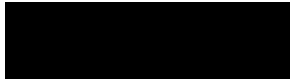


PROJECT

Underwater Archaeological Impact Assessment of dredging works at Ballycotton, Co. Cork.

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1. Introduction

1.1 General

Mizen Archaeology was contracted by Cork County Council to undertake an underwater archaeological impact assessment (UAIA) as part of Ballycotton dredging project, Ballycotton, Co. Cork. The assessment included a geophysical survey. It was planned to dive truth any identified anomalies of potential archaeological significance, however none such were identified in the survey results.

2. Receiving environment

2.1 Location

Situated on the south coast of Co. Cork, Ballycotton Bay is an east-facing inlet, stretching from Ballycotton Island to Knockadoon Head. A small island lies between Ballycotton Island and the mainland. On the SW approach to Ballycotton Bay lie the Smiths and Wheat Rocks which have posed a significant hazard to shipping in the past. Several streams issue into the bay. The foreshore includes areas of sand/shingle, and exposed bedrock.

The harbour and village of Ballycotton are situated at the southern limits of the bay. The harbour is sheltered from the north and northwest by a breakwater while a pier provides protection from the east.

Ballycotton's coastline experiences severe erosion and sections of the cliff face are reinforced with stone and concrete.



Figure 1 Site location map.

3. Scope of works

Cork County Council propose to dredge the area outlined in navy (Figure 1 below) to bedrock level or -3.5m Chart Datum. A geophysical survey formed a component of the underwater archaeological assessment (UAIA). It was planned to dive truth geophysical anomalies of potential archaeological significance, but none were identified from the survey results.



Figure 2 Scope of works in dark blue.

4. Methodology

A range of methodologies were utilised to assess the potential impacts of the works on the cultural heritage, including; a desktop study, geophysical and dive truthing.

4.1 Desktop study

- The Record of Monuments and Places (RMP) compiled by the Archaeological Survey of Ireland comprises lists, classifications of monuments and maps of all recorded monuments with known locations and zones of archaeological significance. The monument records are accessible online from the National Monuments Section (NMS) of the Department of Arts,

Heritage and Gaeltacht (DAHG) at www.archaeology.ie. These were used to establish the wider archaeological context of the site.

- *OSI: Ordnance Survey* Ireland historic and contemporary maps were examined to measure the changing landscape of the riverbank and the development of the village.
- The Excavations Bulletin online database (www.excavations.ie) which contains summaries of all archaeological excavations in Ireland, was consulted to review archaeological investigations done previously in the area.
- Wreck Inventory of Ireland Database (WIID) and Wreck Viewer: The information contained within the inventory was gathered from a broad range of cartographic, archaeological and documentary sources, and each entry in the Inventory gives information on the ship's name, type of vessel, port of origin, owner's name, cargo, date of loss and other relevant information where available. The Record of Piers and Harbours is a draft unpublished document compiled by the DAHG. It draws on various historical sources dealing with historical piers and harbour development in Ireland.
- Cartography: Several historic maps and charts were examined (see references below for a full list).
- Aerial Photography: A variety of low and high-altitude aerial photography was examined (see references below for full list).
- Documentary sources: Several sources were examined. For a full list of all sources examined see Bibliography below.

4.2 Geophysical survey

The geophysical survey of Ballycotton Harbour was undertaken by *Priority Geotechnical Ltd.* in November 2020 with due regard to the unpublished guidelines for the undertaking of maritime geophysics provided by the Underwater Archaeology Unit (UAU) of the Department of Culture, Heritage and the Gaeltacht.

Hemisphere VS330 was used to collect positional information throughout the survey, which was corrected using Trimble VRS now RTK correction stream.

Side scan sonar survey was undertaken to provide high resolution imagery of the survey area. Imaging was obtained using an Edgetech 4125, dual frequency 400/900kHz sonar. The higher 900kHz channel was used throughout the survey to provide the highest image resolution. The towfish was run off the starboard rear side of the survey vessel.

A Geometrics G882 magnetometer was used for the magnetometer survey. This is a cesium vapour magnetometer. This was also towed with the towfish from the starboard rear side of the survey vessel. The speed of the boat was maintained below 3.0-3.5kts during the survey to reduce any effects of wake on the towfish.

A large number of moorings and vessels were present within the survey area. Lines were run where accessible and where the vessel could safely tow the required equipment.

4.3 Dive truthing

The geophysical survey did not identify any anomalies of potential archaeological significance that would have required dive truthing.

4.4 Consultation

As part of the preparation of this report, consultation took place with the Underwater Archaeology Unit (UAU) of the Department of Housing, Local Government and Heritage.

5. Results

5.1 Historical and archaeological background

Ballycotton's development from earliest times has always had a strong association with maritime activity ranging from the abundant raw materials that the first settlers used to trade and seafaring in later times. It is no surprise then, that the known monuments and protected structures primarily are intertwined with the coastal location of the village.



Figure 3 Extract from National Monuments Services website showing the distribution of recorded monuments (red) and protected structures (blue) in Ballycotton Harbour vicinity.

5.1.1 Prehistoric Period

Seasonal occupation of the coastal zone of Ballycotton Bay is evidenced by the presence of a lithic scatter in the townland of Garryvoe Lower. The assemblage consisted of a small collection of flint, including a leaf-shaped arrowhead found in a ploughed field. Approximately 1km to the north of this site a *fulacht fiadh* (CO089-076) is recorded in the townland of Ballycrenane. It was discovered in a marshy area close to Garryvoe beach and levelled in the late 1960s. A butt-trimmed leaf-shaped flint flake, typical of the Mesolithic Period was also found in association with the burnt material.

Ballycotton is notably rich in discoveries of prehistoric gold dating from the Middle to late Bronze Age (c. 1600–600 BC). Examples include two gold bracelets, a gorget, a dress fastener, two gold bracelets, from Ballycotton showing the presence of an elite and powerful group of people in the area (McCarthy 2017)

Six coastal promontory forts are located on low cliffs overlooking Ballycotton Bay; Knockadoon (CO078-033), Capel Island (CO078-039), Glenawilling (CO078-041), Knockadoon (CO078-0420), Ballycotton (CO089-085) and Ballycotton Small Island (CO089-086). Coastal promontory forts are located on headlands above steep cliffs. They are generally connected to the mainland by a narrow neck of land and bounded on the other sides by steep cliff faces. On the mainland side, fortifications of earthen banks, ditches or stone walls run across the narrow neck of the headland. The headlands enclosed by these fortifications vary considerably in size, from relatively small spurs or long narrow necks of lands to substantial areas of 30 or more hectares. The construction date for this monument type is generally assigned to the Iron Age, and many were refashioned and reused in later times. They may have been built for defensive purposes or for prestige/ceremonial use (Downey and Sullivan, 2004).

5.1.2 Historic Period

Ringforts are one of the most common monuments in Co. Cork and there are numerous examples of such sites occurring within a kilometre of Ballycotton Bay including three in the townland of Ballycotton (CO089-039, CO089-070, and CO089-040). They were most likely occupied by extended and dispersed family units and were probably largely self-sufficient. The interior would have contained features such as domestic dwellings, outhouses, animal pens, food processing structures, craft areas, hearths and souterrains. A mixed economy would have been practised which would have involved cereal growing and animal husbandry, in particular, dairying.

Of particular interest to this period is the recovery of a 9th Century Carolingian Brooch found in 1875 'in a bog at, or near, Ballycottin, Co. Cork'. The BM catalogue identifies it as a "gilt copper alloy cross brooch: equal-armed; cast, chip-carved, Anglo-Carolingian style animal in profile in each arm; silver domed-head pseudo-rivet in a lobe at the inner and outer corners of each arm"; Length: 4.4 centimetres, Length: 12 millimetres (setting), Width: 11 millimetres (setting). Overall, its decoration seems to be of 8th–9th century Tassilo style. But what is most intriguing, is what is contained within the central setting, 'a flat, oval black glass setting inscribed with two lines of early Arabic script': sha[ʿa] [a]llah' or 'bismillah' or 'tubna lillah', which has been translated to 'As God wills', 'In the name of 'Allah' or 'We have repented to God'. The item is now in the British Museum collections (British Museum 2018).

Ballycotton is mentioned in the 1364 Pipe Roll of Cloyne '*Rotulus Pipae Clonensis*', a medieval manuscript which provides an account of all the manors and estates of the Bishop of Cloyne. The name of the settlement given in the document was *Balycottyn* but other spellings included *Balycotekyn* (1260), and *Balycocekyn* (1275-76) (MacCotter and Nicholls 1996). The document lists ten men as holding cottages in the town in 1364, and notes that all ten are fishermen who fish for ling, cod, and haddock (MacCotter & Nicholla 1996, 18).

The Down Survey of 1656–8 records that the townland of *Ballycottine*, comprising 228 acres of profitable land, was in the ownership of James Gough in 1641 (Fig. 4 and 5). Following the Uprising, his lands were confiscated and by 1670 Ballycotton was granted to the Bishop of Cloynes (<http://downsurvey.tcd.ie/historical-gis.html>).



Figure 4 Down Survey map of County of Corke (Hibernia Delineatio, 1675).



Figure 5 Excerpt of Down Survey of Imokilly Barony, Cloyne Parish, Ballycotton (1786 Daniel O'Brien copy).

The settlement appears to continue as a small fishing village without formal landing infrastructure into the 19th Century.

In 1750, Smith described Ballycotton Strand as being *'four miles long, smooth and level and very agreeable to take the air on'* (Smith 1815, 130). He mentions that several species which were fished in the bay including flat fish, lobster and trout (*ibid*).

The Commissioners of Inquiry into The State of the Irish Fisheries noted in 1821 that Ballycotton Bay was remarkable for its clean ground, and that if a small pier was constructed local fishermen could pursue their industry through winter.

In 1837 Samuel Lewis described Ballycotton as *'a village and ploughland in the parish of Cloyne, ..containing 856 inhabitants.... and consists of a scattered village comprising about 150 small houses. It is much frequented in the summer for sea bathing'*.

The 1st edition Ordnance Map of Ballycotton published in 1841, illustrates the village of Ballycotton containing approximately one hundred buildings. C. 700m to the southeast of the village, at the tip of the headland is a small group of buildings including the coastguard station (Fig. 6). No harbour infrastructure is denoted on the map. Griffith Valuation of Ballycotton in 1853 shows most the lands in that area still in the ownership of the Bishop of Cloyne.



