

BRITISH TELECOMMUNICATIONS PLC

**Scotland - Northern Ireland (Scot-NI) 3 and 4
Replacement Cables**

**Technical Appendix G3 - Marine Archaeology and Cultural Heritage Technical Report -
Scot NI 3 & Scot NI 4**



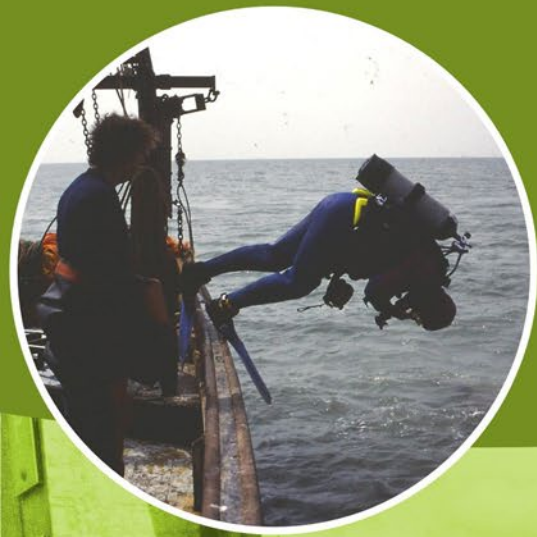
BT Scotland- Northern Ireland: SCOT-NI 3

*Marine archaeology and
cultural heritage
Technical report*

for
Intertek

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BT Scotland-Northern Ireland: SCOT-NI 3 cable

Marine archaeology and cultural heritage technical report

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SUMMARY

Project name: BT Scotland-Northern Ireland: SCOT-NI 3

Coracle Archaeology was commissioned by Intertek Energy & Water Consultancy Services on behalf of British Telecommunications (BT) to provide marine archaeological services in support of the BT Scotland-Northern Ireland telecommunications cables project. These services included an archaeological desk-based assessment, an assessment of geophysical and geotechnical data and walkover and geophysical surveys at the landfall locations, the findings of which are collated here.

The BT-Scotland-Northern Ireland telecommunications cables project is a proposed submarine telecommunications cable system between Scotland and Northern Ireland, comprising two individual, discrete cables:

- **SCOT-NI 3** - landfall at Portpatrick, Scotland and Donaghadee, Northern Ireland; and
- **SCOT-NI 4** - landfall at Girvan, Scotland, and Larne, Northern Ireland.

This technical report presents a summary of the archaeological assessments along the proposed cable route of SCOT-NI 3 (Portpatrick to Donaghadee). A separate report has been prepared for SCOT-NI 4.

The desk-based assessment provided a base line assessment of known sites and features of cultural heritage significance within a 1km study area, centred on the proposed cable route. This report summarises the results solely from within the 500m wide cable survey corridor, which corresponds with the marine geophysical and geotechnical survey areas. Assessment of marine geophysical and bathymetric survey data included the analysis of multibeam echosounder, sidescan sonar, magnetometer and sub-bottom profiler data. The geotechnical assessment reviewed data from cone penetration tests, gravity cores and grab samples to assess the archaeological and palaeo-environmental potential of the sub-surface sediments. The non-intrusive surveys at the proposed landfall locations comprised walkover, hand-held metal-detector and geophysical surveys.

The desk-based assessment recorded 17 cultural heritage assets within the SCOT-NI 3 cable survey corridor, including 16 wrecks and one monument. The non-intrusive landfall surveys assessed both known historic assets and the cultural heritage potential of the study areas. No features of clear archaeological potential were identified, although the walkover survey identified one previously unrecorded feature at Portpatrick.

Analysis of the marine geophysical survey data identified 23 geophysical anomalies with archaeological potential, although none relate to known historic assets. Archaeological exclusion zones have been proposed for 11 of these anomalies, including two considered to be of high, and nine of medium, archaeological potential. The geo-archaeological assessment of the sub-bottom profile data and the collected samples did not reveal any features with palaeo-environmental or archaeological potential.

Five of the archaeological exclusion zones are intersected by the current Proposed Development and will require further mitigation.

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LIST OF ACRONYMS USED IN THE TEXT

ADS	Archaeology Data Service
BMH	Beach manhole
CA	Coracle Archaeology
CD	Chart Datum
CifA	Chartered Institute for Archaeologists
COARS	Coastal and Offshore Archaeological Research Services
CPT	Cone penetration test
CSC	Cable survey corridor
EMODnet	European Marine Observation and Data Network
EPSG	European Petroleum Survey Group
FGMG	Fugro Germany Marine GmbH
GC	Gravity core
GIS	Geographic Information System
GPS	Global Positioning System
GS	Grab sample
grt	Gross registered tonnage
HER	Historic Environment Record
HERoNI	Historic Environment Record of Northern Ireland
HES	Historic Environment Scotland
ka	Kilo annum
LAT	Lowest astronomical tide
MBES	Multibeam echosounder
MHWS	Mean high water springs
nm	Nautical miles
nT	nanoTesla
OSGB	Ordnance Survey Great Britain
RoW	Receiver of Wreck
RSL	Relative sea level
SBP	Sub-bottom profiler
SEA	Strategic Environmental Assessment
SSS	Sidescan sonar
UKHO	United Kingdom Hydrographic Office
UTM	Universal Transverse Mercator
VORF	Vertical Offshore Reference Frames
WGS	World Geodetic System
WOSAS	West of Scotland Archaeology Service
WSA	Wider study area

1. INTRODUCTION

Outline

- 1.1. Coracle Archaeology (CA) was commissioned by Intertek Energy and Water Consultancy (Intertek) on behalf of British Telecommunications (BT) in July 2020 to undertake marine archaeology environmental assessments for the BT Scotland-Northern Ireland telecommunications cables project, including an archaeological desk-based assessment (DBA), non-intrusive geophysical and walkover surveys at the landfall locations, and an assessment of geophysical and geotechnical survey data. The results of these assessments are collated in this technical report.

Proposed development

- 1.2. The BT Scotland-Northern Ireland telecommunications cables project is a proposed submarine telecommunications cable system between Scotland and Northern Ireland, comprising two individual, discrete cables:
- **SCOT-NI 3** - landfall at Portpatrick, Scotland and Donaghadee, Northern Ireland; and
 - **SCOT-NI 4** - landfall at Girvan, Scotland, and Larne, Northern Ireland.
- 1.3. The existing cables (SCOT-NI 1 & 2) are nearing the end of their functional life, and require replacement to maintain crucial telecommunication services. The project intends to add additional capacity to the existing cables, aiming ultimately to replace them.
- 1.4. This report focuses solely on the proposed route of SCOT-NI 3 (henceforth 'the Proposed Development'). A separate technical has been prepared for SCOT-NI 4 (Coracle Archaeology 2020a).
- 1.5. The proposed route for SCOT-NI 3 will run for 43km between Portpatrick, Scotland and Donaghadee, Northern Ireland, including 21.2km in Scottish waters and 20.8km in Northern Irish waters. The existing beach manhole (BMH) infrastructure will be utilised at both landfall locations.

