AtkinsRéalis

Appendix 17-8 – Underwater Archaeological Survey Report

Uisce Éireann
October 2026

BALLINA AND LOUGH TALT WATER SUPPLY UPGRADE

Underwater Archaeological Impact Assessment: Ballina and Lough Talt Water Supply Upgrade, Co. Mayo & Co. Sligo

Archaeological
Management Solutions



Dive Survey Licence No. 26D0002

Detection Device Consent No. 26R0039

By Dr Conn Herriott

For AtkinsRéalis on behalf of Uisce Éireann

March 2026

TITLE PAGE

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Executive Summary

Archaeological Management Solutions (AMS) was engaged by AtkinsRéalis on behalf of Uisce Éireann to carry out an Underwater Archaeological Impact Assessment (UAIA)—including desktop assessment, site walkovers, and underwater surveys—which will inform a broader Environmental Impact Assessment Report (EIAR) in advance of a planning application for the Ballina and Lough Talt Water Supply Upgrade (WSU) between Ballina, Co. Mayo and Lough Talt, Co. Sligo. Previous works undertaken for the project include a Heritage Constraints Report (HCR) produced by Rubicon (O'Flaherty 2024).

This UAIA presents the results of a desktop assessment of recorded archaeological and other cultural heritage sites that lie within and adjacent to the proposed scheme area, as well as the results of: (1) targeted underwater surveys carried out by licence-holding underwater archaeologist Dr Conn Herriott (AMS) and fellow underwater archaeologist Dr Alexander von Lünen (AMS) on 5–6 February 2026; and (2) site walkovers carried out by Conn and fellow archaeologist Niall Jones (AMS) on 24 February 2026 (dive survey licence no. 26D0002; detection device consent no. 26R0039).

The desktop assessment, underwater surveys, and site walkovers focused on (but were not confined to) identifying the scale and nature of any previously unrecorded archaeological and cultural heritage remains in the sections of rivers, streams and lakes at twenty sites where the proposed scheme may impact upon the waterbodies (Table 1).

Combining the results of the desktop assessment, underwater surveys and site walkovers, this UAIA highlights all underwater cultural heritage in the scheme footprint, any likely adverse effects of the proposed scheme on that underwater cultural heritage and presents proposals for archaeological mitigation measures.

No archaeological objects or samples were identified or taken in the course of the surveys and walkovers.

Historic culverts and bridges which may be directly or indirectly impacted by the proposed scheme were identified at Sites 1, 3, 5–7, 9–11, 15 and 20. At four further sites (14, 16, 18 and 19), historic culverts which may be impacted were not visible but were inferred from cartographic evidence. Sites 2 and 8 were not accessible at the time of the underwater surveys due to denial of access by landowners, but a historic bridge which may be impacted was identified from the road at Site 8, and a historic culvert which may be impacted was inferred at Site 2 based on cartographic evidence.

No other direct or indirect impacts arising from the proposed scheme are predicted on any known/recorded cultural heritage within the proposed works area. This UAIA finds that there is **low** potential for unknown cultural heritage remains and archaeological objects within the area which could be directly and negatively impacted by the proposed scheme.

In light of the results of the desktop assessment, underwater surveys and site walkovers, the following archaeological mitigation measures are recommended.

1. All historic bridges, culverts and other identified cultural heritage remains at Sites 1, 3, 5–7, 9–11, 15 and 20 should be preserved *in situ*. If it is not feasible to avoid impacting these cultural heritage features in the course of open-cut trenching for the scheme, they should be archaeologically recorded (i.e., written descriptions, measured survey, photographic recording [see DAHG 2011]).
2. Archaeological monitoring should be carried out for any open-cut trenching at Sites 2, 8, 14, 16, 18 and 19, where no historic culverts were identified/accessible but are likely to be there based on historical mapping. If historic culverts or other features of cultural heritage interest are uncovered in the course of trenching, they should be preserved *in situ*. If this is not feasible, they should be archaeologically recorded.

3. Archaeological monitoring should be carried out for any open-cut trenching works at Site 4. Upcast riverbank and riverbed sediment from any open-cut trenching at Site 4 should be systematically spread (0.2m max. thickness) and searched (visually and using a metal detector), with the location in the river from which each upcast heap was removed to be noted.
4. A toolbox talk should be given by a suitably qualified archaeologist to all proposed works contractors and management, laying out protocols and procedures in the event that unexpected cultural heritage remains or archaeological objects are uncovered in the course of the proposed works.

Recommendations are subject to the agreement of the National Monuments Service (Department of Housing, Local Government and Heritage), the National Museum of Ireland and the local planning authority where required and should only be carried out in accordance with the necessary approvals. Please note that the statutory and local authorities may issue alternative and/or additional recommendations/conditions.

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Abbreviations and Acronyms

Abbreviation/Acronym	Definition
AAP	Area of Archaeological Potential
ACA	Architectural Conservation Area
AMS	Archaeological Management Solutions
CH	Cultural Heritage
DAHG	Department of Arts, Heritage and Gaeltacht
DAHGI	Department of Arts, Heritage, Gaeltacht and Islands
DGPS	Differential Global Positioning System
DHLGH	Department of Housing, Local Government and Heritage
DIER	Database of Irish Excavation Reports
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
GIS	Geographic Information System
GPS	Global Position System
GSI	Geological Survey Ireland
HCR	Heritage Constraints Report
HEV	Historic Environment Viewer
ITM	Irish Transverse Mercator
MCC	Mayo County Council
MGWR	Midland Great Western Railway
NIAH	National Inventory of Architectural Heritage
NMI	National Museum of Ireland
NMS	National Monuments Service
OPW	Office of Public Works
OS	Ordnance Survey
OSI	Ordnance Survey Ireland
RAMS	Risk Assessment Method Statement
RMP	Record of Monument and Places
RPS	Record of Protected Structures
SI	Statutory Instrument
SMR	Sites and Monuments Record
TII	Transport Infrastructure Ireland
UAIA	Underwater Archaeological Impact Assessment
WIID	Wreck Inventory of Ireland Database
WSU	Water Supply Upgrade
WTP	Water Treatment Plant

Coordinate Reference System

All grid coordinates in this report use the Irish Transverse Mercator (ITM) coordinate reference system unless otherwise stated.

1 Introduction

1.1 Project Background

Archaeological Management Solutions (AMS) was engaged by AtkinsRéalis on behalf of Uisce Éireann to carry out an Underwater Archaeological Impact Assessment (UAIA)— including desktop assessment, site walkovers, and underwater surveys—which will inform a broader Environmental Impact Assessment Report (EIAR) in advance of a planning application for the Ballina and Lough Talt Water Supply Upgrade (WSU) between Ballina, Co. Mayo and Lough Talt, Co. Sligo (Figure 1). Previous works undertaken for the project include a Heritage Constraints Report (HCR) produced by Rubicon Archaeology (O'Flaherty 2024).

1.2 Purpose and Scope of this Assessment

The Government policy document *Framework and Principles for the Protection of the Archaeological Heritage* (DAHGI 1999a) states that "where it is considered that a proposed development may (due to its location, size, or nature) have archaeological implications, then an archaeological assessment should be carried out" and defines archaeological assessment as an investigation aimed at:

- "gaining a better understanding of a known or suspected archaeological site or monument with particular reference to considering the implications of proposed development for such a site or monument" and
- "locating previously unidentified archaeological sites or monuments (or possible ones) prior to the commencement of development works with particular reference to considering the implications of proposed development for such sites or monuments" (DAHGI 1999a, 25).

This UAIA presents the results of a desktop assessment of recorded archaeological and other cultural heritage at twenty riverine and lacustrine sites (Table 1) along the proposed scheme route where it had been identified in the HCR that the proposed scheme will potentially impact underwater (and associated) cultural heritage (O'Flaherty 2024). In addition to desktop assessments stipulated by the National Monuments Service (NMS), underwater archaeological surveys were carried out at twelve sites (Sites 1–12) and site walkovers were carried out at a further six sites (Sites 13–16, 19 & 20). Two sites (Sites 17 & 18) were subject to desktop assessments only.

The targeted underwater surveys were carried out by licence-holding underwater archaeologist Dr Conn Herriott (AMS) and fellow underwater archaeologist Dr Alexander von Lünen (AMS) on 5–6 February 2026 (dive survey licence no. 26D0002; detection device consent no. 26R0039, as per Sections 2 and 3 of the National Monuments [Amendment] Act 1987). Site walkovers were carried out by Conn Herriott and fellow archaeologist Niall Jones (AMS) on 24 February 2026.

The desktop assessment, underwater surveys, and site walkovers focused on (but were not confined to) identifying the presence, scale and nature of any previously unrecorded archaeological and other cultural heritage remains in the sections of rivers, streams and lakes at Sites 1–20 where the proposed scheme may impact upon those waterbodies. This UAIA will inform an appropriate mitigation strategy in order to minimise any adverse impacts by the proposed scheme on cultural heritage at those sites.

Table 1: UAIA sites.[1]

UAIA Site No.	HCR Ref.	Townland(s)	Waterbody	Survey Type	ITM
1	CH040	Coonealmore; Broadlands or Knockafarson; Derreens	Abbeytown stream	Wade	522227, 825434
2	-	Coonealmore; Rosserk	Unnamed stream	Wade	522224, 825270
3	CH042	Coonealcauraun; Rathroeen	Unnamed stream	Wade	522819, 823679
4	CH052; CH063 (AAP02)	Behy More; Corimla South	River Brusna	Wade	528712, 818650
5	CH059	Largan; Knocknasliggaun	Glenree River	Wade	537837, 816279
6	CH054; CH065 (AAP04)	Corimla South; Carrownlabaun	Fiddaun River	Wade	530470, 818455
7	CH060	Largan; Gortersluin	Unnamed stream	Wade	539476, 815743
8	CH066 (AAP05)	Carrownlabaun	Srafaungal River	Wade	530899, 818393
9	CH067 (AAP06)	Gortersluin	Unnamed stream	Wade	540535, 814852
10	CH074 (AAP13)	Drumsheen; Bunnyconnellan East	Srafaungal River	Wade	534617, 818322
11	CH075 (AAP14)	Bunnyconnellan West	Unnamed stream	Wade	533415, 818484
12	CH076 (AAP15)	Wherrew	Lough Conn	Dive	517404, 816651
13	CH035; CH069	Lisglennon; Ballinteean	Unnamed stream	Walkover	520420, 826774
14	CH027; CH038	Broadlands or Knockafarson; Rathglass; Derreens	Unnamed stream	Walkover	521987, 826501
15	CH070 (AAP9)	Broadlands or Knockafarson; Derreens	Unnamed stream	Walkover	522252, 825619
16	-	Culleens; Laghta-dawannagh; Farrannoo	Illanmuck River	Walkover	523810, 821588
17	CH023; CH062	Garrankeel; Quignamanger	River Moy	Desktop assessment	525611, 821218

[1] Sites 2 and 8 (shaded grey in Table 1) could not be surveyed due to landowner access permission issues.

UAIA Site No.	HCR Ref.	Townland(s)	Waterbody	Survey Type	ITM
18	CH047	Quignamanger; Rathmeel; Quignashee	Unnamed stream	Desktop assessment	526612, 820655
19	-	Corimla South	Unnamed stream	Walkover	530126, 818438
20	CH058; CH072; CH073	Drumsheen; Knocknasliggaun	Unnamed stream	Walkover	537574, 816408

1.3 Proposed Works

The Ballina and Lough Talt WSU serves a large rural supply area in south Co. Sligo with a population of approximately 13,663 people. The raw water supply for this region is currently abstracted from Lough Talt and treated at Lough Talt Water Treatment Plant (WTP). The proposed project will see increased raw water abstraction from Lough Conn, Co. Mayo at the existing Wherrew Raw Water Intake Site. Currently, two WTPs—Wherrew and Lisglennon—are supplied with raw water which is pumped from the existing intake on the northern shore of Lough Conn.

