Cork County Council

Douglas Flood Relief Scheme (including Togher Culvert)

Constraints Report

REP/1

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Job number 234335-00

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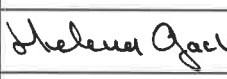
		Signature			
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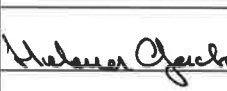
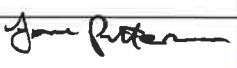
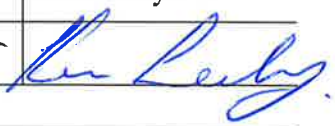
		Signature			
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Contents

Appendices

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
EIS	Environmental Impact Statement
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 Douglas Flood Relief Scheme (Douglas FRS) (including Togher Culvert).

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[1]:

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.

[1] These headings have been selected 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.

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.

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

Impacts on public amenity areas adjacent to the river including riverside walks and parks and playground should be considered, such as walkways through Mangala and Ballybrack, through Doman's Wood, the footpath running parallel to the Tramore River, and the Douglas Community Park, and. Specialist amenity areas such as any sports grounds also be given consideration.

Properties and businesses currently accessed by culverted sections or bridges over the Douglas and Tramore Rivers in Douglas and Togher will need to have access maintained/re-established, if works in these areas are proposed. Access during construction will also need to be considered.

Impacts on sensitive receptors e.g. schools, crèches, and nursing homes should be considered during both construction and operation. Traffic disruption on sensitive receptors during construction should also be considered.

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

Ecology

With regard to terrestrial ecology, the scheme design should take into consideration the following key constraints:

- Designated conservation sites, in particular the Cork Harbour Special Protection Area (SPA), and Douglas River Estuary proposed Natural Heritage Area (pNHA) into which the Tramore River discharges.
- Terrestrial and riparian habitats which are considered of high value at a local level, and which are of high recreational value.
- Bats, through potential loss of roosting sites, foraging areas and disruption of commuting roosts.
- Otter, via noise and disturbance, potential impacts on prey availability, potential impacts on resting areas/holts and potential impacts on movement of otter along watercourses.
- Kingfisher (if present), due to loss of breeding habitat.
- A variety of bird and mammal species, due to loss of habitat, habitat fragmentation and increased noise and disturbance.

- The spread of Japanese Knotweed.

With regard to aquatic ecology, the scheme design should take into consideration the following key constraints:

- Designated sites, and in particular the Cork Harbour SPA and Douglas River Estuary pNHA into which the Tramore River discharges. Impacts on these could potentially occur if severe deteriorations in water quality were to arise due to inappropriate work practices or accidental spillage of hydrocarbons, concrete or other deleterious material.
- Riparian habitat which provides food, cover and shade and helps to stabilise river banks. Loss of riparian habitat, could potentially occur due to culverting and dredging.
- Fish populations of Brown Trout, Eel and Brook Lamprey and macroinvertebrate populations. Impacts could potentially occur on these species due to loss of habitat. In addition, high levels of silt during construction can, in particular, impact on Lamprey and salmonid spawning habitats. High silt levels may also impact on macroinvertebrate populations and on aquatic flora. The scheme design should take into consideration that dredging has the potential to directly impact on eggs and juvenile fish including Brown Trout and Brook Lamprey in sediments.
- Movement of fish. Notwithstanding that there has already been significant culverting of watercourses, the scheme design should take into consideration that further culverting may further restrict the movement of fish and may lead to a net loss of habitat.
- The scheme design should take into consideration that modifications of the river channel structure may result in the loss of habitat for particular age classes of fish i.e. riffle for juvenile fish or pools for adults fish. Such changes may impact on population dynamics.
- In salmonid waters, any instream works should generally be restricted to the period from July to September , inclusive.
- Due to the limited size of watercourses within the project area, relatively small volumes of polluting material during construction could have a significant impact. Inadvertent spills of hydrocarbons, poorly maintained machinery or inadequate storage should be avoided.
- Impacts on otter such as noise and disturbance, and potential impacts on prey availability, on resting areas/holts and on movement of otter along watercourses.

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 aquifers.

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 consideration that there are groundwater wells in the Study Area.

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.

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

Impacts on sites of archaeological, architectural and cultural heritage interest will need to be considered, in the course of this project.

Sites to be considered as key constraints within the Douglas Study Area are:

- All archaeological sites considered to be of regional importance. There are eight sites of regional archaeological importance in the Douglas Study Area. The nearest of these to the Douglas River (Ballybrack stream) are St. Lukes Church and Graveyard, and St. Patrick's Woollen Mills to the North and Donnybrook Mill to the South.
- All buildings or structures listed in the Record of Protected Structures. There are sixteen of these in the Douglas Study Area. The nearest of these to the Douglas River (Ballybrack stream). are St. Luke's Church, and St. Patrick's Woollen Mills.
- Two streetscapes listed as Architectural Conservation Areas, i.e. Church St. Conservation Area, and West Douglas Street.
- Two cultural heritage sites i.e. the Douglas Fingerpost, and St. Columba's Hall in Douglas East.
- Area of Archaeological Potential - The Douglas River (Ballybrack stream). It is possible that remains associated with the mill at Ravensdale and the mill further south in the village of Douglas may still survive along the banks of the river or in the river itself. It is also possible that earlier remains may exist along the banks of the river.

Sites to be considered as key constraints in the Togher Culvert Study Area are:

- Three cultural heritage sites i.e. a single-storey house and a lodge at the junction of Togher Road and Spur Hill, and an old schoolhouse on Togher Road.

- The Tramore River. It is possible that remains associated with human activity from the earliest times may still survive along the banks of the river or in the river itself.

It is recommended that any proposed works to the Douglas River (Ballybrack stream) and Tramore Rivers be archaeologically assessed in advance of works taking place.

Landscape

The scheme design should give consideration to avoid opening up wooded areas to avoid viewing for existing residents and to protect the integrity of the woodland cover, most especially in the urban / suburban areas.

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

The scheme design should protect and retain the protected structure St. Luke's Church of Ireland Church which helps to define the character of Douglas Village.

Noise, Vibration, Air Quality and Climate

Prior to the selection of a preferred flood relief scheme as part of the Engineering Study, it is recommended that the shortlisted flood alleviation measures be assessed in relation to the impact of noise and vibration during the construction phase of the project, and that the effects of vibration during the construction phase be considered in the selection process for potential flood alleviation measures.

It is recommended that mitigation measures be put in place to reduce the impacts on air quality and the noise environment during the construction phase of any proposed flood relief scheme.

The scheme design should take into account any noise/vibration sensitive receptors such as residences, schools and retirement homes located in proximity to works associated with the flood relief scheme. There are a number of schools in the Study Area. A retirement home is located in Church Road in Douglas.

Material Assets

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 City and County Councils 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 Cork City and 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

This report presents the environmental constraints relating to the Douglas Flood Relief Scheme (Douglas FRS) (including Togher Culvert).

Cork County Council, acting as agents for the Office of Public Works, intends to develop a flood relief scheme, including structural works, and a fluvial flood forecasting system, if feasible, for the Douglas River (Ballybrack stream). In addition, it is proposed to replace the existing under-capacity culvert in Togher with a new 560 metre long culvert (3 metres x 1.4 metres), extending from Lehenaghmore Industrial Estate to Greenwood Estate.

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

1.2 Study Area

The Study Area comprises the area in the vicinity of the Douglas River (Ballybrack Stream) and its tributaries within the Douglas area, and the Tramore River between Lehenaghmore Industrial Estate and Greenwood Estate in Togher. 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 Douglas Flood Relief Scheme (including Togher Culvert). The project will be delivered in the following stages:

Table 1.1 Environmental Assessment Stages

<table>
<tr><th colspan="3">Environmental Impact Assessment</th><th>Engineering Study</th></tr>
<tr><td>Stage I</td><td>Part 1</td><td>Constraints Study (this stage)</td><td rowspan="6">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</td></tr>
<tr><td></td><td>Part 2</td><td>Screening for Appropriate Assessment</td></tr>
<tr><td>Stage II</td><td>Part 1</td><td>Environmental Assessment of Viable Options</td></tr>
<tr><td></td><td>Part 2</td><td>Natura Impact Statement (if required)</td></tr>
<tr><td>Stage III</td><td colspan="2">Environmental Impact Statement</td></tr>
</table>

Environmental Impact Assessment		Engineering Study
Stage IV	Public Exhibition	Interference Notices 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

Consultation has taken place with statutory and non-statutory consultees as part of the initial scoping process. All consultation documents are provided in **Appendix D.** Comments and information were sought from consultees. The list of consultees is included as **Appendix D** 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 D**.

2 Scheme Context and Background

2.1 History of Flooding

The history of flood events in the Douglas and Togher areas is provided in the following **Table 2.1**. The most recent of these flood events occurred in June 2012, following extremely heavy rainfall.

Table 2.1 History of Flood Events in the Douglas and Togher Areas

Date of Flood Event	Mechanism	Areas Affected
28 June 2012	Fluvial	Togher, Douglas village
December 2009	Fluvial	Tramore River (Kinsale Road roundabout area only)
27 November 2002	Fluvial	Togher
21 November 2002	Fluvial	Togher, Douglas village
3 December 2001	Fluvial	Togher
30 November 2000	Fluvial	Togher
5 November 2000	Fluvial	Togher, Douglas
1998	Fluvial	Togher
17 March 1947	Fluvial	Douglas
24 December 1895	Fluvial	Douglas
19 November 1892	Fluvial	Douglas
Historic recurring	Fluvial/Tidal	Tramore River downstream of current Cork landfill site, Douglas

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 Douglas River (Ballybrack Stream) and its tributaries, which does not conform with the principles of sustainable drainage, and which adversely affects 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 is concentrated mainly in the valley of the Douglas River (Ballybrack Stream) and its tributaries, and comprises the channel, floodplain and immediate surrounding areas of the Douglas River (Ballybrack Stream), and also the culverted section of the Tramore River, Togher.

In general, the land in the vicinity of the Douglas River slopes steeply northwards from the Castletreasure area before levelling out towards Douglas Village. The land in the vicinity of the Togher culvert slopes gently downwards from the North. The topography of the Study Area is further detailed in **Section 3.8.1** of this 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

The purpose of this section of the report is to describe the key environmental issues relating to the Douglas FRS (including Togher culvert) 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 Douglas Flood Relief Scheme (FRS) (including Togher culvert). 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.

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

Table 3.1 Specialists' Areas

Study	Specialist
Archaeology, Architectural and Cultural Heritage	Lane Purcell Archaeology
Ecology	Dixon Brosnan, Environmental Consultants
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 likely to be undertaken.

3.3.1 Methodology

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

- *Cork County Development Plan 2009 2nd Edition,*
- *Carrigaline Local Area Plan 2011,*
- *Proposed Amendment to the Carrigaline Electoral Area Local Area Plan 2011- Amendment No. 2 Douglas LUTS (November 2013),*

- *DLUTS Douglas Land Use and Transport Strategy Final Report (August 2013),*
- *Regional Planning Guidelines for the South West Region 2010-2022,*
- Censuses of Ireland 2011 and 2006.

3.3.2 Settlements 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 settlements within the Study Area are Douglas and Togher, both of which are located within the 'Cork City South Environs' (Cork County Development Plan 2009 - 2nd Edition). The Cork City South Environs refers to the southern suburbs of Cork City, which lie outside the Cork City Area. These include areas such as Doughcloyne, Togher, Frankfield, Grange, Donnybrook, Douglas, Maryborough and Rochestown (*Carrigaline Electoral Area Local Area Plan 2011*).

The Cork County Development Plan states that the Carrigaline Electoral Area Local Area Plan will establish clear limits on the development of the Cork City South Environs.

Togher is identified in the *Cork County Development Plan 2009 2nd edition* as 'Cork Suburbs – Neighbourhood Centre'. The plan states that neighbourhood centres generally serve smaller, more localised communities where "*the provision of retail facilities are provided in tandem with the location of educational, commercial, recreational facilities within easy reach of the local inhabitants"*.

Development Plan objective SET 2-2 states that:

It is an objective of this Plan to consolidate the rapid growth of recent years with the provision of service, social infrastructure and recreational facilities in the future, protecting the important Green Belt areas to the south and directing pressure for new growth towards the City's North Environs where it can assist in rebalancing the city as a whole. In addition, the Carrigaline Electoral Area Local Area Plan will pay particular attention to the future development potential of the Tramore Valley.

3.3.2.2 Carrigaline Electoral Area Local Area Plan 2011

The *Carrigaline Electoral Area Local Area Plan 2011* sets out land use zonings and other specific objectives for lands within the Electoral Area, including the 'Cork City-South Environs' in which the Study Area is located. Zoning in the Study Area in the vicinity of Togher Culvert is indicated on '*Zoning Map Cork City Environs 1'* (refer to **Appendix A1** of this report), as follows:

- *'Areas susceptible to flooding – Zone A',*
- *'Areas susceptible to flooding - Zone B',*
- *'Walkways',*
- *''Residential',*

- *'Open Space/Sports Recreation/Amenity'*
- *"Existing built up area".*

Zoning in the Study Area for lands in the vicinity of the Douglas River is indicated on '*Zoning Map - Cork City Environs 2'* (refer to **Appendix A2** of this report)::

- *'Areas susceptible to flooding – Zone A',*
- *'Areas susceptible to flooding - Zone B'*,
- *'Walkways',*
- *''Residential',*
- *'Open Space/Sports Recreation/Amenity'*
- *'Special Policy Area X-03(a)*' - Douglas Town Centre
- *'Special Policy Area X-03(b)'* - Douglas Golf Course.

Key Planning Proposals for Douglas and for the Tramore Valley *(Carrigaline Electoral Area Local Area Plan 2011**)*** are as follows:

"Douglas:

- ***Planning Proposal 2.4.12*** *– It is envisaged that Douglas will evolve into a fully functional mixed use higher order urban centre in terms of both its development density and its retail offer with generally enhanced public transport, accessibility and parking demand management.*

- ***Planning Proposal 2.4.13*** *– In order to achieve this, a holistic view of Douglas is required. It is proposed that during the lifetime of this plan that priority will be given to the completion of a Land Use and Transportation Study (LUTS) for the Douglas Area."*

"Tramore Valley:

- ***Planning Proposal 2.4.14: -*** *Although priority must be given to Douglas, it is envisaged that during the lifetime of this plan, and taking into account market conditions, it is intended to prepare an Integrated Area Plan (IAP) for the Tramore Valley. This IAP will consider proposals for the redevelopment of low density brownfield sites for high density mixed use development which will include business and residential uses and high levels of residential amenity. Consideration will also be given to transportation and parking management. It is envisaged that the area will become more pedestrian and cyclist friendly with connectivity throughout."*

A specific objective (Specific Zoning Objective 'X-03: Douglas') of the LAP is to undertake a Landuse and Transportation Study for the Douglas Area. The Plan (Page 41) states that:

"Lands within the clearly defined boundaries (X-03 (a) and X-03(b)) will be subject to a Land Use and Transportation Study (LUTS)…"

Specific objective 'X-02: Tramore Valley' of the Plan (Page 41) states that:

"….the lands within this broad indicative boundary will be subject to an Integrated Area Plan…"

3.3.2.3 Douglas Land Use and Transportation Strategy (DLUTS)

The DLUTS was completed in August 2013 and comprises development proposals for Douglas for a 20 year period covering land use, transportation and urban design.

The goals of the DLUTS are to:

- *"provide a framework for future planning decisions,*
- *optimise the traffic and transport network,*
- *provide a guide to the investment in transport infrastructure,*
- *identify the capacity of the town centre for additional retail and other development,*
- *inform the future use of two areas zoned 'Special Policy Areas' ('Douglas Town Centre - X-03a', and the lands described as Douglas Golf Course – X-03b) in the Carrigaline Electoral Area Local Plan (2011)."*

A number of traffic and transportation proposals are outlined in the strategy, including the following:

- "*a proposed East West Link Bridge linking Donnybrook Hill to the Carrigaline Road.*
- *38km of walking and cycling routes including Mangala/Ballybrack Stream, Tramore Valley Park and City connectivity."*

Land use proposals in the DLUTS with regard to community facilities, recreation and amenities include:

- *"Existing Schools and Douglas Golf Course to remain in present locations,*
- *Urgent need for multi-purpose leisure facility for sports and community clubs,*
- *Urgent need for additional playing fields in Douglas,*
- *Provide walkways/cycleways to connect Donnybrook along Mangala/Ballybrack Stream,*
- *Provide improvement to community park amenity area and provide pedestrian/cycle linkage to City Tramore Valley Park."*

DLUTS Land Use Policy LU-02 is *to consolidate the town centre into 5 precincts comprising the Woollen Mills, Douglas Village Shopping Centre, Cinema Site,*

Barry's Fields and Douglas Court Shopping centre. The priority is to fill existing retail vacancy, and there will be a plan-led approach to town centre development which will provide for an additional 25,000sqm floor space by 2032, and approximately 175 residential units…"

Regarding 'Community Facilities and Recreation', the DLUTs states "*there is a requirement for a multi-purpose leisure facility in Douglas to cater for sports clubs, community organisations and leisure. This facility should be located in or near to the Town Centre to serve the community as a whole. The preferred location for this facility is adjacent to the existing GAA playing pitches and schools for ease of access for the users. Road access to the lands to the west of the GAA playing pitches will require careful assessment."* (refer to Section 8.4.2.1 of the DLUTS).

DLUTS Land Use Policy LU-05 states that "*the DLUTS Study Area is the preferred location for the provision of a multi-purpose leisure facility in Douglas to cater for sports clubs, community organizations and leisure activities. In addition, playing fields, parks and walkways/cycleways that provide a link to the Tramore Valley Park over the N40 and access to Vernon Mount walkway through to Grange, providing an alternative link for Grange and Frankfield residents to get to Douglas Town Centre without using a vehicle…."*

3.3.2.4 Proposed Amendment to the Carrigaline Electoral Area Local Area Plan 2011- Amendment No. 2 Douglas LUTS (November 2013)

Following on from the DLUTS, Cork County Council proposed an Amendment to the *Carrigaline Electoral Area Local Area Plan 2011* for public consultation. The Proposed Amendment *The Carrigaline Electoral Area Local Area Plan 2001- Amendment No. 2 Douglas Luts (Nov. 2013)* states that "*in terms of zoning provisions, the plan is amended by the changes to the zoning of the area known as X-)3(a) and (b), Douglas Town Centre and Douglas Golf Course, respectively".* The purpose of the Proposed Amendment is to incorporate the recommendations of the DLUTS into the Local Area Plan for the Carrigaline Electoral Area.

Section 1.4.42 of the proposed amendment to the LAP states that *"DLUTS has recommended that X-03b zone be retained as an open space and recreation zone for use by the Douglas Golf Course".*

Section 1.4.44 of the proposed amendment to the LAP states that the DLUTS *"has identified a number of town centre zonings that are distinct precincts which have established retail uses, where mixed use development can, and should, take place. It is forecast that by 2032, these precincts can accommodate an additional 175 residential units and up to 25,000m2 of mixed use (offices and retail) development. These precincts are shown on Zoning Map 3 as TC-01 to TC-05".*

Table 1.10 of the proposed amendment to the LAP includes the redevelopment of the following Retail Priority Areas:

- Cinema Site (TC-04)

- Woollen Mills (TC-01)
- Douglas Court (TC-05)
- Barry's Field (TC-03).

The proposed amended LAP Zoning Map (2013) is appended to this report (refer to **Appendix A3**).

Proposed amendments to the Carrigaline Electoral Area LAP (2013), in the general vicinity of the Study Area, include, but are not limited to, the following policies and specific zoning objectives:

Urban Design Policy UD4 relates to the Cinema Site and states *that "there is an opportunity to prepare an Overall Planning and Development Scheme which would involve all landowners.*

Urban Design Policy UD5 relates to the redevelopment of St. Patrick's Woollen Mills.

Specific Zoning Objective No. TC-01 – St. Patrick's Woollen Mills recommends the redevelopment of the whole site, to include mixed use development including offices, retail and residential uses. However, Policy TC-01 states that the redevelopment should only result in an increase of 25% to the floorspace of the existing buildings. The policy states that the site can cater for an additional 70 dwellings, and that car parking for new development should follow the revised parking standards of the County Development Plan.

Specific Zoning Objective TC-02 - Barry's Field recommends the development of the site i.e. "*a mixed use development of 4,000sqm"* to include office and commercial development. The construction of a new municipal car park of at least 200 bays is considered.

Specific Zoning Objective TC-04 - Cinema Site recommends the overall planning and development of the entire site and includes "*the provision of a comprehensive mixed-use development with an additional 5,500sqm of non residential floor space and 70 residential units".* The development of the site "*will incorporate the cinema, the car park, vacant land and the old TSB site and the filling station site…It is desirable to enable the relocation of the filling station and rehabilitation of the site for the construction of a landmark building….Future buildings should form and edge along the relief road on the north of the site…"*

Specific Zoning Objective TC-05 – Douglas Court recommends that "*an Overall Planning or Development Scheme is prepared for the entire site which can be implemented on a phased basis. This shall include the provision of a mixed-use development with an additional 7,500sqm non residential floor space…."*

Urban Design Policy UD7 includes that with regard to the Community Park, "*measures shall be implemented to improve north south and east west connectivity, enhance public safety and install suitable lighting*".

Transportation Policy – Walking and Cycling WC3 is "*to provide a high quality off-road walk and cycleway along the Ballybrack River from the Community Park to the Donnybrook Hill Area".*

Specific Zoning Objective U-07 – "*Provison of new road and bridge between Grange Road and the Carrigaline Road over the Ballybrack River Valley"* (refer to LAP Zoning Map amended 2013 (Proposals for X-03(a) & X-03(b)) in **Appendix A3** of this report).

Specific Zoning Objective O-12 – *Douglas Golf Course.* The Proposed Amendment (page 9) states that DLUTS has recommended that the X-03b zone be retained as an open space and recreation zone for use by the Douglas Golf Course.

Specific Zoning Objective O-13 – *Open Space and Recreation Area. Provision of a multi-purpose leisure facility in Douglas to cater for sports clubs, community organizations and leisure activities. In addition, playing fields parks and walkways/cycleways that provide a link to the Tramore Valley Park over the N40 and access to Vernon Mount walkway through to Grange, should be provided* (refer to LAP Zoning Map amended 2013 (Proposals for X-03(a) & X-03(b)) in **Appendix A3** of this report).

Specific Zoning Objective O-14 – *Douglas Community Park – Improved access to the community park from the north and south should be provided. Within the park, improved lighting, landscaping and security measures should also be provided* (refer to LAP Zoning Map amended 2013 (Proposals for X-03(a) & X-03(b)) in **Appendix A3** of this report).

Specific Zoning Objective O-15 – *Active open space for informal public recreation to be landscaped and planted.* (refer to LAP Zoning Map amended 2013 (Proposals for X-03(a) & X-03(b)) in **Appendix A3** of this report).

Transportation Policy – Walking and Cycling WC2 is to provide a high quality off-road walk and cycleway linking Grange and Frankfield with the village centre of Douglas and should provide a connection to the Tramore Valley Park via an overpass bridge on the N40.

Transportation Policy – Walking and Cycling WC3 is to provide a high quality off-road walk and cycleway along the Ballybrack River from the Community Park to the Donnybrook Hill Area.

3.3.3 Population and Housing

3.3.3.1 Population

The following **Table 3.2** shows the population change in the Study Area, Cork City and Cork County between 2006 and 2011.

Table 3.2 Population Growth in the Study Area 2006-2011

	2006	2011	Growth	Percentage Difference
Douglas ED	18,182	20,397	2,215	12.2
Lehenagh ED	9,534	9,898	364	3.8
Cork County	361,877	399,802	37,925	10.5
Cork City	119,418	119,230	-188	-0.1

Source: (DLUTS 2013)

The above table shows that there was a percentage increase of 12.2% in the Douglas ED in the period 2006 – 2011. The Lehenagh ED had a population increase of 3.8% during the same period. Cork County had a population increase of 10.5%, whereas Cork City which borders the Study Area had a population decrease of 0.1%.

3.3.3.2 Housing

CSO Census 2011 statistics show that the number of households in 2011 in Cork was 188,464 (Cork County 141,142 and Cork City 47,321).

The Cork Area Strategic Plan – Strategy for Additional Economic and Population Growth – An Update (Indecon, RPOS and Savills HOK July 2008) updated household projection for *Douglas/South City Environs* for 2020 is 12,490.

3.3.4 Industry and Business

The CSO online Quarterly National Household Survey Quarter 3 2013 (CSO 2013) survey states that there was an annual increase in employment in the State of 3.2% or 58,000 (a total of 1,899,300 persons employed in the State).

The Cork Area Strategic Plan – Strategy for Additional Economic and Population Growth – An Update (Indecon, RPOS and Savills HOK July 2008) shows an updated employment projection for Douglas/South City Environs for 2020 is 14,734 persons.

Sources of employment in the Study Area comprise education, industry, business and retail, including:

- Schools,
- Hotels
- Douglas Court Shopping Centre,
- Douglas Village Shopping Centre,
- St. Patrick's Woollen Mills (comprises individual business and retail units),

- Restaurants,
- Public Houses,
- Industries in the Lehenaghmore area.