Archaeological assessments

- 1.6. The marine archaeological DBA gathered and collated data for all known sites and features of cultural heritage significance within and in proximity to the 500m cable survey corridor (CSC). The DBA also assessed a wider study area (WSA) 1km either side of the Proposed Development, facilitating a broader understanding of the archaeological potential of the region (Coracle Archaeology 2020b). This technical report collates records solely from within the CSC.
- 1.7. The non-intrusive landfall surveys at Portpatrick and Donaghadee utilised walkover, geophysical (electro-magnetic conductivity) and metal-detector surveys to identify sites and features of archaeological potential. These were compared with the results of the DBA to provide a fuller understanding of the archaeological potential of the proposed landfalls, and to assess the potential impact of the proposed development (Coracle Archaeology 2020c). The landfall geophysical survey data were collected by Coracle Archaeology and assessed by our colleagues at Headland Archaeology.
- 1.8. The marine geophysical and geotechnical survey, conducted by Fugro Germany Marine GmBh (FGMG), collected multibeam echosounder (MBES), sidescan sonar (SSS), magnetometer and sub-bottom profiler (SBP) data. These geophysical datasets were then assessed to identify, locate and characterise anomalies of archaeological potential along the CSC, with selection based on the presence of multiple lines of evidence (confirming datasets).
- 1.9. Any known and located historic assets and geophysical anomalies identified as being of high or medium archaeological potential were then assigned an archaeological exclusion zone (AEZ) to protect them from impacts by the Proposed Development.
- 1.10. The datasets were used also to assess the archaeological and palaeo-environmental potential of sub-surface sediments (Coracle Archaeology 2020c). These were then compared with the results of the DBA. Marine geophysical and geotechnical survey data were assessed for Coracle Archaeology by our colleagues at Coastal and Offshore Archaeological Research Services (COARS), University of Southampton.

2. AIMS AND OBJECTIVES

- 2.1. The aim of this technical report is to present our current understanding of the marine archaeology and cultural heritage that exists within and in proximity to the proposed development.
- 2.2. The objectives of the report are:
 - to synthesise all the project-specific archaeological assessments that have been completed to date; and
 - to include information relevant only to the current proposed development.
- 2.3. All superfluous information, such as the legislative framework and professional guidance, data sources, survey and assessment specifications and methods etc, has been removed, but can be found with reference back to the original report.

Geographical scope

- 2.4. The DBA assessed a 500m wide CSC and 2km wide WSA centred on the Proposed Development, along the entire route from mean high water springs (MHWS) at the proposed landfall locations. The WSA enabled an assessment of the archaeological potential along the route, and highlighted notable sites in the vicinity of the proposed development. The purpose of the DBA was to identify known and potential sites within the CSC that could be affected by the Proposed Development.
- 2.5. Though strictly beyond the remit of the report, the DBA also assessed the archaeological potential of the area in the immediate vicinity of the landfall location, contributing to a broader understanding of the results of the landfall surveys (see Coracle Archaeology 2020c). This technical report collates records solely from within the 500m wide CSC.

Consultation with statutory bodies

- 2.6. The primary statutory bodies consulted for the DBA were Historic Environment Scotland and Historic Environment Division, Department for Communities, Northern Ireland. Consultations were also held with the offices of the Dumfries and Galloway HER. Owing to ongoing COVID-19 constraints at the time of reporting, it was not possible to consult with local curators for the Donaghadee landfall location.

3. RESULTS

Palaeo-environment baseline assessment

- 3.1. The following section outlines the nature of the existing environment in the vicinity of the Proposed Development, through a review of available data and published sources. It assists in the analysis of seabed and sub-seabed deposits, and enables the identification of those likely to be of palaeo-environmental and archaeological interest.
- 3.2. The bathymetry of the study area clearly shows the presence of the deep North Channel that separates Scotland from Northern Ireland. The channel passes through the centre of the route corridor, reaching a maximum depth of c. 200m below chart datum (CD) along the SCOT-NI 3 route. Either side of this channel, the bathymetry shallows gradually towards the coastline, reaching c. 60m below CD within 5-10km of the landfalls.
- 3.3. The geology along the CSC consists largely of undifferentiated bedrock situated below shallow superficial deposits, ranging in age from the Ordovician on the Scottish shore (including the Caradoc and Ashgil Rocks approaching the Portpatrick landfall), through to Upper Cretaceous deposits and unnamed igneous intrusions close to Donaghadee.
- 3.4. The superficial deposits across the seabed in the western part of the study area are composed of thin sands and gravels (less than 1m and often <0.3m in thickness). These occasionally overlie localised thick deposits of glacial till (sometimes exceeding 50m in thickness) preserved within incised channels running parallel with the North Channel. Gravelly sands and muddy sandy also dominate the seabed deposits on the approach to Portpatrick.
- 3.5. The later Pleistocene history of the area is dominated by Late Devensian events associated with the British Irish Ice Sheet, pre-dating the deposition of acoustically-layered silty-clay. Investigations of the glacial history of this area suggest that ice expansion towards the shelf edge commenced c. 35-32 kilo annum (ka), initially spreading into Ireland, the Irish Sea Basin and northern England, before the establishment of an ice divide across the North Channel c. 28-27 ka (Clark *et al.* 2012; Hughes *et al.* 2014; Ballantyne & Small 2019). During this expansion, the North Channel would have constituted an important ice flow path for the ice sheets, forming a substantial

ice stream network together with ice from Ireland and northern Scotland (Hughes *et al.* 2014). This persisted until the separation of the British and Irish Ice Sheets c. 17-16 ka (Clark *et al.* 2012).

- 3.6. The high glacial load in this region indicates that post-glacial relative sea level (RSL) change has been non-monotonic, falling from well above present to a minimum in the early Holocene, then rising again to a mid-Holocene high-stand, before falling to present levels (Shennan *et al.* 2018; Carter 1982). Coastlines emergent after glacial retreat are today recognised as relict features up to 20m above modern sea level. Early Holocene sea levels at c.11 ka are likely to have been only 5-15m below the present level, rising to about 5-10m by c. 6 ka.
- 3.7. This interplay between eustatic and isostatic factors throughout the late Pleistocene and Holocene means that the potential zone for locating submerged palaeo-landscapes on both the Scottish and Northern Irish coastlines is confined to near-shore and on-shore areas, located between c. -15 and +30m. This is replicated in other studies within the Irish record: Westley and Woodman (2020), for example, demonstrate that chronologically-constrained (i.e. concentrated within the Holocene, with perhaps brief windows into the late Glacial) and extensive submerged landscapes are likely to be rare, given the limited shelf exposure, glacial history and high-energy conditions. Evidence for submerged palaeo-landscapes and prehistoric activity are therefore likely to be found only within 1-2km of each respective landfall, with the rest of the route sub-tidal throughout the post-glacial period (see Deegan *et al.* 1973).

Archaeological assessments

Summary

- 3.8. The DBA highlighted 17 records within the CSC along the entirety of the proposed route, including 16 wrecks and one monument (table 1). There are no designated or protected wrecks within the CSC, nor any scheduled monuments below MHWS.
- 3.9. Walkover surveys at the landfall locations identified and recorded known historic assets highlighted in the DBA. No known cultural heritage assets were recorded in the DBA for Donaghadee, and no features of archaeological potential were observed within the CSC.

Beyond the study area, a large modern memorial is located on the headland to the south, whilst a World War II pill-box stands in a field immediately behind the beach (see Coracle Archaeology 2020c). These will not be impacted by the Proposed Development, and will not be considered further in this report.

