L	2013
Lutra lutra	European Otter	W68N, W68P, W68L, W68V, W68W, W77E, W77G, W77H, W77S, W77U, W77Z, W78G, W78S, W78W	2011
Meles meles	Eurasian Badger	W67X, W68S , W68G, W68H, W68L , W68Q, W68R, W68V, W68W, W77D, W77E, W77I, W77J, W77P, W77Z, W78A,, W78F, W78K, W78L, W78Q	2012
Sciurus vulgaris	Eurasian Red Squirrel	W68R, W77D, W77E, W77G, W77H, W77I, W77M, W77N, W77S,	2012
Sorex minutus	Eurasian Pygmy Shrew	W77L	2013
Bats			
Myotis daubentonii	Dabenton's Bat	W68M, W68Q, W77E, W77H	2009
Myotis nattereri	Natterer's Bat	W77G	2005
Myotis spp.	Myotis Bat species	W68M, W68Q, W68R, W77E, W77H	2009
Nyctalus leisleri	Lesser Noctule Bat	W68H, W68R, W77E, W77G, W78B	2008
Pipistrellus pygmaeus	Soprano Pipistrelle	W68H, W68M, W68Q, W68R, W77E, W77G, W77H, W77U, W77Y, W78F, W78K, W78M	2008
Pipistrelle spp.	Pipistrelle Bat species	W68H, W68M, W68Q, W68R, W77E, W77G, W77H, W77U, W77W,W77Y, W78B, W78K, W78M, W78Q,	2008
Plecotus auritus	Brown Long-eared Bat	W68R, W77G	2007

Species	Common Name	Locations (2km OS grid reference)	Year of Most Recent Record
Reptiles			
Zootoca vivipara	Common Lizard	W77M	1975

Table 3.4 lists the non-native invasive species recorded in the Study Area at a 2km grid scale. These species are listed under the Third schedule of the European Communities Birds and Natural Habitats Regulations (2011), and are subject to regulations 49 and 50.

Table 3.4 Records for Non-native Invasive Species recorded in the Area

Species	Common Name	Locations (2km OS grid reference)	Year of Most recent record
Azolla filiculoides	Water Fern	W77L	1995
Elodea nuttallii	Nuttall's Waterweed	W68Q	2008
Fallopia japonica	Japanese Knotweed	W68Q, W77E, W77G, W77H, W77I, W77J	2008
Heracleum mantegazzianum	Giant Hogweed	W77G	1976

Liaison with Inland Fisheries Ireland (IFI) has identified that the Glashaboy is, in general, an excellent salmonid spawning area and nursery, which also supports angling (IFI, pers. comm.). It also contains Eel *Anguilla anguilla* and lamprey. O'Reilly (2004) also reports that the Glashaboy has an excellent run of Sea Trout *Salmo trutta trutta*.

3.4.3 Ecological Walkover Survey

The following sections detail the results of the ecological walkover survey conducted on 14 March 2014.

3.4.3.1 Habitats and Flora

The habitats recorded along the surveyed stretches of river are shown in the Figures below, followed by descriptions of the key habitat types found.

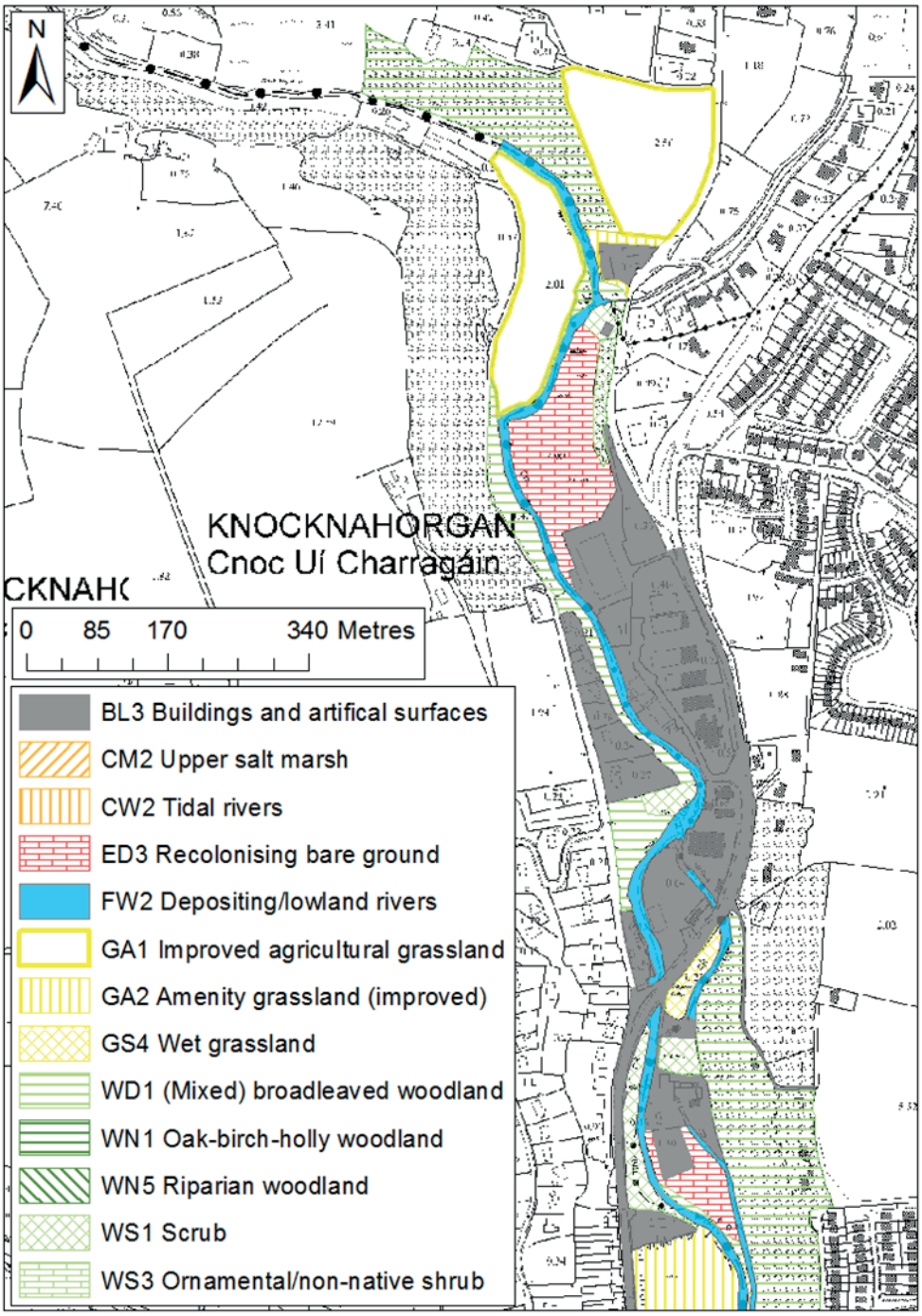

Figure 3.1 Habitats According to the Fossit Classification – Upstream Reach

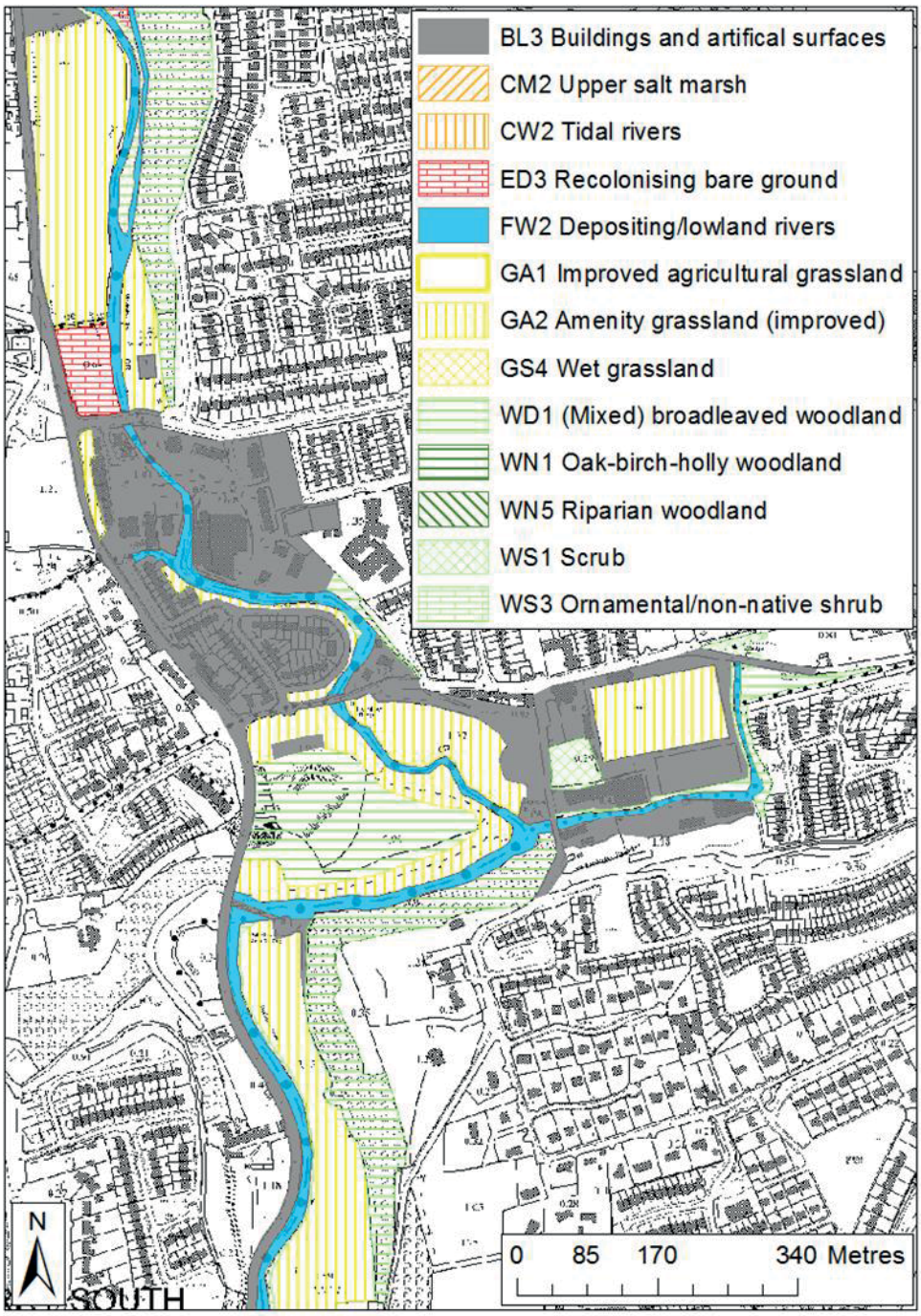

Figure 3.2 Habitats According to the Fossitt Classification – Midstream Reach

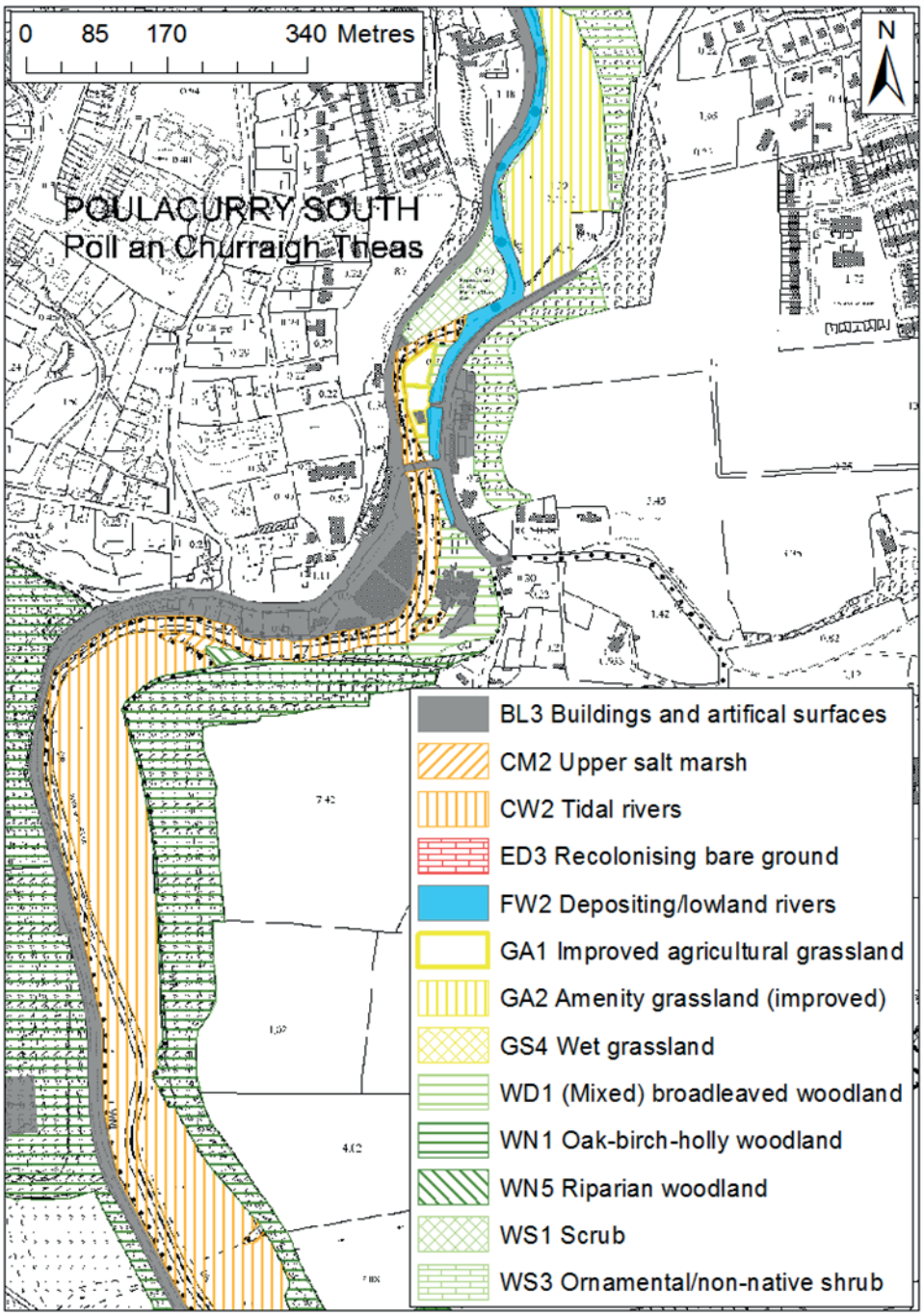

Figure 3.3 Habitats According to the Fossitt Classification - Downstream Reach

Glashaboy River

The Glashaboy River throughout the survey reach, with the exclusion of the estuarine areas at the downstream end, is relatively wide, shallow and fast-flowing with a cobbly and gravelly substrate. For much of the surveyed reach the river is constrained by walls and developments on one, or both of the banks. However, despite this high level of modification, the river banks throughout the survey reach are generally tree-lined with a narrow strip of riparian woodland consisting predominantly of Alder *Alnus glutinosa*, Sycamore *Acer pseudoplatanus*, Ash *Fraxinus excelsior* and Willow *Salix sp*. Due to the high energy fast-flowing conditions, the time of year at which the survey was conducted, the brackish influence at the downstream end, and the cobbly substrate, in-channel vegetation was very limited, with only occasional Hemlock Water-dropwort *Oenanthe crocata* and Water-crowfoot *Ranunculus sp.* noted.

Beneath the tree canopy, ground flora is relatively rich and consists of a range of species, including Polypody *Polypodium vulgare*, Ivy *Hedera helix*, Lords-and-Ladies *Arum maculatum*, Great Wood-rush *Luzula sylvatica* Wood Anemone *Anemone nemorosa*, Butterbur *Petasites hybridus* and Bramble *Rubus fruticosus agg*. In places there are also a number of ornamental species from gardens backing onto the river.

The river walls themselves, in many places, are also relatively maturely vegetated with a range of species including Wall Pennywort *Umbilicus rupestris*, Male Fern *Dryopteris filix-mas*, Ivy, Ivy-leaved Toadflax *Cymbalaria muralis*, Polypody and a rich bryophyte flora.


Photographs 1 & 2 The Glashaboy River

Intertidal Habitats

The downstream reaches of the Glashaboy River are tidal and contain mudflat areas, with very small patches of maritime grassland adjacent to walls in some places. On the right bank, above the main tidally influenced area, ruderal and scrub vegetation is present including *Buddleja davidii*, Sycamore seedlings, Bramble and Traveller's Joy *Clematis vitalba*, with False Oat-grass *Arrhenatherum elatius*, Lesser Celandine *Ranunculus ficaria*, Ivy, Butterbur and Polypody present in the ground flora.

Photograph 3 Intertidal Areas on the Glashaboy River

A number of bird species were observed on these intertidal habitats, including Curlew *Numenius arquata*, Black-headed Gull *Chroicocephalus ridibundus* and Herring Gull *Larus argentatus* and it is likely that these areas provide feeding and roosting areas for species reliant on the large Cork Bay complex at low tide.

Other Watercourses

Two main tributaries join with the Glashaboy in the Glanmire area, the Butlerstown River which joins the Glashaboy at the park in Glanmire and Glenmore River which connects to the Butlerstown River just downstream of Copperalley Bridge. Both tributaries are similar in character to the River Glashaboy, i.e. fast-flowing in nature with a cobbly substrate, with narrow strips of woodland lining the banks and a high level of development on surrounding land.

The Urban Environment

The survey reach throughout is heavily urbanised, with a range of residential, commercial and small industrial developments immediately adjacent to the river.

Between Riverstown Bridge and the weir at the Water Treatment Works is a parkland area which the river bounds on the eastern and southern boundaries. The central area of this park consists of a large rock outcrop covered with mixed broadleaved woodland. Surrounding areas consist of Perennial Rye-grass *Lolium perenne* dominated amenity grassland. A number of sports pitches and other amenity grassland areas are also present alongside the river.

Due to the urban nature of much of the surveyed reach, there are areas of formerly bare ground that are now colonising with a mix of ruderal and scrub species, such as Bramble and Common Nettle *Urtica dioica*. Disturbance was evident in a number of these places, such as in the area north of the Glanmire shopping park, on the right bank, where a number of informal bunds have been created. Japanese Knotweed was also prevalent here, and in other disturbed areas.

Semi-natural Broad-leaved Woodland

Photograph 4 Glanmire Wood pNHA

As discussed above, much of the river corridor is wooded, however, the highly modified banks of the river and urban location, and the presence of garden escapes, Japanese Knotweed and other ornamental species in these woodland strips has led to much of the woodland in the riparian zone being classified under the Fossitt categorisation as a heavily modified/woodland type (i.e. WD1 (mixed) broadleaved woodland).

However, at the downstream end of the river, on the slopes either side of the tidal reaches of the river, semi-natural woodland is present, which has been categorised as WN1 Oak-birch-holly woodland, with Oak and Birch frequent, and *Rhododendron ponticum* also relatively abundant. On the left bank this area is designated as the Glanmire Wood pNHA.

3.4.3.2 Birds

The following bird species were recorded during the field survey:

- Blackbird *Turdus merula*
- Black-headed Gull *Chroicocephalus ridibundus*
- Blue Tit *Cyanistes caeruleus*
- Cormorant *Phalacrocorax carbo*
- Curlew *Numenius arquata*
- Grey Heron *Ardea cinerea*
- Grey Wagtail *Motacilla cinerea*
- Herring Gull *Larus argentatus*
- Jackdaw *Corvus monedula*
- Magpie *Pica pica*
- Mallard *Anas platyrhynchos*
- Robin *Erithacus rubecula*

- Woodpigeon *Columba palumbus*

No natural banks, of a significant enough height for Kingfisher *Alcedo atthis* or Sand Martin *Riparia ripariato* to nest in were observed, although the desk-based assessment did return records of Kingfisher for the area.

The heavily modified sections of river, with large retaining walls, do contain a number of crevices, cracks and voids, which could be exploited by species such as Grey Wagtail or Dipper *Cinclus cinclus* for nesting.

Throughout the surveyed reach there is ample habitat available (i.e. woodland, scrub, gardens) for nesting, particularly for passerine species.

3.4.3.3 Otter

Evidence of Otter was recorded at a number of locations along the river, including at Glanmire Bridge and on the river behind the industrial park at Knocknahorgan (see Photos 5 and 6 below).

Photographs 5 & 6 Otter footprints at Glanmire Bridge

The woodland habitats adjacent to the river in many places provide extensive cover for Otter and potential resting places/holt sites.

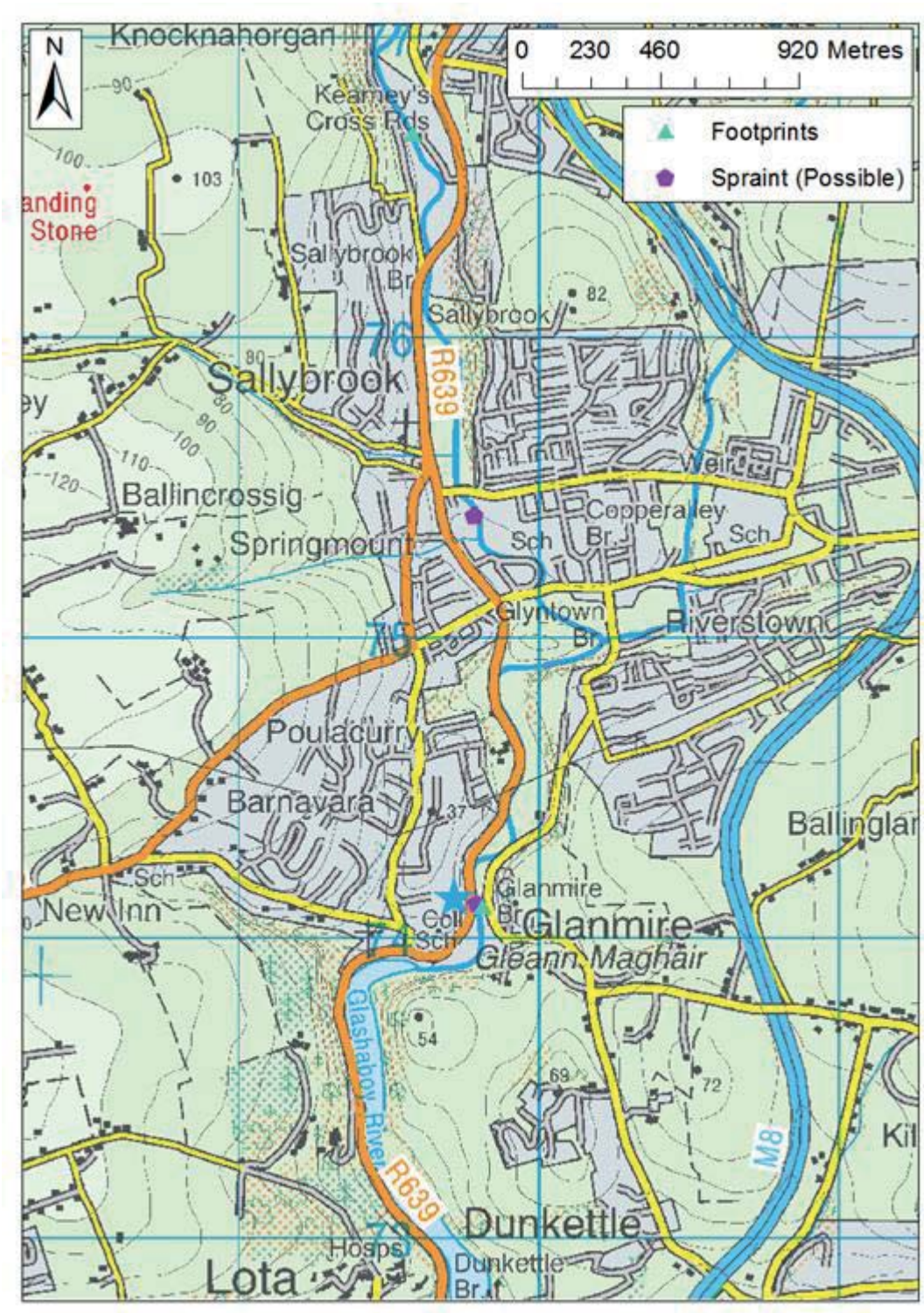

Figure 3.4 Evidence of Otter Recorded

3.4.3.4 Badger

No evidence of Badger activity was recorded during the survey. The urbanised nature of the surveyed area, and extensive development alongside the river, is likely to make the area sub-optimal for this species.