The proposed project will comprise a number of individual work sites:

- As part of the proposed project, expansion of water treatment capacity will be required at the Lisglennon WTP site, inclusive of all associated process infrastructure in addition to a new storage reservoir at the site.
- An upgraded treated water trunk main network (*c*.30.4km length) will be required between the Lisglennon WTP and Lough Talt WTP sites, via Ballina town. Treated water will gravitate to Ballina and onwards towards Bunnyconnellan.
- A new booster pumping station will be required near Bunnyconnellan, from where water will then be pumped to a new storage reservoir near the existing Lough Talt WTP site. Treated water will then gravitate into the existing Lough Talt Regional Water Supply Scheme network.
- Decommissioning works will be carried out at the existing Lough Talt WTP site, which upon delivery of the proposed project will cease abstraction and treatment of water from Lough Talt.
- Renewable energy generation equipment (solar panels and energy recovery turbines) is proposed to be installed as part of the works at all new and upgraded sites.
- The proposed project will necessitate a new water abstraction licence from the Environmental Protection Agency for the Wherrew WTP at Lough Conn.

2 Legislation, Policy, and Guidance

Among other national and international conventions, legislation and guidelines, the UAIA was undertaken with due regard to the following:

- National Monuments Acts 1930–2014
- Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023[2]
- National Cultural Institutions Act 1997
- Heritage Act 1995
- Local Government (Planning and Development) Act 2000, as amended
- Planning and Development Act 2024
- European Convention on the Protection of the Archaeological Heritage (the 'Valletta Convention'), ratified by Ireland in 1997
- UNESCO Convention on the Protection of the Underwater Cultural Heritage (2001) (the Annex of which governing the conduct of archaeological investigations has been adopted by the Irish State – pending full ratification following the enactment of the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023)
- Framework and Principles for the Protection of the Archaeological Heritage (DAHGI 1999a)
- Policy and Guidelines on Archaeological Excavation (DAHGI 1999b)
- Archaeology and Flood Relief Schemes: Guidelines (DHLGH 2023)
- Standards for the Care and Treatment of Archaeological Objects from Excavations (NMI 2022)
- Guidelines for Cultural Heritage Impact Assessment of TII [Transport Infrastructure Ireland] National Road and Greenway Projects (TII 2025)
- Architectural Heritage Protection: Guidelines for Planning Authorities (DAHG 2011)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022)
- Advice Notes on Current Practice (EPA 2003)
- National Inventory of Architectural Heritage Handbook (NIAH 2025)
- A Living Tradition: A Strategy to Enhance the Understanding, Minding and Handing on of Our Built Vernacular Heritage (DHLGH 2021)
- Places for People: National Policy on Architecture (DHLGH 2022)

[2] This was enacted in October 2023 and while this Act is now law, most of its provisions will not enter into force until the Minister for Housing, Local Government and Heritage has made one or more Commencement Orders. This means that the National Monuments Acts 1930–2014 have therefore not yet been repealed and remain in force.

Underwater cultural heritage is protected by Section 3 of the National Monuments (Amendment) Act 1987 and may include submerged wrecks, archaeological objects, weirs, historic bridges, fording points, navigation structures, revetment walls, crannogs, and other associated structures and features. The dive survey licence (26D0002) and detection device consent (26R0039) with which the archaeological dive and wade surveys carried out as part of this UAIA were required under Sections 3 and 2 respectively of the National Monuments (Amendment) Act.

3 Desktop Assessment

The desktop element of this UAIA was divided into two main components: (1) the collation of baseline data comprising a desktop study, and (2) the analysis of these data to determine any likely impacts.

3.1 Methodology

The desktop study focused on the identification of all recorded and previously unrecorded cultural heritage assets within the immediate vicinity of the proposed scheme. The sources listed in Table 2 below were consulted to cross-check and update this baseline. This component also included a high-level desktop review of other readily available information that can provide an indication of the cultural heritage potential within the area of the proposed scheme.

Inventories of cultural heritage assets were compiled, drawing on data and information recorded, and supplemented through additional research. The suggested importance of any cultural heritage assets was rated as **negligible**, **low**, **medium**, **high** or **very high**, in accordance with the TII guidelines (TII 2025; see below). Relative importance derives from a number of factors including current designation or listing (i.e. RMP, SMR, WIID, RPS, NIAH, or none), preservation/condition, and archaeological, architectural, historic, artistic, cultural, scientific, social or technical interest. These importance ratings are for assessment purposes only and professional judgement has been used to determine the importance of individual cultural heritage assets.

The baseline characterisation (see Section 3.5 below) places the footprint of the proposed scheme into its wider spatial and temporal context. Where relevant previous archaeological investigations or research works have been conducted, summary details of the relevant work is provided.

3.2 Data Sources

The desktop assessment aimed to identify, as far as reasonably practicable, the known and potential underwater cultural heritage assets within and adjacent to the proposed scheme as set out above in Section 1.3. The main sources consulted are detailed in Table 2.

For the purposes of this assessment, recorded wrecks are listed according to their Wreck Inventory of Ireland Database (WIID) reference number. Previously recorded sites/monuments and Recorded Monuments are denoted by their identification number in the Sites and Monuments Record (SMR) and/or the Record of Monuments and Places (RMP). Architectural heritage structures are identified by their reference numbers in the County Mayo and County Sligo Records of Protected Structures (RPS) and/or the National Inventory of Architectural Heritage (NIAH).

Table 2: Sources consulted for the assessment.

Data	Source
Background Information	• *Mayo Development Plan 2022–2028*[3] • *Sligo Development Plan 2024–2030*[4] • Topographical/toponymic data: Lewis 1837;[5] *Logainm.ie* (Placenames Database of Ireland); and *Townlands.ie* (Irish townlands data)
Cartography	• Geological Survey Ireland[6] • Historical Ordnance Survey (OS) Mapping: first-edition six-inch (1838–1839) and 25-inch OS (1898 & 1913) maps via Ordnance Survey Ireland's (OSI, now Tailte Éireann) viewer[7, 8] • Aerial & street views: Google Earth & Digital Globe; orthophotographs via OSI's public viewer; Bing images (QGIS Web Mapping Service); Google Street View
Archaeology	• Record of Monuments and Places (RMP) – statutory list of protected places and monuments, with accompanying constraints maps, published for Co. Sligo in 1995[9] and Co. Mayo in 1996[10] • Wreck Inventory of Ireland Database (WIID), which includes underwater airplane wrecks and aviation archaeology[11] • Historic Environment Viewer (HEV) – online database of information on sites and monuments based on the Sites and Monuments Record (SMR).[12] The HEV provides information not only on those archaeological monuments included in the statutory RMP, but also in regard to many more which have been identified since the RMP was issued • Lists of National Monuments in State Care: Ownership and Guardianship for Co. Mayo

[3] Available at: Mayo County Development Plan 2022-2028 [Accessed: March 2026].

[4] Available at: Sligo County Development Plan 2024-2030 [Accessed: March 2026].

[5] Lewis S. 1837. *A Topographical Dictionary of Ireland*. London: S. Lewis & Co. Available at: https://www.libraryireland.com/topog/placeindex.php [Accessed: March 2026].

[6] Available at: https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228 [Accessed: March 2026].

[7] Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=3ae19cc156bf4706a929304bf8fcc4f6 [Accessed: March 2026].

[8] Available at: https://maps.archaeology.ie/HistoricEnvironment/ [Accessed: March 2026].

[9] Available at: archaeology.ie/app/uploads/2025/03/Archaeology-RMP-Sligo-Manual-1995-0044.pdf [Accessed: March 2026].

[10] https://www.archaeology.ie/publications-forms-legislation/record-of-monuments-and-places [Accessed: March 2026].

[11] Available at https://www.archaeology.ie/underwater-archaeology/wreck-viewer [Accessed: March 2026].

[12] Available at: https://maps.archaeology.ie/HistoricEnvironment/ [Accessed: March 2026].

Data	Source
	and Co. Sligo[13] • List of Preservation Orders held by the NMS, published in 2025[14] • Previous Archaeological Investigations: Database of Irish Excavation Reports (DIER)[15]
Built Heritage	• Mayo Record of Protected Structures (RPS)[16] • Sligo RPS[17] • Mayo Architectural Conservation Areas (ACA)[18] • Sligo ACAs[19] • NIAH Building Survey and Survey of Historic Gardens and Designed Landscapes[20]
Intangible Heritage	• The Dúchas Project – National Folklore Collection UCD Digitisation Project[21] • National Inventory of Intangible Cultural Heritage[22]

3.3 Data Structure

Identified cultural heritage assets were digitally mapped using open-source Geographical Information System (GIS) software QGIS (version 3.44.4) which allows for the positional information from the sources listed above to be spatially analysed and cross-checked with current datasets (GSI, Wreck Viewer, RMP, SMR, NIAH, ACA, RPS, etc.). The most up-to-date version of the WIID (20 June 2024) was also checked (Table 2). Historical mapping and satellite imagery were further explored to identify all other structures and features of potential cultural heritage interest.

3.3.1 Data Gaps and Limitations

The data used to compile this UAIA comprise primarily of various secondary sources and datasets. Key sources have been examined for the purposes of the assessment where available. It is assumed that the information within these sources is reasonably accurate.

[13] Available at: National Monuments in State Care - National Monuments Service [Accessed: March 2026].

[14] Available at: Preservation Order listing for web March 2025.xlsx [Accessed: March 2026].

[15] Available at: https://excavations.ie/ [Accessed: March 2026].

[16] Available at: https://www.mayo.ie/getmedia/e7a3e367-eb96-4370-abbe-0d14f9c10dec/MCDP-Record-of-Protected-Structures-with-cover_1.pdf [Accessed: March 2026].

[17] Available at: Microsoft Word - RPS consolidated list [Accessed: March 2026].

[18] Available at: Mayo County Council Architectural Conservation Areas [Accessed: March 2026].

[19] Available at: Volume 2 – Urban Development [Accessed: March 2026].

[20] Available at: https://www.buildingsofireland.ie/ [Accessed: March 2026].

[21] Available at: https://www.duchas.ie/en [Accessed: March 2026].

[22] Available at: https://nationalinventoryich.tcagsm.gov.ie/ [Accessed: March 2026].

3.4 Impact Assessment Criteria

Evaluation of impacts was carried out with reference to the published EPA guidelines (2003, 2022), *Archaeology and Flood Relief Schemes: Guidelines* (DHLGH 2023), and TII's *Guidelines for Cultural Heritage Impact Assessment* (TII 2025). Likely impacts/effects are categorised as one of two types in accordance with the TII guidelines (TII 2025, 68–69):

- **Direct effect** — where a cultural heritage receptor or its setting is physically located within the footprint of a project which would entail its removal in whole or in part. Direct effects can also be defined as those that are directly attributable to the proposed development. Sites or features that occur within the redline boundary are assessed for potential direct negative effects.
- **Indirect effect** — an effect that results indirectly from the proposed project, often occurring away from the development, or because of a sequence of interrelationships or a complex pathway.

The quality of each predicted impact is classified as **negative**, **positive** or **neutral**. Negative impacts reduce the quality of a cultural heritage receptor and might include total or partial loss of a site, monument, structure or its attendant grounds, visual intrusion, severance, degradation of setting and/or amenity (TII 2025, 69). Positive impacts are changes which enhance or improve the quality of the receptor, including increased physical separation, reduced visual and noise intrusion, and enhancement of setting or amenity (*ibid.*). Where no impact is predicted, the quality of impact is rated as **neutral (none)**. The predicted magnitude (level) of impact is rated as **negligible**, **low**, **medium**, **high**, or **very high** (*ibid.*, 71).

