UNDERWATER & INTERTIDAL ARCHAEOLOGICAL ASSESSMENT
CABLE LANDFALL LOCATIONS, RIVER SHANNON
CARRWDOTIA SOUTH TD, COUNTY CLARE
KILPADDOGE & CLOONANOONAGH TD, COUNTY KERRY
TARBERT TO MONEYPOINT 220kV SUBMARINE CABLE PROJECT

09D061, 09R155

Client: Mott MacDonald Ireland/ Eirgrid

THE ARCHAEOLOGICAL DIVING COMPANY LTD.
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TARBERT TO MONEYPOINT 220kV
SUBMARINE CABLE PROJECT

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15th September 2009

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THE ARCHAEOLOGICAL DIVING COMPANY LTD.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUMMARY</td>
<td>1</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>2</td>
</tr>
<tr>
<td>LIST OF PLATES</td>
<td>3</td>
</tr>
<tr>
<td>1.0 INTRODUCTION</td>
<td>5</td>
</tr>
<tr>
<td>2.0 PROPOSED DEVELOPMENT</td>
<td>5</td>
</tr>
<tr>
<td>3.0 THE RECEIVING ENVIRONMENT</td>
<td>5</td>
</tr>
<tr>
<td>4.0 SURVEY METHODOLOGY</td>
<td>10</td>
</tr>
<tr>
<td>5.0 ARCHAEOLOGICAL ASSESSMENT</td>
<td>11</td>
</tr>
<tr>
<td>6.0 PROPOSED IMPACTS</td>
<td>14</td>
</tr>
<tr>
<td>7.0 RECOMMENDATIONS</td>
<td>14</td>
</tr>
<tr>
<td>8.0 ACKNOWLEDGEMENTS</td>
<td>16</td>
</tr>
<tr>
<td>FIGURES AND PLATES</td>
<td></td>
</tr>
</tbody>
</table>
SUMMARY

The Archaeological Diving Company Ltd (ADCO) was commissioned by Mott MacDonald Ireland, consulting engineers on behalf of Erigrd, to undertake an archaeological assessment of two cable landfall locations associated with the Tarbert to Moneypoint 220kV submarine cable project. The proposed submarine cable (Route Option 3) will cross the River Shannon Estuary between the townland of Carrowdotia South, County Clare, and the townlands of Kilpaddoge and Coolnanonnagh, County Kerry; NGR: 104278E,151202N and NGR: 104752E,148456N respectively.

The archaeological assessment included the systematic visual inspection of both inter-tidal and sub-tidal elements at each landfall, extending across a minimum of 400m east-west x 150m north-south area at each location. In addition, the assessment included a metal-detection survey of a sample area seabed area at the Tarbert landfall site. A detailed description of foreshore/seabed topography was made, supplemented by photographic record. The work was carried out under licence from the Department of the Environment, Heritage and Local Government (DoEHLG) on 25th and 26th August 2009; licence numbers 09D061, 09R155.

No archaeologically significant material, deposits, or structures were encountered as part of the assessment at either landfall site. Further archaeological work in advance of construction at each landfall is not deemed necessary. However, it is recommended that archaeological monitoring of all foreshore and riverbed disturbances during construction be undertaken, with the proviso to resolve fully any archaeological material observed at that point. Recommendations are subject to the approval of the Department of the Environment Heritage and Local Government.
LIST OF FIGURES

Figure 1: Extract from OS (1:50,000) Discovery Series Map showing proposed Submarine Cable, Route Option 3, and associated landfall locations.

Figure 2: Extract from Project Drawing showing proposed cable, Route Option 3, and associated Landfall locations [Figure adapted from project drawing number: 231538/02E/010-P1 supplied by Mott MacDonald Ireland].

Figure 3: Extract from First Edition OS map (1840-1841) showing location of ADCO Survey Areas at the proposed landfall locations.

Figure 4: Extract from Third Edition OS map (1896-1897) showing location of ADCO Survey Areas at the proposed landfall locations.

Figure 5: Extract from OS 6" RMP Mapping (Clare sheets: 067-068 & Kerry Sheet 003) showing known archaeological sites located within vicinity of the proposed cable landfall sites.

Figure 6: Extract from Project Drawing with ADCO Survey Areas and plate locations superimposed.
LIST OF PLATES

Plate 1: East-facing view of River Shannon Estuary with Moneypoint and Tarbert power stations visible in distance.

Plate 2: Working shot of archaeological diver preparing for dive en route to the Tarbert landfall site.

Plate 3: Working shot of diver entering the water at the Tarbert landfall site; see Figure 6 for plate location.

Plate 4: Example shot of the poor of underwater visibility present within sub-tidal zone, shot taken at Moneypoint landfall site.

Plate 5: West-facing view of inter-tidal foreshore at the Moneypoint landfall site, shot taken from eastern limit of the inter-tidal survey area (scale: 1m vertical/ 2m horizontal); see Figure 6 for plate location.