3.4.3.5 Bats

A number of the mature trees along the river have extensive Ivy cover on them and could provide roosting opportunities for bats. A number of the buildings within the town could also be exploited for roosting.

Several bridges crossing the river, including Glanmire Bridge and the L3010 Bridge, are relatively old stone built structures that may provide some opportunities for roosting bats. However, given that for much of the surveyed length, the river was constrained by high walls making the channel relatively inaccessible, a thorough inspection of the bridge arches could not be conducted.

The river corridor, despite being heavily urbanised, does also provide good foraging and commuting corridors due to the extensive tree cover.

3.4.3.6 Non-native Invasive Species

Japanese Knotweed is prevalent throughout the surveyed reach, from Glanmire Bridge upstream. It was frequently recorded within the riparian zone, growing on banksides and out of retaining walls along the river. Refer to the following **Figure 3.5,** and also **Photograhs 7** and **8** below.

Photographs 7 & 8 Japanese Knotweed at Glanmire Bridge (left) and at the rear of the Meadowbrook estate (right)

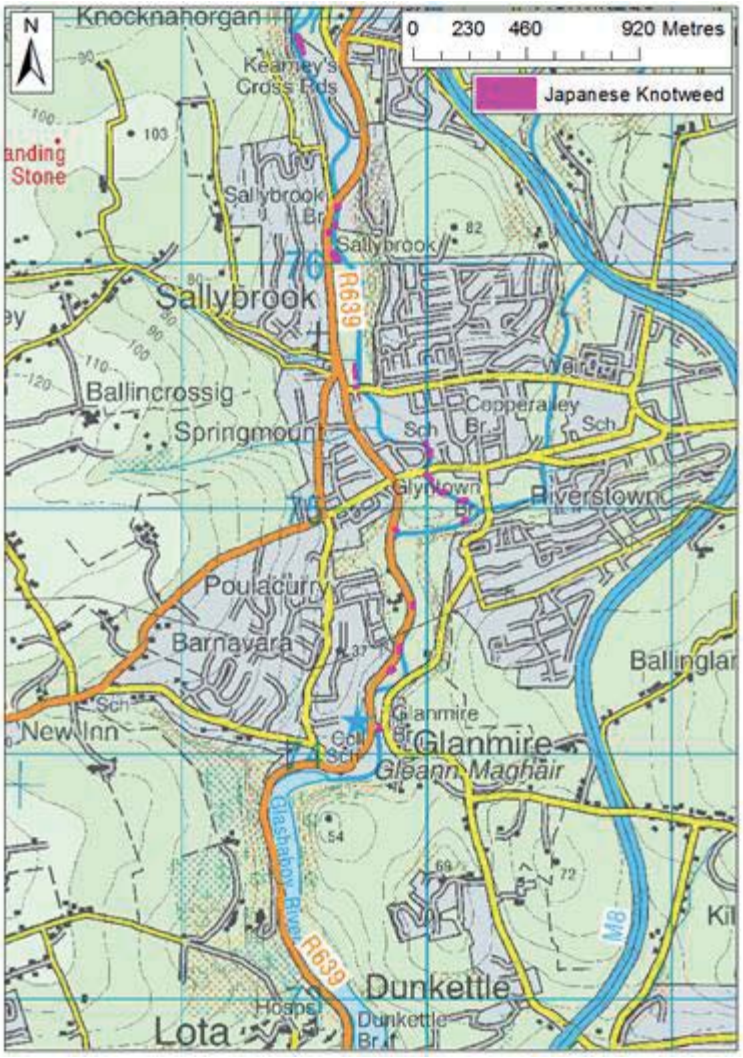

Figure 3.5 Locations of Japanese Knotweed along surveyed reach (where access available)

Rhododendron and Cherry Laurel *Prunus laurocerasus* was also occasionally recorded within wooded areas along the river banks.

3.4.4 Key Ecology Constraints

The mouth of the Glashaboy River and Cork Harbour are home to two statutorily designated nature conservation sites, Cork Harbour SPA and the downstream Great Island Channel cSAC. These sites are protected under the EU Habitats Directive and are of international importance for wintering waders and wildfowl. The sheltered tidal sand and mudflats and Atlantic salt meadow habitats are also protected under the EU Habitats Directive. Measures will need to be put into place to avoid any damage or disturbance to these designated nature conservation sites, and the interest features they support.

Glanmire Wood pNHA, which also forms part of the Cork Harbour SPA, borders the Glashaboy River and therefore is likely to be directly affected by any works undertaken along the river. Appropriate measures will need to be put into place to

ensure minimal disturbance to the woodland and saltmarshes of this designated nature conservation site. Dunkettle Shore pNHA is also located at the very downstream end of the Glashaboy River, immediately upstream of Dunkettle Bridge. Any works in this area may also directly affect the intertidal habitats of this pNHA and cause disturbance to the bird species it supports; appropriate mitigation measures will need to be put place to ensure adverse impacts do not arise.

Japanese Knotweed is a significant constraint to any works proposed along the river as it is prevalent throughout the surveyed reach. Appropriate mitigation will be required to ensure that this species does not spread.

Evidence of Otter was recorded during the site survey, with footprints and possible spraints recorded at a number of bridges. The surrounding woodland also provides extensive potential habitat for resting places/holt locations. Once the exact nature and scale of the works is determined, the areas to be affected should be surveyed to determine the level of Otter activity and if any resting places/holts are present.

The mature trees and bridges along the river provide potential roosting opportunities for bats, with the valley providing good foraging and commuting routes. Once the exact nature and scale of the works is determined, the areas to be affected should be re-surveyed to identify any features with medium or high potential for roosting bats, and activity surveys conducted if necessary.

The riverine corridor provides ample suitable habitat for nesting birds, with the river walls in many places providing a number of cracks and crevices suitable for nesting Dipper and Grey Wagtail. If possible, the works, including vegetation clearance and any works to existing walls and bridges, should be conducted outside of the breeding bird season (March to September inclusive) to protect any nests that may be present. If this is not possible, works areas should first be searched by an experienced ecologist for the presence of any nests. If found, the nests should be safeguarded until the chicks have fledged. A possible ecological opportunity as part of these works will be to include Dipper/Grey Wagtail nesting boxes in any new walls constructed.

The river is also known to support excellent salmonid populations and any in-channel working could have an adverse impact, directly through damage to in-channel habitats or indirectly through impacting upon water quality. Timing constraints should apply to any in-channel working to avoid the salmonid spawning season (usually from October to June, inclusive) and appropriate measures to prevent pollution incidents and silt mobilisation should also be applied.

3.5 Water

This section of the constraints study describes the existing hydrological environment with the Study Area and the immediate surrounding area, in addition to the potential impacts of the Glashaboy FRS.

3.5.1 Methodology

The sources of information consulted in order to identify possible hydrological constraints within the Study Area, included:

- EPA water quality database and maps
- EPA online database and mapping of Hydrometric Stations
- EPA (2010) Compendium of River Water Chemistry 2007-2009 – Appendix 3-3 of Water Quality in Ireland 2007-2009
- Geological Survey of Ireland, (GSI), online groundwater well data www.gsi.ie
- EPA online database and mapping of Hydrometric Stations
- *South West River Basin District Management Plan* (2009-2015)
- *Lee CFRAMS SEA Environmental Report* (OPW 2010)
- *Water Framework Directive website www.wfd.ie online publication Action Plan for the Lower Lee/Owenboy WMU(August 2009)*

The desktop study was supplemented by a site visit, in order to further establish the overall hydrological regime within the Study Area.

3.5.2 Receiving Environment

3.5.2.1 Water Supply

Existing River Abstractions

Table 6.2 of the Blarney Electoral Area LAP 2011 provides the environmental quality of the Glashaboy and Cloghnagashee Rivers in relation to Carrignavar. The table indicates that the Glashaboy River status (Dec. 08) is Moderate. This table also indicates that the Glashaboy is a protected area for drinking water abstraction and includes four surface water drinking waters, i.e. two reaches of Butlerstown River and a tributary, and the Glashaboy River. The publication *Sampling Fish for the Water Framework Directive – Transitional Waters 2008* (page 3) undertaken by the Central and Regional Fisheries Boards in 2008 for the Glashaboy Estuary, also states that the Glashaboy River is used for domestic drinking water operated by the Glashaboy Water Works. (http://www.wfdfish.ie/wp-content/uploads/2009/09/Glashaboy1.pdf)

Existing Groundwater Abstractions

Consultation of GSI online mapping of 'Groundwater Well Data' indicated a number of wells located within the Study Area.

Hydrometric Stations

The following Hydrometric Stations are indicated on EPA online mapping. The details provided were sourced in the EPA online Register of Hydrometric Stations (EPA 2012).

Table 3.5 Details of Hydrometric Stations

Station	Ref	Type	Easting	Northing	Waterbody	Responsible Authority	Active
Glanmire	19006	Recorder	172913	74488	Glashaboy	Cork County Council	No
Riverstown	19007	Recorder	173113	75045	Glashaboy	Cork County Council	No
Sallybrook	19008	Recorder	172608	76600	Glashaboy	Cork County Council	No
Brookhill	19009	Recorder	173559	76274	Butlerstown	Cork County Council	No
Ballyingohig	19010	Recorder	176201	79104	Butlerstown	Cork County Council	No
Meadowbrook	19032	Recorder	172917	75280	Glashaboy	Cork County Council	Yes
Brooklodge	19033	Staff Gauge only	173580	75167	Glenmore	Cork County Council	No

Surface Water Features

Surface water features within the Study Area comprise the Glashaboy River and its tributaries.

The Glashaboy River catchment is described in the *Lee CFRAMS Hydrology Report* as extending from the foothills of the Nagles Mountains to Cork Harbour at Dunkettle, covering an area of 145km^2 . The river flows in a general north to south direction before entering Cork Harbour south of Glanmire. The Glashaboy River drains the west of the catchment, with the Butlerstown River and the Glenmore River draining the east of the catchment. The Butlerstown River, which is a tributary of the Glashaboy River, joins the river at Riverstown. The Black Brook and the Cloghnageshee River join the Glashaboy River in the north of the catchment. Water levels in the lower reaches Glashaboy River are tidal, with the tidal influence extending upstream to the town of Glanmire.

Water Quality

Online EPA data provides information on surface water quality. Biological information is provided in the form of Q values. The water quality of the Glashaboy is indicated on EPA mapping as being Q4 ‘Good Status’. The EPA mapping shows that the Butlerstown River has a Q4 value ‘Good Status’, with stretches of Q5 ‘High Status’. Q values are not available online for the other tributaries. The water quality of the tidal stretch of the Glashaboy (Transitional and Coastal Water Quality) and also Cork Harbour into which the River discharges, is indicated on the EPA online mapping as ‘Intermediate’.

The EPA online publication *Compendium of River Water Chemistry 2007-2009 – Appendix 3-3 of Water Quality in Ireland 2007-2009* (published 2010) was consulted for physic-chemical data. Data for the Glashaboy (Lough Mahon) was available in this publication. The data provided in the publication is presented in the following **Table 3.6**.

Water Framework Directive

The Water Framework Directive (WFD) is a key initiative aimed at improving water quality throughout the EU. It applies to rivers, lakes, groundwater, and coastal waters. The Directive requires an integrated approach to managing water quality on a river basin basis; with the aim of maintaining and improving water quality. The Directive requires that management plans be prepared on a river basin basis and specifies a structured approach to developing those plans. It requires that a programme of measures for improving water quality be brought into effect.

Specifically the WFD aims to: protect/enhance all waters (surface, ground and coastal waters); achieve "good status" for all waters by December 2015; manage water bodies based on river basins (or catchments); involve the public; and streamline legislation.

WFD Status 2007 – 2009, and Risk Scores, for surface waters within the Study Area, where available, are given in the following **Table 3.7.**

Table 3.6 Physico chemical Parameters for Glashaboy (Lough Mahon)

River	Full Code	Parameter/Unit	Location	Min	Mean	Max	Standard Deviation
Glashaboy (Lough Mahon)	RS19G010200	Alkalinity-total (mg/l CaCO3)	Ballyvorisheen Bridge	28.0	42.3	51.0	4.9
		Chloride (mg/l Cl)		10.1	15.9	20.1	2.5
		Conductivity @25°C (µS/cm)		128.0	181.0	201.0	19.8
		pH		6.9	7.3	7.9	0.2
		Sulphate mg/l		3.6	7.5	9.9	1.5
		Temperature °C		4.7	10.8	19.5	3.7
		Total Hardness (mg/l CaCO3)		40.2	59.7	71.3	7.7
		Total Organic Carbon mg/l		3.5500	7.9154	18.8000	3.6164
		True Colour (Hazen)		6.0	37.5	113.0	26.9
		Nitrate (mg/l NO3)		6.790	14.611	25.500	4.367
		Nitrite (mg/l N)		0.010	0.011	0.036	0.005
		ortho-Phosphate (mg/l P)		0.007	0.042	0.136	0.026
		Total Oxidised Nitrogen (mg/l N)		1.550	3.314	5.760	0.984
		Ammonia-Total (mg/l N)		0.010	0.086	0.413	0.095
		BOD - 5 days (Total) (mg/l O2)		0.5	1.4	8.8	1.7
		BOD(2d <5°C+5d incub. 20°C) (mg/l O2)		0.5	0.9	2.0	0.8
		Dissolved Oxygen (% Saturation)		67.4	93.7	108.0	8.6
		Dissolved Oxygen (mg/l)		5.30	10.10	12.60	1.36

Table 3.7 WFD Status 2007-2009, and Risk Scores of Watercourses within the Study Area

Watercourse	Status	Risk
Cloughnagashee River	Not available	At risk of not achieving Good Status
Glashaboy (Upper Reaches)	Good	At risk of not achieving Good Status
Glashaboy (Middle Reaches)	Good	Expected to achieve good status
Glashaboy (Lower Reaches – following junction with Glenmore River)	Good	At risk of not achieving Good Status
Butlerstown River	Good (Upper reaches Moderate)	Possibly at risk of not achieving good status
Glenmore River	Not available	At risk of not achieving Good Status
Black Brook	Not available	Possibly at risk of not achieving good status
Lough Mahon	Good	At risk of not achieving good status

(Source: EPA Maps 2014)

The Study Area is located within the Water Framework Directive (WFD) South Western River Basin District, and the management plan for this area was consulted. The main objectives of the management plan are to:

- prevent deterioration,
- restore good status, reduce chemical pollution in surface waters, and
- achieve protected areas objective.

The programme of measures designed to achieve these objectives outlined in the management plan, include the following:

- control of urban waste water discharges,
- control of unsewered waste water discharges,
- control of agricultural sources of pollution,
- water pricing policy,
- sub-basin management plans and programmes of measures for the purpose of achieving environmental water quality objectives for Natura 2000 sites, designated for the protection of Freshwater Pearl Mussel populations,
- pollution reduction programmes for the purpose of achieving water quality standards for designated shellfish waters, and
- control of environmental impacts from forestry.

Appendix 3.1 of the South Western RBD Management Plan includes tables of sensitive and protected areas and identifies the Glashaboy and Butlerstown Rivers as Drinking Water Protected Areas (page 94 of the Plan). Nutrient Sensitive Areas are also identified and include the 'Lee Estuary and Lough Mahon' Nutrient Sensitive Area.

Information on status, objectives and measures in the South Western RBD has been compiled for smaller, more manageable geographical areas than river basin districts, termed water management unit action plans. There are twenty-eight water Management units (WMUs) in the South Western RBD. The Study Area is located within the Glashaboy WMU.

In relation to 'Future Pressures and Developments', the WMU Action Plan states:

"*Throughout the river basin management cycle, future pressures and developments will need to be managed to ensure compliance with the objectives of the Water Framework Directive and the Programme of Measures will need to be developed to ensure issues associated with these new pressures are addressed."*

The key measures to be implemented in the Glashaboy WMU are summarised in Table 5.1 of the River Basin Management Plan, and include measures for :

- *"Control of urban waste water discharges,*
- *Treatment plants requiring further investigation,*
- *Agglomorations requiring investigation of CSOs,*
- *Properties that will be subject to performance, operational and maintenance standards for onsite waste water treatment systems,*
- *Licences for discharges to waters under the Water Pollution Acts that require review,*
- *River waterbodies assessed to be at risk from diffuse sources, including agriculture.*

Hydrogeology

Geological Survey of Ireland (GSI) online mapping (Groundwater Public Viewer) indicates that the aquifer in the Study Area is classified as *'Li – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones'*.

Aquifer vulnerability is indicated on GSI online mapping as '*H - High'* , '*E – Extreme*' '*X- (Rock near Surface or Karst*) and '*M – Moderate'*.

The GSI online mapping (Groundwater Public Viewer) also indicates that the Study Area comprises four groundwater bodies, namely 'Cork City 1', 'Glanmire Town 1' ,'Ballinhassig 1'and 'Ballinhassig C'. These groundwater bodies in the Study Area are classified on GSI Groundwater Public Viewer mapping as 'Poorly productive bedrock'.

Online EPA 'My Local Environment – Timpeall an Ti' data states that the status of groundwaters Ballinhassig 1 and Cork City 1 and Glanmire Town 1 is 'good' (date 22.06.2011).

Appendix 3.1 of the *South Western RBD Management Plan* includes tables of sensitive and protected areas and identifies a number of 'Drinking Water Protected Areas- Groundwater' bodies (page 94 of the Plan) in the Study Area including Cork City 1, Glanmire Town 1, Ballinhassig 1 and Balllinhassig C.

3.5.3 Key Water Constraints

The scheme design should take into consideration the impact that any proposed flood relief scheme will have on the yields of existing groundwater abstractions from the Study Area groundwater bodies, taking into account the vulnerability rating of the local aquifer.

The scheme design should take into consideration the main objectives of the South Western River Basin Management Plan, by ensuring that any works proposed do not result in the deterioration of water quality.

The scheme design should take into consideration the 'Drinking Water Protected Areas' of the Glashaboy and Butlerstown Rivers which are identified in Appendix 3.1 of the *South Western District River Basin Plan*, to ensure that the quantity and quality of these drinking water sources are not affected.

The scheme design should take into consideration the 'Nutrient Sensitive Area' the 'Lee Estuary and Lough Mahon' Area identified in Appendix 3.1 of the *South Western District River Basin Plan* to ensure this area is not affected by any works proposed.

The scheme design should take into consideration the 'Drinking Water Protected Areas – Groundwater' Cork City 1, Glanmire Town 1 , Ballinhassig 1 and Balllinhassig C identified in Appendix 3.1 of the *South Western District River Basin Plan* to ensure the quantity and quality of these areas are not affected any works proposed.

The scheme design should ensure that any works proposed do not result in the deterioration of water quality in Cork Harbour.

3.6 Soils and Geology

This section describes the soils and geology within the Study Area.

3.6.1 Methodology

This section describes the bedrock geology, superficial deposits, economic geology and geological heritage of the Study Area which have been identified from desktop information sources only.

Sources of information consulted include the following:

- Bing Map aerial mapping,
- Cork County Council *Cork County Development Plan 2009 (2nd Edition)*
- Cork County Council online 'Quarry Viewer' (http://quarries.corkcoco.ie/quarries_by_townland.htm)
- EPA online *Historic Mines Inventory* (www.epa.ie),
- Geological Survey of Ireland online database www.gsi.ie,
- National Parks and Wildlife Service online mapping (www.npws.ie)
- Mine Heritage Society of Ireland (www.mhti.com/minedetails.htm.)

3.6.2 Receiving Environment

3.6.2.1 Bedrock Geology

GSI online mapping indicates the dominant rock types in the southern portion of the Study Area to be '*Sandstone with mudstone and siltstone'* (Gyleen Formation). '*Flaser-bedded sandstone and minor mudstone'*(Old Head Sandstone Formation), '*Flaser-bedded sandstone and mudstone'* (Cuskinny Member), '*Purple mudstone and sandstone'* (Ballytrasna formation). The dominant rock type in the northern portion of the Study Area is '*Sandstone and siltstone'* (Gortanimill Formation).

3.6.2.2 Soils

GSI online Quaternary data (Teagasc Subsoil data) indicates that the soils in the Study Area comprise '*Alluvium*' (gravelly), '*Tills*' (*undifferentiated Till*), '*Rock*' (*bedrock at surface*), '*Glaciofluvial sands and gravels'* (*undifferentiated*).

3.6.2.3 Economic Geology

The term economic geology refers to commercial activities involving soil and bedrock. Activities involved include aggregrate extraction (sand and gravel pits and quarries) and mining.

The desktop study found no records of the above activities in the Study Area. A quarry site at Brookville (CO064-110) is recorded in the Record of Monuments and Places. Refer to **Table 3.8** of this report.

3.6.2.4 Geological Heritage

Areas of Geological Interest in Cork County are listed in Chapter 3 (Section 3.5) of the Cork County Development Plan 2009 2nd Edition. There are no areas of Geological Interest in the Study Area.

3.6.3 Key Soils and Geology Constraints

It is recommended that a geotechnical investigation be carried out when the flood alleviation measures have been developed in order to identify local geology and ground conditions.

3.7 Archaeology, Architectural and Cultural Heritage

3.7.1 Introduction

This section assesses and evaluates the potential archaeological, architectural and cultural heritage constraints of the Study Area. Archaeology includes all pre-1700 sites and all levelled/buried features of any date. Architecture includes upstanding buildings and structures which largely date post 1700. This section summarises

the cultural heritage report. The full cultural heritage report and mapping are attached as **Appendix C** to this report.

Definitions

'Archaeological Heritage' can be described as the study of past human societies through their material remains and artefactual assemblages. Our knowledge and understanding of past societies, with no written record, is enhanced by the study of archaeological remains.

'Architectural Heritage' is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

The phrase 'Cultural Heritage' is a generic term that spans thousands of years and covers a multitude of cultural, archaeological and architectural sites and monuments within the landscape. EPA Guidelines (2003) define cultural heritage as including archaeological heritage, architecture, history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names.

3.7.2 Methodology

This section was compiled using the following documents:

- *Guidelines on the information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 2002).
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (Environmental Protection Agency, 2003).
- *Framework and Principles for the Protection of the Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).
- *Policy and Guidelines on Archaeological Excavation* (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).
- *Guidelines for the assessment of Archaeological Heritage Impacts of National Road Schemes* (National Roads Authority, 2005). (Although the proposed project is not a road it is a linear corridor extending continuously across the landscape and thus these guidelines were considered appropriate).
- *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes* (National Roads Authority, 2005)

In compiling the desktop study, the following sources were used:

- **Database of Irish Excavation Reports (www.excavations.ie)** – This web site provides a database of summary reports of all archaeological excavations and investigations in Ireland undertaken from 1970 to 2010.
- **Cartographic Sources** – The various editions of the Ordnance Survey six-inch maps; first, second and third editions for Cork were consulted.