Figure 6 1st edition Ordnance Survey map of Ballycotton (1842).

According to Antony Marmion there was a dire need for the construction of a harbour;

'In Ballycotton Bay there is capital anchorage, and in the passage from Cork to Dublin there is not so safe a refuge in a gale of wind. A harbour should be constructed here which would not cost more than about £15,000, and for the trifling sum accommodation would be affording to 400 ships of the largest size. The want of such a harbour has been productive of the loss of life and property to an enormous extent (Marmion, 1855, 546).'

Following decades of petitions and from merchants of Youghal and Cork, shipowners, masters, Cork Harbour Board, and the Admiralty a lighthouse on Ballycotton Island in 1851. In particular, the wrecking of the infamous paddle steamship *Sirius* on 16 January 1847 had been the impetus for prioritising this project.

A Report from the Board of Public Works for 1852-53 notes that Ballycotton had *'a substantial stone pier, extending into six feet water at low-water springs, and affording, in a very exposed place, excellent wharfage, sheltered from all winds except those blowing over the land, which, however, in this direction is bluff, and affords considerable protection.'*

A RNLI Station was established in Ballycotton in 1858 at a cost of £83. Its first lifeboat was a small rowing boat having a crew of eight and pulling six oars which was kept on a carriage and in a small boat house (<https://rnli.org/ballycotton-lifeboat-station/station-history-ballycotton>).

The Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1880 stated that *'The harbour as it exists is little better than a trap, for when gales set in from the south-east if the boats were not removed at once they would inevitably be destroyed.'* The pier refurbishment and a new breakwater was begun in 1884 and completed in 1887 at a cost of £20,500 (Inspectors of Irish Fisheries 1881; Inspectors of Irish Fisheries 1885, 12; Inspectors of Irish Fisheries 1888, 16).

The 2nd edition Ordnance Survey (1897) illustrates Ballycotton Harbour with a pier, breakwater, lifeboat station and slip, another boathouse and slip. The slipway has since been refurbished with new layers of concrete poured on top, but the slip from the 19th century remains as the base. This late 19th century map largely corresponds to the harbour as it remains today (Figure 7).



Figure 7 2nd edition Ordnance Survey map (1897) showing structures of Ballycotton Harbour.

Refurbishments to the harbour structures were undertaken throughout the 20th Century. Records indicate that the pier was repaired between 1903 and 1910. Many proposals for extensions, maintenance, and public toilets were submitted in the 1950s, 1960s, and 1970s but stagnated while awaiting surveys and further investigation. Storm damage during 1990, cause severe splitting of the pier structure. A £3 million grant was awarded in 1993 to construct the concrete and steel extension.

In July 2004 an undersea mains electricity cable was laid by ESB from the pier to Ballycotton Island in order to power three generators for the Ballycotton Island lighthouse (Commissioners of Irish Lights). The most recent development in the harbour is the addition of a floating pontoon to the pier in 2012.

5.1.2 Ballycotton Pier

The pier was surveyed by *Mizen Archaeology* in 2018 as part of the Ballycotton Sewerage Scheme (O'Donoghue and Madden, 18D0097 and 18R0142). The following is an extract from the above report.

The pier has undergone several phases of refurbishment, but its overall footprint remains largely consistent with the structure shown on the 6-inch Ordnance Survey map of 1897. It extends from the

land in an NNE direction for c. 103m and then turns in an NNW direction. It measures c. 164m in overall length, 12.5m in width at the southern end and 13.5m at the northern end.

The northern half of the pier comprises reinforced concrete and steel piles, constructed following severe damage to the structure in the early 1990's.

The southern half of the pier retains its historic fabric. It is generally constructed of well selected coursed rubble sandstone that vary in size from 0.20m by 0.40m to 0.30m and 0.90m on the western elevation and from 0.3m by 0.4m to 0.2m by 0.6m on the eastern elevation. It is nicely finished or edged at the top by squared and dressed linear blocks. The masonry was originally bonded with mortar that is visible in places while more recent pointing is also visible.

A 1m wide band of stone paving is exposed along the western edge of the pier deck. These stones measure on average 0.7m by 1.10m in width. Elsewhere the original decking is concealed or replaced with a concrete deck.

A flight of seventeen steps provides access from the pier to the foreshore on the western elevation. The steps comprise sixteen sandstone blocks and a larger basal flagstone. The blocks measure on average 1m in width and c.0.23m in height.

The parapet wall is constructed of random rubble with the stones varying in size from 0.1m by 0.1m to 0.3 by 0.5m and bonded with a coarse lime mortar. It measures 1.3m in height and is capped with concrete.

Two temporary storage structures and two permanent structures (public toilets and a pump house) are located at the southern end of the pier. An emergency storm overflow outfall is located on the east elevation of the pier. The pier is equipped with electric lighting and a water tap. Two types of mooring bollards are in use on the pier; metal mushroom-top bollards (40 cm in height and 20cm in diameter) and squared conical concrete bollards (c. 1m in height).

The pier is not a recorded archaeological monument, though it is included in the National Inventory of Architectural Heritage (Reg. No. 20824038).

5.2 Shipwrecks

The Wreck Inventory of Ireland Database (WIID) records 157 wrecking events within Ballycotton Bay.

A list of wrecking events associated with Ballycotton Bay can be found in Appendix 1. Most of these wreck list the location of the wrecking event as "Ballycotton" in general, which could put them in the harbour, in the bay, or in the nearby area. However, two wrecking events are recorded within the

harbour itself. The first is a fishing boat No. 53 (W17622), wrecked in Ballycotton Harbour in May 1887. The second is the schooner *Spring* (W13706), which was wrecked at the entrance to Ballycotton.



5.3 Geophysics

The geophysics report produced by *Priority Geotechnical Ltd.* gives full detail of the geophysics results, which will be summarized here as they pertain to the underwater archaeological assessment. The side scan sonar results are shown in a mosaic drawing (Appendix 9.4). Nine targets were identified from the survey, names BAL01 to BAL09. The majority of the targets are taken as detritus, and mooring related blocks, lines and chains present within the harbour. Areas of gravel were identified on the inshore area of the harbour and around the harbour entrance.

Upon review of the resulting mosaic, no anomalies with potential archaeological significance were identified. However, due to the resolution of the received data, some potential archaeological material may have been overlooked.

The magnetometer results were heavily influenced by the sheet piling on the western pier structure, which caused a large decrease in the magnetic intensity (leeside). Due to this constraint, it is possible that potential archaeological material was not detected in the survey.

6. Impacts

There is archaeological evidence of human activity in the vicinity of Ballycotton Bay from the prehistoric period through to modern times. The town of Ballycotton itself is referenced in

documentary sources from as early as the 14th century AD, with particular reference to fishing activity at that time. Maritime activity continued to be central to Ballycotton, although it would not receive a harbour structure until the 19th century. The Wreck Inventory shows numerous wrecking events in Ballycotton, including two specifically within the harbour. As a result of this intense history of occupation and maritime activity, there is a high potential for archaeological material to be preserved within the seabed material within the dredging area.

The proposed dredging within the harbour will bring it down to bedrock level or to -3.5m Chart Datum within the area outlined in the scope of works. This will have a significant impact on the seabed and, as such, has a high potential to negatively impact on archaeological material buried in the seabed.

7. Mitigation

It is recommended that dredging works are archaeologically monitored by a suitably qualified underwater archaeologist under licence from the National Monuments Service.

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Database of Archaeological Excavations www.excavations.ie

Down Survey of Ireland www.downsurvey.tcd.ie/

National Monuments Service online database www.archaeology.ie

Ordnance Survey of Ireland online historic mapping www.osi.ie

RNLI-Ballycotton Station www.rnli.org

9. Appendices

9.1 Shipwreck inventory

ID	VESSEL NAME	VESSEL TYPE	DATE OF LOSS	LOCATION	SOURCE
W05141	Richard de Larrinaga (SS)	Steamship	1919	Ballycotton Island, 15 miles SE	UKHO Wreck Data, www.uboaat.net
W05382	Aylevarroo (SS)	Steamship	07/10/2917	Ballycotton Island	BMS 1914-18,155; BVLS 1914-18,69; Larn & Larn 2002 LR 1917-18 No 1802(A); LCWLR 1914-18,306; SIC Vol. 1,219; Hocking 1989, 65; Lloyd's List, No. 32,265, Thur. 22nd Nov. 1917, 5 c.1."
W05420	Gracia (SS)	Steamship	11/03/1917	Ballycotton, Co Cork, offshore	ANCL 1914-18,109; Larn & Larn 2002 LCWLR.1914-18,102: LR 1915-16 No. 704(G).
W05449	Mai	Barque	07/01/1874	Ballycotton Bay, Co Cork, Capel Island	Larn & Larn 2002 Lloyd's List No 18,632: 08.01.1874(Thu)(R),4 Col 17.
W05508	Sunbeam	Dandy	19/08/1884	Ballycotton, Co Cork, 3 miles E	Lloyd's List No. 14,665, Wednesday 20th August 1884; Larn & Larn 2002 e BOT Wk Rtn 1884 Appx C Table 1,99(375); PP 1887, LXXIV, 99
W05730	Inniscarra (SS)	Steamship	12/05/1918	Ballycotton, Co Cork, lightship, 13 miles SE from	
W07863	Abbett	Schooner	12/03/1841	Ballycotton, Co Cork, off	PP 1843, Vol. IX, Appendix 3 'A Return of all Vessels', 18; Lloyd's List 8, 431, Wednesday 17th March 1841.
W07889	Alexandra/Alexander	Unknown	10/11/1861	Ballycotton, Co Cork, 25 miles off	Lloyd's List, No. 14, 853, Tuesday 12th November 1861; Lloyd's List, No. 14, 855, Thursday 14th November 1861; Register of Examinations on oath concerning wrecks & casualties on the coasts of the U.K....by the Receiver of Wreck for the district of Baltimore, 1854 - 1869, HMSO, London, 1869, 40.
W07924	Anne	Unknown	28/04/1849	Ballycotton, Co Cork	Bourke 1994, 95