Plate 6: Example of bedrock forming the cliff-face across the upper foreshore at the Moneypoint landfall site (scale 1m); see Figure 6 for plate location.

Plate 7: Example shot of bladderwack seaweed located across the high water mean at the Moneypoint landfall site (1m scale); see Figure 6 for plate location.

Plate 8: South-facing view of inter-tidal zone at the Moneypoint Cable landfall site (scale: 1m); see Figure 6 for plate location.

Plate 9: Example shot of foreshore composition at the Moneypoint landfall site (scale: 1m); see Figure 6 for plate location.

Plate 10: South-facing view of the upper foreshore and inter-tidal zone, shot taken from eastern limits of the inter-tidal survey area at the Tarbert landfall site (scale: 1m vertical/ 2m horizontal); see Figure 6 for plate location.

Plate 11: South-facing view of low-lying bedrock cliff and overlying boulder-clay/ vegetation that delineates the upper foreshore along the Tarbert side of the estuary (scale: 2m vertical/ 1m horizontal); see Figure 6 for plate location.

Plate 12: Detail shot of boulder clay and rock inclusions (scale: 1m).

Plate 13: South-facing view of the inter-tidal zone at the Tarbert landfall site (scale: 1m horizontal/ 2m vertical); see Figure 6 for plate location.

Plate 14: South-facing detail shot showing foreshore composition and exposed area of shelving bedrock (scale: 1m horizontal/ 2m vertical); see Figure 6 for plate location.
1.0 INTRODUCTION

The Archaeological Diving Company Ltd (ADCO) was commissioned by Mott MacDoland Ireland to undertake the archaeological assessment and interpretation of geophysical data acquired by SM Pelorus Ltd. on behalf of Eirgrid, for the Tarbert to Moneypoint 220kV submarine cable project (Figure 1, Plate 1). The report assessed the archaeological potential that exists within the survey area, based on a review of existing desktop information and an assessment of the marine geophysical data acquired. This report documented a series of marine geophysical anomalies located on the seabed within the preferred Cable Route wayleave (Route Option 3), and highlighted the archaeological potential of the cable landfall sites. The current report addresses the archaeological potential at the two landfall locations associated with Route Option 3.

The archaeological assessment at each landfall 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. The survey was to extend across the full width of the cable route corridor, identified as 200m in width. Systematic visual inspection was undertaken across the inter-tidal and sub-tidal elements at each landfall, extending across a minimum of 400m in width east-west x 150m north-south area at each location.

The archaeological assessment was undertaken by a team of three maritime archaeologists and a dive supervisor on 25th and 26th August 2009 under licence from the Department of the Environment, Heritage and Local Government (DoEHLG); licence numbers 09D061, 09R155. 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.

1 Dr. Niall Brady, Archaeological Interpretation of Geophysical Data, Tarbert to Moneypoint Cable Route, 07R2258, April 2009.
2.0 PROPOSED DEVELOPMENT

The proposed development seeks to lay a 220kV submarine cable across the Shannon Estuary, running between the townland of Carrowdotia South, NGR: 104278E, 151202N, Co. Clare and the townlands of Kilpadoge and Coolnanonnagh, NGR: 104752E, 148456N, Co. Kerry. It is anticipated that four parallel cables are to be laid with 30m spacing. The cable-route is identified as the Route Option 3, which runs in NNW to SSE line, measures 2.8km in length (Figures 1-2). The cable wayleave measures 150m in width, extending c.50m either side of the seabed impact area arising from the insertion of the submarine cable. Marine Geophysical survey conducted for this scheme included bathymetry, side-scan sonar, magnetometry, and sub-bottom profile surveys along 200m-wide corridors for each cable route.3

3.0 THE RECEIVING ENVIRONMENT

The Shannon estuary is the largest inlet located along the Irish coastline and constitutes an exposed inter-tidal zone of around 200km in length (combined length of both sides of the river). The estuary is part of a dynamic landscape that includes raised bogland, freshwater fens, salt marshes and inter-tidal mudflats. Estuarine environments are sensitive to sea-level change and large areas of prehistoric foreshore have been submerged by relatively small fluctuations in that level. The inter-tidal environment provides for an extremely rich archaeological holding content and archaeological / palaeoenvironmental evidence of Mesolithic, Neolithic, Bronze Age and post-medieval date has been recovered from the River Shannon estuary.5 Areas of submerged Neolithic forest have been identified, buried deep within the estuarine clays at both the River Shannon (Meelick Rocks, E52) and the nearby River Fergus (17km northwest of the Shannon estuary).6 Sampling of these

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2 The following relates to project information provided by Mott MacDonald Ireland and does not relate to specific engineering details. An indicative project design was reviewed for the purposes of assessing the potential impacts arising from the project.
3 The marine geophysical survey was conducted by S.M. Pelorus Ltd, and the data interpreted archaeologically by Brady, *Archaeological Interpretation of Geophysical Data, Tarbert to Moneypoint Cable Route*.
4 This section provides a concise treatise of the archaeological environment relating to the landfall sites under assessment. For a comprehensive desktop study of the area, the reader is directed to the previous study undertaken by ADCO as part of the geophysical data interpretation report: Brady, *Archaeological Interpretation of Geophysical Data, Tarbert to Moneypoint Cable Route*, pp. 5-13.
submerged forests is of particular importance to dendrochronological analysis as it increases the regional data-set against which archaeologically recovered wood can be matched.