- **Record of Monuments and Places (RMP)** - This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It provides a list of all known archaeological monuments and places of archaeological interest, with an accompanying set of constraint maps. Its numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey (OS) map number six-inch to the mile scale, the second part is the number which refers to the specific archaeological site e.g. CO64-10 refers to circle 10 on OS sheet 64 for Cork. This number is generally placed beside a circle which surrounds the archaeological site. The area within the circle is referred to as the Zone of Archaeological Notification for that site. The RMP for County Cork was published in 1998. It is an offence to interfere with any of the sites or monuments listed in the RMP without first giving two months notice in writing to the National Monuments Service (NMS) at the Department of Arts Heritage and the Gaeltacht (DAHG).
- **Sites and Monuments Database of the Archaeological Survey of Ireland** - The purpose of the Archaeological Survey of Ireland (ASI) is to compile a base-line inventory of the known archaeological monuments in the State. The large archive and databases resulting from the survey is being continually updated. This database, complete with maps is available at www.archaeology.ie. The database also provides lists of National Monuments that are in the ownership or guardianship of the State.
- *National Monuments* – Section 8 of the National Monuments (Amendment) Act 1954 provides for the publication of a list of monuments, the preservation of which is deemed to be of national importance. Ministerial consent must be granted before any works are carried out with respect to a National Monument. There are no National Monuments in the ownership or guardianship of the state within the Study Area.
- **Files of the National Monuments Service** - Some recorded archaeological sites have been afforded added protection under the following legislation (National Monuments are mentioned above:
- *Monuments subject to Preservation Orders and Temporary Preservation Orders* – The National Monuments Act 1930, provides for the making of preservation orders to protect national monuments that are considered to be under threat. The prior written consent of the Minister is required for any works at or in proximity to the monument. There are no monuments subject to preservation orders or temporary preservation orders in the Study Area.
- *Register of Historic Monuments* – Under Section 5 of the National Monuments (Amendment) Act 1987, two months notice must be given in writing to the Minister in advance of any proposal to carry out work in relation to a historic monument or archaeological area entered on the Register. There are two monuments within the Study Area which are listed in the Register: a ringfort in Killalough (CO064-004) and a ringfort in Whitechurch (CO063-015).
- **County Development Plan for Cork (2009)** – The County Development plan for Cork 2009 outlines the County Council's objectives with regard to the preservation of the archaeological and architectural heritage of the county. The plan outlines the Council's objectives regarding the protection of the archaeological heritage including the protection of all archaeological monuments listed in the RMP and also those archaeological sites discovered since the publication of the RMP. The zones of archaeological potential

identified in the RMP are to be protected as well as historic towns, underwater archaeology and industrial archaeology. The County Development Plan for Cork provides a Record of Protected Structures (RPS) as required in the Planning and Development Act 2000 (Part IV). This record lists structures or parts of structures which due to their special architectural, historical, archaeological, artistic, cultural, scientific or technical interest warrant inclusion for protection on this record. There are thirty-five protected structures within the constraint Study Area (Table 2 of **Appendix C**). The County Development Plan includes an objective to preserve the physical character of towns and villages where collections of buildings and their settings as a whole enhance the character of that area. This is designated an Architectural Conservation Area (ACA) and gives protection to the built heritage which may not be suitable for inclusion in the RPS. There are no ACAs in the constraint Study Area.

- **Draft County Development Plan for Cork (2013)** – The Draft County Development Plan for Cork (2013) outlines additional objectives regarding archaeological heritage including the protection of monuments listed in the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP), as well as 'sites, features and objects of archaeological and historical interest generally'. The zones of archaeological potential identified in the RMP are to be protected as well as underwater archaeology and historic towns. The significance of medieval archaeology, post medieval archaeology, industrial archaeology, battlefield and siege sites as well as structures shown on the 1st and 2nd edition Ordnance Survey 6 inch maps will be assessed prior to any development. The maintenance of burial grounds will be encouraged.
- The draft plan also outlines additional objectives regarding architectural heritage to ensure that changes or alterations to the buildings included in the RPS will retain and enhance their existing special character and setting under criteria set out in Architectural Heritage Protection – Guidelines for Planning Authorities (2005). The draft plan outlines the extension of the RPS to form a comprehensive schedule for the county; protect structures listed in the RPS as well as their curtilage and attendant grounds; ensure that development proposals for protected structures are appropriate and of high quality and ensure best conservation practises are promoted. In addition the council will seek to enhance all historic structures, features and landscapes not included in the RPS as well as non-structural elements such as historic gardens, stone walls, ditches and street furniture.
- The draft plan further defines ACAs as a place, area, group of structures or townscape that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of protected structures. The objectives for the ACA include the protection of the features and elements of the ACA from demolition and non-sympathetic alterations, to promote sensitive re-use and rehabilitation of buildings and sites in the ACAs, to ensure new development with or nearby is sympathetic and of high quality. Encourage repair and re-use of traditional shop fronts and high quality architectural design within the ACA, ensure that new signage etc is appropriate and that open spaces are protected and that appropriate material are uses during public infrastructure projects.
- **National Inventory of Architectural Heritage (NIAH)** - The work of the National Inventory of Architectural Heritage (NIAH) involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in

a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey. The main function of both is to identify and evaluate the country's architectural heritage in a uniform and consistent manner as an aid to its protection and conservation. The National Inventory of Architectural Heritage carried out a survey of the buildings of the County between 2006 and 2011. This provides the basis for the recommendations of the Minister for Arts Heritage and the Gaeltacht to the planning authority for inclusion of structure in the RPS. The minister has recommended that all buildings of 'Regional' importance or higher be included in the RPS. If this is not adopted by the local authority the reasons must be communicated to the Department. The Building and Historic Garden Survey for County Cork is available online (www.buildingsofireland.ie). A selection of some of the buildings and structures listed in the NIAH within the constraint Study Area is listed in Table 3 of appended cultural heritage report in **Appendix C**.

3.7.3 Receiving Environment

The receiving environment is described in the following sections.

3.7.3.1 Overview of the Archaeological, Architectural and Cultural Heritage Environment

Table 1 of the full cultural heritage report in **Appendix C** gives details of all archaeological sites listed in the RMP for County Cork within the constraint Study Area and referred to in this section. The overview is based mainly on information from the Sites and Monuments Database of the Archaeological Survey of Ireland, the RMP and the Archaeological Inventory of County Cork: Volume 2 East and South Cork (Power 1994) and Volume 5 (Ronan, Egan, Byrne 2009).

The Glashaboy River rises to the north of the village of Carrignavar in the townland of Glashaboy North. It flows roughly southwards passing along the east side of Carrignavar and on its south side is joined by another south-flowing stream coming from the west side of the village. The river continues southeastward towards Glanmire before discharging into the Lee estuary in the inner reaches of Cork Harbour at Lough Mahon. Glanmire village was home to a thriving milling industry in the 18th century and the Glashaboy provided power for these mills. The village of Glanmire is located c. 5km to the east of Cork City and has become a commuter town to the City in recent times.

The constraints Study Area for the Glashaboy Flood Relief Scheme is extensive, with the majority of the area extending eastwards from the Glashaboy River and covering an area of approximately 180 Square km. It spreads from edge of the eastern suburbs of Cork City (Ballyvolane, Mayfield and Montonette) as far east as, and beyond, Watergrasshill and Knockraha: it extends from the edge of Lough Mahon to the south as far north as Watergrasshill to the northeast and Glashaboy townland to the northwest. The River flows at the western side of the Study Area with only a narrow corridor between it and the western edge of the Study Area. A second river, the Butlerstown, rises in the area of Mitchellsfort and flows south to discharge to the Glashboy at Glanmire while a third, lesser river, the Glenmore, flows from the east joining the Butlerstown at Glanmire. There are approximately 100 townlands in the constraints Study Area. There are five settlement clusters within the Study Area, all of which could be described as commuter areas to Cork

City. Perhaps the fastest growing of these is the area of Glanmire/Sallybrook at its southern end where both settlements have grown into one another. Carrignavar and Whitechurch are at the northwest end, Watergrasshill is at the northeastern end and Knockraha is towards the southeast. The N8 Cork-Dublin National Primary Road runs roughly north/south through the eastern part of the Study Area. The landscape is undulating, dominated by rolling hills and valleys. The Study Area spans the civil parishes of Caherlag, Carrigtwohill, Ballydeloher, Rathcooney, Kilquane, Killaspugmullane, Templeusque, St Michael's, Whitechurch, Dunbulloge, Ballydeloher and the Baronies of Cork, Barretts and Barrymore.

There are 331 archaeological sites listed in the RMP within the Study Area giving evidence of early human activity in the area from as early as the late Neolithic (3, 000 - 2,400 BC) and Bronze Age (c. 2,400 BC to 500 BC). In the course of the development of the N8 Glanmire-Watergrasshill bypass a number of archaeological sites were excavated (Hanley & Hurley 2013) and these are all listed in the RMP. These dated from all periods and are included in this assessment. Although they are not considered as constraints, as they no longer exist, they are indicative of the range of human activity in the Study Area and are considered in this overview.

All archaeological sites, architectural features included in the Draft County Development Plan 2013 and County Development Plan 2009 Record of Protected Structures, and buildings and structures listed in the NIAH, and which are located in the constraint Study Area, are included in the full cultural heritage report in **Appendix C** of this report. The Glashaboy, Butlerstown and Glenmore Rivers can be considered as Areas of Archaeological Potential. Archaeological sites of local importance but which are not considered to be key constraints are also listed in the cultural heritage report in **Appendix C.**

3.7.4 Key Archaeological, Architectural and Cultural Heritage Constraints

3.7.4.1 Perceived Importance of Sites

For the purpose of this report, an assessment is given of the perceived (not necessarily definitive) importance of the various cultural heritage sites within the Study Area. The assessment of perceived importance is based on professional judgement of the information to hand, framed within the confines of the study. On a site-by-site basis, the levels of perceived cultural heritage importance are liable to future revision where new information is brought to light, either through more detailed investigations, surveys or research. The classification of levels of perceived importance is therefore based on an appraisal of current information and an assessment of importance probability.

All recorded archaeological sites are afforded the same protection under National Monuments legislation. An assessment is given below of the perceived relative importance of the various sites of archaeological heritage. Archaeological sites that have been completely excavated have been preserved by record and removed from the landscape and are not considered constraints (the moated site in Ballyvinny South (CO064-156001-) was partially and not completely excavated and thus is considered a key constraint).

a) International Importance: A site is deemed to be of international importance where, its known importance is perceived by the study to merit international recognition as a site of exemplary importance. There are no sites considered to be on international importance within the Study Area.

b) National Importance: A site is deemed to be of national importance where, its known importance is perceived by the study to merit national recognition as a site of considerable importance. There are no sites considered to be of national importance within the Study Area.

c) Regional Importance: A site is deemed to be of regional importance where, its known importance is perceived by the study to merit regional recognition as a site of high importance. Examples of site types within the Study Area include megalithic tombs, anomalous stone groups, stone rows, standing stone pairs, ogham stones, ringforts, souterrains, early ecclesiastical enclosures, castles, tower houses, moated sites, churches, graveyards and burial grounds. There are ninety-five archaeological sites considered to be of regional importance within the Study Area of which twelve are also listed in the Record of Protected Structures in the Draft Cork County Development Plan (2013) (refer to the following Table 5 of the appended cultural heritage report in Appendix C).

d) Local Importance: A site is deemed to be of local importance where, its known importance is perceived by the study to merit local recognition as a site of notable importance. Examples of site types within the Study Area include Fulachtai Fia, standing stones, possible ringforts, enclosures, earthworks, holy wells, cross slabs, bridges and mills. There are one hundred and seventy-seven archaeological sites considered to be of local importance within the Study Area (refer to the following Table 6 of the appended cultural heritage report in Appendix C).

All architectural heritage sites listed in the Record of Protected Structures are afforded the same protection under the Planning and Development Act 2000. Buildings and structures listed in the National Inventory of Architectural Heritage are graded in importance with the majority of buildings classified as being of Regional importance, however, unless they are also listed in the Record of Protected Structures they are not afforded legal protection.

The majority of cultural heritage sites by their nature are not protected and this is particularly the case if the sites are non-specific. In the case of sites such as buildings etc. which may be of cultural heritage as well as architectural heritage value they may be afforded protection under the Planning and Development Act 2000. There are no site specific cultural heritage sites within the Study Area which are not already afforded protection as archaeological sites or architectural heritage sites.

Based on the assessment of the archaeological, architectural and cultural heritage constraints within the Study Area, the following appraisal can be made:

Within the Study Area:

- There are no sites listed as National Monuments.
- There are two sites listed in the Register of Historic Monuments, both ringforts; one in Killalough (CO064-004) and the other in Whitechurch (CO063-015).

- There are no sites subject to Preservation Orders.
- There are no archaeological sites considered to be of international or national importance.
- There are ninety-five archaeological sites considered to be of regional importance (see Table 5 of **Appendix C**).
- There are 35 buildings and structures listed in the Record of Protected Structures (see Table 2 of **Appendix C**).
- There are three Areas of Archaeological Potential - The Glashaboy River and its two tributaries the Butlerstown River and the Glenmore River (see Table 4 of **Appendix C**).
- There are no site specific cultural heritage sites which are not already afforded protection as archaeological sites or architectural heritage sites.

Sites to be considered as key constraints (Tables 4 and 5 of **Appendix C**):

- All sites listed as National Monuments (none within Study Area).
- All sites listed in the Register of Historic Monuments.
- All sites subject to a Preservation Order (temporary or full) (none within Study Area).
- All archaeological sites considered to be of international, national or regional importance.
- All buildings or structures listed in the Record of Protected Structures.
- Areas of Archaeological Potential.

3.7.5 Recommendations

It is recommended that all sites of archaeological, architectural and cultural heritage interest be avoided in the course of this project.

Sections of the Glashaboy, Butlerstown and Glenmore Rivers are the subject of this study and, as rivers, are considered to be Areas of Archaeological Potential and key constraints. It is likely that the rivers have been impacted in localised areas in the past when they were used as a power source for various mills and industrial activities. It is recommended that further proposed works to the rivers should be archaeologically assessed in advance of works taking place.

3.8 Landscape

3.8.1 Introduction

The Study Area extends from the mouth of the Glashaboy River as it enters the River Lee at Dunkettle to the upper reaches of the Glashaboy river catchment to the north. Much of the Study Area is an elevated agricultural landscape sloping southwards towards the lower lying urban suburb of Glanmire, Sallybrook and Riverstown, just north east of Cork City. The main landscape features include woodland corridors along the steep valleys of the Glashaboy River that flows into Lough Mahon and merges with Cork Harbour as well as the protected structures

and associated grounds located on the high grounds in close proximity to Lough Mahon, with expansive views of Cork Harbour.

3.8.2 Landscape Character

The *Draft Landscape Strategy of Cork County 2007* defines the landscape character for the County. The *Cork County Development Plan 2009* supports the Landscape Strategy by defining its objectives in Chapter 7: Heritage and Environment. The Study Area is defined as two character types, they are;

The southern end of the Study Area is defined as City Harbour and Estuary and the character area for this type of landscape is noted as **No. 19 – City Estuary Harbour and Island Complex**. The landscape value and sensitivity is classed as 'Very High' in the above documents.

The northern half of the Study Area is defined as Fissured Fertile Middleground and the character area for this type of landscape is noted as **No. 10b – Fissured Patchwork Middleground.** The landscape value is classed as 'Medium' and its sensitivity classed as 'High Value' in the above documents.

The key characteristics of the two landscape character types, relevant to the Study Area are as follows:

a) City Harbour and Estuary

- Predominantly a rural area with a mix of the intensely urban low lying area of Glanmire and the associated suburbs of Riverstown and Sallybrook combined with a large expansive harbour (immediately south of the Study Area). The agricultural land stretches beyond north, and features high terrain at Rupperagh (200 m above Ordnance Datum (aOD)) and Glashaboy North (300 m).
- Landscape of fertile farmland of mixed use and mature broadleaf hedgerows, which slope to the harbour (southern part of the Study Area). Extensive woodland areas line the corridors of the rivers and pockets of urban framework.
- The rural areas around much of the greater harbour area are now characterised by the prevalence of roads, bridges and electricity power lines. The M8 runs north to south, through the Study Area and is a prominent feature in this landscape.
- The high quality vernacular built environment is portrayed by the high concentration of protected structures that are evident throughout the landscape. Protected structures are noted as large houses such as Dunkathel House, St. Mary's and All Saints Church in Glanmire and bridges such as Riverstown Bridge.
- The area has a strong economic base due to its strong urban character and diversity of economic activities. The proximity to the City and industrial area of the docks defines the area as an important economic node.
- As a large population centre this area is not only important locally as a place to live and work but also contributes significantly at a regional scale.

b) Fissured Fertile Middleground

- This landscape type has characteristics of both the flatter fertile farmland areas and the higher marginal hilly farmland.
- The Glashaboy River flows southwards into the River Lee, with steep valley sides are covered with broadleaf woodland.
- This is an elevated landscape, which is fissured by the fairly gentle slopes, with reasonable fertile agricultural land comprising a mosaic of small to medium sized farms.
- Houses, farmsteads and sheds are dispersed across this landscape whilst villages and hamlets such as Carrignavar and Knockraha nestle against the hillsides.
- Economically, the land is used for dairying mainly with some arable production.

3.8.3 Designated Landscape Significance

There are a number of pockets of **scenic landscapes** designated within the Glanmire, Riverstown and Sallybrook area. These areas are predominantly located along the steep valleys of the Glashaboy River and Butlerstown River.

Within the Study Area, part of the Scenic Route **S41: R639 Dunkettle – Glanmire** passes through the site.

In addition the Scenic Route **S42: Forestown – Caherlag** lies immediately east of the Study Area. There will be views from both of these routes to the Study Area.

There are a number of protected structures and associated grounds which help to define the character and landscape of the area. They include:

- Dunkathel House
- Lotamore House
- Lota House
- Lota Park
- Glanmire Bridge
- St. Mary's and All Saints Church, Glanmire
- Riverstown Bridge
- Riverstown House
- Templemichael Bridge

3.8.4 Other Landscape Elements

Within the Study Area there are a number of key amenity areas, they include:

- John O'Callaghan Park
- Sallybrook multi-use games area
- Glanmire GAA sports grounds

- Sarsfield Hurling Club
- Glanmire Area Community Association Playing fields
- Carrignavar GAA pitches
- Rock Road / Hermitage Walkway
- Coillte Trail at Moanbaun
- A number of public open greens within housing developments that are used by local residents.

There is extensive riparian broadleaf woodland along the valleys of the Glashaboy, Black Brook and Butlerstown Rivers. These wooded areas extend as far as Carrignavar in the north west and to Knockraha in the north east of the Study Area.

Hedgerows define the agriculture land in much of the medium to small-sized farms within the reminder of the Study Area. Given the exposure and elevation of much of these lands, hedgerows remain fairly low in height.

There are plantations of coniferous forest on both Rupperagh Hill in the north east and Glashaboy North in the north west of the Study Area. These areas also add both shelter and screening within the landscape.

Groupings of mature trees are located within the confines of Glanmire Village, which provide amenity value to the urban framework and screening for residents.

Objective Env 1-10 of Chapter 7: Heritage and Environment of the Cork County Development Plan 2009, supports preserving tree cover.

3.8.5 Key Landscape Constraints

The riparian wooded corridors along the rivers provide both screening to residents and are of amenity value in the suburb areas of Glanmire, Riverstown and Sallybrook. Further out in the agricultural areas these woodlands provide shelter to the dispersed residential units and are of also of amenity value, defining the character of the Study Area. Careful consideration must be given these areas to avoid opening up viewing for existing residents and to protect the integrity of the woodland cover, most especially in the suburban areas.

The amenity areas of the Study Area provide important facilities to the residents of the area and should be protected and retained.

The protected structures of large houses such as Dunkathel House and historic infrastructures such as the bridge at Riverstown define the landscape character of the Study Area and need to be protected and retained.

3.9 Air Quality, Climate and Noise and Vibration

3.9.1 Methodology

This section describes the existing air quality and existing noise environment in the Study Area and identifies possible issues which have the potential to constrain the flood relief scheme design.

The methodology included:

- Identification of possible air quality issues.
- Identification of locations where there may be existing noise/vibration sensitive receptors.
- Identification of any existing noise or vibration sources in the area.
- Qualitative description of the existing noise climate.

The following sources of information were consulted:

- *Cork County Development Plan 2009, 2nd Edition*
- *Cork County Council Draft Noise Action Plans 2013-2018*
- *Air Quality in Ireland 2012* (EPA 2013)
- EPA database of IPPC Licences.

3.9.2 Receiving Environment

3.9.2.1 Air Quality and Climate

The Environmental Protection Agency publication *Air Quality in Ireland 2012* (EPA 2013) provides an overview of air quality in Ireland for 2012, based on data obtained from 29 monitoring stations that form the National Ambient Air Quality Monitoring Network. The Glashaboy Air Quality Station is located in the Study Area.

Ireland is divided into zones (Zones A, B C and D) for the assessment and management of air quality, in compliance with EU legislation. The Study Area is located in two zones, Zone B Cork Conurbation and also Zone D which is the remainder of the State excluding Zones A, B, and C.

The EPA publication indicates that the air quality in Zone B and D in 2012 was ‘good’.

It is not envisaged that a flood relief scheme recommended by the Engineering study will increase the volume of traffic within the Study Area in the long term.

It is not envisaged that a flood relief scheme will have a long term detrimental effect on air quality in the Study Area. There may be a temporary local impact during the construction works associated with the flood relief scheme, in particular due to the localised generation of dust during some construction operations.

3.9.2.2 Noise and Vibration

The noise environment in the Study Area arises from activities associated with agricultural land, and a mosaic of busy retail areas, roads, and quieter residential areas.

Residential developments are concentrated towards the urban centre of the Study Area. One-off housing is also scattererd throughout the area. The Study Area also includes a number of schools.

It is not envisaged that the preferred flood relief scheme emerging from the Engineering study will have long term adverse effect on the noise environment within the Study Area, however noise during the construction phase of the project may have a temporary local adverse impacts.

Vibration during construction could have the potential to cause damage to structures, such as buildings, bridges and walls in the vicinity of the works.

3.9.3 Key Air and Noise Constraints

The key constraints include any noise/vibration sensitive receptors located in proximity to works associated with the flood relief scheme. These should be taken into consideration during design of the flood relief measures.

3.10 Material Assets

Material assets within the Study Area include:

- Potable water infrastructure
- Waste water infrastructure
- The build environment
- Waste management facilities
- Roads and Transportation network

3.10.1 Methodology

The following were consulted in the assessment of material assets within the Study Area:

- EPA Waste Water Discharge Licence Applications for Waste Water Agglomerations within the Study Area,
- EPA online mapped Licenced Waste Facilities
- *County Cork Waste Management Plan* (2004)
- National Waste Collection Permit Office online data (www.nwcpo.ie)
- *Cork County Development Plan 2009 (2nd Edition)*
- Cork County Council website
- Department of the Environment, Community and Local Government *Water Services Investment Programme (WSIP) 2010-2012* www.environ.ie

3.10.2 Receiving Environment

3.10.2.1 Waste Water Infrastructure

The *Blarney Electoral Area Local Area Plan 2011* (Section 2.2.45) states that

"the sewerage scheme starts at Sarsfield Court and gravitates along the valley to a pumping station at Glanmire Bridge. The sewage is pumped to the top of the hill at Dunkettle and from there it gravitates to a pumping station at Little Island

where it is connected to the treatment plant at Carrigrennan, Little Island." The Blarney LAP also states that *"the Glanmire, waste water infrastructure is considered adequate as it is connected to the Waste Water Treatment Plant at Carrigrennan, Little Island."*

The *Blarney Electoral Area Local Area Plan 2011* (Section 2.2.48) states that to facilitate future development in Carrignavar, a new water source is identified with sufficient capacity to cater for existing and proposed development within the Village and also that the waste water treatment plant be upgraded. The LAP (page 69) states that the water supply to Carrignavar Village is inadequate and that the construction of a storage reservoir and associated network modifications is required. The Village is served by a waste water treatment unit, which discharges to the Cloghnagashee River, which in turn discharges to the River Glashaboy.