Table 1 Cultural heritage assets within the CSC

Type	Total
Wreck	16
Obstruction	0
Findspot	0
Monument	1
Building	0
Total	17

- 3.10. At Portpatrick, the DBA highlighted a number of cultural heritage assets beyond the CSC, but within the WSA. These assets, including the Glen Cottage standing stone, Ouchtriemakain cave and the Port Kale cable house, were located and recorded during the landfall surveys. The latter is a category B listed building, constructed in 1852 to house apparatus for testing the first telegraph cable to be laid between Scotland and Ireland (see Coracle Archaeology 2020b & c for more details). The severed remains of redundant cables are also clearly visible in section just below the cable house at the head of the beach. None of these assets will be impacted by the proposed development, and will not be considered further.
- 3.11. Five linear anomalies, indicative of buried services or cables, were identified in the geophysical survey data collected at the landfall locations: three at Portpatrick, and two at Donaghadee (see Coracle Archaeology 2020c). No anomalies of archaeological potential were identified in the landfall survey data.
- 3.12. There is no apparent patterning in the distribution of metal detections at Portpatrick or at Donaghadee, though the line of detections along the high water mark at Portpatrick may be indicative of casual losses driven ashore by the tides (see Coracle Archaeology 2020c). The perpendicular line of higher value detections along the centre of the beach at Portpatrick may also mark the location of the buried cable detected in the geophysical

survey (Coracle Archaeology 2020c). At Donaghadee detections were numerous, with a significant quantity of high value detections indicating non-ferrous metals. It is likely that this is indicative of the presence of scrap-metal, observed on the surface of the beach.

- 3.13. Twenty-three geophysical anomalies with archaeological potential were identified during the analysis of marine survey data (table 2). Of these, two are classified as being of high, and nine of medium archaeological potential, although none correspond to known historic assets.
- 3.14. Archaeological exclusion zones (AEZs) have been defined for each of the identified anomalies considered to be of high or medium archaeological potential, ranging in radius from 10-35m. Five AEZs are currently intersected by the Proposed Development (**CA_3002-3; CA_3006; CA_3010; CA_3021**).
- 3.15. Other geophysical anomalies identified in the survey data consisted of boulders, often with associated scour. These anomalies had no associated magnetic signature so are likely to be natural in origin and have no archaeological potential.
- 3.16. A number of in-operation cables were also identified crossing the CSC. Anomalies associated with these cables are not considered further in this archaeological assessment (see Global Marine 2020 for more information).

Table 2 Geophysical anomalies within the CSC

CA no.	Easting UTM 30N	Northing UTM 30N	Description	Archaeological potential	Proposed AEZ radius
CA_3001	363093	6080042	SSS anomaly SN3-P-SC0783 (3.2 x 1m) associated with bathymetry depression 5.6 x 2.7x 0.15m	Medium	10m
CA_3002	363003	6079953	Collection of SSS anomalies on the seabed (SN3-P-SC1049-54 and SN3-P-USC0272), each 4-11m in length. Suggest a wide debris spread, with the northernmost SSS anomaly (SN3-P-USC0272) associated with a series of magnetic anomalies up to 227nT (SN3-P-UMC064). Bathymetry shows two depressions, the southwestern most (centred on SN3-P-SC1051) measures 22 x 33 x 0.2 m, while the northwestern most (centred on SN3-P-USC0272) measures 11 x 13 x 0.4m. Some of these anomalies could relate to the Donaghadee-Portpatrick No6/No7.	High	25m

CA no.	Easting UTM 30N	Northing UTM 30N	Description	Archaeological potential	Proposed AEZ radius
CA_3003	362974	6079939	Visible shipwreck outline (SSS Anomaly SN3-P-USC0274) measuring 18 x 2.8 x 0.3m, orientated NE-SW, with bow at the NE end. Associated with magnetic anomalies SN3-P-UMC058 (251nT) and SN3-P-MC024 (734nT)	High	18m
CA_3004	362602	6080033	SSS Anomaly SN3-P-SC0994 (7 x 4m) associated with bathymetric feature 7 x 5 x 1.2m. Possible rock or archaeological material	Low	N/A
CA_3005	361790	6076493	Magnetic Anomaly SN3-D-UMC0456 (92nT)	Low	N/A
CA_3006	361798	6076399	Collection of three magnetic anomalies: SN3-D-UMC0356 (125nT), SN3-D-UMC0358 (127nT) and SN3-D-MC0036 (72nT)	Medium	20m
CA_3007	359439	6066163	Cluster of magnetic anomalies SN3-D-UMC0425-31 (10-38nT). No anomalies visible in SSS or bathymetry	Low	N/A
CA_3008	357593	6063621	Magnetic anomalies SN3-D-MC0089 (176nT) and SN3-D-MC0141 (257nT)	Low	N/A
CA_3009	352367	6059105	SSS Anomaly SN3-D-SC0403 (3x2m) associated with Magnetic Anomaly SN3-D-MC0011 (27nT)	Medium	25m
CA_3010	352270	6059275	Magnetic anomalies SN3-D-UMC0144-49 (31-55nT). Single clearly defined SSS anomaly 3 x 2m. No associated bathymetry anomaly	Medium	20m
CA_3011	352686	6059505	Pair of oval depressions, 10 x 7m, visible in SSS and bathymetry. No associated magnetic anomalies	Low	N/A
CA_3012	352159	6059209	SSS anomaly 3 x 1m. No magnetic or bathymetry anomaly	Low	N/A
CA_3013	351415	6058815	SSS anomaly 3 x 1m. No magnetic or bathymetry anomaly	Low	N/A
CA_3014	350161	6059103	Cluster of small (<1m) angular dark SSS reflectors, possibly indicating debris	Low	N/A
CA_3015	347470	6058576	Magnetic anomaly SN3-D-UMC0091 (96nT) associated with a series of linear SSS anomalies, possibly fishing gear, covering an area c. 7x10m.	Medium	20m
CA_3016	346801	6058348	Magnetic anomalies SN3-D-UMC0062 (4nT) and SN3-D-UMC0066 (50nT)	Low	N/A
CA_3017	345808	6058151	Magnetic anomalies SN3-D-MC0018 (7nT), SN3-D-UMC0053 (8nT) and SN3-D-UMC0054 (19nT)	Low	N/A
CA_3018	345047	6058014	Magnetic anomaly SN3-D-MC0023 (14nT) associated with SSS anomaly SN3-D-SC0885 (3.4 x 3.3 x 2.9m)	Medium	15m
CA_3019	344566	6057880	SSS anomalies SN3-D-SC0878 and SN3-D-SC0879, both linear angular dark reflectors up to 6m in length	Low	N/A
CA_3020	344398	6057662	Magnetic anomaly SN3-D-UMC0042 (146nT)	Low	N/A
CA_3021	344196	6057551	Cluster of magnetic anomalies SN3-D-UMC0030-39 (6-60nT)	Medium	35m
CA_3022	343003	6056531	Magnetic anomaly SN3-D-MC0009 (738nT) associated with bathymetry anomaly measuring 22 x 14 x 2m. Also visible in SSS.	Medium	35m
CA_3023	337556	6055591	Magnetic anomaly SN3-T-UMC074 (166nT) associated with area of rough seabed, possibly associated with debris.	Medium	20m

Sites of cultural heritage interest in proximity to the CSC

3.17. Sixteen wrecks and one monument are located within the SCOT-NI 3 CSC (table 3). There are no designated or protected wrecks, nor any scheduled monuments below MHWS. Full details of all gazetteer entries can be found in the DBA (Coracle Archaeology 2020b).

