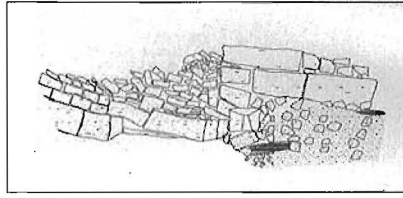


10. Appendix: ADCO Report

The following report details the archaeological assessment of the intertidal/ underwater locations in the study areas at the Owenboy River and the ferry terminal crossing between Passage West and Carrigaloe. Predicted impacts and suggested mitigation is provided.

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**Underwater Archaeological Assessment,
River Lee Estuary, Monkstown, Co Cork**

**Inter-tidal Foreshore Survey,
Owenduff River, Carrigaline, Co. Cork**

Cork Harbour Lower Drainage Scheme

07D0030, 07R0135

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Client: Aegis Archaeology Ltd.

THE ARCHAEOLOGICAL DIVING COMPANY LTD.

**Underwater Archaeological Assessment,
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Owenduff River, Carrigaline, Co. Cork**

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20th October 2007

Project Director
Project Archaeologist

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THE ARCHAEOLOGICAL DIVING COMPANY LTD.

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SUMMARY

The Archaeological Diving Company Ltd. was appointed by Aegis Archaeology Ltd, on behalf of Mott Macdonald Pettit (consulting engineers for Cork County Council), to undertake an underwater and intertidal archaeological survey of two pipeline impact corridors as part of the Environmental Impact Assessment for the proposed Cork Harbour Lower Drainage Scheme: the underwater assessment was undertaken along the works corridor identified for the proposed marine pipeline, crossing between Monkstown and Cobh (River Lee Estuary), and the inter-tidal survey was carried out across the route of the proposed foreshore pipeline at Carrigaline (north side of Owenduff River).

Systematic visual inspection of the sub-tidal seabed and intertidal/ foreshore areas surrounding the proposed impacts did not reveal any material or features of archaeological significance. The work was carried out under licence from the DoEHLG, 07D0030 and 07R0135, on 24th and 25th September 2007. It is recommended that archaeological monitoring of riverbed/ seabed disturbances during construction be undertaken, with the proviso to resolve fully any archaeological material observed at that point. Archaeological Monitoring of the proposed foreshore pipeline is not deemed necessary.

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1.0 INTRODUCTION

The Archaeological Diving Company Ltd (ADCO) was appointed by Aegis archaeology Ltd., on behalf of Mott MacDonald Pettit (consulting engineers for Cork County Council) to undertake a non-disturbance archaeological assessment of two proposed pipeline impact areas as part of the Cork Harbour Lower Drainage Scheme (Figure 1). The assessment was commissioned as part of the Environmental Impact Assessment to be undertaken prior to the drainage scheme commencing. ADCO carried out an underwater dive assessment, including metal-detection survey, across the River Lee at Monkstown (c.390m wide crossing-point) and field-walking of the intertidal section of the proposed pipeline route (c.2.4km long corridor, Owenduff River near Carrigaline).

The archaeological surveys sought to identify and record the location, nature and dimensions of any archaeological features, fabric or artefacts that may be impacted by the proposed development. Assessment was concentrated within the immediate impact areas, although a sizeable buffer zone was incorporated into each assessment; significantly extending the survey area either side of the proposed seabed/ foreshore impacts.

The assessment was carried out on 24th and 25th September 2007 by a team of three maritime archaeologists, under licence from DoEHLG, licences: 07D0030, 07R0135.

The following report addresses the known and potential archaeological environment; assesses the actual and proposed impacts on that environment from the works programme; and makes recommendations to resolve any further archaeological requirements during/ following the works programme.

2.0 PROPOSED DEVELOPMENT¹

It is proposed to construct a new Waste Water Treatment Plant and Sludge Treatment Centre on a greenfield site, located east of Carrigaline, and to expand/ upgrade the existing waste-water drainage network. The proposed development will facilitate storm water run-off and sewage collection from the population centres of

¹ The following relates to project information provided by Mott MacDonald Pettit Ltd. and does not relate to specific engineering details; only an indicative project design has been provided for the purposes of assessing the potential impacts arising from the project.