The predicted significance of effect is evaluated by comparing the predicted magnitude of impact with the suggested importance of the asset using the schedule and definitions of significance adapted from the DHLGH guidelines (DHLGH 2023, 45; see also TII 2025, 72). Significance of effect is summarised therein as:

- **Imperceptible** — an effect capable of measurement but without significant consequences;
- **Not Significant** — an effect which causes noticeable changes in the character of the cultural heritage receptor but without significant consequences;
- **Slight** — an effect which causes noticeable changes in the character of the cultural heritage receptor without affecting its importance;
- **Moderate** — an effect that alters the character of the cultural heritage receptor in a manner that is consistent with existing and emerging baseline trends;
- **Significant** — an effect which, by its character, magnitude, duration or intensity alters an important aspect of the cultural heritage receptor;
- **Very Significant** — an effect which, by its character, magnitude, duration or intensity considerably alters most of an important aspect of the cultural heritage receptor;

- **Profound** — an effect which obliterates a cultural heritage receptor of high or very high importance.

3.5 Archaeological Background and Potential (after O'Flaherty 2024)

A detailed archaeological and historical background was compiled as part of the HCR (O'Flaherty 2024, 11–13), reproduced here:

> *Prehistoric activity within the study area is indicated by two fulachtaí fiadh (CH004–CH005) located c.35m from one another in the townland of Farrannoo. Located to the south of the two fulachtaí fiadh was another excavated site, CH006, which comprised three stakeholes located near four discrete thin spreads. The fulachtaí fiadh, CH004 and CH005, lie 50m and 20m respectively from CH006. Given their proximity, CH006 was interpretated as an occupation site associated with the fulachtaí fiadh or as the disturbed remnants of a third fulacht fiadh. Fulachtaí fiadh are the most numerous prehistoric sites in Ireland, with over 4,500 known examples (Power 1990, 13–17). The majority of radiocarbon dates place these monuments in the Bronze Age (Brindley & Lanting 1990, 55–56). Fulachtaí fiadh survive as low mounds, usually horseshoe shaped, of charcoal-enriched soil packed with fragments of heat-shattered stones (termed 'burnt mound'); when levelled, they are often noticeable as black spreads in ploughed fields. They were usually situated close to a water source, like a stream, or in wet marshy areas. It is generally accepted that they were probably used as cooking places (Ó Drisceoil 1988). Water was boiled in a regular pit (lined with wooden planks or stone slabs to form a trough) by the addition of hot stones from a fire close by. O'Kelly (1954, 105–155) showed by experiment that the large quantities of water can be boiled in this way in about twenty minutes. He also demonstrated that meat, wrapped in straw and immersed in the boiling water, cooked at a rate of twenty minutes per pound weight. When the cooking was over the remnants of heat-shattered stones in the trough were discarded to one side. Eventually, after many cookings, these would form a mound curving round three sides of the trough, hence the horse-shape mound (Power et al. 1997, 75). It is not certain whether fulachtaí fiadh were elements of temporary hunting camps or of permanent settlements.*
>
> *There are four levelled enclosures (CH003, CH008–CH009, CH016) and two earthworks (CH010, CH013) within the study area which could date to the prehistoric period, although this is difficult to prove without excavation.*
>
> *The early medieval period (AD c.400–1169) was a time of rapid expansion of agriculture. Throughout this period Ireland was a predominantly rural society characterised by dispersed settlement. The economy was based on mixed agriculture though the rearing of cattle was seen as very important. Ringforts and enclosures are indicative of settlement at this time. Ringforts are undoubtedly the most widespread and characteristic archaeological field monument in the Irish countryside. There are four known ringforts (CH001–CH002, CH011, CH015) within the study area. However, it is possible that the four enclosures could either be levelled ringforts or date to the early medieval period. One of the enclosures (CH016) is located 50m northeast of a ringfort (CH015). The ringfort is basically a circular or roughly circular area enclosed by an earthen bank formed of material thrown up from concentric fosse (ditch) on its outside. Generally, the diameter of the enclosure is between 25 m and 50 m. A single bank and fosse (univallate) are the most usual form; double rings (bivallate) or triple rings (trivallate) are rarer. The number of rings of defence are thought to reflect on the status of the site, rather than the strengthening of its defences (Power 1992, 131). Archaeological excavation has shown that the majority of ringforts were enclosed farmsteads, built in the early medieval period. Though not forts in the military sense, the earthworks acted as a defence against natural predators like wolves, as well as human predators. Local warfare and cattle raiding*

were commonplace at this time. The construction of so many throughout the country, in a relatively short period (400–500 years), reflects on the stability and wealth of society at the time, and also its homogeneity. As well as farming-related activities like corn-grinding and animal husbandry, the ringfort was home to a wide variety of craft industries, including spinning, weaving, metal- and glassworking (Power 1992, 131). One of the ringforts, CH011, contains a souterrain (CH012) within its interior, closed to the bank in the southwest quadrant. Souterrains are early medieval monuments, often found in association with ringforts but can be found in apparent isolation. According to O'Sullivan and Downey (2004), souterrains are artificially made underground structures comprising one or more chambers linked by tunnels called creepways, with a concealed entrance/s. Souterrains vary in complexity, with some simple in design, and others more complex, with two or more interlinked chambers (O'Sullivan & Downey 2004). Two functions have been suggested for souterrains. The first is a place of refuge in times of danger. The second is as a storage cellar where dairy and other food products were stored at cool temperatures (O'Sullivan & Downey 2004).

A key site within the study area is Belleek Abbey, also called Belleek Manor, located in the townland of Garrankeel in Mayo. The country house (CH021) and adjoining stables (CH022) were built for Lieutenant-Colonel Sir Francis Arthur Knox-Gore (1803–1873). Sir Francis Arthur Knox-Gore was created a Baronet in 1868 and was Lord Lieutenant of Sligo from 1831 to 1873. He was the son of James Knox-Gore, Lady Maria Louisa Gore. James Knox-Gore had taken the name Knox-Gore as condition of his grandfather's will, Paul Annesley Gore of Belleek. In the nineteenth century, the Knox-Gore estate included lands in the parishes of Doonfeeny, Kilmoremoy and Ballysakerry, barony of Tirawley, in the parishes of Bohola, Killasser and Kilgarvan, barony of Gallen, in the parish and barony of Burrishoole, county Mayo and in the barony of Tireragh, county Sligo. In 1876, the estate measured to 22,023 acres in county Mayo and 8569 acres in county Sligo but was greatly reduced by the twentieth century (University of Galway 2024). The construction of both the house and stables began in 1825 and was completed by 1831. Sir Francis Arthur Knox-Gore was succeeded by his son Charles James Knox (1831–1890), second Baronet. Charles James Knox commissioned a Mausoleum (CH007) on the manor of Belleek Abbey as a memorial to his Sir Francis Arthur Knox-Gore. The mausoleum is located 150m southeast from Belleek Abbey. Following the death of Charles James Knox, the male line died out and the family was succeeded by the Saunders-Knox-Gore family. In the 1940s, the house was sold to the Beckett family who later resold it to Mayo County Council. The house became a sanatorium, but it now functions as a hotel called Belleek Castle (University of Galway 2024). During the late nineteenth century, there were changes to the study area including the extension of the MGWR. This was opened by the MGWR company in 1893. A crossing guard lodge (CH020) was commissioned in 1893 as part of the railway infrastructure. This was house built by 1896 and was decommissioned in 1934.

3.5.1 Underwater Cultural Heritage

The NMS Wreck Viewer has no record of any wrecks within the scheme footprint; however, it does show two wrecks (W06704 [also MCC RPS 1 & NIAH 31303025] & W06731) located 90m and 120m north respectively of Site 17 (River Moy [CH023, CH062]) (Table 3; Figure 59).[23] The Wreck Inventory of Ireland Database (WIID) records two other wrecks (W06825 & W06947) on the River Moy in the Ballina area; however, the precise locations of these wrecks are unknown (Table 3).[24] The only recorded

[23] National Monuments Service: Wreck Viewer [Accessed: March 2026].

[24] WIID spreadsheet downloaded from Wreck Viewer on 9 March 2026.

wreck in Lough Conn is a boat (W12885) lost in 1816 'eight miles from Crossmolina' and therefore *c.*11km south of the Site 12 survey area. There are no wrecks recorded in the WIID for any other named waterbodies included in this UAIA. Niall Gregory's PhD thesis records no logboats in any of the townlands intersected by the sites focused on in this UAIA (Gregory 1997).

Table 3: Wrecks recorded in the Wreck Viewer and WIID in the general vicinity of the proposed scheme.

WIID No.	Vessel Name	Vessel Type	Date of Loss	Place of Loss	Details
W06704; also MCC RPS 1; NIAH 31303025	*Creteboom*	Tug	22/09/1937	River Moy, Ballina	"[…] A 267-ton steam-powered tug built from ferroconcrete. […] 38m-long vessel completed in July 1920. […] In 1937 the vessel was sold to the Ballina Harbour Commissioners as a derelict vessel. The Commissioners planned to sink it to form a 'groyne' to keep the navigation channel clear at the mouth of the river. However, as the *Creteboom* was being towed into position, it collided with another vessel and was damaged below the waterline. Efforts to keep it afloat failed and the concrete tug drifted and sank mid-channel where it stayed for 30 years. The tug was re-floated during the mid-1970's by the OPW and moved a short distance away from the channel to its present position alongside Belleek Woods, where it helps direct the flow of water along the main navigation channel." (Excerpt from Wreck Viewer)
W06731	*Floweret (Flowerette)*	Sailing Ship	1937	River Moy, Ballina. 240m NW of Quignamanger Quay	"In 1937 the Ballina Harbour Commissioners purchased a number of derelict vessel with the plan to sink them to form groynes to keep the navigation channel clear at the mouth of the River Moy. The *Floweret* was one such vessel and was an English wooden sailing boat which had sailed from England before being abandoned in the navigation channel in 1937. A different account suggests the *Floweret*, while cruising around Killala Bay caught fire while those on board were enjoying a picnic. […] The skeletal remains of the wooden boat are barely visible." (Excerpt from Wreck Viewer)

WIID No.	Vessel Name	Vessel Type	Date of Loss	Place of Loss	Details
W06825	*Opriglikiden*	?	November 1825	Ballina, Co Mayo, River Moy Bar	Sources: Larn & Larn 2002; Lloyd's List No. 6120: 30.05.1826(Tue)(R).
W06947	?	?	?	River Moy, Carraig Baite, Ballina	Source: Bourke 1994, 191.

3.5.2 Recorded Archaeological Sites and Monuments

There are three designated archaeological heritage assets listed on the RMP and the SMR within the 200m of the UAIA sites: a passage tomb (MA031-056----) located *c.*130m south of Site 6; a rath (MA022-063----) *c.*150m west-northwest of Site 14; and an earthwork (MA030-042----) *c.*150m east of Site 18 (Table 4; Figure 21–Figure 23, Figure 50–Figure 52, Figure 62–Figure 64).

In the wider scheme, the HCR (O'Flaherty 2024) identified a total of 80 cultural heritage receptors across the entire scheme. Of these, 24 were identified as key constraints and comprised eighteen Recorded Monuments (CH001–CH018) and seven structures (CH007, CH019–CH024) listed in the National Inventory of Architectural Heritage (NIAH), of which two are Protected Structures (CH007, CH021). One of the Protected Structures (CH007) is also a Recorded Monument (MA030-037----). In addition, sixteen sites were identified as potential constraints and comprised buildings or structures marked on historical mapping (CH025–CH031), areas of archaeological potential (AAP) that may require in-water mitigations (CH062–CH067, CH073 and CH076), and townland boundaries that may potentially be intersected by the proposed project (CH037 and CH047). The eight AAPs which are the subjects of this assessment were among those identified as potentially impacted.