3.10.2.2 Waste Management

The EPA online database, along with the *Waste Management Plan for Cork County* (2004), and Cork County Council website (www.corkcoco.ie) was consulted in relation to waste management facilities within or in the general area of the Study Area.

Consultation of the EPA database (www.epa.ie) showed that the following EPA licensed facility is located within the Study Area.

Table 3.8 EPA Licensed Waste Facilities with the Study Area

Facility Name	Licence No	Location
Green Star	W0136-02	Sarsfieldcourt

Cork County is part of the Southern Waste Management Region, one of three in the State. The Council website states that the Waste Management Plan for Cork County (2004) will remain applicable until the adoption of the new Southern Regional Waste Management Plan (due to be published in 2015).

Cork County Council website includes a list of current 'Waste Facility Permits – Certificates of Registration'. Consultation of this list showed the following permitted facilities (**Table 3.9**) in the Study Area.

Table 3.9 Cork County Council permitted Waste Facilities - Certificates of Registration, in the Study Area

Facility Name	Permit No.	Location	Facility Type	Waste Type
Capwell Industries Ltd.	WFP-CK-09-0028-02	Riverstown, Glanmire	Transfer Station	Tyres, Waste plastic, Wastes not otherwise specified (Polyurethane foam)
Wisetek Solutions Ltd	WFP-CK-09-0036-01	O'Connell Warehousing Unit 17, Brooklodge, Glanmire	Transfer Station	Paper, cardboard, wood, metals, batteries
Glyntown Enterprises Ltd	WFP-CK-10-0047-02	Sarsfield Industrial Est., Glanmire	Transfer Station	Glass, paper cardboard, metal, wood, food Regs EWCs
Green Dragon Recycling Ltd.	WFP-CK-10-0060-02	Corbally North, Glanmire	Transfer Station	Metals, wood, plastic

The *Waste Management Plan for Cork County* (2004) includes a table of 'Licensed Landfill Sites' (Table 2.1 of Appendix 4 of the Plan). The sites listed in Table 2.1 of the Plan include the following in the vicinity of the Study Area.

Table 3.10 Licensed Landfill Sites within the Study Area

Facility Name	Location	Issue Date	Type of Waste
Lotamore Landfill	Glanmire	30/05/01	Construction & Demolition

The *Waste Management Plan for Cork County* (2004) also includes a table of 'Licensed Civic Amenity Sites, Waste Transfer Stations and other Waste Treatment Facilities' (Table 2.2 of Appendix 4 of the Plan). The following table provides details of licensed Waste Transfer Stations in the Study Area shown in the Cork County Council Table 2.2.

Table 3.11 Licensed Civic Amenity Sites, Waste Transfer Stations and other Waste Treatment Facilities in the Study Area

Facility Name	Location	Applicant	Issue Date	Type of Waste
Sarsfieldcourt Industrial Estate Waste Transfer Station	Sarsfieldcourt, Glanmire.	Greenstar Recycling (Munster) Ltd.	17/05/04	Household C & I, Bio-Waste, C & D.

In addition, Appendix 4.1 of Appendix 4 of the *Waste Management Plan for Cork County* (2004) comprises a table of Waste Permit Holders. The following in the general vicinity of the Study Area are included in the Cork County Council table.

Table 3.12 Waste Permit Holders (listed in Appendix 4.1 of Appendix 4 of the Waste Management Plan for Cork County (2004) and located in the general vicinity of the Study Area

Name	Ref No.	Location of Facility	Description
John Cashman	CK (S) 39/02	Glenview, Bruah, Glanmire	Soil & Stone recovery
Glyntown Enterprises		Unit 3, Silverbullet Warehousing, Sarsfield Court, Glanmire	Recycling facility (plastic cardboard etc)

3.10.2.3 Roads and Transportation Infrastructure

Roads and transportation infrastructure in the Study Area comprises the following:

The primary access routes to the Study Area is via the M8 and N8, and from a number of regional and local roads.

All roads in the Study Area, apart from National Primary Routes, are maintained by Egis Lagan Services on behalf of Cork County Council. Any modifications to National Primary Routes would require consultation with the National Roads Authority.

3.10.2.4 Utilities

Utilities in the Study Area include water supply networks, telecommunications, electricity supply and gas pipelines. In addition to sewerage infrastructure, some of these services also cross the rivers in the Study Area at various locations.

The Water Services Investment Programme (WSIP) is a Department of the Environment, Community and Local Government programme relating to the provision of major water and wastewater schemes to meet key environmental and economic objectives. The 2010-2012 Programme, published by the Department, gives an indication of proposed water services investment for the various river basin districts in upcoming years. There are a number of schemes in the publication in relation to the South Western River Basin District however no schemes are indicated for the Study Area.

Neither the County Cork Waste Management Plan 2004 nor the Cork County Development Plan 2009 (2nd Edition) contain plans to develop additional Waste Management Facilities within the Study Area.

No records of proposed road changes were identified for the Study Area.

3.10.3 Key Material Asset Constraints

- It is recommended that the existing and proposed location of watermains and underground services in the vicinity of any proposed flood relief scheme be ascertained as part of the Engineering study. It is recommended that Cork County Council and other utility providers with services in the Study Area be consulted regarding the location and priority of existing and proposed

services. It is further recommended that the services be protected as part of any proposed flood relief scheme.

- It is recommended that the locations of abstractions from the Glashaboy and Butlerstown Rivers for drinking water supplies be ascertained as part of the Engineering study and that drinking water supplies should not be affected by any flood relief measures.
- It is recommended that Cork County Council and the National Roads Authority, where relevant, be consulted in relation to any effects on the existing and proposed roads infrastructure in the Study Area from any proposed flood relief scheme.
- It is recommended that the requirements of the Cork County Council Development Plan 2009 be observed in relation to waste management assessments.

4 Public Consultation

This section provides details and analysis of the first Public Consultation (Public Information Day).

4.1 Public Consultation Arrangements

A public information day (PID) was held on Tuesday, 25 February 2014 in the Glanmire GAA Hall. The purpose of the PID was to present the Study Area to the general public and to outline the process involved in the preparation for the Glashaboy FRS.

The PID was held between between 3pm and 7pm for members of the general public. A presentation was made to elected representatives immediately prior to the PID consultation. The PID was attended and staffed by members of Arup's engineering and environmental teams, and staff from JBA Consulting, in addition to representatives from Cork County Council and the OPW, who were available to answer questions from the members of the public who attended, and to explain the Study Area and the flood relief scheme process, while accepting information from the attendees.

4.1.1.1 Advertising of the Public Information Day

Arup prepared publicity leaflets, brochures, posters, and letters to stakeholders, newspaper and radio advertisements. Advertising of the PID was undertaken in the local printed press and on local radio shows in the week preceding the event and details are provided in the following **Tables 4.1** and **4.2.**

Table 4.1 Details of Advertisements in Local Press

Publication	Date	Size
Irish Examiner	20.02.2014	12cm x 2cm column
Evening Echo	20.02.2014	12cm x 2cm column
Cork Independent	20.02.2014	12cm x 2cm column
Cork News	20.02.2014	12cm x 2cm column

Table 4.2 Details of Advertisements on Local Radio

Radio Station	Date		Number of spots per day
96 FM and C103	22.02.2014 23.02.2014 24.02.2014		3 3 3
Red FM	22.02.2014 23.02.2014 24.02.2014		3 3 3
Cork City Community Radio	22.02.2014 23.02.2014		3 3

In addition, leaflets were provided to the Meadowbrook Residents Association who represent some of the most adversely affected people in the 2012 flood event.

The event was also publicised through postings on the Cork County Council website.

4.1.1.2 Literature Available for the Public Information Day

Information leaflets, posters and questionnaires were available at the PID on the 25th February. Copies are provided in **Appendix D**. The return date for receipt of completed questionnaires was the 27th March 2014. Information in addition to the questionnaires was also accepted on the day of the event or subsequently by post. Letters of response and also information provided in the questionnaires are presented in **Appendix D6** and **D7**.

4.2 Public Consultation Materials

4.2.1 Public Consultation Information Leaflet

A Constraints Study Public Consultation information leaflet was produced for the scheme. The information leaflet showed the Study Area under consideration and provided a brief explanation as to the process involved and the options being considered. The information leaflets were freely available to the members of the public and interested parties, both during and after the PID. A copy of the information leaflet is attached in **Appendix D3.**

4.2.2 Public Consultation Questionnaire

A questionnaire with pre-printed questions was available to each attendee, in association with the information leaflet. This provided an opportunity for members of the public to express their views on the Study Area shown and to provide information regarding flooding in their area, in addition to other comments they may have had relating to design or the Environmental Constraints Study. A copy of the blank questionnaire is attached in **Appendix D5**.

4.2.3 Pubic Consultation Posters

Poster exhibited during the PID Constraints Study Consultation included the following information:

- Study Area Map – including Archaeological and Ecological Sites
- Constraints Study – including Primary Constraints
- Public Involvement
- Scheme Objectives and Overview
- Planning Process for the Proposed Scheme
- Flood Relief Scheme Process
- Map of Flood Relief Scheme area

A copy of the poster is included in **Appendix D4**.

4.2.4 Project Website

A dedicated website, to make details of the Glashaboy FRS, has been set up and is live. The website address www.glashaboyfrs.ie was publicised at the PID, and attendees were informed that all information on display at the public exhibition, including information leaflets, posters, questionnaires etc. would be available for download from the website.

It is intended to keep the website live for the duration of the scheme and for it to become a destination for interested members of the public to get project information and news and where project documentation can be made available for download.

4.3 Public Information Day Exhibition

4.3.1 Numbers of Public Attendees

Members of the public visiting the exhibition were invited to sign a visitors' list to enable a record of the number of attendees to be maintained. A total of 56 attendees signed the attendance list at the event in Glanmire GAA Hall. However, the total attendance was estimated to be approximately 100 persons.

4.4 Public Consultation Response

Visitors to the exhibition are considered to have, in the main, understood the proposals as presented at the exhibition. Feedback was generally positive. Most of those that attended had particular interest in properties or lands in the Study Area and explained the extent to which their properties had been affected by previous flood events and what they considered to be the contributing factors that resulted in the flooding.

Information was provided by the public which identified areas in which they felt works should be undertaken to alleviate flooding.

Information provided verbally at the PID by a number of attendees is summarised below.

4.4.1 Information Provided Verbally at the PID

A summary of the information relating to previous flood events and which was provided verbally at the PID is as follows:

- A flow of water, from the watercourse, at the northern end of Meadowbrook Estate, from the backing up of the river, was the source of most of the water in the estate in the June 2012 flood event. The flow did not come down from the area to the north of the esate. The water came in from the stream and the main river upstream of the end of the flood defence wall. The location and timing was also provided.
- One attendee who had lived in the area for approximately 80 years, related that the Pike Field (GAA Pitches), and Meadowbrook used to flood frequently in the past, and confirmed that the flood of 1969 was from the river (not the

mill race). A number of floods like this occurred a number of times, however the dates were not specified.

- A number of attendees recalled the Meadowbrook area flooding regularly before the houses were built.
- The rain during the June 2012 event appeared to be concentrated in the western and upper part of the Glashaboy catchment, and not the Butlerstown river side of the catchment.
- The NPWS ranger, responsible for the upstream part of the catchment, said that most of the various flood relief options would not impact on upstream part of the catchment except possibly the upstream storage, and that there were no designated areas in the upstream part of the catchment.

4.4.2 Returned Questionnaires

By 27th March 2014, the stated deadline, a total of 46 completed questionnaires had been returned to the project team. Questionnaires received following this date were not included in the analysis.

4.4.3 Other Submissions

In addition to the returned questionnaires, other submissions were received by post and by email following the PID. These comprised:

- A letter from the Meadowbrook Residents Association providing copies of representations made by them over the past two years relating to the 2012 flood event.
- A letter from Inland Fisheries Ireland which stated that any proposed flood alleviation measures must be sustainable and in keeping with the requirements of the Fisheries Acts, Habitats Directive and Water Framework Directive and that in this context the current assessment should be a catchment wide process. The letter also referred to the significance of the rivers involved in terms of fisheries. Measures for the assessment of existing conditions and for assessment of impacts, at the EIS stage were also included in the letter.
- A submission by McCuthcheon Halley Walsh, chartered planning consultants, on behalf of their client Peter Casey of Oliver Plunkett Street Cork. Mr. Casey who is the owner of a large commercial site (3.8hectares) in the Sallybrook area.. The submission stated that only a very small fraction of the site at the southern end is susceptible to flooding but only if there are no changes made to the property.
- Attached to the submission was a copy of a Flood Risk Assessment report undertaken by Dr. Eamon McKeogh of the Flood Study Group, Department of Civil an Environmental Engineering UCC (Nov 2007). The UCC report states that the existing site is protected by a levee/embankment which is adequate to provide flood protection from extreme flood events. The conclusions of the UCC FRA include that the site does not function as or provide any role in relation to flood storage, that the structural stability of the embankment may need to be improved, that changes to the structure and composition of the embankment will not effect the flood levels calculated in the study, provided that the embankment profile is not changed on the river side, and that

reinforcing or raising of the embankment will not change upstream or downstream water levels.

- The submissions outlines the most appropriate effective flood protection measures for the Sallybrook area which include 'catchment management', 'flood containment' and 'conveyance'.
- An email from the Development Applications Unit (DAU) of the Department of Arts, Heritage and the Gaeltacht with attached observations in relation to underwater archaeology. The observations include that the Environmental Impact Statement should contain a detailed section on the Cultural Heritage, including the underwater cultural heritage, which may be impacted by any proposed flood relief scheme. The services of a suitably qualified underwater archaeologist and project archaeologist would be required.
- Information was also provided by Cork County Council with regard to the pond at the Old Mill, Sallybrook. The pond which has been there since approximately the early 1800s recently dried up and resulting in fish kill and loss of wildlife including ducks and ducklings.

Copies of the above letters, and attachments are provided in **Appendix D** of this report.

4.4.4 Analysis of Public Consultation Response

4.4.4.1 Analysis of Questionnaires

In total, there were 46 respondents to the questionnaire, all of whom live or work within the Study Area and have a direct interest in or have previously been affected by the historical flood events in the Study Area. Full details of the responses to questionnaires (including photographs) were provided to the Project Team. A summary of the information provided in the questionnaires is outlined below.

4.4.4.2 Flooding Information (from questionnaire)

When asked about previous flood events, 40 of the respondents had personal experience with previous flood events, with the majority of those affected by the 2012 flood event. Most of the properties affected were residential, however retail, office, workshops and open space had also been affected.

Information provided by respondents with regard to previous flood events was that:

- The flood events had had a serious impact on business development in the area due to the reluctance of businesses moving to an area which is subject to flooding.
- As a result of flooding, there are now new empty business units at the Hazelwood Centre and that any further flooding would seriously affect the business centre.
- Flooding had been devastating for residential properties, in particular the residents of Meadowbrook, Glanmire.
- No further developments or construction of houses to be erected in flood plain.

4.4.4.3 Flood Alleviation Information (from questionnaire)

When asked in Question 13 of the questionnaire if they had a preference for the type of flood alleviation method, the majority of first preferences was for 'Flood Containment through the Construction of Flood Defences' (46%). Other first preferences given were 'To Pump Water from Behind Flood Defences' (11%), followed by 'flow Diversion (e.g. river diversion or flood flow bypass channel) (9%), 'Increase Conveyance of Channel' (9%), 'Sediment Deposition and Possible Sediment Traps (9%). Flow Reduction (e.g. upstream catchment or flood storage) was 7%.

The majority of second preferences in relation to the above Question 13 were for Flow Reduction (e.g. upstream catchment management and flood storage) (17%), followed by 'Flow Diversion (e.g. river diversion or flood flow bypass channel) (13%) followed by the other proposed measures to a lesser degree.

When asked in Question 14 of the questionnaire how they thought the issue of flooding could be resolved, the main suggestions proposed by respondants are summarised as follows:

- Flood containment, the installation of proper flood barriers/flood defences, and reinforcement and heightening of the estuary wall.
- Management of water coming down Spring Hill and the road parallel to it,
- Grids at bottom of Barnavara hill to take flowing water from the hill and divert the water into the park or below the weir.
- Care to be taken that water in the park does not fill up and spill into Meadowbrook Estate
- With regard to Meadowbrook Estate, the wall should be re-inforced and built higher and extended to the whole of Meadowbrook Estate. The drainage system for Meadowbrook Estate should be improved and an independent system installed including non-return drains. Drainage should be be piped on past the weir downstream.
- With regard to bridges, they should be kept free/eyes of bridges opened, and Riverstown Bridge should be redesigned.
- With regard to the river, the river bed should be widened/deepened, trees overhanging river should be removed and and riverside maintenance should be ongoing. Debris build up in the river should be avoided. The river floodplains should be retained and no further development should be allowed on these.
- Roadside drains should be cleaned, and inspected more regularly by the Council.
- A trash screen should be installed on the culvert in the vicinity of Cuil Chluthair, Sallybrook.
- The pond at Sallybrook should be re-installed, and it should be dredged so that it would act as flood storage. This would also act as a flowreduction outlet for the area above the Brook Inn. In addition the re-installment of the pond would reinstate wild life.

4.4.4.4 Environmental Constraints

Question 15 of the Questionnaire was to rank the importance of each of seven environmental topics. These topics and the responses are summarised in the following **Table 4.1**.

Table 4.1 Questionnaire Responses to Ranked Environmental Topics

Topic	Very Important	Important	Moderately Important	Of Little Importance	Unimportant
Flood Related Socio-Economic & Social Issues	41%	9%	11%	4%	0%
Flora & Fauna	15%	22%	20%	17%	9%
Local Fisheries	7%	26%	20%	9%	9%
Habitats	11%	24%	28%	11%	0%
Water Quality	57%	13%	9%	6.6%	0%
Architectural & Cultural Heritage	11%	11%	37%	24%	0%
Landscape & Visual Amenity	11%	20%	30%	13%	4%
Angling, Tourism & Recreation	9%	20%	28%	20%	4%

The above table indicates that 'Water Quality' was considered the most important of the environmental constraints, with 57% of respondents indicating that it is was 'Very Important'. 'Flood Related Socio-Economic & Social Issues' was indicated by 41% of respondents to be 'Very Important'. 'Flora & Fauna' and 'Local Fisheries' were considered generally to be 'Important', whilst 'Habitats', 'Architectural & Cultural Heritage', 'Landscape & Visual', and Angling & Tourism were generally considered to be 'Moderately Important'.

Not all respondents completed this question or completed this question fully, therefore this should be bourne in mind when drawing to conclusions from the responses to this question.

In addition, the respondents were given the opportunity to provide comments specific to each of the environmental topics. A summary is provided below:

- Impacts on human health.
- Impacts on business in the area.
- Loss of flora and fauna as a result of flooding.
- Reinstating the pond at Sallybrook which would have a positive effect on biodiversity.
- Ensure that flood defence options do not impact unfavourably on the swans and other wildlife on the pond in Sallybrook, adjacent to the Glansillagh Mill, and also upriver.
- Repairs to weirs and deepening of the river bed.
- If the Glashaboy was a well maintained river system, it would enhance the trout, salmon and white trout stocks and would attract more tourism.

- Habitats should be preserved, especially for bats, dippers and others.
- No further developments or construction of houses should be erected in flood plain.
- The John O'Callaghan Park area should be examined fully in an effort to alleviate flooding problems there also.

A full list of the comments is provided in **Appendix D7.**

4.5 Conclusion

The Public Consultation was held to inform the general public of the Constraints Study and preliminary aspects of the Glashaboy FRS and to obtain information about flooding or other relevant environmental information about the Study Area presented. Interested persons were able to consult the consultation materials, have relevant questions answered and take away an information leaflet setting out the project for future reference.

Valuable information and comment was received on the day and also received subsequently.

The overall feedback from the public was positive.

4.6 Presentation to Cork County Council Public Representatives

Arup gave a presentation to the Southern Committee (County Councillors) about the scheme on 18 March 2014.

5 Sources of Information

5.1 General

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- Environmental Protection Agency (EPA) guidelines *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements 2003*
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- Inland Fisheries Ireland Website www.ifi.ie
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5.2 Human Beings

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- South West Regional Authority *Regional Planning Guidelines 2010-2022*

5.3 Ecology

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- RSPB (1994) *The New Rivers and Wildlife Handbook*. The Royal Society for the Protection of Birds, Sandy
- Smith, G.F., O'Donoghue, P., O'Hora, K. and Delaney E. (2011) *Best Practice Guidance for Habitat Survey and Mapping.* The Heritage Council, Kilkenny
- Strachan, R., Moorhouse, T. and Gelling, M. (2011) . Water Vole Handbook 3nd Edition. Wildlife Conservation Unit, University of Oxford.

5.4 Water

- Environmental Protection Agency water quality online database and maps,
- Environmental Protection Agency (EPA) online database and mapping of Hydrometric Stations
- Environmental Protection Agency (EPA) (2010) *Compendium of River Water Chemistry 2007-2009 – Appendix 3-3 of Water Quality in Ireland 2007-2009*
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- Halcrow Ireland Ltd Office of Public Works (2010) *Lee CFRAMS SEA Environmental Report*

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- *South West River Basin District Management Plan* (2009-2015).
- Water Framework Directive website www.wfd.ie online publication *Action Plan for the Lower Lee/Owenboy WMU(August 2009)*

5.5 Soils and Geology

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- Cork County Council *Cork County Development Plan 2009 (2nd Edition)*
- Cork County Council online 'Quarry Viewer' (http://quarries.corkcoco.ie/quarries_by_townland.htm)
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- Geological Survey of Ireland online database www.gsi.ie,
- National Parks and Wildlife Service online mapping (www.npws.ie)
- Mine Heritage Society of Ireland (www.mhti.com/minedetails.htm.)

5.6 Archaeology, Architectural and Cultural Heritage

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- National Inventory of Architectural Heritage www.buildingsofireland.ie

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5.7 Landscape

- Cork County Council *Draft Landscape Strategy of Cork County 2007*
- Cork County Council *Cork County Development Plan 2009*

5.8 Air Quality, Climate, and Noise and Vibration

- Cork County Council *Cork County Development Plan 2009 2nd Edition*
- Cork County Council D*raft Noise Action Plans 2013-2018*
- Environmental Protection Agency (2013) *Air Quality in Ireland 2012*
- Environmental Protection Agency online database of IPPC licenced facilities.