W07926	Anne	Brig	24/12/1870	Ballycotton, CO cork, 7 miles S	PP 1871, Vol. LXI, ëWrecks, casualties & collisionsí, 41, 53
W07941	Argo	Smack	21/07/1886	Ballycotton, Co Cork	Troy, Fr. B., Vol. II, 38
W08017	Britannia	UNKNOWN	22/12/1825	Ballycotton, Co Cork	Bourke 1998, 105.
W08086	City of Bristol (SS)	Steamship	1829-1840	Ballycotton, Co Cork	Troy, Vol. I, 20
W08095	Clementson	Brig	27/11/1838	Ballycotton, Co Cork, E of	Bourke 1994, 100; Lloydís List, No. 7719, Sat. Dec. 1, 1838; Troy, Vol. I, 20; Freeman's Journal, Dublin, Saturday, December 1, 1838, Vol. LXXIII, 4, c4
W08112	Cooleen	Barque	08/01/1894	Ballycotton, near lighthouse, 1 mile along cliffs	Bourke 1994, 100; PP 1895, LXXXVII, 137; Larn & Larn 2002; LCR.189, 13(h); LR 1891-2 No.1345(C) & (O), 16; SIC(1), 100; LR 1894 No. 1261(C); Lloydís Report of Total Loss, Casualty etc. 15.01.1894; Troy, Vol. II, 40-41; Lloydís List, No. 17, 584 Tue. 9th Jan. 1894, 10, c.21; Lloydís List, No. 17, 585 Wed. 10th Jan. 1894; Lloydís List, No. 17, 594 Sat. 20th Jan. 1894, 10; Lloydís List, No. 17, 601 Mon. 29th Jan. 1894, 3
W08134	Dart (SS)	Steamship	14/06/1917	Ballycotton lightship, 6 miles SSW	BMS 1914-18, 114; Bourke 1994, 218; BVLS 1914-18, 55; Larn & Larn 2002; LCWLR 1914-18, 145; LR 1916-17 No 191(D); PP 1919, Vol. LXII, 55; PRO Kew ADM 137/2962; SIC Vol. 1p218
W08166	Dring	Yawl	17/10/1883	Ballycotton, Co Cork	Bourke 1994, 100; Troy, Vol. I, Vol. II.
W08171	Dukat (SS)	Merchant vessel	20/02/1917	Ballycotton, Co Cork	ANCL 1914-18, 80; Bourke 1994, 221; Larn & Larn 2002; LCWLR 1914-18, 96; LR 1916-17 No 19(supp); SIC Vol. 1, 221
W08175	Dunsyre (SS)	Collier	01/04/1900	Ballycotton, Co Cork, lightship, 4 miles WSW	Cork Examiner, 3.4.1900; BOT Wk Rtn 1900 Appx C Table 1, 113(623); Larn & Larn 2002; NLR; PP 1901, Vol. LXVIII, 113. Lloyd's List 19, 520, Monday, 2nd April 1900; Lloyd's List 19, 522, Wednesday, 4th April 1900; Lloyd's List 19, 529, Thursday, 12th April 1900; Lloyd's List 19, 540, Thursday, 26th April 1900; Lloyd's List 19, 565, Friday, 25th May 1900; Lloyd's List 19, 573, Monday, 4th June 1900
W08207	Elizabeth	Unknown	20/12/1825	Ballycotton, Co Cork	Lloyd's List No. 6076, Tuesday, 27th Dec. 1825; Troy, Vol. I, 13

W08225	Enterprise	Brigantine	05/01/1867	Ballycotton, Co Cork, near	BOT Wk Rtn 1867 Pt II Table 21, 31 (463); Bourke 1994, 101; Larn & Larn 2002; NLR; PP 1867-8 LXIII, 31, 44
W08245	Falcon	Schooner	13/12/1848	Ballycotton, Co Cork	Bourke 1994, 100; PP 1852-3, Vol. XCVIII, 2; Troy, Vol. I, 31; Lloyd's List 10, 842, Saturday 16th December 1848
W08269	Florida (SS)	Steamship	22/03/1887	Ballycotton, off	Lloyd's List No. 16, 550, Tuesday, 30th April 1867; Bourke 1994, 101; BOT Wk Rtn 1867 Pt II Table 21, 34(466); NLR; SIC Vol. 1, 101; Larn & Larn 2002; PP 1867-8 LXIII, 34, 45
W08281	Foyle	Unknown	06/01/1821	Ballycotton, Co Cork	Lloyd's List no. 5560, 16 January 1821
W08358	Hebe	Unknown	26/12/1848	Ballycotton, Co Cork	Troy, Vol. I, 32-33; Lloyd's List 10, 853, Saturday 30th December 1848
W08405	Idolette	Brig	19/11/1872	Ballycotton, Co Cork	Troy, Vol. I, 28
W08420	Iodes	Unknown	05/05/1917	Ballycotton, Co Cork	Bourke 1994, 99
W08450	John		24/09/1874	Ballycotton, Co Cork	Bourke 1994, 100; Troy, Vol. I, Vol. II
W08471	Joseph Mitchell	UNKNOWN	Pre 8/3/1950	Ballycotton, Co Cork, lightship, 246 degrees, 2.1 miles from	
W08489	Katie	Ketch	08/07/1896	Ballycotton, Co Cork, 30 miles S of	BOT. Wk. Rtn. 1896 Appx.C Tab. 1, 107(545); Larn & Larn 2002; NLR; PP 1898, LXXXIII, 107
W08516	Lahaina	Brig	30/12/1869	Ballycotton, Co Cork	Bourke 1994, 100; Troy, Vol. I, 24-25; PP 1870 LX, 35, 50; Lloyd's List, No. 17, 383; Saturday 1st January 1870, 3; Lloyd's List, No. 17, 384; Monday 2nd January 1870, 3; Lloyd's List, No. 17, 385; Tuesday, 4th January 1870, 4; Lloyd's List, No. 17, 398; Wednesday 19th January 1870, 6
W08536	Little Pet	UNKNOWN	Between 26/02/1846 and 02/03/1846	Ballycotton, Co Cork	PP 1846, Vol. XLV, Collisions of Shipping, 22
W08539	Lodes (SS)	Steamship	05/05/1917	Ballycotton, Co Cork, 4 miles SE of	Bourke 1994, 218; PP 1919, Vol. LXII, 49; Hocking, 1989, 430; BVLS 1914-18, 49

W08568	Magnificent	UNKNOWN	18/03/1836	Ballycotton, Co Cork	ourke 1994, 100; Lloydís List, No. 7144, Tue. Mar. 22, 1836; Troy, Vol. I, 16-19
W08765	Porto Nova	Schooner	18/12/1853	Ballycotton, Co Cork	Bourke 1994, 100; PP 1854, Vol. XLII, Admiralty Register of Wrecks, 76-7; Troy, Vol. I, 34; Lloydís List, No. 12400, Wed. 21st Dec. 1853, 3 c.9
W08818	Rosina	Schooner	27/11/1810	Ballycotton, Co Cork	Bourke 1994, 100; Larn & Larn 2002; Lloydís List, No. 4514; 27th Nov. 1810; Troy, Vol. I, Vol. II
W08941	Tadorna (SS)		15/11/1911	Ballycotton, Co Cork	Bourke 1994, 96; Hocking, 1969, 678; PP 1912-13, LXXVI, 96; Lloydís List, No. 23, 130, Wed. 15 Nov. 1911, 11 c.24; Lloydís List, No. 23, 130, Wed. 15 Nov. 1911, 11 c.25; Lloydís List, No. 23, 131, Thur. 16th Nov. 1911, 11 c.23; Lloydís List, No. 23, 133, Fri. 17th Nov. 1911, 8 c.23; Lloydís List, No. 23, 133, Sat. 18th Nov. 1911, 11 c.23; Lloydís List, No. 23, 134, Mon. 20th Nov. 1911, 9 c.23; Lloydís List, No. 23, 135, Tue. 21st Nov. 1911, 11 c.23; Lloydís List, No. 23, 136, Wed. 22nd Nov. 1911, 11; Lloydís List, No. 23, 137, Thur. 23rd Nov. 1911, 11 c.25-6; Lloydís List, No. 23, 138, Fri. 24th Nov. 1911, 8 c.23; Lloydís List, No. 23, 140, Mon. 27th Nov. 1911, 9 c.23; Lloydís List, No. 23, 140, Tue. 28th Nov. 1911, 11 c.23; Lloydís List, No. 23, 142, Wed. 29th Nov. 1911, 9 c.25; Lloydís List, No. 23, 143, Thur. 30th Nov. 1911, 11 c.24; Lloydís List, No. 23, 144, Fri. 1st Dec. 1911, 8 c.25; Lloydís List, No. 23, 145, Sat. 2nd Dec. 1911, 11 c.22; Lloydís List, No. 23, 146, Mon. 4th Dec. 1911, 9 c.23; Lloydís List, No. 23, 147, Tue. 5th Dec. 1911; Lloydís List, No. 23, 148, Wed. 6th Dec. 1911, 9 c.24; Lloydís List, No. 23, 149, Thur. 7th Dec. 1911, 11 c.23; Lloydís List, No. 23, 150, Fri. 8th Dec. 1911, 9 c.24; Lloydís List, No. 23, 152, Mon. 11th Dec. 1911, 9 c.23; Lloydís List, No. 22, 155, Thur. 14th Dec. 1911, 11, c.24; Lloydís List, No. 23, 157, Sat. 16th Dec. 1911, 12; Lloydís List, No. 23, 160, Wed. 20th Dec. 1911, 11 c.23; Lloydís List, No. 23, 175, Mon. 8th Jan. 1912, 9, c.22; Lloydís List, No. 23, 200, Tue. 6th Feb. 1912, 11, c.24
W08970	Trader	UNKNOWN	28/10/1892	Ballycotton, Co Cork	PP 1894, Vol. LXXVI, Floating Derelicts, 86; Lloydís List, No. 17, 213 Sat. 29th Oct. 1892, 7, c.17; Lloydís List, No. 17, 219 Sat. 5th Nov.