Carrigaline, Ringaskiddy, Shanbally, Coolmore, Cobh, Monkstown/ Passage West, and Crosshaven.

Archaeological assessment has been undertaken by Aegis Archaeology Ltd. for the site of the proposed treatment plant and all on-shore pipeline corridors. ADCO Ltd. has been contracted to carry out archaeological survey of the works corridor for a 390m long marine pipeline crossing and a c.2.4km long foreshore pipeline (Figure 2).

The marine pipeline will allow sewage to be pumped from Cobh, across the River Lee Estuary, to Monkstown and onto the proposed treatment plant. The pipeline will cross between NGR: 177565EE, 675250N and NGR: 177166E, 673999N, immediately south of the existing route of the Passage West Car Ferry. The foreshore pipeline will run along the northern limit of the upper foreshore of the Owenduff River, between NGR: 175153E, 628423N and NGR: 173395E, 624741N, east of Carrigaline Town.

3.0 THE RECEIVING ENVIRONMENT

For a comprehensive outline of the archaeological and historical background of townlands impacted by the Cork Lower Drainage Scheme the reader is directed to the desktop survey undertaken by Aegis Archaeology Ltd as part of the EIS².

There are no archaeological sites listed in the Record of Monuments and Places for the immediate vicinity of the Marine Pipeline Crossing, the nearest sites lying 900m to the southeast of the proposed impact area; CO087:008: Possible Ringfort, and CO087:009: Graveyard (Figure 3). However, the history of maritime activity within this area is well established; an activity that is further attested to by the number of vessels listed in the Shipwreck Inventory for this stretch of coastline (Appendix 1)³.

The proposed crossing lies within an extremely active stretch of waterway, approximately 800m from the mouth of the River Lee and the greater expanse of Cork Harbour (Plate 1). The east side of the river is occupied by the site of a disused boatyard, currently under development, and a series of boat-moorings are located immediately upstream of the pipeline crossing (Plate 2). The Cobh to Monkstown Car Ferry operates in close proximity to the pipeline crossing; leaving from a slipway

² EIS compiled by Mott McDonald Pettit Ltd. 2007

³ List compiled from the Shipwreck Inventory prepared by the Underwater Archaeological Unit DEHLG. The Inventory provides a listing of inshore wreckings as noted from the middle of the eighteenth century, when systematic recording of such incidents in Irish waters began.

190m upstream of the eastern limit of the pipeline, and arriving at a slipway 60m upstream on the western limit of the pipeline.

The R610 roadway runs along the western side of the river, behind which, a series of detached houses are located. A steep, wooded hill is located behind these residences (Plate 3). The remains of the Royal Victoria Baths are located upon the waterfront, to the east of the roadway. The site is impacted by the pipeline corridor along its northern (upstream) side. The baths consisted of two wings, with an interlinking corridor, and provided separate bathing areas for both male and female patrons. A plunge pool and 150ft swimming area was located on the eastern side of this interlinking corridor, at the river's edge. The southern wing was one storey, while the northern wing was three stories high. The baths were extended in 1858 to include an entertainment area and Turkish bath. The northern wing was destroyed by a fire in 1859 and the baths were extensively refurbished. The baths underwent a decline in popularity during the latter part of the nineteenth-century, and by 1929 they were left in a derelict state. Shortly after the upstanding elements of the structure were demolished, the rubble being used to in-fill the swimming area. The foundations of both the north and south wings are still visible today and rise c.2.5m from the waters edge at Low Water (Plates 4-5).

The Owenaboy River rises in near Adamstown and runs eastwards, passing through Carrigaline to exit at Crosshaven. To the east of Carrigaline town, the river becomes tidal in nature and extensive mudflats flank the river at Low water. The remains of fish-traps, fish-weirs, wooden jetties/ causeways, trackways, and submerged seasonal habitation sites are included among the more frequent archaeological sites/ structures encountered within the intertidal zone. In addition, the possibility remains that mudflat sediments will retain isolated archaeological features, such as log boats (dug-out canoes) or other river/sea craft.

