
Appendix 7A

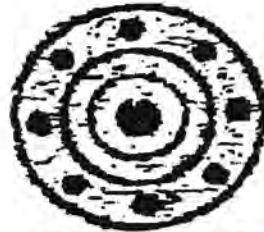
Cultural Heritage Report

**Impact Assessment
on the
Potential Archaeology & Architectural Heritage
for the
Cork Lower Harbour Drainage Scheme**
Including underwater and intertidal dimension by ADCO Ltd

Planning Ref.: PRE-PLANNING

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ÆGIS



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That the archaeological recommendations, mitigation proposals and suggested methodology followed in this report are similar to those used on previous similar projects approved by the Archaeological Planning and Licencing Unit National Monuments Section (formerly Dúchas), Dun Sceine, Harcourt Lane, Dublin 2. The National Monuments Acts 1930-2004, The Planning and Development Act 2002 and the most recent EPA guidelines were consulted. Guidelines and Plans issued from time-to-time by the statutory bodies have been consulted. This study also follows the NRA Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes and Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes (NRA n.d.; NRA n..d.a). These are listed in the reference section of this report.

Every effort has been taken in the preparation and submission of this report to provide as complete an assessment as possible within the terms of the brief, and all statements and opinions are offered in good faith. However, ÆGIS cannot accept responsibility for errors of fact or opinion resulting from the data supplied by any third party, for any loss or other consequences arising from decisions made or actions taken on the basis of facts and opinions expressed in this report, (and any supplementary information), howsoever such facts and opinions may have been derived, or as the result of unknown and undiscovered sites or artefacts.

ÆGIS acknowledges the information supplied from the Archaeological Survey of Ireland Files, maintained by the National Monuments Section (formerly Dúchas), and information supplied by the client. The National Monuments Acts 1930-2004 is the current legislation in relation to archaeological projects.

This report is based on a template formulated by ÆGIS. All technical information, mapping and aerial photos were supplied by Mott MacDonald Pettit.

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II. Glossary of Terms Used

ASI	Archaeological Survey of Ireland, a division of the DoEHLG
Barony, Parish, Townland	These terms refer to land divisions in Ireland. The barony is the largest land division in a county, which is formed from a number of parishes. These parishes are in turn made up of several townlands, which are the smallest land division in the country. The origins of these divisions are believed to be in the Early Medieval/Christian period (AD500-AD1000), or may date earlier in the Iron Age (500BC-AD500).
CCC	Cork County Council
CH	Cultural Heritage Feature Number
CLH	Cork Lower Harbour
CTC	Cobh Town Council
DoEHLG	Department of Environment, Heritage and Local Government
E	East
EPA	Environmental Protection Agency
First Edition	This relates to editions of the OS 6 inch maps for each county. The first edition map completed for the area dates to the early 1840s and this is referred to in the text as the "First Edition".
Inventory	Published archaeological inventory for County Cork.
KM	Kilometre
M	Metres, all dimensions are given in metres or part of a metre, unless otherwise stated
MMP	Mott MacDonald Pettit (lead consultants to the project)
N	North
n.d.	No Date (of publication or of unpublished report)
NGR	National Grid Reference
NIAH	National Inventory of Architectural Heritage
NMI	National Museum of Ireland
NMS	National Monuments Section. Regulatory body within the DoEHLG with responsibility for archaeological heritage
NRA	National Roads Authority
OS	Ordnance Survey
OSI	Ordnance Survey of Ireland
Pers. Comm.	Personal Communication
PO	Preservation Order
PS	Protected Structure
Refs	References
RMP	Record of Monuments and Places. An update of the older SMR, (sites and monuments record), on which all known archaeological sites are marked and listed in an accompanying list. The sites marked afford legal protection under the National Monuments Acts 1930-2004. The record is based on the 6-inch map series for the country and is recorded on a county basis. Each archaeological monument on the RMP has a unique code known as the RMP number (see below)
RMP Number CO-	This code is the number of the site on the RMP constraint map. It begins with the county code, here CO for Cork, the 6-inch sheet number, followed by the number of the archaeological monument on that sheet.
RPS	Record of Protected Structures
S	South
Sheet	This relates to the 6-inch map for each county, which is divided into sheets.
SMR	Sites and Monuments Record. The precursor of the RMP, the SMR now commonly relates to the archive paper files of known archaeological monuments maintained by the Archaeological Survey of Ireland (ASI). These files are arranged according to RMP number.
TB	Townland Boundary
W	West

- WWTP** Waste Water Treatment Plant
- ZAP** Zone of archaeological potential. This refers to the area indicated around a recorded archaeological monument on the RMP constraint map. This zone is for indication purposes only and is usually circular in shape or more irregular depending on nature of the archaeological monument is it indicating.

1. Introduction to the Study Area

1.1 Scope of Study (figs 1 & 2)

A full description of the proposed development project was supplied by the lead consultants Mott MacDonald Pettit.

This report details the archaeological and architectural cultural heritage assessment of the proposed upgrade of the existing waste water system and the provision of a waste water treatment plant (WWTP) and sludge treatment centre of the Cork Lower Harbour and environs, as detailed in the preceding paragraphs. The report is a pre-planning assessment report and fulfils the criteria of an impact assessment and follows the most recent EPA guidelines on the compilation of an EIS (2002). NRA guidelines have also been used in this regard (n.d.; n.d.a). The objective of any cultural heritage (architecture and archaeology) assessment study includes the identification of all recorded archaeological monuments within the study area including the legal status, if any, of these features (NRA n.d., 16). For architectural heritage the study is to identify structures and features of known architectural merit. This study collates information from readily available sources that will be used to inform the later stages of the planning process (NRA, n.d.a, 13). For both archaeological and architectural heritage at assessment stage data collection is based on a desk study to identify all features and structures of known architectural merit and all known and recorded archaeological monuments, from *published sources* (NRA n.d., 16; NRA n.d.a, 13). Fieldwork is also undertaken. In the case of this study, the historical integrity of some of the locations in the study area, is also very important and must be considered. Cobh town being a particular case in point. The entire town's entity being perhaps greater than the sum of its parts, due to its location and its rich maritime history associated with voyages of the *Titanic* and the *Sirius*.

The report details the recorded and potential archaeological and cultural heritage features within the study area and in its vicinity and discusses the proposed impact of the development on that archaeology and/or cultural heritage.

The following brief has been fulfilled by this report:

- The identification of all recorded archaeological monuments within the pipeline areas and pumping stations, including the legal status, if any, of these monuments;
- The identification of structures and features of architectural merit within the study area based on published sources;
- A report on the archaeological walkover inspection of the proposed pipeline and waste water treatment lands;
- A general account of the historical and archaeological background of the study area, including examination of RMP maps, SMR files and the topographical files, as well as a concise summary of the historical background of the study area;
- The predicted impact(s) (if any) of the proposed development on the known and potential archaeology and architecture is discussed;
- Suggested mitigation procedures for addressing those predicted impacts (if any).

No intrusive archaeological investigations (test-trenching or excavation) have been undertaken at this stage. Suggested further archaeological (and/or cultural heritage) mitigation is stated at end of the report.

1.2 Definition of Archaeological & Architectural Heritage

The archaeological heritage may be defined as

a finite non-renewable physical and material resource. Archaeology is the study of past human societies through their material remains and artefactual assemblages. The study of archaeological remains increases our understanding and knowledge of the structure and culture of the past and ancient societies that are not recorded by any other means (NRA n.d., 8).

Every archaeological monument is unique and contains valuable information on the individual site as well as evidence for a wider cultural framework. As a group, archaeological monuments can contribute information on cultural evolution and important changes over time, while providing insights into communications, trade, and growth of past human societies (*ibid.*).

Architectural heritage is defined by the Architectural Heritage (National Inventory) and Historic Monuments Act 1999 as all

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 (NRA n.d.a, 7).

It is important to note that not all archaeological or architectural heritage is known or recorded at present and “new” sites are constantly being identified, by a variety of methods.