					1892, 7, c.20; Lloyd's List, No. 17, 241 Thur. 1st Dec. 1892, 10, c.19; Lloyd's List, No. 17, 241 Thur. 1st Dec. 1892, 11." Trafalgar (SS),W08971,Steel Steamship,"Fastnet, 54 miles SW by W of / 54 miles SW by S",23/08/1915,50.83333,-10.63333,UKHO,We regret that we are unable to supply descriptive details for this record at present.,"PP 1919, Vol. XLII, 10 (636); LR. 1915-16 No 1015(T); PRO. Kew ADM. 137/2959; BMS.1914 - 18, 106; Larn & Larn 2002; BVLS 1914-18, 12.
W08995	UNKNOWN	Schooner	25/11/1835	Ballycotton, Co Cork	Bourke 1994, 100; Bourke 1998, 110; Troy, Vol. I, 15
W08999	UNKNOWN	UNKNOWN	UNKNOWN	Ballycotton, Co Cork	PP 1852-3, Vol. XCVIII, 5
W09008	UNKNOWN	Yawl	17/10/1883	Ballycotton, Co Cork	Troy, Vol. II, 37
W09011	UNKNOWN	UNKNOWN	23/11/1868	Ballycotton, Co Cork	Tory, Vol II, 22
W09129	UNKNOWN	UNKNOWN	1905	Ballycotton, Co Cork	Board of Trade Harbour Dept., Obstructions to Navigation, National Archives Ireland, Box 4/654, H15126; Report on the Sea and Inland Fisheries of Ireland for 1905, xxiii.
W09203	UNKNOWN	Collier	26/12/1763	Ballycotton, Co Cork	Freeman's Journal 1763, Record of vessels lost through shipwreck, Dec. 27th - 31st, 139.
W09211	Upupa (SS)	Steamship	16/01/1903	Ballycotton, Co Cork	Lloyd's List 20, 389, Monday, 19th January 1903; Lloyd's List 20, 390, Tuesday, 20th January 1903; Lloyd's List 20, 396, Tuesday, 27th January 1903; Lloyd's List 20, 402, Tuesday, 3rd February 1903; Lloyd's List 20, 409, Wednesday, 11th February 1903; Lloyd's List 20, 426, Tuesday, 3rd March 1903; Lloyd's List 20, 444, Tuesday, 24th March 1903; Lloyd's List 20, 459, Saturday, 11th April 1903; Bourke 1994, 95.
W09215	Valiant	Brig	14/12/1848	Ballycotton, Co Cork	Bourke 1994, 100; Troy, Vol. I, 31-32.
W09226	Vernon	UNKNOWN	26/12/1763	Ballycotton, Co Cork	Freeman's Journal, Column called 'Ireland', 130.
W09230	Victoria				
W11916	UNKNOWN	UNKNOWN	Novemner 1850	Ballycotton, Co Cork	PP 1852-3 XCVIII (385), 5.

W12893	Mary	UNKNOWN	03/01/1795	Ballycotton, Co Cork	Freeman's Journal Sat. Jan. 3rd 1795 No. 75 Vol. XXXIV.
W13675	Joseph	UNKNOWN	08/01/1828	Ballycotton, Co Cork	Lloyd's List No. 6290, Tue. Jan. 15, 1828
W13706	Spring	Schooner	21/03/1828	Ballycotton, entrance to	Lloyd's List No. 6310, Tue. Mar. 25, 1828; Lloyd's List No. 6314, Tue. Apr. 8, 1828.
W13975	UNKNOWN	Steamship	25/03/1941	Ballycotton, near	Lloyd's List 39, 429, Tuesday 25th March 1941.
W14011	UNKNOWN	Brig	08/06/1840	Ballycotton	Lloyd's List 8, 193, Thursday 11th June 1840.
W14187	UNKNOWN	Schooner	01/12/1835	Ballycotton, off	Lloyd's List, No. 7113, Fri. Dec. 4, 1835.
W14270	UNKNOWN	UNKNOWN	12/10/1845	Ballycotton	Lloyd's List No. 9858, Fri. Oct. 17, 1845.
W14382	Jane	UNKNOWN	23/11/1846	Ballycotton	Lloyd's List 10, 201, Tuesday, 24th November 1846.
W14857	UNKNOWN	UNKNOWN	18/12/1848	Ballycotton, off	Lloyd's List 10, 845, Wednesday 20th December 1848.
W14865	Lancashire	Barque	28/02/1894	Ballycotton, off	Lloyd's List, No. 17, 628 Thur. 1st Mar. 1894, 7, c.17.
W15656	Jane	Schooner	10/12/1856	Ballycotton	Lloyd's List, No. 13324, Fri. 12th Dec. 1856 P.4, c.13
W15737	Douro	UNKNOWN	27/11/1859	Ballycotton Strand	Lloyd's List, No. 14, 246, Thur. 1st Dec. 1859, 4 c.15.
W15852	Catherine	Schooner	08/02/1858	Ballycotton, rocks off	Lloyd's List, No. 13685, Thur. 11th Feb. 1858, 3 c.10; Lloyd's List, No. 13687, Sat. 13th Feb. 1858, 3 c.9; Lloyd's List, No. 13686, Fri. 12th Feb. 1858, 4 c.14; Lloyd's List, No. 13688, Mon. 15th Feb. 1858, 4 c.15; Lloyd's List, No. 13692, Fri. 19th Feb. 1858, 3 c.12.
W15954	UNKNOWN	UNKNOWN	03/12/1850	Ballycotton, near	Lloyd's List, No. 11453, Thurs. Dec. 5, 1850.
W15983	UNKNOWN	UNKNOWN	20/12/1853	Ballycotton, off	Lloyd's List, No. 12401, Thur. 22nd Dec. 1853, 3 c.9.
W16032	UNKNOWN	East Indiaman	06/02/1856	Ballycotton, on the shore	Lloyd's List, No. 13063, Sat. 9th Feb. 1856 P.3, c.9.
W16757	Naomi & Jane	Sloop	20/02/1874	Ballycotton	Lloyd's List, No. 18, 677, Monday 2nd March 1874, 8; Lloyd's List, No. 18, 679, Wednesday 4th March 1874, 9.
W17091	UNKNOWN	UNKNOWN	09/02/1872	Ballycotton, near	Lloyd's List, No. 18, 040, Tuesday 13th February 1872, 5.

W17092	UNKNOWN	UNKNOWN	09/02/1872	Ballycotton, near	Lloyd's List, No. 18, 040, Tuesday 13th February 1872, 5.
W17117	UNKNOWN	UNKNOWN	17/02/1874	Ballycotton	Lloyd's List, No. 18, 669, Friday 20th February 1874, 8.
W17284	UNKNOWN	Barge	03/10/1908	Ballycotton, off	Lloyd's List 22, 166, Wednesday 9th October 1908.
W17622	No. 53	Fishing boat	23/05/1887	Ballycotton Harbour	Lloyd's List No. 15, 521, Monday 23rd May 1887.
W18027	UNKNOWN	Brig	29/01/1865	Ballycotton	Lloyd's List No. 15, 854, Wednesday 1st February 1865.
W18187	Alma	Schooner	10/01/1867	Ballycotton	Lloyd's List No. 16, 460, Monday, 14th January 1867.
W18218	Belem	Barque	19/03/1867	Ballycotton, off	Lloyd's List No. 16, 516, Wednesday, 20th March 1867; LL No. 16, 517, Thursday, 21st March 1867.

Table 1 Recorded wrecks in the vicinity of Ballycotton.

9.2 Record of piers and harbours

Ballycotton, Co. Cork

SiteName *Ballycotton, Co. Cork*

“A substantial stone pier, extending into six feet water at low-water springs, and affording, in a very exposed place, excellent wharfage, sheltered from all winds except those blowing over the land, which, however, in this direction is bluff, and affords considerable protection.” (p. 48)

CSP 1852-53, Vol. XLI, Reports from Commissioners, Twentieth Report from the Board of Public Works, Ireland, Piers and Harbours, p. 47-51

“The harbour as it exists is little better than a trap, for when gales set in from the south-east if the boats were not removed at once they would inevitably be destroyed.”

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1880, p.

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1880. 1881. The Queen’s Printing Office, Dublin.

Work at Ballycotton was expected to be finished by 1st. June 1887. The estimated cost was £20,500.

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1884. 1885. (1884, p. 10) The Queen’s Printing Office, Dublin.

“The building of the pier which, I believe, will be begun this year, will be of great benefit, as at present there is no protection whatever from easterly winds.”

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1884. 1885 (1884, p. 12). The Queen’s Printing Office, Dublin.

Work at Ballycotton was expected to be finished by 1st. June 1887. The estimated cost was £20,500. The contract was for £18,795.

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1885. 1886 (1885, p. 10). The Queen’s Printing Office, Dublin.

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1886. 1887 (1886, p. 11). The Queen’s Printing Office, Dublin.

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1887. 1888 (1887, p. 16). The Queen’s Printing Office, Dublin.

Work was completed in December 1887.

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1887. 1888 (1887, p. 16). The Queen’s Printing Office, Dublin.

Site Name Ballycotton

The Pipe Roll of Cloyne makes refernce to Ballycotton in the year c.1364. 10 men are listed as holding cottages and it is stated that all are fishermen. In season they fish for ling, cod and haddock.

MacCotter & Nicholls 1996 p.18

‘About two leagues west of Ring-point, is the island of Ballycotton, appearing pretty high; within it, is a tolerable road for ships in westerly winds, at four, five, or six fathom.

Smith 1815 p.289

Smith, C. 1815 *The Ancient and Present State of the County and City of Cork*, Vol. II, a new edition Cork

“The pier at Ballycottin is making good progress and will no doubt when finished be of great assistance to the fishermen of that place, by enabling them to employ larger boats, &c.”

Report of the Inspectors of Irish Fisheries on the Sea and Inland Fisheries of Ireland for 1885. 1886 (1885, p. 15). The Queen’s Printing Office, Dublin.

“Ballycotton Bay is remarkable for its clean ground: it is from two to nine fathoms deep; and if a small pier or harbour were formed in it, to provide a shelter against S.E. gales, the fishermen would be able to pursue their industry in winter; at present their boats must be hauled up during the winter months. It is probable that a local contribution could be obtained.”

First Report of the Commissioners of Inquiry into The State of the Irish Fisheries; with The Minutes of Evidence, and Appendix, p. 227. MDCCCXXXVI. His Majesty’s Stationery Office, Dublin.