There are no known sites of archaeological or architectural interest located within the immediate vicinity of pipeline route. However, it is important to remember the high recovery potential for portable archaeological artefacts from riverine environments. The National Museum of Ireland's (NMI) topographic files attest to the large amount of archaeological material recovered from Ireland's waterways. No artefacts are listed in the National Museum of Ireland's Topographical Files for Owenaboy River.

The Record of Monuments and Places lists six sites for the townlands surrounding the proposed foreshore pipeline corridor and these are tabulated below (Figure 4):

RMP Number:	National Grid Reference:	Townland:	Site Type:	Distance from Pipeline:
CO087:036-01	17414E, 06259N	Carrigaline Middle	Graveyard	300m north
CO087:036-02	17414E, 06259N	Carrigaline Middle	Church	300m north
CO087:036-03	17414E, 06259N	Carrigaline Middle	Church of Ireland	300m north
CO087:037	17446E, 06275N	Carrigaline East	Castle	200m north
CO099:001	17543E, 06147N	Kilnaglery	Fulacht Fiadh	500m south
CO099:001-02	17542E, 06149N	Kilnaglery	Fulacht Fiadh	500m south

4.0 SURVEY METHODOLOGY

Visual inspection and magnetometry survey by hand-held metal-detection was employed to assess the archaeological potential of the seabed over an area that extended 12m upstream and 50m downstream of the proposed marine pipeline (Figure 5); the upstream survey area was restricted due to the presence of an active ferry service between Cobh and Passage West. Detailed descriptions were made of the seabed topography and bottom composition. Where possible, metal-detected anomalies were inspected and logged. A finds retrieval strategy dealing with conservation issues, cataloguing, and locational recording was in place to deal with any artefacts recovered during the survey. Maximum seabed coverage was obtained using a diver-towed survey methodology.

A very strong current of five-knots+ was noted during both the flood and the ebb-tides. As such, the dive survey was undertaken during the tide-change, at which time the current fell to around two-knots; the interaction between river and sea meant no 'slack-water' period was evident at this site. Due to the diving conditions present it was not possible to undertake a metal-detection survey across the central channel or the eastern side of the river. However, a band of reduced current was noted along the western limit of the survey and a metal-detection survey was undertaken across this area. A maximum water depth of 16.68m was recorded for the central channel. Visibility ranged between 1m-2m, depending on location within the river. Diving operations were carried out to HSA/HSE standard using surface supplied equipment, supported with suitable boat cover and VHF communications to the relevant authorities.

The proposed intertidal/ foreshore locations were field-walked to assess their archaeological potential and a photographic record was made (Figure 6). This was undertaken at Low Water to maximise survey coverage. A metal-detection survey

was undertaken along a 50m stretch of foreshore to provide a sample target-ratio that would be representative of the rest of the foreshore survey area. A hand-held GPS unit was used to log any items of interest encountered as part of the survey.

5.0 ARCHAEOLOGICAL ASSESSMENT

Seabed Topography & Underwater Assessment

The riverbed/ seabed topography at this location is characterized by gently sloping sides that lead to an abrupt 2m+ drop into the central-channel (50° angle). The eastern side of the waterway is composed of silt and mud deposits, measuring between 0.05-0.10m in depth, interspersed with frequent sub-angular stones (size range: 0.05m x 0.10m - 0.20m x 0.30m). A moderately compact silty-clay (approximately 30%/ 70% mix) forms the natural riverbed/ seabed beneath the silt and mud deposits at this location. Frequent modern debris was observed and included miscellaneous metallic objects/ fragments, bottles, cans, etc. This debris scatter most likely represents jetsam from the nearby, upstream, boat moorings and adjacent dockyard.

The central-channel is composed of small sub-rounded stones (average size 0.04 x 0.05m) and a 0.02m deep gravel deposit, overlying a very compact silty-clay bottom (approximately 10%/ 90% mix). This area of riverbed/ seabed is flat, featureless, and free from any debris scatter. It is likely that the strong currents present within this area have shifted any dumped or mobile deposits further downstream to less active seabed areas. The only noticeable feature was a large starfish colony that has taken hold along the western margin of the central-channel area, measuring approximately 40m in width by 80m in length.