The HCR recommended appropriate protective/preventative measures for the duration of the onsite works to reduce the risk of accidental damage due to the proximity of works to vulnerable cultural heritage receptors and in-water mitigations (O'Flaherty 2024).

Table 4: Recorded archaeological sites and monuments within 200m of the UAIA sites.

SMR/RMP Ref. No.	Site Type	Townland	ITM (centroid)	Status/ Designation	Nearest UAIA Site
MA022-063----	Ringfort – rath	Rathglass East	521838, 826551	Recorded Monument	Site 14
MA030-042----	Earthwork	Rathmeel	526824, 820626	Recorded Monument	Site 18
MA031-056----	Megalithic tomb – passage tomb	Carrowreagh (Gallen By., Kilgarvan Par.)	530451, 818316	Recorded Monument	Site 6

3.5.3 NMI Topographical Files

The NMI Topographical Files and Finds Database were consulted by appointment in preparation for the HCR (O'Flaherty 2024). There were no finds recorded from any of the townlands intersected by the UAIA sites.

3.5.4 Previous Archaeological Investigations

There is one previous investigation recorded on the Database of Irish Excavation Reports (DIER) located within 200m of the UAIA sites: archaeological monitoring (licence no. 10E0447) *c.*100m north of Site 12, during which nothing of archaeological significance was found (Table 5; Figure 44).

Table 5: Previous archaeological investigations recorded within 200m of the UAIA sites.

Licence Ref.	Investigation Type	Townland	ITM (centroid)	Result
10E0447[25]	Monitoring	Wherrew	517295, 816831	No archaeology

3.5.5 Designated Built Heritage[26]

There are two designated architectural heritage assets within 200m of the UAIA sites: a crossing guard's lodge (NIAH 31303015) *c.*100m south of Site 3; and the aforementioned *Creteboom* wreck (MCC RPS 1; NIAH 31303025; W06704) *c.*90m north of Site 17 (Table 6; Figure 11 & Figure 59).

Table 6: Designated architectural heritage assets within 200m of the UAIA sites.

Ref.	Type	Status	ITM	Nearest UAIA Site
NIAH 31303015	Guard's Lodge	Listed in the NIAH	522840, 823595	Site 3
MCC RPS 1; NIAH 31303025; also WIID W06704	*Creteboom* wreck	Protected Structure; listed in the NIAH	581174, 752967	Site 17

3.5.6 Historic Gardens and Demesnes[27]

There are no historic gardens and demesnes at or adjacent to the UAIA sites.

[25] 21717 - Excavations.ie and 21717 - Excavations.ie [Accessed: March 2026].

[26] See Buildings Search - Buildings of Ireland for further details of Built Heritage structures mentioned in this section [Accessed: March 2026].

[27] Historic Environment Viewer [Accessed: March 2026].

3.6 Desktop Assessment Results

3.6.1 Site 1: Abbeytown Stream (CH040[28])

This site (ITM 522227, 825434) is located on the Abbeytown Stream where it flows through low-lying pasture and defines the boundary between Coonealmore, Broadlands or Knockafarson and Derreens townlands, being crossed by a road (R314) at the site (Figure 2). The surrounding landscape is represented on the historical first-edition six-inch Ordnance Survey (OS) map (1839) and 25-inch OS map (1898) as arable land of varying sizes of field divisions with scattered farmhouses (Figure 3–Figure 4). These historical maps also depict a forested area to the northwest of Site 1.

Coonealmore, Broadlands or Knockfarson, Derreens and Rosserk townlands are located within the barony of Tirawley, in the civil parish of Ballysakeery (Table 7).

Table 7: Townlands intersected by Site 1 (Abbeytown Stream [CH040]).[29]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Broadlands or Knockafarson	Tirawley	Ballysakeery	*Cnoc an Phearsúin*	Hill [of the Parsons family]
Coonealmore	Tirawley	Ballysakeery	*Cuan Néill Mór*	The harbour [of big Níall]
Derreens	Tirawley	Ballysakeery	*Doirín*	Little oak wood
Rosserk	Tirawley	Ballysakeery	*Ros Eirc*	Height, promontory?

3.6.2 Site 2: Unnamed Stream – Coonealmore/Rosserk

This unnamed stream (ITM 522224, 825270) is located in an area of low-lying pasture (Figure 6). The road (R314) is depicted on the historical first-edition six-inch OS map (1839) and 25-inch OS map (1898) as crossing the stream by means of a bridge/culvert between Coonealmore and Rosserk townlands (Figure 7–Figure 8). These townlands lie within the barony of Tirawley, in the civil parish of Ballysakeery (Table 8).

Table 8: Townlands intersected by Site 2 (Coonealmore/Rosserk).[30]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Coonealmore	Tirawley	Ballysakeery	*Cuan Néill Mór*	The harbour [of big Níall]
Rosserk	Tirawley	Ballysakeery	*Ros Eirc*	Height, promontory?

[28] Cultural heritage site numbers and Area of Archaeological Potential (AAP) numbers—usually referring to townland boundaries—originate from the HCR (O'Flaherty 2024) and are included here in order to facilitate cross-referencing with that report and the main EIAR text.

[29] https://www.logainm.ie/en/ [Accessed: March 2026].

[30] https://www.logainm.ie/en/ [Accessed: March 2026].

3.6.3 Site 3: Unnamed Stream (CH042, CH043, CH071)

This site (ITM 522819, 823679) is located on an unnamed stream which forms part of the boundary between Coonealcauraun and Rathroeen townlands, in an area of low-lying pasture (Figure 9). The stream crosses the road under a bridge, visible in the historical first-edition six-inch OS map (1839) and the 25-inch OS map (1898) (Figure 10–Figure 11). The 25-inch map also depicts the Mayo branch of the Midland Great Western Railway (MGWR) and a detached three-bay single-storey crossing guard's lodge (CH020; NIAH 31303015).

Coonealcauraun and Rathroeen townlands lie within the barony of Tirawley in the civil parish of Ballysakeery (Table 9).

Table 9: Townlands intersected by Site 3 (unnamed stream [CH042, CH043, CH071]).[31]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Coonealcauraun	Tirawley	Ballysakeery	*Cárán Chuan Néill*	? Harbour [of Níall]
Rathroeen	Tirawley	Ballysakeery	*Ráth Ruaín*	The fort [of Ruán]

3.6.4 Site 4: River Brusna (CH052, CH063, AAP02)

This site (ITM 528712, 818650) centres on the River Brusna which forms part of the boundary between Behy More and Corimla South townlands (Figure 13). The site is located *c.*3.5km east of Ballina town, in agricultural lands divided into long, rectangular strips. The river meanders roughly northeast–southwest to the Behy and Glenree Rivers. The first-edition six-inch OS map (1839) depicts larger fields, which are shown on the 25-inch OS map (1901) as subdivided (Figure 14–Figure 15); the latter map also includes a footbridge located *c.*110m southwest of the proposed scheme. The course of the river, as depicted on historical OS maps, appears largely unaltered to the present day.

Behy More and Corimla South townlands lie within the barony of Tireragh, in the civil parish of Kilmoremoy (Table 10).

Table 10: Townlands intersected by Site 4 (River Brusna [CH052, CH063, AAP02]) and their suggested placename meanings.[32]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Behy More	Tireragh	Kilmoremoy	*An Bheithigh Mhór*	The big [beast?]
Corimla South	Tireragh	Kilmoremoy	*Corr Imligh Uachtair*	The southern round hill [of marginal land?]

[31] https://www.logainm.ie/en/ [Accessed: March 2026].

[32] https://www.logainm.ie/en/ [Accessed: March 2026].

3.6.5 Site 5: Glenree River (CH059)

This site (ITM 537837, 816279) is located on the Glenree River which marks the boundary between Largan and Knocknasliggaun townlands (Figure 17). This is an upland boggy area, depicted on the first-edition six-inch OS map (1838) and 25-inch OS map (1913) as a largely undeveloped area with a few dispersed houses and sheepfolds (Figure 18–Figure 19). The area is also labelled as 'The Gap' on the 25-inch map. It is currently known as 'The Windy Gap'.

Largan and Knocknasliggaun townlands are located within the barony of Leyny, in the civil parish of Kilmacteige (Table 11).

Table 11: Townlands intersected by Site 5 (Glenree River [CH059]) and their suggested placename meanings.[33]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Knocknasliggaun	Leyny	Kilmacteige	*Cnoc na Sligeán*	The hill [of the shells?]
Largan	Leyny	Kilmacteige	*An Leargain*	[Hillside?]

3.6.6 Site 6: Fiddaun River (CH054, CH065, AAP04)

This site (ITM 530470, 818455) is located on the Fiddaun River which forms part of the boundary between Corimla South and Carrownlabaun townlands, as well as Tireragh and Gallen baronies and Kilmoremoy and Kilgarvan civil parishes (Figure 21). This site is located *c.*2.2km west of Bunnyconnellan village, among a small, scattered group of houses in a wider arable landscape. The river is spanned by a bridge which is depicted on the first-edition six-inch OS map (1839) and 25-inch OS map (1898) (Figure 22–Figure 23). The 25-inch map also depicts an OS benchmark. This stone bridge is now largely rebuilt in concrete. There is a passage tomb (MA031-056----) *c.*120m south of the survey area.

Corimla South townland lies within the barony of Tireragh, in the civil parish of Kilmoremoy. Carrownlabaun townland lies within the barony of Gallen, in the civil parish of Kilgarvan (Table 12).

Table 12: Townlands intersected by Site 6 (Fiddaun River [CH054, CH065, AAP04]) and their suggested placename meaning.[34]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Carrownlabaun	Gallen	Kilgarvan	*Corr Imligh Uachtair*	The southern round hill [of marginal land?]
Corimla South	Tireragh	Kilmoremoy	*Corr Imligh Uachtair*	The southern round hill [of marginal land?]

[33] https://www.logainm.ie/en/ [Accessed: March 2026].

[34] https://www.logainm.ie/en/ [Accessed: March 2026].

3.6.7 Site 7: Unnamed Stream (CH060)

This site (ITM 539476, 815743) centres on an unnamed stream which marks the boundary between Largan and Gortersluin townlands, on the northern shore of Lough Talt (Figure 25). The site is partly overgrown by low undergrowth and trees. The first-edition six-inch OS map (1838) shows a small settlement (Figure 26) and the 25-inch OS map (1913) depicts a post office, OS benchmark and limekiln in the vicinity (Figure 27). Both historical maps depict a cluster of buildings (CH031) east of the site.

Largan and Gortersluin townlands are in the barony of Leyny and civil parish of Kilmacteige (Table 13).

Table 13: Townlands intersected by Site 7 (unnamed stream [CH060]) and its suggested placename meaning.[35]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Gortersluin	Leyny	Kilmacteige	*Gort ar Slinn*	The field [on the slate/slab?]
Largan	Leyny	Kilmacteige	*An Leargain*	[Hillside?]

3.6.8 Site 8: Srafaungal River (CH066, AAP05)

This site (ITM 530899, 818393) is located on the Srafaungal River in Carrownlabaun townland *c.*2km west of Bunnyconnellan, among a small, scattered group of houses in a wider arable landscape (Figure 29). The river meanders roughly northeast–southwest before turning westward *c.*200m to the south. The river is spanned by a bridge which is depicted on the first-edition six-inch OS map (1839) and 25-inch OS map (1898) (Figure 30–Figure 31). The 25-inch map also depicts an OS benchmark. The bridge is stone and rubble-built, repointed with concrete. The 25-inch map also depicts a footbridge *c.*60m south of the site, and a lime kiln *c.*160m west.

Carrownlabaun townland lies within the barony of Gallen, in the civil parish of Kilgarvan (Table 14).

Table 14: Townland intersected by Site 8 (Srafaungal River [CH066, AAP05]) and its suggested placename meaning.[36]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Carrownlabaun	Gallen	Kilgarvan	*Corr Imligh Uachtair*	The southern round hill [of marginal land?]