Site Name Ballycotton Pier

1884-1888 - ‘Improvements to pier and harbour.’

OPW Archives Piers and Harbours, OPW 6387/88

1885-1896 - ‘Question as whether there is subsidence in the sea walls since repairs were carried out some years previously.’

OPW Archives Piers and Harbours, OPW 10395/96

1903-1910 - ‘Proposed improvements to pier.’

OPW Archives Piers and Harbours, OPW 7897/10

9.3 Previous archaeological excavations and investigations

The Database of Irish Excavation Reports lists the following investigations for Ballycotton;

- 07D33, 07R150 underwater assessment for Ballycotton/Shanagarry/Garryvoe Sewage Scheme. In June 2007 an underwater assessment was carried out at two outfall sites in Ballycotton. The assessment discovered no archaeological features in the outfall areas.
- 10R109, 10D38 geophysical survey in Ballycotton. Sub-bottom profiler survey, multi-beam echo sounder survey, and a marine magnetometer survey were carried out between June and September 2010 to determine the best path for a pipeline project. The two most significant finds of the project were the discovery of the remains of the World War I German U-boat U58. The survey concluded that while the deeper waters of Ballycotton Bay could increase preservation of materials, the amount of trawling in the area decreased the survival of archaeological material.
- 2014: *ADCO* Desktop Survey of Ballycotton Bay. A desktop assessment noted seventeen known wrecks that would be within 1500 meters of the cable proposed cable line.
- 2018: *Mizen Archaeology* AIA for sewerage scheme comprising of a desktop assessment and a wade survey. No archaeology was uncovered.



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Ballycotton Harbour, Co. Cork
Geophysical Survey Report
Report Number: P20126_Gp_Rp_D01
Project: P20126



REPORT CONTROL SHEET

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Engineer Representative	Byrne Looby					
Project Name	Ballycotton Harbour, Co. Cork					
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Acronyms

bgl – below ground level

PGL – Priority Geotechnical Ltd.

ITM – Irish Transverse Mercator

OD Malin – metres above Ordnance Datum Malin (OSGM15)

A) Executive Summary

Priority Geotechnical Ltd. was instructed by Byrne Looby Consulting Engineers on behalf of Cork County Council to undertake a geophysical investigation at Ballycotton Harbour, Co. Cork. This geophysical survey is in conjunction with an overall site investigation project.

The survey consisted of marine side scan sonar and magnetometer surveying. The survey locations are shown in Figure B-1 below.

The survey was carried out on 5th and 10th November 2020. The survey was conducted over periods of high water.

The side scan sonar mosaic and contoured magnetic intensity are shown in APPENDIX A: DRAWINGS Drawing No. P20126_GP_D01 to D02. These drawings are plotted at paper size ISO A3 and can be supplied in AutoCAD format.

A number of targets have been identified by the magnetometer and side scan sonar surveys. From the side scan sonar dataset, a large amount of mooring line, mooring chain and mooring blocks are present within the survey area. A selection of targets has been selected from the side scan data and are presented in APPENDIX B: SIDE SCAN SONAR TARGETS. Gravel is seen to be present on the inshore areas of the harbour.

The magnetometer dataset was greatly affected by the sheet piling present in the quay walls. A small target has been identified on the entrance of the harbour.

B) Introduction

B.1) Scope of Works

Priority Geotechnical Ltd. was instructed by Byrne Looby Consulting Engineers on behalf of Cork County Council to undertake a geophysical investigation at Ballycotton Harbour, Co. Cork. This geophysical survey is in conjunction with an overall site investigation project.

The survey consisted of marine side scan sonar and magnetometer surveying.

The survey was carried out on 5th and 10th November 2020. The survey was conducted over periods of high water across the survey area as indicated in Figure B-1.

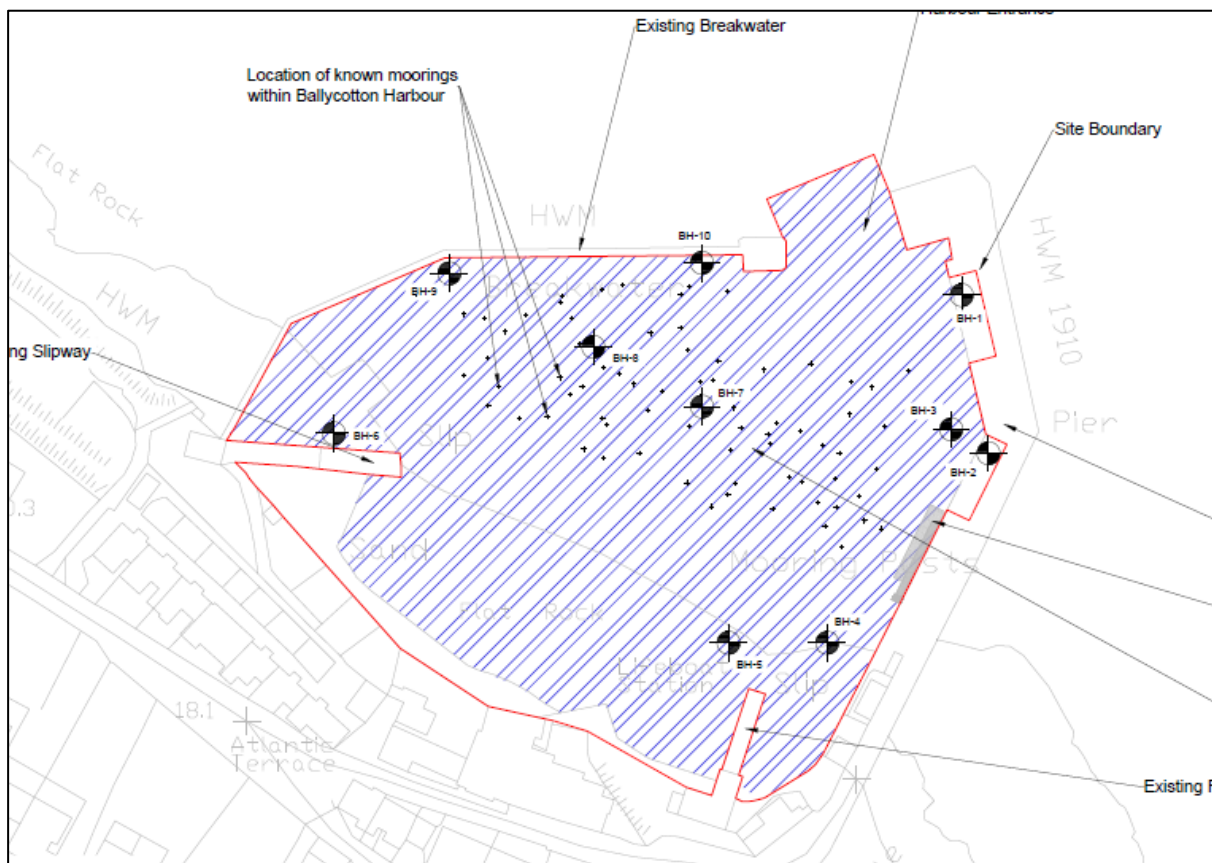


Figure B-1: Geophysical Survey Area

B.2) Survey Objectives

The purpose of the investigation was to record high quality side scan sonar and magnetometer data across the survey area.

B.3) Coordinate System and Datum

All coordinates are given in Irish Transverse Mercator (ITM). All elevations are given in metres Ordnance Datum Malin (OD Malin) corrected using geoid model OSGM15.

B.4) Intrusive Works

This report considers all relevant site investigation results. Relevant site investigation results have been overlaid on the interpretive drawings.

C) SURVEY METHODOLOGY.

C.1) Planned Survey Lines

The survey area was as outlined in Figure B-1 above. A large number of moorings and vessels were present within the survey area. Lines were run where accessible and where the vessel could safely tow the required equipment.

C.2) Positioning Control

A Hemisphere VS330 was used to collect all positional information throughout the survey. The Hemisphere VS330 was corrected using Trimble VRS now RTK correction stream. Published accuracies of the Trimble VRS network are 0.01 – 0.02m horizontal and 0.01 – 0.03m vertical.

In the VRS correction method a server generates a virtual station close to the user and network corrections are interpolated at this virtual station which in turn transmits corrections across a very short single baseline to the roving receiver.

Hypack™ software was used for navigation purposes during all data acquisition where the planned survey lines were preloaded and online transformation from WGS84 Lat / Lon to Irish Transverse Mercator was undertaken.

1.1 Side Scan Sonar Survey

The side scan sonar survey was undertaken to provide high resolution imagery of the survey area.

Sidescan sonar imaging was obtained using a Edgetech 4125, dual frequency 400/900kHz, sonar. The higher 900kHz channel was used throughout this survey to provide the highest image resolution.

The towfish was run off the starboard rear side of the survey vessel. The GNSS signal was interfaced in Max View and Hypack™ survey software where all layback values were applied.

Survey lines were run in a manner to acquire a 100% data overlap and achieve maximum data resolution.

Processing was undertaken utilizing Edgetech processing software and mosaics produced in AutoCAD charts using Hypack™ survey software.

C.3) Magnetometer Survey

For the magnetometer survey a Geometrics G882 magnetometer was used. This magnetometer is a cesium vapour magnetometer. The system was equipped with an altimeter to provide water depth below fish, zero for atmospheric pressure pre deployment.

This is a towed magnetometer, with the towfish towed from the starboard rear side of the survey vessel. The speed of the boat was maintained below 3.0-3.5kts during the survey to reduce any effects of wake on the towfish.

The magnetometer was interfaced with navigation software MagLog during acquisition. All offsets were entered within the acquisition software. The towfish position was calculated through MagLog using the position and heading of the boat.

Data was recorded as individual profiles along the predesignated profiles in the MagLog standard format. Navigation was provided in real-time to the skipper.

Processing was also undertaken in the MagMap software. Where necessary a despiking filter was applied. Each individual profile was inspected for integrity.

The towfish positions were checked against the raw GNSS positions to ensure the integrity of the locations.

C.4) List of equipment used

- Navigation: Hemisphere VS330 receiver with RTK corrections (Trimble VRS Now)
- Magnetometer: G882
- Side Scan Sonar: Edgetech 4125

D) Results and Geophysical Interpretation

The side scan sonar mosaic and contoured magnetic intensity are shown in APPENDIX A: DRAWINGS Drawing No. P20126_GP_D01 to D02. These drawings are plotted at paper size ISO A3 and can be supplied in AutoCAD format.