1.3 Protection of Heritage: The Legislative Frameworks

The current relevant legislation in relation to the protection of the archaeological and architectural heritage is detailed below, (there is some overlap in the legislation at present, and this accounts for the repetition in the list below, from NRA n.d., 9; n.d.a 8, with additions):

Level of Legislation	Archaeological Heritage Legislation	Architectural Heritage Legislation
National	National Monument Act 1930 amended 1954, 1987, 1994, 2004 Road Act 1993 National Cultural Institutions Act 1997 The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous) Provisions Act 1999 <i>Framework and Principles for the Protection of the Archaeological Heritage</i> (Dept of Arts, Heritage, Gaeltacht and the Islands 1999) Local Government (Planning and Development) Act 2000 <i>Advice notes on current practice (in the preparation of environmental impact statements</i> (EPA 2003) <i>Guidelines on the information to be contained in Environmental Impact Statements</i> (EPA 2002) <i>Environmental Impact Assessment of National Road Schemes – A Practical Guide</i> (NRA 2005) <i>Code of Practice between the NRA and the Department of Arts, Heritage, Gaeltacht and the Islands</i> (2000)	National Monument Act 1930 amended 1954, 1987, 1994, 2004 Heritage Act 1995 The Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous) Provisions Act 1999 Local Government (Planning and Development) Act 2000 <i>Architectural Heritage Protection Guidelines for Planning Authorities</i> (DoEHLG 2004) Action on Architecture 2002-2005 Government Policy on Architecture <i>Advice notes on current practice (in the preparation of environmental impact statements</i> (EPA 2003) <i>Guidelines on the information to be contained in Environmental Impact Statements</i> (EPA 2002) <i>Code of Practice between the NRA and the Department of Arts, Heritage, Gaeltacht and the Islands</i> (2000) <i>NIAH Handbook</i> (National Inventory of Architectural Heritage DoEHLG June 2006)
European	European Convention on the Protection of the Archaeological Heritage ratified by the ROI 1997 (“The Valetta Convention”) Council of Europe Convention on the Protection of the Architectural Heritage of Europe ratified by the ROI 1997 (“The Granada Convention”)	Council of Europe Convention on the Protection of the Architectural Heritage of Europe ratified by the ROI 1997 (“The Granada Convention”) European Council Directive on Environmental Impact assessment (85/337/EEC) 1985 and amending directive (97/11/EC) 1997 Charter for the Conservation and Restoration of Monuments and Sites (Venice 1964)
International	International Council on Monuments and Sites (ICOMOS) advisory body to UNESCO concerning the protection of sites and recommendation of World Heritage sites ratified by the ROI 1992	Convention for the Protection of World Cultural and National Heritage (1972)

Table 1. Relevant legislation in relation to the protection of the archaeological and architectural heritage

Using the above legislative framework, there are a number of methods can be applied to secure the protection of archaeological/architectural monuments. These include National Monument designation (ownership and guardianship by the State including local authorities), the Register of Historic Monuments, The Record of Monuments and Places (RMP), the placing of Preservation Orders and temporary Preservation Orders on endangered archaeological

monuments. The government department with responsibility for the archaeological heritage is the Department of the Environment, Heritage and Local Government and its Minister. Protected Structure legislation is currently in place to protect the architectural heritage of the country. The work of the NIAH (National inventory of architectural heritage) informs the compilation of lists of Protected Structures by local authorities. The NIAH's work is ongoing. The NIAH has yet to undertake fieldwork in the study area, though this is scheduled for later in 2007 (W. Cummins NIAH pers. comm.).

National monuments may be acquired by the Minister by agreement or by compulsory purchase order. The State or the local authority may assume the guardianship of any national monument (apart from dwellings). The owners of national monuments may also appoint the Minister or local authority as guardian of that monument, should they be in agreement. Once in the ownership or guardianship of the State, the site cannot be interfered with without the written consent of the Minister. At the time of writing there are no National Monuments being directly impacted by the proposed development.

The **Register of Historic Monuments** was enacted under the 1987 amendment to the National Monuments Act. It required that the Minister established and maintained a Register of Historic Monuments and archaeological areas, which once on the register, would be afforded statutory protection under the 1987 Act. Two months notice in writing is required to be provided to the Minister, prior to any works being undertaken on or in the vicinity of a registered monument. With the establishment of the RMP (under the 1994 amendment Act) the Register became somewhat redundant. At the time of writing, there were no Registered Monuments being directly impacted by the proposed development.

The **Record of Monuments and Places (RMP)** was established under the 1994 amendment to the Act. It was the duty of the Minister to establish and maintain such a record where the Minister believes such monuments may exist. The record comprises a list of monuments and places and a constraint map indicating the location of such monuments and places. The RMP is maintained on a county basis. Sites on the RMP all received statutory protection under the National Monuments Act 1994. (The current protective legislation at the time of writing is the National Monuments Act 1930-2004.) The **black line or circle** on the RMPs (figure 4.6) indicates the zone of archaeological potential (ZAP) either around an individual archaeological site (usually a circle) or around a town or archaeological complex (usually an irregular shape). This line provides a protective zone of archaeological potential, which is a zone that is protected under The National Monuments (amendment) Acts 1930-2004 legislation.

According to section 12 of the National Monuments Acts 1930-2004, where “the owner or occupier (other than the Minister for Environment and Local Government) of a monument or place included in the Record, or any other person, proposes to carry out, or cause or permit the carrying out of any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister for the Environment and local Government to carry out work and shall not, except in the case of urgent necessity and with the consent of the Minister, commence the work until two months after giving the notice”. The **Sites and Monuments Record (SMR)** was the precursor to the RMP and now commonly refers to the paper archive housed in the Archaeological Survey of Ireland, which details pertinent information on each individual archaeological monument.

In the event that archaeological sites are deemed to be in immediate danger of destruction or damage a **Preservation Order** can be issued under the provisions of the 1930 (principal) National Monuments Act. These Orders make any interference with the site illegal. Under the 1954 Act, Temporary Preservation Orders can also be issued, while having the same function as a Preservation Order, have a time limit of six months, after which the case must be reviewed. Again, work on or in the vicinity of archaeological monuments under temporary or full Preservation Orders require Ministerial written consent. At the time of writing, it appeared that there were no Preservation Orders on archaeological monuments being directly impacted by the proposed development.

There are also a number of methods in which the architectural heritage may be protected. The Heritage Council was established by **The Heritage Act 1995**. Its main objective seeks to promote the interest in, knowledge and protection of all Irish heritage, which includes the archaeological and architectural resource. The 1995 Act, protects all heritage buildings owned by local authorities from damage or destruction. The **Architectural Heritage Act 1999** requires the Minister to establish a survey in order to identify record and evaluate the architectural heritage of the State. The body established to undertake this work is known as the **NIAH**, National Inventory of Architectural Heritage, which is undertaking the survey at present. The NIAH has not yet undertaken the inventory for this area of Cork and there are no structures included in the survey for the study area at the time of writing. Inclusion of structures on this inventory does not provide statutory protection; however, local authorities are encouraged to use the NIAH surveys as a baseline in creating their **Record of Protected Structures (RPS)**. The RPS is an obligation of local authorities under the Local Government (Planning and Development) Act 2000. This record should list structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The Record of Protected Structures for County Cork is included in the Cork County Development Plan 2003, (Cork

County Council). Cobh town also has a Development Plan (Cobh Town Council 2005), which lists all the Protected Structures in the town. Cobh is also important on a wider level due to its historical importance, particularly its maritime history.

“Cultural heritage” is the loose collective term applied to both archaeological and architectural heritage (Buttimer *et al* 2000). However, as a rule of thumb the archaeological resource covers sites and monuments from the prehistoric to the post medieval period, while the architectural resource includes standing structures and sites dating from the post-medieval to the modern period.

2. Method of Study

The following resources and methods of establishing the archaeological and architectural status of the study area were used. This follows the NRA and EPA guidelines on both archaeological and architectural consultation to gather baseline information (NRA n.d. 16; NRA n.d.a 13). Information on the proposed development was provided by the lead consultant, MMP:

- The proposed pipeline routes (green field and existing), waste water treatment (WWTP) site, major pump station sites and archaeological and cultural heritage sites in the vicinity of the proposed development were examined and inspected by two qualified archaeologists;
- A comprehensive review of published archaeological and cultural heritage work undertaken in the vicinity of the study area was undertaken by the writers (including Excavations Bulletins, searched on the online research database www.excavations.ie compiled to 2003 at the time of writing);
- The National Museum topographical files were consulted;
- The Record of Monuments and Places (RMP) constraint maps and list were consulted;
- The published archaeological inventory for the study area was consulted (*Archaeological Inventory of County Cork- Volume II: East and South Cork* 1994). This is an important resource for the archaeological heritage of Co. Cork;
- Cork County Development Plan 2003 (Cork County Council), Cobh Town Development Plan (Cobh Town Council 2005) and applicable local area plans were consulted for the locations of possible Protected Structures in the vicinity of the proposed development;
- The National Inventory for Architectural Heritage (NIAH) was consulted. The NIAH has not yet undertaken the inventory for this area of Cork, but are beginning fieldwork presently;
- A wide range of local historical and archaeological records relevant to the study area were consulted, including the OS First Edition six-inch map (c.1840);
- Suitable aerial photos, analysed for archaeological purposes were used in the study. These were supplied by MMP;
- Access was permitted for the proposed WWTP site and this was inspected by the writers;
- Where the proposed pipeline corresponded with roadway or public areas these were visited and/or a windscreen survey was undertaken by the writers;
- The assessment of the intertidal and underwater locations of the proposed development site (marked in blue on the accompanying mapping) was undertaken by ADCO Limited.