3.3.4.1 Integrated Pollution Prevention Control (IPPC) Licensed Facilities

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

The EPA online mapping indicates that there are no licensed IPPC facilities within the Study Area.

Details of the nearest licensed IPPC facility, Brooks Haughton, are provided in the following **Table 3.3**. Details of other IPPC licensed sites are also provided.

Table 3.3 Licensed IPPC Facilities

IPPC Licence No.	Facility	Location	Activity Category
P0343-01	Brooks Haughton Ltd.	Pouladuff Industrial Estate, Togher. Located northeast of the Togher Culvert Study Area	8.3.0: Wood, Paper, Textiles and Leather
P0391-01	Galco Ltd.	Tramore Road, Cork	3.4.0: Metals
P0407-01	Irish Pioneer Works (Fabricators) Ltd.	Kinsale Road, Cork	3.4.0: Metals

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, hotels, restaurants, public houses and retail outlets.

3.3.6 Community Facilities

3.3.6.1 Education

Primary schools in the Study Area, include:

- Gael Scoil na Duglaise, Douglas,
- St. Columba's Primary School for Boys, Douglas
- St. Columba's Primary School for Girls, Douglas
- St. Lukes National School, Douglas
- Togher National School, Togher .

Post Primary Schools in the Study Area are:

- Douglas Community School.

3.3.6.2 Recreation and Amenities

Recreation and amenity in the Study Area include the Douglas Community Park and the Ballybrack walkway/cycleway. The Study Area also includes a number of sports clubs which include the following:

- Douglas Hurling and Football Club,
- Douglas Camogie Club,
- Douglas Pitch and Putt Club,
- Douglas Golf Club,
- Tramore Athletic, and
- Greenwood Football Club.

Angling within the Study Area will also need to be considered. Consultation with angling clubs will need to be carried out.

3.3.7 Key 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.

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

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 in the flood relief scheme.

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 *Carrigaline Local Area Plan 2011* and the *proposed Amendment No.2 Doulas LUTS to the Carrigaline Local Area Plan 2011* and any future developments in the Study Area.

3.4 Ecology

DixonBrosnan Environmental Consultants assessed the potential ecological (both terrestrial and aquatic) impacts associated with the Douglas Flood Relief Scheme. The first stage of this assessment is the identification of significant ecological constraints.

3.4.1 Terrestrial Ecology

3.4.1.1 Methodology

A desktop study was undertaken to identify the ecological features of the Study Area, assess the ecological value of habitats within the Study Area and to assess possible impacts on fauna. The survey area was examined with the aid of aerial photography and Ordnance Survey maps. The following bodies and or individuals, and websites provided information for this report either via publicly available documents or direct consultation:

- Environmental Protection Agency (EPA)
- National Parks and Wildlife Service (NPWS)
- Inland Fisheries Ireland (IFI)
- Water Framework Directive Ireland (WFDI) www.wfdi.ie
- *Bat survey of Ballybrack River Valley, Douglas Co. Cork* (Dr Daniel J. Buckley, 2013)
- *Ballybrack Valley (Mangala) Greenway, Douglas - Ecological Report* (Atkins, 2013)
- *Bats and their distribution: A case study of bats and their distribution in the Douglas environs using a bat detector and six line transect routes from June to September 2013.* (Dissertation John Redmond, 2013)
- *Cork City Urban Otter Survey 2011-2012*. (Irish Wildlife Trust 2013)
- *Ecological Screening Report for the Proposed Douglas East-West Link Road, Douglas, Co. Cork* (DixonBrosnan, 2013).

3.4.1.2 Receiving Environment

Designated sites-Natura 2000

A list of the protected Natura 2000 sites within 10km of the proposed development site is outlined in **Table 3.4** and shown on **Figure 3.4.1.** Site synopses for the Cork Harbour SPA and Great Island Channel SAC, which are considered relevant to this project, are included in **Appendix B** of this report. It is noted that the Tramore River discharges directly into Cork Harbour within the Cork Harbour SPA. Although significant impacts on designated sites are unlikely to occur, potentially there could be detrimental impacts associated with construction work such as increased noise and disturbance or impacts on water quality. Therefore Screening for Appropriate Assessment will be required. Depending on the results of this screening exercise, a Stage 2 Natura Impact Assessment may be required. Qualifying habitats and species for these sites are listed in **Tables 3.5** and **3.6.**

Table 3.4 Natura 2000 Sites within 10km.

Site	Code	Distance
Cork Harbour SPA	004030	Tramore River discharges directly into the Cork Harbour SPA
Great Island Channel SAC	1058	6.7 km from entry point of the Tramore River into the estuary.

Natura 2000 sites - Qualifying Interests

The NPWS lists the following habitats as qualifying interests for the Great Island Channel SAC (001058) **(Table 3.5)** and the following birds species as conservation interests for the Cork Harbour SPA (004030) **(Table 3.6)**.

Table 3.5 Qualifying Habitats - Great Island Channel SAC 1058

Name	Habitat Code	Habitat	% cover Approx.
Great Island Channel	(Qualifying Habitat) 1330	Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)	2
Great Island Channel	(Qualifying Habitat) 1140	Mudflats and sandflats not covered by seawater at low tide	62
Great Island Channel	1320	Spartina swards (*Spartinion maritimae*)	10
Great Island Channel	1130	Estuaries	20

Figure 3.4.1 Cork Harbour SPA (vertical lines) and Great Island Channel SAC (orange shade) in relation to the Tramore River.

(source NPWS online mapping www.npws.ie)

Table 3.6 Birds listed as Special Conservation Interests under the EU Birds Directive for SPA 004030

Annex of EU Birds Directive	Common Name	Scientific name
N/A	Cormorant	*Phalacrocorax carbo*
N/A	Shelduck	*Tadorna tadorna*
N/A	Oystercatcher	*Haematopus ostralegus*
Annex 1	Golden Plover	*Pliuvialis apricaria*
N/A	Lapwing	*Vanellus vanellus*
N/A	Dunlin	*Calidris alpina*
N/A	Black tailed godwit	*Limosa limosa*
Annex 1	Bar tailed godwit	*Limosa lapponica*
N/A	Curlew	*Numenius arquata*
N/A	Redshank	*Tringa totanus*
Annex 1	Common tern	*Sterna hirundo*
N/A	Little grebe	*Tachybaptus ruficollis*
N/A	Great crested grebe	*Podiceps cirstatus*
N/A	Grey heron	*Ardea cinerea*
N/A	Wigeon	*Anas penelope*
N/A	Teal	*Anas crecca*
N/A	Pintail	*Anas acuta*
N/A	Shoveler	*Anas clypeata*
N/A	Red-breasted merganser	*Mergus serrator*
N/A	Grey plover	*Pluvialis squatarola*
N/A	Black headed gull	*Larus ribundus*
N/A	Common gull	*Larus canus*

Source: European Communities (Conservation of Wild Birds (Cork Harbour Special Protection Area 004030) Regulations 2010

Designated sites- Natural Heritage Areas

Natural Heritage Areas and proposed Natural Heritage Areas are designated under National, rather than European, legislation. Although there are a number of these sites within a 10km radius of the Study Area, the Douglas River Estuary pNHA is considered the most relevant. The Tramore River discharges directly into Cork Harbour within the Douglas River Estuary pNHA which largely overlaps with the Cork Harbour SPA as shown above in **Figure 3.4.1.**

The Douglas River Estuary pNHA is a large site situated in the north-west part of Cork Harbour, stretching from Blackrock to Passage West. It is an integral part of Cork Harbour, which contains several other pNHAs. This site occurs within the

upper harbour and consists of extensive mudflats, formed from fine silts, bisected by the Douglas River. Damp grassland occurs on part of the southern side, extending to some low islands which are inundated in extreme tides.

Generally, mudflats within Cork Harbour are covered in algal mats (*Enteromorpha sp.)* with some growth of Cord Grass. This site is of interest because it is an essential part of the Cork Harbour complex and contains much higher densities of waders than would be expected from its relative size. It is ranked as the second most important area within the harbour.

Impacts, whether direct or through impacts on water quality and increases in noise and disturbance, could have a detrimental effect on the ecological functioning of this designated site.

Terrestrial Habitats

The Douglas River (Ballybrack River) is a small stream; however the valley through which it runs is considered of high amenity value and supports a variety of relatively common habitats. The Ballybrack valley was surveyed by Atkins in 2013 and habitats were classified according to Fossit, 2000. The survey recorded a variety of semi-natural habitats including Drainage ditches (FW4), Dry meadows and grassy verges (GS2), (Mixed) broadleaved woodland (WD1), Mixed broadleaf/conifer woodland WD2, Scattered trees and parkland (WD5), Treelines (WL2), Wet willow-alder-ash woodland (WN6) and Scrub (WS1).

Doman's wood which runs along a tributary to the west of the Ballybrack valley is accessed from housing estates in this area and is of amenity value. The wood includes beech, sycamore, alder and holly and is classified as (Mixed) broadleaved woodland (WD1).

Whilst these habitats are not considered of value at a national or regional level, the mosaic of habitats present within the valley and along the river's edge are an important ecological resource at a local level. The valley also functions as an important wildlife corridor for species such as Otter and Bat. As noted earlier, the location of this valley on the periphery of an urban area gives it a high amenity value. Thus any significant impact on the semi-natural habitats within the valley and/or along the Ballybrack River has to be potential to have a detrimental ecological impact.

Invasive Species

Of particular concern is the presence of Japanese Knotweed within the Ballybrack Valley and along the Ballybrack River. This species was also recorded in Doman's Wood. It is noted that further surveys will be required to determine if this species occurs along the Tramore River. This is a highly invasive species which forms dense stands and has a significant ecological impact primarily by shading out native species. Small fragments of rhizome or stem can spread this species and thus works that disturb existing stands species could impact on local ecology and on designated sites further downstream. Whilst there are mechanisms available to deal with this species, it can be problematical and has cost implications which may be significant. A detailed survey for invasive species will be required at the EIS stage.

Bats

All bat species in Ireland are protected under the Wildlife Act 1976, as amended in 2000 and the Habitats Directive which was transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. The Irish government is also a signatory to the Bonn convention (Convention on the conservation of migratory species of wild animals, Bonn 1979) and the Bern Convention, 1982 (The convention on the conservation of European wildlife and natural habitats) and has a commitment to the "Eurobats" agreement (Agreement on the Conservation of bats in Europe, 1991).

A variety of bat species have been recorded along the Ballybrack Valley i.e. soprano pipistrelle, common pipistrelle, Leisler's and an unidentified *Myotis* species (Buckley 2013) and Daubenton's (Redmond, 2013). Doman's wood is also likely to be of high value for bats. It is also probable that bats feed along sections of the Tramore River although less information is available with respect to this watercourse. Bats can be negatively affected due to the loss of individual mature trees or structures which provide roosts, loss of foraging habitat and in particular by fragmentation of commuting routes. This can occur if linear features such as riparian treelines are removed.

Otter

Otters, along with their breeding and resting places are protected under the provisions of the Wildlife Act 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive which is transposed into Irish law in the European Communities (Natural Habitats) Regulations (S.I 94 of 1997), as amended. Otters are also listed as requiring strict protection in Appendix II of the Berne Convention on the Conservation of European Wildlife and Natural Habitats and are included in the Convention on International Trade of Endangered species (CITES).

Otters are known to occur along the Tramore River (Irish Wildlife Trust, 2013) and Ballybrack River (Atkins, 2013). They also occur along the Douglas Estuary (personal observation). Otters can be potentially affected by direct impacts on resting areas/holts, obstacles to movement along rivers such as culverts, increased noise and disturbance during construction works and increased accessibility by pedestrians and dogs. If there is a net loss of fish habitat due to direct works or due to impacts on water quality this could reduce prey availability for otters.

Other Species

A range of other birds and mammals will use habitats along the Tramore River and in particular the Ballybrack River. These species may be affected by loss of feeding or breeding habitat or increased levels of noise and disturbance. Species which may occur include hedgehog, red squirrel, rodent species and a variety of bird species including some species such as heron, mallard etc. which specifically use aquatic habitats. It is considered unlikely that kingfisher which is listed on Annex 1 of the

Birds Directive occurs along either river; however, this cannot be entirely discounted without further survey work.

3.4.1.3 Key Terrestrial Ecology Constraints

The key terrestrial ecology constraints are as follows;

- Potential impacts on designated sites and in particular the Cork Harbour SPA and Douglas River Estuary pNHA into which the Tramore River discharges.
- Potential impact on terrestrial and riparian habitats which are considered of high value at a local level and which are of high recreational value.
- Potential impacts on bats through potential loss of roosting sites, foraging areas and disruption of commuting roosts.
- Potential impacts on otter via noise and disturbance, potential impacts on prey availability, potential impacts on resting areas/holts and potential impacts on movement of otter along watercourses.
- Potential impacts on kingfisher (if present) due to loss of breeding habitat.
- Potential impacts on a variety of bird and mammal species due to loss of habitat, habitat fragmentation and increased noise and disturbance.
- Potential impacts from the spread of Japanese Knotweed.

3.4.2 Aquatic Ecology

3.4.2.1 Methodology

A desktop study was carried out to identify the surface water features of the Study Area and assess the aquatic ecological, fisheries and water quality of the aquatic areas present. The survey area was examined with the aid of aerial photography and Ordnance Survey maps. The following bodies or documents provided information for this report either via publicly available documents or direct consultation:

- Environmental Protection Agency (EPA)
- National Parks and Wildlife Service (NPWS)
- Douglas Flood Relief Scheme (Including Togher Culvert) - Response from Inland Fisheries Ireland (IFI, 2014)
- Water Framework Directive Ireland (WFDI)
- Irish Wildlife Trust
- Ballybrack Valley (Mangala) Greenway, Douglas - Ecological Report (Atkins, 2013)
- Ecological Screening Report for the Proposed Douglas East-West Link Road, Douglas, Co. Cork (DixonBrosnan, 2013).

3.4.2.2 Receiving Environment

Designated sites - Natura 2000

Information, including location and qualifying interests, for designated Natura 2000 sites potentially affected by the proposed works are given in the above terrestrial ecology section. Potentially there could be impacts on the Cork Harbour SPA into which the Tramore River discharges and Great Island Channel SAC which is located 6.7km away but is hydrologically connected. The Tramore River also discharges directly into the Douglas River Estuary pNHA which largely overlaps with the Cork Harbour SPA. Theoretically impacts on water quality within these designated sites could occur if significant contamination of surface water were to occur due to chemical contamination e.g. by hydrocarbons, or the generation of excessive levels of silt. Such impacts are not considered probable. However, Screening for Appropriate Assessment will be required. Depending on the results of this screening exercise, a Stage 2 Natura Impact Assessment may be required.

Aquatic fauna and Fisheries

Due to culverting, poor gradient and possible water quality impairment in the past, the Tramore River has limited fisheries potential. It does however provide habitat for a resident population of brown trout. The Ballybrack has a more natural flow pattern, with areas of gravel suitable for salmonid spawning and well developed riparian zone. It supports a good population of brown trout. As one of Cork's few urban streams in good condition, it is considered by Inland Fisheries Ireland (IFI) to be an important community resource (M. McPartland IFI, pers. comm.).

Consultation will be carried out with local angling clubs to determine the importance of the Tramore and Ballybrack for angling.

The Ballybrack, Grange and Donnybrook streams are small but the IFI noted that they provide spawning habitat for salmonids (IFI, 2014).

Due to substantial culverting in the lower reaches, neither stream is likely to support migratory species such as salmon, river lamprey and sea lamprey which are listed on Annex II of the Habitats Directive. For the same reason, sea trout are not expected to occur. Due to the size of the streams and the underlying geology, crayfish and freshwater pearl mussel will not occur.

Other fish such as eel, which is now considered under threat and brook lamprey which is listed on Annex II of the Habitats Directive have also been recorded from the Study Area (IFI, 2014). Although improbable, there is also the potential for the Annex I Habitat *Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation* to occur.

Inland Fisheries Ireland Response

Inland Fisheries Ireland (IFI) provided a detailed response in relation to the project which is included as **Appendix D6** of this report. IFI noted the following:

> *"The Study Area encompasses the Tramore River, the Ballybrack, Grange and Donnybrook streams and their tributaries all of which contain salmonid spawning and nursery waters. In addition to salmonids, lamprey and eels*

have been recorded within the constraints Study Area. The aforementioned watercourses have suffered negative impacts from urbanisation over the years but still remain important habitats and have undergone significant rejuvenation in recent years.

While IFI are fully aware of, and sensitive to, the hardship caused by flooding events any proposed flood alleviation measures must be sustainable and in keeping with the requirements of the Fisheries Acts, Habitats Directive and Water Framework Directive.

In this context IFI feels that the current assessment of flooding events must be a catchment wide process assessing the impact of changes in drainage, development and land use patterns and practices on the response of flows in rivers to rainfall events involved to rainfall events. Likewise potential solutions should consider the catchment in its entirety and not focus solely on the relatively small area set out in the constraints study. Each solution or series of solutions proposed should be considered not alone in financial terms but also in the context of long term sustainability and durability in combination with flood control effectiveness".
(IFI 7 April 2014).

IFI requested that sufficient data be provided at the EIS stage, and should include mapping and quantification of aquatic habitat types, redd counts, mapping of bank side vegetation, complete fish stock survey and identification of channel characteristics. The impact assessment should determine the loss of habitat and impacts on flora and fauna, impacts on fish stock densities, changes in flow dynamics and impacts on fish movement and migration and compatibility of any proposed measures with existing legislative requirements.

3.4.3 Key Aquatic Ecology Constraints

The scheme design should take into consideration the potential impacts:

- on designated sites, and in particular the Cork Harbour SPA and Douglas River Estuary pNHA into which the Tramore River discharges, which could occur if severe deteriorations in water quality were to arise due to inappropriate work practices or accidental spillage of hydrocarbons, concrete or other deleterious material.
- from loss of habitat due to culverting and dredging and from loss of riparian habitat which provides food, cover and shade and helps to stabilise river banks. Significant impacts on fish populations of brown trout, eel and brook lamprey and on macroinvertebrate populations could occur due to such loss of habitat. Inland Fisheries Ireland generally prefer not to see culverting and dredging being carried out on salmond rivers (M. McPartland pers. comm.)
- associated with construction which could include the mobilisation of high levels of silt. High silt levels can impact in particular on lamprey and salmonid spawning habitats. Excessive siltation can cause salmon and trout eggs and fry to be smothered. Spawning salmonids and lamprey are likely to avoid traditional spawning areas due to excessive silt deposits. Adult fish may also be affected by increased silt levels as gills may become damaged by exposure to elevated

suspended solids levels. High silt levels may also impact on macroinvertebrate populations and on aquatic flora.

- which may arise via inadvertent spills of hydrocarbons, poorly maintained machinery or inadequate storage. Due to the limited size of watercourses within the project area, relatively small volumes of polluting material could have a significant impact.
- on otter via noise and disturbance, potential impacts on prey availability, potential impacts on resting areas/holts and potential impacts on movement of otter along watercourses.
- consultation will be carried out with local angling clubs to determine the importance of the Tramore and Ballybrack for angling.

Other key constraints include:

- Notwithstanding that there has already been significant culverting of watercourses, the scheme design should take into consideration that further culverting may further restrict the movement of fish and may lead to a net loss of habitat.
- The scheme design should take into consideration that modifications of the river channel structure may result in the loss of habitat for particular age classes of fish i.e. riffle for juvenile fish or pools for adults fish. Such changes may impact on population dynamics.
- The scheme design should take into consideration that dredging has the potential to directly impact on eggs and juvenile fish including brown trout and brook lamprey in sediments.
- In salmonid waters, any instream works should generally be restricted to the period from July to September, inclusive.

3.5 Water

This section of the constraints study describes the existing hydrological environment within the Study Area and the immediate surrounding area, in addition to the potential impacts of the Douglas FRS (including Togher culvert).

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,
- Geological Survey of Ireland, (GSI), online groundwater well data
- EPA online database and mapping of Hydrometric Stations
- Water Framework Directive website www.wfd.ie
- *South West River Basin District Management Plan* 2009-2015.
- *Lee CFRAMS SEA Environmental Report* (2010)

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

Any abstractions from the Tramore River or the Douglas River which may be identified during the engineering study should be protected in the scheme design.

Existing Groundwater Abstractions

GSI online mapping of 'Groundwater Well Data' indicates that there are groundwater wells in the Douglas River area. GSI mapping indicates that the Togher Culvert area is located approximately 60m west of two areas indicated as 'Wells Accuracy within 1km'.

Hydrometric Stations

Consultation of EPA online mapping indicates that there is one Hydrometric Gauge (Recorder - ID 19052) on the Tramore River which is maintained by Cork County Council. The location of the Hydrometric Station is shown in the following **Table 3.7.**

Table 3.7 – Details of Hydrometric Station

Station	Ref	Type	Easting	Northing	Waterbody	Responsible Authority	Active
Cork Landfill	19052	Recorder	168337	69448	Tramore	Cork County Council	Yes

Surface Water Features

Surface water features within the Study Area comprise the Tramore River and the Douglas River (Ballybrack Stream) and its tributaries.

The *Lee CFRAMS Hydrology Report* (Halcrow 2008) describes the Tramore River catchment as covering an area of 21km^2 and lying to the South of Cork City. The catchment includes the suburban areas of Ballyphehane, Douglas, Grange and Donnybrook. The Tramore River rises in the southwest of the catchment and flows into Lough Mahon in Cork Harbour. It is joined by a number of small tributaries draining the land to the south of the catchment with the most significant of these tributaries being the Trabeg Stream from the North, and the Douglas River joining it in Douglas, The tributaries of the Douglas River (Ballybrack) are the Donnybrook

Stream and the Grange Stream. The Douglas River flows in a northerly direction before joining the Tramore River.

Two discharge points from the north side of Cork Airport carry runoff from the airport to the Tramore River (Lee CFRAMS).

3.5.2.2 Water Quality

Online EPA biological data provides information on surface water quality. Biological information is provided in the form of Q values. However no Q values were indicated on the EPA online mapping (at the time of consultation for this report) for the water features in the Study Area. However, the Tramore River is believed to have suffered a degree of water quality impairment in the past. In estuarine waterways, the EPA rates water quality as 'Unpolluted', 'Intermediate', 'Potentially Eutrophic' and 'Eutrophic'. The former two water quality ratings are considered to be indicative of acceptable estuarine water quality, while the latter two are considered as unsatisfactory. The following **Table 3.8** displays the results for Lough Mahon.

Table 3.8 EPA Water Quality Status

Area	Water Quality Status
Lough Mahon	**Estuarine & Coastal Water Quality - Intermediate**

(Source EPA EnVison mapping)

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 for the Douglas and Tramore Rivers. No data was found in this publication for either of these rivers.

The status of the rivers is provided in the following section *Water Framework Directive.*

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.

The Water Frameworks Directive assesses the water quality of rivers and ranks their status as follows: 'High', 'Good', 'Moderate', 'Poor', 'Bad' and 'Yet to be determined'.

The Water Frameworks Directive also determines the "Risk" level of a river as follows: 1a – At risk of not achieving Good Status, 1b – Probably at risk of not archiving Good Status, 2a – Expected to achieve Good Status and 2b – strongly expected to achieve Good Status.

Relevant data for surface waters within the Study Area, where available, are given in **Table 3.9**.

Table 3.9. WFD Status of Watercourses within the Study Area

Watercourse	Status	Risk
Lough Mahon	Good	1a – At risk of not achieve Good Status
SW_Coastalt2_Tramore_1Lower (Includes the lower sections of the Tramore River and the Ballybrack River)	Moderate (2009)	1a – At risk of not achieve Good Status

(Source: EPA Envision map system**)**

The Study Area is located within the Water Framework Directive (WFD) South Western River Basin District. The management plan for this area was consulted during the preparation of this report. 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 wasted 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."*

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 Lower Lee/Owenboy WMU. The figure in this Action Plan for the Lower Lee/Owenboy WMU (August 2009) which includes water quality, indicates that the status of the Tramore River and the Douglas River is 'Moderate'.

The key measures to be implemented in the Lower Lee/Owenboy 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 capital works,*
- *Treatment plants requiring further investigation,*
- *Treatment plants requiring attention to meet Shellfish waters PRPs* (Pollution Reduction Programmes),
- *Treatment plants requiring improvements in operational performance,*
- *Urban aggglomerations requiring investigation of CSOs* (Combined Sewer Overflows),
- *Agglomerations that require management of development,*
- *Properties that will be subject to performance, operational and maintenance standards for onsite waste water treatment systems,*
- *IPPC licences with discharges to waters that require review,*
- *Licences for discharges to waters under the Water Pollution Acts that require review, and*
- *River waterbodies assessed to be at risk from diffuse sources, including agriculture."*

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."*

Hydrogeology

Aquifers in the Study Area are classified on GSI online mapping (Groundwater Public viewer) as '*Li – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones'* and '*RKd – regionally Important Aquifer – Karstified (diffuse)'*.