The western side of the waterway is defined by a large debris scatter of rough-curt masonry, concrete blocks, iron pipe fragments, and broken roof slates. It is clear that much of this material is associated with the nineteenth-century Royal Victoria Baths, the remains of which are located adjacent to the survey area (Plates 4-5, Figure 5). This debris scatter is interspersed with large sub-angular stones (average size 0.20m x 0.30m) and heavy gravel deposits overlying a silty-clay bottom (approximately 40%/ 60% mix). The current is reduced in this area and a degree of *back-welling* was noted, providing conditions favourable for the deposition of material. In addition, seaweed has begun to take hold, anchored to larger rocks and masonry.

Foreshore Visual Survey and Assessment

A total of 2.4km of upper foreshore and inter-tidal mudflats were inspected as part of the survey, undertaken along the northern side of the Owenduff River. The survey commenced at NGR: 175277E, 628969N, 138m east of the pipeline start-point and terminated at NGR: 1773358E, 624860N, 40m west of the pipeline terminus. Also, the survey extended a minimum of 5m either side of the pipeline corridor (Figures 6-7).

The first 250m stretch of foreshore is characterized by a 3m+ high artificial bank running east-west, parallel to the upper foreshore and the R613 roadway. The upper foreshore is composed of large angular boulders and shale rocks, varying in size from 0.30m x 0.40m – 0.05 x 0.10m. Below this, along the High Water Mark (HWM), a band of seaweed is present (3-4m width), overlying smaller stones and river gravels (Plate 6). A 50m area of gently undulating mudflats, composed of a silty-clay (40%/60% mix), occupies the inter-tidal zone between the HWM and the Low Water Mean (Plate 7).

Approximately 400m along the survey area the upper foreshore changes topography and a 0.20m high lip delineates the High Water Mark. Rough grasses and low-lying vegetation are located behind the HWM and stretch northwards for a distance of c.10m before reaching a recently constructed gabion wall (Plate 8). This wall is associated with a recent housing development and has been placed to minimise the effects of winter flooding on adjacent houses. The foreshore gently slopes towards the inter-tidal zone, the upper reaches (c. 20m width) of which are composed of small angular stones and large gravels with sporadic patches of seaweed (Plates 9-10). The rest of the inter-tidal zone is composed a silty-clay (40%/60% mix) that stretches 30m southwards to the Low Water Mean (LWM). This foreshore topography remains consistent for the next 400m, although the inter-tidal zone increases in width (60m+), and a mixture of rock-armour and a steep sided (earthen) flood-embankments replace the gabion wall along the limits of the upper foreshore (Plates 11-13).

Approximately 800m along the survey area, the banding of small stones, river gravels, and patches of seaweed located along the upper reaches of the inter-tidal zone increase in width to c. 40m (Plates 14-16). A large amount of fibre glass and high density plastic fragments litter this zone, probably associated with an active boatyard located nearby. Three softwood vertical timbers (0.10m x 0.10m) protrude from the mudflats at NGR: 1774476E, 626237N and were most likely represent temporary mooring posts (Plate 15).

The foreshore topography remains largely unchanged for the remainder of the survey area, although the inter-tidal zone between 1000m and 1600m decreases in width to c.20m as the estuary narrows and the central river-channel meanders to the north (Plates 19-27). At NGR: 174329E, 623438N (c.1120m along the survey area) a linear deposit of rocks stretches across the waterway, this appears to be rock-armour protection for a pipeline crossing the river (Plate 21). In addition, a series of concrete pipe-divisions are located along the HWM, running for a distance of approximately 800m, between NGR: 174304E, 623933N and NGR: 173706E, 623612N (Plate 22).