2.1 Limitations to the Study

A number of difficulties in relation to the study were encountered during the assessment process. It is important that these limitations are acknowledged. The mitigation section of this report suggests suitable mitigation to alleviate some of these limitations. They are as follows:

- Due to the scale of proposed development and the fact that much of it is linear pipeline along both existing roadways and green field sites, only those known (recorded) archaeological sites whose zone of archaeological potential (ZAP) is predicted to be directly impacted by the route of the pipe have been included in the assessment.
- It was not known at the time of assessment what side of the roadway the pipelines may take and if the pipes are going to be placed in existing culverts or new service trenches.
- Aerial photography for the proposed development study area is in the form of orthophotos. While these are adequate for a number of purposes, sometimes they are not clear enough to identify the smaller possible archaeological sites. Suitable mitigation has been suggested to accommodate this limitation.
- Access was not permitted to portion of the proposed pipelines, in the green field areas, which are through private lands. Aerial photos were used as a substitute and the areas were viewed from the roadsides or gateways.
- The intertidal and underwater assessment required an archaeological licence, which was not received from the relevant bodies until September 2007 (This licence was applied for in May 2007). This delayed this part of the cultural heritage assessment significantly. This work was undertaken in September 2007.
- The minor pumping station locations are marked as triangles on the accompanying mapping and the general locations of these features were assessed. Aerial photos were used at these locations.
- As the fieldwork for the assessment was carried out in the summer season, vegetation growth may have obscured some features of archaeological or cultural heritage interest.

2.2 Assessment Dates

All desk based research, file consultation and aerial photo analysis was undertaken prior to fieldwork. The assessment fieldwork was carried out on the following dates:

- Aegis field inspection was undertaken on 27th June, 10th July and the 16th September 2007.
- ADCO underwater assessment was undertaken on 25th and 26th September 2007.

3. Existing Environment

The study area is located in the Cork lower harbour area in and around Passage West, Monkstown, Raffeen/Strawhall, Carrigaline, Ringaskiddy and Cobh, Co. Cork (figs 1 & 2). The study area incorporates thirty townlands (see table 1). The collection system and WWTP impacts the Zones of Archaeological Potential (ZAPs) for twenty recorded monuments (RMP) in the study area. The archaeological walkover was undertaken by two qualified and experienced archaeologists (figs 1- 3).

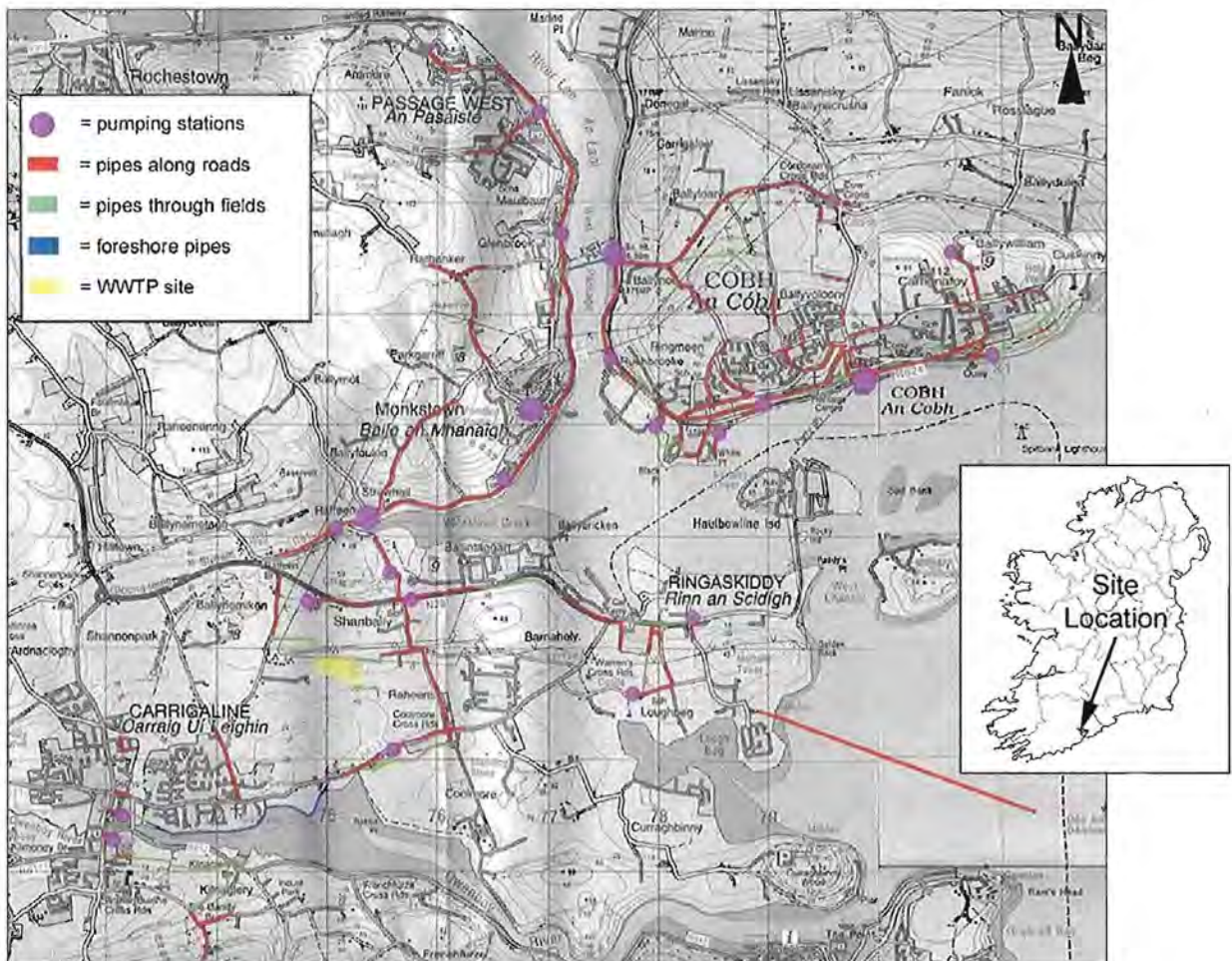


Figure 1. Discovery Series map Nos 81, 87 showing collection system & WWTP locations (OSI 1997)

3.2 The Archaeological Inspection (fig.3)

The proposed collection system pipeline routes comprise a mixture of green-field, roadways intertidal and underwater areas. It is proposed that some of the pipeline will follow existing trenches and pipes, while others will be completely new. (These are not yet specified at time of writing. This information will be available at detailed design stage.) As the area of the study is extensive, for ease of description the area has been divided into sections around the principal centres that the scheme will ultimately serve. They are as follows:

- Passage West, Monkstown, Raffeen/Strawhill (map detail no. 1)
- Carrigaline (map detail no. 2)
- Shanbally (WWTP) (map detail no. 3)
- Ringaskiddy (map detail no. 4)
- Cobh and environs (map detail no. 5)