Large sections of the River Shannon Estuary provide suitable environmental conditions for the preservation of archaeological material within inter-tidal zone; deep deposits of estuarine mud providing an anaerobic environment within which archaeological material is preserved. 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 inter-tidal zone. Exemplar sites include: Bunratty 4, medieval fish-trap; Bunratty 6, medieval basket; Fergus West 1, Bronze Age post-and-wattle structure; Carrigdirty Rock, Bronze Age occupation site. However, the estuarine topography located between the Tarbert and Moneypoint, within the landfall survey areas, does not provide for this form of preservation, the upper foreshore and inter-tidal zones being predominantly composed of shelving bedrock, shingle, and rock deposits.

Recorded structures of historic and archaeological significance located within the vicinity of the proposed cable route are restricted to a nineteenth-century slipway located east of Moneypoint Quarry and two nineteenth-century fish weirs located c.500m west of the cable route on either side of the river. The first, catalogued as Weir 3 in the desktop study previously undertaken by ADCO, is located within the townland Coolnanoonagh, Co. Kerry. The other, catalogued as Weir 5, is located off the townland Carrowdotia South, west of Money point Power Station, Co. Clare. Both sites are marked on the third edition maps ‘Salmon Weirs’.

At a remove from the shoreline, but still within 1km radius of the coastline, are a series of other archaeological sites that provide clear evidence of the early medieval settlement of the townlands located on either side of the estuary. A number of souterrains and a ringfort in Kilpaddoge townland, Co. Kerry, attest to this occupation, a picture that is mirrored on the north side of the estuary with ringforts and associated structures located in the townlands of Carrowdotia North and Carrowdotia South.

**Cartographic Evidence**
Examination of the Ordnance Survey First Edition (1840-1841) and Third Edition (1896-1897) maps of the assessment area depict a foreshore environment and field-boundary system that has remained largely unaltered from the mid to late nineteenth-century (Figures 3-4). Noticeable differences are limited to the expansion of Money Point Quarry, both southward and eastward, and the construction of two opposing
salmon weirs; listed as Weir 3 and Weir 5 in the catalogue of sites prepared for the preceding ADCO report. The First Edition map notes that there is ‘Good Anchorage’ off Glenclodsagh Bay, c. 400m offshore.

Record of Monuments and Places (RMP)\(^7\)

The Record of Monuments & Places (RMP) is a list of archaeological sites known to the National Monuments Service with accompanying RMP Maps, based on OS 6" Sheets, which indicate the location of each recorded site. The RMP list is based on The Sites and Monuments Record files housed in the National Monuments Services offices. The Sites and Monuments Records (SMR) are lists with accompanying maps and files of all known or possible archaeological sites and monuments, predominately pre-1700AD in date, for all counties. These lists were, in many cases, initially based on cartographic, documentary and aerial photographic sources. The SMR (as revised in the light of available fieldwork) form the basis of the statutory RMP. The record is updated on a constant basis and focuses on monuments that predate 1700AD. Buildings belonging to the seventeenth-century and later are not well represented in their archive, although they are considered as archaeological sites today.

Nine RMP sites are located within a 1km radius of the proposed landfall site at Carrowdotia South, five of which are located within the aforementioned townland itself, CL067-041, 042, 043, 050, 051 (Figure 5). These sites represent ringforts or associated souterrain sites. Seven RMP sites are located within a 1km radius of the proposed landfall site at Killpddoge/ Coolnanonnagh, four of which are located within the aforementioned townland itself, KE003-090, 90-01 & 010, 010-01 (Figure 5). These sites also represent ringforts and associated souterrain sites. No RMP sites are located close to the proposed landfall locations, the closest recorded sites being located 454m to the northeast at the Moneypoint landfall and 651m to south-southeast at the Tarbert landfall site.