Table 3 Sites of cultural heritage interest in proximity to the CSC

CA no.	Name	Type	Date	Status	UTM 30N Easting	UTM 30N Northing
CA3_1	Unknown	Wreck	1775	Unknown	363093	6080110
					362309	6078900
CA3_2	<i>Goodintent</i>	Wreck	1799	Unknown	363093	6080110
CA3_3	<i>Deveonshire</i>	Wreck	1810	Unknown	361808	6078990
CA3_4	<i>James</i>	Wreck	1811	Unknown	361807	6078990
CA3_5	<i>Mary</i>	Wreck	1820	Unknown	363089	6080310
CA3_6	<i>Elizabeth</i>	Wreck	1858	Unknown	362990	6080210
					361807	6078990
CA3_7	<i>Ossier</i>	Wreck	1866	Unknown	360251	6069070
					361808	6078990
CA3_8	<i>Mauritus</i>	Wreck	1872	Unknown	361809	6078990
CA3_9	<i>Elizabeth & Ann</i>	Wreck	1879	Unknown	361809	6078990
CA3_10	<i>Norseman</i>	Wreck	19thc	Unknown	361808	6078990
CA3_11	Unknown	Wreck	19thc	Unknown	362798	6079710
CA3_12	Unknown	Wreck	19thc	Unknown	361809	6078990
CA3_13	<i>Perseverance</i>	Wreck	19thc	Unknown	361807	6078990
CA3_14	Unknown	Wreck	1943	Unknown	363093	6080110
CA3_15	<i>Phasma</i>	Wreck	19th-20thc	Unknown	363207	6080330
CA3_16	<i>Morning star</i>	Wreck	20thc	Unknown	363093	6080110
CA3_17	<i>St Kain's well</i>	Monument	1893	Unknown	362309	6078900
n/a	Beach shelter/ boat house	Site	Unknown	n/a	363093	6080110

3.18. Little or no information is available for many of these wrecks and their locations are considered tentative at best (e.g. CA3_2; CA3_4-5; CA3_8; CA3_11-13; CA3_15-16). It is likely therefore that they are representative of reports of losses within the area, rather than the physical location of known wreck sites and incidents. No anomalies were identified at or in proximity to these locations during the archaeological review of the

marine survey data, nor were the remains of **CA3_11**, an unknown vessel reportedly lost inshore, visible at low water. These wrecks will not be considered further in this report.

- 3.19. An unnamed vessel (**CA3_1**) carrying a cargo of cotton, tallow and lemons was reportedly lost off the coast of Portpatrick on 20 January 1775. The wreckage and cargo were salvaged from Dunskey Glen (canmore.org.uk). The wreck of the Deveonshire (**CA3_3**; possibly Downshire), a British packet vessel lost on 17 November 1810 is also recorded at this site, though it is noteworthy that the HER and HES report different locations for both wrecks (see table 3), suggesting that the location should be considered tentative at best.
- 3.20. No geophysical anomalies were recorded at either of the locations, nor were the remains of the vessel visible at low water, at the inshore location given in the HER, during the walkover surveys. A clearly defined vessel hull is, though, visible in the marine geophysical datasets approximately 210m SSE of the position assigned by HES (**CA_3003**; see Coracle Archaeology 2020c). The anomaly measures c. 18m in length, with a visible beam of c. 3m. Another unknown wreck (**CA3_14**) is situated c.290m SW of **CA_3003**. The archaeological potential of this anomaly is considered to be high.
- 3.21. An AEZ of 18m radius has been assigned to protect **CA_3003**. The wreck lies perpendicular to the coast and parallel to the Proposed Development; the AEZ ensures a minimum of 15m clearance on all sides. The anomaly is also located in close proximity to **CA_3002**, with the two AEZs intersecting (see Coracle Archaeology 2020c).
- 3.22. *Elizabeth* (**CA3_6**) was a British sloop of 23 grt, built in 1853 and registered in Stranraer. The vessel was driven from anchor at Portpatrick whilst under ballast on 13 July 1858. The crew made it ashore, but the uninsured vessel was wrecked. HES record the wrecking incident in the same location as that of the *Ossier* (**CA3_7**), a Northern Irish brig *en route* from Workington to Belfast with a cargo of coal when it was wrecked on 13 January 1866. The crew were rescued by the Portpatrick coastguard using a rocket apparatus. Alternative locations for both these incidents are recorded in the Dumfries and Galloway HER (see Coracle Archaeology 2020b); no wreckage associated with these records were detected in the survey data at either of the reported locations, nor

were any remains visible at low water in the inshore location suggested in the HER during the walkover surveys. These wrecks will not be considered further in this report.

- 3.23. The *Elizabeth and Ann* (**CA3_9**) was a Northern Irish wooden dandy of 40 grt. It was built in Belfast in 1816, and was owned at the time of its loss by W. Whyte. It foundered *en route* from Workington to Mill Bay on 29 November 1879 with a cargo of coal (canmore.org.uk). No anomalies were visible in the archaeological analysis of marine geophysical survey data at or around the reported location, and it will not be considered further here.
- 3.24. The *Norsemen* (**CA3_10**) was a steamship of 155 grt, built at Paisley in 1875 and owned at the time of its loss by JJ McFarlane of Glasgow. The coastal steamer is believed to have foundered during a gale off the coast of Portpatrick, with the loss of all nine crew. Wreckage confirming the wreck's identity was subsequently washed ashore between Portpatrick and Knock Bay. No exact date of loss is provided, and no wreckage associated with this recorded loss was detected in the geophysical survey data. It will not be considered further in this report.
- 3.25. One monument (**CA3_17**) is recorded within the CSC. *St Kain's well* (or St Cainneach or Canigus) is classified as a Holy Well; a well or spring reputed to possess healing properties (canmore.org.uk). The monument is recorded in the same location as **CA3_1** and **CA3_3**, described above; the location should therefore be considered arbitrary. No anomalies were detected in the geophysical survey data, nor were any remains visible at low water during the walkover surveys. It will not be considered further in this report.
- 3.26. A potential new site was identified on the beach at Portpatrick during the landfall surveys. A stone-built shelter measuring c. 4.5m x 2m with a height of c. 1.8m is possibly the remains of a beach hut or boat house (see Coracle Archaeology 2020c for more information). The site is located c. 37m away from the Proposed Development and will not be impacted by it. It will not therefore be considered further in this report.
- 3.27. A series of linear anomalies visible on the seabed surface in the MBES data, some associated with magnetic anomalies (**CA_3002**; Coracle Archaeology 2020c), are indicative of scour around an upstanding feature. The origin of these features is unclear,

but they are likely to represent a scatter of debris on the seabed. It is possible that they represent exposure cables, possibly the Donaghadee - Portpatrick No.6 / No.7 telecommunications cable, although the area over which these features are visible would suggest that it is not a single cable exposure. It could represent exposures of the earlier Donaghadee - Portpatrick Anglo-Irish cables; the original cable was laid in 1870 (No. 1), with further cables laid in 1893 (No. 2), 1922 (No. 3), 1937 (Nos 4 & 5) and 1950 (Nos 6 & 7). The possibility that it is indicative of a previously unmapped wreck-site cannot, however, be discounted. The archaeological potential of this anomaly is considered to be high.

3.28. Nine geophysical anomalies are classified as having medium archaeological potential:

- an SSS anomaly (**CA_3001**) of 3.2m x 1m is associated with a depression visible in the bathymetric data, measuring 5.6m x 2.7m x 0.15m;
- a collection of three magnetic anomalies (**CA_3006**) ranging from 72nT (nanoTesla) to 127nT;
- an SSS anomaly of 3m x 2m (**CA_3009**) associated with a magnetic anomaly of 27nT;
- a cluster of magnetic anomalies (31-55nT) associated with a single, clearly defined SSS anomaly of 3m x 2m (**CA_3010**). No corresponding depression is visible in the bathymetry;
- a magnetic anomaly (**CA_3015**) of 96nT, associated with a series of linear SSS anomalies covering an area of c. 7m x 10m. It is possible that these may be fishing gear;
- a magnetic anomaly (**CA_3018**) of 14nT, associated with an SSS anomaly measuring 3.4m x 3.3m x 2.9m;
- a cluster of magnetic anomalies (**CA_3021**) ranging from 6-60nT;
- a magnetic anomaly (**CA_3022**) of 738nT associated with a bathymetric anomaly measuring 22m x 14m x 2m. This anomaly is also visible in the SSS data; and

- a magnetic anomaly (**CA_3023**) of 166nT associated with a rough area of seabed, possibly indicative of debris.