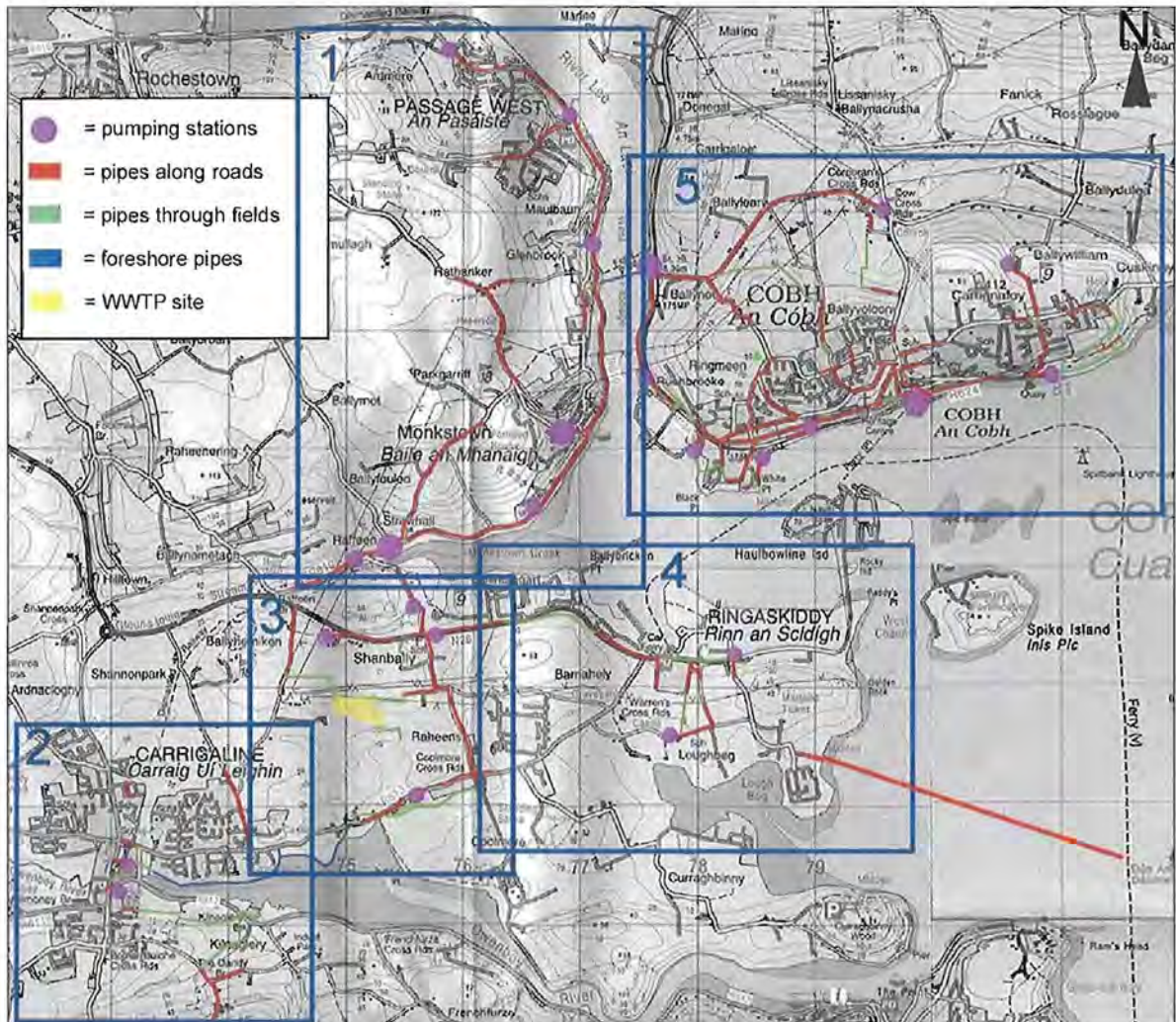


Figure 3. Master map showing section description areas (Discovery Series map with additions)

The topography of the study area as shown above is varied. This area is also known as Cork Lower Harbour Area. The location is the estuary of the River Lee. Cork Harbour is one of the most extensive natural harbours in Ireland. Cork Harbour is a Special Protection Area (CCC 2005, Carrigaline Electoral Area Local Area Plan, section 7.2.8., 21). A description of this landscape and topography can be summarised as follows (synopsis by CCC):

The topography and landscape components in this area, primarily the River Lee as well as the vast open and natural harbour, have provided the opportunity for human settlement and the development of a city. The River Lee and many smaller rivers make their way to the harbour by cutting through carboniferous limestone or mudstone between east-west ridges of sandstone. The Lee forms a broad alluvial flood plain, which has provided an ideal location for settlement and growth into a large urban centre. Most of the smaller rivers form shallow mudflat estuaries where they meet the sea. In terms of landform, the harbour is dominated by Great Island. A narrow harbour mouth is established by two steeply rising rocky knolls of green sandstone and mudstone which are, in turn, articulated by the old military fortifications which crown their summits.

Shelter has been afforded by the steep but shallow valley sides and the broad and safe natural harbour. The city was originally structured by the River Lee, which still etches its way through the core urban mass. Along the northeastern side of the harbour, flanking the Lee prior to her entry into the harbour, the valley steps up along the steep surrounding banks to form a terraced streetscape and villa landscape. The city gradually breaks open to form an urban and periurban sprawl. It spreads out across the flat alluvial flood plain through suburbs and, further, to identifiable satellite communities [such as those in the study area] to eventually merge with the rural hinterland. While the harbour limits expansion eastwards, the river valley provides the line of expansion westwards channelled by the valley sides to the north and south. The harbour at the broad topographic scale includes large islands, which, along with much of the harbour shore, comprise landscape of rural farmland character falling gently to the sea. It comprises a mosaic of fertile fields of mixed use on brown podzols. These fields are defined by broadleaf hedgerows as well as swaths of broadleaf woodland.

The city profile is dominated by church spires and tall offices, most notably the County Hall west of the centre, while silos, high factory blocks and chimney stacks are scattered beyond the city core and extend into the rural environs. Attractive historical terraced houses rise up against the steep slopes of the Lee valley immediately north of the harbour (flanking the N25), interspersed among individual houses set in a landscape well endowed with vegetation. South of this road modern industrial and business parks spread out in an orderly fashion across a plane, extending towards the harbour. Two noteworthy features of development are the passenger ferry port located where the city meets the harbour and the airport inland to the south. Other significant areas are Ringaskiddy and Little Island to the south of the city on the western side of the harbour, supporting industrial development. On higher ground along the valley and city

periphery an occasional telecommunication mast or water storage tower punctuates the skyline. Extending from the city the docks in particular contribute to the cultural and commercial character and give testimony to the city's relationship to the sea and mercantile history. In profile they are identified by tall skeletal cranes hovering across the skyline and large ships. Further eastwards and to the south marinas catering for smaller boats and boating activity as well as occasional industrial sites link the docks to the broader harbour.

On Great Island the town of Cobh opens southwards towards the harbour. It rises from the shore up the steep incline on which it has grown, almost forming a terraced structure. Its historical development cultural complexity are visible in the resulting tightly packed layering of architectural form, comprising religious, commercial and residential buildings. At the southern extremity of the harbour, the steep and narrow mouth is articulated by Carlisle Fort on the east (built c.1798) and Camden Fort on the west side (an example of a bastion fort begun in the late 16th century), otherwise known by their pre-colonial names as Meaghar and Davis respectively.

Notwithstanding the rural character around much of the greater harbour area, the tell-tale signs of urban intensity are evident everywhere through the prevalence of infrastructure such as roads, bridges and electricity power lines and the frequency of urban clusters. Overall, the city and harbour comprise a balance of intensely urban form, rural character and seascape. The course of the River Lee creates a linear structure along which the older city core is strung and a spatial release west-wards between the northern and southern containing valley sides. The broader harbour also provides some spatial release while creating a sense of containment or focus to which the surrounding landscape falls and refers. In the less built up but heavily wooded areas a sense of spatial confinement and forward visual focus is experienced as one travels many of the roads due to the densely spaced tall broadleaves in roadside hedgerows. This creates a temporary tunnelled darkness, relatively speaking, which eventually gives way to openness and light. A steep and wooded precipice on the southern side of the N22 heading towards Ballincollig combines with tall mature trees on the northern side to create such an effect. In contrast, certain roads along the sea shore, such as an estuary like Poolnabibe or a channel like Passage West, involve spatial containment on one side and openness on the other. A visual connection is created between these and the land masses on opposite sides of the water through a natural sense of curiosity that is the experience of a desire to explore and understand distant landscapes.

3.2.1 Passage West, Monkstown, Raffeen/Strawhill (fig. 4; plates 3.1-3.7; 3.42-3.44)



Figure 4. Location of pipeline routes within the Passage West, Monkstown, Raffeen/Strawhill (detail map no. 1)

Pipeline Routes along Existing Roads

The pipeline in the Passage West, Monkstown, Raffeen/Strawhill area follows along the R610 directly from the north of Passage West, through the itself village and onto Monkstown, along Monkstown Creek to the Raffeen bridge/Strawhill area at south. From this main pipeline along the R610, are a further four lines of pipe proposed, which diverge from the main proposed line along the R610. These four lines are proposed to travel along existing roadways generally to the west of the R610 line. The most northerly travels eastwards and uphill from the R610 in Passage West. This is along an existing roadway through a primarily residential area. The second line is a very short stretch, which runs parallel to the R610 near the Ferry Terminal in the townland of Monkstown. This proposed line is to be connected, to the main R610 pipeline via a short green field pipeline route (see below). The third line is to the northeast of Monkstown village itself and travels uphill to the northwest towards the

townland of Rathanker, along Glen Road. This line is separate from the remainder of the proposed lines in this area (new pipe will link up with existing pipes in this area). The line to Rathanker commences along the road to the north northwest of three recorded monuments (RMPs), CO-087-027--- (td Monkstown Castlefarm; classified as an abbey); CO-087-028--- (td Monkstown Castlefarm; classified as a fortified house) and CO-087-029--- (td Monkstown Castlefarm; classified as a church and graveyard). The proposed pipeline is not intended to impact on their ZAPs, so they are not designated CHs in this report. They are included here for information only. They are not visible from the road where the pipeline commences. At a "Y-shaped" junction in Rathanker, the proposed pipeline diverges for a distance of approximately 250m respectively.