5.9 Material Assets

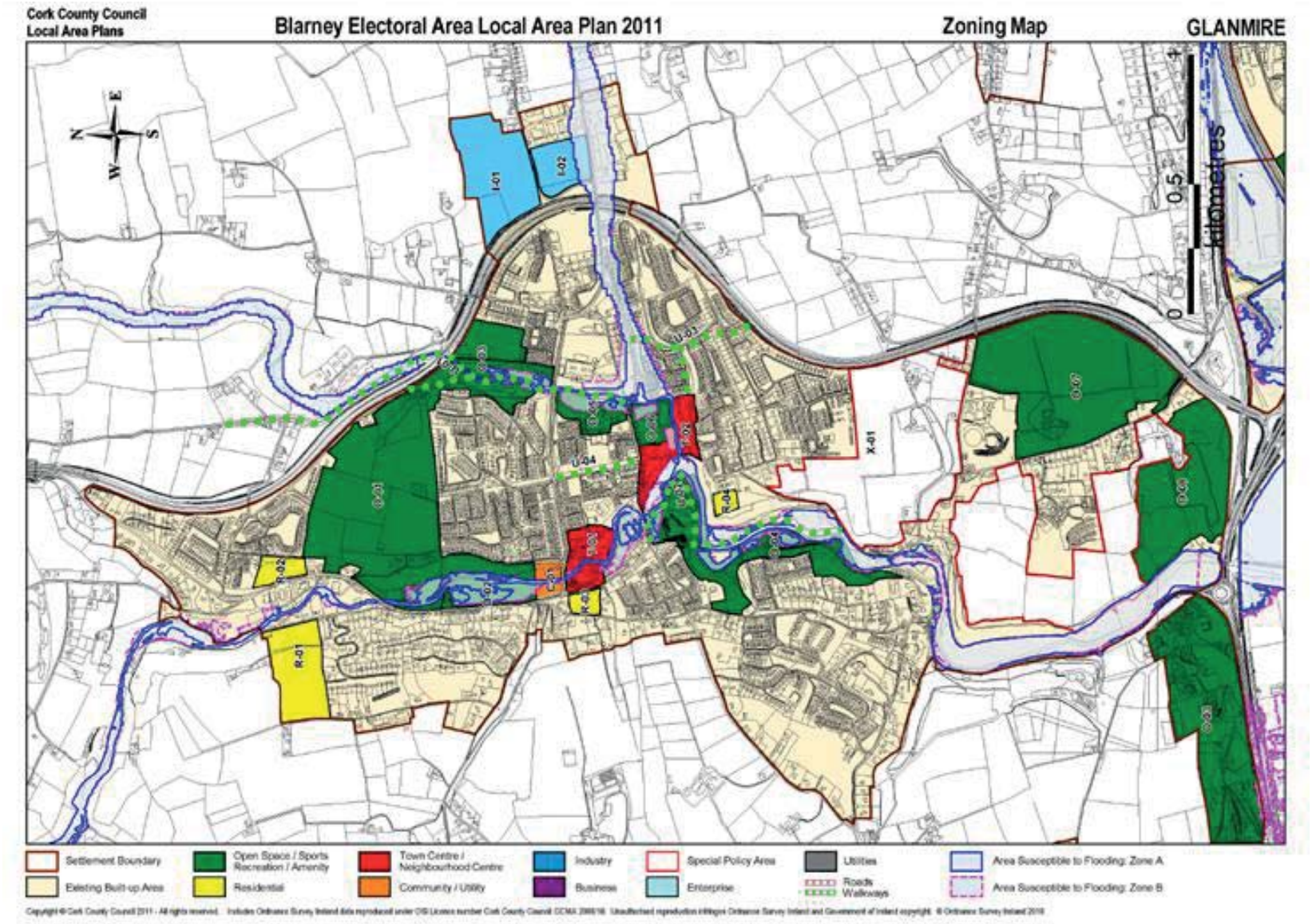
- Cork County Council website www.corkcoco.ie
- *Cork County Development Plan 2009 (2nd Edition)*
- *County Cork Waste Management Plan* (2004),
- Department of the Environment, Community and Local Government *Water Services Investment Programme (WSIP) 2010-2012* www.environ.ie
- EPA Waste Water Discharge Licence Applications for Waste Water Agglomerations within the Study Area http://www.epa.ie/terminalfour/wwda
- EPA online mapped Licenced Waste Facilities
- National Waste Collection Permit Office online data (www.nwcpo.ie)

Appendix A

Blarney Electoral Area LAP
Zoning Map for Glanmire

A1 Blarney Electoral Area LAP Zoning Map for Glanmire

The zoning map for Glanmire is provided overleaf.


Cork County Council
Local Area Plans
Blarney Electoral Area Local Area Plan 2011
Zoning Map
GLANMIRE
N
E
S
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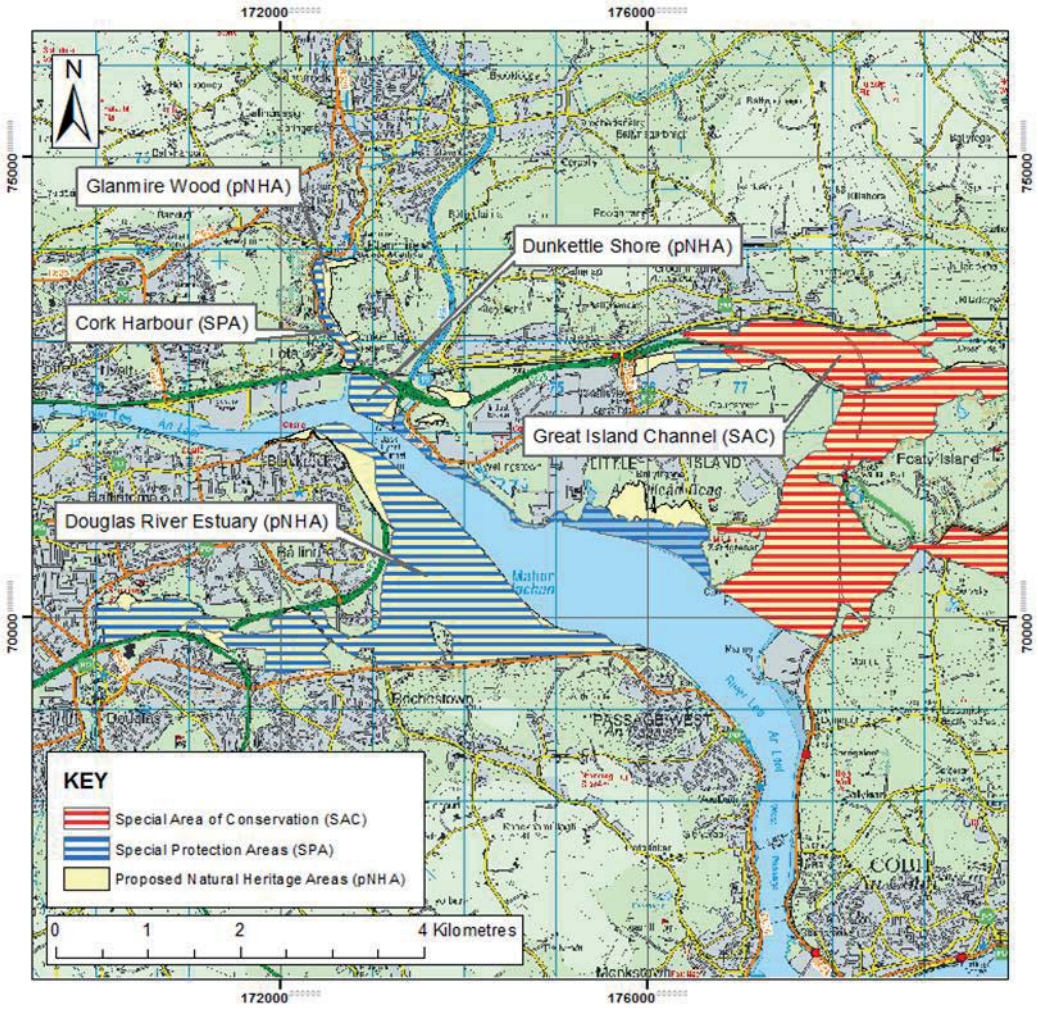
0
0.5
1
kilometres
I-01
I-02
U-01
U-04
X-01
R-01
R-02
R-04
Settlement Boundary
Existing Built-up Area
Open Space / Sports Recreation / Amenity
Residential
Town Centre / Neighbourhood Centre
Community / Utility
Industry
Business
Special Policy Area
Enterprise
Utilities
Roads
Walkways
Area Susceptible to Flooding: Zone A
Area Susceptible to Flooding: Zone B

Appendix B

Map of Nature Conservation Sites

B1 Details of Nature Conservation Sites

A map of statutorily designated conservation sites, and proposed natural heritage areas is provided below.



Statutorily designated conservation sites and proposed natural heritage areas

Appendix C

Archaeological Report and Mapping

C1 Archaeological Report and Mapping

The full Archaeological report and mapping is provided overleaf.

Archaeology, Architectural and Cultural Heritage

1 Introduction

This section assesses and evaluates the potential archaeological, architectural and cultural heritage constraints of the Study Area. Archaeology includes all pre-1700 sites and all levelled/buried features of any date. Architecture includes upstanding buildings and structures which largely date post 1700.

Definitions

'Archaeological Heritage' can be described as the study of past human societies through their material remains and artefactual assemblages. Our knowledge and understanding of past societies, with no written record, is enhanced by the study of archaeological remains.

'Architectural Heritage' is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

The phrase 'Cultural Heritage' is a generic term that spans thousands of years and covers a multitude of cultural, archaeological and architectural sites and monuments within the landscape. EPA Guidelines (2003) define cultural heritage as including archaeological heritage, architecture, history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names.

2 Methodology

This section was compiled using the following documents:

- *Guidelines on the information to be contained in Environmental Impact Statements* (Environmental Protection Agency, 2002).
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (Environmental Protection Agency, 2003).
- *Framework and Principles for the Protection of the Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).
- *Policy and Guidelines on Archaeological Excavation* (Department of Arts, Heritage, Gaeltacht & the Islands, 1999).
- *Guidelines for the assessment of Archaeological Heritage Impacts of National Road Schemes* (National Roads Authority, 2005). (Although the proposed project is not a road it is a linear corridor extending continuously across the landscape and thus these guidelines were considered appropriate).
- *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes* (National Roads Authority, 2005

In compiling the desktop study, the following sources were used:

- **Database of Irish Excavation Reports (www.excavations.ie)** – This web site provides a database of summary reports of all archaeological excavations and investigations in Ireland undertaken from 1970 to 2010.

- **Cartographic Sources** – The various editions of the Ordnance Survey six-inch maps; first, second and third editions for Cork were consulted.

- **Record of Monuments and Places (RMP)** - This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It provides a list of all known archaeological monuments and places of archaeological interest, with an accompanying set of constraint maps. Its numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey (OS) map number six-inch to the mile scale, the second part is the number which refers to the specific archaeological site e.g. CO64-10 refers to circle 10 on OS sheet 64 for Cork. This number is generally placed beside a circle which surrounds the archaeological site. The area within the circle is referred to as the Zone of Archaeological Notification for that site. The RMP for County Cork was published in 1998. It is an offence to interfere with any of the sites or monuments listed in the RMP without first giving two months notice in writing to the National Monuments Service (NMS) at the Department of Arts Heritage and the Gaeltacht (DAHG).

- **Sites and Monuments Database of the Archaeological Survey of Ireland** - The purpose of the Archaeological Survey of Ireland (ASI) is to compile a base-line inventory of the known archaeological monuments in the State. The large archive and databases resulting from the survey is being continually updated. This database, complete with maps is available at www.archaeology.ie. The database also provides lists of National Monuments that are in the ownership or guardianship of the State.

  National Monuments – Section 8 of the National Monuments (Amendment) Act 1954 provides for the publication of a list of monuments, the preservation of which is deemed to be of national importance. Ministerial consent must be granted before any works are carried out with respect to a National Monument. There are no National Monuments in the ownership or guardianship of the state within the Study Area.

- **Files of the National Monuments Service** - Some recorded archaeological sites have been afforded added protection under the following legislation (National Monuments are mentioned above:

  Monuments subject to Preservation Orders and Temporary Preservation Orders – The National Monuments Act 1930, provides for the making of preservation orders to protect national monuments that are considered to be under threat. The prior written consent of the Minister is required for any works at or in proximity to the monument. There are no monuments subject to preservation orders or temporary preservation orders in the Study Area.

Register of Historic Monuments – Under Section 5 of the National Monuments (Amendment) Act 1987, two months notice must be given in writing to the Minister in advance of any proposal to carry out work in relation to a historic monument or archaeological area entered on the Register. There are two monuments within the Study Area which are listed in the Register: a ringfort in Killalough (CO064-004) and a ringfort in Whitechurch (CO063-015).

- **County Development Plan for Cork (2009)** – The County Development plan for Cork 2009 outlines the County Council's objectives with regard to the preservation of the archaeological and architectural heritage of the county. The plan outlines the Council's objectives regarding the protection of the archaeological heritage including the protection of all archaeological monuments listed in the RMP and also those archaeological sites discovered since the publication of the RMP. The zones of archaeological potential identified in the RMP are to be protected as well as historic towns, underwater archaeology and industrial archaeology. The County Development Plan for Cork provides a Record of Protected Structures (RPS) as required in the Planning and Development Act 2000 (Part IV). This record lists structures or parts of structures which due to their special architectural, historical, archaeological, artistic, cultural, scientific or technical interest warrant inclusion for protection on this record. There are thirty-five protected structures within the constraint Study Area (Table 2 of archaeology report in **Appendix C**). The County Development Plan includes an objective to preserve the physical character of towns and villages where collections of buildings and their settings as a whole enhance the character of that area. This is designated an Architectural Conservation Area (ACA) and gives protection to the built heritage which may not be suitable for inclusion in the RPS. There are no ACAs in the constraint Study Area.

- **Draft County Development Plan for Cork (2013)** – The Draft County Development Plan for Cork (2013) outlines additional objectives regarding archaeological heritage including the protection of monuments listed in the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP), as well as 'sites, features and objects of archaeological and historical interest generally'. The zones of archaeological potential identified in the RMP are to be protected as well as underwater archaeology and historic towns. The significance of medieval archaeology, post medieval archaeology, industrial archaeology, battlefield and siege sites as well as structures shown on the 1st and 2nd edition Ordnance Survey 6 inch maps will be assessed prior to any development. The maintenance of burial grounds will be encouraged.

  The draft plan also outlines additional objectives regarding architectural heritage to ensure that changes or alterations to the buildings included in the RPS will retain and enhance their existing special character and setting under criteria set out in Architectural Heritage Protection – Guidelines for Planning Authorities (2005). The draft plan outlines the extension of the RPS to form a comprehensive schedule for the county; protect structures listed in the RPS as well as their curtilage and attendant grounds; ensure that development proposals for protected structures are appropriate and of high quality and ensure best conservation practises are promoted. In addition the council will

seek to enhance all historic structures, features and landscapes not included in the RPS as well as non-structural elements such as historic gardens, stone walls, ditches and street furniture.

The draft plan further defines ACAs as a place, area, group of structures or townscape that is of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest or contributes to the appreciation of protected structures. The objectives for the ACA include the protection of the features and elements of the ACA from demolition and non-sympathetic alterations, to promote sensitive re-use and rehabilitation of buildings and sites in the ACAs, to ensure new development with or nearby is sympathetic and of high quality. Encourage repair and re-use of traditional shop fronts and high quality architectural design within the ACA, ensure that new signage etc is appropriate and that open spaces are protected and that appropriate material are uses during public infrastructure projects.

- **National Inventory of Architectural Heritage (NIAH)** - The work of the National Inventory of Architectural Heritage (NIAH) involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey. The main function of both is to identify and evaluate the country's architectural heritage in a uniform and consistent manner as an aid to its protection and conservation. The National Inventory of Architectural Heritage carried out a survey of the buildings of the County between 2006 and 2011. This provides the basis for the recommendations of the Minister for Arts Heritage and the Gaeltacht to the planning authority for inclusion of structure in the RPS. The minister has recommended that all buildings of 'Regional' importance or higher be included in the RPS. If this is not adopted by the local authority the reasons must be communicated to the Department. The Building and Historic Garden Survey for County Cork is available online (www.buildingsofireland.ie). A selection of some of the buildings and structures listed in the NIAH within the constraint Study Area is listed in Table 3.

3 Receiving Environment

The receiving environment is described in the following sections. Archaeological mapping is presented in **Appendix C** of the constraints report.

3.7.3.1 Overview of the Archaeological, Architectural and Cultural Heritage Environment

Table 1 gives details of all archaeological sites listed in the RMP for County Cork within the constraint Study Area and referred to in this section. The overview is based mainly on information from the Sites and Monuments Database of the Archaeological Survey of Ireland, the RMP and the Archaeological Inventory of County Cork: Volume 2 East and South Cork (Power 1994) and Volume 5 (Ronan, Egan, Byrne 2009).

The Glashaboy River rises to the north of the village of Carrignavar in the townland of Glashaboy North. It flows roughly southwards passing along the east side of Carrignavar and on its south side is joined by another south-flowing stream coming from the west side of the village. The river continues southeastward towards Glanmire before discharging into the Lee estuary in the inner reaches of Cork Harbour at Lough Mahon. Glanmire village was home to a thriving milling industry in the 18th century and the Glashaboy provided power for these mills. The village of Glanmire is located c. 5km to the east of Cork City and has become a commuter town to the City in recent times.

The constraints Study Area for the Glashaboy Flood Relief Scheme is extensive, with the majority of the area extending eastwards from the Glashaboy River and covering an area of approximately 180 Square km. It spreads from edge of the eastern suburbs of Cork City (Ballyvolane, Mayfield and Montonette) as far east as, and beyond, Watergrasshill and Knockraha: it extends from the edge of Lough Mahon to the south as far north as Watergrasshill to the northeast and Glashaboy townland to the northwest. The River flows at the western side of the Study Area with only a narrow corridor between it and the western edge of the Study Area. A second river, the Butlerstown, rises in the area of Mitchellsfort and flows south to discharge to the Glashboy at Glanmire while a third, lesser river, the Glenmore, flows from the east joining the Butlerstown at Glanmire. There are approximately 100 townlands in the constraints Study Area. There are five settlement clusters within the Study Area, all of which could be described as commuter areas to Cork City. Perhaps the fastest growing of these is the area of Glanmire/Sallybrook at its southern end where both settlements have grown into one another. Carrignavar and Whitechurch are at the northwest end, Watergrasshill is at the northeastern end and Knockraha is towards the southeast. The N8 Cork-Dublin National Primary Road runs roughly north/south through the eastern part of the Study Area. The landscape is undulating, dominated by rolling hills and valleys. The Study Area spans the civil parishes of Caherlag, Carrigtwohill, Ballydeloher, Rathcooney, Kilquane, Killaspugmullane, Templeusque, St Michael's, Whitechurch, Dunbulloge, Ballydeloher and the Baronies of Cork, Barretts and Barrymore.

There are 331 archaeological sites listed in the RMP within the Study Area giving evidence of early human activity in the area from as early as the late Neolithic (3, 000 - 2,400 BC) and Bronze Age (c. 2,400 BC to 500 BC). In the course of the development of the N8 Glanmire-Watergrasshill bypass a number of archaeological sites were excavated (Hanley & Hurley 2013) and these are all listed in the RMP. These dated from all periods and are included in this assessment. Although they are not considered as constraints, as they no longer exist, they are indicative of the range of human activity in the Study Area and are considered in this overview.

Table 1 lists all archaeological sites within the constraint Study Area and referred to in the report.

Table 1 Archaeological sites included on the RMP and Sites and Monuments database within the constraint Study Area

RMP	Townland	Site Type
CO042-082	Tooreen South	Burial
CO042-083	Glashaboy North	Fulacht fia
CO051-039	Glashaboy South	Possible ogham stone
CO051-158	Dromgarriff North	Fulacht fia
CO052-001	Ballyvorisheen West Ballyvorisheen East Gormlee	Bridge
CO052-007	Gormlee	Possible ringfort
CO052-008	Gormlee	Standing stone
CO052-009	Ballynaglogh East	Standing stone
CO052-010	Ballynaglogh East	Standing stone
CO052-011	Ballynaglogh East	Moated site
CO052-012	Ballybrack	Earthwork
CO052-013	Pouladown	Possible ringfort
CO052-014	Longstone	Ogham stone
CO052-015	Longstone	Standing stone
CO052-016	Longstone	Standing stone
CO052-017	Longstone	Standing stone
CO052-018	Farranastig	Possible ringfort
CO052-019	Ryefield East	Possible ringfort
CO052-020	Ryefield East	Wedge tomb
CO052-021	Gormlee	Possible standing stone
CO052-022	Laharan	Holy well
CO052-023	Laharan	Rectangular enclosure
CO052-024	Ballycaskin	Standing stone
CO052-025001-	Gormlee	Possible ringfort
CO052-025002-	Gormlee	Possible souterrain
CO052-026	Carrignavar	Possible ringfort
CO052-027	Carrignavar	Standing stone
CO052-028	Carrignavar	Church of Ireland church
CO052-029	Carrignavar	Standing stone
CO052-030	Lyre	Ringfort
CO052-031	Ballynabortagh	Ringfort
CO052-032	Ballynabortagh	Circular enclosure
CO052-033	Ballynabortagh	Standing stone
CO052-034001-	Ballynabortagh	Possible early ecclesiastical enclosure
CO052-034002-	Ballynabortagh	Church
CO052-034003-	Ballynabortagh	Bullaun stone

RMP	Townland	Site Type
CO052-034004-	Ballynabortagh	Burial ground
CO052-035	Ballynaglogh East	Standing stone
CO052-036	Ballynabortagh	Castle (site of)
CO052-037	Ballynabortagh	Rectangular enclosure
CO052-038	Ballynabortagh	Souterrain
CO052-039001-	Ballynabortagh	Ogham stone
CO052-039002-	Ballynabortagh	Rectangular enclosure
CO052-039003-	Ballynabortagh	Anomalous stone group
CO052-039004-	Ballynabortagh	Souterrain
CO052-039005-	Ballybrack	Holy well
CO052-040	Templemichael	Possible standing stone
CO052-041	Templemichael	Possible ringfort
CO052-042	Ballyskerdane	Possible ringfort
CO052-043	Ballynamaddree	Fulacht fia
CO052-044	Ballythomas	Possible ringfort
CO052-045	Ballynamaddree	Fulacht fiadh
CO052-046	Ballynamaddree	Possible ringfort
CO052-047	Ballindeenisk	Ringfort
CO052-048	Ballindeenisk	Stone row
CO052-049	Ballindeenisk	Standing stone
CO052-051	Knockanroe	Redundant Record
CO052-052	Knockboy	Bullaun stone
CO052-053	Ballynabortagh	Ogham stone
CO052-055	Laharan	Cross-slab
CO052-056	Carrignavar	Possible souterrain
CO052-057	Ballynabortagh	Possible souterrain
CO052-058	Knockboy	Fulacht fia
CO052-059	Knockboy	Fulacht fia
CO052-060	Glashaboy East	Moated site
CO052-061001-	Ballynabortagh	Souterrain
CO052-061002-	Ballynabortagh	Ogham stone
CO052-061003-	Ballynabortagh	Ogham stone
CO053-031	Pouladown	Ringfort
CO053-035	Ballinlegane	Standing stone
CO053-036	Ballinlegane	Possible ringfort
CO053-037	Ballinlegane	Possible ringfort
CO053-038	Ballinlegane	Fulacht fia
CO053-039	Ballinlegane	Possible ringfort