3.6.9 Site 9: Unnamed Stream (CH067, AAP06)

This unnamed stream (ITM 540535, 814852) flows into Lough Talt *c.*7.6km southeast of the village of Bunnyconnellan, in a marshy upland area (Figure 32). The first-edition six-inch OS map (1838) shows dispersed clacháns in the general area (none within 200m), and the 25-inch OS map (1913) depicts

[35] https://www.logainm.ie/en/ [Accessed: March 2026].

[36] https://www.logainm.ie/en/ [Accessed: March 2026].

more intensive settlement with increased field boundaries (Figure 33–Figure 34). The latter map also shows a well *c.*70m south of the site, and a benchmark *c.*100m south.

Gortersluin townland is located within the barony of Leyny, in the civil parish of Kilmacteige (Table 15).

Table 15: Townland intersected by Site 9 (unnamed stream [CH067, AAP06]) and its suggested placename meaning.[37]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Gortersluin	Leyny	Kilmacteige	*Gort ar Slinn*	The field [on the slate/slab?]

3.6.10 Site 10: Srafaungal River (CH074, AAP13)

This site (ITM 534617, 818322) is located on the Srafaungal River (CH074, AAP13) in Drumsheen and Bunnyconnellan East townlands, *c.*1.8km west of the village of Bunnyconnellan (Figure 36). The landscape here is one of undulating agricultural land with localised wooded strips along the course of the river. The first-edition six-inch OS map (1839) and 25-inch OS map (1898) depict the river meandering from north to south (Figure 37–Figure 38), with two lime kilns also marked on the 25-inch map, *c.*90m south-southwest and *c.*160m east-southeast of the site respectively. The historical maps show the river crossing the road under a bridge named 'Frenchman's Bridge'.

Drumsheen and Bunnyconnellan East townlands lie within the barony of Gallen, in the civil parish of Kilgarvan (Table 16).

Table 16: Townlands intersected by Site 10 (Srafaungal River [CH074, AAP13]) and their suggested placename meanings.[38]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Bunnyconnellan East	Gallen	Kilgarvan	*Muine Chonalláin Thoir*	[Connallán's] thicket East.
Drumsheen	Gallen	Kilgarvan	*Droim Síon*	? hill

3.6.11 Site 11: Unnamed Stream (CH075, AAP14)

This site (ITM 533415, 818484) is an unnamed stream—a tributary of the Fiddaun River—in Bunnyconnellan West, northeast of Bunnyconnellan village (Figure 40). The site is located in a boggy upland landscape. The land to the southeast is marked as 'liable to flood' on the 25-inch map. Both the first-edition six-inch OS map (1839) and 25-inch OS map (1898) depict the stream here as running

[37] https://www.logainm.ie/en/ [Accessed: March 2026].

[38] https://www.logainm.ie/en/ [Accessed: March 2026].

beneath a bridge/culvert on the L51172 road (Figure 41–Figure 42). The 25-inch map shows a well *c.*80m east of the site, and 'Ford' *c.*100m west of the site.

Bunnyconnellan West townland lies within the barony of Gallen, in the civil parish of Kilgarvan (Table 17).

Table 17: Townland intersected by Site 11 (unnamed stream [CH075, AAP14]) and its suggested placename meaning.[39]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Bunnyconnellan West	Gallen	Kilgarvan	*Muine Chonalláin Thiar*	[Connallán's] thicket West.

3.6.12 Site 12: Lough Conn (CH076, AAP15)

This site (ITM 517404, 816651) is in Lough Conn, immediately offshore of Wherrew townland (Figure 44). The site is located at the Wherrew WTP, *c.*3.6km southeast of the town of Crossmolina. According to local information, the maximum depth of water in this part of Lough Conn is *c.*5m. The first-edition six-inch OS map (1839) depicts the surrounding landscape as an unenclosed area which is liable to flooding (Figure 45). There is a small linear settlement to the northeast with long, narrow plots of land to their rears. A corn kiln is depicted to the east of the proposed development near the lake. The 25-inch OS map (1898) shows that the area had been divided into regular field boundaries and settlement had been intensified (Figure 46).

Wherrew townland lies within the barony of Tirawley, in the civil parish of Kilbelfad (Table 18).

Table 18: Townland intersected by Site 12 (Lough Conn [CH076, AAP15]) and its suggested placename meaning.[40]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Wherrew	Tirawley	Kilbelfad	*Foithriú*	?

3.6.13 Site 13: Unnamed Stream (CH035, CH069)

This site (ITM 520420, 826774) is located on an unnamed stream forming the boundary between Lisglennon and Ballinteean townlands, where the watercourse is culverted under a local road (Figure 47). The site is located in low-lying pasture, immediately south of tank facilities associated with the Lisglennon WTP. The land use pattern in this area does not appear to have changed significantly from the first-edition six-inch OS map (1839) to the 25-inch map (1898) to the present (Figure 48–Figure

[39] https://www.logainm.ie/en/ [Accessed: March 2026].

[40] https://www.logainm.ie/en/ [Accessed: March 2026].

49). However, the point where the stream crosses the road was not marked as a bridge/culvert on the 1839 map. On the 1898 map, this point is labelled 'Ford'.

Lisglennon and Ballinteean townlands lie within the barony of Tirawley, in the civil parish of Ballysakeery (Table 19).

Table 19: Townlands intersected by Site 13 (unnamed stream [CH035, CH069]) and their suggested placename meanings.[41]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Lisglennon	Tirawley	Ballysakeery	*Lios Gleannáin*	Glennon's fort
Ballinteean	Tirawley	Ballysakeery	*Baile an tSiáin*	Townland/town/homestead of the fairy mound

3.6.14 Site 14: Unnamed Stream (CH027, CH038)

This site (ITM 521987, 826501) is located on an unnamed stream forming the boundary between Rathglass East and Derreens townlands, where the watercourse is culverted under the R314 road (Figure 50). The site is located in low-lying pasture. A rath (MA022-063----) lies *c.*150m west-northwest of the site. This rath is labelled 'Rathnageeroge' on the first-edition six-inch OS map (1839) and the 25-inch OS map (1898) (Figure 51–Figure 52). A building (CH027) is marked on the 1839 map, *c.*20m north of the site.

Derreens and Rathglass East townlands lie within the barony of Tirawley, in the civil parish of Ballysakeery (Table 20).

Table 20: Townlands intersected by Site 14 (unnamed stream [CH027, CH038]) and their suggested placename meanings.[42]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Derreens	Tirawley	Ballysakeery	*Doirín*	Little oak wood
Rathglass East	Tirawley	Ballysakeery	*An Ráth Ghlas Thoir*	Green fort

3.6.15 Site 15: Unnamed Stream (CH070, AAP09)

This site (ITM 522252, 825619) is located on an unnamed stream in Broadlands or Knockafarson and Derreens townlands, where it was culverted under the R314 road (Figure 53). The site is located in low-lying pasture, and is partly overgrown by deciduous trees. Apart from some expansion of farmyards and houses, there has been no appreciable change in land use, field systems or structures

[41] https://www.logainm.ie/en/ [Accessed: March 2026].

[42] https://www.logainm.ie/en/ [Accessed: March 2026].

in this immediate vicinity since the second half of the nineteenth century, according to the first-edition six-inch OS map (1839) and the 25-inch OS map (1898) (Figure 54–Figure 55).

Broadlands or Knockafarson and Derreens townlands lie within the barony of Tirawley, in the civil parish of Ballysakeery (Table 21).

Table 21: Townlands intersected by Site 15 (unnamed stream [CH070, AAP09]) and their suggested placename meanings.[43]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Broadlands or Knockafarson	Tirawley	Ballysakeery	*Cnoc an Phearsúin*	Hill [of the Parsons family]
Derreens	Tirawley	Ballysakeery	*Doirín*	Little oak wood

3.6.16 Site 16: Ilanmuck River

This site (ITM 523810, 821588) is on the Ilanmuck River where it crosses the R314 road, in a semi-urban lowland area at the intersection of Culleens, Farrannoo and Laghtadawannagh townlands on the northern outskirts of Ballina town (Figure 56). According to the first-edition six-inch OS map (1839), the area immediately south and east of the site was wooded; the course of the Ilanmuck River east of the R314 road is not clear (Figure 57). On the 25-inch OS map (1898), the MGWR is depicted running parallel with the R314 road, while the wooded area to the east of the site is shown as largely removed (Figure 58). Many fields in the area were subdivided by this time. The river's course to the east of the road is also not clear on the 25-inch OS map. Housing estates and warehouses have been built in the area in recent decades.

Farrannoo, Culleens and Laghtadawannagh townlands lie within the barony of Tirawley, in the civil parish of Kilmoremoy (Table 22).

Table 22: Townlands intersected by Site 16 (Ilanmuck River) and their suggested placename meanings.[44]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Culleens	Tirawley	Kilmoremoy	*Na Coillíní*	The little woods
Farrannoo	Tirawley	Kilmoremoy	*An Fearann Nua*	New land
Laghtadawannagh	Tirawley	Kilmoremoy	*Leacht Dá Mhanach*	Monument of the two monks

3.6.17 Site 17: River Moy (CH023, CH062)

This site (ITM 525611, 821218) is located on the River Moy in the northern part of Ballina town, in Garrankeel and Quignamanger townlands (Figure 59). The river is *c.*150–200m wide and tidal at this

[43] https://www.logainm.ie/en/ [Accessed: March 2026].

[44] https://www.logainm.ie/en/ [Accessed: March 2026].

location, with intertidal mudflats on either side. There are two wrecks (W06704 [also MCC RPS 1 & NIAH 31303025] & W06731; CH023) located 90m and 120m north respectively of the site. The land on the west bank of the river is wooded here, with a quay to the south; the east bank is partly within Ballina quay, in a semi-built-up area. The first-edition six-inch OS map (1839) and the 25-inch OS map (1898) show the land on the west bank to be unchanged (Figure 60–Figure 61). By the time of the 1898 map, the quays had been built.

Garrankeel lies within the barony of Tirawley, in the civil parish of Kilmoremoy, while Quignamanger lies within the barony of Tireragh, in the civil parish of Kilmoremoy (Table 23).

Table 23: Townlands intersected by Site 17 (River Moy [CH023, CH062]) and their suggested placename meanings.[45]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Garrankeel	Tirawley	Kilmoremoy	*An Garrán Caol*	Narrow copse
Quignamanger	Tireragh	Kilmoremoy	*Cúige na Mainséar*	The fifth of the mangers

3.6.18 Site 18: Unnamed Stream (CH047)

This site (ITM 526612, 820655) is located on an unnamed stream in a semi-built-up area in the northeast outskirts of Ballina town, at the intersection of Quignamanger, Rathmeel and Quignashee townlands (Figure 62). There is an earthwork (MA030-042----) *c.*150m east of the site. The stream is indicated on the first-edition six-inch OS map (1839), where it appears to flow beside the road (now Creggs Road) to the east of the site before being culverted under the road and diverted into a drain to the west (Figure 63). The 25-inch OS map (1898) shows Creggs Road extended west, with the stream running in a roadside ditch (Figure 64). This map also shows a quarry *c.*80m northwest of the site. At present, the stream appears to run under the road in a pipe, at least to the west of the site as no ditch is visible here in satellite imagery.

Quignamanger, Rathmeel and Quignashee townlands are in Tireragh barony and Kilmoremoy civil parish (Table 24).

Table 24: Townlands intersected by Site 18 (unnamed stream [CH047]) and their suggested placename meanings.[46]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Quignamanger	Tireragh	Kilmoremoy	*Cúige na Mainséar*	The fifth of the mangers
Quignashee	Tireragh	Kilmoremoy	*Cúige na Sí*	The fifth of the fairy hills

[45] https://www.logainm.ie/en/ [Accessed: March 2026].