<table>
<thead>
<tr>
<th>RMP Number</th>
<th>National Grid Reference:</th>
<th>Townland:</th>
<th>Site Type:</th>
<th>Proximity to assessment area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL067-040</td>
<td>103690E,152341N</td>
<td>Carrowdotia North</td>
<td>Ringfort/Rath</td>
<td>980m NW</td>
</tr>
<tr>
<td>CL067-041</td>
<td>103802E,152217N</td>
<td>Carrowdotia South</td>
<td>Ringfort/Rath</td>
<td>873m NW</td>
</tr>
<tr>
<td>CL067-042</td>
<td>103920E,152242N</td>
<td>Carrowdotia South</td>
<td>Ringfort/Rath</td>
<td>907m NW</td>
</tr>
<tr>
<td>CL067-043</td>
<td>104039E,15211N</td>
<td>Carrowdotia South</td>
<td>Ringfort/Rath</td>
<td>804m NNW</td>
</tr>
<tr>
<td>CL067-045</td>
<td>104219E,152348N</td>
<td>Carrowdotia North</td>
<td>Ringfort/Rath</td>
<td>1km N</td>
</tr>
</tbody>
</table>

\(^7\) 07R2258, Dr. Niall Brady, *Archaeological Interpretation of Geophysical Data, Tarbert to Moneypoint Cable Route*, April 2009.

\(^8\) The RMP is maintained by the National Monument Section, Department of Environment, Heritage and Local Government (DoEHLG).
National Inventory of Architectural Heritage

The National Inventory of Architectural Heritage (NIAH) is a county by county database that identifies, records, and evaluates the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid to the protection and conservation of the nation’s built heritage. The NIAH surveys provide the basis for the recommendations of the Minister for the Environment, Heritage and Local Government to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS). There are no entries listed in the NIAH for the townlands under assessment.

Shipwreck Inventory

The Historic Shipwreck Inventory at the Department of the Environment, Heritage and Local Government (DoEHLG) includes a brief list of ten wrecking events in the Shannon estuary close to the survey area (Table xx). The data provides some indication of the pattern of wrecking from c.1750, after which regular records were maintained of such events. The locations of these wrecking incidents are not absolute, and refer to the nearest headland or other known topographic feature. The headlands considered for the assessment include Moneypoint, Money Point, Burrane Point, Clonderalaw Bay, Kilkerin Point, Bolands Rocks and Colman’s Point on the Clare side, and Ballydonohue Point, Tarbert, Carrigaduaun, and Ardmore Point on the Limerick/Kerry side. The Inventory reveals very few wrecking events occurring in relation to these topographic points. There are significantly more events recorded downriver at Scattery Island, and upriver at Foyles. Tarbert is a tricky anchorage and suffers from a strong ebb-tide. This may explain the absence of shipwrecking incidents noted in the Tarbert area. It should be noted that the Inventory does not include the townlands under assessment.

<table>
<thead>
<tr>
<th>Site Code</th>
<th>UTM Easting</th>
<th>UTM Northing</th>
<th>Feature Name</th>
<th>Feature Type</th>
<th>Distance to Cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL067-050</td>
<td>104747E</td>
<td>151701N</td>
<td>Carrowdotia South</td>
<td>Ringfort/Rath</td>
<td>454m NE</td>
</tr>
<tr>
<td>CL067-051</td>
<td>105723E</td>
<td>151515N</td>
<td>Carrowdotia South</td>
<td>Ringfort/Rath</td>
<td>539m NE</td>
</tr>
<tr>
<td>CL067-052</td>
<td>104847E</td>
<td>152391N</td>
<td>Paulinadaree</td>
<td>Ringfort/Rath</td>
<td>1km NE</td>
</tr>
<tr>
<td>CL067-055</td>
<td>105046E</td>
<td>152348N</td>
<td>Paulinadaree</td>
<td>Ringfort/Rath</td>
<td>993m NE</td>
</tr>
<tr>
<td>KE003-007</td>
<td>103746E</td>
<td>148185N</td>
<td>Coolnanoongh</td>
<td>Ringfort</td>
<td>1km WSW</td>
</tr>
<tr>
<td>KE003-008</td>
<td>103647E</td>
<td>147580N</td>
<td>Carhoona Church</td>
<td>Ringfort</td>
<td>1km SW</td>
</tr>
<tr>
<td>KE003-008-01</td>
<td>103647E</td>
<td>147580N</td>
<td>Carhoona Graveyard</td>
<td>Ringfort</td>
<td>1km SW</td>
</tr>
<tr>
<td>KE003-009</td>
<td>105014E</td>
<td>147816N</td>
<td>Kilpadoge</td>
<td>Ringfort/Rath</td>
<td>651m SSE</td>
</tr>
<tr>
<td>KE003-009-01</td>
<td>105014E</td>
<td>147816N</td>
<td>Kilpadoge Souterrain</td>
<td>Ringfort</td>
<td>651m SSE</td>
</tr>
<tr>
<td>KE003-010</td>
<td>105412E</td>
<td>147965N</td>
<td>Kilpadoge</td>
<td>Ringfort/Rath</td>
<td>700m SE</td>
</tr>
<tr>
<td>KE003-010-01</td>
<td>105412E</td>
<td>147965N</td>
<td>Kilpadoge Souterrain</td>
<td>Ringfort</td>
<td>700m SE</td>
</tr>
<tr>
<td>KE003-021</td>
<td>105064E</td>
<td>147487N</td>
<td>Farranwana</td>
<td>Ringfort/Rath</td>
<td>983m SSE</td>
</tr>
</tbody>
</table>

Table 1: List of RMP sites located within 1km radius of the proposed landfall sites.
claim to record shipwrecking instances in any detail before c.1750. It therefore remains possible that earlier wreckings and other sea-related instances occurred but have left no historical record.