D.1) Side Scan Sonar Results

The side scan sonar results have been presented as a georeferenced tiff mosaic image. Individual side scan sonar files can be provided to the client if required. The mosaic is presented in APPENDIX A: DRAWINGS Drawing No. P20126_Gp_D01. Artifacts of water column (horizontal black lines) and variation in gain resulting in a contrast in shading are present in the mosaic.

A list of targets has been picked directly from inspection of each file. These targets are named BAL01 to BAL09 and are detailed in the accompanying drawing and listed with pictures in APPENDIX B: SIDE SCAN SONAR TARGETS.

The majority of the targets are taken as detritus, and mooring related blocks, lines and chains present within the harbour. Areas of gravel have been identified on the inshore area of the harbour and around the harbour entrance.

D.2) Magnetometer Survey Results

Magnetometer survey results have been presented as a contour map with a 1 dipole target identified from the survey, see Table D-1. The magnetometer survey results were influenced heavily by the sheet piling on in the western pier structure causing a large decrease in the magnetic intensity (leeside).

Magnetometer field strength varied from 33656nT and 49033nT (mean 47175nT, median 48238nT, 95%tile 48726nT) with areas above and below this present in dipolar anomalies.

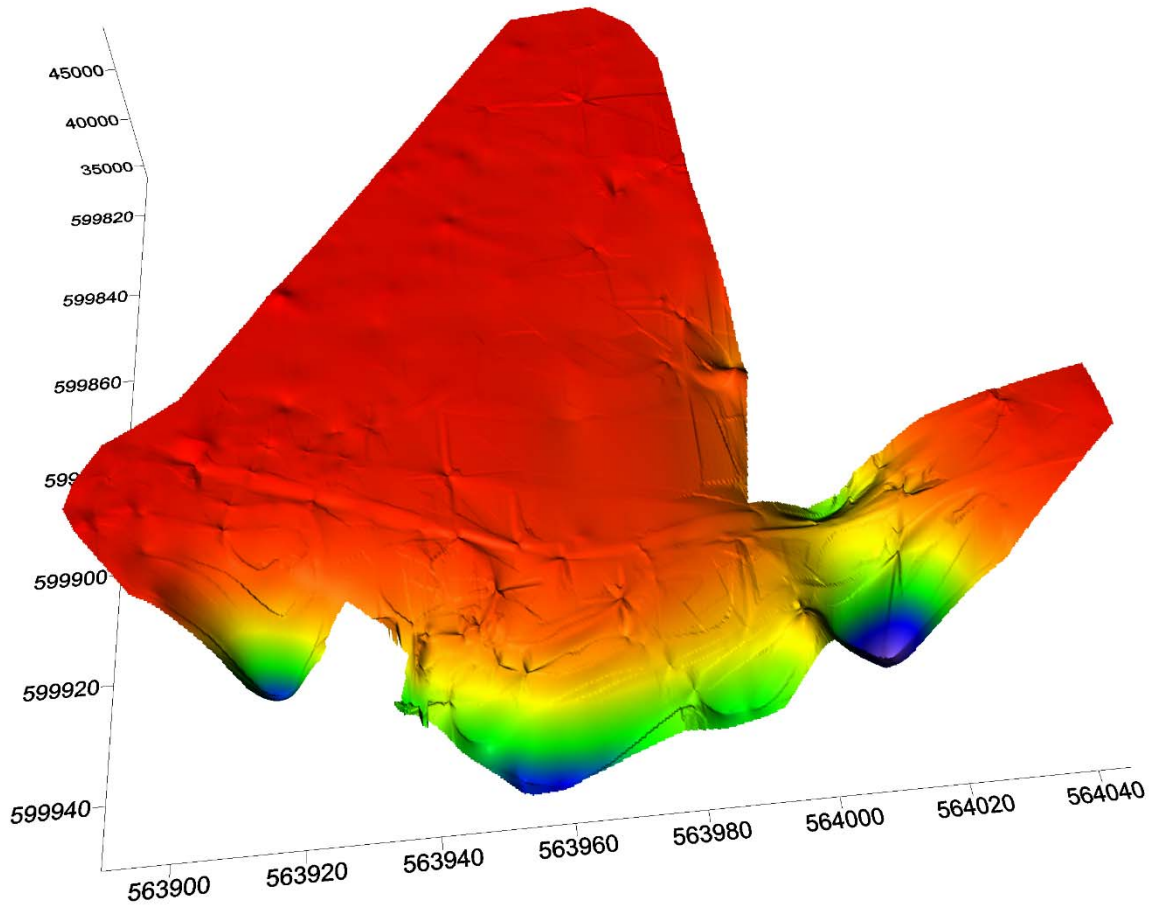


Figure D-1: 3D contours of magnetometer data north up

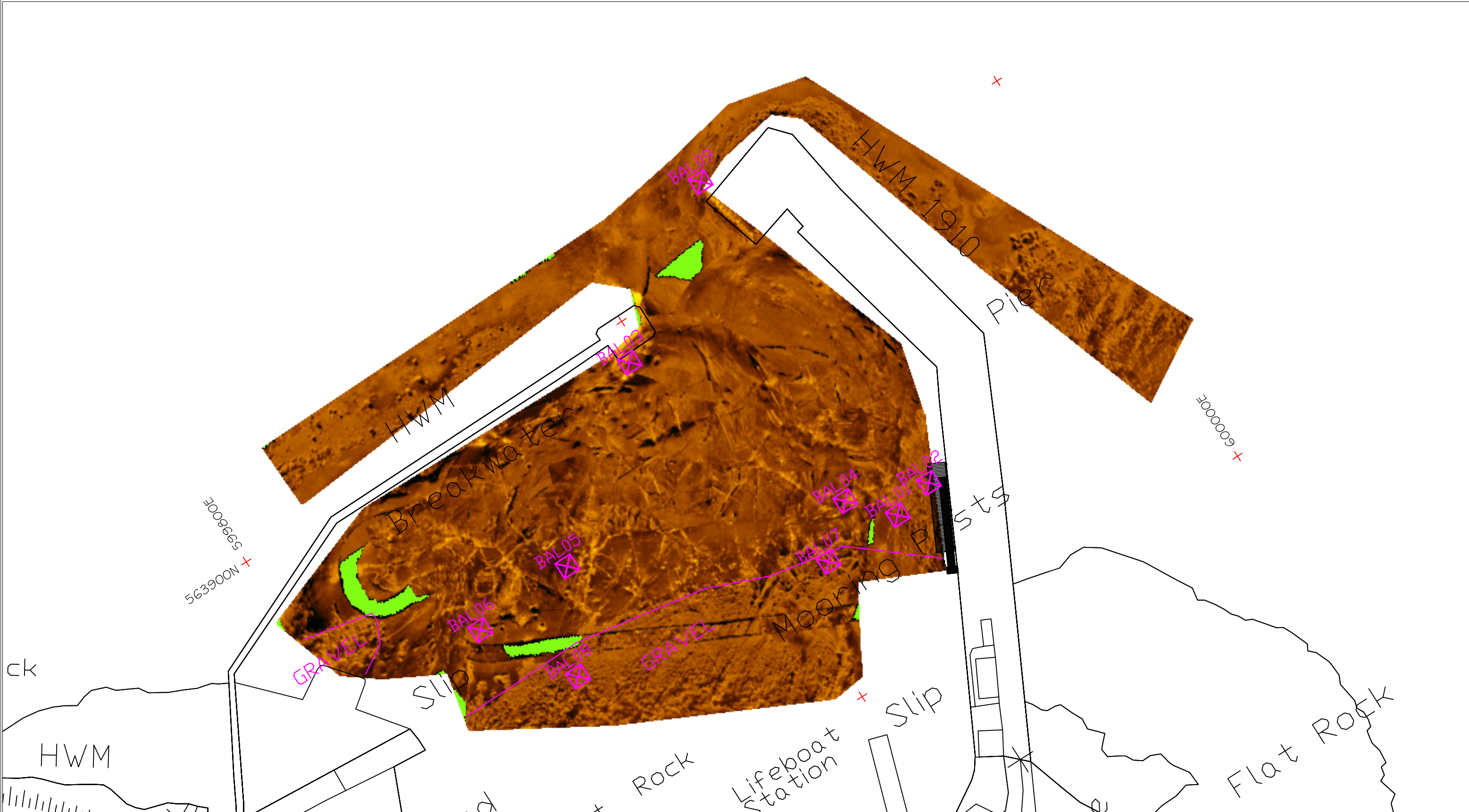
Target	Easting	Northing	Target Strength
A1	599913	564015	Weak

Table D-1: Targets identified by magnetometer survey

APPENDIX A: DRAWINGS

Drawing Number	Description	Scale
P20126_Gp_D01	Side Scan Sonar Survey Results	1:800 @ A3
P20126_Gp_D02	Magnetometer Survey Results	1:800 @ A3

FIGURE 1: SIDE SCAN SONAR MOSAIC AND INTERPRETATION INCLUDING ALL TARGETS
 SCALE: 1:800



PROJECT:
 Ballycotton Harbour, Co. Cork
 Geophysical Investigation

SHEET TITLE:
 Side scan sonar mosaic
 including interpretation and
 all targets

CLIENT:
 Cork County Council

CONSULTING ENGINEERS:
 Byrne Looby

SURVEYED BY:

JOB NUMBER:
 P20126

DRAWING NUMBER:
 P20126_Gp_D01

REVISION:
 D01 - Draft for comment

DRAWN BY:
 HP

APPROVED:
 GH

COORDINATE SYSTEM:
 ITM

VERTICAL DATUM:
 Malin (OSGM15)

SCALE:
 1:800@A3

ISSUE DATE:
 19/11/2020

LEGEND:

A1 MAGNETOMETER SURVEY TARGET

BAL 01 SIDE SCAN SONAR SURVEY TARGET

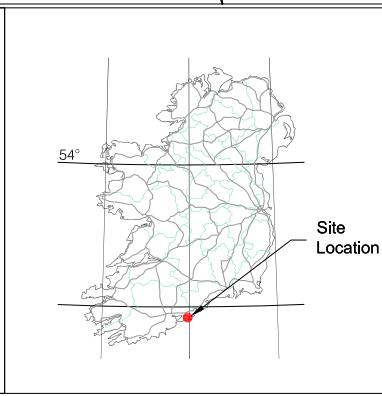
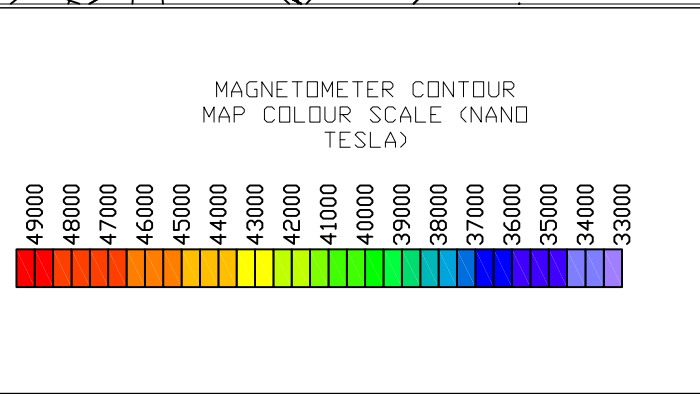
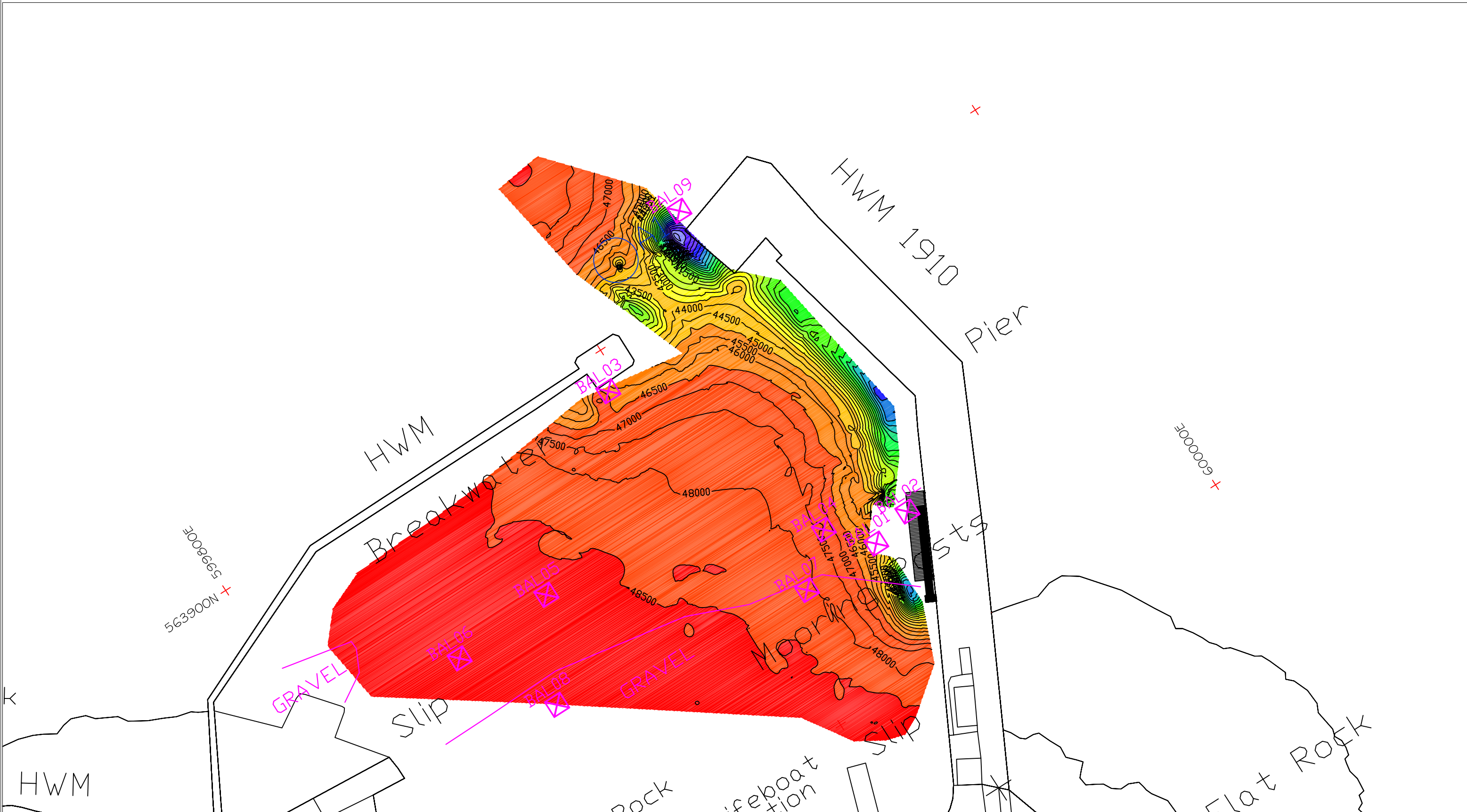


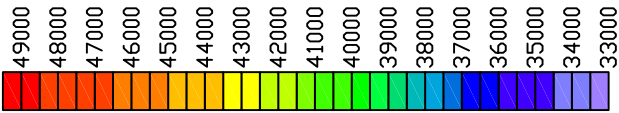
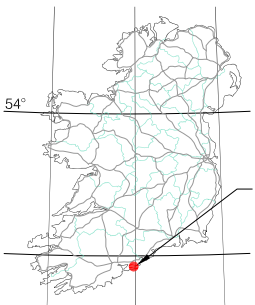



FIGURE 1: MAGNETOMETER SURVEY RESULTS INCLUDING ALL TARGETS
 SCALE: 1:800

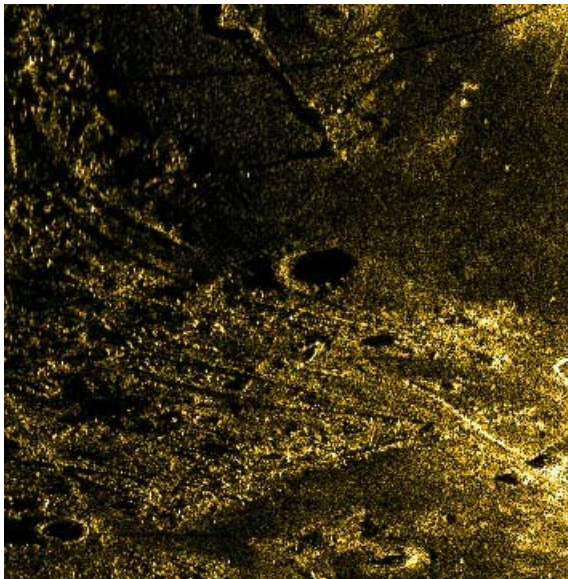


PROJECT: Ballycotton Harbour, Co. Cork Geophysical Investigation	CLIENT: Cork County Council	JOB NUMBER: P20126	DRAWN BY: HP	APPROVED: GH	LEGEND:  MAGNETOMETER SURVEY TARGET  SIDE SCAN SONAR SURVEY TARGET	MAGNETOMETER CONTOUR MAP COLOUR SCALE (NANO TESLA) 	 Site Location
	CONSULTING ENGINEERS: Byrne Looby	DRAWING NUMBER: P20126_Gp_D02	COORDINATE SYSTEM: ITM				
SHEET TITLE: Magnetometer survey results including all targets	SURVEYED BY: 	REVISION: D01 - Draft for comment	VERTICAL DATUM: Malin (OSGM15)		SCALE: 1:800@A3	ISSUE DATE: 19/11/2020	

APPENDIX B: SIDE SCAN SONAR TARGETS

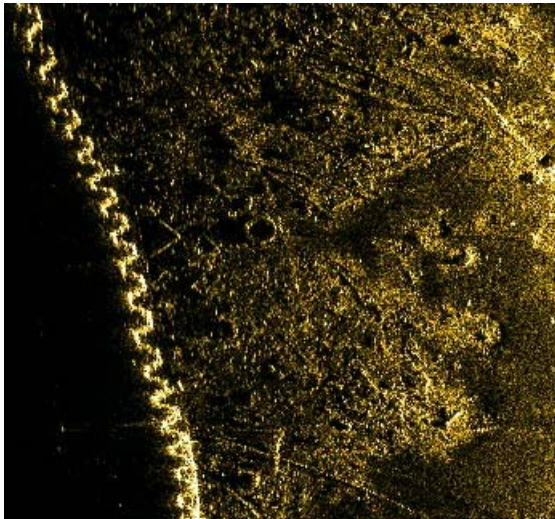
Name	Date	11/05/2020
BAL01	Time	08:45:50
Survey File	Event	0
20201105084124_ss1	X	599928.7
Capture File	Y	563930.0
BAL01.JPG	WGS84 Latitude	51 49 39.393 N
	WGS84 Longitude	008 00 3.7238 W
	Heading	224.0
	Fish Altitude	2.70
	Range to Target	8.1
	Height Above Bottom	0.0
	Length	1.3
	Width	0.9

Notes	Length: 1.3 Width: 0.9 hole in seabed
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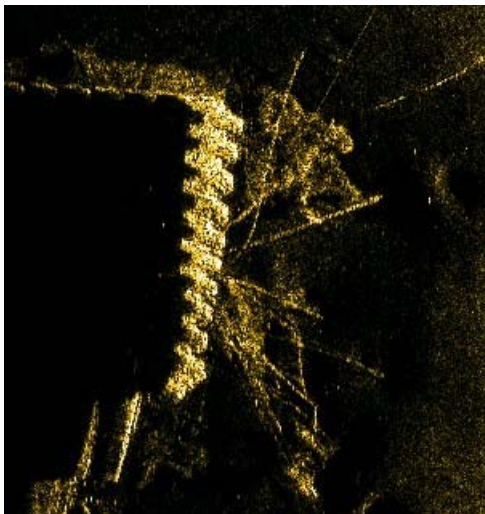
Name	Date	11/05/2020
BAL02	Time	08:45:43
Survey File	Event	0
20201105084124_ss1	X	599938.5
Capture File	Y	563932.3
BAL02.JPG	WGS84 Latitude	51 49 39.4675 N
	WGS84 Longitude	008 00 3.212 W
	Heading	223.2
	Fish Altitude	2.90
	Range to Target	13.6
	Height Above Bottom	0.0
	Length	1.1
	Width	0.6