The fourth extension from the main line along the R610 travels from Raffeen/Strawhill in the south in a northeasterly direction. This line is proposed to follow an existing roadway in Ballyfouloo townland. This road continues to run along the townland boundary between Ballyfouloo and Monkstown Castlefarm townlands.

Pipeline Routes through "Green Field" Areas

There are five very short stretches of proposed pipeline in this area which are "proposed pipes through fields", or green field locations. The first is in Passage West, on the divergent route off the R610. The second is to the west of the Ferry Terminal which is at present a steep slope, so that it might connect the second proposed line which runs along a road (see above). The third green field area is a very short stretch required in the middle of Monkstown, which appeared at the time of inspection to be situated in a residential area. Nothing of an archaeological nature was noted during the field inspection. The fourth green field location is a very short stretch immediately to the east of the major pumping station location (see below). The fifth is a very short stretch at the Raffeen/Strawhill pumping station (see below). These are extremely short stretches and they will serve to aid in the connection of pipes along the roadways. These locations (and all others) were viewed from the closest roadways and if not visible were examined from the orthophotography. Nothing of an archaeological nature was noted in these locations.

Pumping Stations (figs 5 & 6)

There are two types of pumping stations proposed for this project: minor pumping stations and major pumping stations. The minor pumping stations were considered part of the overall piping route, when this was visited. There are five minor pumping stations required for this area of the project. They are situated in the townlands (from north) of Pembroke (2); Lackroe;

Monkstown (Castle Farm); Raffeen. Two major pumping stations are proposed for this area, one at Monkstown and the other at Strawhill (Ballyfouloo td). Both are proposed to be located adjacent to existing roadways.

Monkstown Pumping Station

The proposed major pumping station at Monkstown is to be located in the southeast corner of the public Park on Glen Road and is to be connected to the pipeline route running along Glen Road, via a sewer pipeline. The proposed location is at present a surface carpark, which services the public park, which lies to the north. There is a residential house that overlooks this area. It is a good example of a fine residential structure in Monkstown, from which the pumping station would be visible. The pumping station might be screened from view with suitable screening to alleviate this predicted visual impact (see section 5). Nothing of an archaeological nature was noted during the inspection of this location.

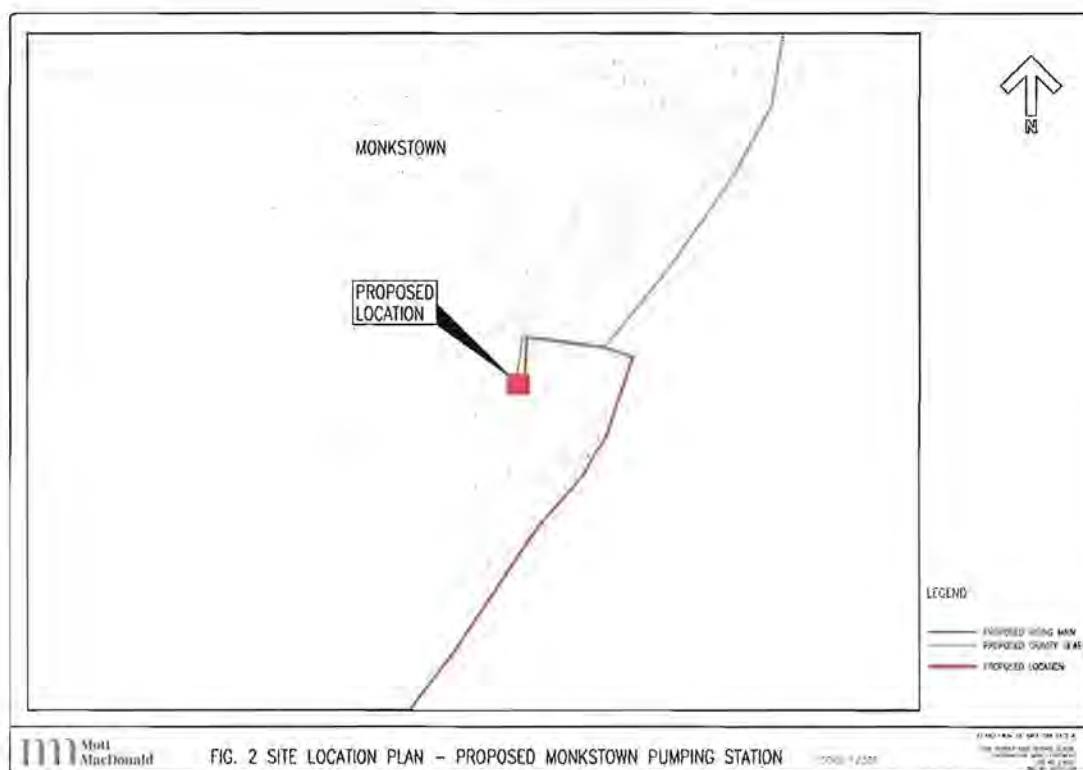


Figure 5. Location of Monkstown Pumping Station

Raffeen/Strawhall Pumping Station

The proposed major pumping station at Raffeen/Strawhill is to be located in the townland of Ballyfouloo, on the southern side of the R610 road in an area of ground reclaimed from the tidal area of Monkstown Creek. Nothing of an archaeological nature was noted during the inspection. CH23 a railway embankment and concrete and steel bridge, associated with the Great southern railway and lies approximately 30m to the southeast of the proposed location of the pumping station (see section 5).

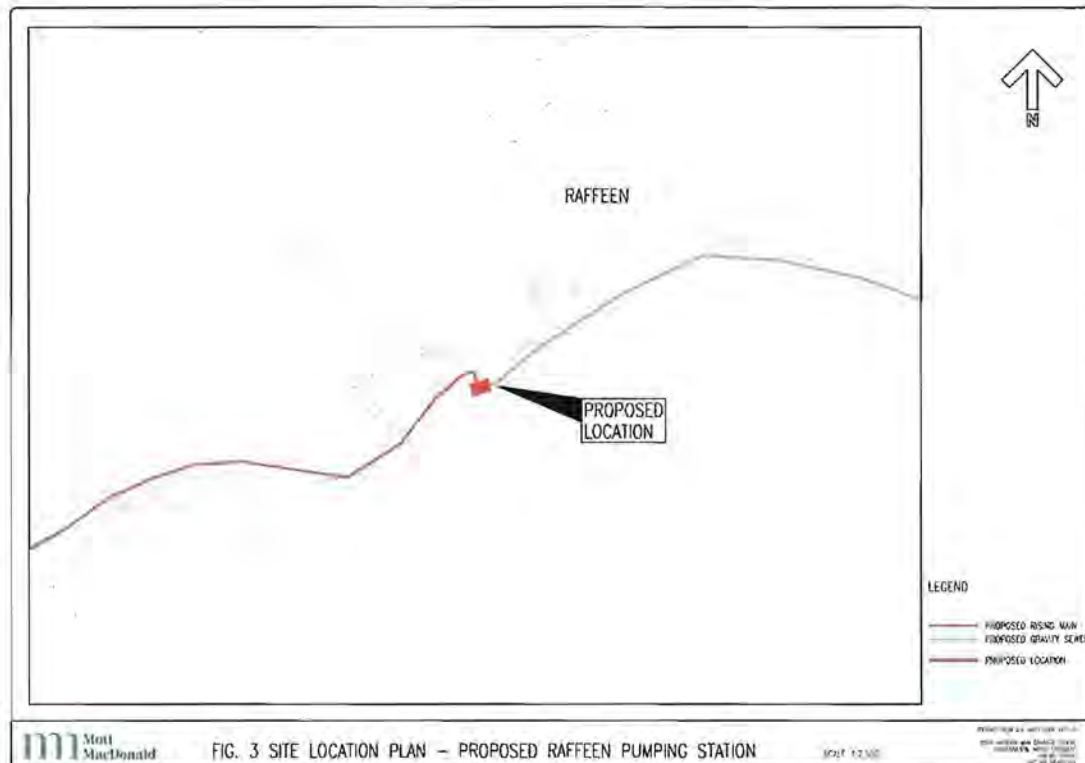


Figure 6. Location of Raffeen/Strawhill pumping station

Intertidal/Underwater Zone

The portion of pipeline marked in blue which traverses from Passage West on the right bank to the ferry terminal at Carrigaloe on the left bank of the estuary is being assessed by ADCO (see appendix section 10).