3.29. A further 12 anomalies are classified as having low archaeological potential. AEZs are not considered necessary, and they will not be considered further here.

3.30. Five of the proposed AEZs are encroached by the current Proposed Development. Of these, two are deemed to be of high, and three of medium archaeological potential. None correspond directly to known historic assets identified in the DBA. Further mitigation and avoidance strategies will need to be adopted to ensure that there are no adverse impacts from the Proposed Development on any potential cultural heritage assets

Table 4 AEZs encroached by the current Proposed Development

CA no.	Easting UTM 30N	Northing UTM 30N	Description	Archaeological Potential	Proposed AEZ Radius
CA_3002	363003	6079953	Collection of SSS anomalies on the seabed (SN3-P-SC1049-54 and SN3-P-USC0272), each 4-11m in length. Suggest a wide debris spread, with the northernmost SSS anomaly (SN3-P-USC0272) associated with a series of magnetic anomalies up to 227nT (SN3-P-UMC064). Bathymetry shows two depressions, the southwestern most (centred on SN3-P-SC1051) measures 22 x 33 x 0.2 m, while the northwestern most (centred on SN3-P-USC0272) measures 11 x 13 x 0.4m. Some of these anomalies could relate to the Donaghadee-Portpatrick No6/No7.	High	25m
CA_3003	362974	6079939	Visible shipwreck outline (SSS Anomaly SN3-P-USC0274) measuring 18 x 2.8 x 0.3m, orientated NE-SW, with bow at the NE end. Associated with magnetic anomalies SN3-P-UMC058 (251nT) and SN3-P-MC024 (734nT)	High	18m
CA_3006	361798	6076399	Collection of three magnetic anomalies: SN3-D-UMC0356 (125nT), SN3-D-UMC0358 (127nT) and SN3-D-MC0036 (72nT)	Medium	20m
CA_3010	352270	6059275	Magnetic anomalies SN3-D-UMC0144-49 (31-55nT). Single clearly defined SSS anomaly 3 x 2m. No associated bathymetry anomaly	Medium	20m
CA_3021	344196	6057551	Cluster of magnetic anomalies SN3-D-UMC0030-39 (6-60nT)	Medium	35m

Submerged palaeo-landscapes

3.31. The stratigraphic sequence outlined in the DBA was confirmed by the SBP and geotechnical data (see Coracle Archaeology 2020b & c). No features with archaeological potential, e.g. palaeo-channels containing fine-grained/ organic deposits, were visible in

the data provided, and the potential for the presence of submerged palaeo-landscapes within the CSC is considered to be low.

4. CONCLUSIONS

- 4.1. Detailed investigations have sought to assess the archaeology, the submerged palaeo-archaeology and the archaeological potential of the proposed route of SCOT-NI 3. This will ensure that the impact of the Proposed Development on the cultural heritage resource will be minimised.
- 4.2. Assessment of the sub-bottom and geo-technical survey data did not reveal the presence of any palaeo-environmental features that might be considered to be of archaeological potential.
- 4.3. The desk-based assessment identified 17 cultural heritage assets within the CSC, including 16 wrecks and one monument. None of these are protected wrecks or designated monuments, and none were positively identified during the analysis of the marine geophysical or landfall survey data.
- 4.4. No anomalies of archaeological potential were identified in the geophysical and metal-detector surveys at the landfall locations. Walkover surveys identified one potential new feature, a stone-built beach shelter or boat house, at Portpatrick. It is located on the periphery of the CSC and will not be impacted by the Proposed Development.
- 4.5. A total of 23 geophysical anomalies with archaeological potential were identified along the CSC, none of which correspond to any of known historic assets identified in the DBA. Two of the anomalies are classified as of high, nine of medium, and 12 of low archaeological potential. AEZs have been proposed for 11 anomalies considered to be of high or medium archaeological potential.
- 4.6. Five of the AEZs are intersected by the current Proposed Development. Further mitigation and avoidance strategies will need to be developed around these AEZs to ensure the Proposed Development does not have an adverse impact on potential cultural heritage assets.

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BT Scotland- Northern Ireland: SCOT-NI 4

*Marine archaeology and
cultural heritage
Technical report*

for
Intertek

CA ref: 190203

November 2020



BT Scotland-Northern Ireland: SCOT-NI 4 cable

Marine archaeology and cultural heritage technical report

Coracle project no.: 190203

Coracle report no.: 190203.5

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SUMMARY

Project name: BT Scotland-Northern Ireland: SCOT-NI 4

Coracle Archaeology was commissioned by Intertek Energy & Water Consultancy Services on behalf of British Telecommunications (BT) to provide marine archaeological services in support of the BT Scotland-Northern Ireland telecommunications cables project. These services included an archaeological desk-based assessment, an assessment of geophysical and geotechnical data, and walkover and geophysical surveys at the landfall locations, the findings of which are collated here.

The BT-Scotland-Northern Ireland telecommunications cables project is a proposed submarine telecommunications cable system between Scotland and Northern Ireland, comprising two individual, discrete cables:

- **SCOT-NI 3** - landfall at Portpatrick, Scotland and Donaghadee, Northern Ireland; and
- **SCOT-NI 4** - landfall at Girvan, Scotland, and Larne, Northern Ireland.

This technical report presents a summary of the archaeological assessments along the proposed cable route of SCOT-NI 4 (Girvan to Larne). A separate report has been prepared for SCOT-NI 3.

The desk-based assessment provided a base line assessment of known sites and features of cultural heritage significance within a 1km study area, centred on the proposed cable route. This report summarises the results solely from within the 500m wide cable survey corridor, which corresponds with the marine geophysical and geotechnical survey areas. Assessment of marine geophysical and bathymetric survey data included the analysis of multibeam echosounder, sidescan sonar, magnetometer and sub-bottom profiler data. The geotechnical assessment reviewed data from cone penetration tests, gravity cores and grab samples to assess the archaeological and palaeo-environmental potential of the sub-surface sediments. The non-intrusive surveys at the proposed landfall locations comprised walkover, hand-held metal-detector and geophysical surveys.

The desk-based assessment recorded seven cultural heritage assets within the SCOT-NI 4 cable survey corridor, including five wrecks, one aircraft and one monument. The non-intrusive landfall surveys assessed both known historic assets and the cultural heritage potential of the study area. No features of clear archaeological potential were identified.

Analysis of the marine geophysical survey data identified 15 geophysical anomalies with archaeological potential; it is possible that one relates to a known historic asset previously recorded beyond the cable survey corridor. Archaeological exclusion zones have been proposed for seven of these anomalies, including four considered to be of high, and three of medium archaeological potential. The geo-archaeological assessment of the sub-bottom profile data and the collected samples did not reveal any features with palaeo-environmental or archaeological potential.

Two of the archaeological exclusion zones are intersected by the current Proposed Development and will require further mitigation.