<table>
<thead>
<tr>
<th>Vessel Name</th>
<th>Date</th>
<th>Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aid</td>
<td>24/12/1852</td>
<td>Tarbert Road, Shannon</td>
<td>Vessel was stranded in Force 10 wind. Was got off and taken to Limerick.</td>
</tr>
<tr>
<td>Britannia or Liverpool</td>
<td>08/11/1825</td>
<td>Rocks between Tarbert and Glynn</td>
<td>Went onto rocks, spars and rigging saved.</td>
</tr>
<tr>
<td>Diana</td>
<td>06/02/1820</td>
<td>Rock near Tarbert</td>
<td>Vessel lost while en route from London to Limerick.</td>
</tr>
<tr>
<td>Mary of Millford</td>
<td>1875</td>
<td>Boland Rocks, Kilrush</td>
<td>75-tonne schooner, wrecked.</td>
</tr>
<tr>
<td>Osprey</td>
<td>08/09/1851</td>
<td>Between Tarbert and Glynn</td>
<td>Went ashore.</td>
</tr>
<tr>
<td>Topaz</td>
<td>28/12/1900</td>
<td>1 mile below Glin Pier</td>
<td>Wooden Brigantine, 196 tonnes, with cargo of wood. Stranded and total loss.</td>
</tr>
<tr>
<td>Unknown</td>
<td>11/1839</td>
<td>The Beeves, near Tarbert</td>
<td>---</td>
</tr>
<tr>
<td>Unknown</td>
<td>c.20/11/1850</td>
<td>Between Kilrush and Tarbert</td>
<td>Ferry boat operating between Kilrush and Tarbert was caught in a gale and sank.</td>
</tr>
<tr>
<td>Unknown</td>
<td>15/08/1892</td>
<td>Off Tarbert</td>
<td>18-foot rowing vessel, travelling to Kilrush and onward to Kilkee.</td>
</tr>
<tr>
<td>Unknown</td>
<td>8/10/1896</td>
<td>Tarbert Roads</td>
<td>12-tonne iron lighter, moored at Tarbert with a general cargo, founded in SW Force 1 and became a total loss.</td>
</tr>
</tbody>
</table>

Table 2: Instances of shipwrecking within general area based on the DoEHLG. shipwreck Inventory.

Topographic Files
The National Museum of Ireland Topographical Files is the national archive of all known antiquities recorded by the National Museum. These files relate primarily to artefacts but also include references to monuments and also contain a unique archive of records of previous archaeological excavations. The Museum’s files present an accurate catalogue of objects reported to that institution from 1928. There is a computerised database of finds from the 1980s onwards. The find-spots of artefacts
can also be an important indication of the archaeological potential of the related or surrounding area. An examination of the Topographic Files in the National Museum of Ireland indicates that there are no archaeological artefacts reported to the museum from within the survey areas and the adjacent townlands.

**Excavations Bulletin**

The *excavations bulletin* provides a published (yearly) summary of accounts of archaeological excavations undertaken throughout Ireland.\(^9\) Summaries may also be submitted for inter-tidal survey, underwater assessments, and the archaeological monitoring of marine dredging works. The majority of the entries relate to development-led archaeological work. Examination of the published excavations lists indicates that no licensed archaeological work has been reported from the townlands of Moneypoint, Kilpaddoge, Coolnanonnagh, or the section of River Shannon under assessment.

**Unpublished Reports**

Interpretation of the marine geophysical data acquired across the Shannon estuary for the present scheme identified as series of anomalies along the cable route under review, in addition to the two salmon weirs on the opposing shorelines.\(^10\) A total of five anomalies lie within the wayleave identified for the cable route, these include: ss1, ss2, ss4, ss7, ss8, and mg7 (Table 3). These anomalies have been categorized as being of low archaeological potential.

<table>
<thead>
<tr>
<th>Anomaly Number</th>
<th>NGR:</th>
<th>Description</th>
<th>Archaeological Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>ss1</td>
<td>104563E,149314N</td>
<td>Linear scar across gravely seabed; probable dragline</td>
<td>Low</td>
</tr>
<tr>
<td>ss2</td>
<td>104551E,149251N</td>
<td>Isolated small anomaly, well defined and oval in shape; probable debris</td>
<td>Low</td>
</tr>
<tr>
<td>ss7</td>
<td>104444E,150072N</td>
<td>Oblong acoustic shadow in area of ridging set askew to the underlying topography</td>
<td>Low</td>
</tr>
<tr>
<td>ss8</td>
<td>104371E,150351N</td>
<td>Oblong anomaly, possibly with broadly pointed end, barely perceptible among the background gravel.</td>
<td>Low</td>
</tr>
<tr>
<td>mg7</td>
<td>104565E,148671N</td>
<td>---------------</td>
<td>---------------</td>
</tr>
</tbody>
</table>

Table 3: marine geophysical anomalies located within the wayleave of proposed cable route 3.