Cultural Heritage Features (Fig. 19)

No new unrecorded archaeological or cultural heritage features were noted during the inspection. From the desk based study and field inspection, there are five Cultural Heritage (CH) features located within this area. They are:

Cultural Heritage No. CH	Designation	Townland	Classification
1	RMP CO087-006---	Rathanker	Ringfort
16	RMP CO087-097---	Rathanker	Souterrain (possible)
3	RMP CO087-024---	Parkgarriff	Ringfort
4	RMP CO087-025---	Ballyfouloo	Holy Well
5	RMP CO087-026---	Monkstown (Castlefarm)	Lime Kiln
23	none	Ballyfouloo	Great Southern Railway Embankment

None of these sites is predicted to be directly impacted by the proposed project. Their ZAPs are predicted to be impacted. CH1 is a ringfort in the townland of Rathanker. This monument extant as a ringfort (inventory no. 4614). CH16 is a possible associated souterrain (inventory 5140). This could not be located during field inspection, but it can be suggested that it is partially within the ringfort enclosure. The proposed route of the pipeline terminates on the road to the east of the ZAP for this monument. CH3, also a ringfort (inventory no. 4973) is no longer extant and is obscured by modern buildings. The proposed pipeline route runs along the road to the southeast of the ZAP for this monument. CH4, a Holy Well (inventory 5186) could not be located on the ground at the time of inspection (it had been quite dry prior to the inspection and the well may have temporarily dried up). The proposed pipeline route runs through the ZAP for this monument. CH23 is a railway embankment for the Great Southern railway located to the SE of the proposed pumping station at Raffeen/Strawhill.

3.2.2 Carrigaline & Environs (fig. 7; plates 3.8-3.14; 3.16-3.23; 3.48-3.51)

The proposed pipeline route in the Carrigaline area will travel mainly through green field areas. However, the pipeline will follow along some roadways in the centre and east and south of Carrigaline. Carrigaline is at present a busy town in its own right, with many residential areas around its perimeter. It is built on the Owenboy River. The river estuary is designated as a conservation area (see section 6).



Figure 7. Location of pipeline routes within Carrigaline and its environs (map detail no. 2)

Pipeline Routes along Existing Roads

Seven stretches of pipeline are proposed to follow existing roadways in the centre and environs of Carrigaline town. Some are proposed to be quite short as figure 7 illustrates. The longest stretch is immediately north of Church Road and travels northward for a distance of approximately 750m. This is uphill and is an existing fairly substantial roadway. Nothing of note was recorded during the inspection at this location. Three further short stretches are proposed to the north of Carrigaline town centre and to the west of the main carriageway to

Cork City. These areas are all proposed for residential and built-up areas. There is another east - west running stretch in another residential area of Carrigaline, which is proposed to connect some green field stretches of pipeline.

The final stretch of pipeline proposed for existing roadways is around The Dandy Bridge (CH24). The proposed pipeline runs from north to south, with another line running perpendicular at a T-junction to the south of The Dandy Bridge. The route of the pipeline was inspected and nothing of an archaeological nature was noted. The bridge is designated a CH (see below).

Pipeline Routes through "Green Field" Areas

There are six stretches of pipeline proposed to traverse green field locations. These will form part of the route with the pipelines along the existing roadways described above. A new pipeline is proposed to run parallel to the carriageway to Cork City, along its western edge. This is currently a modern landscaped area along the western side of the road. Another new route diverges from the one just described, which heads in an eastern direction, crossing the carriageway and connecting to the intertidal route (marked in blue on mapping see intertidal zone section below). This green field area is public space near public buildings. Nothing of an archaeological nature could be determined.

There is a section of new pipe proposed for the centre of Carrigaline, which will run generally along the left bank of the Owenboy River. This river is open and runs through the town. This route was inspected where possible and nothing of a cultural heritage nature was noted.

The longest stretch of proposed new pipeline is proposed for the southeast of Carrigaline, and to the south of the Crosshaven road, the R612. This route traverses private lands, which were not accessible at the time of writing. From aerial photos, nothing of an archaeological nature could be ascertained. This stretch links with another which leads from The Dandy Bridge northeastwards to Kilnaglery, where the two pipelines converge to outfall at Kilnaglery Bridge. This bridge appears to be modern and nothing of antiquity could be noted at the time of inspection. Immediately to the north of this location is a Great Southern railway Embankment, which was designated CH25 (see below).

Pumping Stations

There are two types of pumping stations proposed for this project: minor pumping stations and major pumping stations. The minor pumping stations were considered part of the overall

pipings route, when this was visited. There are no major pumping stations proposed for this location at the time of writing.

The Intertidal Zone

The proposed pipeline route to the east of Carrigaline town is proposed for the intertidal zone, which runs to the south of the road R613. The Owenboy estuary is designated a conservation area (see section 6). From a cultural heritage perspective, this area was assessed by ADCO (see appendix section 10).

Cultural Heritage Features (Figs 21 & 23)

The cultural heritage features impacted by the pipeline in this area are: CH6, CH7, CH17, CH19, CH24 and CH25. CH6 is a mill in the centre of Carrigaline town. It is also a Protected Structure. This mill is extant and has recently been renovated. CH7 is a church and graveyard. It is also a Protected Structure and extant. The pipeline route runs along the road which runs to the north of CH7. CH17 was a possible souterrain found during the construction of a house at this location. CH17 no longer extant. CH19 is the location of a possible *fulacht fiadh* (burnt mound). No surface trace visible. CH24 is The Dandy Bridge. This is extant and already has pipes running along its base. CH25 Kilnaglery Bridge, which appears modern and the Great Southern Railway embankment, which now forms part of a local amenity walk to Crosshaven.

3.2.3 Waste Water Treatment Plant (WWTP) (fig. 8; plates 3.15-3.23)



Figure 8. Location of pipeline routes and WWTP (in yellow) around Shanbally area (map detail no. 3)

This area incorporates the proposed waste water treatment plant (WWTP) at Shanbally and associated pipeline. Pipeline routes follow existing roads N28 and R613 as well as interconnecting roads in Raheens and Shanbally. The pipeline is to be laid from the existing roads at east and west.

Pipeline Routes along Existing Roads

The majority of the pipeline route in this area follows existing roads. The most northerly stretch continues from Raffeen/Strawhill pumping station, which follows the R610 to Raffeen Bridge. Another pipe route runs along a third class road southwards from Raffeen Bridge towards Carrigaline in the direction of the WWTP (and an existing ESB substation). A third short stretch is to be located immediately to the south of the R28 in a cluster of houses. The longest stretch runs from north along a road near a golf course to the south of Monkstown Creek, southwards to the junction with the R28 at Shanbally. The route continues southwards

across the R28 to Coolmore Cross Roads. There is a westwards branch off this main north-south line to service the WWTP (it follows the lane to the current sports field at this location).

At Coolmore Crossroads, the pipeline along the roads follows for a short distance to the east and south and follows to the west along the R613 towards Carrigaline.

Pipeline Routes through "Green Field" Areas

There are several sections of Greenfield pipeline proposed at this location. The majority are proposed to feed to the WWTP and three emanate from the northwest, northeast and southeast corners of the WWTP. These are proposed to follow existing field boundaries. Nothing of an archaeological nature was noted along the northwest stretch. The northeast section will impact on CH9 and CH10 (see below).

There is a short stretch of green field pipeline proposed to the east of Raffeen Bridge in order to connect two stretches of pipeline along the road. This is going through a wooded area.

The final stretch of green field pipeline runs generally parallel to the R613 from Coolmore Cross Roads towards Carrigaline. The route runs behind houses which front onto the R613 and so could not be walked at the time of writing. It would appear from viewing from the R613 that the route is through fields under both pasture and crops. A short stretch is located on the northern side of the R613 and was viewed from aerial photos. Nothing of an archaeological nature was noted from the aerial photos.

Pumping Stations and WWTP

The proposed treatment plant is to be located in a green field site on the slope of a hill overlooking the Owenboy River to the south.