RMP	Townland	Site Type
CO053-040	Bishop's Island	Standing stone
CO053-041	Bishop's Island	Ringfort
CO053-043	Bishop's Island	Standing stone
CO053-044	Bishop's Island	Circular enclosure
CO053-093	Ballinlegane	AP: Rectangular enclosure
CO053-094	Ballinlegane	Circular enclosure
CO053-028	Bishop's Island	Possible fulacht fia
CO053-092001-	Mitchellsfort	Fulacht fia
CO053-092002-	Mitchellsfort	Fulacht fia
CO053-092003-	Mitchellsfort	Possible fulacht fia
CO053-050	Ballindeenisk	Ringfort
CO053-051	Coneybeg	Possible ringfort
CO053-052	Trantstown	Castle (site of)
CO053-053	Trantstown	Ringfort
CO053-054	Trantstown	Ringfort
CO053-055	Rathfilode	Possible ringfort
CO053-056	Rathfilode	Possible ringfort
CO053-057	Mitchellsfort	Circular enclosure
CO053-058	Mitchellsfort	Tree ring
CO053-059	Mitchellsfort	Ringfort
CO053-060	Mitchellsfort	Ringfort
CO053-061	Mitchellsfort	Ringfort
CO053-062	Shanballyreagh	Possible ringfort
CO053-102	Mitchellsfort	Cremated remains
CO053-100	Mitchellsfort	Burnt mound
CO053-101	Mitchellsfort	Burnt mound
CO053-097	Trantstown	Burnt mound
CO063-095	Whitechurch	Ornamental tower
CO063-104	Whitechurch	Standing stone
CO063-014001-	Whitechurch	Graveyard
CO063-014002-	Whitechurch	Church of Ireland church
CO063-015	Whitechurch	Ringfort
CO063-016	Whitechurch	Moated site
CO063-017	Whitechurch	Possible ringfort
CO063-018	Whitechurch	Ringfort
CO063-020	Knockaneag	Redundant record
CO063-021	Ballyhesty	Standing stone pair
CO063-022001-	Carrignavar	Tower house

RMP	Townland	Site Type
CO063-022002-	Carrignavar	Castle(site of)
CO063-106	Knockaneag	Standing stone
CO063-023	Coole West	Rectangular enclosure
CO063-107	Dunbullogue	Souterrain
CO063-025001-	Dunbullogue	Graveyard
CO063-025002-	Dunbullogue	Church
CO063-026	Dunbullogue	Ogham stone
CO063-027	Dunbullogue	Ringfort
CO063-028001-	Templemichael	Circular enclosure
CO063-028002-	Templemichael	Church
CO063-029	Coolgreen	Holy well
CO063-030	Ballindeenisk	Ringfort
CO063-031001	Templeusque	Graveyard
CO063-031002-	Templeusque	Church
CO063-032	Templeusque	Ringfort
CO063-033	Templeusque	Possible ringfort
CO063-034	Templeusque	Possible ringfort
CO063-035	Ballynaparson	Possible ringfort
CO063-036	Coole East	Possible ringfort
CO063-037	Coole East	Possible ringfort
CO063-038	Coole East	Possible ringfort
CO063-039	Coole East	Possible ringfort
CO063-040	Coole East	Possible ringfort
CO063-041	Cool East	Ringfort
CO063-042	Sarsfieldscourt	Possible ringfort
CO063-043	Sarsfieldscourt	Standing stone
CO063-044	Sarsfieldscourt	Possible ringfort
CO063-098	Templemichael Coole East	Bridge
CO063-099	Coole East	Woollen mill
CO063-109	Templeusque	Bullaun stone
CO063-004	Sarsfieldscourt	Spade mill
CO063-075	Ballynoe	Possible ringfort
CO063-077	Ballinvriskig	Possible standing stone
CO063-089	Ballyphilip	Circular enclosure
CO063-090	Ballyphilip	Possible standing stone
CO063-091	Knocknahorgan	Standing stone
CO063-092	Knocknahorgan	Possible ringfort
CO063-093	Knocknahorgan	Cloth mill

RMP	Townland	Site Type
CO063-094	Riverstown	Cloth mill
CO063-069	Riverstown	Paper mill
CO063-079	Garraneboy	Possible standing stone
CO063-080	Garraneboy	Possible standing stone
CO063-081	Garraneboy	Possible standing stone
CO063-082	Garraneboy	Possible ringfort
CO063-084	Lahardane	Fulacht fia
CO063-085	Rathcooney	Fulacht fia
CO063-086	Rathcooney	Possible ringfort
CO063-087001-	Rathcooney	Graveyard
CO063-087002-	Rathcooney	Church
CO063-088001-	Rathcooney	Country house
CO063-088002-	Rathcooney	Ornamental tower
CO064-146	Crushyriree	Horizontal wheeled mill
CO064-147	Crushyriree	Fulacht fia
CO064-148001-	Crushyriree	Fulacht fia
CO064-148002-	Crushyriree	Fulacht fia
CO064-148003-	Crushyriree	Fulacht fia
CO064-149	Crushyriree	Fulacht fia
CO064-150	Crushyriree	Fulacht fia
CO064-151	Killalough	Fulacht fia
CO064-152	Killalough	Fulacht fia
CO064-001	Coneybeg	Circular enclosure
CO064-003	Crushyriree	Possible ringfort
CO064-004001-	Killalough	Ringfort
CO064-004002-	Killalough	Possible souterrain
CO064-005	Trantstown	Limekiln
CO064-006	Ballinvinny North	Possible ringfort
CO064-007	Ballinvinny North	Circular enclosure
CO064-008	Ballinvinny North	Possible ringfort
CO064-009	Ballinvinny North	Possible ringfort
CO064-010	Ballinvinny South	Ringfort
CO064-011	Ballinvinny South	Possible ringfort
CO064-012001-	Coolnacaha	Graveyard
CO064-012002-	Cllonacaha	Church
CO064-013	Ballingohig	Possible ringfort
CO064-014001-	Kilrussane	Early ecclesiastical enclosure
CO064-014002-	Kilrussane	Church

RMP	Townland	Site Type
CO064-014003-	Kilrussane	Church
CO064-015	Trantstown	Holy well
CO064-016	Rathfilode	Levelled circular enclosure
CO064-017	Rathfilode	Ringfort
CO064-018	Rathfilode	Circular enclosure
CO064-019	Rathfilode	Ringfort
CO064-020	Rathfilode	Possible ringfort
CO064-021001-	Rathfilode	Ringfort
CO064-021002-	Rathfilode	Possible souterrain
CO064-022	Coolguerisk	Possible ringfort
CO064-023	Coolguerisk	AP: Circular enclosure
CO064-024	Coolguerisk	AP: Square enclosure
CO064-025	Kilquane	Holy well
CO064-026001-	Kilquane	Early ecclesiastical enclosure
CO064-026002-	Kilquane	Graveyard
CO064-026003-	Kilquane	Church
CO064-027	Kilquane	Standing stone
CO064-028	Knockraha East	Possible ringfort
CO064-029	Knockraha East	Circular enclosure
CO064-030	Knockraha East	Possible ringfort
CO064-031	Lisheenroe	Ringfort
CO064-044	Sarsfieldscourt	Castle (site of)
CO064-045	Killydonoghoe	Circular enclosure
CO064-046	Killydonoghoe	Burial ground
CO064-047	Hermitage	Standing stone
CO064-048	Hermitage	Standing stone
CO064-049	Hermitage	Sweathouse
CO064-050	Riverstown	Ornamental lake
CO064-051	Riverstown	Country house
CO064-052	Brooklodge	Tuck mill
CO064-053	Brooklodge	Holy well
CO064-054001-	Brooklodge	Graveyard
CO064-054002-	Brooklodge	Church of Ireland church
CO064-055	Brooklodge	Castle(site of)
CO064-056	Brooklodge Corbally North	Fish pond
CO064-057	Ballyvisteale Demesne	Country house
CO064-058	Ballyvisteale	Possible ringfort
CO064-059	Ballyvisteale	Standing stone

RMP	Townland	Site Type
CO064-060	Ballyvisteale	Enclosure
CO064-061	Blossomgrove	Possible ringfort
CO064-062	Blossomgrove	Possible ringfort
CO064-063	Blossomgrove	Possible ringfort
CO064-064	Gogganstown	Possible ringfort
CO064-065	Ballynanelagh	Possible ringfort
CO064-066	Ballynanelagh	Possible standing stone
CO064-067	Ballynagarbragh	Possible ringfort
CO064-068	Lackenroe	Possible ringfort
CO064-069	Lackenroe	Possible ringfort
CO064-070	Ballycurreen	Paper mill
CO064-071	Ballynagaul	Ringfort
CO064-072	Ballynagaul	Ringfort
CO064-073	Killeena	Possible ringfort
CO064-074	Killeena	Possible ringfort
CO064-075	Killeena	Enclosure
CO064-076	Killeena	Bullaun stone
CO064-077	Killeena	Possible ringfort
CO064-078	Ballinbrittig	Ringfort
CO064-079	Ballinbrittig	Holy well
CO064-080	Ballinbrittig	Ringfort
CO064-081	Ballinbrittig	Ringfort
CO064-082	Ballinbrittig	Ringfort
CO064-083	Ballinbrittig	Possible ringfort
CO064-084	Ballinbrittig	Ringfort
CO064-110	Brookville	Quarry
CO064-111	Riverstown Poulacurry North Poulcurry South	Bridge
CO064-142	Riverstown	Lime kiln
CO064-002	Ballynagaul	Country house
CO064-089001-	Killacloyne	Fulacht fia
CO064-089002-	Ballinbrittig	Church
CO064-170	Kilrussane	Metal working
CO064-177	Trantstown	Burnt mound
CO064-175	Trantstown	Metal working
CO064-164	Ballinvinny North	Furnace
CO064-162	Ballinvinny North	Kiln-corn drying
CO064-156001-	Ballinvinny South	Moated site

RMP	Townland	Site Type
CO064-156002-	Ballinvinny South	House –medieval
CO064-156003-	Ballinvinny South	House –medieval
CO064-156004-	Ballinvinny South	House 16th /17th century
CO064-157	Ballinvinny South	House 16th /17th century
CO064-158	Ballinvinny South	House 16th /17th century
CO064-159	Ballinvinny South	House 16th /17th century
CO064-160	Ballinvinny South	House 16th /17th century
CO064-161	Ballinvinny South	Road/trackway
CO064-163	Ballinvinny South	Metal working
CO064-153	Ballinvinny South	Burnt mound
CO064-169	Killydonoghoe	Pit burial
CO064-168	Killydonoghoe	Pit burial
CO064-171	Killydonoghoe	Excavation –miscellaneaous
CO064-167	Killydonoghoe	House –Bronze Age
CO064-166	Killydonoghoe	Pit burial
CO064-165	Killydonoghoe	Enclosure
CO074-022	Ballyharoon	Ringfort
CO074-113	Ballyharoon	Country house
CO074-071	Poulacurry South	Mound
CO074-104	Poulacurry South	Church of Ireland church
CO074-023	Lotamore	Ringfort
CO074-024	Lotabeg	Country house
CO074-025	Lotabeg	Gate pier
CO074-026	Lotamore	Country house
CO075-001	Poulacurry South	Cloth mill
CO075-002001-	Ballinglanna	Corn mill
CO075-002002-	Ballinglanna	Lime kiln
CO075-003	Ballinglanna	Distillery
CO075-004	Rowgarrane	Possible ringfort
CO075-006	Corbally South	Possible ringfort
CO075-007	Rowgarrane	Possible ringfort
CO075-069	Ballinglanna	Coaching house
CO075- 048	Ballinglanna Poulacurry South	Bridge
CO075-080	Dunkettle	Ice house
CO075-075	Dunkettle	Country house
CO075-002002-	Ballinglanna	Lime kiln
CO075-094001-	Ballinglanna	Architectural fragment
CO075-094002-	Ballinglanna	Architectural fragment

The earliest evidence of human activity in the Study Area is a wedge tomb in Ryefield East (CO052-020) at the northwest of the Study Area. These tombs are one of four types of communal burial tombs found in the landscape the origins of which date to the Neolithic (4000-2400 BC) and extend into the Bronze Age (2400-500 BC). The large majority of megalithic tombs found in Co Cork are wedge tombs which generally date to the Neolithic – Bronze Age transition or the Chalcolithic. The majority of wedge tombs conform to a general design; they have a pronounced wedge shape in plan and section with the entrance generally located at the broader southwestern end. The human remains interred in the monuments are generally cremated and grave goods frequently accompany them.

There is one anomalous stone group (CO052-039003-) in Ballynabortagh in the northwest of the Study Area. These are megalithic stone monuments which do not conform to known monument types, however, they may represent partially destroyed Bronze Age monuments.

There are a large number of monuments which date to the Bronze Age in the Study Area. There are twenty fulachtai fia (CO042-083, CO051-158, CO052-043, CO052-045, CO052-058, CO052-059, CO053-038, CO053-092001-, CO053-092002-, CO063-084, CO063-085, CO064-147, CO064-148001-, CO064-148002-, CO064-148003-, CO064-149, CO064-150, CO064-151, CO064-152 and CO064-089001-) and 2 possible fulachtai fia (CO053-028 and CO053-092003-) from throughout the Study Area as well as five burnt mounds (CO053-100, CO053-101, CO053-097, CO064-153 and CO064-177). Fulachtai fia are ancient cooking sites also known as burnt mounds which present as low crescent shaped mounds usually in poorly drained ground. Many have been levelled and are visible as a spread of heat shattered stones and blackened soil in ploughed fields. A number of the above listed features were found in advance of and during construction works on the N8 Glanmire Watergrasshill by-pass including five in Mitchellsfort (CO053-092001-, CO053-092002-, CO053-092003-, CO053-100 and CO053-101), one each in Trantstown (CO064-177), Ballinvinny South (CO064-153) and Killalough (CO064-152).

There are twenty-three standing stones in the Study Area (CO052-008, CO052-009, CO052-010, CO052-015, CO052-016 and CO052-017, CO052-024, CO052-027, CO052-029, CO052-033, CO052-035, CO052-049, CO053-035, CO053-040, CO053-043, CO063-104, CO063-106, CO063-043, CO063-091, CO064-027, CO064-047, CO064-048 and CO064-059) and eight possible standing stones (CO052-021, CO052-040, CO063-077, CO063-090, CO063-079, CO063-080, CO063-081 and CO064-066). Single standing stones are quite common in the landscape and may date from several periods and may have fulfilled several functions. Ancient standing stones are generally thought to be of Bronze Age date, but may also be later extending into the Iron Age or historical period. The long axis of the ancient stones is frequently oriented northeast southwest. Their precise dating can usually only be determined by excavation. Standing stones had a number of possible functions in the landscape from prehistoric burial markers to boundary markers along ancient routeways. In more recent times they were sometimes erected as scratching posts for cattle and these can be difficult to distinguish from ancient examples.

Other monuments which also date to the Bronze Age are stone rows and standing stone pairs. Stone rows are three or more closely set standing stones generally on a southwest northeast axis. There is one (CO052-048) in the north of the Study Area in Ballindeenisk. Standing stone pairs are two closely set stones in a line

generally on a southwest northeast axis. There is one (CO063-021) in the northwest of the Study Area. These two monuments were quite similar in nature and date and probably had similar ritual or ceremonial functions.

During the construction of the southern portion of the N8 Glanmire Watergrasshill By-pass a number of Bronze Age sites were revealed in Killydonoghoe and excavated. The remains of a timber built Bronze Age circular house (CO064-167) c. 6m diameter, with a central hearth was excavated and a short distance west of the house remains a series of grain storage pits containing fragment of saddle querns were excavated (CO064-171). Three Bronze Age pit burials (CO064-169, CO064-168 and CO064-166) which contained cremated humans remains and some contemporary funerary pottery were also excavated. During construction works on the northern section of the road in Mitchellsfort cremated remains (CO053-102) were revealed with no accompanying grave goods.

During construction works on the N8 Glanmire Watergrasshill by-pass a number of metal working sites comprising bowl furnaces were identified and excavated. Five were found in Kilrussane (CO064-170) and were dated to 4th century BC. Two similar features were found in Trantstown (CO064-175) to the north as well as a single furnace to the south in Ballinvinny North (CO064-162). All date to the Iron Age.

Ogham stones are inscribed stones on which a series of parallel lines or notches represent letters of the Roman alphabet. There are generally dated to the second or third centuries AD and continued in use during the following centuries when Christianity was introduced. They are most commonly found in Co Cork and Kerry. There are six ogham stones in the Study Area (CO052-039001-, CO052-053, CO063-026, CO052-014, CO052-061002- and CO052-061003-) and one possible example (CO051-039). Two of these ogham stones (CO052-061002- and CO052-061003-) which were re-used in the construction of a later souterrain in Ballynabortagh (CO052-061001-) where they were found when the souterrain collasped. The ogham stone in Longstone (CO052-014) is locally known as ‘An Cloch Fhada’. All of the ogham stones are located in the northwestern part of the Study Area.

There are a large number of sites within the Study Area which date to the Early Christian or early medieval period (c. 500 to 1100 AD). The early medieval period in Ireland is characterised by the introduction of Christianity from the late 4th century onwards becoming widely established during the second half of the sixth century. One of the most characteristic secular monuments of this period was the ringfort, occupied by the elite and their families of the time. Ringforts are defended farmsteads generally circular or oval in plan defined by an earthen bank with an external ditch or fosse. On more elaborate sites additional banks and ditches can be present (bi-vallate and tri-vallate) but the large majority of ringforts are uni-vallate. The main phase of construction and occupation of these sites dates from the beginning of the 7th century AD to the end of the 9th century. There are thirty-two ringforts in the Study Area (CO052-030, CO052-031, CO052-047, CO053-031, CO053-041, CO053-050, CO053-053, CO053-054, CO053-059, CO053-060, CO053-061, CO063-015, CO063-018, CO063-027, CO063-030, CO063-032, CO063-041, CO064-004001-, CO064-010, CO064-017, CO064-019, CO064-021001-, CO064-031, CO064-071, CO064-072, CO064-078, CO064-080, CO064-081, CO064-082, CO064-084, CO074-022 and CO074-023). There are fifty-eight possible ringforts in the Study Area (CO052-007, CO052-013, CO052-018, CO052-019, CO052-025001-, CO052-026, CO052-041, CO052-042,

CO052-044, CO052-046, CO053-036, CO053-037, CO053-038, CO053-051, CO053-055, CO053-056, CO053-062, CO063-017, CO063-033, CO063-034, CO063-035, CO063-036, CO063-037, CO063-038, CO063-039, CO063-040, CO063-042, CO063-044, CO063-075, CO063-092, CO063-082, CO063-086, CO064-003, CO064-006, CO064-008, CO064-009, CO064-011, CO064-013, CO064-020, CO064-022, CO064-028, CO064-030, CO064-058, CO064-061, CO064-062, CO 064-062, CO064-063, CO064-064, CO064-065, CO064-067, CO064,068, CO064-069, CO064-073, CO064-074, CO064-077, CO064-083, CO075-004, CO075-006 and CO075-007). There are thirteen circular enclosures (CO052-032, CO053-044, CO053-094, CO053-057, CO063-028001-, CO063-089, CO064-001-, CO064-007, CO064-018, CO064-029 and CO064-045) of which one is levelled (CO064-016) and another was identified from an aerial photograph (CO064-023). Many of these circular enclosures may be levelled ringforts or cashels but in the absence of further archaeological investigation cannot be further classified.

Contemporary ecclesiastical sites are also represented in the Study Area. Rural monasteries were generally enclosed by an oval or circular earthen enclosure ranging in diameter from 40m to 400m. The largest of these enclosures would have contained a church, graveyard, dwellings, outbuildings and workshops while the smaller one may only have contained a church and graveyard. Bullaun stones and cross slabs are frequently found associated with the early ecclesiastical enclosures and holy well are frequently found in their general vicinity, located outside the enclosure.

There are two early ecclesiastical enclosures in the Study Area in Kilrussane and Kilquane (CO064014001- and CO064-026001-) and one possible early ecclesiastical enclosure in Ballynabortagh (CO052-034001-). There are four church site associated with these enclosures (CO052-034002-, CO064-014002-, CO064-014003- and CO064-026003-); two burial grounds (CO052-034004- and CO064-046) and one graveyard (CO064-026002-). There are four Bullaun stones in the Study Area (CO052-034003-, CO052-052, CO063-109 and CO064-076); one cross slab (CO052-055) and seven holy wells (CO052-022, CO052-039005, CO063-029, CO064-015, CO064-025, CO064-053 and CO064-079).

Some ecclesiastical sites as well as secular ringforts have associated souterrains, or man-made underground tunnels leading to a chamber or series of chambers. These were largely defensive features to give refuge at times or strife and may have had a secondary function for storage. There are four souterrains (CO052-038, CO052-039004-, CO052-061001- and CO063-107) in the study are and six possible souterrains (CO052-025002-, CO052-039004-, CO052-056, CO052-057, CO064-004002-, CO064-021002-).

The importance of arable agriculture to the economy of the early medieval period is in evidence through technological and engineering developments the remains of which are sometimes identified during construction works and added to the archaeological record. There is one horizontal wheeled mill (CO064-146) in Crushyriree in the central part of the Study Area. This was identified during drainage works in 1994 on a stream which flows into the Butlerstown River and was subsequently excavated and dated to around AD 800 (Cotter 1994). Horizontal wheeled mills are the earliest example of hydro-engineering known in Ireland and usually are revealed during drainage or land improvement works. Water from a millpond was channelled onto the horizontal wheel which was

housed in a sunken wheelhouse. The mill stones were driven by a vertical shaft attached to the wheel.

There is one corn drying kiln in the Study Area in Ballinvinny North (CO064-162). This was identified during construction works on the N8 Glanmire Watergrasshill by-pass. It was keyhole shaped in plan and comprised a bowl, flue and hearth. It was radiocarbon dated to the 9th to 11th centuries AD.

The beginning of the high medieval period in Ireland corresponds largely to the arrival of the Anglo-Normans in 1169 and over the following centuries their influence of the landscape grew. Moated sites (Anglo-Norman farmsteads) provide the earliest physical evidence for Anglo-Norman settlement in the country. These were manorial centres from which control was exerted over agricultural production in the surrounding landscape. They usually consist of square, rectangular, trapezoidal or occasionally circular enclosures. They are among the most numerous earthworks of the period. The interior is often raised and enclosed by one or more earthen banks with a wide, often water-filled, fosse and causewayed entrance. There are four moated sites in the Study Area (CO052-011, CO052-060, CO063-016 and CO064-156001-) of which the latter at Ballinvinny South was partially excavated in advance of construction on the N8 Glanmire Watergrasshill by-pass. The remains of two medieval houses (CO064-156002- and CO064-156003-), a probable entrance gate, and sherds of medieval pottery were revealed within the partially excavated eastern section of the moated site. During the post medieval period (16th and 17th centuries) this areas became the focus of settlement activity again when five houses (CO064-156004-, CO064-157, CO064-158, CO064-159 and CO064-160) were built on the site of the medieval moated site and immediately south of it. A metalworking site (CO064-163) revealed a short distance to the south and a road/ trackway (CO064-161) revealed further south again were probably associated with the post medieval settlement activity. All were excavated in advance of and during construction works on the N8 Glanmire Watergrasshill by-pass.

There are five rectangular enclosures (CO052-023, CO052-037, CO052-039002-, CO063-023 and CO053-093) in the Study Area, the latter was identified from aerial photography as well as one square enclosure (CO064-024). These probably represent the levelled remains of moated sites the precise nature of which cannot be confirmed in the absence of further archaeological investigation.

During this period the first castles were built in the country by the Anglo-Norman colonists. These functioned as well-defended fortress and private residence and were a strong visual presence in the landscape. The majority of castles in Ireland can be broadly classified into two groups; the early castles of the late 12th and 13th centuries and the tower houses of the 15th – 17th centuries. The latter are more common but frequently if only scant upstanding remains are present these are generally classified as castle (site of). There are five sites classified as castles (site of) in the Study Area (CO052-036, CO053-052, CO063-022002-, CO064-044 and CO064-055) and one tower house (CO063-022001-). Tower houses were tall, generally rectangular towers of three to five storeys usually built within a bawn or enclosure. These were built by both native Irish and Normans to defend against attacks rather than being substantial defensive military centres.