A modern iron anchor is located 16m from the HWM, within the inter-tidal zone at NGR: 174163E, 626237N; approximately 1300m along the survey area (Plate 24). In addition, a partially buried iron-trackway and associated boat-trolley are located nearby at NGR: 174153E, 623661N (centre-point) and NGR: 174154E 623514N respectively (Plates 25-26). The trackway is visible for a length of 12m. A second iron-trackway is located 1520m along the survey area at NGR: 1739171E, 623537N (centre-point). This trackway is fully exposed and runs between the HWM and LWM for a distance of 19m (Plates 28-29). Both these structures are believed to be of late-nineteenth or early twentieth century origin. The remains of a partially constructed, modern, boat jetty are located 20m west of this second trackway. The jetty is constructed of iron tubes resting on a 10m long wall of dry-stone construction. The jetty is located at NGR: 173896E, 623589N (Plate 30).

Residential units line the river between NGR: 173319E, 623493N and NGR: 173659E, 623662N; 1550m - 1750m (Plates 31-34). Large angular rocks (0.05m x 0.10m – 0.30 x 0.40m) run along the upper foreshore providing rock armour protection along this area. A 17m wide deposit of small stones and coarse gravels, with intermittent patches of seaweed, runs along the HWM. The inter-tidal mudflats run southwards for a distance of 70m before reaching the LWM. A small park and river walk delineates the northern side of the river along the final stretch of the survey area (NGR: 173659E, 623662N to NGR: 173319E, 625060N; 1750m- 2400m along the survey area, Plates 35-37).

Underwater Magnetometer Survey

The underwater magnetometer survey, by hand held metal-detection, was limited to the western side of the River Lee, as it was not possible, due to the strong currents, to undertake the survey elsewhere within the river. The metal-detection survey was undertaken across a 60m (north-south) by 40m (east-west) area adjacent to the western bank. An extremely high target-ratio of 1-2 targets every 1m² was observed. The majority of these targets represented surface (ferrous-metal) hits associated with

the mass of building material located adjacent to the Royal Victoria Baths (Figure 5). All of the metal-detection hits identified constituted modern metallic debris such as iron piping, gutter fragments, metal-drum fragments, iron-railing fragments, and miscellaneous concreted iron fragments.

Foreshore Magnetometer Survey

A metal-detection survey was undertaken along a 50m stretch of foreshore to provide a sample target-ratio that would be representative of the rest of the foreshore survey area (Plate 38). The survey was undertaken between NGR: 174410E, 624499N and NGR: 174374E, 624184N. A high target ratio of 1 hit every 1m² was encountered. The majority of these hits were sub-surface. Surface hits included drinks cans, iron nails, a fishing hook, an iron rowlock, and a metal bucket fragment.

Conclusion

The underwater and intertidal assessments were comprehensive and extended beyond the site boundaries as indicated (Figures 5-7).

The compact nature of the riverbed/ seabed, coupled with high water velocities across of the central-channel and the eastern side of the river, provides an extremely poor holding content for archaeological material. A moderate to poor holding content can be ascribed to the western side of the river, where current is reduced and some sediment deposition is taking place. No archaeologically significant materials/ structures were observed during the in-water assessment of the pipeline route. While the presence of masonry and other building material located along the western limit of the underwater survey area is of interest, most likely associated with the nineteenth-century Royal Victoria Baths, it retains an historic rather than archaeological significance. However, whilst no surface archaeological material has been encountered, there always remains the possibility of buried, *in-situ*, archaeology remains.

Likewise, a poor archaeological potential has been observed for the pipeline corridor at Owenduff River. It is evident that extensive modern alteration has taken place with the construction of flood protection measures and the presence of an existing pipeline running along the upper foreshore. This pipeline runs along approximately 70% of the survey area. In contrast, a good archaeological holding content can be ascribed to the inter-tidal mudflats, where the deep build up of silt and clay sediments provide ideal conditions for the preservation of archaeological material. No archaeologically significant material/ structures were observed during the inter-tidal assessment of the pipeline route. Only two structures of note were encountered as part of the survey.

These included the remains of two iron-trackways with associated boat-trolleys. However, while these structures provide a useful insight into the river-use in the early 1900s, they hold no inherent archaeological value.