The site incorporates two fields (labelled fields A and B for the purposes of description). Field A is the western field of the proposed location for the WWTP. It is bounded by mature hedgerows all around. The central portion of this field is proposed for the WWTP. The field slopes from a high at north to a low at south. High tension power lines cross the site from east to west (an esb substation lies to the southwest). The field at the time of inspection was under grass. Nothing of an archaeological or cultural heritage nature was found in this field. Field B is the eastern field of the proposed WWTP location. This field was also under pasture at the time of writing. Nothing of an archaeological or a cultural heritage nature was noted as being extant at the time of inspection. However immediately outside the boundary of field B are two

features: CH9 and CH10. These are recorded archaeological monuments RMPs. Both are enclosures and likely to be ringforts. CH9 is partially extant with its northern portion being maintained in the field boundary. CH10 was noted as a crop mark. Both these features are predicted to be impacted by the proposed WWTP and associated pipe work. The predicted negative impacts on these CH sites are detailed in section 5.

Cultural Heritage Features (Fig. 21)

This area incorporates three cultural heritage features, CH8, CH9 and CH10 in the townland of Shanbally. CH8 is a limekiln (inventory no. 6163) and an RMP. Access to this site was not permitted at the time of writing and it was densely overgrown so could not be viewed from the road. Its ZAP is predicted to be impacted rather than the limekiln itself. CH9 (inventory 5312) is an RMP and is classified an enclosure. It is likely to be a ringfort based on its morphology and location. CH10 is another RMP enclosure (inventory 6364) and manifested itself as a crop mark. No trace visible on ground at time of inspection. Both CH9 and CH10 are predicted to be impacted by the pipeline route. Impacts and mitigation suggested in section 5.

3.2.4 Ringaskiddy & Environs (fig. 9; plates 3.24-3.29)



Figure 9. Location of pipeline routes within the Ringaskiddy area (map detail no. 4)

Pipeline Routes along Existing Roads

The pipeline at this location again comprises both green field and existing/roadway pipelines, but the majority is along existing routes. Where it deviates from the N28 the pipe is proposed to run along the grass verge of the roadway. In the Ringaskiddy area it follows along the N28 at north, firstly along the roadway (at western end from Shanbally) where it then diverges from the road into the grass verge on the southern side of the N28 before meeting up with the N28 again. After a distance of approximately 500m the proposed pipeline then again will follow the grass verge of the N28 until its terminus.

The pipeline route is to be located along smaller roads in the Loughbeg area at south of the N28. All these routes were accessed for archaeological or cultural heritage features. None was noted during the inspection.

The proposed outfall pipe at the eastern side of the area is to follow an existing IDA outfall (as marked on the mapping).

Pipeline Routes through “Green Field” Areas

Green field locations of the pipe for the N28 in Ringaskiddy have been noted above in the existing routes, as it is proposed that the pipes will travel along the road verges (which are disturbed ground in any case). A short stretch of pipe is routed across fields to the west of a school. This stretch was not accessed at the time of writing but was seen on the aerial photos. The route follows existing field boundaries.

Pumping Stations

There are two types of pumping stations proposed for this project: minor pumping stations and major pumping stations. The minor pumping stations were considered part of the overall piping route, when this was visited. There are no proposals for a major pumping station at this location at the time of writing.

Cultural Heritage Features (Fig. 22)

There are four Cultural Heritage (CH) features located within this area, CH11 and 12, and new sites noted during the walkover inspection CH20 and CH21. CH11 is recorded in the RMP as a possible church, though the inventory does not include it. No trace found during the walkover inspection. Location marked on constraint illustrates as per RMP. CH12 is a shell midden (inventory 4271). This feature was noted during the walkover inspection. As there are no predicted works in this area, it is not predicted to be impacted at this time. There is an existing IDA outfall at this location. CH20 is a modern roadside memorial. It is predicted to be impacted. CH21 is a plaque dating to 1980. It may be impacted depending on which side of the road the pipeline route will be located.

3.2.5 Cobh & Environs (fig. 10; plates 3.30-3.41, 3.45-3.47)

Due to Cobh's historical importance for a number of reasons, including its unique maritime history, it has been allocated a CH number for the purposes of this study: CH26. It is suggested that the boundary for CH26 follow the limits of the Town Council as set out in its Development Plan (CTC 2005). Where specific features of note have been inspected within the zone for Cobh, these have been given additional CH numbers.

For the majority of the works proposed around Cobh, the pipeline is to be located along existing roadway. There are some notable green field areas too, however.



Figure 10. Location of pipeline routes around Cobh and its environs (map detail no. 5)

Pipeline Routes along Existing Roads

The pipeline proposed follows the R624 from Carrigaloe to the north (see pumping station below), through Rushbrooke, along the road at West Beach (the main street in Cobh), east Beach eastwards as far as Carrigafoey (the current harbour commissioners). This road is undulating as it clings to the steep sides of Cork harbour. There are several branches of pipeline from the main spine along West Beach.

A stretch follows Spy Hill and the Bishop's Road, another stretch follows Westbourne Place, and the road that the Heritage Centre and Garda station is located. Pipes are proposed for

Casement Square and Pearse Square, Rahilly Street, Bond Street and Bishop Street. Another existing pipe route proposed is northwards from Carrigafoy harbour office to Golf Club road. A further existing stretch is proposed for a roadway, which leads to Cushkinny Bay and east ferry, in the townland of Ballywilliam.

There are proposed existing pipelines along roads at White Point and Black Point to the west of Cobh town.

To the north of Cobh town, between the existing ferry cross on the R624 on the west and Cow Cross roads on the east, it is proposed to run a pipeline along this third class road with a diverging pipeline at the Y-shaped junction in the townland of Ballynoe, about 500m in length.

There is an additional short stretch to the west of Clonmel Church at Ballyvoloon. This is an important church of Ireland with a graveyard attached. Some of the casualties of the Lusitania are reputedly buried here.

One previously unrecorded feature was noted during the walkover CH22 (see below).

Pipeline Routes through "Green Field" Areas

The green field locations in Cobh are necessitated to connect the red routes detailed above. The green field route proposed for White point and Black Point were inspected. Nothing of an archaeological or cultural heritage nature was noted along these stretches.

Another green field stretch was noted at Rushbrook on the approach to Cobh from the west. Access was not permitted at the time of inspection. It appears from photos that the area through which the pipeline traverses is residential in nature. This will be verified at detailed design stage. There are two short stretches within the centre of Cobh which connect existing pipelines. Near Carrigafoy there are longer stretches of proposed green field pipeline. The topography of the ground here is very steep and rocky from a low at south to a high at north, and the locations were inspected from the fort itself and viewed from viewing locations in that area. The area around Carrigafoy crossroads to Cushkinny /East Ferry and the Golf Club also has some Greenfield pipes and this appears to correspond with grass verges.

At Cows Crossroads a stretch of green field pipeline route runs southward from near Clonmel Church and graveyard through a field in pasture to connect with an existing pipeline. Access was not permitted along this stretch at the time of writing, but it was viewed from a gateway

at north. A sort stretch of green field pipeline is also required to the west of Cow Crossroads to connect to roadway line at this point.

The final stretch of green field pipeline is required from the y-junction at Ballynoe eastwards to Ballyvoloon (this route goes through pasture to connect two third class roads). No access was permitted to this stretch at the time of writing. Orthophotos were used in this case.

Pumping Stations (Figs 11 & 12)

There are two types of pumping stations proposed for this project: minor pumping stations and major pumping stations. The minor pumping stations were considered part of the overall piping route, when this was visited. There are five minor pumping stations required for this area of the project. They are situated in the townlands (from north) of Pembroke (2); Lackroe; Monkstown (Castle Farm); Raffeen. Two major pumping stations are proposed for this area, one at West Beach, Cobh and the other at Carrigaloe (adjacent to the ferry terminal).

West Beach, Cobh



Figure 11. West Beach Cobh proposed pumping station location

This major pumping station is proposed to be located in the intertidal zone immediately adjacent to the T-shaped pier, known as Pier Head at West Beach, Cobh. The proposed site was inspected at low tide mark and nothing of an archaeological nature was noted during the

inspection. This location is important as it is in the centre of the historic town of Cobh (CH26). (See below for discussion of same.) It is supposed that this pumping station will be set on an area of ground reclaimed from the harbour. This reclamation and the construction of the station is predicted to obscure some view some of the stone quay wall.