GSI online data indicates that the aquifer vulnerability in the vicinity of the Douglas River comprises '*X- Rock at or near Surface or Karst'*, '*E - Extreme*' '*High*' and '*M- Moderate',* and in the vicinity of Togher Culvert, the aquifer vulnerability is

similarly classified, with '*Moderate*' aquifer vulnerability to the north of the Togher Culvert.

Geological Survey of Ireland (GSI) online data indicates that the Study Area comprises two groundwater bodies, namely CorkCity_2 and CorkCity_3. The GSI online data indicates that the status of both of these groundwater bodies 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 2 and Cork City 3.

3.5.3 Key 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 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 take into consideration the 'Drinking Water Protected Area – Groundwater' bodies Cork City 2 and Cork City 3, 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 Lough Mahon Estuary.

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:

- The Geological Society of Ireland's online mapping and database (www.gsi.ie),
- Cork County Council online 'Quarry Viewer'

  (http://quarries.corkcoco.ie/quarries_by_townland.htm)
- Bing Map aerial photography,
- EPA online Historic Mines inventory (www.epa.ie),

- National Parks and Wildlife Service online mapping of proposed Natural Heritage Areas (www.npws.ie)
- Mine Heritage Society of Ireland (www.mhti.com/minedetails.htm.)

3.6.2 Receiving Environment

3.6.2.1 Bedrock Geology

The GSI online database indicates that the dominant rock type in the southern portion of the Study Area comprises '*Purple mudstone and sandstone' (Ballytrasna Formation*). Further north, the dominant rock type is '*Sandstone with mudstone and siltstone' (Gyleen Formation)*. To the north of this, the dominant rock type is classified as '*Flaser-bedded sandstone and minor mudstone' (Old Head Sandstone Formation).* Further north again, the dominant rock type is classified as '*Flaser-bedded sandstone and mudstone (Cuskinny Member).*

3.6.2.2 Soils

GSI online Quaternary data (Teagasc Subsoil data) indicates that the dominant soil in the Study Area comprises '*Till derived chiefly from Devonian sandstones'*. *Bed outcrop* is indicated along the routes of the rivers, with *Alluvium* along the Glashaboy River. Large areas of *Made ground* are also indicated on the mapping.

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.

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 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 Areas of the Douglas River and the Togher Culvert. 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. Cultural Heritage includes history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers) and place names.

3.7.1.1 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)
- *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 website provides a database of summary reports of all archaeological excavations and investigations in Ireland undertaken from 1970 to 2010.

The database was searched for any excavations that were undertaken in any of the townlands within the constraint Study Area.

- 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. CO86-10 refers to circle 10 on OS sheet 86 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 now available for consultation via the NMS website 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.

- **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 no monuments in the register of historic monuments in the Study Area.

- **County Development Plan for Cork (2009)** – The County Development Plan for Cork outlines the Cork 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 sixteen protected structures within the constraint Study Area (**Table 3.11**). 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 two ACAs in the Study Area.

  Draft Cork County Development Plan (2013) - The *Draft County Development Plan for Cork (2013)* outlines additional objectives regarding archaeological heritage including the protection of monuments listed in the SMR and 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. There are two ACAs in the Study Area Church Street Conservation Area and West Douglas Street Conservation Area (**Table3.12**).

- **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). There are thirty-one buildings and structures listed in the NIAH within the constraint Study Area (**Table 3.13**).

3.7.3 Receiving Environment

3.7.3.1 Overview of the archaeological, architectural and cultural heritage environment

This section provides a broad chronological overview of the landscape of the Douglas River (Ballybrack Stream) and a concise summary of the Togher culvert area. The overview is based mainly on information from the Sites and Monuments Database of the Archaeological Survey of Ireland, the RMP and the *Archaeological Inventories of County Cork: Volume 2 East and South Cork* (Power 1994) and Volume 5 (Ronan, Egan, Byrne 2009) and on local publications.

Douglas River Constraint Study Area

Douglas Village is located approximately 3km south of Cork City and has in the last decade become one of the City's largest suburbs. The Douglas River (Ballybrack Stream) rises in Ballinimlagh c. 2.5km to the south of the Douglas Village, and flows north forming the townland boundary between Ballinimlagh and Moneygourney, Castletreasure and Maryborough, Castletreasure and Ardarrig, Ballybrack and Ardarrig, before flowing into the village of Douglas through the townland of Douglas. It flows north through the village, joining the Tramore River,

before discharging into the Douglas Estuary in the inner reaches of Cork Harbour. The Village, which developed here in the early 18th century, grew up around the establishing textile industries. The power which was harnessed from the River initially attracted these industries to Douglas.

The catchment area of the River which lies within the constraint study extends beyond the lowlying townlands of Douglas, Grange, Inchisarsfield and Ardarrig to the higher ground south, southeast and southwest of the river into the townlands of Ballybrack, Castletreasure, Ballinvuskig, Ballinimlagh, Ballinrea, Moneygurney, Rathmacullig East, Maryborough, Curraghconway, and Ballycurreen. These townlands span the three civil parishes of St Finbar's, Carrigaline and Killanully and are all in the barony of Cork. With the exception of Maryborough, the names of these townlands are Irish and incorporate commonly used place names such as baile meaning townland, town or homestead, rath meaning ringfort and muine (money) meaning thicket (www.loganim.ie). Additional details on the placename information is given in **Appendix C**.

There is evidence of earlier human activity in these areas which extends to the Bronze Age (c. 2,400 BC to 500 BC). There are two fulachtai fia in Curraghconway (CO086-106 and CO086-108) at the southwest of the Study Area. 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.

In Ballinvuskig at the southern edge of the Study Area there is a standing stone (CO086-089) and two possible standing stones (CO086-090 and CO086-091). 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. 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 precise date of these monuments can usually only be determined by excavation.

There are a 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 to the island from the late 4th century onwards becoming widely established during the second half of the sixth century. One of the most characteristic 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 is a ringfort in Douglas (CO086-014) at the northeastern end of the Study Area and a possible ringfort in each of the townlands of Ballinvuskig (CO086-011), at the southern edge of the Study Area, Ballinrea (CO086-028) and Castletreasure (CO086-012001) both at the southeatern end of the Study Area. Some ringforts have associated

souterrains, or man-made underground tunnels leading to a chamber or series of chambers. A possible souterrain (CO086-012002) is associated with the ringfort in Castletreasure.

The site of Castletreasure Castle (CO086-013) is at the southeast of the Study Area. No visible trace of the castle survives but its location was marked on all editions of the OS 6 inch maps and some structural remains were depicted on the 1842 OS map. Lewis, in1837 (Cadogan 1998, 222) notes 'some slight remains of Treasure castle'.

There are three graveyards and a possible church in the Study Area. Two of the graveyards are in Douglas (CO074-097 and CO074-098) and the other is in Moneygourney (CO086-103) at the southeastern edge of the Study Area. There is a possible church in Ballinvuskig (CO086-010) in the southwest of the Study Area. Although churches and graveyards can date to a multitude of periods, all of these sites appear to be post medieval in date. Douglas itself was part of Carrigaline Parish during the medieval period, but appears to have become a parish probably in 1752 when a church was built near Grange Cross. No visible remains of this church now survive (Foley 1991, 39-40).

The graveyard in Moneygourney (CO086-103) at the southeast of the Study Area was initially a famine burial ground and later a paupers' burial ground.

The possible church site in Ballinvuskig (CO086-010) is in the northwestern part of the townland where, according to local information, there was a church and burial ground.

There is a record that the Augustinians held property including a mill in west Douglas at the beginning of the Reformation (ibid. 166). The mill was apparently built by the O'Dalys in Ballybrack (ibid.).

There is also a tradition of a Mass Rock in a wooded area in Donnybrook in a small structure known as the 'Shelly House'. Foley (ibid. 41), however, notes this is an unlikely location for a Mass Rock as it is in proximity to a number of estate houses.

In the post medieval period, when the walls of Cork City were removed and the suburbs expanded many of its wealthier citizens choose to move beyond the City's medieval core. In the 18th century, Douglas was one of the favoured areas, where the City's merchant princes choose to locate their new more spacious homes mixing them with the existing country houses and estates of the wealthy farming community. In 1837 Lewis (Cadogan 1998 221-2) lists in excess of 30 houses as principal seats in the Douglas area which he describes in very attractive terms. Douglas was a thriving milling village from the 18th to the 20th century. There was a sailcloth mill in Donnybrook from the 18th century known as Douglas Woollen Mills and then later St Patricks Woollen Mills was founded in Douglas village in the 19th century. The village of Douglas contains many buildings associated with these two mills and it continued to thrive into the middle of the 20th century as a result of their presence. There were also a number of smaller mills in the village, one at Ravensdale and another thought to be in the area of Douglas Street West and

Church Street (Foley 1991, 31). The mill pond for this mill is marked on the 1842 OS map and the mill at Ravensdale is marked on this map. The village was serviced by a tram which connected Douglas with the City. This electric tram service began in 1898 and continued until 1931 and the only surviving memory of this service is in the name of Tramway Terrace in the eastern side of the village. St Columbas Hall, referred to locally as the 'tinny shed' is located at the end of this terrace and is a corrugated iron structure. It was built as a recreation hall for the mill workers in the early 20th century and has continued in the same vein, where it now houses a bar and provides a base for a number of clubs in the Douglas area. This structure is not listed by the NIAH or by Cork County Council. It is, along with many other structures in the village of Douglas, a building of cultural heritage interest and is given a Cultural Heritage number for the purpose of this report (CHS 2). The Fingerpost is at the junction of the Rochestown Road with Maryborough Hill and East Douglas Street. The original post was used to hang a local man, Phil Carty of Donnybrook, for his part in the 1798 rebellion (ibid. 97-8). It remains an important local landmark today. It is named as a 'Guide Post' on the 25-inch map. In this report it is considered a cultural heritage site (CHS 1).

The Douglas River (Ballybrack stream) has played its part in the development of Douglas and may have been an important resource from early times. It has been used and changed in the past but continues to remain as an integral part of the village. It is likely that it has been impacted in the past when it was used as a power source for various mills and possibly when it may have been dredged and deepened in earlier attempts to curb flooding. It is, therefore, classed as an Area of Archaeological Potential.

Table 3.10 lists all archaeological sites within the constraint Study Area and referred to in the report.

Table 3.11 lists buildings and structures listed in the Draft Cork County Development Plan (2013). A total of sixteen buildings and structures are listed in the draft development plan within the Study Area or very close to it

Table 3.12 lists Architectural Conservation Areas (ACAs) listed in The Cork County Development Plan which are within the Study Area: these are Church Street Conservation Area and West Douglas Street Conservation Area. A map showing the locations of these is provided in **Appendix C** of this report

The NIAH lists many more buildings some within Douglas village and these are listed in **Table 3.13** below. Many of these overlap with those listed in the Record of Protected Structures in the County Development Plan.

Table 3.10: Archaeological site included on the RMP and Sites and Monuments database within the Douglas constraint Study Area.

RMP	Townland	Site Type
CO086-010	Ballinvuskig	Possible Church
CO086-108	Curraghconway	Fulacht Fiadh
CO086-106	Curraghconway	Fulacht Fiadh
CO086-011	Ballinvuskig	Possible Ringfort
CO086-089	Ballinvuskig	Standing Stone
CO086-090	Ballinvuskig	Possible Standing Stone
CO086-091	Ballinvuskig	Possible Standing Stone
CO086-028	Ballinrea	Possible Ringfort
CO086-103	Moneygurney	Graveyard
CO086-060	Castletreasure	Country House
CO086-012001	Castletreasure	Possible Ringfort
CO086-012002	Castletreasure	Possible Souterrain
CO086-013	Castletreasure	Castle (site of)
CO086-014	Douglas	Ringfort
CO086-100	Grange	Flax Mill
CO086-102	Castletreasure	Country House
CO074-095	Grange	Woollen Mill
CO074-097	Douglas	Graveyard
CO074-098	Douglas	Graveyard

Table 3.11: Architectural features included in the Draft County Development Plan (including the records from the County Development Plan) Record of Protected Structures in the Douglas constraint Study Area

RPS	Townland	Name
0481	Douglas	St Luke's Church of Ireland Church
0684	Douglas	Former Garda Station
0482	Douglas	Douglas Woollen Mills
1243	Inchisarsfield	St Patricks Woollen Mills (Industrial Estate)
0566	Grange	Millhouses
1231	Grange	No. 11 Grange Terrace
1232	Grange	No. 10 Grange Terrace
1233	Grange	No. 9 Grange Terrace
1234	Grange	No. 8 Grange Terrace
1235	Grange	No. 7 Grange Terrace
1236	Grange	No. 6 Grange Terrace
1237	Grange	No. 5 Grange Terrace
1238	Grange	No. 4 Grange Terrace
1239	Grange	No. 2 Grange Terrace
1240	Grange	No. 3 Grange Terrace
1241	Grange	No. 1 Grange Terrace

Table 3.12: **Architectural Conservation Areas in the Douglas constraint Study Area**

Townland	Name
Douglas	Church St Conservation Area
Douglas	West Douglas Street

Table 3.13 Architectural features listed in the NIAH within the Study Area (of local importance)

No	Name	Location
20871034	St Columba's boys School	Old Carrigaline Rd
20871038	River View B&B	Douglas St
20871040	Schoolhouse Studio	Carrigaline Rd
20871043	St Luke's C of I Church and environs	Churchyard Lane
20871042	Sextons House, St Lukes Church	Churchyard Lane
20871045	John Slye Scout Hall	Churchyard Lane
20871046	St Columba's Roman Catholic Church	Churchyard Lane
20871050	Single arch road bridge	Church Road/ Carrigaline Rd
20871036	Ballybrack House	Donnybrook Hill
20871035	Ballybrack House - environs of	Donnybrook Hill
20871049	The Rectory	Carrigaline Rd
20872002	Douglas House,	Maryborough Hill
20871033	1-7 St Patricks Terrace	West Douglas St
20908623	Terrace of 5 houses	Donnybrook
20908625	Terrace of 6 houses	Donnybrook
20908622	Douglas Woollen Mills	Donnybrook
20871030	St Patricks Woollen Mills	Douglas
20871031	St Patricks Woollen Mills water tower	Douglas
20871032	St Patricks Woollen Mills	Douglas
20871033	1 – 7 St Patricks Woollen terrace	Douglas
20871047	House	Church Rd
20871048	Pair of semi detached houses	Church Rd
20908624	Pair of 2-storey houses	Donnybrook
20908626	Former Gate Lodge	Donnybrook
20908628	Warehouse	Donnybrook
20908627	Cast iron post box	Grange
20908630	Christy Floor Coverings	Donnybrook
20908631	Terrace of 5 Houses	Donnybrook
20908632	Donnybrook House	Donnybrook
20872004	Maryborough House Hotel	Maryborough
20908629	Warehouse	Donnybrook

Cartographic evidence

The Study Area is depicted on the 1842 OS map as mainly rural, with the village of Douglas on its northern edge, centred at the confluence of the Douglas River (Ballybrack stream) and the Tramore River. The Besnards sailcloth factory is shown in Donnybrook and the mill at Ravensdale is also depicted. A mill pond is marked to the south of the Ravensdale mill and it is thought that this served a mill in the area of Douglas West and Church St. The land to the south of Ravensdale is occupied by estate houses and gardens. Extending further into the Study Area to the south, southeast and southwest the landscape is a rural one with occasional dwellings set generally within their own landscaped grounds surrounded by agricultural land.

By the turn of the 20th century, when the 25-inch OS map was compiled, settlement in the village of Douglas had become more dense. St Patrick's Woollen Mills, and to the south, Douglas Woollen Mills, (largely on the site of Besnards sailcloth factory) appear as prominent features.

In the following century, the nature and scale of the settlement, both within the Study Area and at Douglas, changed completely from rural to suburban. Numerous residential housing estates have created a large suburb of Cork City, and the centre of Douglas is a thriving hub of commercial activity. The rural village and surrounding landscape of country house estates has been completely replaced.

Togher Culvert Constraint Study Area

This section also examines the archaeological, architectural and cultural heritage of a small area around the Togher Culvert. The overview is based mainly on information from the Sites and Monuments Database of the Archaeological Survey of Ireland, the RMP and the *Archaeological Inventories of County Cork: Volume 2 East and South Cork* (Power 1994) and Volume 5 Ronan, Egan, Byrne 2009) and on local publications.

Togher is a surburb of Cork, located *circa* five kilometres to the southwest of the City centre and has in the last decade grown to become one of the City's largest suburbs. The Tramore River/Libery Stream rises to the south of Togher between the townlands of Gortagoulane and Lehanagh More and flows north, forming the townland boundary between the two townlands and then between Doughcloyne and Lehanagh More, before turning east (where it is named Tramore River) towards the Douglas estuary. It is difficult to pinpoint an exact centre for the village of Togher, however, it seems to spread linearly from the bottom of Spur Hill roughly northwards as far as Vicars Road. In the mid 19th century, Togher was depicted and named on the 1842 OS map as a crossroads with a school, a smithy and a small cluster of houses. The entrance and lodge to Doughcloyne House (situated to the west) is at this junction. By the turn of the 20th century, the cluster of houses, the lodge and the smithy remained on the 25 inch OS map. The school, however, is now further to the north (along the Togher Road), houses are depicted along the road to the north of the school and the name Togher is now attached to a set of houses further north. The Cork & Macroom Direct Railway line runs east-west between the houses. It remained thus until the second half of the century when it grew as a suburb to the City. In more recent times, the railway fell into disuse and became the route for the N40 South Ring Road.

The proposed Togher Culvert runs along a section of the early phase of the north-flowing Tramore River where it forms the townland boundary between Lehanagh More and Doughcloyne. It is culverted and runs roughly northeastwards for a short distance with a modern housing estate to its north and an industrial estate to its south. As it reaches a north-south minor road to the east it turns north along the western edge of the road where it runs over ground until it reaches a crossroads with Spur Hill and Togher Road (where the settlement of Togher it is depicted on the 1842 OS map) when it goes underground again. At this point the culvert continues northwards along the edge of Togher Road, within the townland of Lehanagh More, as far as the football pitch where the river becomes overground again and turns to flow eastwards. The constraint Study Area is limited to a very small area on each side of this stretch of the River and encompasses a small part of the townlands of Doughcloyne and Lehanagh More. These townlands are in the civil parish of St

Finbar's, and in the barony of Cork. The names of these townlands are derived from the Irish. Doughcloyne comes from Dúchluain or Dúbh chluain meaning black lawn or bog meadow. Lehanagh comes from Liath eanach meaning grey morass and Mór means big. Togher comes from Tochar meaning causeway.

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 (ancient cooking places) dating from the Bronze Age. The Tramore River can, therefore, be considered as an Area of Archaeological Potential.

The constraint Study Area for the culvert comprises a very small area in and around the culvert. There are no sites listed in the RMP, NIAH or County Development plan within the Study Area. Some buildings of cultural heritage interest fall within the constraint Study Area as the culvert runs through the old settlement of Togher. At the junction of Spur Hill and Togher Road there is a single storey house (CHS 3) which is shown on all editions of the OS maps; the lodge (CHS 4) to the now-demolished Doughcloyne House stands opposite this and a school (CHS 5) depicted on the 1902 OS 25 inch map remains standing further to the north.

Given that there are no sites of archaeological, or architectural interest in the Study Area, there are no archaeological or architectural constraints for this culvert.

The single storey house (CHS 3), lodge (CHS 4) and school (CHS 5) are considered to be cultural heritage constraints.

The Tramore River is an Area of Archaeological Potential and is in itself a constraint. The Tramore river was impacted when it was culverted and it may have been dredged and drained at various times in the past.

Table 3.14 lists Cultural Heritage Sites within the Togher Culvert constraint Study Area, and referred to in the report.

Table 3.14: Cultural Heritage sites within the Togher Culvert Constraint Study Area

CHS No	Name	Location
CHS 3	Single storey house	Junction Togher Rd /Spur Hill
CHS 4	Lodge	Junction Togher Rd /Spur Hill
CHS 5	Old Schoolhouse	Togher Rd

3.7.4 Key Constraints

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.

(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 two Study Areas.

(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 two Study Areas.

(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 castles, ringforts, churches and graveyards. There are eight archaeological sites considered to be of regional importance within the Douglas River (Ballybrack stream) Study Area (Table 3). There are none within the Togher Culvert Study Area.

(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 fulachta fiadh, possible ringforts or enclosures and holy wells. There are eleven archaeological sites considered to be of local importance within the Douglas River (Ballybrack stream) Study Area (**Table 3.13**). There are none within the Togher Culvert Study Area.

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 two site specific cultural heritage sites in the Douglas River (Ballybrack stream) Study Area which are not afforded any protection; these are the Fingerpost road sign (CHS 1) and St Columba's Hall (CHS 2), both at the south end of Douglas village. Both are considered to be of local importance. There are three site specific cultural heritage sites in the Togher Culvert Study Area which are not afforded any protection; these are the the single storey house (CHS 3) and the Lodge (CHS 4) at the junction of Spur Hill and Togher Rd and the old school (CHS 5) on Togher Rd. These are considered to be of local importance.

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

Within the Douglas River (Ballybrack stream) Study Area :

- There are no sites listed as National Monuments.
- There are no sites listed in the Register of Historic Monuments.
- There are no sites subject to Preservation Orders.
- There are no archaeological sites considered to be of international or national importance.
- There are eight archaeological sites considered to be of regional importance (**Table 3.15**).
- There are 11 archaeological sites considered to be of local importance (**Table 3.16**).
- There are 16 structures listed in the Record of Protected Structures (**Table 3.11**).
- There are two streetscapes listed as Architectural Conservation Areas (**Table 3.12**).
- There are two Cultural Heritage Sites not listed in any of the above (**Table 3.17**).
- There is one Area of Archaeological Potential - The Douglas River (Ballybrack stream).

Sites to be considered as key constraints within the Douglas River (Ballybrack stream) Study Area:

- All archaeological sites considered to be of regional importance.
- All buildings or structures listed in the Record of Protected Structures.
- Streetscapes listed as Architectural Conservation Areas.
- Two cultural heritage sites (CHS 1 & 2) not listed in any of the above (**Table 3.18**).

- Area of Archaeological Potential - The Douglas River (Ballybrack Stream). It is possible that remains associated with the mill at Ravensdale and the mill further south in the village of Douglas may still survive along the banks of the river or in the river itself. It is also possible that earlier remains may exist along the banks of the river.

Table 3.15: Archaeological and Architectural sites in the Study Area of Regional Importance or Key Constraints.

RMP/ RPS	Townland	Site Type
CO086-010	Ballinvuskig	Possible Church
CO086-103	Moneygurney	Graveyard
CO086-013	Castletreasure	Castle (site of)
CO086-014	Douglas	Ringfort
CO086-100 / 0482	Grange	Douglas Woollen Mills/ Flax Mill
CO074-095 / 1243	Grange	St Patricks Woollen Mill (Industrial Estate)
CO074-097	Douglas	Graveyard
CO074-098	Douglas	Graveyard
0481	Douglas	St Luke's Church of Ireland Church
0684	Douglas	Former Garda Station
0566	Grange	Millhouses
1231	Grange	No. 11 Grange Terrace
1232	Grange	No. 10 Grange Terrace
1233	Grange	No. 9 Grange Terrace
1234	Grange	No. 8 Grange Terrace
1235	Grange	No. 7 Grange Terrace
1236	Grange	No. 6 Grange Terrace
1237	Grange	No. 5 Grange Terrace
1238	Grange	No. 4 Grange Terrace
1239	Grange	No. 2 Grange Terrace
1240	Grange	No. 3 Grange Terrace
1241	Grange	No. 1 Grange Terrace
ACA	Grange & Douglas	West Douglas Street Conservation Area
ACA	Douglas	Church Street Conservation Area

Table 3.16: Cultural Heritage sites in the Study Area of Local Importance.

RMP	Townland	Site Type
CO086-108	Curraghconway	Fulacht Fiadh
CO086-106	Curraghconway	Fulacht Fiadh
CO086-011	Ballinvuskig	Possible Ringfort
CO086-089	Ballinvuskig	Standing Stone
CO086-090	Ballinvuskig	Possible Standing Stone
CO086-091	Ballinvuskig	Possible Standing Stone
CO086-028	Ballinrea	Possible Ringfort
CO086-060	Castletreasure	Country House
CO086-012001	Castletreasure	Possible Ringfort
CO086-012002	Castletreasure	Possible Souterrain
CO086-102	Castletreasure	Country House

Table 3.17: Cultural Heritage sites in the Study Area of Local Importance (but which are not considered to be key constraints).

CHS	Townland	Site Type
CHS 1	Douglas	Road sign (Fingerpost)
CHS 2	Douglas	St Columbas hall/Tinny Shed

Within the Togher Culvert Study Area:

- There are no sites listed as National Monuments.
- There are no sites listed in the Register of Historic Monuments.
- There are no sites subject to Preservation Orders.
- There are no archaeological sites considered to be of international, national, local or regional importance.
- There are no structures listed in the Record of Protected Structures.
- There are three Cultural Heritage Sites not listed in any of the above (**Table 3.10**).
- There is one Area of Archaeological Potential - The Tramore River.