6.0 PROPOSED IMPACTS⁴

The insertion of the Marine Pipeline between Cobh and Monkstown will result in a direct and significant impact to the existing riverbed/ seabed environment. While no archaeologically significant material/structures/deposits were encountered during the survey, the potential of impacting buried, *in-situ*, archaeological material still remains. In addition, the pipeline will impact the foundations of the northern wing of the Royal Victoria Baths. It is recommended that direct impacts to this structure be avoided, preserving the *in-situ* masonry foundations of the northern wing. It is recommended that the pipeline either be placed outside the site of the Royal Baths, or inserted between the north and south wings; originally the swimming pool area. No *in-situ* remains are believed to remain within this intersection between the north and south wings.

In contrast, the insertion of the pipeline along the upper foreshore of the Owenduff River does not represent a significant impact to the existing foreshore environment. The upper foreshore has already undergone extensive and successive modern alteration with the placement of flood protection measures and a concrete encased pipeline. Should the impact area remain limited to the pipeline corridor identified on the Project Drawings, it is extremely unlikely that any archaeological material/structures/deposits will be impacted during the construction process.

7.0 RECOMMENDATIONS

Pre-construction Measures

No further ameliorative measures are recommended in advance of construction commencing.

Construction Phase Measures

ARCHAEOLOGICAL MONITORING. Archaeological monitoring licensed to the Department of the Environment, Heritage and Local Government is recommended during all riverbed/seabed disturbances associated with insertion of the Marine Pipeline between Cobh and Monkstown, with the proviso for full excavation of any

⁴ No specific engineering details are currently available, only an indicative project design has been provided for the purposes of assessing the potential impacts arising from the project.

archaeologically significant material uncovered at this time. In addition, it is recommended that direct impacts to the site of the Royal Victoria Baths be avoided, preserving the *in-situ* masonry foundations.

No construction phase measures are recommended for the insertion of the upper foreshore pipeline along the northern side of Owenduff River. However, Archaeological Monitoring Archaeological monitoring licensed to the Department of the Environment, Heritage and Local Government is recommended, should any significant impacts to take place along the inter-tidal mudflats.

RETAINING AN ARCHAEOLOGIST/S. An archaeologist should be retained for the duration of the relevant works.

THE TIME SCALE for the construction phase should be made available to the archaeologist, with information on where and when ground disturbances and dredging will take place.

SUFFICIENT NOTICE. It is essential for the developer to give sufficient notice to the archaeologist/s in advance of the construction works commencing. This will allow for prompt arrival on site to monitor the ground disturbances. As often happens, intervals may occur during the construction phase. In this case, it is also necessary to inform the archaeologist/s as to when ground disturbance works will recommence.

DISCOVERY OF ARCHAEOLOGICAL MATERIAL. In the event of archaeological features or material being uncovered during the construction phase, it is crucial that any machine work cease in the immediate area to allow the archaeologist/s to inspect any such material.

ARCHAEOLOGICAL MATERIAL. Once the presence of archaeologically significant material is established, full archaeological recording of such material is recommended. If it is not possible for the construction works to avoid the material, full excavation would be recommended. The extent and duration of excavation would be a matter for discussion between the client and the licensing authorities.

ARCHAEOLOGICAL TEAM. It is recommended that the core of a suitable archaeological team be on standby to deal with any such rescue excavation. This would be complimented in the event of a full excavation.

SECURE SITE OFFICES and facilities should be provided on or near those sites where excavation is required.

FENCING of any such areas would be necessary once discovered and during excavation.

ADEQUATE FUNDS to cover excavation, post-excavation analysis, and any testing or conservation work required should be made available.

MACHINERY TRAFFIC during construction must be restricted as to avoid any of the selected sites and their environs.

SPOIL should not be dumped on any of the selected sites or their environs.

PLEASE NOTE: All of the above recommendations are based on the information supplied for the Cork Harbour Lower Drainage Scheme, Monks town and Carrigaline, Co. Cork. Should any alteration occur, further assessment maybe required.

PLEASE NOTE: Recommendations are subject to the approval of The Department of the Environment, Heritage and Local Government, and of the National Museum of Ireland at the Department of Arts, Tourism, and Sport.

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