Carrigaloe

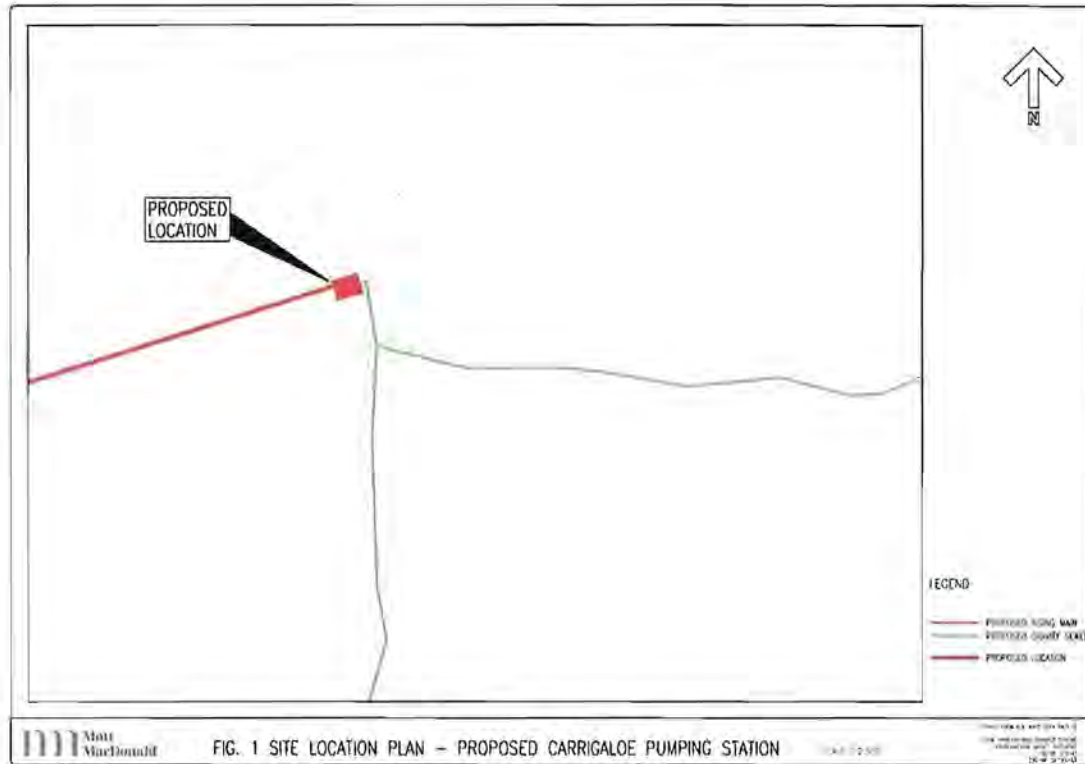


Figure 12. Carrigaloe proposed pumping station location

The proposed location for this major pumping station is immediately to the south of the current ferry terminal at Carrigaloe, on the opposite riverbank and to the east of Passage West. This site at the time of inspection was a shipyard area, with a large modern shed. The ground (after a visual inspection) appeared to be artificially and “made up” ground. The site was viewed from both the road (east) and the water (west). Nothing of an archaeological nature was noted during the inspection.

Cultural Heritage Features (Fig. 20)

There are several cultural heritage features in the environs of Cobh. They are as follows: CH2 a holy well, CH13, 15, 14 church and graveyards, CH18 battery, CH22 limekiln, CH26 historic town, CH27 church and graveyard.

3.2.6 Intertidal & Underwater Zones (assessment undertaken by ADCO) (Fig. 2)

The intertidal and underwater zones marked on Figure 2 in blue were assessed by ADCO Limited in September 2007. Their results are detailed in section 10 of this report.



Plate 3.1. Proposed route along roadway north of Passage West, from northwest



Plate 3.2. C of I church on Church Hill west of Passage West, from southwest



Plate 3.3. View along R610, Monkstown, from south



Plate 3.4. Road within ZAP of CH1 and CH16 in Rathanker, from southeast



Plate 3.5. Route of pipe along road within ZAP of CH3 in Parkgarriff, from northeast



Plate 3.6. Pipe route within ZAP of CH4, in Ballyfouloo, from northeast



Plate 3.7. Pipe route flanked by CH5 along Monstown Creek road, from south



Plate 3.8. Pipeline route in the Carrigaline area, north of CH6, from west



Plate 3.9. CH 6 in Carrigaline, from south



Plate 3.10. Mill race to southeast of CH6, Carrigaline, from west



Plate 3.11. Proposed piping along grass verge, northeast of Carrigaline village centre



Plate 3.12. View southward over 'Dandy bridge' in Kilnagarry



Plate 3.13. Pipeline route within ZAP of CH19, from northeast



Plate 3.14. Pipeline route along roadway within ZAP of CH8, from northeast



Plate 3.15 View of proposed pipeline from Coolmore cross roads at south



Plate 3.16. View from south across N28 near Raffeen Bridge, from south



Plate 3.17. Pipeline route along Carrigaline to Raffeen bridge road to northwest of WWTP, from south



Plate 3.18. Pipeline route to northeast of WWTP site, from east



Plate 3.19. CH9 at northeast extent of WWTP, from west (bank arrowed)



Plate 3.20. Field b, from northeast



Plate 3.21. Field a, from southeast



Plate 3.22. Proposed pipeline route (arrowed) to southeast of WWTP, from northwest



Plate 3.23. General location of CH10 to east of WWTP, from northwest



Plate 3.24. Pipe route along N28, from northwest



Plate 3.25. Pipe route along roadway in Loughbeg, from east



Plate 3.26. WWTP outfall in existing IDA outfall area, within ZAP of CH12, from north



Plate 3.27. CH20 (arrowed) along N20 grass verge, from southeast



Plate 3.28. CH 20, memorial, from northeast



Plate 3.29. CH21, commemorative plaque, from southwest



Plate 3.30. Pipeline along roadway at east side of Cobh, from east



Plate 3.31. Pipeline route north of Cobh town centre, from north



Plate 3.32. Route of pipe along road in Ballyvoloon area, from east



Plate 3.33. Route of pipe west of Clonmel church graveyard wall, from south



Plate 3.34. Green field pipe location at south of White Point area, from east



Plate 3.36. CH2, from east

Plate 3.35. Pipeline route within ZAP of CH2 (location arrowed),
from east



Plate 3.38. View to green field pipe locations from CH18 at west

Plate 3.37. Interior CH18 to south of pipeline route, from west



Plate 3.39. Montage showing pipeline along road from east



Plate 3.40. CH22, in white point Cobh, from northeast



Plate 3.41. Pipeline route along roadway in White Point, from south



Plate 3.42. Proposed location for major pumping station at Monkstown, from east



Plate 3.43. Proposed location for major pumping station at Raffeen/Strawhill, from northwest



Plate 3.44. Detail of proposed location of Raffeen/Strawhill major pumping station, from west (modern fill)



Plate 3.45. Proposed location of major pumping station at West Beach Cobh, viewed from southwest



Plate 3.46. Location of major pumping station at West Beach Cobh, from south



Plate 3.47. View of Spike Island (arrowed) from proposed location of major pumping station at West Beach Cobh, from north



Plate 3.48. View of The Dandy Bridge (CH24), parapets arrowed, from west



Plate 3.49. View of paving beneath bridge, marking fording point, from east

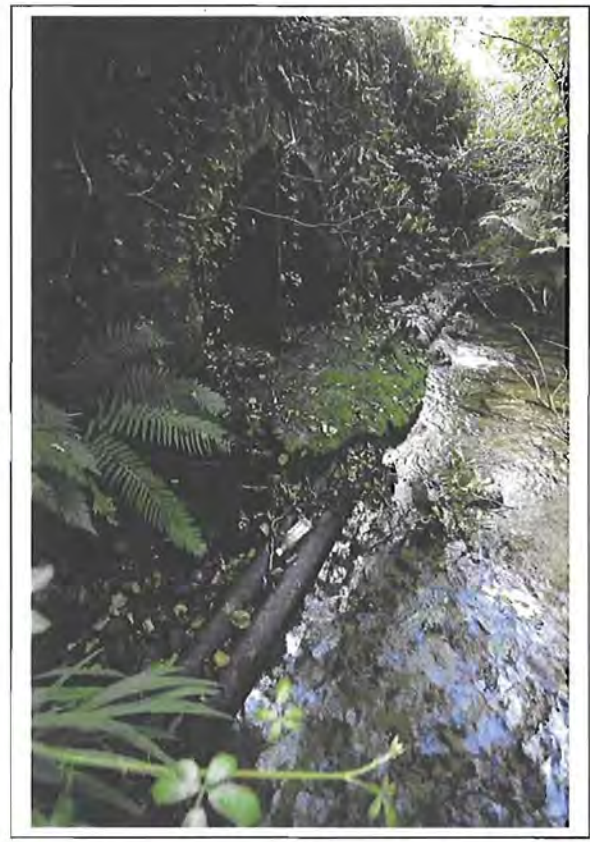


Plate 3.50. View of The Dandy Bridge Arch, modern pipes and concrete, from east



Plate 3.51. Location of proposed outfall at Kilnaglery Bridge, near Carrigaline, CH25 arrowed, from southeast