Sites to be considered as key constraints in the Togher Culvert Study Area:

- Three cultural heritage sites (CHS 3, 4 & 5) (**Table 3.14** above)
- The Tramore River. It is possible that remains associated with human activity from the earliest times may still survive along the banks of the river or in the river itself.

3.7.5 Recommendations

Impacts on sites of archaeological, architectural and cultural heritage interest will need to be considered, in the course of this project.

Sections of both the Douglas and Tramore Rivers are the subject of this study and both, as rivers, are considered to be constraints. It is likely that the Douglas River (Ballybrack stream) has been impacted in the past when it was used as a power source for various mills and possibly when it may have been dredged and deepened in earlier attempts to curb flooding. The Tramore River was impacted when it was culverted and it too may have been dredged and drained in the past. 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 includes the Douglas river valley and Togher river culvert. South of Douglas, topography rises steeply to agricultural rideglines, which are incised by

river valleys. These river valleys are flanked and defined by extensive riparian wooded corridors along the rivers flow from the south to north of the area merging together at Douglas Village.

The general landscape character in the northern half of the Study Area is defined by the low lying urban framework and associated residential areas of Frankfield, Douglas and Maryborough as well as the outer suburbs of Castletreasure and Moneygourney.

The southern half of the Study Area is defined by open agricultural land, with farmsteads and one off houses. Terrain is flat with views to the City and harbour. The highest point in the Study Area is at Rathmacullig to the south east of the site at 170 metres.

The Togher culvert Study Area extends from the residential area of Brooke Avenue, up to the roundabout at Togher Road, where a section of the Tramore River is not culvert, then the culvert continues north to meet the open section of the River at Greenwood Estate, at the top of Togher Road. The area is mixed residential and industrial.

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. These documents define the character type of the site as City Harbour and Estuary. The character area for this type of landscape is noted as 'No. 19 – City Estuary Harbour and Island Complex'. In addition, the landscape value and sensitivity is classed as 'Very High' in the above documents. The key characteristics of this landscape character, relevant to the Study Area are as follows;

- Mix of rural and intensely urban areas combined with a large expansive harbour (immediately north of the Study Area). The two hills at Maryborough and Castletreasure, provide the main landscape features and backdrop to the urban areas of *Douglas*, *Frankfield* and *Grange* and determine this rural / urban character mix.
- Landscape of fertile farmland of mixed use and mature broadleaf hedgerows, which slope to the sea (southern part of the Study Area). Extensive woodland areas line the corridors of the rivers and pockets of the urban framework.
- The rural areas around much of the greater harbour area are now characterised such as roads, bridges and electricity power lines and some urban sprawl. Road infrastructure linking to the City to the industrial area of Ringaskiddy to the south and airport to the east of the site are a prominent feature to the area.
- The high quality vernacular built environment reflects the high concentration of protected structures that are evident throughout the landscape. Protected structures are noted in Douglas, Grange and Maryborough. St. Luke's Church of Ireland Church and associated grounds is the most notable within the Study Area.
- The area has a strong economic base due to its strong urban character and diversity of economic activities. The proximity to the City, airport and industrial area of Ringaskiddy 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 regional and national scale.

3.8.3 Designated Landscape Significance

Within the Study Area there are no designated scenic landscapes or routes. The nearest scenic route is noted in the *Cork County Development Plan 2009* as the S56; from Farmer's Cross on the N27 / R600 Road, east of the airport, this is approximately 300 metres west of the Study Area at the nearest location. S55; Rochestown Road lies 2km to the east of the Study Area. Views towards the Study Area are limited by intervening topography.

Table 3.12 lists Architectural Conservation Areas (ACAs) listed in The Cork County Development Plan which are within the Study Area: these are Church Street Conservation Area and West Douglas Street Conservation Area. The objective for Architectural Conservation Areas is defined in 'Env 4-6' and promotes to enhance the special character area of the area including;

…'streetscape, landscape and setting'.

A map showing the locations of these is provided in **Appendix C** of this report.

There are a number of protected structures in the Study Area at Grange, Douglas and Maryborough as indicated on Heritage and Conservation: Map 15 of Cork *County Development Plan 2009*. St. Luke's Church of Ireland Church, located in the centre of Douglas Village, is the most notable in terms of its landscape setting. Views to and from this Church are important as this feature determines the character of the area.

There are no protected structures in the Togher Culvert Study Area.

3.8.4 Other Landscape Elements

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

1. Douglas Community Park and playground
2. Douglas GAA pitches
3. Douglas Golf Course
4. Douglas Pitch & Putt course
5. Corinthians Park at Castletreasure
6. Green space at Ardfield Road, Pinecroft
7. Walkways through Doman's Wood
8. Walkways through woods at Castletreasure.
9. Walkway through Mangala and Ballybrack.

There is a sports pitch just south of the N40 and north of Greenwood Estate, just outside the Study Area of the Togher culvert Study Area, it is within the Cork City boundary. There is a footpath running parallel to the Tramore River that follows east along green space. Though it is not a designated footpath, it still is an important amenity for residents.

In addition, there are a number of public open greens within housing developments that are used by local residents.

There is existing riparian broadleaf woodland along the river corridors in the Study Area that provide screening and amenity value to the area. Doman's Wood is the largest woodland corridor stretching from Grange to Lisroe. Species are predominately riparian in nature and include species such as Ash, Alder, Oak, Hazel, Rowan, Hawthorn and Blackthorn.

Motorway type planting is evident to both the north and south of N25 and east and west of the N40. Species include Ash, Oak and Rowan, which help to screen residential areas from the traffic corridors.

Groupings of trees and shrubs associated with the Togher culvert play an important part in screening residents from industrial units.

Hedgerows define the agriculture land in the south of the Study Area, predominantly Ash and Hawthorn.

Groupings of mature trees are located within the confines of Douglas 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 Constraints

The key landscape constraints identified are:

- The wooded areas provide both screening to residents and are of amenity value. 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 urban / 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 structure of St. Luke's Church defines the character of Douglas Village and should 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, and
- 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 online database of IPPC licensed facilities.

3.9.2 Receiving Environment

3.9.2.1 Air

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.

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 Zone B 'Cork' (the Cork conurbation).

The EPA publication indicates that the air quality in Zone B in 2012 was 'good'.

It is not envisaged that a flood relief scheme 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 existing noise environment in the Study Area is associated with the activities in a mosaic of busy industrial estates, shopping centres and roads, and quieter residential areas.

Noise/Vibration-sensitive Receptors within the Study Area

Residential developments are present throughout the Study Area. The Study Area also includes a number of schools. A retirement home is located on Church Road in Douglas.

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

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 Summary of Key Constraints and Implications

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

Prior to the selection of a preferred flood relief scheme as part of the Engineering Study, it is recommended that the shortlisted flood alleviation measures be assessed in relation to the impact of noise and vibration during the construction phase of the project, and that the effects of vibration during the construction phase be considered in the selection process for potential flood alleviation measures.

It is recommended that mitigation measures be put in place to reduce the impacts on air quality and the noise environment during the construction phase of any proposed flood relief scheme.

3.10 Material Assets

Material assets within the Study Area include:

- The built environment,
- Waste water infrastructure,
- Waste management facilities, and
- 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 http://www.epa.ie/terminalfour/wwda
- 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).*

3.10.2 Receiving Environment

3.10.2.1 Waste Water Infrastructure

Waste water infrastructure in the Study Area comprises sewerage networks and varied domestic treatment systems. The sewerage networks eventually discharge to

the Carrigrenan Waste Water Treatment Plant (WWTP) at Little Island, east of Cork City. The Carrigrenan WWTP, in turn discharges to Lough Mahon in Cork Harbour.

The EPA Waste Water Discharge Licence Application lists emergency overflows and Combined Sewer Overflows, which are designed to be activated during high flows in the combined collection network, as a result of high rainfall. This includes overflows to the Douglas Estuary and to Lough Mahon.

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 vicinity area of the Study Area.

Consultation of the EPA database (www.epa.ie) showed that there are no EPA licensed waste management facilities within the Study Area. There are two EPA licensed waste management facilities in the wider area, as outlined in the following **Table 3.18**.

Table 3.18 EPA Licensed Waste Management Facilities in the General Area

Licensed Facility	Location	EPA Licence Reference No.
Kinsale Road Landfill	Kinsale Road, Cork Located northeast of the Study Area	W0012-03
Greenstar Environmental Services Ltd.	Forge Hill, Kinsale Road, Cork Located to the east of the Study Area	W0173-01

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 *Regional Waste Management Plan*. Cork County Council's website states that this is not expected to occur until Quarter 2 of 2014.

Cork County Council website includes a list of current 'Waste Facility Permits – Certificates of Registration'. The following facilities in the current County Council list are located in the general area (following **Table 3.19**).

The *Waste Management Plan for Cork County* (2004) includes a table of 'Licensed Landfill Sites' (Table 2.1 of Appendix 4 of the Plan). None of the sites listed in Table 2.1 of Appendix 4 of the Plan are located within the Study Area. The only site listed in the general area is the Kinsale Road Landfill.

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). None of the sites listed in Table 2.2 of Appendix 4 of the Plan lie within the Study Area. Sites listed in Table 2.2 of Appendix 4 of the Plan which are in the general area are shown in the following **Table 3.20**.

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 3.21**).

Table 3.19 Current Waste Facility Permits – Certificates of Registration (www.corkcoco.ie)

Facility	Address	Activity	Waste Permit No.
Cork Recycling Co. Ltd	Lehenaghmore, Togher	Recycling facility (paper, cardboard etc.)	WFP-CK-09-0022-02
Cork Hygiene Ltd	Unit 32, Doughcloyne Industrial Est., Togher	Transfer Station	WFP-CK-09-0015-01
Instant Waste Disposal Ltd	Ballinvuskig, Grange, Douglas	Transfer Station (paper, cardboard, metals, wood)	WFP-CK-11-0095-01
Ballycurreen Auto Dismantlers Ltd.	Unit 11, Ballycurreen Industrial Estate, Frankfield	ATF End of life vehicles	WFP-CK-12-0118-01

Table 3.20 Licensed Civic Amenity Sites, Waste Transfer Stations and other Waste Treatment Facilities

Facility Name	Location
Greenstar Recycling Holdings Ltd. (see also **Table 3.18** above)	Forge Hill, Kinsale Road, Cork
IPODEC Ireland Ltd.	Forge Hill, Kinsale Road, Cork

Table 3.21 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.

Permitted Facility	Location	Type of Facility	Permit Reference No.	Cork County Council List of Current Waste Facility Permits – Certificates of Registration (www.corkcoco.ie)
Pouladuff Dismantlers Ltd.	Forge Hill, Kinsale Road, Cork	Dismantling and Vehicle Recovery	CK(S)07/01	No
IPODEC Ireland Ltd.	Forge Hill, Kinsale Road	Recycling facility (paper, cardboard etc.)	CK(S)02/01	No
Cork Recycling Co. Ltd	Lehenaghmore, Togher	Recycling facility (paper, cardboard etc.)	CK(S)17/02	Yes (Waste Register No. 43-2010)
Advanced Skip Hire	Lehenaghmore, Togher	Recycling facility (paper, cardboard etc.)	CK(S)12/01	No

The *Cork County Development Plan* 2009 *2nd Edition* states that the Council will require project C & D Waste Management Plans to be prepared for projects in excess of any of the following thresholds:

- *"Demolition/renovation /refurbishment projects generating in excess of 100m^{3}in volume of construction and demolition waste.*
- *Civil engineering projects producing in excess of 500 m^3 of waste, excluding waste materials used for development works on the site."*

3.10.2.3 Roads and Transportation Infrastructure

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

The primary access route to the Study Area is the N40 South Ring Road.

Secondary access to the Douglas area is provided by the following Regional roads:

- From the East, the R610 (Rochestown Road)
- From the North the R851 (Douglas West)

- From the West and South, the R851 (Grange Road and Donnybrook Hill, respectively).

Secondary access to the Togher Culvert area is from the local road Togher Road.

Access within the Study Area is also provided by cycle paths and walkways.

All roads in the Study Area are maintained by Cork City and Cork County Councils, however any modifications to National Primary and Secondary roads would require consultation with the NRA.

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.

3.10.2.5 Future Changes

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.

It is proposed to provide a new road and bridge between Grange Road and the Carrigaline Road over the Ballybrack River Valley.

It is proposed to widen sections of the existing N28.

3.10.3 Summary of Key Constraints and Implications for the Proposed Scheme

- 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 City and County Councils 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 Cork City and County Councils 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 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

4.1.1 Public Information Day

A public information day (PID) was held on Wednesday 26th February 2014 in the Douglas Community Centre. 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 Douglas 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 representatives of Cork County Council and the Office of Public Works, 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

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

In addition, information leaflets were delivered to residents on the route of the proposed culvert in Togher and to properties in Douglas affected by the 2012 flood event.

4.1.1.2 Literature Available for the Public Information Day

Information leaflets, posters and questionnaires were available at the PID on the 26th 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 D**.

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 D**

4.2.2 Public Consultation Questionnaire

A questionnaire with pre-printed questions was provided 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 any design or the Environmental Constraints Study. A copy of the blank questionnaire is attached in **Appendix D**.

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

Copies of the posters are included in **Appendix D**.

4.2.4 Project Website

A dedicated website, to make details of the Douglas FRS, has been set up and is live. The website address www.douglasfrs.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 31 attendees signed the attendance list at the event in Douglas Community Centre. However, the total attendance was estimated to be between 70 and 80 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 a 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 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 resident of the eastern end of Greenwood Estate (near the river) stated that flooding had occurred at Greenwood Estate in 2000, 2009 and 2012. The resident also stated that the flow 'out of the culvert at Southern Fruit estate cannot get back into the stream from Togher Road', and that in a past flood, the depth of flooding was relieved by him opening a gate at the side of his house and allowing the flood from the front of the property to pass to the rear, causing damage in his garden'. He suggested leaving access for surface water to get from the road to the culvert in future, in general given the surface water runoff from higher ground in the area and also specifically in case there was a problem with water bypassing the entrance of the new culvert in Southern Fruit.
- Togher Community Centre advised of surface water run off (from the road) to the soccer club grounds on the hill above Togher Village.

4.4.2 Returned Questionnaires

By 27th March 2014, which was the closing date for receipt of comments, a total of 10 questionnaires had been returned to the Environmental Team. Questionnaires received following this date were not included in the project team 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 of the following:

- A letter from Canmount,
- A letter from Inland Fisheries Ireland.
- An email from the Development Applications Unit (DAU) of the Department of Arts, Heritage and the Gaeltacht
- A copy of a newspaper cutting showing flooding in Togher in 1947 was received from a resident of Greenwood Estate
- Video footage of flooding was received at the PID from the Togher Community Association.

The Canmount submission contained a number of comments including comments relating to the funding of the stages of the programme, the timing of the study, the flood events of June 2012, river maintenance, and Community Park works.

The letter from Inland Fisheries Ireland 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.

An email was received via the project email from the Development Applications Unit (DAU) of the Department of Arts, Heritage and the Gaeltacht, with attached observations in relation to nature conservation and terrestrial and underwater archaeology.

The DAU observation in relation to nature conservation is that the Douglas Estuary forms part of the Cork Harbour Special Protection Area which should be taken into account in the Constraints Study.

With regard to archaeological heritage, the DAU observations are that in the Record of Monuments and Places (RMP), extensive recorded archaeological sites are to be found within the areas addressed for the Constraints Study, and attention to the Department's policy in relation to the terrestrial archaeological assessment of large-scale developments on sites where there are no previously recorded monuments. Similarly previously unknown underwater archaeological heritage should be considered in any Constraints Study. The DAU observation includes that the services of a suitably qualified archaeologist, with coastal or underwater experience should be engaged.

Because all watercourses have the potential to contain underwater archaeological heritage, if any direct interventions in the watercourses are proposed at the design stage, an assessment of the impacts on underwater archaeology will be completed at that stage. This assessment will be carried out by a suitably qualified archaeologist, to ensure appropriate protection of archaeological heritage.

A copy of a newspaper cutting was received from a resident of Greenwood Estate, showing flooding in Togher in 1947 following heavy rainfall, gale force winds which coincided with Spring tides.

Video footage of flooding was received at the PID from the Togher Community Association.

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

4.5 Analysis of Public Consultation Response

4.5.1 Analysis of Questionnaires

In total, there were 10 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 Douglas and Togher Culvert areas. Full details

of the responses to questionnaires were provided to the Design Team. Outlined below is a summary of the information provided in the questionnaires.

4.5.1.1 Flooding Information (from questionnaire)

When asked about previous flood events, four of the respondents had personal experience with previous flood events, with the majority of those affected by the 2012 flood event. Two of the properties affected were residential. Other properties affected were an open space (yard), the community centre and a recreational/meeting hall.

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

- In the Togher Area, flooding was mainly from the river/stream with one report of overground (surface water flow)
- Storm water drainage in the Southern Fruit and Coho area in Togher is not being addressed. During the recent extreme weather, the volume of water running down the hill into Togher was enormous.
- The proposed culvert at Togher will be on limited use, because of its location at a higher level than the adjoining roads, which currently act as water courses. There is a need to capture the water early i.e.higher up the slopes with intercepters and thereby divert the run off into the enlarged culvert.
- As a result of the previous flood events, properties are no longer covered by insurance against flooding.

4.5.1.2 Flood Alleviation Information

When asked in Question 13 of the questionnaire if they had a preference for the type of flood alleviation method, first preferences were equally distributed between 'Non-structural Measures', 'Re-location of Properties and/or Infrastructure' 'Flood Containment through the Construction of Flood Defences', 'Flow Diversion (e.g. river diversion or flood flow bypass channel), , 'Reconstruction of Properties and/or infrastucture to a higher level', 'Flow reduction (e.g upstream catchment management and flood storage)and 'Flow Diversion'

The majority of second preferences in relation to the above Question 13 were for Flow Reduction (e.g. upstream catchment management and flood storage) (30%), followed by 'Increase the Conveyance of the Channel' (10%).

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

- **Togher**:
    - Put 36" Gratings and larger pipes to the stream. Also taper the road to suit gratings.
    - Increase the main culverts and storm drainage system to be able to handle the increase in the volume of water.

- Intercepter drains and gullies, Diversion to larger culvert, Very minor engineering works to allow any overflow to enter existing culvert of Tramore River drainage scheme

- **Douglas**:
  - Prevent "back up" of water in the river. (Flood caused by "back up" from culvert). Dredge the River regularly
  - By using the defence works chosen and by researching other areas where buildings have been built on flood plains as happened in this case.

4.5.1.3 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 4.3**.

Table 4.3 Summary of Question 15 of the Questionnaire ranging the importance of each of seven environmental topics.

Topic	**Very Important**	**Important**	**Moderately Important**	**Of Little Importance**	**Unimportant**
Flood Related Socio-Economic & Social Issues	50%	0%	0%	0%	0%
Flora & Fauna	10%	20%	10%	0%	0%
Local Fisheries	0%	10%	20%	10%	0%
Habitats	0%	20%	30%	0%	0%
Water Quality	40%	10%	0%	0%	0%
Architectural & Cultural Heritage	0%	50%	0%	0%	0%
Landscape & Visual Amenity	10%	40%	0%	0%	0%
Angling, Tourism & Recreation	0%	30%	10%	0%	10%

The above table indicates that 'Flood Related Socio-Economic & Social Issues' was considered the most important of the environmental constraints, with 50% of respondents indicating that it was 'Very Important'. 'Water Quality was indicated by 40% of respondents to be 'Very Important'.

'Flora and Fauna' were mainly considered to be 'Important', whilst 'Habitats' and 'Local Fisheries 'were mainly considered to be 'Moderately Important'. 'Architectural & Cultural Heritage', 'Landscape & Visual Amenity' and 'Angling, Tourism & Recreation' were mainly considered to be '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:

- Information with regard to the volume of stormwater running down the hill into Togher,
- Consideration of Cork City Council using the northern culvert between Kinsale Road Landfill and Park and Ride to enable pedestrian access/egress from site when developed as a park.
- Culvert at Togher will be at a higher level than the adjoining roads.
- Concerns regarding difficulties obtaining flood insurance.

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

4.5.1.4 Conclusion

The Public Consultation was held to inform the general public of the Constraints Study and preliminary aspects of the Douglas 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 PID, 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

- Environmental Protection Agency (EPA) guidelines *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements 2003*
- Environmental Protection Agency ENVision Online Database www.epa.ie
- Environmental Protection Agency My Local Environment (Timpeall an Tí) online Database www.epa.ie
- Inland Fisheries Ireland Website www.ifi.ie
- Office of Public Works (2010) Lee CFRAMS SEA Environmental Report
- Ordnance Survey Discovery Series Mapping at 1:50,000 scale

5.2 Human Beings

- Central Statistics Office – online Censuses of Ireland 2006 and 2011, (www.cso.ie)
- Central Statistics Office *Quarterly National Household Survey Quarter 3 2013 (*www.cso.ie)
- Cork County Council *Cork County Development Plan 2009 (2nd Edition),*
- Cork County Council *Carrigaline Electoral Area Local Area Plan 2011,*
- Cork County Council *Proposed Amendment to the Carrigaline Electoral Area Local Area Plan 2011- Amendment No. 2 Douglas LUTS (November 2013),*
- Cork City and County Councils *Cork Area Strategic Plan 2001-2020*
- Fáilte Ireland *Annual Report 2012*
- Indecon, RPOS and Savills HOK (2008) *The Cork Area Strategic Plan – Strategy for Additional Economic and Population Growth – An Update*
- MVA Consultancy, Cork County Council (2013) *Douglas Land Use and Transport Strategy (DLUTS) Final Report*
- South West Regional Authority *Regional Planning Guidelines 2010-2022,*

5.3 Ecology

- Atkins, (2013) *Bat survey of Ballybrack River Valley, Douglas Co. Cork* (*Ballybrack Valley (Mangala) Greenway, Douglas - Ecological Report*
- Buckley,D. J (2013*)*
- DixonBrosnan,(2013) *Ecological Screening Report for the Proposed Douglas East-West Link Road, Douglas, Co. Cork.*

- Environmental Protection Agency (EPA) www.epa.ie
- Inland Fisheries Ireland (IFI) www.ifi.ie
- Irish Wildlife Trust (2013) Cork City Urban Otter Survey 2011-2012.
- National Parks and Wildlife Service (NPWS) www.npws.ie
- Redmond, J. (2013) Dissertation *Bats and their distribution: A case study of bats and their distribution in the Douglas environs using a bat detector and six line transect routes from June to September 2013.*
- Water Framework Directive Ireland (WFDI) www.wfdi.ie

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*
- Geological Survey of Ireland, (GSI), online groundwater well data www.gsi.ie
- Halcrow (2008) *Lee CFRAMS Hydrology Report*
- OPW, Cork City, Cork County Council (2010) *Lee CFRAMS SEA Environmental Report*
- *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

- 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,
- Mine Heritage Society of Ireland (www.mhti.com/minedetails.htm.),
- National Parks and Wildlife Service online mapping (www.npws.ie) .

5.6 Archaeology, Architectural and Cultural Heritage

- Cadogan, T. (1998) *Lewis' Cork: A topographical dictionary of the Parishes, towns and villages of Cork City and County (First published in 1837.)* The Collins Press, Cork.
- Cork County Council (2013) *Draft Cork County Development Plan*
- Database of Irish Excavation Reports www.excavations.ie
- Department of Arts, Heritage, Gaeltacht & the Islands, (1999) *Framework & Principles for the Protection of the Archaeological Heritage*
- Department of Arts, Heritage, Gaeltacht & the Islands, (1999) *Policy & Guidelines on Archaeological Excavation*
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- St. Leger A (1991) *Silver Sails and Silk – Huguenots in Cork 1685-1850*. Cork Civic Trust Ltd.

- Stout, M. (1997). *The Irish Ringfort*. Four Courts Press, Dublin.