[46] https://www.logainm.ie/en/ [Accessed: March 2026].

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Rathmeel	Tireragh	Kilmoremoy	*An Ráth Mhaol*	Flat rath or earthen fort

3.6.19 Site 19: Unnamed Stream – Corimla South

This site (ITM 530126, 818438) is located on an unnamed stream in low-lying pasture in Corimla South townland, where the watercourse is culverted under the R294 road (Figure 65). The stream is not marked on the first-edition six-inch OS map (1839) but is shown as culverted under the road on the 25-inch OS map (1898) (Figure 66–Figure 67).

Corimla South is in the barony of Tireragh and the civil parish of Kilmoremoy (Table 25).

Table 25: Townland intersected by Site 19 (unnamed stream, Corimla South) and its suggested placename meaning.[47]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Corimla South	Tireragh	Kilmoremoy	*Corr Imligh Uachtair*	The southern round hill [of marginal land?]

3.6.20 Site 20: Unnamed Stream (CH058, CH072, CH073)

This site (ITM 537574, 816408) is located on an unnamed stream in an upland bogland area, defining the boundary between Drumsheen and Knocknasliggaun townlands (Figure 68). The stream is culverted under the R294 at this location. This culvert is indicated on the first-edition six-inch OS map (1838), and appears to be indicated on the 25-inch map (1913) also (Figure 69–Figure 70).

Drumsheen lies within the barony of Gallen and the civil parish of Kilgarven. Knocknasliggaun lies within the barony of Leyny and the civil parish of Kilmacteige (Table 26).

Table 26: Townlands intersected by Site 20 (unnamed stream [CH058, CH072, CH073]) and their suggested placename meanings.[48]

Townland Name (English)	Barony	Civil Parish	Townland Name (Irish)	Suggested Translation
Drumsheen	Gallen	Kilgarvan	*Droim Síon*	? hill
Knocknasliggaun	Leyny	Kilmacteige	*Cnoc na Sligeán*	Hill of the shells

[47] https://www.logainm.ie/en/ [Accessed: March 2026].

[48] https://www.logainm.ie/en/ [Accessed: March 2026].

4 Underwater Surveys and Site Walkovers

4.1 Aims

Targeted underwater surveys were carried out by licence-holding underwater archaeologist Dr Conn Herriott (AMS) and fellow underwater archaeologist Dr Alexander von Lünen (AMS) on 5–6 February 2026 (dive survey licence no. 26D0002; detection device consent no. 26R0039). Site walkovers were carried out by Conn and archaeologist Niall Jones (AMS) on 24 February 2026. The surveys and walkovers were focused on (but not confined to) identifying the presence, scale and nature of any previously unrecorded archaeological and cultural heritage remains in the sections of rivers, streams and lakes at sixteen of the 20 UAIA sites where the proposed scheme may impact upon those sites (Table 27). Of the other four UAIA sites, two (Sites 17 & 18) were subject only to desktop assessment, while two others (Sites 2 & 8) were inaccessible due to denial of permission by landowners.

The surveys and walkovers were carried out with due regard to all relevant legislation, guidance and policy (see Section 2 above). More specific considerations with regard to field surveys are laid out in *Guidelines for Cultural Heritage Impact Assessment of TII National Road and Greenway Projects* (TII 2025, 59–60) and *Archaeology and Flood Relief Schemes: Guidelines* (DHLGH 2023, 37–38). As per the latter guidance document, the purpose of the survey was to:

- "ascertain the existence, location, character, condition and extent of any recorded and previously unrecorded archaeological features/deposits, sites/monuments or objects, built heritage or cultural heritage within a study area and likely to be affected by the proposed works (including any associated temporary works, SI [Site Investigation] works)";
- "facilitate accurate mapping and inventorying (including photography) of any recorded and previously unrecorded archaeological features/deposits, sites/monuments, or objects, built heritage or cultural heritage";
- compile a report identifying "the likely effects on archaeological, built, and cultural heritage sites";
- "recommend appropriate measures (such as archaeological exclusion zones) for the avoidance of these remains or, where this cannot be achieved, measures to mitigate the impact of the works"; and
- "include proposals for further investigations, as required, as part of the assessment process."

4.2 Survey Methodology

4.2.1 Wade Survey Methodology (Sites 1–11)

The underwater surveys in each of the eleven wade survey areas (Sites 1–11) comprised a walkover, wade survey and waded metal detector survey. Suitable in-water clothing (drysuit) was worn,

accompanied by life jacket or flotation device. Breathing apparatus was not required for this type of survey.

Each survey area was subjected to a systematic walkover and wade survey to identify any evidence for archaeological remains (structures/features/deposits) and archaeological objects located in or adjacent to the waterbody. All identified cultural heritage features were described, recorded, photographed and their location and extent surveyed.

Each survey was based on a survey grid with a base line established in the field for survey control. The survey was performed over the entirety of each site, where this could be achieved.

Each metal detector survey identified, investigated, described, and recorded the location, nature, type and dimensions of all ferrous and non-ferrous material contained within each survey area. In doing so, the metal detector survey provided a quantitative estimation of the amounts of metals in each survey area. The survey was undertaken using a suitable underwater metal detector (high-performance Minelab Excalibur II metal detector with 11-inch elliptical search waterproof coil, 1.5−40kHz frequency range and with discrimination mode for non-ferrous, ferrous or all metals).

The locations of all cultural heritage remains were recorded by Differential Global Positioning System (DGPS). All cultural heritage remains were photographed *in situ*.

Any constraints encountered (e.g., the presence of immovable obstacles or areas unsuitable for survey etc.) which impede completion of the survey were recorded and described.

4.2.2 Dive Survey Methodology (Site 12)

The dive survey at Site 12 (Lough Conn) comprised an underwater visual and metal detector survey. The dive team were fitted with commercial SCUBA diving equipment (Interspiro Divator with hardwire audio and verbal communication) and operated from a 5m Humber inflatable RIB dive vessel moored over the survey area. Due to the limited underwater visibility (2m max.), the survey employed a combination of appropriate underwater survey methodologies including transects and pendulum swims (2m spacing between swathes). The surveying archaeologist swam horizontal transects to identify any evidence for archaeological remains (structures/features/deposits) and archaeological objects located in or adjacent to the waterbody. The dive survey was carried out with the aid of DGPS equipment, in order to record the location and extent of cultural heritage remains on the lakebed. The entirety of the survey area was archaeologically inspected.

The underwater metal detector survey (using high-performance Minelab Excalibur II metal detector with 11-inch elliptical search waterproof coil, 1.5−40kHz frequency range and with discrimination

mode for non-ferrous, ferrous or all metals) recorded the location of all ferrous and non-ferrous material within the survey area.

4.2.3 Site Walkover Methodology (Site 13–16, 19, 20)

Each survey area was subjected to a systematic walkover to identify any evidence for archaeological remains (structures/features/deposits) and archaeological objects located in or adjacent to the waterbody. All identified cultural heritage features were described, recorded, photographed and their location and extent surveyed.

Each site walkover was based on a survey grid with a base line established in the field for survey control. The walkover was performed over the entirety of each site, where this could be achieved.

4.3 Recording Methods

Each site area, watercourse profile, and any cultural heritage were plotted in real time by Global Positioning System (GPS). During the surveys and walkovers, every effort was made to ensure the highest possible level of identification of archaeological features, objects and deposits, through careful visual inspection in order to establish their nature, extent, depth, date and significance. The metal detector survey (using waterproof high-performance Minelab Excalibur II metal detector. A full and detailed record of surveys and site walkovers was maintained throughout using a site diary. Recording included written descriptions, high-resolution photographs with appropriate scale, and drawings.

4.4 Objects and Samples

No archaeological objects or samples were identified or taken in the course of the surveys and walkovers.

4.5 Weather Conditions

It was raining or overcast throughout the surveys and walkovers.

4.6 Constraints on the Archaeological Methods

Sites 2 and 8 were inaccessible due to denial of permission by landowners. In several watercourses (see Section 4.8 below) underwater visibility was poor; this was addressed by investigating the streambed by feel. There were no other constraints on the archaeological methods employed in the survey. All potential constraints were considered and have informed the survey strategy. Thick vegetation covered small portions of most wade survey and walkover site. However, by proceeding slowly and systematically, the entirety of each survey area (except Sites 2 & 8) was comprehensively investigated for all potential cultural heritage remains.

4.7 Health and Safety

All archaeological works were carried out in accordance with the Safety, Health and Welfare at Work (Construction) Regulations 2013 (SI no. 291 of 2013),[49] the Safety, Health & Welfare at Work (Diving) Regulations 2018 (SI no. 254 of 2018),[50] and the *Code of Practice for Inland Diving and Inshore Diving* (HSA 2019).[51] A Health and Safety plan—a project-specific Risk Assessment Method Statement (RAMS)—were in place at the commencement of the underwater surveys.

The surveys took place in challenging riverine and lacustrine environments, involving a range of obstacles and unpredictable ground conditions. Health and safety are at the core of AMS operations, and the heightened risk when conducting underwater surveys and site walkovers in such environments is clearly understood by all involved. Consideration of associated site-specific risks were included in the RAMS. On-site safety equipment included an emergency medical kit, rescue throw ropes and buoyant throw flotation device.

All staff had access to welfare facilities and all necessary Personal Protective Equipment to undertake the work required (the minimum being safety boots, hard hat, safety glasses and high visibility clothing).

All biosecurity measures outlined in the project Method Statement were strictly adhered to (McGrath & Herriott 2025).

4.8 Underwater Survey and Site Walkover Results

The underwater surveys and site walkovers confirmed the findings of the HCR (O'Flaherty 2024) and identified further cultural heritage remains within the survey areas. The results of the surveys are summarised below.

4.8.1 Site 1: Abbeytown Stream (CH040)

This survey area (ITM 522227, 825434) focused on Abbeytown Stream (CH040) where it is crossed by the R314 road, at the intersection of four townlands: Coonealmore, Broadlands or Knockafarson, Rosserk, and Derreens (Plate 1; Figure 2 & Figure 5). The stream is 1.5–2m wide and max. 1.2m deep, with max. 0.4m water depth at the time of the survey. Underwater visibility within the stream was poor, due to high turbidity in the brown water. The streambed is uneven, being covered in rubble (see

[49] https://www.hsa.ie/eng/Legislation/New_Legislation/SI_291_2013.pdf [Accessed: March 2026].

[50] https://enterprise.gov.ie/en/legislation/legislation-files/si-no-254-of-2018.pdf [Accessed: March 2026].

[51] https://www.hsa.ie/eng/publications_and_forms/publications/codes_of_practice/code_of_practice_for_inland_diving_and_inshore_diving.html [Accessed: March 2026].

below), as well as small stones and gravel. The stream banks are steep, with trees lining the north bank. There is a raised bank (1.5–2m wide, 0.5–1m high) on the south side of the stream. Modern metal pipes cross the stream *c.*5m east of the road.

At the west end of the survey area the stream is carried under the R314 road by a finely constructed single-arch stone bridge (int. dims. 2.2m high, 1.5m wide) (Plate 2). The bridge interior (barrel) comprises vertical side walls (1.6m high) built on concrete (or concrete reinforced) footings, with an even interior vaulting on the arch (barrel ceiling). The barrel walls and arch are unevenly coursed, with the stonework bonded by light-grey cementitious mortar. There is some calcite like mineral growth on the barrel arch. The bridge's eastern exterior (spandrel) wall is built from similar stonework to the interior, with hammer and chisel-dressed voussoirs. A string course runs along the exterior of the parapet wall, above which the parapet wall rises a further four courses. The parapet walls are capped by half-barrel-shaped concrete blocks. Wing-walls splay out to the east of the bridge at 45° angles, being built from rough stones with a rubble and mortar core, laid on a concrete footing/reinforcement. Most of the ivy-covered eastern parapet wall of the bridge have collapsed, partly covering the south wing-wall and the stream. The western exterior of the bridge is not accessible; however, a large metal pipe is visible crossing over the stream to the west of the bridge, running parallel to the road. This bridge is assessed to be nineteenth-century in date, with later concrete reinforcement.