Notes	Length: 1.1 Width: 0.6 rubble at base if sheet piling
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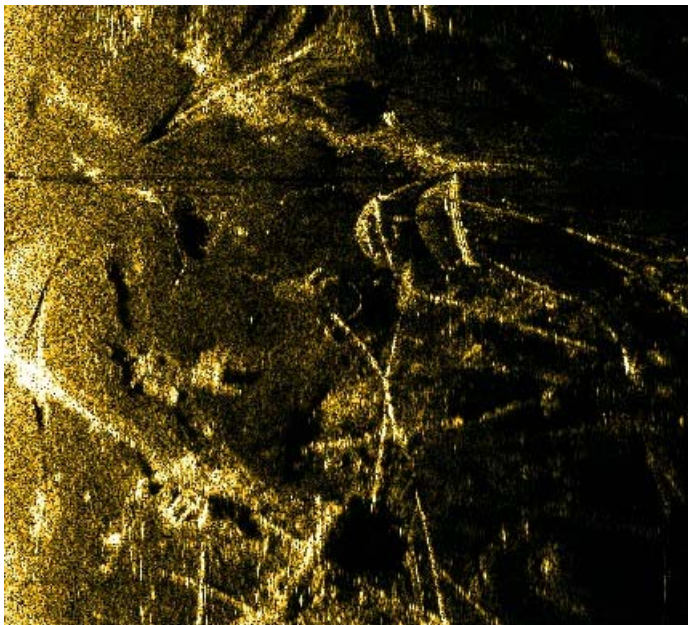
Name	Date	11/05/2020
BAL03	Time	08:44:51
Survey File	Event	0
20201105084124_ss1	X	599896.5
Capture File	Y	563991.3
BAL03.JPG	WGS84 Latitude	51 49 41.3767 N
	WGS84 Longitude	008 00 5.4056 W
	Heading	78.4
	Fish Altitude	4.10
	Range to Target	15.7
	Height Above Bottom	0.0
	Length	0.0
	Width	0.0

Notes	mooring lines / chains connecting to pier
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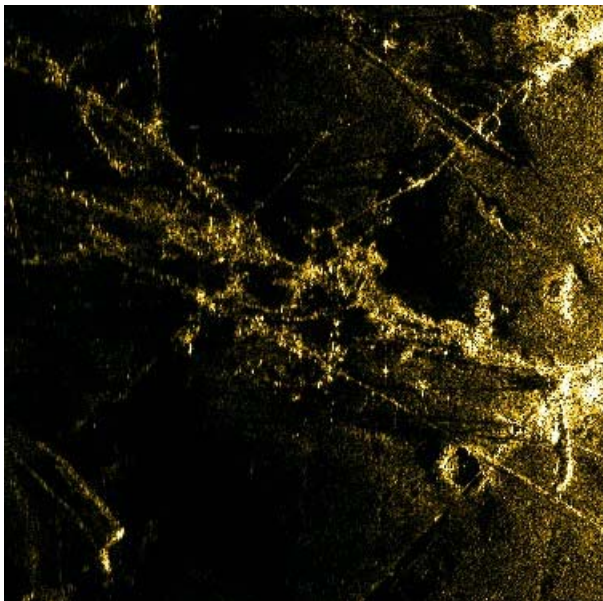
Name	Date	11/05/2020
BAL04	Time	08:49:22
Survey File	Event	0
20201105084612_ss1	X	599920.5
Capture File	Y	563939.0
BAL04.JPG	WGS84 Latitude	51 49 39.6843 N
	WGS84 Longitude	008 00 4.1521 W
	Heading	40.4
	Fish Altitude	2.50
	Range to Target	15.2
	Height Above Bottom	0.0
	Length	0.0
	Width	0.0

Notes	cluster of mooring chain / lines / blocks
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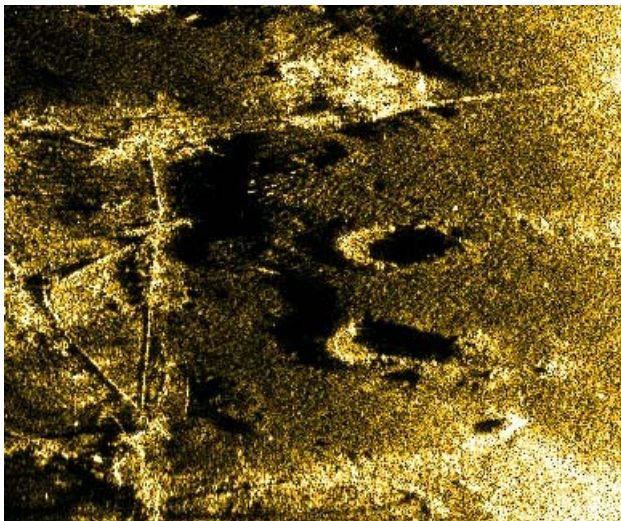
Name	Date	11/05/2020
BAL05	Time	08:48:31
Survey File	Event	0
20201105084612_ss1	X	599860.1
Capture File	Y	563960.3
BAL05.JPG	WGS84 Latitude	51 49 40.3735 N
	WGS84 Longitude	008 00 7.3067 W
	Heading	104.2
	Fish Altitude	2.00
	Range to Target	15.4
	Height Above Bottom	0.0
	Length	0.0
	Width	0.0

Notes	cluster of mooring chain / line / blocks
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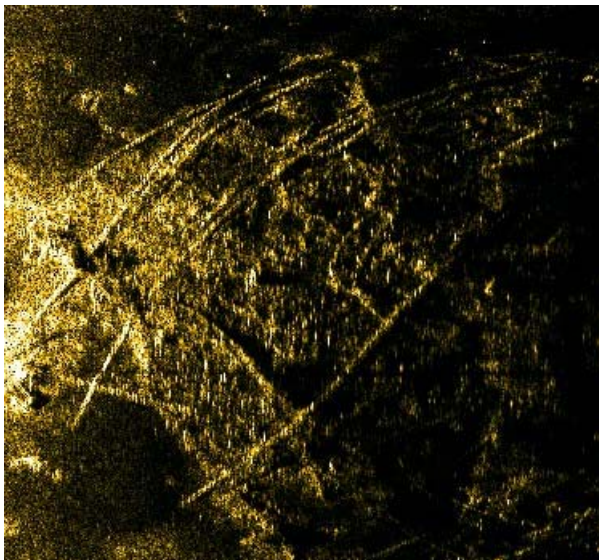
Name	Date	11/05/2020
BAL06	Time	08:48:13
Survey File	Event	0
20201105084612_ss1	X	599836.0
Capture File	Y	563958.8
BAL06.JPG	WGS84 Latitude	51 49 40.325 N
	WGS84 Longitude	008 00 8.5654 W
	Heading	106.5
	Fish Altitude	1.80
	Range to Target	6.2
	Height Above Bottom	0.0
	Length	1.6
	Width	0.9

Notes	Length: 1.6 Width: 0.9 two large holes in seabed
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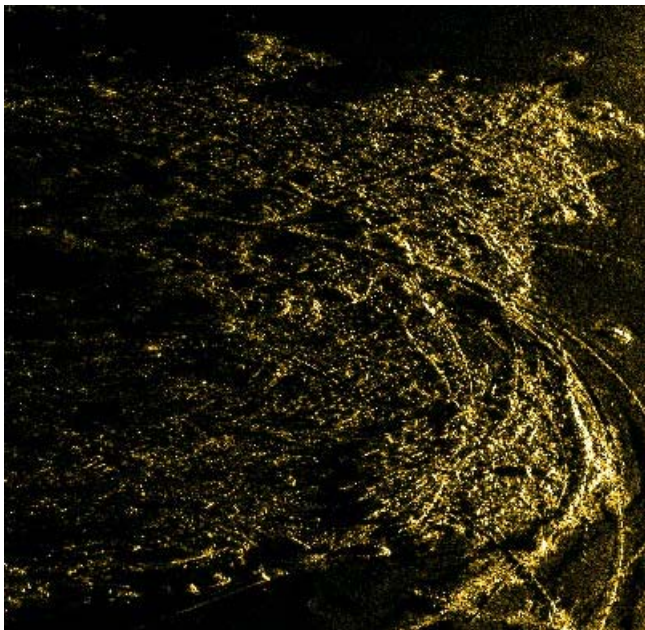
Name	Date	11/05/2020
BAL07	Time	08:55:24
Survey File	Event	0
20201105084805_ss1	X	599910.0
Capture File	Y	563929.6
BAL07.JPG	WGS84 Latitude	51 49 39.3801 N
	WGS84 Longitude	008 00 4.7005 W
	Heading	119.3
	Fish Altitude	2.30
	Range to Target	13.8
	Height Above Bottom	0.0
	Length	0.0
	Width	0.0

Notes	general detritus including mooring line / chain
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Name	Date	11/05/2020
BAL08	Time	08:53:55
Survey File	Event	0
20201105084805_ss1	X	599848.8
Capture File	Y	563938.2
BAL08.JPG	WGS84 Latitude	51 49 39.6583 N
	WGS84 Longitude	008 00 7.8968 W
	Heading	268.7
	Fish Altitude	2.00
	Range to Target	10.7
	Height Above Bottom	0.0
	Length	0.0
	Width	0.0

Notes	area of gravel with mooring chain / line
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Name	Date	11/05/2020
BAL09	Time	08:58:48
Survey File	Event	0
20201105085012_ss1	X	599931.8
Capture File	Y	564016.8
BAL09.JPG	WGS84 Latitude	51 49 42.202 N
	WGS84 Longitude	008 00 3.562 W
	Heading	315.6
	Fish Altitude	5.80
	Range to Target	16.5
	Height Above Bottom	0.0
	Length	0.0
	Width	0.0

Notes	gravel around pier head
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REFERENCES

GSEG (2002) Geophysics in Engineering Investigations. Geological Society Engineering Geology Special Publication 19, London, 2002.

Milsom, (1989). Field Geophysics. John Wiley and Sons.

Telford W.S., Geldart L.P, Sheriff R.E. (1990) Applied Geophysics Second Edition (Cambridge University Press) 769pp