5.7 Landscape

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

5.8 Noise, Air Quality and Climate

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

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
- Environmental Protection Agency Waste Water Discharge Licence Applications for Waste Water Agglomerations within the Study Area http://www.epa.ie/terminalfour/wwda
- Environmental Protection Agency online mapped Licenced Waste Facilities
- National Waste Collection Permit Office online data (www.nwcpo.ie)

Appendix A

Carrigaline Electoral Area LAP Zoning Map 2011 & Proposed Amendment to Zoning Map November 2013

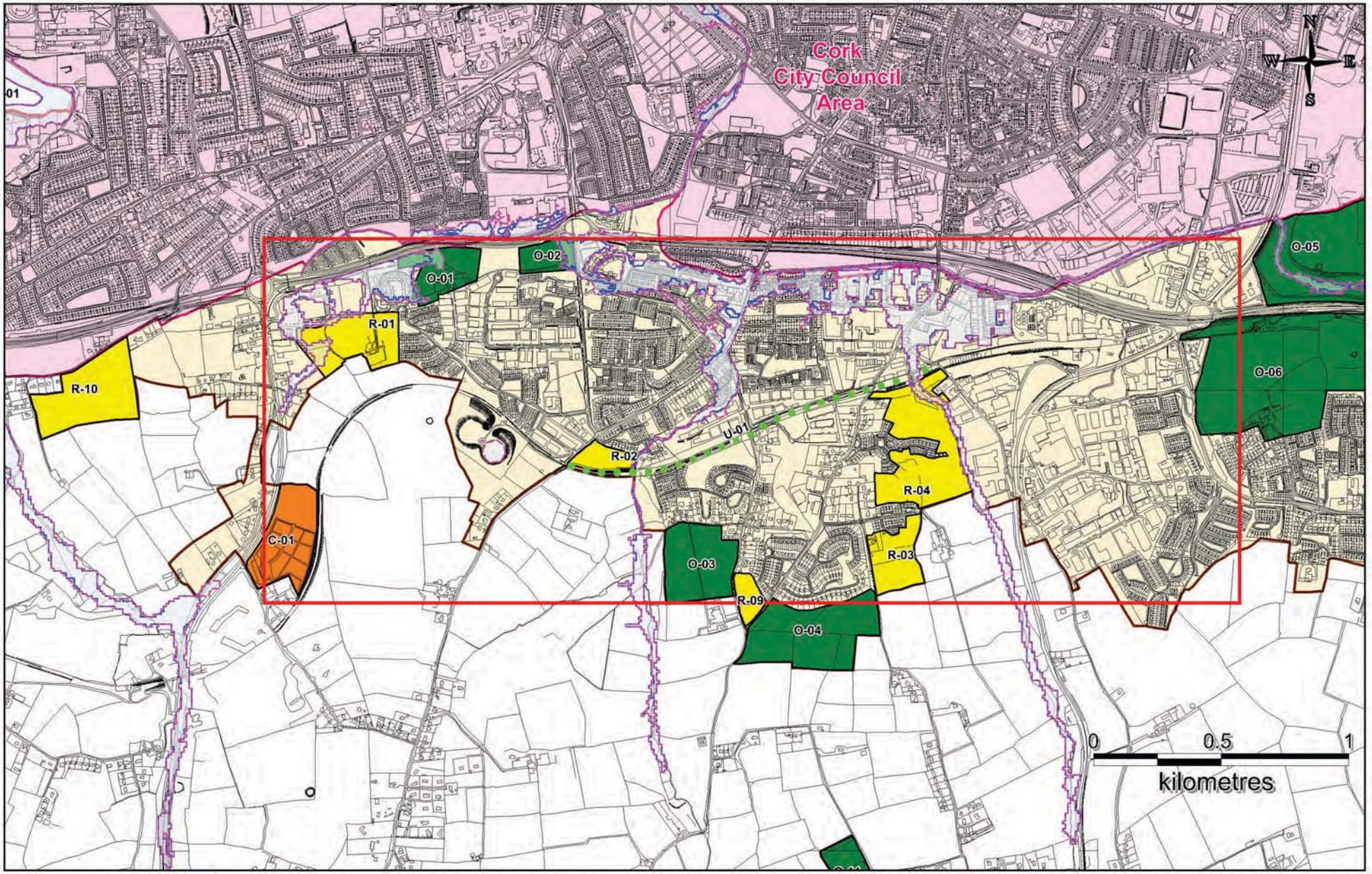
A1 Zoning Map

The Carrigaline Electoral Area Local Area Plan 2011 Zoning Map, and the proposed amendment to the Zoning Map (November 2013) are provided overleaf.

Cork County Council
Local Area Plans

Carrigaline Electoral Area Local Area Plan (August 2011) Zoning Map

CORK CITY SOUTH ENVIRONS 1



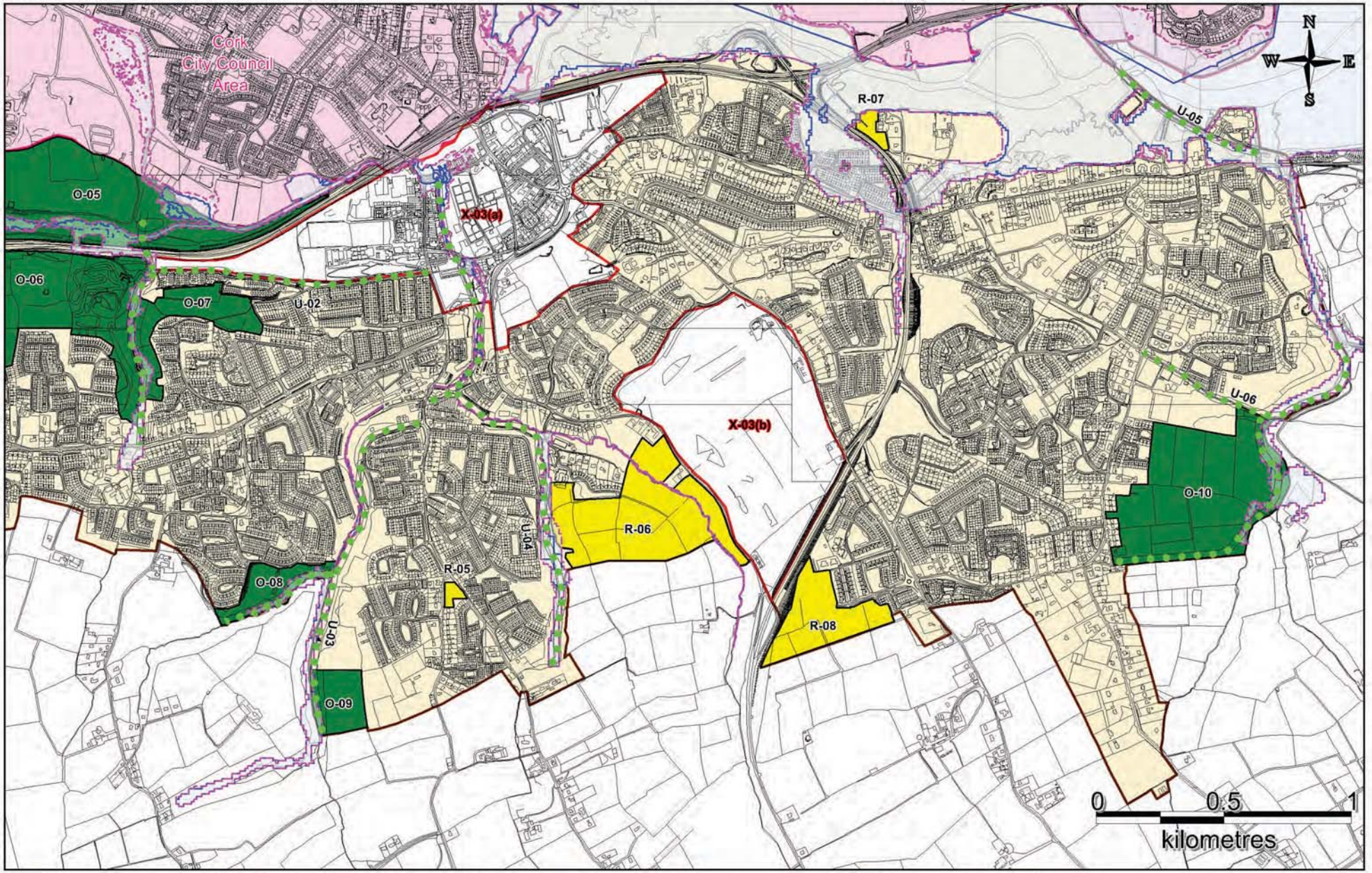
Settlement Boundary
Existing Built-up Area
Open Space / Sports Recreation / Amenity
Residential
Town Centre / Neighbourhood Centre
Community / Utility
Industry
Business
Special Policy Area
Enterprise
Utilities
Roads
Walkways
Area Susceptible to Flooding: Zone A
Area Susceptible to Flooding: Zone B

Cork County Council
Local Area Plans

Carrigaline Electoral Area Local Area Plan 2011

Zoning Map

CORK CITY SOUTH ENVIRONS 2



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

Site Synopses for Cork Harbour SPA and Great Island Channel SAC

B1 Site Synopses

Site synopses for Cork Harbour SPA and Great Island Channel SAC are provided overleaf.

SITE SYNOPSIS

SITE NAME: CORK HARBOUR SPA

SITE CODE: 004030

Cork Harbour is a large, sheltered bay system, with several river estuaries - principally those of the Rivers Lee, Douglas, Owenboy and Owennacurra. The SPA site comprises most of the main intertidal areas of Cork Harbour, including all of the North Channel, the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay and the Rostellan and Poulnabibe inlets.

Owing to the sheltered conditions, the intertidal flats are often muddy in character. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi*, *Nereis diversicolor* and *Corophium volutator*. Green algae species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially where good shelter exists, such as at Rossleague and Belvelly in the North Channel. Salt marshes are scattered through the site and these provide high tide roosts for the birds. Salt marsh species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Lax-flowered Sea-lavender (*Limonium humile*) and Sea Arrowgrass (*Triglochin maritima*). Some shallow bay water is included in the site. Cork Harbour is adjacent to a major urban centre and a major industrial centre. Rostellan Lake is a small brackish lake that is used by swans throughout the winter. The site also includes some marginal wet grassland areas used by feeding and roosting birds.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Little Grebe, Great Crested Grebe, Cormorant, Grey Heron, Shelduck, Wigeon, Teal, Pintail, Shoveler, Red-breasted Merganser, Oystercatcher, Golden Plover, Grey Plover, Lapwing, Dunlin, Black-tailed Godwit, Bar-tailed Godwit, Curlew, Redshank, Black-headed Gull, Common Gull, Lesser Black-backed Gull and Common Tern. The site is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

Cork Harbour is an internationally important wetland site, regularly supporting in excess of 20,000 wintering waterfowl, for which it is amongst the top five sites in the country. The two-year mean of summed annual peaks for the entire harbour complex was 55,401 for the period 1995/96 and 1996/97. Of particular note is that the site supports internationally important populations of Black-tailed Godwit (905) and Redshank (1,782) - all figures given are average winter means for the two winters 1995/96 and 1996/97. At least 18 other species have populations of

national importance, as follows: Little Grebe (51), Great Crested Grebe (204), Cormorant (705), Grey Heron (63), Shelduck (2,093), Wigeon (1,852), Teal (922), Pintail (66), Shoveler (57), Red-breasted Merganser (88), Oystercatcher (1,404), Golden Plover (3,653), Grey Plover (84), Lapwing (7,688), Dunlin (10,373), Bar-tailed Godwit (417), Curlew (1,325) and Greenshank (26). The Shelduck population is the largest in the country (over 10% of national total). The site has regionally or locally important populations of a range of other species, including Whooper Swan (10), Pochard (145) and Turnstone (79). Other species using the site include Gadwall (13), Mallard (456), Tufted Duck (113), Goldeneye (31), Coot (53), Mute Swan (38), Ringed Plover (34) and Knot (38). Cork Harbour is a nationally important site for gulls in winter and autumn, especially Black-headed Gull (4,704), Common Gull (3,180) and Lesser Black-backed Gull (1,440).

A range of passage waders occurs regularly in autumn, including such species as Ruff (5-10), Spotted Redshank (1-5) and Green Sandpiper (1-5). Numbers vary between years and usually a few of each of these species over-winter.

The wintering birds in Cork Harbour have been monitored since the 1970s and are counted annually as part of the I-WeBS scheme.

Cork Harbour has a nationally important breeding colony of Common Tern (3-year mean of 69 pairs for the period 1998-2000, with a maximum of 102 pairs in 1995). The birds have nested in Cork Harbour since about 1970, and since 1983 on various artificial structures, notably derelict steel barges and the roof of a Martello Tower. The birds are monitored annually and the chicks are ringed.

Extensive areas of estuarine habitat have been reclaimed since about the 1950s for industrial, port-related and road projects, and further reclamation remains a threat. As Cork Harbour is adjacent to a major urban centre and a major industrial centre, water quality is variable, with the estuary of the River Lee and parts of the Inner Harbour being somewhat eutrophic. However, the polluted conditions may not be having significant impacts on the bird populations. Oil pollution from shipping in Cork Harbour is a general threat. Recreational activities are high in some areas of the harbour, including jet skiing which causes disturbance to roosting birds.

Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, there are at least 18 wintering species that have populations of national importance, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Golden Plover, Bar-tailed Godwit, Ruff and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it.

SITE SYNOPSIS

SITE NAME: GREAT ISLAND CHANNEL

SITE CODE: 001058

The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. It is an integral part of Cork Harbour which contains several other sites of conservation interest. Geologically, Cork Harbour consists of two large areas of open water in a limestone basin, separated from each other and the open sea by ridges of Old Red Sandstone. Within this system, Great Island Channel forms the eastern stretch of the river basin and, compared to the rest of Cork Harbour, is relatively undisturbed. Within the site is the estuary of the Owennacurra and Dungourney Rivers. These rivers, which flow through Midleton, provide the main source of freshwater to the North Channel.

The main habitats of conservation interest are the sheltered tidal sand and mudflats and Atlantic salt meadows, both habitats listed on Annex I of the EU Habitats Directive. Owing to the sheltered conditions, the intertidal flats are composed mainly of soft muds. These muds support a range of macro-invertebrates, notably *Macoma balthica*, *Scrobicularia plana*, *Hydrobia ulvae*, *Nepthys hombergi, Nereis diversicolor* and *Corophium volutator*. Green algal species occur on the flats, especially *Ulva lactua* and *Enteromorpha* spp. Cordgrass (*Spartina* spp.) has colonised the intertidal flats in places, especially at Rossleague and Belvelly. The salt marshes are scattered through the site and are all of the estuarine type on mud substrate. Species present include Sea Purslane (*Halimione portulacoides*), Sea Aster (*Aster tripolium*), Thrift (*Armeria maritima*), Common Saltmarsh-grass (*Puccinellia maritima*), Sea Plantain (*Plantago maritima*), Greater Sea-spurry (*Spergularia media*), Sea Lavender (*Limonium humile*), Sea Arrowgrass (*Triglochin maritimum*), Mayweed (*Matricaria maritima*) and Red Fescue (*Festuca rubra*).

The site is extremely important for wintering waterfowl and is considered to contain three of the top five areas within Cork Harbour, namely North Channel, Harper's Island and Belvelly-Marino Point. Shelduck are the most frequent duck species with 800-1000 birds centred on the Fota/Marino Point area. There are also large flocks of Teal and Wigeon, especially at the eastern end. Waders occur in the greatest density north of Rosslare, with Dunlin, Godwit, Curlew and Golden Plover the commonest species. A population of about 80 Grey Plover is a notable feature of the area. All the mudflats support feeding birds; the main roost sites are at Weir Island and Brown Island and to the north of Fota at Killacloyne and Harper's Island. Ahanesk supports a roost also but is subject to disturbance. The numbers of Grey Plover and Shelduck, as given above, are of national importance.

The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. Overall, Cork Harbour regularly holds over 20,000 waterfowl and contains Internationally important numbers of Black-tailed Godwit (1,181) and Redshank (1,896) along with Nationally important numbers of

nineteen other species. Furthermore, it contains the large Dunlin (12,019) and Lapwing (12,528) flocks. All counts are average peaks, 1994/95 – 1996/97. Much of the site forms part of Cork Harbour Special Protection Area, an important bird area designated under the EU Birds Directive.

While the main land use within the site is aquaculture (Oyster farming), the greatest threats to its conservation significance come from road works, infilling, sewage outflows and possible marina developments.

The site is of major importance for the two habitats listed on the EU Habitats Directive that it contains, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.

2.10.2001

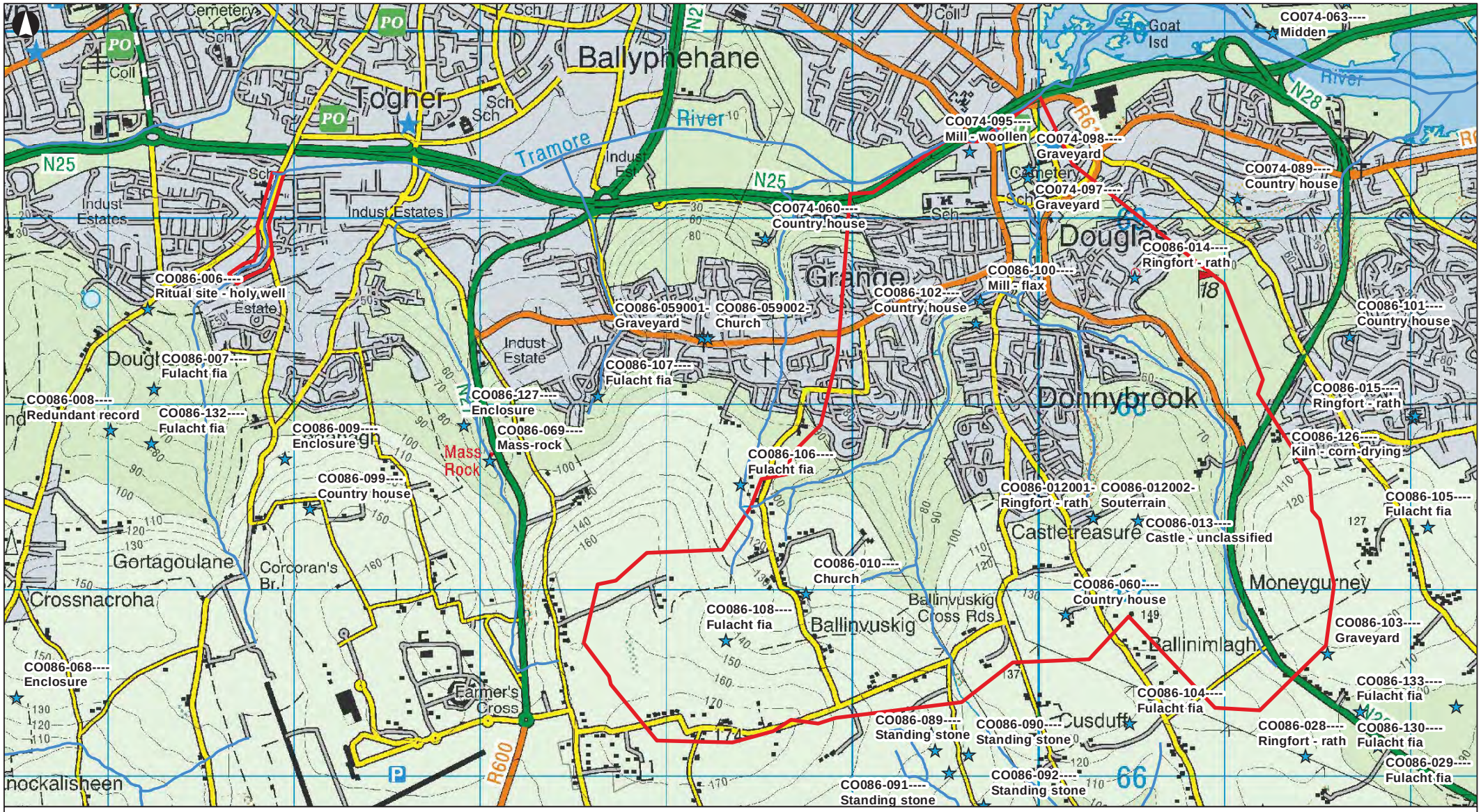
Appendix C

Archaeological mapping and Place Name Information

C1 Archaeological Mapping and Placename Information

Archaeological mapping and placename information is provided overleaf

A3



Legend

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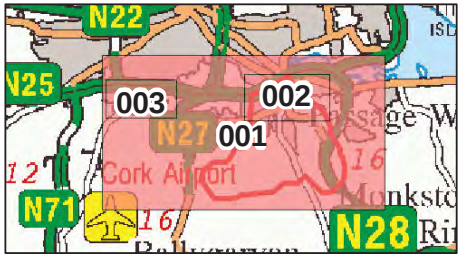
- River
- Study Area



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

ARUP

Arup
15 Oliver Plunkett Street, Cork, Ireland
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www.arup.com

Metres
0 250 500 1,000

Client
Cork County Council

Job Title
Douglas Flood Relief Scheme
(including Togher Culvert)

Archaeological, Architectural and Cultural Heritage Sites

Scale at A3
1:20,000

Job No	Drawing Status
234335-00	For Information

Drawing No	Issue
001	P1

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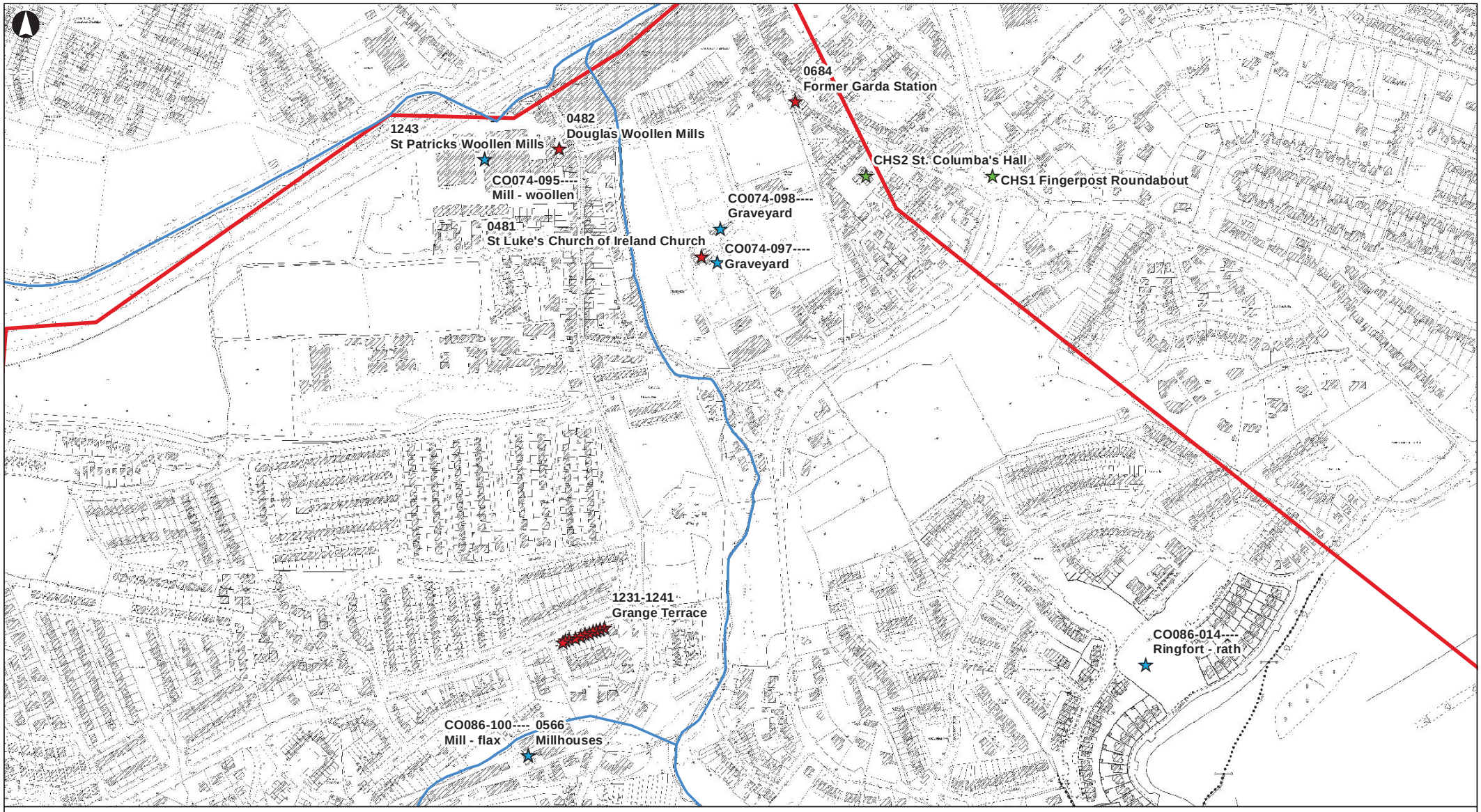

Legend

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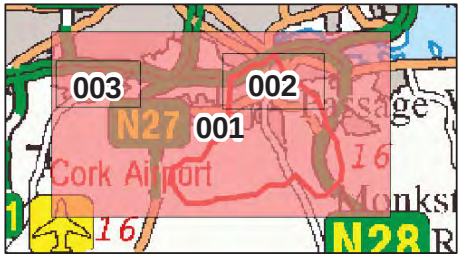
- Record of Monuments and Places (RMP)
- Record of Protected Structures (RPS)
- River
- Study Area



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

ARUP

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15 Oliver Plunkett Street, Cork, Ireland
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Metres
0 62.5 125 250

Client
Cork County Council

Job Title
Douglas Flood Relief Scheme
(including Togher Culvert)