4.8.2 Site 2: Unnamed Stream – Coonealmore/Rosserk

As noted above (Section 4.1), Site 2 (ITM 522224, 825270)—an unnamed stream crossed by the R314 road between Coonleamore and Rosserk townlands—was not accessible for underwater survey, due to denial of permission by the landowner when contacted by the scheme's landowner liaison officer (Figure 6). However, according to the first-edition six-inch OS map (1839) and the 25-inch OS map (1898), the watercourse was historically culverted under the road (Figure 7–Figure 8). It is very likely that remains of this historic culvert are intact at the site.

4.8.3 Site 3: Unnamed Stream (CH042, CH043, CH071)

This survey area (ITM 522819, 823679) focuses on an unnamed stream (CH042, CH043, CH071) between Coonealcauraun and Rathroeen townlands (Plate 3; Figure 9), which the first-edition six-inch OS map (1839) shows as being crossed by the R314 road by means of a bridge/culvert (Figure 10), while the 25-inch OS map (1898) depicts the Mayo branch of the MGWR also crossing the stream here (Figure 11).

The stream is 1m wide and 1.1–1.3m deep, with max. 0.05m water depth at the time of the survey (Figure 12). The stream bed is more or less level, and covered in pebbles and small stones, with

occasional medium-sized stones also. The earthen banks are very steep and partly covered by fern-like vegetation. The survey area is overgrown by plants and small trees.

At the west end of the survey area there is an arched stone culvert (int. dims. 0.9m high, 0.8m wide), carrying the stream under the road (Plate 4). The voussoirs are dressed, while the walls are built from undressed and unevenly coursed blocks. The stonework is bonded by cementitious mortar. The base of the culvert is concave in profile, and lined with concrete. The west end of the culvert is not accessible, but can be seen to be partly blocked by rubble. The stream falls 0.8m from the east side of the culvert to the streambed to the east of the road, before flowing away to the east. This culvert is assessed as nineteenth-century in date.

There are no visible vestiges of the MGWR railway line, apart from a somewhat level and consistently overgrown area running parallel to the road's east side.

4.8.4 Site 4: River Brusna (CH052, CH063, AAP02)

This survey area (ITM 528712, 818650) comprises the River Brusna (CH052, CH063, AAP02) which marks the boundary between Behy More and Corimla South townlands (Plate 5; Figure 13–Figure 16). The river is 7m wide and max. 0.5m deep, with moderate/steep grass-covered banks (max. 0.5m high) on which occasional deciduous trees grow. The riverbed is covered by small cobbles and gravel, with grass-like underwater vegetation. There are occasional large stones on the west bank. No cultural heritage remains are visible.

4.8.5 Site 5: Glenree River (CH059)

This survey area (ITM 537837, 816279) comprises the Glenree River (CH059) which marks the boundary between Largan and Knocknasliggaun townlands (Plate 6; Figure 17–Figure 20). The river is 1–1.5m wide. The riverbanks range from moderately sloping to very steep (1.5–2.5m high), with frequent boulders and partly covered by rushes and heather. The banks overhang slightly in places. The riverbed is uneven and covered by cobbles as well as very intermittent gravel patches. The water depth was 0.4m at most at the time of the survey, with good visibility.

At the south end of the survey area, the river is culverted under the R294 (Plate 7). Only the north exterior wall of the culvert is accessible. This wall is constructed from well-cut blocks, laid in seven–eight even courses and bonded by cementitious mortar of which little is visible. In the interior of the culvert (1.4m high, 1.8m wide), the barrel/vaulting of the arch is constructed from unevenly/randomly coursed, unworked blocks. The side walls of the culvert interior are built from roughly squared blocks. The base of the culvert is covered by small–large natural rocks, with a natural bedrock step (*c.*0.5m

high) near the north end of the culvert. There is a small amount of vegetation—moss, ferns and grass—on the culvert walls. This culvert is assessed as nineteenth-century in date.

4.8.6 Site 6: Fiddaun River (CH054, CH065, AAP04)

This survey area (ITM 530470, 818455) is located on the Fiddaun River which straddles the townlands of Corimla South and Carrownlabaun (Plate 8; Figure 21–Figure 24). The river is 3.5m wide and max. 0.3m deep, with moderate vegetation within the river channel. The riverbanks were steep (0.5–1.1m high) and earthen, with occasional stones. The riverbed is covered in small stones and occasional medium-sized stones, with patches of gravel in places. A fence and fallen tree lie across the river halfway along the survey area.

Immediately northeast of the survey area, the R294 road is carried over the river by a small two-arched stone bridge. Each arch of this bridge is 1m wide and 0.6m high (Plate 9). The northern exterior wall and parapet of the bridge are built of concrete. The southern exterior wall and parapet are constructed from cut-stone blocks laid in nine even courses and bonded by cementitious mortar. A modern electric light is attached to this exterior wall. The bridge's interior walls are built from uncoursed fieldstones. The riverbed within the culvert is covered in stones. This bridge was assessed as dating to the nineteenth century.

4.8.7 Site 7: Unnamed Stream (CH060)

This survey area (ITM 539476, 815743) comprises an unnamed stream (CH060) which marks the boundary between the Largan and Gortersluin townlands, on the northern shore of Lough Talt (Plate 10; Figure 25–Figure 28). The watercourse banks in the survey area are overgrown by trees, brambles and reeds. The stream is mostly dry (max. 0.2m water depth in places), with its bed composed of silt. The stream channel is 1.5–2m wide, with moderate/steeply sloping banks (0.2–0.9m high). The stream banks are covered in thorns and trees, with modern debris strewn along the west bank.

The stream is carried under the R294 road by an ivy-covered culvert (opening 1.5m wide, 0.5m high) built from cut-stone blocks laid in four even courses, and bonded by cementitious mortar (Plate 11). The culvert parapets are built from concrete blocks. The culvert is only accessible on the south side of the road. This culvert is assessed as nineteenth-century in date.

4.8.8 Site 8: Srafaungal River (CH066, AAP05)

As noted above (Section 4.1), Site 8—the Srafaungal River in Carrownlabaun townland (ITM 530899, 818393)—was not accessible for underwater survey, due to denial of permission by the landowner when contacted by the scheme's landowner liaison officer (Figure 29). However, according to the first-edition six-inch OS map (1839) and the 25-inch OS map (1898), the watercourse was historically

bridged at this location (Figure 30–Figure 31). From the road a stone and rubble bridge is visible here, repointed with concrete. The 25-inch map also depicts an OS benchmark here, and a 'Foot Bridge' *c.*60m to the south.

4.8.9 Site 9: Unnamed Stream (CH067, AAP06)

This survey area (ITM 540535, 814852) focuses on an unnamed stream (CH067, AAP06) where it flows into Lough Talt (Plate 12; Figure 32–Figure 35). This site is located *c.*7.6km southeast of the village of Bunnyconnellan, in a marshy upland area. The survey area comprises a steeply sloping field in rushes and long grass. The stream appears to follow the same northeast–southwest course and location as shown on the OS 25-inch OS map (1913), but is generally not detectable within the vegetation throughout most of the field. At the south end of the field where it meets the road, the stream has eroded a steep-sided tree-filled hollow, *c.*10m wide and 3m deep. The stream is visible at the base of this hollow (0.75–2m wide, max. depth 0.2m), flowing through natural stony ground with frequent boulders into a culvert (1.9m wide, 0.75m high) which carries the stream under the R294 road and into Lough Talt (Plate 13).

The culvert is built of well-dressed stone blocks (avg. 0.6 x 0.25m) laid in eight even courses and bonded by grey cementitious mortar. The culvert parapets are built from concrete blocks. The culvert's exterior walls are partly overgrown by moss and fern-like plants. The culvert's interior walls are unevenly coursed and partly covered in calcite. The culvert base is uneven and covered in loose stones, with a bedrock outcrop visible near the south end, and occasional natural wood debris and vegetation. This culvert is assessed as nineteenth-century in date. On the southwest side of the road, the stream flows through bramble-lined low banks into Lough Talt.

4.8.10 Site 10: Srafaungal River (CH074, AAP13)

This survey area (ITM 534617, 818322) comprises the Srafaungal River (CH074, AAP13) in Drumsheen and Bunnyconnellan East townlands (Plate 14; Figure 36–Figure 39). The river is *c.*2.5–4m wide, with a maximum water depth of 0.4m at the time of the survey. The water is clear and tinted brown. The riverbed is composed of gravel and cobbles, with occasional boulders. The earthen riverbanks are steep, measuring *c.*0.5m high. On either side of the river and set back from the riverbanks, there are raised banks (levees?), *c.*1.5–2.5m wide and *c.*0.3m high, with a boulder core which was revealed where these banks are eroded. There are deciduous trees growing on these raised banks, as well as fir/spruce trees further back from the river throughout the survey area; many of these trees have fallen.

At the north end of the survey area, the L51172 is carried over the river by a single-arch bridge (Plate 15)—'Frenchmans Bridge' on the 1839 and 1898 OS maps. This bridge is mostly faced with concrete, but with cut-stone voussoirs extant, bonded by cementitious dark grey mortar. The barrel of the bridge is covered by light grey mortar. This bridge is assessed as nineteenth-century in date.

4.8.11 Site 11: Unnamed Stream (CH075, AAP14)

This survey area (ITM 533415, 818484; CH075 [AAP14]) is centred on an unnamed stream (tributary of the Fiddaun River) northeast of Bunnconnellan village, in Bunnyconnellan West townland (Plate 16; Figure 40–Figure 43). The stream is 1–1.2m wide, with a maximum water depth of 0.2–0.3m, and with a level streambed composed of gravel and stones. The watercourse is generally very overgrown. The vertical/overhanging banks are 0.4m high, with trees growing densely along the banks. On the west side of and parallel to the stream is a grass-covered bank (avg. 0.7m high, 1.2m wide), composed of a stone core and grassy sod.

At the northwest end of the survey area, the stream is culverted under the L51172 road (Plate 17). Only the south exterior wall of this culvert is accessible. This exterior wall is constructed from randomly coursed fieldstones, with cut-stone block voussoirs. The culvert opening is 2m wide and 1m high. Iron pins and bands are set between several voussoirs (remains of a fence to stop livestock escaping?). Two iron pipes are visible running across the culvert interior, roughly under the middle of the road. This culvert is assessed as nineteenth-century in date.

4.8.12 Site 12: Lough Conn (CH076, AAP15)

This survey area (ITM 517404, 816651; CH076, AAP15) is located in Lough Conn, immediately offshore of the Wherrew WTP in Wherrew townland (Plate 18; Figure 44–Figure 46). The maximum lake depth within the survey area is 4.2m, with no current and underwater visibility of 0.5–1.5m. To the east and west of the WTP and its artificially excavated intake channel, the lakeshore is characterised by shingle with occasional boulders, partly overgrown by small trees. The very gently southward sloping lakebed comprises a mix of rocky shallow areas similar to the lakeshore, with more silty sand on the lakebed in the deeper southern two thirds of the survey area (Plate 19). Only modern objects were found in the course of the dive survey (metal bars, small fragments of metal sheeting, etc.).