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LIST OF ACRONYMS USED IN THE TEXT

ADS	Archaeology Data Service
BMH	Beach manhole
CA	Coracle Archaeology
CD	Chart Datum
CifA	Chartered Institute for Archaeologists
COARS	Coastal and Offshore Archaeological Research Services
CPT	Cone penetration test
CSC	Cable survey corridor
EMODnet	European Marine Observation and Data Network
EPSG	European Petroleum Survey Group
FGMG	Fugro Germany Marine GmbH
GC	Gravity core
GIS	Geographic Information System
GPS	Global Positioning System
GS	Grab sample
grt	Gross registered tonnage
HER	Historic Environment Record
HERoNI	Historic Environment Record of Northern Ireland
HES	Historic Environment Scotland
ka	Kilo annum
LAT	Lowest astronomical tide
MBES	Multibeam echosounder
MHWS	Mean high water springs
nm	Nautical miles
nT	nanoTesla
OSGB	Ordnance Survey Great Britain
RoW	Receiver of Wreck
RSL	Relative sea level
SBP	Sub-bottom profiler
SEA	Strategic Environmental Assessment
SSS	Sidescan sonar
UKHO	United Kingdom Hydrographic Office
UTM	Universal Transverse Mercator
VORF	Vertical Offshore Reference Frames
WGS	World Geodetic System
WOSAS	West of Scotland Archaeology Service
WSA	Wider study area

1. INTRODUCTION

Outline

- 1.1. Coracle Archaeology (CA) was commissioned by Intertek Energy and Water Consultancy (Intertek) on behalf of British Telecommunications (BT) in July 2020 to undertake marine archaeology environmental assessments for the BT Scotland-Northern Ireland telecommunications cables project, including an archaeological desk-based assessment (DBA), non-intrusive geophysical and walkover surveys at the landfall locations, and an assessment of geophysical and geotechnical survey data. The results of these assessments are collated in this technical report.

Proposed development

- 1.2. The BT Scotland-Northern Ireland telecommunications cables project is a proposed submarine telecommunications cable system between Scotland and Northern Ireland, comprising two individual, discrete cables:
- **SCOT-NI 3** - landfall at Portpatrick, Scotland and Donaghadee, Northern Ireland; and
 - **SCOT-NI 4** - landfall at Girvan, Scotland, and Larne, Northern Ireland.
- 1.3. The existing cables (SCOT-NI 1 & 2) are nearing the end of their functional life, and require replacement to maintain crucial telecommunication services. The project intends to add additional capacity to the existing cables, aiming ultimately to replace them.
- 1.4. This report focuses solely on the proposed route of SCOT-NI 4 (henceforth 'the Proposed Development'). A separate technical has been prepared for SCOT-NI 3 (Coracle Archaeology 2020a).
- 1.5. The proposed route for SCOT-NI 4 will run for 84.4km between Girvan, Scotland, and Larne, Northern Ireland, including 57.5km in Scottish waters and 26.9km in Northern Irish waters. At Girvan, the existing beach manhole (BMH) infrastructure will be utilised. If necessary, a new BMH may be constructed at Larne.

Archaeological assessments

- 1.6. The marine archaeological DBA gathered and collated data for all known sites and features of cultural heritage significance within and in proximity to the 500m cable survey corridor (CSC). The DBA also assessed a wider study area (WSA) 1km either side of the Proposed Development, facilitating a broader understanding of the archaeological potential of the region (Coracle Archaeology 2020b). This technical report collates records solely from within the CSC.
- 1.7. The non-intrusive landfall surveys at Girvan and Larne utilised walkover, geophysical (electro-magnetic conductivity) and metal-detector surveys to identify sites and features of archaeological potential. These were compared with the results of the DBA to provide a fuller understanding of the archaeological potential of the proposed landfalls, and to assess the potential impact of the proposed development (Coracle Archaeology 2020c). The landfall geophysical survey data were collected by Coracle Archaeology and assessed by our colleagues at Headland Archaeology.
- 1.8. The marine geophysical and geotechnical survey, conducted by Fugro Germany Marine GmBh (FGMG), collected multibeam echosounder (MBES), sidescan sonar (SSS), magnetometer and sub-bottom profiler (SBP) data. These geophysical datasets were then assessed to identify, locate and characterise anomalies of archaeological potential along the CSC, with selection based on the presence of multiple lines of evidence (confirming datasets).
- 1.9. Any known and located historic assets, and geophysical anomalies identified as being of high or medium archaeological potential were then assigned an archaeological exclusion zone (AEZ) to protect them from impacts by the Proposed Development.
- 1.10. The datasets were used also to assess the archaeological and palaeo-environmental potential of sub-surface sediments (Coracle Archaeology 2020c). These were then compared with the results of the DBA. Marine geophysical and geotechnical survey data were assessed for Coracle Archaeology by our colleagues at Coastal and Offshore Archaeological Research Services (COARS), University of Southampton.

2. AIMS AND OBJECTIVES

- 2.1. The aim of this technical report is to present our current understanding of the marine archaeology and cultural heritage that exists within and in proximity to the proposed development.
- 2.2. The objectives of the report are:
- to synthesise all the project-specific archaeological assessments that have been completed to date; and
 - to include information relevant only to the current proposed development.
- 2.3. All superfluous information, such as the legislative framework and professional guidance, data sources, survey and assessment specifications and methods etc, has been removed but can be found with reference back to the original report.

Geographical scope

- 2.4. The DBA assessed a 500m wide CSC and 2km wide WSA centred on the Proposed Development, along the entire route from mean high water springs (MHWS) at the proposed landfall locations. The WSA enabled an assessment of the archaeological potential along the route, and highlighted notable sites in the vicinity of the proposed development. The purpose of the DBA was to identify known and potential sites within the CSC that could be affected by the Proposed Development.
- 2.5. Though strictly beyond the remit of the report, the DBA also assessed the archaeological potential of the area in the immediate vicinity of the landfall location, contributing to a broader understanding of the results of the landfall surveys (see Coracle Archaeology 2020c). This technical report collates records solely from within the 500m wide CSC.

Consultation with statutory bodies

- 2.6. The primary statutory bodies consulted for the DBA were Historic Environment Scotland and Historic Environment Division, Department for Communities, Northern Ireland. Consultations were also held with the offices of the South Ayrshire HER, as curated by the West of Scotland Archaeology Service (WoSAS). Owing to ongoing COVID-19

constraints at the time of reporting, it was not possible to consult with local curators at Larne.

3. RESULTS

Palaeo-environment baseline assessment

- 3.1. The following section outlines the nature of the existing environment in the vicinity of the Proposed Development, through a review of available data and published sources. It assists in the analysis of seabed and sub-seabed deposits, and enables the identification of those likely to be of palaeo-environmental and archaeological interest.
- 3.2. The bathymetry of the study area clearly shows the presence of the deep North Channel that separates Scotland from Northern Ireland. The channel passes through the centre of the route corridor, reaching a maximum depth of c. 200m below chart datum (CD). Either side of this channel, the bathymetry shallows gradually towards the coastline, reaching c. 60m below CD c. 30km from Girvan and 5-10km from Larne.
- 3.3. The geology along the CSC consists largely of undifferentiated bedrock situated below shallow superficial deposits, ranging in age from the Ordovician on the Scottish shore through to Upper Cretaceous deposits and Tertiary-age Lower Basalts around Larne.
- 3.4. The superficial deposits across the seabed in the western part of the study area are composed of thin sands and gravels (less than 1m and often <0.3m in thickness). These occasionally overlie localised thick deposits of glacial till (sometimes exceeding 50m in thickness) preserved within incised channels running parallel with the North Channel.
- 3.5. By contrast, thick deposits of acoustically-layered, silty-clay, up to 30m in thickness, dominate the proposed route in Scottish waters in the lower Firth of Clyde. These overlie 5-10m of till sitting on the bedrock surface and extend up to 30km offshore from Girvan.
- 3.6. Where these layered silty-clays have been investigated, the reflectors have been shown to be unrelated to lithological changes and the sediment-type appears relatively homogeneous. These deposits are likely to have been deposited in a marine

environment in the late-glacial period, though fluctuations in sea-level could have led to some deposits in shallow water becoming littoral. This is evident along the Ayrshire coastline, where a wedge of sand interfingers seawards into the deeper water clay facies.