Archaeological, Architectural and Cultural Heritage Sites Douglas

Scale at A3
1:5,000

Job No	Drawing Status
234335-00	For Information

Drawing No	Issue
002	P1

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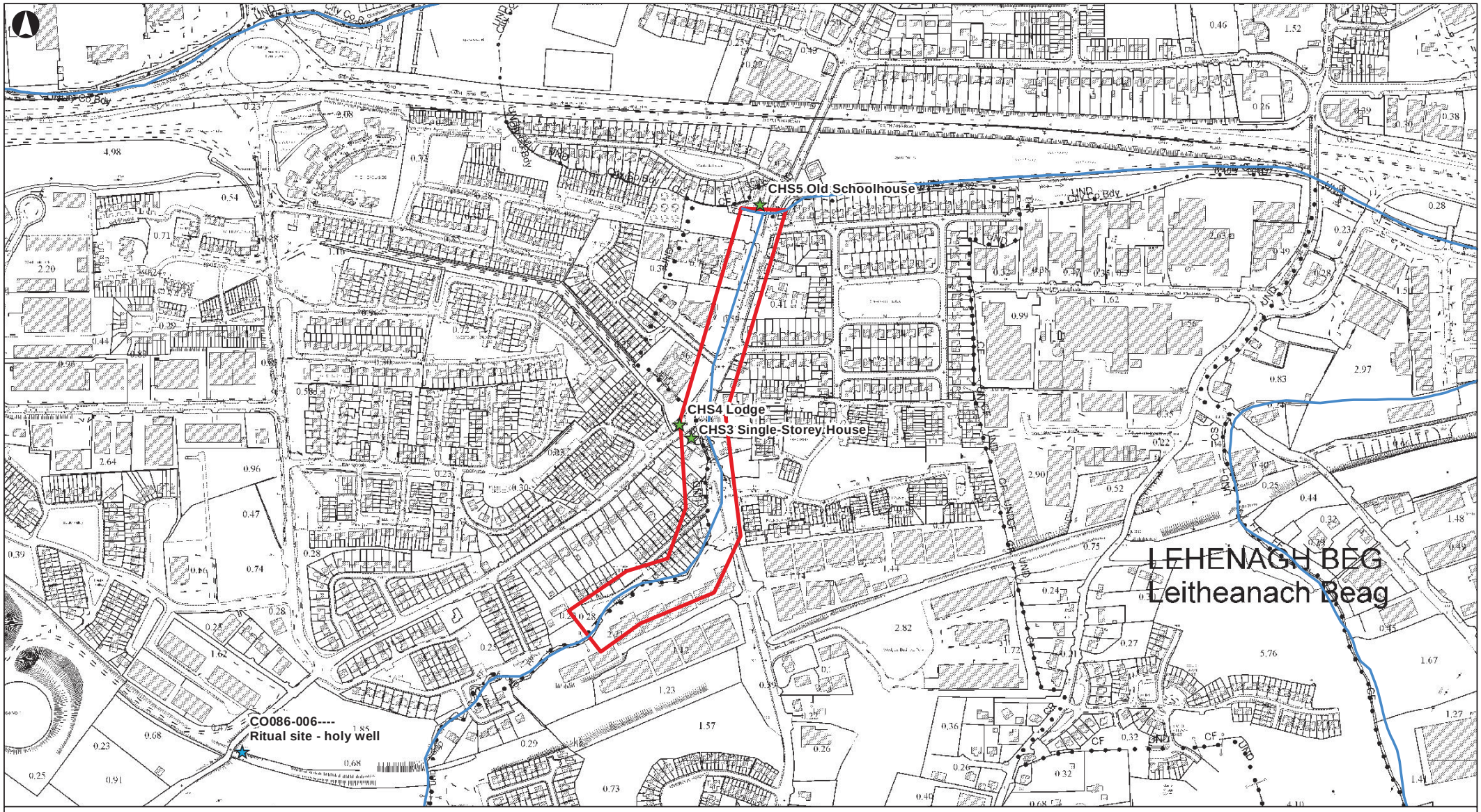
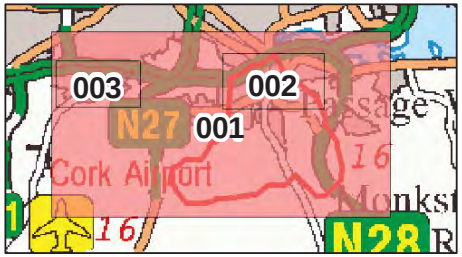
A3



Legend

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



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

ARUP

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Metres
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Client
Cork County Council

Job Title
Douglas Flood Relief Scheme (including Togher Culvert)

Archaeological, Architectural and Cultural Heritage Sites Togher

Scale at A3
1:5,000

Job No	Drawing Status
234335-00	For Information

Drawing No	Issue
003	P1

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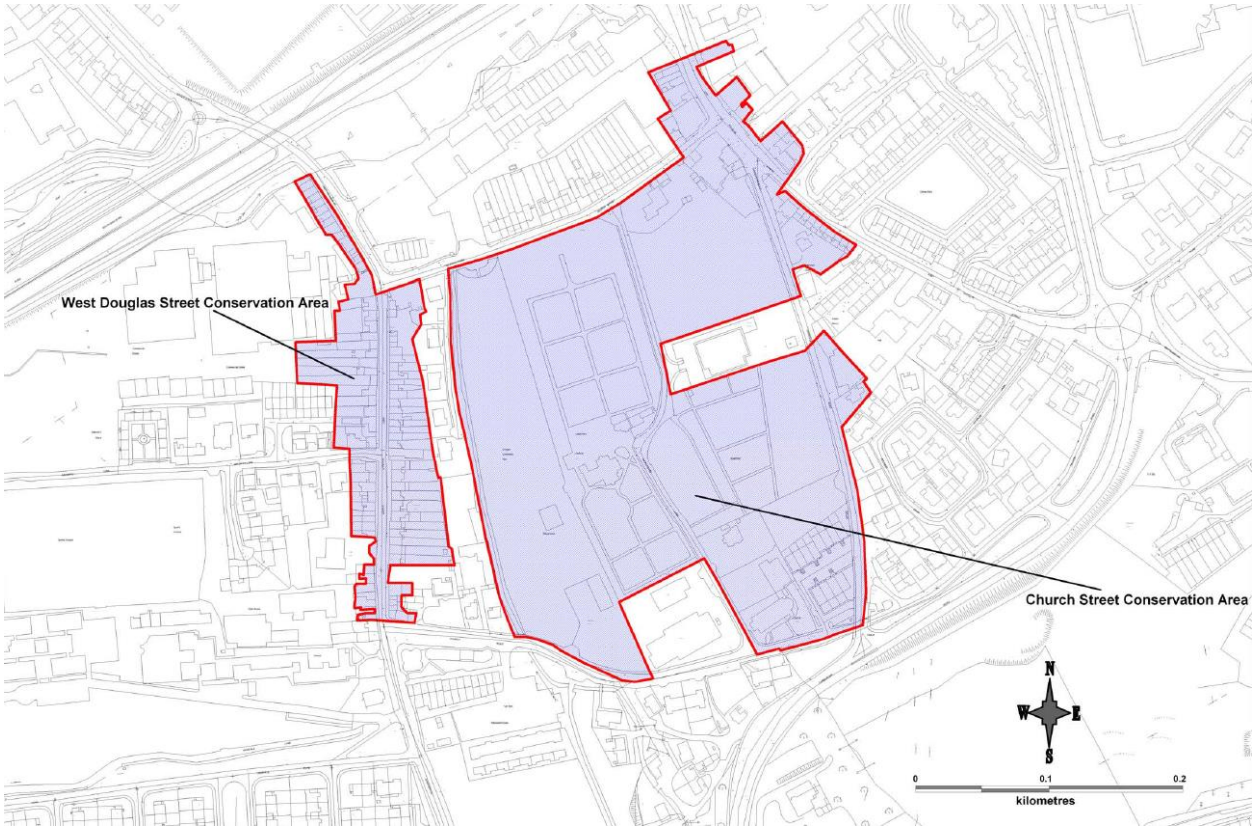
Architectural Conservation Areas Douglas



Placename information taken from www.logainm.ie

Douglas – Dúglas or Dhúglais (Carrigaline parish)

Grange – gráinseach meaning grange, monastic farm (St Finbar's and Carrigaline parish)

Inchisarsfield – inis meaning a river or meadow (St Finbar's parish)

Ardarrig – ard meaning height or high –dearg meaning red or red one (Carrigaline parish)

Ballybrack – An Baile Breac, baile meaning townland, town or homestead and breac meaning speckled (Carrigaline parish)

Castletreasure – the meaning of the second word is unclear but it is clear from the historical evidence that it is not the English word treasure (Carrigaline parish)

Ballinvuskig – Baile an Bhoscaigh, baile meaning townland, town, homestead (Killanully parish)

Ballinimlagh – Baile na nImleach baile meaning townland, town, homestead (Carrigaline parish)

Ballinrea – Baile an Réithigh baile meaning townland, town, homestead (Carrigaline parish)

Moneygurney – Muine Guairne, muine meaning thicket (Carrigaline Parish)

Rathmacullig East – Ráth Mhic Coiligh Thoir Rath meaning ringfort (Killanully parish)

Maryborough – English name

Curraghconway – Corr Cheannmhaí, corr meaning round hill, pointed hill, hollow; pointed, conspicuous, odd (St Finbars parish)

Ballycurreen – Baile Uí Chuirrín meaning the town of Ó Cuirín; Ó Cuirín a surname and baile townland, town or homestead (St Finbar's parish)

Doughcloyne - Dúchluain or Dúbh chluain meaning black lawn or bog meadow.

Lehanagh - Liath eanach meaning grey morass and Mor means big.

Togher - Tochar meaning causeway

Appendix D

Consultation

D1 List of Consultees

The list of consultees is provided overleaf

List of Consultees

Organisation	Interest
Department of Arts, Heritage & Gaeltacht Development Applications Unit	Architectural and archaeological heritage and nature conservation
National Monuments Service	Architectural and archaeological heritage
National Parks and Wildlife Service	Nature conservation
Co-ordination Unit, Department of Communications, Energy & Natural Resources	Fisheries and the marine environment
Head Office Department of the Environment, Community & Local Government	Environment
Head Office Department of Agriculture, Food and Marine	Agriculture, food and marine issues
Inniscara EPA Regional Inspectorate Cork	Environment
Heritage Services Office of Public Works	Heritage Sites
South West Regional Authority	Regional planning guidelines
Cork City Council: Office of the Lord Mayor	Local issues
City Manager	Local issues
Environment Section	Local environmental issues
Heritage Officer	Local heritage issues
Water Services Section	Local water services issues
Cork City Councillors: Cllr. Des Cahill, Cllr. Laura McGonigle, Cllr. Denis O'Flynn, Cllr. Terry Shannon, Cllr. Chris O'Leary, Cllr. Kieran McCarthy, Cllr. Jim Corr,	Local issues.

Organisation	**Interest**
Cllr. Lorraine Kingston, Cllr. Emmet O'Halloran, Cllr. Sean Martin Cllr. Mick Finn, Cllr. Fiona Kerins.	
Cork County Council:	Local issues
Heritage Officer	Local heritage issues
Environment Directorate	Local environmental issues
Divisional Manager	Local issues
Director of Water Services	Local water services
An Comhairle Ealaion (The Arts Council)	Development of the Arts
Angling Council Ireland	Angling issues
Angling in Ireland - The Irish Federation of Pike Angling Clubs	Pike angling and pike conservation issues
An Oige	Youth hostels and outdoor events
An Taisce - The National Trust for Ireland	Heritage and conservation
Bat Conservation Ireland	Bat conservation
Birdwatch Ireland	Ecology (in particular birds) and conservaton
Bord Gais Networks	Gas networks
Bord Failte	Tourism
BSBI Recorder	Recording of flora
Coillte Teoranta	Owns and manages forest and associated parks
Commission for Electricity Regulation	Energy regulation

Organisation	Interest
Conor Kelleher, Bat Consultant	Bat recording and conservation
Cork & District Angling Club	Angling issues
Cork Business Association	Local business interests
Cork Chamber of Commerce	Promotion, development and expansion of commercial life in the Cork region
Cork County Development Board	Integration of the economic, social and cultural development of Cork County.
Cork Environmental Forum	Local umbrella organisation with an interest in promoting sustainable development
Cork Federation of Gun Clubs	Shooting and conservation issues
Cork GAA	GAA sports issues
Cork Historical & Archaeological Society	Historical and archaeological issues
Discover Ireland	Tourism issues
Cork County Councillor Seamus McGrath	Local issues
Cork County Councillor Deirdre Forde	Local issues
Cork County Councillor Tim Lombard	Local issues
Cork County Councillor Paula Desmond	Local issues
Cork County Councillor John A Collins	Local issues
Cork County Councillor David Boyle	Local issues
Douglas Business Association	Local business issues
Douglas Camogie Club	Local GAA

Organisation	Interest
Douglas Community Association	Community Issues
Douglas Golf Club	Local golf.
Douglas Hurling & Football Club	Local GAA
Douglas Pitch & Putt Club	Local pitch and putt
Dr. Padraig Whelan	Plant issues
Dr. Patrick Sleeman	Wildlife issues, in particular Otter
Eircom	Eircom services
Electricity Supply Board	ESB services
ENFO	Public environmental and sustainable development services
Environmental Sciences Association of Ireland	Environmental issues
Failte Ireland	Tourism
FISSTA - Federation of Irish Salmon & Sea Trout Anglers	Salmon and Sea trout issues
Forest Service (Dept. of Agriculture)	Forestry issues
Geographical Society of Ireland	Status and study of geography
Geological Survey of Ireland	Local geology and geological heritage
Greenwood FC	Sports
Health & Safety Authority	H & S
HSE Southern Regional Health Forum	Human health

Organisation	Interest
Inland Fisheries Ireland Macroom	State agency responsible for protection management and conservation of inland fisheries and sea angling resources
Institute of Geologists of Ireland	Promotion of geology and geosciences and
Irish Creamery Milk Suppliers Association (ICMSA)	Represents the views of dairy farmers
Irish Farmers Association (Cork Region)	Farming
Irish Heritage Trust	Heritage
Irish Planning Institute	Represents professional planners
Irish Wildlife Trust	Nature and conservation
Landscape Alliance Ireland	Landscape quality
National Association of Regional Game Councils	Game shooting and conservation
National Building Agency	Sustainable communities and development
National Federation of Group Water Schemes	Represents community-owned rural water services Ireland
National Museum of Ireland	Collection and preservation of Ireland's portable material heritage and natural history
National Roads Authority	National road network
National Trails Office	Recreational trails
Salmon Research Agency of Ireland	Salmon research
Soutwest River Basin District Office	River Basin management
Teagasc	Agriculture and the environment
The Heritage Council	Heritage

Organisation	Interest
The Meteorological Service	Weather and climate. Agricultural and environmental services
The Mining Heritage Trust of Ireland	Conservation of mining heritage
Tidy Towns - Douglas	Maintaining tidiness in Douglas Village area
Tourism Ireland	Tourism issues
Tramore Athletic FC	Sports
Voice of Irish Concern for the Environment	Environmental issues

D2 Letter of Consultation

A copy of the letter of consultation is provided overleaf

Your ref
Our ref 234335
File ref

ARUP

15 Oliver Plunkett Street
Cork
Ireland

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f +353 21 4272345

douglasfrs@arup.com
www.arup.com

14 February 2014

Dear Sir/Madam

Douglas Flood Relief Scheme (including Togher Culvert)
Public Information Day

Arup has been appointed by Cork County Council to develop a Flood Relief Scheme for the Douglas and Togher Areas. An Environmental Impact Statement will be prepared as part of this work. This project follows on from the Lee Catchment Flood Risk Assessment and Management Study (CFRAMS) and the major flood event of June 2012.

The Study Area for the scheme is shown in red on the enclosed map. In advance of the preparation of a full Engineering Study, it is not possible at this point to say exactly what flood alleviation measures will be proposed as part of the Flood Relief Scheme, however the range of flood measures typically considered are included on the enclosed sheet for your information.

The first stage of the project is to prepare a Constraints Study in order to identify the key issues (including environmental issues) in the 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.

A Public Information Day will be held in Douglas Community Centre on the 26th February between 3:00pm and 7:00pm at which you are invited to give us your comments.

The objectives of the Public Information Day are:

- To explain the process involved in the development of the flood relief scheme
- To gather information from the public regarding their:
    - experiences of flooding,
    - thoughts on solutions to the flooding problem and their preferences in this regard,
    - thoughts on environmental issues, and
    - thoughts on constraints with regard to environmental issues and implementation of solutions etc.

Alternatively, if you are unable to attend the Public Information Day, you are invited to submit your comments in writing to Arup, 15 Oliver Plunkett Street Cork, or email us at douglasfrs@arup.com.

We would welcome your comments in relation to the study area and particularly in relation to any relevant issues associated with a potential Flood Relief Scheme.

A second public consultation will take place later on this year prior to preparation of the Environmental Impact Statement for the scheme, at which stage details of the emerging preferred option will be available. You will be given a further opportunity to comment at this stage.

Yours sincerely
for
Ove Arup & Partners Ireland Ltd t/a Arup

Ken Leahy
Project Manager

D3 Leaflet Accompanying Consultation Letter

A copy of the leaflet which accompanied the letter of consultation is provided overleaf.

What Happens Next?

All comments received in response to this Public Information Event will be considered by Cork County Council and will be taken into account in the preparation of the first stage of the Douglas Flood Relief Scheme Engineering Study and Environmental Impact Assessment.

The Environmental Impact Assessment and Engineering Study for the Douglas Flood Relief Scheme will be delivered in the following stages:

Environmental Impact Assessment			Engineering Study	
Stage I	Part 1	Constraints Study *(this stage)*	Stage I	Scheme Development
	Part 2	Screening for Appropriate Assessment		Data Gathering and Surveying
Stage II	Part 1	Environmental Assessment of Viable Options		Hydrology Study & Hydraulic Modelling
				Site Investigations
	Part 2	Appropriate Assessment		Flood Risk Assessments
Stage III		Environmental Impact Statement		Flood Risk Management Options
Stage IV		Public Exhibition or Part 8 Planning		Cost Benefit Analysis
				Selection of Preferred Option
			Stage II	Public Exhibition or Part 8 Planning
			Stage III	Detailed Design
			Stage IV	Construction

Your Feedback is Important

Cork County Council wishes to consider all viewpoints in relation to the Study Area being examined. This is your opportunity to take part at the early stages of the planning of the Douglas Flood Relief Scheme. Time spent communicating your views to Cork County Council is appreciated.

The general public and all interested parties are invited to give their opinions on the Study Area. Please examine the Study Area shown overleaf and let your views be known by:

- Completing and returning the attached Questionnaire by 28th March 2014
- Emailing us at douglasfrs@arup.com
- Writing to the address below by Friday 28th March 2014
- Website: www.douglasfrs.ie

Further Information

All queries, questionnaires and comments in relation to this project can be addressed to:

Ken Leahy

Project Manager

Ove Arup & Partners Ireland Ltd.

15 Oliver Plunkett Street

Cork

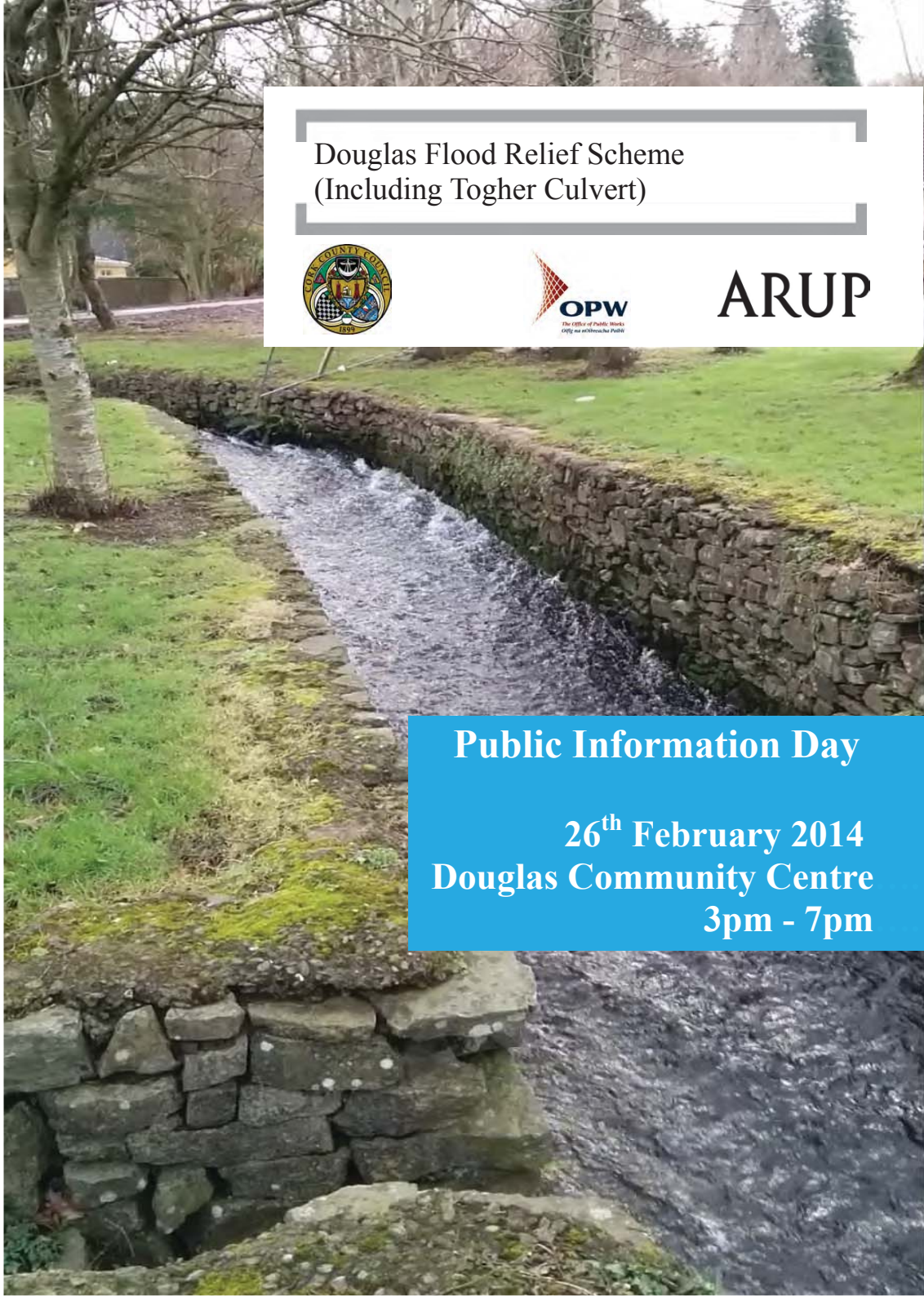
Tel: +353 (021) 4277670

Tel: +353 (021) 4272345

Email: douglasfrs@arup.com

Outline Delivery Programme

Stage	Description	Key dates
Stage I	Development of a number of flood defence options and the identification of a preferred Scheme	Complete by July 2014
Stage II	Public Exhibition of Scheme	Complete by December 2014
Stage III	Detailed Design, Confirmation and Tender	Complete by September 2015
Stages IV and V	Construction and Handover of the Works	Commence September 2015



Douglas Flood Relief Scheme (Including Togher Culvert)

OPW

ARUP

Public Information Day

26th February 2014

Douglas Community Centre

3pm - 7pm

Arup has been appointed by Cork County Council to undertake the design and implementation of the proposed Douglas Flood Relief Scheme (Including Togher Culvert).