---

\(^9\) Isabel Bennett (ed.) *Excavations Bulletin: summary Accounts of archaeological excavations in Ireland*, Wordwell Ltd.

Conclusion

The Shannon Estuary provides an archaeologically rich landscape, with evidence of river-use and exploitation from the prehistoric period onward. The cable route corridor across the estuary identifies a series of anomalies that have yet to be inspected. The two cable landfall locations, which are the subject of the present report, is highlighted as areas of nineteenth-century activity, in the form of quarrying along the upper foreshore and the construction of slipways and fish weirs across the inter-tidal zones.

4.0 SURVEY METHODOLOGY

Underwater non-disturbance visual inspection was employed to assess the archaeological potential of the sub-tidal elements of the two landfall locations (Figure 6). The sub-tidal survey area measured 150m north-south x 100m east-west (maximum) at the Moneypoint landfall and 200m north-south x 270m east-west (maximum) at the Tarbert landfall. In addition, a 400m section of inter-tidal foreshore was field-walked on Moneypoint side of the estuary and a 600m section at the Tarbert side.

Diving was conducted from a Fastworker 26 support vessel, using Surface Supplied Diving Equipment (Plates 2-3). Dive assessment was carried out at Low/High water slack to minimise currents affecting the diver. A diver-towed method was employed to systematically cover the seabed areas; the diver being towed in 5m (east-west) search corridors.

Both surveys were undertaken in a systematic manner, and particular attention was paid to recording the existing seabed and foreshore environment; detailed descriptions of seabed/foreshore topography were made and, where possible, a photographic record was taken. A buffer-zone was incorporated into the survey at both landfall locations; extending the in-water survey area by a minimum of 50m either side of the cable wayleave.

A hand-held GPS unit was used to position-fix and map any features/structures/deposits of interest encountered as part of the surveys. A finds retrieval strategy dealing with conservation issues, cataloguing, and locational recording was in place to deal with any artefacts recovered during the dive surveys.

A team of three maritime archaeologists and a certified dive supervisor undertook the underwater surveys. Underwater visibility, ranged between zero and 0.20m,
depending on depth (Plate 4). Diving operations were carried out to HSA/HSE standard using surface supplied equipment, supported with suitable boat cover and VHF communications to the relevant Port Authority. ADCO operates in compliance with the following regulations and approved codes of practice:

- Code of Practice for inland/inshore diving (Safety, Health and Welfare at Work (Diving at Work) regulations 2005).
- Code of Practice for inland/inshore diving (Safety, Health and Welfare at Work (Diving at Work) regulations 2008)_DRAFT.
- Diving at Work Regulations 1997 (UK), ACOP Commercial diving projects inland/inshore.
- Diving at Work Regulations 1997 (UK), ACOP Scientific and archaeological diving projects.

5.0 ARCHAEOLOGICAL ASSESSMENT

Foreshore Topography, Moneypoint landfall site (Figure 6)
The shoreline at this location is delineated by a steep-sided, gorse-covered cliff composed of shelving-bedrock of mudstone composition (Plate 5-6). Evidence of faulting is visible within the cliff-face, which measures between 7-8m in height. A sparse band of bladderwack seaweed (*Fucus vesiculosus*) is located across the high water mark (HWM), towards the base of the cliff-face (Plate 7). Limpets (*Patella vulgata*) were also visible across the HWM.

The inter-tidal zone slopes at a 30° angle and is largely composed of flat mudstone/shale cobbles (50% of foreshore) lying within large, sub-angular mudstone rocks (average size: 0.50m x 0.30m x 0.12m) which comprise c. 30% of the foreshore (Plates 8-9). Angular rocks and pebbles form c. 18% of the foreshore, with smaller clasts forming the remaining c. 2%. Clast size increases towards the low water mark (LWM) reflecting the strong currents and high-energy environment present at this location. Occasional large boulders, measuring up to 1.1m length x 0.70m width x 0.30m depth, are visible along the base of the cliff-face. These boulders represent collapsed bedrock material for the cliff-face. Evidence of fossilized seabed rippling was evident upon the upper face of a number of these erratic boulders.

Seabed Topography, Moneypoint landfall site (Figure 6)
The foreshore gently slopes from the LWM for a distance of c.10m into the channel (south) before sloping at a 70° angle for a distance of c.25m, to reach a depth of 22m. Foreshore composition extends from the LWM to the base of the slope, this area being composed of flat, sub-angular, mudstone rocks, interspersed with angular
rocks and pebbles. Travelling southward across the riverbed, towards the southern limit of the sub-tidal survey area, the mudstone deposits becomes less concentrated and pockets of silty-clay (approx. 70%/30% mix) were encountered across on the seabed. No marine vegetation was noted as part of the underwater survey at this location.