- 3.7. Investigations of the base of the layered silty-clays, south-east of Campbeltown, Kintyre have shown that the base of the sequence was likely to have been deposited during the Windermere interstadial, c. 14.7-12.7 kilo annum (ka). The Loch Lomond stadial cooling (c. 12.7-11.7 ka) was observed by a significant reduction in cysts, with a further increase in populations indicating the onset of the Holocene period c. 11.7 ka (Deegan *et al.* 1973). To the west, the thickness of superficial deposits significantly reduces towards the North Channel area where the strong tidal currents result in very thin and discontinuous deposits.
- 3.8. The later Pleistocene history of the area is dominated by Late Devensian events associated with the British Irish Ice Sheet, pre-dating the deposition of acoustically-layered silty-clay. Investigations of the glacial history of this area suggest that ice expansion towards the shelf edge commenced c. 35-32 kilo annum (ka), initially spreading into Ireland, the Irish Sea Basin and northern England, before the establishment of an ice divide across the North Channel c. 28-27 ka (Clark *et al.* 2012; Hughes *et al.* 2014; Ballantyne & Small 2019). During this expansion, the North Channel would have constituted an important ice flow path for the ice sheets, forming a substantial ice stream network together with ice from Ireland and northern Scotland (Hughes *et al.* 2014). This persisted until the separation of the British and Irish Ice Sheets c. 17-16 ka (Clark *et al.* 2012).
- 3.9. The high glacial load in this region indicates that post-glacial relative sea level (RSL) change has been non-monotonic, falling from well above present to a minimum in the early Holocene, then rising again to a mid-Holocene high-stand, before falling to present levels (Shennan *et al.* 2018; Carter 1982). Coastlines emergent after glacial retreat are today recognised as relict features up to 20m above modern sea level. Early Holocene

sea levels at c.11 ka are likely to have been only 5-15m below the present level, rising to about 5-10m by c. 6 ka.

- 3.10. This interplay between eustatic and isostatic factors throughout the late Pleistocene and Holocene means that the potential zone for locating submerged palaeo-landscapes on both the Scottish and Northern Irish coastlines is confined to near-shore and on-shore areas, located between c. -15 and +30m. This is replicated in other studies within the Irish record: Westley and Woodman (2020), for example, demonstrate that chronologically constrained (i.e. concentrated within the Holocene, with perhaps brief windows into the late Glacial) and extensive submerged landscapes are likely to be rare, given the limited shelf exposure, glacial history and high-energy conditions. Evidence for submerged palaeo-landscapes and prehistoric activity are therefore likely to be found only within 1-2km of each respective landfall, with the rest of the route sub-tidal throughout the post-glacial period (see Deegan *et al.* 1973).

Archaeological assessments

Summary

- 3.11. The DBA highlighted seven records within the CSC along the entirety of the proposed route, including five wrecks, one aircraft and one monument (Table 1). In addition, following the analysis of the marine geophysical survey data (Coracle Archaeology 2020c), one wreck (**CA4_18**) that was initially recorded beyond the CSC is now included within this assessment. There are no designated or protected historic assets within the SCOT-NI 4 CSC.
- 3.12. The landfall walkover surveys located and recorded known assets highlighted in the DBA, including one monument within the CSC at Girvan (see Coracle Archaeology 2020c). No known assets were identified at Larne in the DBA, and no new features of archaeological potential were observed within the CSC at either location.

Table 1 Cultural heritage assets within the CSC

Type	CSC
Wreck	6
Aircraft	1
Obstruction	0
Findspot	0
Monument	1
Site	0
Total	8

- 3.13. Electrical conductivity surveys conducted at both landfall locations did not identify any anomalies of archaeological potential (see Coracle Archaeology 2020c).
- 3.14. The presence of scrap metal on the beaches at Girvan and Larne may account for the significant numbers of metal-detections at both locations. At Girvan, it is possible to discern some line-patterning in the data; at Larne the combination of scrap-metal and casual beach losses may explain the seemingly random distribution of detections, many of which appear to have been moved by the tides, close to the high water mark (Coracle Archaeology 2020c).
- 3.15. Fifteen geophysical anomalies with archaeological potential were identified during the analysis of marine survey data (Table 2; see also Coracle Archaeology 2020c). Of these, four are classified as being of high, and three of medium, archaeological potential. It is possible that one corresponds to a known historic asset.
- 3.16. Archaeological exclusion zones have been defined for all anomalies classified as being of high or medium archaeological potential, ranging in radius from 18-50m. Two AEZs are currently intersected by the Proposed Development (**CA_4002; CA_4013**).
- 3.17. Other geophysical anomalies identified in the survey data consisted of boulders, often with associated scour. These anomalies had no associated magnetic signature so are likely to be natural in origin and have no archaeological potential.

3.18. A number of in-operation cables were also identified crossing the CSC. Anomalies associated with these cables are not considered further in this archaeological assessment (see Global Marine 2020 for more information).

Table 2 Geophysical anomalies within the CSC

CA no.	Easting UTM 30N	Northing UTM 30N	Description	Archaeological Potential	Proposed AEZ Radius
CA_4001	376047	6120983	Magnetic anomalies SN4-G-UMC018 (119nT) and SN4-G-UMC019 (137nT). No SSS or bathymetry anomalies	Low	N/A
CA_4002	371356	6120172	Magnetic anomalies SN4-D-UMC0350-55 (55-172nT) associated with area of increased seabed roughness in SSS	Medium	30m
CA_4003	370391	6119987	Magnetic anomaly SN4-D-MC157 (102nT)	Low	N/A
CA_4004	369743	6120053	Magnetic anomalies SN4-D-UMC0423-28 (1-53nT)	Low	N/A
CA_4005	366358	6119530	SSS anomaly, 15 x 2m	Low	N/A
CA_4006	365705	6119524	Magnetic anomaly SN4-D-MC191 (347nT)	Low	N/A
CA_4007	361228	6118890	SSS anomaly SN4-D-SC4955, 20 x 4 x 1m, showing a linear feature within a bathymetric depression measuring 55 x 24 x 2m. Possible wreck site	High	40m
CA_4008	353851	6117914	Magnetic anomaly SN4-D-MC073 (127nT)	Low	N/A
CA_4009	348136	6118686	SSS anomaly SN4-D-SC4154 (24 x 5 x 0.7m) linear anomaly visible in both SSS and bathymetry, attributed to a wreck site. Possible debris c. 20m to the south associated with SSS anomalies SN4-D-SC4155 and SN4-D-SC4162	High	50m
CA_4010	348112	6118618	SSS anomalies SN4-D-SC4158 and SN4-D-SC4159, possibly debris associated with CA_4009	High	20m
CA_4011	348091	6118577	SSS anomalies SN4-D-SC4152, SN4-D-SC4156, SN4-D-SC4157, SN4-D-SC4160 and SN4-D-SC4161, possibly debris associated with CA_4009	High	30m
CA_4012	339722	6109344	SSS anomaly SN4-D-SC4376 (3/3 x 0.53 x 0.46m), possibly debris	Low	N/A
CA_4013	339430	6107395	Magnetic anomalies SN4-D-MC093 (17nT), SN4-D-UMC1207 (35nT), SN4-D-UMC1208 (36nT) and SN4-D-UMC1209 (53nT) associated with an angular dark SSS reflector, 7 x 3 m	Medium	20m
CA_4014	331417	6094511	SSS anomaly SN4-D-SC0489 (3.7 x 6.3m) associated with bathymetric anomaly	Medium	18m
CA_4015	325779	6087932	Magnetic anomalies SN4-D-UMC1110 (63nT) and Magnetometer Contact (102nT)	Low	N/A

Sites of cultural heritage interest in proximity to the CSC

3.19. Seven assets were recorded within the Scot-NI 4 CSC, including five wrecks, one aircraft and one monument (Table 3). One further wreck (**CA4_18**), initially recorded beyond the CSC, is also considered here. There are no designated or protected wrecks, nor any

scheduled monuments below MHWS. Full details of all gazetteer entries can be found in the DBA (Coracle Archaeology 2020b).