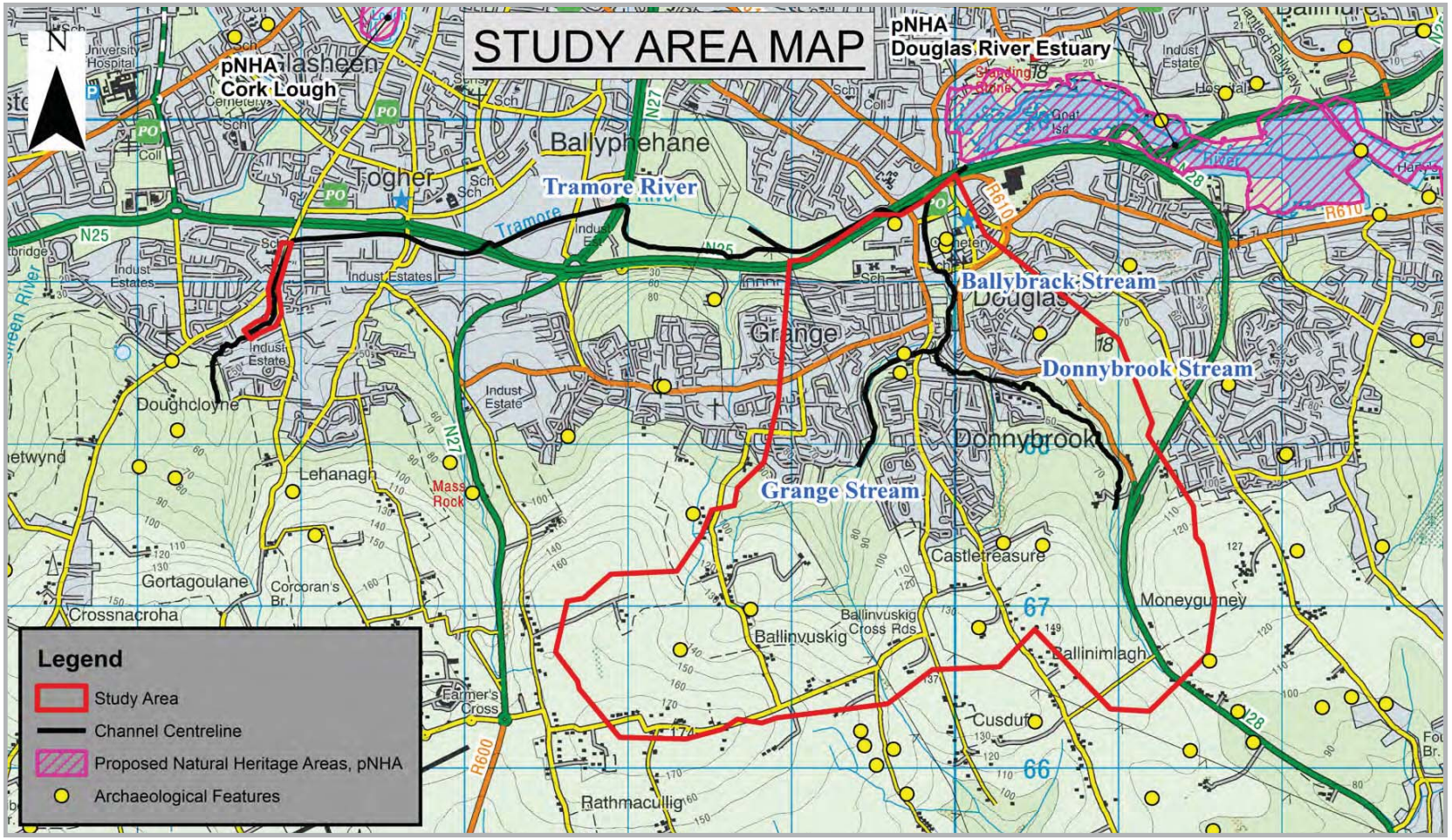
This is the first public consultation day for the project; its objective is to gather information from the public about their experiences of flooding in the Study Area along with their thoughts on possible solutions to the flooding problem and their preferences in this regard. Local experience, knowledge and insight is an essential pre-requisite for any successful Flood Relief Scheme. We also welcome any thoughts on potential environmental issues within the Study Area, in particular thoughts on constraints with regard to environmental issues and implementation of solutions.

Purpose Of The Project

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

Current Position

The OPW in partnership with Cork City and Cork County Councils have carried out a Catchment Flood Risk Assessment and Management (CFRAM) Study for the Lee Catchment. The Draft Catchment Flood Risk Management Plan was published in February 2010. It did not recommend flood relief measures for the Douglas area. However, Douglas was badly affected by flooding in June 2012. As a result Cork County Council, acting as Agents for the OPW has now commissioned this project to develop a Flood Relief Scheme for Douglas. The proposed scheme will also incorporate the replacement of the existing under capacity culverts on the Tramore River with a new 560m long culvert between Lehenaghmore Industrial Estate and Greenwood Estate as recommended by the Lee CFRAM Study. The Study Areas for the project are outlined in red on the map above.



(Flooding in Douglas June 2012)

What is a Constraints Study?

A Constraints Study identifies the key environmental issues in a study area which may be impacted upon by possible flood alleviation measures and/or which may impose constraints on the design and viability of these measures.

Engineering Study

The Engineering Study will assess a range of engineering measures typically considered for possible flood alleviation schemes including, but not limited to those listed in the box to the right. Typically an Engineering Study of this nature may identify between three and five viable options.

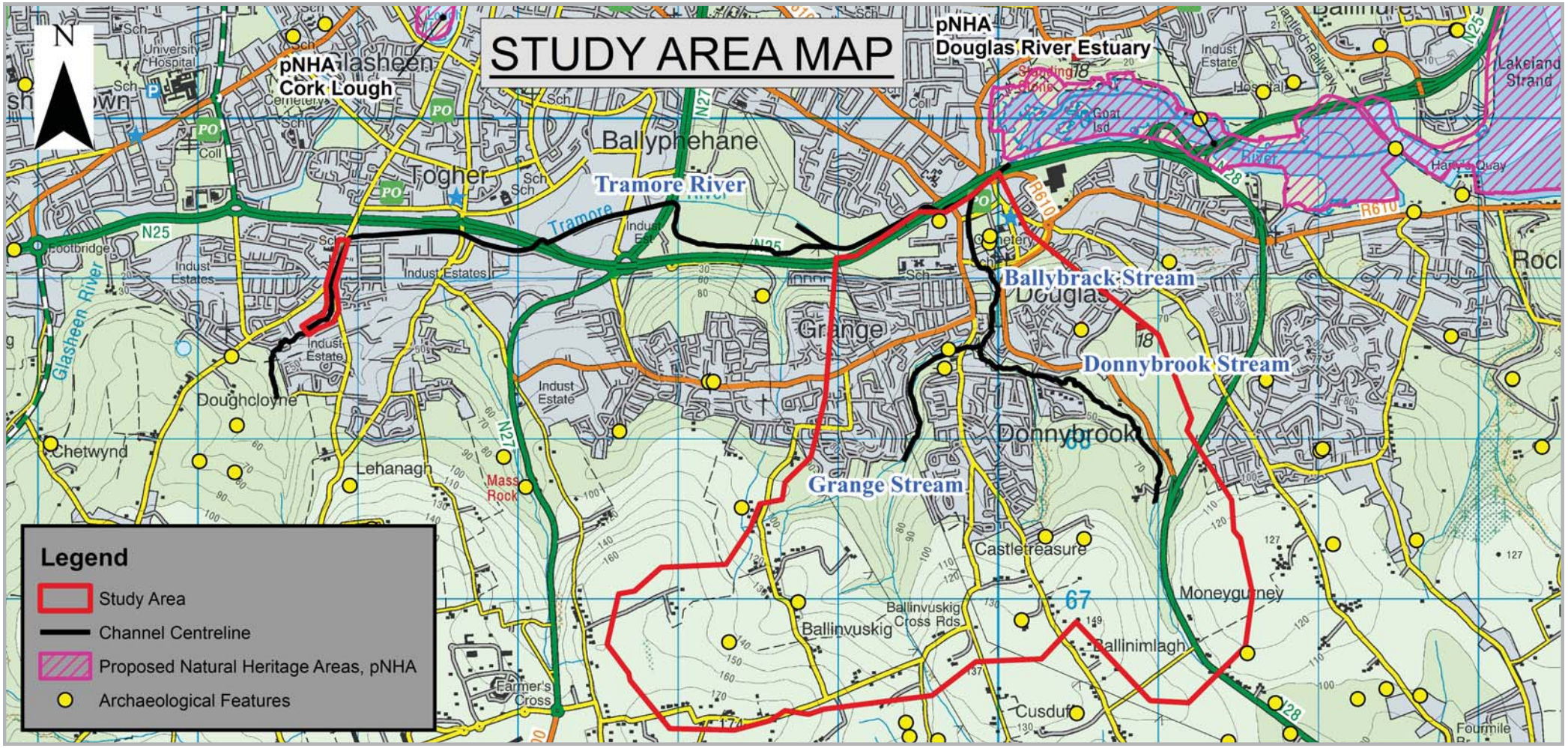
Potential Flood Alleviation Measures

a) **Do nothing (i.e., implement no new flood alleviation measures)**
b) **Non-Structural Measures (e.g. flood warning system or individual property protection)**
c) **Relocation of properties and/or infrastructure**
d) **Reconstruction of properties and/or infrastructure at a higher level**
e) **Flow Diversion (e.g. river diversion or flood flow bypass channel)**
f) **Flow Reduction (e.g. upstream catchment management or flood storage)**
g) **Flood Containment through Construction of Flood Defences**
h) **Increase Conveyance of Channel (upstream and/or through and/or downstream of the town)**
i) **Sediment Deposition and Possible Sediment Traps**
j) **Pump storm waters from behind flood defences**

D4 Posters

Copies of the posters are provided overleaf.

Douglas Flood Relief Scheme
(Including Togher Culvert)



CORK COUNTY COUNCIL 1899

OPW
The Office of Public Works
Oifig na nOibreacha Poibli

ARUP

Douglas Flood Relief Scheme
(Including Togher Culvert)

Constraints Study

A Constraints Study is currently being undertaken by Arup, the Design Consultants. The purpose of the Constraints Study is to determine and document the constraints that may inform the selection and design of the proposed Flood Alleviation Measures.

Primary Constraints

A range of constraints is being considered including the following topics:

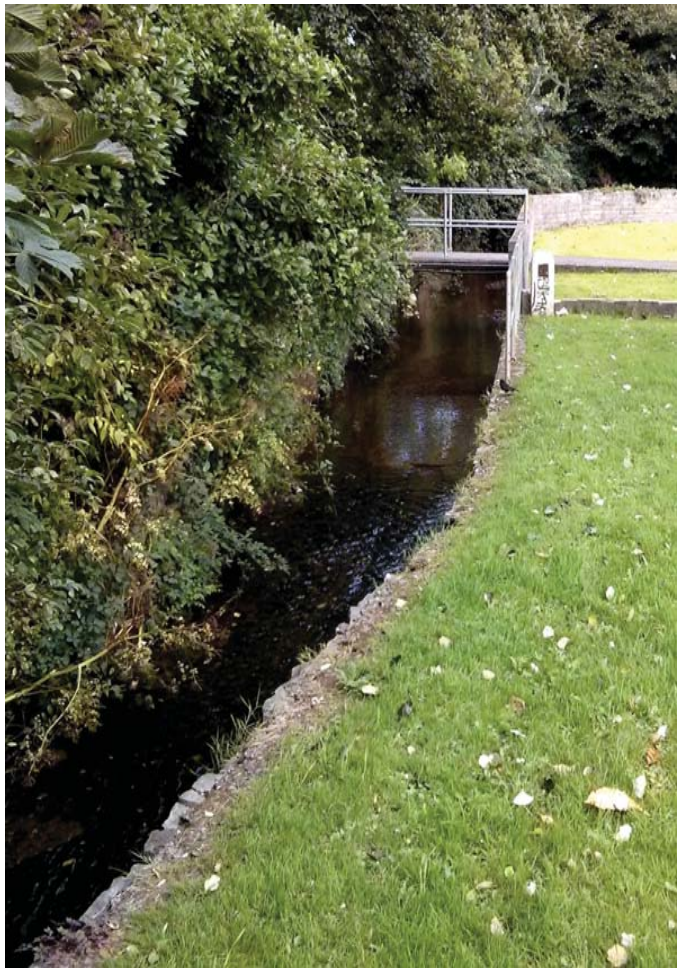
- **Flood Related Socio-Economic and Social Issues**
- **Flora and Fauna**
- **Fisheries**
- **Habitats**
- **Water Quality**
- **Archaeological, Architectural and Cultural Heritage**
- **Landscape and Visual Amenity**
- **Angling, Tourism and Recreational Use**

CORK COUNTY COUNCIL 1899

OPW
The Office of Public Works
Oifig na nOibreacha Poibli

ARUP

Douglas Flood Relief Scheme
(Including Togher Culvert)



Public Involvement

Consultation will be undertaken throughout the process to ensure that the views of the public and other stakeholders are taken into account.

The purpose of this initial Public Information Day (PID) is to:

- Provide information about the Objectives of the Scheme
- Outline the Design and Statutory Process
- Provide an Opportunity for Comment at a preliminary stage
- Gather information about Environmental Constraints
- Obtain other information relevant to the Scheme

Following this initial public consultation, there will be further opportunities for involvement through attendance at future information days, when updates on the scheme progress will be presented. A questionnaire is available for you to complete and return with your own comments.

Members of the project team are present today to answer any questions you have, or take note of any relevant information.

CORK COUNTY COUNCIL 1899

OPW
The Office of Public Works
Oifig na nOibreacha Poibli

ARUP

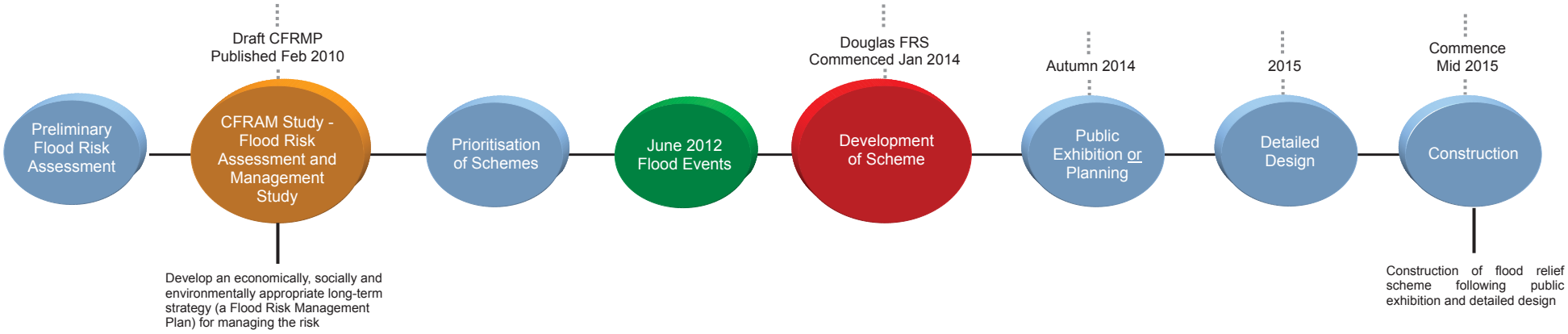
Douglas Flood Relief Scheme
(Including Togher Culvert)

Scheme Objectives and Overview

The Office of Public Works (OPW) have carried out a Catchment Flood Risk Assessment and Management (CFRAM) Study for the Lee Catchment. From this study, the draft Catchment Flood Risk Management Plan, published in February 2010, recommended a new culvert in Togher. It did not however recommend flood relief measures for the Douglas area. However Douglas Village was subsequently badly affected by flooding in June 2012.

Cork County Council has now commissioned an Engineering and Environmental Study to assess and develop a viable, cost-effective and sustainable Flood Relief Scheme for the Douglas area, and to also include the recommended new Togher culvert. A report will be prepared describing the findings of the Engineering Study, which will include a description of the measures and scheme options assessed and the justification for its selection.

The Project Team includes a Design Team made up of Arup (consulting engineers), Cork County Council and the OPW. A study area has been identified and the initial stages of the Douglas Flood Relief Scheme have commenced, including the Constraints Study and Preliminary Design Surveys. An Indicative Flow chart showing the process from inception through to construction for the Flood Relief Scheme is shown on the figure below:



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ARUP

Douglas Flood Relief Scheme
(Including Togher Culvert)

Planning Process For The Proposed Scheme

The planning process for the preferred scheme will be decided at the end of Stage 1. The planning options are as follows.

Once a preferred Flood Relief Scheme has been determined and an outline design completed, Cork County Council will decide whether to formally publicly exhibit the proposed scheme in accordance with Section 5 of the Arterial Drainage Acts 1945, or choose Part 8 Planning under the Planning and Development Regulations 2001 – 2002.

If Public Exhibition is Chosen:

- This statutory process includes a four week Public Exhibition, during which the plans and particulars of the proposed scheme will be put on Public Display.
- Representatives of the Project Team will attend the Public Exhibition on various dates to explain the scheme to members of the public and to address queries.
- Copies of the Environmental Impact Statement (EIS) for the scheme will be available for sale to the public during this time.
- Members of the public will be invited to submit written observations which will be considered and responded to.
- An Exhibition Report, including all observations received will be sent to the Minister for Public Expenditure and Reform before formal approval of the Scheme. This will form the basis for the next stage.

If Part 8 Planning is Chosen:

- Complete the necessary planning drawings/documents and all other statutory processes, which may include; Appropriate Assessment (if determined necessary); EIS; CPO of lands required for the implementation of the preferred scheme, Section 50 consents etc.
- Amend the final draft Flood Relief Scheme if and as necessary following completion of the planning and statutory procedures.

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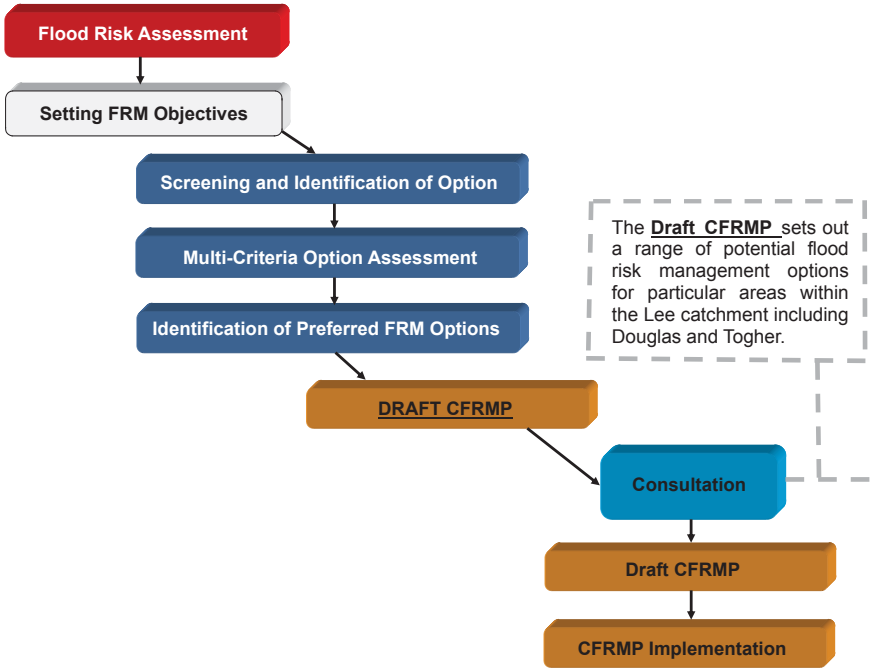
Douglas Flood Relief Scheme (Including Togher Culvert)

CFRMP Process



The **Draft CFRMP** sets out a range of potential flood risk management options for particular areas within the Lee catchment including Douglas and Togher.

Lee Catchment Flood Risk Assessment and Management Study (Lee CFRAMS)

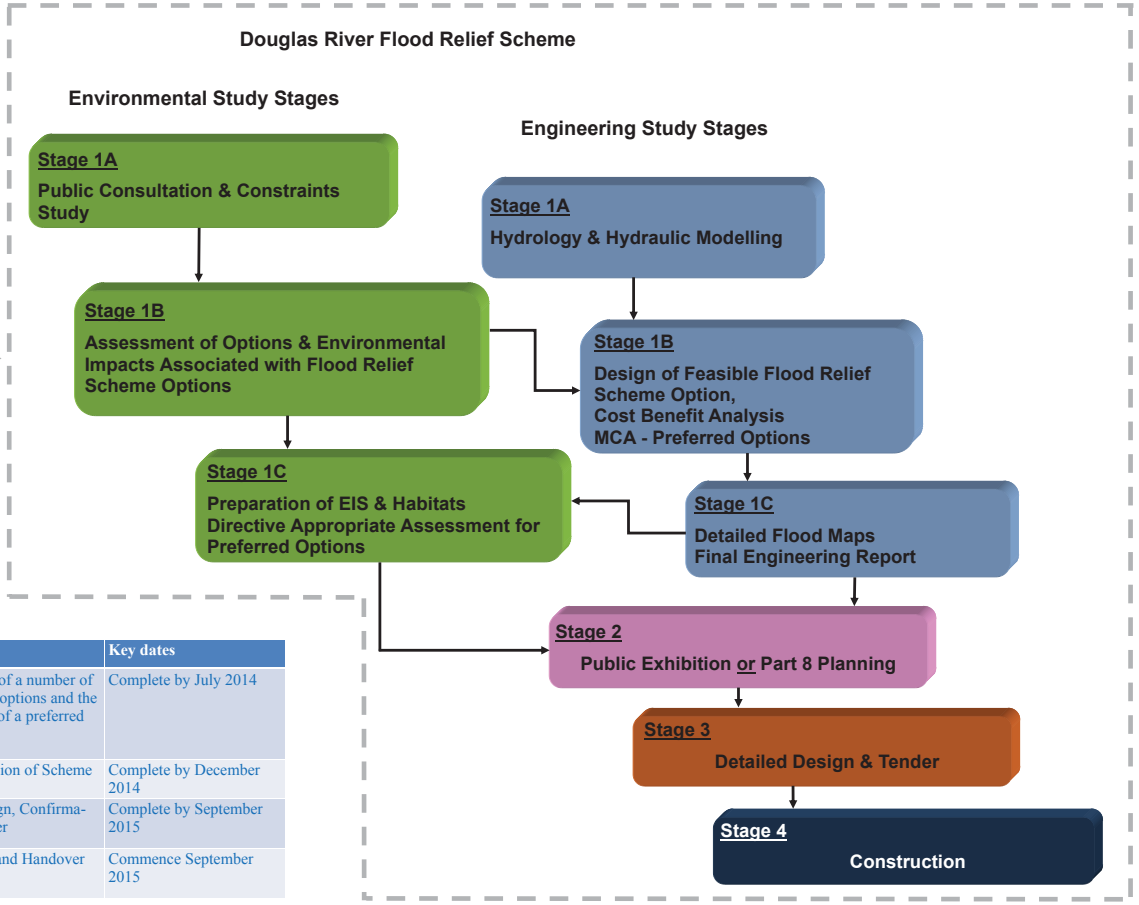
Catchment Flood Risk Assessment and Management Studies (CFRAMS) and their product - Catchment Flood Risk Management Plans (CFRMP) - are at the core of the new national policy for flood risk management and the strategy for its implementation.

The Lee CFRAM Study was the first pilot CFRAM Study for the new Flood Risk Assessment and Management Programme. The **CFRMP Process** chart above shows how the range of potential flood risk management options identified in the draft CFRMP progress to the Douglas Flood Relief Scheme as part of the overall **Lee CFRAMS.**

Douglas Flood Relief Scheme (Including Togher Culvert)

Cork County Council has employed Arup (Consulting Engineers) to undertake an Engineering and Environmental Study of the flooding problems along the Douglas River including all of its tributaries and the Tramore River Culverts in Togher.