**Foreshore Topography, Tarbert landfall site** (Figure 6)
The upper foreshore is delineated by a low, 0.50 m-1 m high, cliff-face composed shelving bedrock with an overlying deposit of boulder-clay (Plates 10-11). This deposit comprises of a light grey-brown silty-clay (approx. 60%/40% mix) with angular, un-sorted, stone inclusions (size range: 0.06m x 0.04m to 0.40m x 0.30m) and measures between 1m and 2.5m in depth (Plate 12). A 0.5m deposit of poor quality, sandy, soil overlies the boulder-clay. Low-lying vegetation (1m+ in height) covers the top of the cliff and includes: gorse, thistles, nettles, ferns, and mixed-grass species.

The inter-tidal zone slopes at approximately a 20º angle toward the LWM and is composed of poorly-sorted, angular to sub-rounded, mudstone/shale rocks and boulders (60%), interspersed with rounded pebbles (30%) and coarse gravel deposits (10%). These deposits overlie shelving bedrock that is exposed in several sections and extends from the HWM to the sub-tidal zone (Plate 13-14). Periwinkle (Vinca minor) and limpets (Patella vulgata) are located across the lower foreshore and frequent fragments of oyster shells (native Irish species) were also encountered.

**Seabed Topography, Tarbert landfall site** (Figure 6)
The seabed gently slopes northward toward the central-estuary channel. The first c.20m of the sub-tidal zone is of similar composition to that of the inter-tidal zone, after which it is replaced by sandy-silt seabed (approx. 30%/70% mix), interspersed with angular rocks (>0.30m x 0.40m) and patches of green and brown seaweed. This composition remains much the same until c.100m from the LWM, the only noticeable difference being increases in the sand content across the northern half of this seabed area. a seabed penetration of 0.05m was recorded for this area.

The seabed between 100m and 200m from the LWM is composed of a deposit of grey marl (0.08m penetration) with frequent native oyster, periwinkle, and mussel shell inclusions. A layer of course-sand and angular gravels with frequent crushed shell fragments and small stones overlies the marl deposit. A depth of 8m was recorded at the 150m mark from the LWM. The riverbed at the 200m mark is composed of a thick marl measuring 0.30m+ in depth with 0.05m hand-penetration.
Angular to sub-angular rocks (size range: 0.25m length x 0.25m width - 0.40m length x 0.30m width) were intermittently (approximately 1 every 2m²) encountered protruding from this marl deposit. A water-column depth of 14m was recorded for this area of seabed.

**Visual Survey and Assessment**

No archaeologically significant material, deposits, or structures were encountered as part of the assessment of the upper foreshore and inter-tidal zone at either landfall location. Likewise, no archaeologically significant material, deposits, or structures were encountered as part of the sub-tidal assessment. The sub-tidal element of Moneypoint landfall is located within a high-energy estuarine environment. The seabed at this location is composed of sub-angular, mudstone rocks, interspersed with angular rocks and pebbles, and provides a very poor holding-content for archaeological material. This coupled with the presence of strong currents and tidal erosion has meant a low archaeological potential has be ascribed to this seabed area. In contrast, the clay deposits located within the sub-tidal zone at the Tarbert landfall provide a medium to good holding-content; one that increases towards the northern limits of the underwater survey area. In addition, the gently sloping topography and decreased current at this location would assist in the preservation of any *in-situ* archaeological material at this location. A medium-good archaeological potential has been ascribed to the sub-tidal zone at the Tarbert landfall site.

**Magnetometer Survey**

A magnetometer survey, by hand held metal-detection, was across a sample 50m x 20m area of riverbed at the Tarbert landfall survey area, as indicated in Figure 6. It was deemed impractical, due to the lack of visibility and strong currents to undertake an underwater survey the Moneypoint landfall site. A low target-ratio of approximately 1 target every 4m² was observed. The majority of these targets represented buried (ferrous-metal) hits. Surface targets constituted modern metallic debris such as iron piping, metal-drum fragments, iron-railing fragments, and miscellaneous concreted iron fragments. No archaeological material was encountered as part of the metal-detection survey.

**Conclusion**

A systematic underwater archaeological survey was undertaken at both landfall locations associated with the proposed submarine cable, Route Option 3. The survey included the inter-tidal and sub-tidal zones and extended a minimum of 100m into the estuary channel from the LWM. No archaeologically significant material, deposits, or structures were encountered as part of the assessment at either landfall site. The archaeological potential at the Moneypoint landfall site is considered low, while a
greater potential can be ascribed to the seabed area surrounding the Tarbert landfall site.