Table 3 Sites of cultural heritage interest in proximity to the CSC

CA no.	Name	Type	Date	Status	UTM 30N Easting	UTM 30N Northing
CA4_1	Unknown	Wreck	Unknown	Unknown	353953	6117970
CA4_2	Unknown	Wreck	Unknown	Unknown	320503	6087160
CA4_3	Unknown	Wreck	1749	Unknown	380499	6121350
CA4_4	<i>Nabby</i>	Wreck	1795	Unknown	380499	6121350
CA4_5	<i>Favourite</i>	Wreck	1870	Unknown	380499	6121350
CA4_6	<i>Bristol Beaufort</i>	Aircraft	1942	Unknown	380499	6121350
CA4_7	<i>Shalloch Castle, Smithy</i>	Monument	Unknown	n/a	381464	6121470
CA4_18	Unknown	Wreck	Unknown	Unknown	347250	6118270

- 3.20. Two unidentified wrecks of unknown status (**CA4_1** and **CA4_2**) are reported within the CSC but no further information is available. No anomalies were visible in the geophysical datasets at or in proximity to their reported locations, so they will not be considered further here.
- 3.21. Three wrecks (**CA4_3-5**) and one aircraft (**CA4_6**) are recorded at the same location in the bay at Girvan. Their locations are considered tentative by Historic Environment Scotland; it is likely therefore that they are representative of reports of losses in the area, rather than the physical location of known wreck sites and incidents. No anomalies were visible at or in proximity to their recorded locations during the archaeological review of the marine survey data, nor were any remains visible at low water during the landfall surveys. They will not be considered further in this report.

- 3.22. One monument, Shalloch Castle (**CA4_7**; also known as the 'Smiddy' or 'Smithy') is recorded on the foreshore within the CSC at Girvan (see Coracle Archaeology 2020b). Demolished in c.1895, it is likely to have been an ordinary cottage rather than a castle, and little remains of it today. The monument is located on the periphery of the CSC, c. 246m from the Proposed Development (though see Coracle Archaeology 2020c for an alternative location, outside of the CSC). The Proposed Development will have no impact on the monument, and it will not be considered further here.
- 3.23. An SSS anomaly consisting of a linear feature measuring 20m x 4m x 1m (**CA_4007**; see Coracle Archaeology 2020c) may be indicative of a previously unmapped wreck site. The anomaly sits in a depression visible in the bathymetric data, measuring 55m x 24m x 2m. No known wreck site was identified in the DBA at this location (Coracle Archaeology 2020b). The archaeological potential of this anomaly is considered to be high.
- 3.24. A clearly defined hull is visible in the both the SSS and MBES datasets (**CA_4009**; Coracle Archaeology 2020c), measuring c.20m in length with a visible beam of c. 5m. A series of SSS anomalies (**CA_4010** and **CA_4011**) are located to the south of the wreck site for a distance of c.120m, which may be indicative of scattered debris. No known wreck site was identified in the DBA at this location (see Coracle Archaeology 2020b). An unknown wreck (**CA4_18**) was, however, recorded lying c. 900m southwest of the wreck site (outside of the CSC, but within the wider study area; Coracle Archaeology 2020b). Given the historical difficulties inherent in reporting losses at sea, it is possible that these represent the same vessel. The archaeological potential of these anomalies is considered high.
- 3.25. Three geophysical anomalies are classified as having medium archaeological potential:
- a cluster of magnetic anomalies ranging from 55-172 nanoTelsa (nT; **CA_4002**), associated with an area of increased seabed roughness apparent in the SSS data;

- four magnetic anomalies ranging from 17-53 nT (**CA_4013**). An angular dark reflector is also visible in the SSS data, measuring 7m x 3m; and
- an SSS anomaly (**CA_4014**) measuring 3.7m x 6.3m, associated with a bathymetric anomaly.

3.26. A further 12 anomalies are classified as having low archaeological potential. AEZs are not considered necessary, and they will not be considered further here.

3.27. Two of the proposed AEZs are encroached by the current Proposed Development (Table 4); both are considered to be of medium archaeological potential and neither correspond to known assets identified in the DBA. Further mitigation and avoidance strategies will need to be adopted to ensure that there are no adverse impacts from the Proposed Development on any potential cultural heritage assets.

Table 4 AEZs encroached by the Proposed Development

CA no.	Easting UTM 30N	Northing UTM 30N	Description	Archaeological Potential	Proposed AEZ Radius
CA_4002	371356	6120172	Magnetic anomalies SN4-D-UMC0350-55 (55-172nT) associated with area of increased seabed roughness in SSS	Medium	30m
CA_4013	339430	6107395	Magnetic anomalies SN4-D-MC093 (17nt), SN4-D-UMC1207 (35nT), SN4-D-UMC1208 (36nT) and SN4-D-UMC1209 (53nT) associated with an angular dark SSS reflector, 7 x 3 m	Medium	20m

Submerged palaeo-landscapes

3.28. The stratigraphic sequence outlined in the DBA was confirmed by the SBP and geotechnical data (see Coracle Archaeology 2020b & c). No features with archaeological potential, e.g. palaeo-channels containing fine-grained / organic deposits, were visible in the data provided, and the potential for the presence of submerged palaeo-landscapes within the CSC is considered to be low.

4. CONCLUSIONS

- 4.1. Detailed investigations have sought to assess the archaeology, the submerged palaeo-archaeology and the archaeological potential of the proposed route of SCOT-NI 4. This will ensure that any impact of the Proposed Development on the cultural heritage resource will be minimised.
- 4.2. Assessment of the sub-bottom and geo-technical survey data did not reveal the presence of any palaeo-environmental features that might be considered to be of archaeological potential.
- 4.3. The desk-based assessment identified seven cultural heritage assets within the CSC, including five wrecks, one aircraft and one monument. Following the review of the marine geophysical survey data, one wreck initially recorded beyond the CSC was also included in this report. None of these are protected wrecks or designated monuments; one was tentatively identified during the analysis of the marine geophysical data.
- 4.4. No anomalies or new features of archaeological potential were identified by the non-invasive surveys at the landfall locations.
- 4.5. A total of 15 geophysical anomalies with archaeological potential were identified along the CSC, including four classified as high, three of medium, and eight of low potential. AEZs have been proposed for each of the anomalies with high or medium archaeological potential.
- 4.6. Two of the AEZs are intersected by the current Proposed Development. Further mitigation and avoidance strategies will need to be developed around these AEZs to ensure it does not have an adverse impact upon potential cultural heritage assets.

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