The chart below shows how the Douglas River Flood Relief Scheme follows on from the Lee CFRAMS and details the interaction between the Environmental Study Stages and the Engineering Study Stages for the Scheme



Outline Delivery Programme

Stage	Description	Key dates
Stage I	Development of a number of flood defence options and the identification of a preferred Scheme	Complete by July 2014
Stage II	Public Exhibition of Scheme	Complete by December 2014
Stage III	Detailed Design, Confirmation and Tender	Complete by September 2015
Stages IV and V	Construction and Handover of the Works	Commence September 2015

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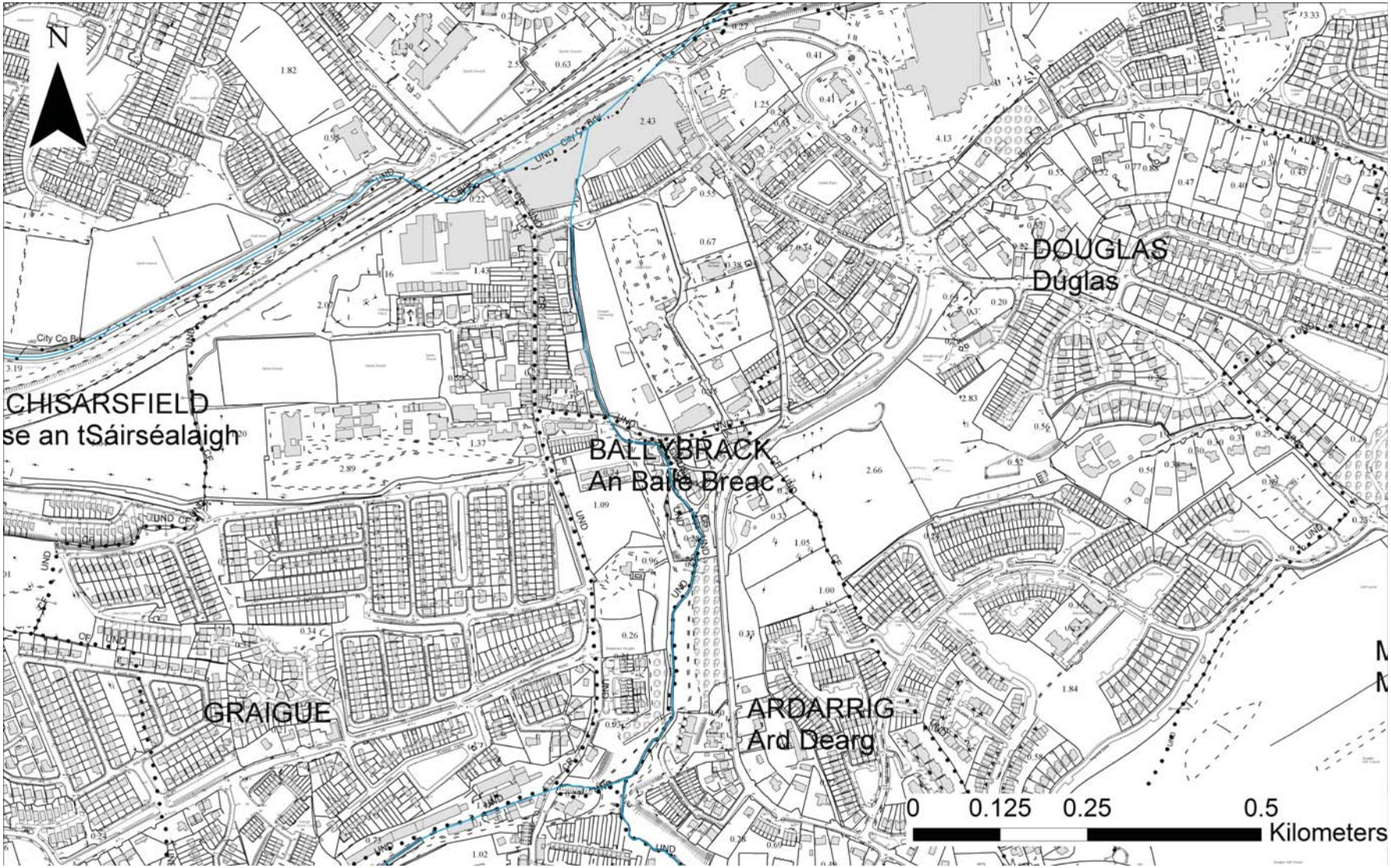
Douglas Flood Relief Scheme (Including Togher Culvert)



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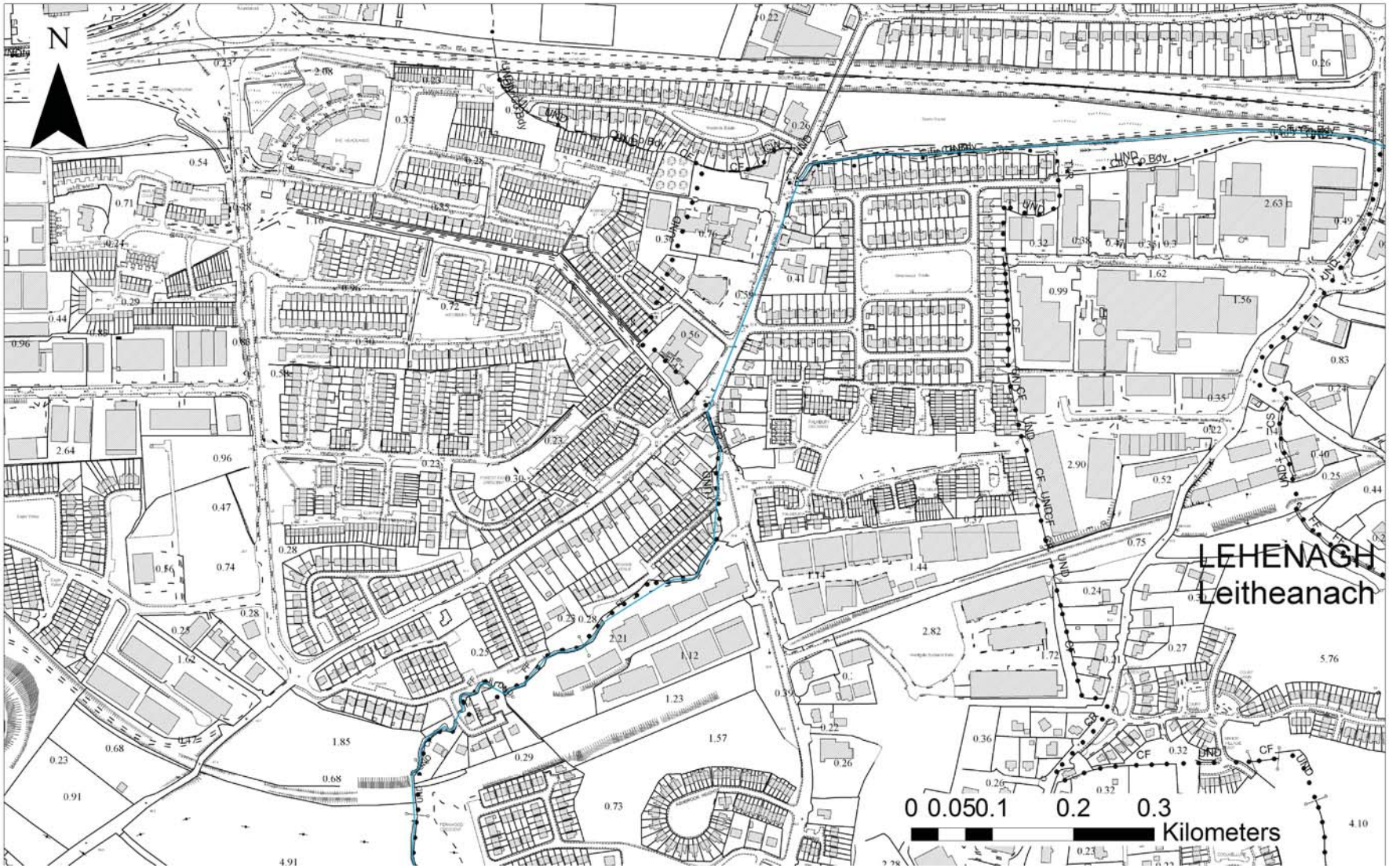
Douglas Flood Relief Scheme (Including Togher Culvert)



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ARUP

D5 Questionnaire

A copy of the blank questionnaire is provided overleaf

Landscape & Visual Amenity

Comment:

Angling, Tourism & Recreation

Comment:

Other

Comment:

Cork County Council undertakes to hold any information provided to it by individuals or others on a confidential basis, subject to Cork County Council's **obligations** under law, including the Freedom of Information Act. If, for any reason, it is intended that information **provided** to Cork County Council should not be disclosed due to the sensitive nature of such information, it is incumbent on the person or body supplying the information to make clear this wish and to specify the reasons for the information's sensitivity. Cork County Council will consult with any individual or body so supplying sensitive information before making a decision on any freedom of information request received.

THANK YOU FOR YOUR CO-OPERATION

Douglas Flood Relief Scheme
(Including Togher Culvert)
PUBLIC CONSULTATION NO.1 - CONSTRAINTS STUDY QUESTIONNAIRE

(Please complete this questionnaire and return to Ken Leahy, Arup Consulting Engineers, 15 Oliver Plunkett Street, Cork, or douglasfrs@arup.com by Friday 28th March 2014)

1. **Name** *(optional)*: _____

   Address: _____

   _____

   _____

   Phone *(optional)*: _____ **Email** *(optional)*: _____

2. **Are you aware of the Lee Catchment Flood Risk Assessment and Management Study, CFRAMS and its findings or recommendations?** **Yes** ☐ **No** ☐

3. **Do you own, rent or occupy a property within the study area being considered?** **Yes** ☐ **No** ☐

4. **Address of property (if different from home address)**

   _____

5. **Have you had any personal experience of flooding?** **Yes** ☐ **No** ☐

6. **If yes, please give date(s):** **Most recent** _____ **Previous** _____ **Previous** _____

7. **Type of property flooded:**

Residential	☐	**Retail**	☐
Office	☐	**Workshop**	☐
Open Space	☐	**Other**	☐

   If other, please describe: _____

8. **Approximate maximum depth of flooding:** _____

9. **Source of Flooding:**

Directly from River/ Stream	☐
From Drains	☐
Overground flow (surface water)	☐

10. **Do you have photographs of flooding?** **Yes** ☐ **No** ☐

11. **If you do, may Cork County Council have permission to use them?** **Yes** ☐ **No** ☐

    Note: Photographs will be collected at a later date

12. **Have you put in place measures to prevent or reduce the impact of flooding?** **Yes** ☐ **No** ☐
If so, please describe:

13. **Please indicate, in order of preference, your preferred flood defence works:**
(please score from 1-10 as appropriate)

No Works (Do Nothing)		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	

14. **How do you think the issue of flooding can be resolved?**

15. **In your opinion, how important are the following environmental constraints to the proposed Flood Relief Scheme?** *(please tick appropriate boxes)*

Issue	Very Important	Important	Moderately Important	Of Little Importance	Unimportant
Flood Related Socio-Economic & Social Issues	☐	☐	☐	☐	☐
Flora and Fauna	☐	☐	☐	☐	☐
Local Fisheries	☐	☐	☐	☐	☐
Habitats	☐	☐	☐	☐	☐
Water Quality	☐	☐	☐	☐	☐
Architectural and Cultural Heritage	☐	☐	☐	☐	☐
Landscape and Visual Amenity	☐	☐	☐	☐	☐
Angling, Tourism & Recreation	☐	☐	☐	☐	☐

If you have any comments relating to the proposed scheme or the constraints, please record them here:

Flood Related Socio-Economic and Social Issues

Comment:

Flora and Fauna

Comment:

Local Fisheries

Comment:

Habitats

Comment:

Water Quality

Comment:

Architectural & Cultural Heritage

Comment:

D6 Letters of Response from Consultees

Letters received in response to consultation are provided overleaf.

An Roinn
Ealaíon, Oidhreachta agus Gaeltachta
Department of
Arts, Heritage and the Gaeltacht

Our Ref: G Pre00072/2014

08 May 2014

Ken Leahy
ARUP Consulting Engineers
15, Oliver Plunkett St
Cork
douglasfrs@arup.com

Re: Douglas & Togher First Stage invitation for Flood Relief Scheme Environmental Constraints Study

A Chara,

On behalf of the Department of Arts, Heritage and the Gaeltacht, I refer to the notification in relation to the above proposal.

Outlined below are the observations of the Department of Arts, Heritage and the Gaeltacht in relation to nature conservation and to archaeology.

Nature Conservation

The proposed Constraints Study should take into account the fact that Douglas Estuary forms part of the Cork Harbour Special Protection Area.

Terrestrial and Underwater archaeology:

In the ***Record of Monuments and Places*** **(RMP)** extensive recorded archaeological sites are to be found within the areas addressed for Constraints study. These Recorded Monuments are protected under the National Monuments (Amendment) Act 1994. The RMP is not an exhaustive list of all archaeology in existence, and in this regard the DAHG would like to draw the applicant's attention to the Department's published policy in relation to the archaeological assessment of large-scale developments on sites where there are no previously recorded monuments (*Framework and Principles for the Protection of the Archaeological Heritage* – Published by Dúchas The Heritage Service).

Similarly, contained within the areas covered may be coastal zones, rivers and possible lakes. These may contain known and previously unknown underwater archaeological heritage that should be considered in any Constraints study. Such sites can include fortifications with associated slipways, quays, etc., harbours with associated marine infrastructure, shipwrecks, fish traps, lakeside dwellings, causeways, logboats, singular sites such as rock cut platforms and steps, and of course artefactual material associated with sites or as individual depositions in underwater environments.

As a general policy with regard to any Flood Relief Plan, the OPW should seek to protect the terrestrial and underwater archaeological heritage from direct damage or indirect impact through ill-considered design. However, the applicants shall also take into account the advice and recommendations of the Department in this regard.

Any proposed works either above or below ground or above or below water, within the vicinity of a site of known archaeological interest shall not be detrimental to the character of the archaeological site or its setting. Further, any development either above or below ground or above or below water, within the vicinity of an area of archaeological potential should seek to address this potential in advance of any proposed finalisation of design works.

It is the policy of the Department that proposed developments, due to their location, size, or nature, that may have implications for the archaeological heritage should be subject to archaeological assessment. Such developments include those that are located at or close to an archaeological monument or site, those that are extensive in terms of area (1/2 hectare or more) or length (1 kilometre or more), those that may impact the underwater environment (marine, intertidal/foreshore, riverine or lacustrine) and developments that require an Environmental Impact Statement. Archaeological heritage includes:

- National Monuments in the ownership or care of the State or Local Authority
- Archaeological and Architectural monuments/sites in the Record of Monuments and Places
- Monuments in the Register of Historic Monuments
- Zones of Archaeological Potential in Historic Towns
- Underwater Archaeological Heritage, including Historic Wrecks
- Previously unknown and unrecorded archaeological sites (including subsurface elements with no visible surface remains and potential sites underwater in rivers, lakes or the sea, that can include wharves, jetties, quays, piers, fish traps, anchorages, bridges, fording points, rock cut steps or sea caves)
- Potential sites located in the vicinity of large complexes of site or monuments
- Present or former wetlands, unenclosed land, rivers or lakes, or the inter-tidal zone.

Archaeological assessment:

The applicants should therefore engage the services of a suitably qualified archaeologist, with coastal or underwater experience, to carry out a detailed assessment of all proposed works within the Constraints Study area.

The Environmental Constraints Study shall contain a specific section on the cultural heritage and shall detail both the terrestrial and underwater archaeological heritage of the area and the potential for previously unrecorded archaeology to be located there.

The section shall also contain a detailed desktop study looking to the available historical, archaeological, cartographic and journalistic sources to inform on the cultural landscape through time. The Shipwreck Inventory of Ireland, Ports and Harbours Archive, Topographical Files of the National Museum shall be consulted as will relevant historical and local sources.

The Heritage Sections of the Study shall conclude with both a detailed Impact Statement and shall put forward specific recommendations for the protection of known cultural heritage and the protection of potential, previously unrecorded archaeology.

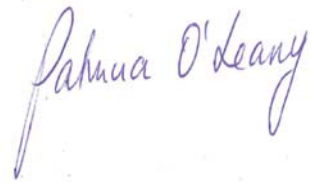
The archaeological assessment shall be licensed to this Department, with a detailed method statement accompanying the method statement. The archaeologist shall apply for both a dive survey licence to cover coastal and intertidal zones and shall also take out a detection device licence to cover a hand-held metal detection survey of the foreshore. If specific plans are available for the subtidal zones, then it is recommended that an underwater archaeological assessment be carried out also. If this is not informed by specific locational details of the subtidal works, then such a survey can be recommended within the overall results of the Heritage Section in the Constraints Study report. Such a survey can then be carried out at planning stage.

The acknowledgement to this letter or any further information should ideally be sent to manager.dau@ahg.gov.ie; if this is not possible, correspondence may alternatively be sent to:

The Manager
Development Applications Unit
Department of Arts, Heritage and the Gaeltacht
Newtown Road
Wexford

Finally, the above observations and recommendations are based on the papers submitted to this Department on a pre-planning basis and are made without prejudice to any observations the Minister may make in the context of any consultation arising on foot of any development application referred to the Minister, by the planning authority, in his role as statutory consultee under the Planning and Development Act 2000, as amended.

Is mise, le meas



Patricia O'Leary
Development Applications Unit
Tel: (053) 911 7482

Ken Leahy
Project Manager
Ove Arup & Partners
Ireland Ltd.
15 Oliver Plunkett Street
Cork

7 April 2014

RE: Douglas Flood Relief Scheme (Including Togher Culvert)

Dear Mr Leahy,

Thank you for contacting IFI regarding the above-mentioned.

The study area encompasses the Tramore River, the Ballybrack, Grange and Donnybrook streams and their tributaries all of which contain salmonid spawning and nursery waters. In addition to salmonids, lamprey and eels have been recorded within the constraints study area. The aforementioned watercourses have suffered negative impacts from urbanization over the year but still remain important habitats and have undergone significant rejuvenation in recent years.

While IFI are fully aware of, and sensitive to, the hardship caused by flooding events any proposed flood alleviation measures must be sustainable and in keeping with the requirements of the Fisheries Acts, Habitats Directive and Water Framework Directive.

In this context IFI feels that the current assessment of flooding events must be a catchment wide process assessing the impact of changes in drainage, development and land use patterns and practices on the response of flows in rivers to rainfall events involved to rainfall events. Likewise potential solutions should consider the catchment in its entirety and not focus solely on the relatively small area set out in the constraints study. Each solution or series of solutions proposed should be considered not alone in financial terms but also in the context of long term sustainability and durability in combination with flood control effectiveness.

More specifically considering the significance of the rivers involved terms of fisheries, the EIS associated with any proposed flood alleviation measures needs to address the following

Assessment of Existing Conditions
The following data is necessary, both within the study area and to the limits of the zone of influence of any proposed works, to assess existing conditions:-

a) Mapping of the range, location and extent of each aquatic habitat type e.g. pools, nursery and spawning areas.

b) Redd counting in the proposed study area and upstream to the limits of the zone of influence of any proposed works be carried out over at least the next 2 years.

c) Mapping of both the extent and nature of bankside vegetation, highlighting in particular all areas subject to river bank erosion at present.

d) A complete stock survey of all fish species.

e) Characterization and quantification of each habitat area, identified in (a), based on its macro invertebrate population.

f) Detailed assessment and characterization of all potentially impacted channels in terms of their surface and sub-surface sedimentology.

Impact Assessment:
The following requirements apply from a fisheries perspective in relation to impact assessment of any proposed works:-

a) Quantification of habitat losses and the impact on both flora and fauna.

b) Impact of any proposed works on fish stock densities for each species.

c) Changes in flow dynamics, the consequent impact on fish migrations and the loss of opportunity for fish movement.

d) Compatibility of any proposed measures with existing legislative requirements.

I would ask that you keep IFI updated as the study progresses. Should you require any clarification please do not hesitate to contact me.

Yours sincerely,

_____.
Michael McPartland
Environmental Officer

C A N M O N T L T D

Montrose House, Carrigaline Road, Douglas, Co. Cork, IRELAND.
Phone +353 (0)21 4371200 Fax +353 (0)21 4371529

Ken Leahy,
Project Manager,
Ove Arup & Partners Ireland Ltd.,
15 Oliver Plunkett Street,
Cork.

douglasfrs@arup.com

28th of March 2014

Re: Douglas Flood Relief Scheme

1.0 Background.

Canmont Ltd is the owner of Douglas Village Shopping Centre (Centre) which was severely flooded in June 2012 when a Cork County Council Trash screen on the Ballybrack Stream blocked causing the Ballybrack Stream to flow into the Centre with resultant damage to the Centre and its tenant's property.

2.0 Scheme Delivery Programme – Not Fully Funded.

As presented your delivery programme suggests that all five stages of the programme are funded and will happen. However when we queried this at the public information day it became clear that the only funded commitment at this stage was to complete Phases 1 and 2.

There is no doubt that there is a desire to move through to full completion but a desire doesn't equal a commitment and your public information should clearly state this fact because at present both press and local representative comments suggest that phases 1 to 5 are fully funded and committed to and this does not appear to be the case.

3.0 Priority and Timing of Study – Far too Long.

The study was promised by the County Manager in the immediate aftermath of the June 2012 floods. It was said that it would start immediately and that whatever was found to be needed would be done immediately on completion of the report.

All that said it was over 18 months later that Arup were appointed and the long promised study began but with an extraordinary time frame of 36/40 months to complete. So the likelihood is that, subject to funding being available for completion of all Phases, it will take at least until June 2017 for the promised remedial works to be completed.

In the meantime the Centre and traders that suffered in the flood event of June 2012 continue to struggle to get flood insurance. This is not fair and is not right and much more urgency is required in the delivery of all phases of the Scheme.

It is noted that priority has clearly been given to other areas that suffered in the Flood events of June 2012 and that decision should be explained and justified as a matter of public policy.

4.0 Flood History at the "Centre".

Prior to June 2012 there was never a flood event at Douglas Village Shopping Centre, notwithstanding the presence of a smaller than present Ballybrack culvert which had service pipes crossing within. There was also no Trash screen at the southern end of the Community Park.

5.0 Flood Events of June 2012.

It should be noted that there were two Flood events on the Ballybrack Stream on 28 June 2012 – (Flood Event 1)

The first was south of the Community park and did not flood the Centre – (Flood Event 2)

5.1 Flood Event 1

The Ballybrack broke its banks south of Church Road at Ravensdale and the flood waters, on reaching Church Road split east and west along Church Rd.

The west bound flow which was the dominant flow on reaching West Douglas Street then flowed north until it found a route into the Tramore river culvert.

The much smaller east bound flow flowed down Church Yard lane and on reaching Church street then turned east onto East Douglas Street where it ponded.

Flood Maps Ireland contains a report and maps suggesting that these flood waters flowed through the Community park covering all the Community Park and then down into the Centre. This report is wrong as this did not happen.

It was not what was witnessed on the night of the flood and it was not evidenced in an examination of the Community Park in the morning after the flood event.

The substantial mud deposits left behind after the flood clearly showed the areas that had accommodated the flow of the flood waters which was extensive north of and along Church Road. However there was no evidence of flooding in the southern end of the Community Park or in or around the Community Hall.

Flood Map Ireland's report needs to be corrected and investigated as it continues to do substantial damage to the Centre in linking the flood events.

5.2 Flood Event 2

The Council Trash Screen on the Ballybrack Stream at the Northern end of the Community Park blocked and then the full flow of the Ballybrack overtopped into the Community Park and out through the entrance gates onto Church Street.

The flow then split 3 ways;

A small element went east along Church Street and flooded some of the houses on Church Street.

The largest amount went straight across the road and down into the Shopping Centre and then though the Centre onto the North Road, East Douglas Street, and also back out onto Church street opposite Barry's Pub.

The remainder went west to West Douglas Street.

All this is visible on CCTV coverage of the Centre and was also confirmed by witnesses.

Eventually the flood waters made it to the Tramore river culvert where levels were always substantial below the flood levels in Douglas.

Post the flood event the extent of the flooding in the community park was clearly visible from very large deposits of mud. These were very visible in the area in and around the Trash screen, and there was also a small isolated area midway up the park where the river bank was low but there was no other evidence of any flooding within the remainder of the Community Park.

6.0 Trash Screen

The Trash Screen on the Ballybrack Stream was removed by Cork County Council in December 2012, so presumably the advice that the Council received, post flood was that it shouldn't have been there in the first place.

It is also noted that this Trash Screen did not comply with any of the design guidelines.

What is also noted is that since the removal of the Trash screen the culvert has operated at all times with very substantial spare capacity and this was especially noticeable during recent flooding events in Cork City & County.

7.0 River Maintenance

Notwithstanding numerous requests Cork County Council has as yet not published or supplied any detail on the maintenance schedule, if any, it has in place for the Ballybrack Catchment. The reluctance to detail this is surprising and worrying and does nothing to assure Insurers and property owners and tenants. It is not even known if there is a budget for maintenance.

Immediately post the June 2012 flood event there was a very substantial amount of clearing and maintenance with a number of lorry loads of material removed from the river. However since that date there has been little evidence of any further maintenance works.

8.0 Community Park Works

Some time after the Flood event some low level flood gates were installed at the northern end of the Community Park.

Had they been operating for the June 2012 flood they would have had little impact other than to delay the flood flow by a matter of minutes.

With the trash screen no longer in place it is very difficult to see why these flood gates should be there at all.

They perpetuate the belief that the Centre is a flood risk which it never was until the trash screen was installed by the Council.

Doulas LUTS was also launched showing the park open up at the northern boundary with Church Street and no Flood gates.

In addition to the above it is noted that the Council also recently published a Part 8 proposal for a cycle way through the centre of the Community Park away from the embankment of the river. Surely given the need for access to the river for maintenance it would be best to locate the cycle and walkway along the side of the river in order to improve access for maintenance.

I would be glad of the opportunity to discuss the above with you at any time and look forward to the publication of the preferred scheme.

D7 Comments from Questionnaires

A list of comments provided in questionnaires are presented in the table overleaf.

Comments Provided in Questionnaires

Comments on 'Flood Related Socio-Economic & Social Issues' and 'Other' comments were provided in the questionnaires. These are shown in the following Tables D7.1 and D7.2. No comments were provided in the questionnaires with regard to 'Flora & Fauna', 'Local Fisheries', 'Habitats', 'Water Quality', 'Architectural and Cultural Heritage', 'Landscape & Visual amenity' and 'Angling Tourism & Recreation'.

Table D7.1 'Flood Related Socio-Economic & Social Issues'

Comment
Delighted such an in depth study is being carried out. Important to have follow through action.
I attended your information evening in Douglas. I am concerned that the storm water drainage in our area (Southern Fruit and Coho) in Togher is not being addressed. During the recent extreme weather the volume of water running down the hill into Togher was enormous. Is there some way of being able to divert the flow into the new culvert.

Table D7.2 'Other'

Comment
In conjunction with this study I would appreciate if a flooding issue which arose in Belmont Estate in Frankfield was considered, which may have future flooding implications
Comments on issues with Trabeg River, problems with new constraints at Nemo mean that water levels are much higher, backing-up drains. Also noted that raw sewage is being pumped directly into the Trabeg River at Greenhills Estate [From property to the North]
Get the flooding right., the inlet at southern fruit
Cork City Council requests consideration of CCC using the Northern culvert between Kinsale Road Landfill and Park & Ride to enable pedestrian access/egress from site when developed as a park.
The proposed culvert at Togher will be on limited use, because of its location at a higher level than the adjoining roads, which currently act as water courses. There is a need to capture the water early i.e. higher up the slopes with interceptors and thereby divert the run off into the enlarged culvert
Douglas ICA are no longer covered for flood protection since the flood in June 2012. This is a big worry to the guild members

As I now enter my 70's, I know that the area has never flooded like this before. Although I accept there was an unusually high level of rainfall on the night other factors have been forgotten and if not taken into consideration will surface again, e.g. cleaning of Ballybrack River