A well and folly both in Ballinglanna incorporate architectural fragments (CO075-094001- and CO075-094002-) of medieval masonry probably from the window of a tower house although there is no record of a tower house on the site.

The remains of a 16th /17th century house are in Ballyharoon (CO074-113). This belonged to the St Leger family and is in a field known as the 'Castle Field'.

There are a number of churches (CO063-025002-, CO063-028002-, CO063-031002-, CO063-087002-, CO064-012002- and CO064-089002-) and graveyards (CO063-025001-, CO063-031001-, CO063-087001-, CO064-012001-) in the Study Area. These were probably built during the 15th or 16th centuries, as parish churches and had gone out of use by the 17th century.

The term enclosure is applied to archaeological sites, which cannot be definitively classified. Very often these enclosures are ringforts or cashels, which fall beyond the accepted size range for these monuments (i.e. less than 20m or more than 60m in diameter). Sometimes they can be of indeterminate shape and may date to as early as the Bronze Age or as recently as the last century, when they were used as animal shelters. There are three enclosures within the Study Area. Two of these (CO064-060 and CO064-075) were depicted on the 1842 OS map and are now no longer visible and the other (CO064-165) is a sub-rectangular enclosure which was identified during construction works on the N8 Glanmire Watergrasshill by pass in Killydonoghoe.

Earthworks are sites which are generally raised or depicted as such on cartographic sources. The nature of these sites is generally unclear in the absence of further archaeological investigation. There is a single earthwork in the Study Area in Ballybrack (CO052-012). This was shown on the 1842 OS map and is now visible as a low oval mound.

There is a mound in Poulacurry South (CO074-071), in the grounds of the no longer extant Castle Jane House, which is believed to be ancient.

Sites and features dating to the post medieval period are quite common in the Study Area. These sites are ecclesiastical, infrastructural, industrial, residential, decorative, rural and agricultural.

There are four Church of Ireland churches in the Study Area in Carrignavar (CO052-028), Poulacurry South (CO074-104), Whitechurch (CO063-014002-) and Brooklodge (CO064-054002-). At Whitechurch and Brooklodge there were associated graveyards (CO063-014001- and CO064054001-). There is a burial site in Tooreen South (CO042-082) located at summit of a hill thought to be the burial place of a highwayman.

There are a number of bridges in the Study Area crossing the Glashaboy River and its tributaries. All of those listed in the RMP and RPS are spanning the Glashaboy River. At the north of the Study Area there is a double arch road bridge (CO052-001) in Ballyvorisheen East, Ballyvorisheen West and Gormlee. In Templemichael and Coole East there is a substantial road bridge, Templemichael Bridge, (CO063-098 RPS00386) spanning the Glashaboy River and the mill race to Coole Mill (CO063-099). In Riverstown, Poulacurry North and Poulacurry South there is a five arch hump-backed road bridge, Riverstown Bridge, (CO064-111 RPS00394). In Ballinglanna and Poulacurry South there is a three arch hump-backed road bridge, Glanmire Bridge, (CO075-048 RPS00483).

During the post medieval period the Glashaboy valley became a centre of industrial activity. There are a large number of mills of various types in the Study Area some of which are included in the RMP and RPS. There is a woollen mill at Coole East (CO063-099); a spade mill at Sarsfieldscourt (CO063-004); three cloth

mills at Knocknahorgan (CO063-093 RPS00388), Riverstown (CO063-094 RPS00389) and Poulacurry South (CO075-001 RPS00484); two paper mills at Riverstown (CO063-069, RPS00390) and Ballycurreen (CO064-070); a tuck mill at Brooklodge (CO064-052) and a corn mill at Ballinglanna (CO075-002001-RPS00485).

All of the mills are shown on the 1842 OS map and many are shown and named on subsequent editions, often after their use had been changed. The Paper Mill in Riverstown was depicted and named on subsequent editions as 'Sallybrook Woollen Mills' and the Cloth Mill at Knocknahorgan was named 'Silversprings Starch Works' on subsequent editions. The buildings in these complexes are in various states of disuse and decay (the woollen mill at Coole East has collapsed, the Riverstown cloth mill was partially damaged in a fire in the 1980s) and none are functioning as mills today. Most of these mills are situated on and were powered from, the Glashaboy River except the paper mill in Ballycurreen known in 1842 as the Glenmore Paper Mill which is on the Glenmore River and the Tuck Mill in Brooklodge which is on the Butlerstown River.

There was a distillery in Ballinglanna (CO075-003) on the Glashaboy River. This was named Distillery on the 1842 OS map and Brewery on the 1902 edition reflecting its change of use.

There is a large number of lime kilns in the Study Area which are shown on the 1842 OS map, only four of those within the Study Area are listed in the RMP (CO064-005, CO064-142, CO075-002002- and CO075-002002-). These sites generally date to the 18th and 19th centuries and were used in the production of fertilizer (quicklime) for agricultural use. There is a quarry site in Brookville (CO064-110).

There is a large number of country houses in the Study Area, a small number of which are included in the RMP and RPS. The country houses generally date to the 18th and 19th centuries when the post medieval suburbs of the city began to expand as the wealthier citizens left behind the overcrowded, cramped city centre to build attractive spacious houses set within generous estates but still within easy reach of the city. The country houses include Rathcooney House (CO063-088001-); Riverstown House (CO064-051 RPS00395) an early 18th century house remodelled in the 1730s; the late 18th century Brooklodge House or Ballyvisteale House in Ballinvisteale Demesne (CO064-057 RPS00398); Ballynagaul House (CO064-002); Lotabeg (CO074-024) built c.1800; the 18th century Lota House in Lotamore (CO074-026 RPS00477) overlooking the mouth of the Glashaboy River as it discharges into the Lee Estuary; and nearby the late 18th century Dunkettle House (CO075-075 RPS00493).

The country houses had many of the associated features of contemporary estates including ornamental towers (CO063-0880020 and CO063-095), ornamental lakes (CO064-050), fish ponds (CO064-056), gate piers (CO074-025) an ice houses (CO075-080), a tree ring (CO053-058) and a coaching house in Ballinglanna (CO075-069) associated with Glyntown House. A sweat house in Hermitage (CO064-049) is a circular stone- built building with a fireplace and chimney.

The Draft Cork County Development Plan (2013), the County Development Plan 2009, the NIAH and the RMP list houses, public buildings and structures and industrial buildings in the Study Area. A total of thirty-five buildings and structures are listed in the Draft Development Plan (2013) within the constraint

Study Area, as outlined below in **Table 2**. This table also includes the buildings and structures listed in the County Development Plan 2009. There are no Architectural Conservation Areas within the Study Area listed in the Draft Cork County Development Plan (2013) or in the County Development Plan 2009.

Table 2 Architectural features included in the Draft County Development Plan and County Development Plan Record of Protected Structures in the constraint Study Area

RPS	Townland	Name
00477	Lota More	Lota House
00473	Lota More	Lota Park
01407	Dunkettle	Outbuilding
01405	Dunkettle	Outbuilding
00493	Dunkettle	Dunkettle House
01406	Dunkettle	Gate Lodge
00494	Kilcoolishal	Dunsland House
00500	Inchera	North Esk Lodge
00474	Lota More	Lota Lodge (now Vienna Woods Hotel)
01292	Glanmire	Almshouse
00470	Poulacurry South	St Mary's and All Saints
00471	Poulacurry South	Glen Mervyn House
00472	Poulacurry South	Glanmire House (now Colaiste na Piarsaigh)
00485	Ballinglanna	Corn mill
01305	Ballinglanna	Gateway
01301	Ballinglanna	Gothic Structure
01015	Poulacurry South	Eastcliffe House, Northern half
00483	Ballinglanna	Glanmire Bridge
00820	Ballinglanna	Woodlea (6 cottages)
00484	Poulacurry South	Cloth mill and mill race
00475	Poulacurry North	Poul na Corr – Hydraulic barn
00394	Riverstown/ Poulacurry North/ Poulacurry South	Riverstown Bridge
00395	Riverstown	Riverstown House
00391	Ballincrossig	St Joseph's Catholic Church
00400	Brooklodge	Brooklodge House
00389	Riverstown	Glansillagh Mills
00390	Riverstown	Sallybrook Mills
00388	Knocknahorgan	Silversprings Starch Works
00386	Templemichael/Coole East	Templemichael Bridge
00830	Whitechurch	St Patrick's Roman Catholic Church (Harry Clarke windows)
00606	Castletown	St Joseph's Catholic Church

RPS	Townland	Name
01300	Mitchellsfort	Former Church of Ireland
00392	Ballingohig	Ashton Grove/Murphy's Fort
00397	Brookville	Brookville Country House
00398	Ballyvisteale Demesne	Ballyvisteale House

The NIAH lists many more buildings in the Glashaboy Valley, some of which are listed below in **Table 3**. Some of these overlap those listed in the County Development Plan.

Table 3 Some architectural features listed in the NIAH within the Study Area

No.	**Name**	**Location**
20860001	Lauriston	Youghal Old Road
20860002	Lauriston Lodge	Youghal Old Road
20860004	Barnavara House	Barnavara Rd, Glanmire
20860005	Poulacurry House	Glanmire
20860006	Glenkeen House	Church Hill, Glanmire
20860007	Glenkeen Lodge	Church Hill, Glanmire
20860008	The Cottage	Church Hill, Glanmire
20860009	Glen Mervyn House	Glanmire
20860010	St Mary's and All Saints Church	Church Hill, Glanmire
20860011	Church Hill	Glanmire
20860012	The Cottages	3 Cork Road
20860013	The Cottages	2 Cork Road
20860014	The Cottages	1 Cork Road
20860015	The Old Post Office	Cork Road
20860017	Glen Mervyn House	Cork Road
209063226	Saint Stephen's Hospital	Glanmire
20906323	Saint Stephen's Hospital	Unit 8 Glanmire
20906324	Saint Stephen's Hospital	Glanmire
20906325	Saint Stephen's Hospital	Glanmire
20906326	Saint Stephen's Hospital	Unit 7 Glanmire
20906327	Saint Stephen's Hospital	Glanmire
20906328	Saint Stephen's Hospital	Glanmire
20906329	Saint Stephen's Hospital	Glanmire
20906330	Saint Stephen's Hospital	Glanmire
20906331	Saint Stephen's Hospital	Glanmire
20907505	Glanmire Bridge	Glanmire
20907506	Woodlea	Glanmire
20907507	Eastcliffe	Glanmire
20907508	Eastcliffe /Glanmire Chirpractic Clinic	Glanmire

No.	Name	Location
20907509	Ballinglanna House	Glanmire
20907510	Former Mill	Glanmire
20907512	Post box	Glanmire
20907513	Glanmire Rectory	Glanmire
20906332	Sallybrook House	Sallybrook
20906335	Riverstown Community Centre R.A.C.A Ltd	Riverstown
20906414	Riverstown House	Riverstown
20906415	Riverstown Bridge	Riverstown
20906416	Three-bay, two-storey house	Riverstown
20906417	Copperalley Bridge	Riverstown
20907502	Former coach house	Riverstown
20907504	Saint Patrick's Mill	Riverstown
20905208	Three-bay, two-storey house	Carrignavar
20905209	Three-bay, two-storey house	Carrignavar
20905210	Water hydrant	Carrignavar
20905211	Carrignavar Bridge	Carrignavar
20905308	Parochial house	Watergrasshill
20905309	Watergrasshill Church of Ireland Church	Watergrasshill

The Glashaboy, Butlerstown and Glenmore Rivers have played their part in the development of the constraint Study Area. Rivers have been resourced by humans since the earliest times. They have served as routeways, crossing points and as a food source. Settlements centred around the crossing points which could have varied from stepping stones to timber or eventually stone bridges. The earliest evidence for settlement along stream banks is in the form if Fulachtai Fia dating from the Bronze Age. It is likely that they have been impacted in the past when they were used as a power source for various mills and that they were possibly dredged and deepened in earlier efforts to curb flooding. The three rivers can, therefore, be considered as Areas of Archaeological Potential, as outlined in **Table 4** below.

Table 4 Areas of Archaeological Potential in the Study Area and Key Constraints

AAP	Site Type
AAP1	Glashaboy River
AAP2	Butlerstown River
AAP3	Glenmore River

3.7.4 Key Constraints

3.7.4.1 Perceived Importance of Sites

For the purpose of this report, an assessment is given of the perceived (not necessarily definitive) importance of the various cultural heritage sites within the Study Area. The assessment of perceived importance is based on professional judgement of the information to hand, framed within the confines of the study. On a site-by-site basis, the levels of perceived cultural heritage importance are liable to future revision where new information is brought to light, either through more detailed investigations, surveys or research. The classification of levels of perceived importance is therefore based on an appraisal of current information and an assessment of importance probability.

All recorded archaeological sites are afforded the same protection under National Monuments legislation. An assessment is given below of the perceived relative importance of the various sites of archaeological heritage. Archaeological sites that have been completely excavated have been preserved by record and removed from the landscape and are not considered constraints (the moated site in Ballyvinny South (CO064-156001-) was partially and not completely excavated and thus is considered a key constraint).

a) International Importance: A site is deemed to be of international importance where, its known importance is perceived by the study to merit international recognition as a site of exemplary importance. There are no sites considered to be on international importance within the Study Area.

b) National Importance: A site is deemed to be of national importance where, its known importance is perceived by the study to merit national recognition as a site of considerable importance. There are no sites considered to be of national importance within the Study Area.

c) Regional Importance: A site is deemed to be of regional importance where, its known importance is perceived by the study to merit regional recognition as a site of high importance. Examples of site types within the Study Area include megalithic tombs, anomalous stone groups, stone rows, standing stone pairs, ogham stones, ringforts, souterrains, early ecclesiastical enclosures, castles, tower houses, moated sites, churches, graveyards and burial grounds. There are ninety-five archaeological sites considered to be of regional importance within the Study Area of which twelve are also listed in the Record of Protected Structures in the Draft Cork County Development Plan (2013) (refer to the following **Table 5**).

d) Local Importance: A site is deemed to be of local importance where, its known importance is perceived by the study to merit local recognition as a site of notable importance. Examples of site types within the Study Area include Fulachtai Fia, standing stones, possible ringforts, enclosures, earthworks, holy wells, cross slabs, bridges and mills. There are one hundred and seventy-seven archaeological sites considered to be of local importance within the Study Area (refer to the following **Table 6**).

All architectural heritage sites listed in the Record of Protected Structures are afforded the same protection under the Planning and Development Act 2000. Buildings and structures listed in the National Inventory of Architectural Heritage

are graded in importance with the majority of buildings classified as being of Regional importance, however, unless they are also listed in the Record of Protected Structures they are not afforded legal protection.

The majority of cultural heritage sites by their nature are not protected and this is particularly the case if the sites are non-specific. In the case of sites such as buildings etc. which may be of cultural heritage as well as architectural heritage value they may be afforded protection under the Planning and Development Act 2000. There are no site specific cultural heritage sites within the Study Area which are not already afforded protection as archaeological sites or architectural heritage sites.

Based on the assessment of the archaeological, architectural and cultural heritage constraints within the Study Area, the following appraisal can be made:

Within the Study Area:

- There are no sites listed as National Monuments.
- There are two sites listed in the Register of Historic Monuments, both ringforts; one in Killalough (CO064-004) and the other in Whitechurch (CO063-015).
- There are no sites subject to Preservation Orders.
- There are no archaeological sites considered to be of international or national importance.
- There are ninety-five archaeological sites considered to be of regional importance (see following **Table 5**).
- There are 35 buildings and structures listed in the Record of Protected Structures (see above **Table 2**).
- There are three Areas of Archaeological Potential - The Glashaboy River and its two tributaries the Butlerstown River and the Glenmore River (see above **Table 4**).
- There are no site specific cultural heritage sites which are not already afforded protection as archaeological sites or architectural heritage sites.

Sites to be considered as key constraints (**Tables 4** and **5**):

- All sites listed as National Monuments.
- All sites listed in the Register of Historic Monuments.
- All sites subject to a Preservation Order (temporary or full).
- All archaeological sites considered to be of international, national or regional importance.
- All buildings or structures listed in the Record of Protected Structures.
- Areas of Archaeological Potential.

The following **Table 5** lists archaeological and architectural sites of regional importance in the Study Area, i.e. key constraints.

Table 5 Archaeological and Architectural sites in the Study Area of Regional Importance or Key Constraints (Sites which are included in the RMP and RPS are cross-referenced and thus are included twice)

RMP/RPS	Townland	Site Type
CO051-039	Glashaboy South	Possible ogham stone
CO052-011	Ballynaglogh East	Moated site
CO052-014	Longstone	Ogham stone
CO052-020	Ryefield East	Wedge tomb
CO052-028	Carrignavar	Church of Ireland church
CO052-030	Lyre	Ringfort
CO052-031	Ballynabortagh	Ringfort
CO052-034001-	Ballynabortagh	Possible early ecclesiastical enclosure
CO052-034002-	Ballynabortagh	Church
CO052-034004-	Ballynabortagh	Burial ground
CO052-036	Ballynabortagh	Castle (site of)
CO052-038	Ballynabortagh	Souterrain
CO052-039001-	Ballynabortagh	Ogham stone
CO052-039003-	Ballynabortagh	Anomalous stone group
CO052-039004-	Ballynabortagh	Souterrain
CO052-047	Ballindeenisk	Ringfort
CO052-048	Ballindeenisk	Stone row
CO052-053	Ballynabortagh	Ogham stone
CO052-060	Glashaboy East	Moated site
CO052-061001-	Ballynabortagh	Souterrain
CO052-061002-	Ballynabortagh	Ogham stone
CO052-061003-	Ballynabortagh	Ogham stone
CO053-031	Pouladown	Ringfort
CO053-041	Bishop's Island	Ringfort
CO053-050	Ballindeenisk	Ringfort
CO053-052	Trantstown	Castle (site of)
CO053-053	Trantstown	Ringfort
CO053-054	Trantstown	Ringfort
CO053-059	Mitchellsfort	Ringfort
CO053-060	Mitchellsfort	Ringfort
CO053-061	Mitchellsfort	Ringfort
CO063-014001-	Whitechurch	Graveyard
CO063-014002-	Whitechurch	Church of Ireland church
CO063-015	Whitechurch	Ringfort
CO063-016	Whitechurch	Moated site

RMP/RPS	Townland	Site Type
CO063-018	Whitechurch	Ringfort
CO063-021	Ballyhesty	Standing stone pair
CO063-022001-	Carrignavar	Tower house
CO063-022002-	Carrignavar	Castle(site of)
CO063-107	Dunbullogue	Souterrain
CO063-025001-	Dunbullogue	Graveyard
CO063-025002-	Dunbullogue	Church
CO063-026	Dunbullogue	Ogham stone
CO063-027	Dunbullogue	Ringfort
CO063-028002-	Templemichael	Church
CO063-030	Ballindeenisk	Ringfort
CO063-031001	Templeusque	Graveyard
CO063-031002-	Templeusque	Church
CO063-032	Templeusque	Ringfort
CO063-041	Cool East	Ringfort
CO063-098 00386	Templemichael Coole East	Bridge
CO063-093 00388	Knocknahorgan	Cloth mill
CO063-094 00389	Riverstown	Cloth mill
CO063-069 00390	Riverstown	Paper mill
CO063-087001-	Rathcooney	Graveyard
CO063-087002-	Rathcooney	Church
CO064-004001-	Killalough	Ringfort
CO064-010	Ballinvinny South	Ringfort
CO064-012001-	Coolnacaha	Graveyard
CO064-012002-	Cllonacaha	Church
CO064-014001-	Kilrussane	Early ecclesiastical enclosure
CO064-014002-	Kilrussane	Church
CO064-014003-	Kilrussane	Church
CO064-017	Rathfilode	Ringfort
CO064-019	Rathfilode	Ringfort
CO064-021001-	Rathfilode	Ringfort
CO064-026001-	Kilquane	Early ecclesiastical enclosure
CO064-026002-	Kilquane	Graveyard
CO064-026003-	Kilquane	Church
CO064-031	Lisheenroe	Ringfort

RMP/RPS	Townland	Site Type
CO064-044	Sarsfieldscourt	Castle (site of)
CO064-046	Killydonoghoe	Burial ground
CO064-051 00395	Riverstown	Country house
CO064-054001-	Brooklodge	Graveyard
CO064-054002-	Brooklodge	Church of Ireland church
CO064-055	Brooklodge	Castle(site of)
CO064-057 00398	Ballyvisteale Demesne	Country house
CO064-071	Ballynagaul	Ringfort
CO064-072	Ballynagaul	Ringfort
CO064-078	Ballinbrittig	Ringfort
CO064-080	Ballinbrittig	Ringfort
CO064-081	Ballinbrittig	Ringfort
CO064-082	Ballinbrittig	Ringfort
CO064-084	Ballinbrittig	Ringfort
CO064-111 00394	Riverstown Poulacurry North Poulcurry South	Bridge
CO064-089002-	Ballinbrittig	Church
CO064-156001-	Ballinvinny South	Moated site
CO074-022	Ballyharoon	Ringfort
CO074-104	Poulacurry South	Church of Ireland church
CO074-023	Lotamore	Ringfort
CO074-026 00477	Lotamore	Country house
CO075-001 00484	Poulacurry South	Cloth mill
CO075-002001- 00485	Ballinglanna	Corn mill
CO075- 048 00483	Ballinglanna Poulacurry South	Bridge
CO075-075 00493	Dunkettle	Country house
00477 CO074-026	Lota More	Lota House
00473	Lota More	Lota Park
01407	Dunkettle	Outbuilding
01405	Dunkettle	Outbuilding
00493	Dunkettle	Dunkettle House

RMP/RPS	Townland	Site Type
CO075-075		
01406	Dunkettle	Gate Lodge
00494	Kilcoolishal	Dunsland House
00500	Inchera	North Esk Lodge
00474	Lota More	Lota Lodge (now Vienna Woods Hotel)
01292	Glanmire	Almshouse
00470	Poulacurry South	St Mary's and All Saints
00471	Poulacurry South	Glen Mervyn House
00472	Poulacurry South	Glanmire House (now Colaiste na Piarsaigh)
00485 CO075-002001-	Ballinglanna	Corn mill
01305	Ballinglanna	Gateway
01301	Ballinglanna	Gothic Structure
01015	Poulacurry South	Eastcliffe House, Northern half
00483 CO075-048	Ballinglanna	Glanmire Bridge
00820	Ballinglanna	Woodlea (6 cottages)
00484 CO075-001	Poulacurry South	Cloth mill and mill race
00475	Poulacurry North	Poul na Corr – Hydraulic barn
00394 CO064-111	Riverstown/ Poulacurry North/ Poulacurry South	Riverstown Bridge
00395 CO064-051	Riverstown	Riverstown House
00391	Ballincrossig	St Joseph's Catholic Church
00400	Brooklodge	Brooklodge House
00389 CO063-094	Riverstown	Glansillagh Mills
00390 CO063-069	Riverstown	Sallybrook Mills
00388 CO063-093	Knocknahorgan	Silversprings Starch Works
00386 CO063-098	Templemichael/ Coole East	Templemichael Bridge
00830	Whitechurch	St Patrick's Roman Catholic Church (Harry Clarke windows)
00606	Castletown	St Joseph's Catholic Church

RMP/RPS	Townland	Site Type
01300	Mitchellsfort	Former Church of Ireland
00392	Ballingohig	Ashton Grove/Murphy's Fort
00397	Brookville	Brookville Country House
00398 CO064-057	Ballyvisteale Demesne	Ballyvisteale House

The following **Table 6** lists archaeological sites of local importance in the Study Area which are not considered key constraints.