6.0 PROPOSED IMPACTS

Information to be supplied by Mott MacDonald regarding method of construction and nature of seabed impact, etc.

7.0 RECOMMENDATIONS

Pre-construction Measures
No further ameliorative measures with respect to the two landfall locations are recommended in advance of construction commencing.

ARCHAEOLOGICAL DIVE INSPECTION, OR OTHER MEANS OF VISUAL INSPECTION is recommended to assess further the series of xx anomalies identified within the cable route corridor that crosses the estuary to meet these two landfall locations, in those instances where it is not possible to redirect the cable route around observed anomalies. The dive/other visual inspections would seek to clarify further the nature and extent of the anomaly from an archaeological perspective. Such work is conducted under license from the Department of the Environment, Heritage and Local Government, and would be conducted in advance of any cable-laying. A suitable lead-in time must be allowed in any schedule to acquire the license, conduct the inspection work, and report the results to the DoEHLG and to the National Museum of Ireland. It is recommended that this period of time be not less than three months. Consideration should be given

Construction Phase Measures
ARCHAEOLOGICAL MONITORING. Archaeological monitoring is recommended during any seabed/ foreshore disturbances associated with the insertion of the submarine cable. This archaeological monitoring should be carried out by a suitably qualified archaeologist with previous experience of the monitoring of development projects undertaken within a marine context. This monitoring is to be overseen by the

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11 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.
12 This section relates specifically to the sub-tidal and inter-tidal areas of the proposed cable-lay and does not comment on any anticipated impacts to the seabed within the central channel area.
Department of the Environment, Heritage and Local Government and is to follow an approved methodology.

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 Tarbert to Moneypoint, 220kV Submarine Cable Project, Coolnanoonagh/ Kilpaddoge townlands, Co. Kerry and Carrowdotia South, Co. Clare. 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.

8.0 ACKNOWLEDGEMENTS

Thanks are extended to Tom Keane, Donna Hasset, and Slawomir Horodecki at Mott MacDonald Ireland Ltd. Thanks are also extended to Flan Gibson who provided boat support for the underwater survey. The survey team included Rex Bangerter (Project Maritime Archaeologist), Jimmy Lenehan (Maritime Archaeologist), Dr. Edward Pollard (Maritime Archaeologist) and Brian McAllister (Dive Supervisor). The report was written by Rex Bangerter and edited by Dr. Niall Brady, Project Manager.
Figure 4 - OS Third Edition map (1896-1897) showing approximate location of ADCO Survey Areas at the proposed landfall locations.
Plate 1: East-facing view of River Shannon Estuary with Moneypoint and Tarbert power stations visible in distance.

Plate 2: Working shot of archaeological diver preparing for dive en route to the Tarbert landfall site.
Plate 3: Working shot of diver entering the water at the Tarbert landfall site; see Figure 6 for plate location.

Plate 4: Example shot of the poor of underwater visibility present within sub-tidal zone, shot taken at Moneypoint landfall site.
Plate 5: West-facing view of inter-tidal foreshore at the Moneypoint landfall site, shot taken from eastern limit of the inter-tidal survey area (scale: 1m vertical/ 2m horizontal); see Figure 6 for plate location.

Plate 6: Example of bedrock forming the cliff-face across the upper foreshore at the Moneypoint landfall site (scale 1m); see Figure 6 for plate location.
Plate 7: Example shot of bladderwack seaweed located across the high water mean at the Moneypoint landfall site (1m scale); see Figure 6 for plate location.

Plate 8: South-facing view of inter-tidal zone at the Moneypoint Cable landfall site (scale: 1m); see Figure 6 for plate location.
Plate 9: Example shot of foreshore composition at the Moneypoint landfall site (scale: 1m); see Figure 6 for plate location.

Plate 10: South-facing view of the upper foreshore and inter-tidal zone, shot taken from eastern limits of the inter-tidal survey area at the Tarbert landfall site (scale: 1m vertical/ 2m horizontal); see Figure 6 for plate location.
Plate 11: South-facing view of low-lying bedrock cliff and overlying boulder-clay/vegetation that delineates the upper foreshore along the Tarbert side of the estuary (scale: 2m vertical/1m horizontal); see Figure 6 for plate location.

Plate 12: Detail shot of boulder clay and rock inclusions (scale: 1m).
Plate 13: South-facing view of the inter-tidal zone at the Tarbert landfall site (scale: 1m horizontal/ 2m vertical); see Figure 6 for plate location.

Plate 14: South-facing detail shot showing foreshore composition and exposed area of shelving bedrock (scale: 1m horizontal/ 2m vertical); see Figure 6 for plate location.
Recording prehistoric logboat at Gormanston, Co. Louth GAS 2025 Irish Sea Interconnector

Underwater elevation of bridge pier collapsed in 1763. River Nore Flood Alleviation Scheme

Iron cannon on site of 17th-century timber wreck discovered during dredging programme, Waterford Harbour