Table 6 Archaeological sites of Local Importance in the Study Area which are not considered Key Constraints

RMP	Townland	Site Type
CO042-082	Tooreen South	Burial
CO042-083	Glashaboy North	Fulacht fia
CO051-039	Glashaboy South	Possible ogham stone
CO051-158	Dromgarriff North	Fulacht fia
CO052-001	Ballyvorisheen West Ballyvorisheen East Gormlee	Bridge
CO052-007	Gormlee	Possible ringfort
CO052-008	Gormlee	Standing stone
CO052-009	Ballynaglogh East	Standing stone
CO052-010	Ballynaglogh East	Standing stone
CO052-012	Ballybrack	Earthwork
CO052-013	Pouladown	Possible ringfort
CO052-015	Longstone	Standing stone
CO052-016	Longstone	Standing stone
CO052-017	Longstone	Standing stone
CO052-018	Farranastig	Possible ringfort
CO052-019	Ryefield East	Possible ringfort
CO052-021	Gormlee	Possible standing stone
CO052-022	Laharan	Holy well
CO052-023	Laharan	Rectangular enclosure
CO052-024	Ballycaskin	Standing stone
CO052-025001-	Gormlee	Possible ringfort
CO052-025002-	Gormlee	Possible souterrain
CO052-026	Carrignavar	Possible ringfort
CO052-027	Carrignavar	Standing stone
CO052-029	Carrignavar	Standing stone
CO052-032	Ballynabortagh	Circular enclosure
CO052-033	Ballynabortagh	Standing stone

RMP	Townland	Site Type
CO052-034003-	Ballynabortagh	Bullaun stone
CO052-034004-	Ballynabortagh	Burial ground
CO052-035	Ballynaglogh East	Standing stone
CO052-037	Ballynabortagh	Rectangular enclosure
CO052-039002-	Ballynabortagh	Rectangular enclosure
CO052-039005-	Ballybrack	Holy well
CO052-040	Templemichael	Possible standing stone
CO052-041	Templemichael	Possible ringfort
CO052-042	Ballyskerdane	Possible ringfort
CO052-043	Ballynamaddree	Fulacht fia
CO052-044	Ballythomas	Possible ringfort
CO052-045	Ballynamaddree	Fulacht fiadh
CO052-046	Ballynamaddree	Possible ringfort
CO052-049	Ballindeenisk	Standing stone
CO052-052	Knockboy	Bullaun stone
CO052-055	Laharan	Cross-slab
CO052-056	Carrignavar	Possible souterrain
CO052-057	Ballynabortagh	Possible souterrain
CO052-058	Knockboy	Fulacht fia
CO052-059	Knockboy	Fulacht fia
CO053-035	Ballinlegane	Standing stone
CO053-036	Ballinlegane	Possible ringfort
CO053-037	Ballinlegane	Possible ringfort
CO053-038	Ballinlegane	Fulacht fia
CO053-039	Ballinlegane	Possible ringfort
CO053-040	Bishop’s Island	Standing stone
CO053-043	Bishop’s Island	Standing stone
CO053-044	Bishop’s Island	Circular enclosure
CO053-093	Ballinlegane	AP: Rectangular enclosure
CO053-094	Ballinlegane	Circular enclosure
CO053-028	Bishop’s Island	Possible fulacht fia
CO053-051	Coneybeg	Possible ringfort
CO053-055	Rathfilode	Possible ringfort
CO053-056	Rathfilode	Possible ringfort
CO053-057	Mitchellsfort	Circular enclosure
CO053-058	Mitchellsfort	Tree ring
CO053-062	Shanballyreagh	Possible ringfort
CO053-097	Trantstown	Burnt mound

RMP	Townland	Site Type
CO063-095	Whitechurch	Ornamental tower
CO063-104	Whitechurch	Standing stone
CO063-017	Whitechurch	Possible ringfort
CO063-106	Knockaneag	Standing stone
CO063-023	Coole West	Rectangular enclosure
CO063-028001-	Templemichael	Circular enclosure
CO063-029	Coolgreen	Holy well
CO063-033	Templeusque	Possible ringfort
CO063-034	Templeusque	Possible ringfort
CO063-035	Ballynaparson	Possible ringfort
CO063-036	Coole East	Possible ringfort
CO063-037	Coole East	Possible ringfort
CO063-038	Coole East	Possible ringfort
CO063-039	Coole East	Possible ringfort
CO063-040	Coole East	Possible ringfort
CO063-042	Sarsfieldscourt	Possible ringfort
CO063-043	Sarsfieldscourt	Standing stone
CO063-044	Sarsfieldscourt	Possible ringfort
CO063-099	Coole East	Woollen mill
CO063-109	Templeusque	Bullaun stone
CO063-004	Sarsfieldscourt	Spade mill
CO063-075	Ballynoe	Possible ringfort
CO063-077	Ballinvriskig	Possible standing stone
CO063-089	Ballyphilip	Circular enclosure
CO063-090	Ballyphilip	Possible standing stone
CO063-091	Knocknahorgan	Standing stone
CO063-092	Knocknahorgan	Possible ringfort
CO063-079	Garraneboy	Possible standing stone
CO063-080	Garraneboy	Possible standing stone
CO063-081	Garraneboy	Possible standing stone
CO063-082	Garraneboy	Possible ringfort
CO063-084	Lahardane	Fulacht fia
CO063-085	Rathcooney	Fulacht fia
CO063-086	Rathcooney	Possible ringfort
CO063-088001-	Rathcooney	Country house
CO063-088002-	Rathcooney	Ornamental tower
CO064-147	Crushyriree	Fulacht fia
CO064-148001-	Crushyriree	Fulacht fia

RMP	Townland	Site Type
CO064-148002-	Crushyriree	Fulacht fia
CO064-148003-	Crushyriree	Fulacht fia
CO064-149	Crushyriree	Fulacht fia
CO064-150	Crushyriree	Fulacht fia
CO064-151	Killalough	Fulacht fia
CO064-001	Coneybeg	Circular enclosure
CO064-003	Crushyriree	Possible ringfort
CO064-004002-	Killalough	Possible souterrain
CO064-005	Trantstown	Limekiln
CO064-006	Ballinvinny North	Possible ringfort
CO064-007	Ballinvinny North	Circular enclosure
CO064-008	Ballinvinny North	Possible ringfort
CO064-009	Ballinvinny North	Possible ringfort
CO064-011	Ballinvinny South	Possible ringfort
CO064-013	Ballingohig	Possible ringfort
CO064-015	Trantstown	Holy well
CO064-016	Rathfilode	Levelled circular enclosure
CO064-018	Rathfilode	Circular enclosure
CO064-020	Rathfilode	Possible ringfort
CO064-021002-	Rathfilode	Possible souterrain
CO064-022	Coolguerisk	Possible ringfort
CO064-023	Coolguerisk	AP: Circular enclosure
CO064-024	Coolguerisk	AP: Square enclosure
CO064-025	Kilquane	Holy well
CO064-027	Kilquane	Standing stone
CO064-028	Knockraha East	Possible ringfort
CO064-029	Knockraha East	Circular enclosure
CO064-030	Knockraha East	Possible ringfort
CO064-045	Killydonoghoe	Circular enclosure
CO064-047	Hermitage	Standing stone
CO064-048	Hermitage	Standing stone
CO064-049	Hermitage	Sweathouse
CO064-050	Riverstown	Ornamental lake
CO064-052	Brooklodge	Tuck mill
CO064-053	Brooklodge	Holy well
CO064-056	Brooklodge Corbally North	Fish pond
CO064-058	Ballyvisteale	Possible ringfort
CO064-059	Ballyvisteale	Standing stone

RMP	Townland	Site Type
CO064-060	Ballyvisteale	Enclosure
CO064-061	Blossomgrove	Possible ringfort
CO064-062	Blossomgrove	Possible ringfort
CO064-063	Blossomgrove	Possible ringfort
CO064-064	Gogganstown	Possible ringfort
CO064-065	Ballynanelagh	Possible ringfort
CO064-066	Ballynanelagh	Possible standing stone
CO064-067	Ballynagarbragh	Possible ringfort
CO064-068	Lackenroe	Possible ringfort
CO064-069	Lackenroe	Possible ringfort
CO064-070	Ballycurreen	Paper mill
CO064-073	Killeena	Possible ringfort
CO064-074	Killeena	Possible ringfort
CO064-075	Killeena	Enclosure
CO064-076	Killeena	Bullaun stone
CO064-077	Killeena	Possible ringfort
CO064-079	Ballinbrittig	Holy well
CO064-083	Ballinbrittig	Possible ringfort
CO064-110	Brookville	Quarry
CO064-142	Riverstown	Lime kiln
CO064-002	Ballynagaul	Country house
CO064-089001-	Killacloyne	Fulacht fia
CO074-113	Ballyharoon	Country house
CO074-071	Poulacurry South	Mound
CO074-024	Lotabeg	Country house
CO074-025	Lotabeg	Gate pier
CO075-002002-	Ballinglanna	Lime kiln
CO075-003	Ballinglanna	Distillery
CO075-004	Rowgarrane	Possible ringfort
CO075-006	Corbally South	Possible ringfort
CO075-007	Rowgarrane	Possible ringfort
CO075-069	Ballinglanna	Coaching house
CO075-080	Dunkettle	Ice house
CO075-002002-	Ballinglanna	Lime kiln
CO075-094001-	Ballinglanna	Architectural fragment
CO075-094002-	Ballinglanna	Architectural fragment

3.7.5 Recommendations

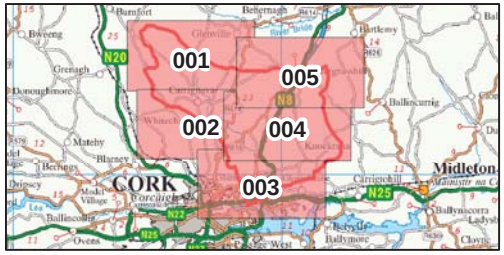
It is recommended that all sites of archaeological, architectural and cultural heritage interest be avoided in the course of this project.

Sections of the Glashaboy, Butlerstown and Glenmore Rivers are the subject of this study and, as rivers, are considered to be Areas of Archaeological Potential and key constraints. It is likely that the rivers have been impacted in localised areas in the past when they were used as a power source for various mills and industrial activities. It is recommended that further proposed works to the rivers should be archaeologically assessed in advance of works taking place.

A3

Legend

- Record of Protected Structures (RPS)
- Record of Monuments and Places (RMP)
- River
- Study Area



Issue	Date	By	Chkd	Appd
P1	2014-04-16	AL	HJ	DG

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Job Title
Glashaboy River (Glanmire/Sallybrook) Flood Relief Scheme

Archaeological, Architectural and Cultural Heritage Sites

Scale at A3
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Job No	Drawing Status
234334-00	**For Information**

Drawing No	Issue
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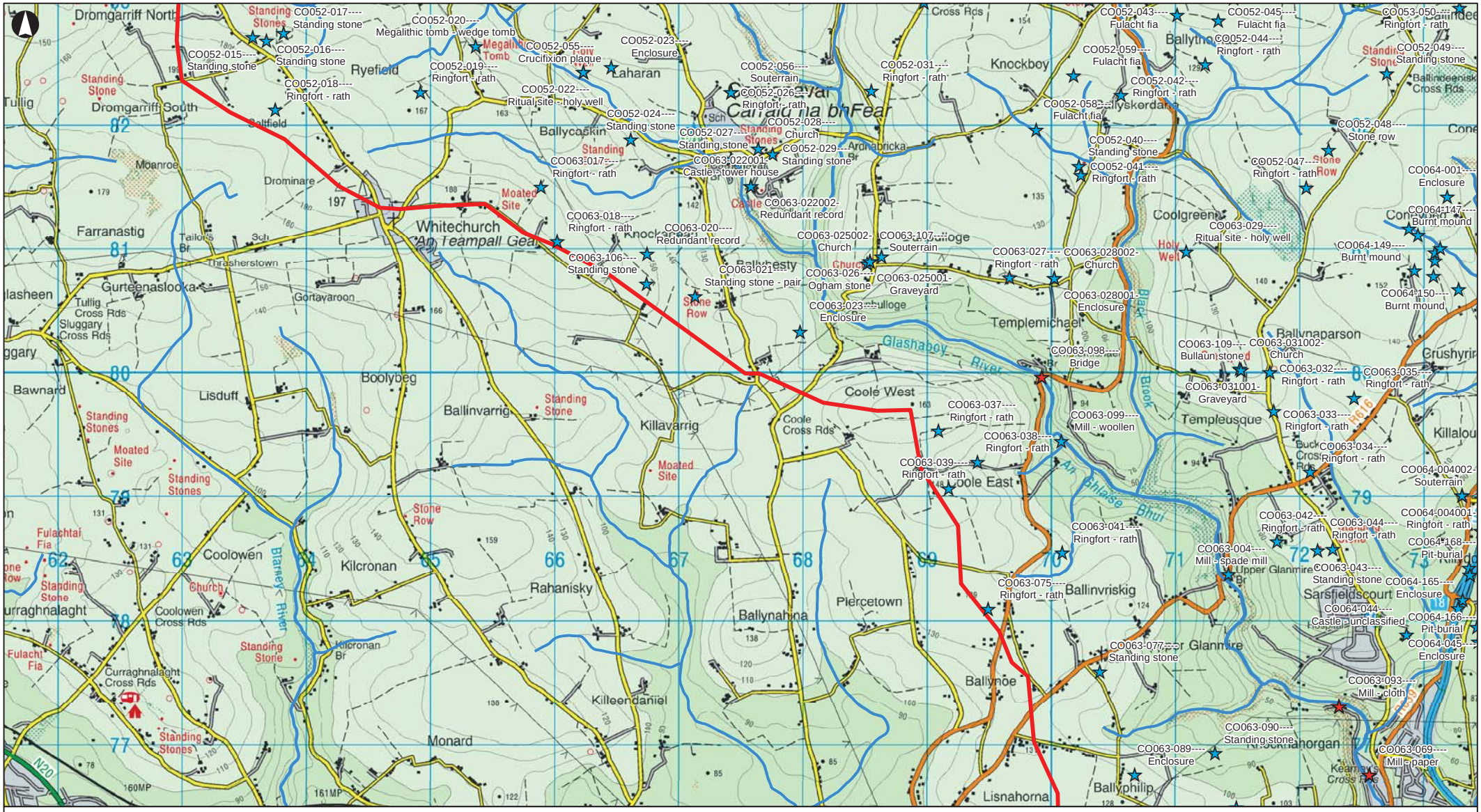

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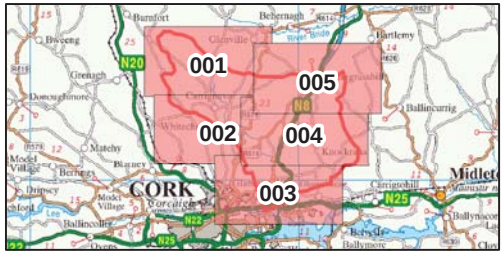

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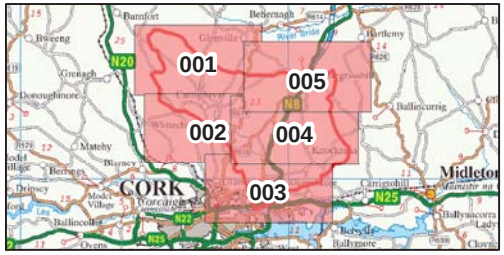

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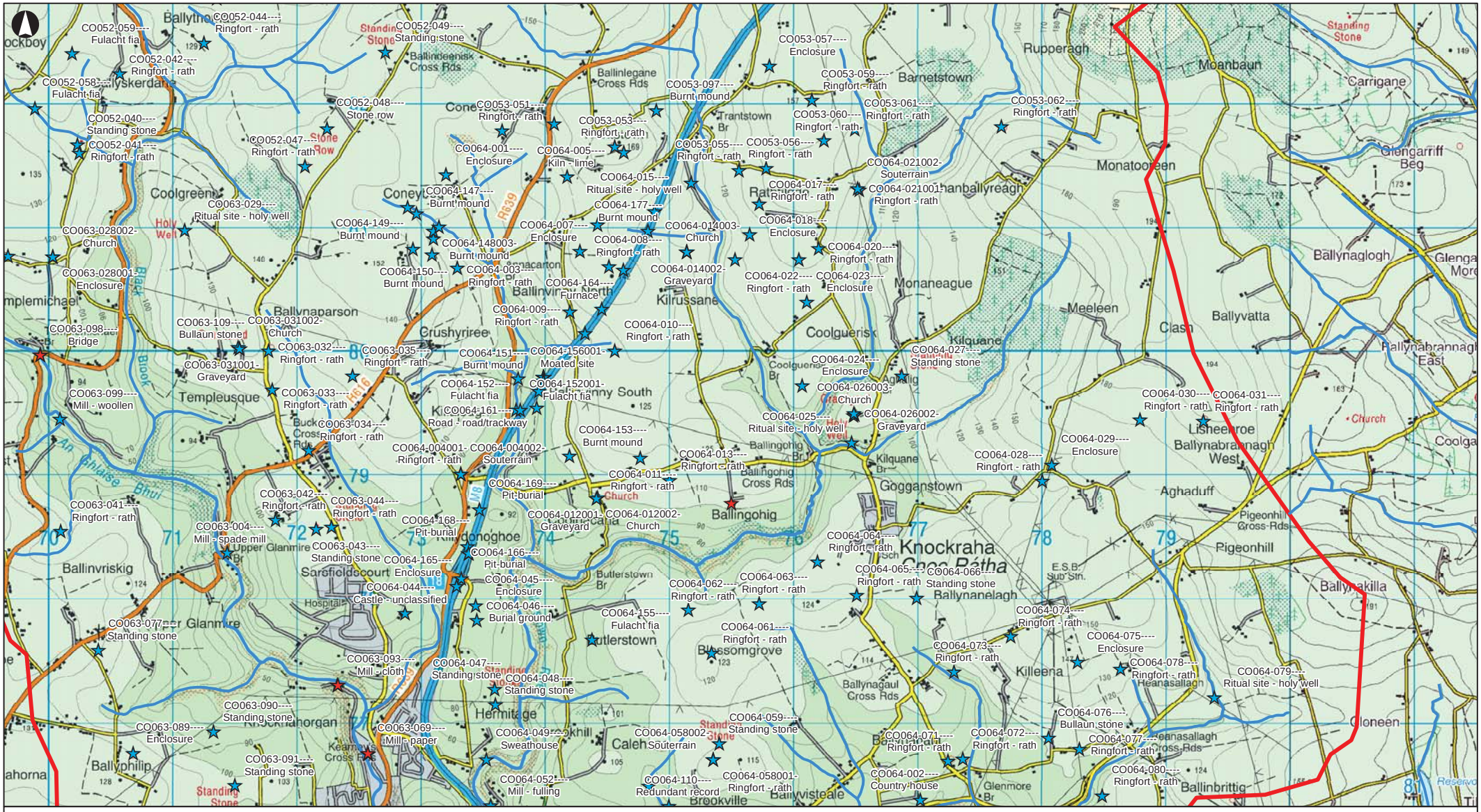

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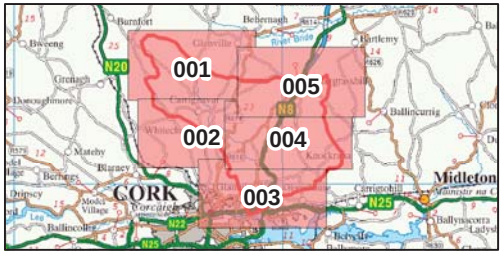

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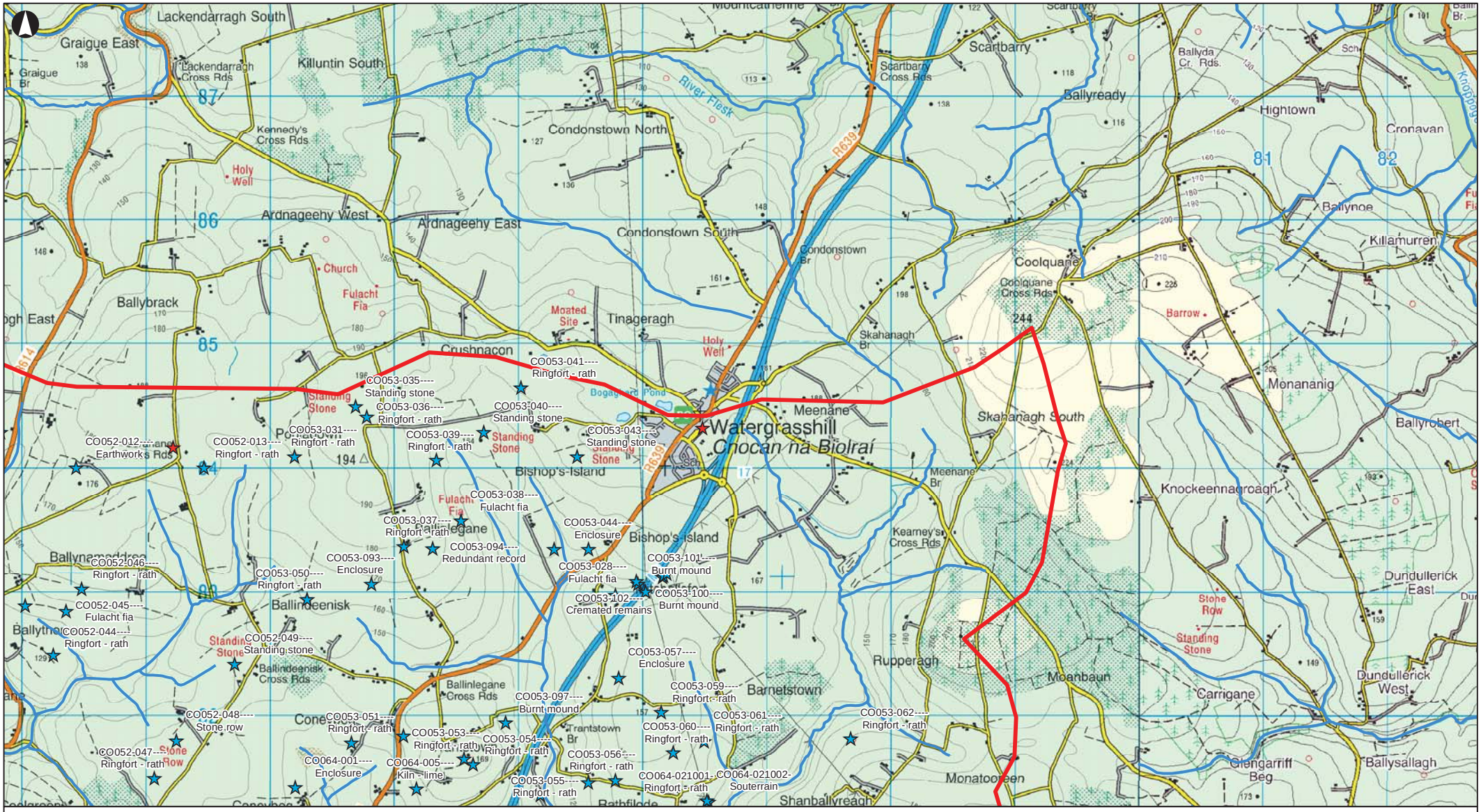

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