4.8.13 Site 13: Unnamed Stream (CH035, CH069)

This site (ITM 520420, 826774)—requiring desktop survey and site walkover only (Table 1)—comprises an unnamed stream forming the boundary between Lisglennon and Ballinteean townlands, where the watercourse is culverted under a local road (Plate 20; Figure 47–Figure 49). The site is located immediately south of tank facilities associated with the Lisglennon WTP. The watercourse is U-shaped

in profile, with steep sides (0.7m high) and an uneven level streambed of mud and small stones (water depth *c.*0.1m) (Plate 21). The stream was culverted under the road by a concrete pipe, which was visible on the north side of the road. Roadside drainage ditches conjoined with the stream on both the north and south sides of the road. The stream was heavily overgrown by vegetation on the north side of the road, but less so on the south side which was therefore accessible.

No cultural heritage remains were identified. The lack of any historic culvert here may be unsurprising, given that the site location was labelled 'Ford' on the 25-inch OS map (1898), so presumably the stream had not yet been culverted then.

4.8.14 Site 14: Unnamed Stream (CH027, CH038)

This site (ITM 521987, 826501)—requiring desktop survey and site walkover only (Table 1)—comprised an unnamed stream forming the boundary between Rathglass East and Derreens townlands, where the watercourse was culverted under a road (R314) (Plate 22; Figure 50–Figure 52). The site was located *c.*130m east-southeast of a rath (MA022-063----). The watercourse had a shallow profile, with very gently sloping sides (0.4m high) and a concave base (water depth *c.*0.2m). On the west side of the road, the watercourse was dry and grass-covered at the time of the survey, appearing much like a shallow ditch. On the east side of the road, the stream had slightly steeper sides and was overgrown. The stream was culverted under the road by a concrete pipe, which was visible on the west side of the road (Plate 23). No cultural heritage remains were identified. The stream appears to have been culverted here by the time of the 1839 OS map, but no remains of that historic culvert were visible.

4.8.15 Site 15: Unnamed Stream (CH070, AAP09)

This site (ITM 522252, 825619)—requiring desktop survey and site walkover only (Table 1)—was centred on an unnamed stream in Broadlands or Knockafarson and Derreens townlands, where it was culverted under a road (R314) (Plate 24; Figure 53–Figure 55). On the east side of the road, this stream (1m wide, max. 0.2m deep) had steep, low uneven banks (0.5m high) composed of earth and stone. On the west side of the road, the stream was wider (1.3m), deeper (0.5m), but had evidently been modified at least in part, with a concrete pipe culverting the stream here in order to allow access to a roadside field.

The stream was culverted under the main road (R314) by a historic stone culvert (1.5m wide, 0.9m high) built from uncoursed fieldstones (dims.) bonded by light-grey, coarse stony mortar (Plate 25). The culvert's internal walls and barrel were rendered with this mortar, although the render only survived in patches. The culvert base comprised loose stones and was partly silted up. The culvert opening was intact on the east side of the road, while on the west side it had been covered by rubble

earth spoil heap, within which the aforementioned concrete pipe culverted the stream. The only element of the culvert visible on the west side of the road was the exposed top of the culvert barrel, on the grassy verge adjacent to the road (Plate 26).

Given the rough vernacular stonework and non-cementitious coarse mortar used in the culvert's construction, as well as cartographic evidence—the first-edition six-inch OS map (1839) shows the stream as already culverted here—it seems likely that the culvert dates to the eighteenth/early nineteenth century, if not earlier.

4.8.16 Site 16: Ilanmuck River

This site (ITM 523810, 821588)—requiring desktop survey and site walkover only (Table 1)—focused on the Ilanmuck River at the intersection of Farrannoo, Culleens and Laghtadawannagh townlands (Plate 27; Figure 56–Figure 58). There was no sign of any watercourse or culvert at this location, although the presumed course of the river was fully overgrown on the west side of the road, while on the east side the ground along the river's course appeared to have been worked or modified—perhaps suggesting that the river was culverted in this area (Plate 28). This possible culvert may date to the nineteenth century.

4.8.17 Site 19: Unnamed Stream – Corimla South

This site (ITM 530126, 818438)—requiring desktop survey and site walkover only (Table 1)—focused on the unnamed stream in Corimla South townland. On the north side of the road (R294), the watercourse had a shallow profile, with very gently sloping sides (0.4m high) and a concave base (water depth *c.*0.2m) (Plate 29; Figure 65–Figure 67). The watercourse here was almost dry and largely grass-covered at the time of the survey, appearing much like a shallow ditch. On the south side of the road, there was no sign of the watercourse—just an overgrown shallow ditch running parallel to the road (Plate 30). The stream was culverted under the road by a concrete pipe, which was visible on the north side of the road (Plate 31). No cultural heritage remains were identified. The stream appears to have been culverted here by the time of the 1898 OS map, but no remains of that historic culvert were visible (Plate 30 & Plate 31).

4.8.18 Site 20: Unnamed Stream (CH058, CH072, CH073)

This site (ITM 537574, 816408)—requiring desktop survey and site walkover only (Table 1)—was centred on a fast-flowing, unnamed stream (0.6–1.1m wide, max. 0.2m deep) defining the boundary between Drumsheen and Knocknasliggaun, where it was culverted under a road (R294) (Plate 32; Figure 68–Figure 70). On the northeast side of the road, this stream had moderately sloping, uneven banks (0.7–1m high) composed of rush-covered peaty sod and stones. The northeast face of the culvert

was constructed from concrete (Plate 32). On the southwest side of the road, the culvert face (1m high, 1.7m wide) was built from uncoursed and mostly unworked fieldstones and slabs, with at least one roughly worked block (Plate 33). As far as could be ascertained from visual inspection outside the culvert, its interior was constructed similarly, with large flat roof slabs. The culvert comprised two parallel channels, both measuring 0.55m high and 0.5m wide, although a block is missing at the west side of the eastern channel's opening. The streambed outside and within the culvert comprised loose stones. The stream was clear and tinted brown.

Given the rough vernacular stonework and non-cementitious coarse mortar used in the culvert's construction, as well as cartographic evidence—the first-edition six-inch OS map (1838) appears to show the stream as already culverted here—it seems likely that the culvert dates to the eighteenth/early nineteenth century, if not earlier.

5 Discussion

The results of the desktop assessments, underwater surveys and site walkovers undertaken as part of this UAIA confirmed the findings of the HCR (O'Flaherty 2024) and identified further cultural heritage remains at several sites which may be impacted by the proposed scheme (Table 27). Historic culverts and bridges were identified at Sites 1, 3, 5–7, 9–11, 15 and 20. At four further sites (14, 16, 18 & 19), historic culverts were not visible but were inferred from cartographic evidence. Sites 2 and 8 were not accessible at the time of the underwater surveys due to denial of access by landowners, but a historic bridge was identified from the road at Site 8, and a historic culvert was inferred at Site 2 based on cartographic evidence.

No other direct or indirect impacts arising from the proposed scheme are predicted on any known/recorded underwater cultural heritage within the proposed works area.

Table 27: Cultural heritage findings at the UAIA sites.

UAIA Site No.	HCR Ref.	Waterbody	Survey Type	Cultural Heritage Findings
1	CH040	Abbeytown stream	Wade	Finely constructed single-arch stone bridge (int. dims. 2.2m high, 1.5m wide) at W end of site. Assessed to date to 19th century.
2	-	Unnamed stream	Wade	Cartographic evidence suggests historic culvert under road, dating to 19th century or older.
3	CH042	Unnamed stream	Wade	Arched stone culvert (int. dims. 0.9m high, 0.8m wide) at W end of site. Assessed to date to 19th century.
4	CH052; CH063 (AAP02)	River Brusna	Wade	No cultural heritage findings.
5	CH059	Glenree River	Wade	Arched stone culvert (int. dims. 1.4m high, 1.8m wide) at S end of site. Assessed to date to 19th century.
6	CH054; CH065 (AAP04)	Fiddaun River	Wade	Two-arched stone bridge at NE end of site. Assessed to date to 19th century.
7	CH060	Unnamed stream	Wade	Stone culvert (int. dims. 1.5m wide, 0.5m high). Assessed to date to 19th century.
8	CH066 (AAP05)	Srafaungal River	Wade	Stone bridge, assessed to date to 19th century.
9	CH067 (AAP06)	Unnamed stream	Wade	Stone culvert (int. dims. 1.9m wide, 0.75m high) at S end of site. Assessed to date to 19th century.
10	CH074 (AAP13)	Srafaungal River	Wade	Stone bridge, assessed to date to 19th century.

UAIA Site No.	HCR Ref.	Waterbody	Survey Type	Cultural Heritage Findings
11	CH075 (AAP14)	Unnamed stream	Wade	Stone culvert (int. dims. 1m high, 2m wide) at N end of site. Assessed to date to 19th century.
12	CH076 (AAP15)	Lough Conn	Dive	No cultural heritage findings.
13	CH035; CH069	Unnamed stream	Walkover	No cultural heritage findings.
14	CH027; CH038	Unnamed stream	Walkover	Cartographic evidence suggests historic culvert under road, dating to 19th century or older.
15	CH070 (AAP9)	Unnamed stream	Walkover	Stone culvert (int. dims. 0.9m high, 1.5m wide). Assessed to date to 19th century or older.
16	-	Illanmuck River	Walkover	Cartographic evidence suggests historic culvert under road, dating to 19th century.
17	CH023; CH062	River Moy	Desktop assessment	No cultural heritage findings.
18	CH047	Unnamed stream	Desktop assessment	Cartographic evidence suggests historic culvert under road, dating to 19th century.
19	-	Unnamed stream	Walkover	Cartographic evidence suggests historic culvert under road, dating to 19th century.
20	CH058; CH072; CH073	Unnamed stream	Walkover	Stone culvert (1m high, 1.7m wide) on SW side of road. Assessed to date to 19th century or older.

6 Likely Impacts and Significance of Effect

6.1 Introduction

This section presents the likely impacts and significance of effect on cultural heritage assets at the UAIA sites. As highlighted above (Section 3.4), there are two types of impact to be assessed:

- **Direct effect** — where a cultural heritage receptor or its setting is physically located within the footprint of a project which would entail its removal in whole or in part. Direct effects can also be defined as those that are directly attributable to the proposed development. Sites or features that occur within the redline boundary are assessed for potential direct negative effects;
- **Indirect effect** — an effect that results indirectly from the proposed project, often occurring away from the development, or because of a sequence of interrelationships or a complex pathway; or

The following summarises the predicted impacts—if any—on known/recorded archaeological and cultural heritage assets.

6.1.1 Impacts to Cultural Heritage

Direct or **indirect** impacts arising from the proposed scheme are predicted on the cultural and architectural heritage remains (historic culverts and bridges) identified at all but four of the UAIA sites (see Table 27). Any impact on that cultural heritage by the proposed works would be of **medium** magnitude, resulting in a **slightly significant negative** effect.

No other direct or indirect impacts arising from the proposed development are predicted on known/recorded archaeological remains within the proposed scheme area, either in water or on lakeshores and riverbanks. However, the absence of known or recorded archaeological remains within the footprint of the proposed scheme does not preclude the potential for such remains to survive both *ex situ* and *in situ* either within the UAIA sites or in their immediate vicinity.

This UAIA finds that there is **low** potential for unknown/unrecorded archaeological remains to be encountered within the UAIA sites which could be directly and negatively impacted by the proposed works. Any impact on unknown archaeological sites, features or objects would be of **medium** magnitude, resulting in a **slightly significant negative** effect on that archaeology—assuming that it is of sufficient importance. This determination is based on the level of potential highlighted through the interrogation and assessment of the available data, including the quantity and quality of recorded archaeological findings in the immediate vicinity.

6.1.2 Potential for Positive Effects on Cultural Heritage

The archaeological recording of the historic bridges and culverts described in this UAIA may potentially lead to new information and insights about these cultural and architectural heritage features—i.e., a **moderate positive effect**. Such findings create potential for indirect positive effects through raising public awareness and contributing to archaeological research, including appropriate dissemination. Any such work would allow for Uisce Éireann to work with local communities, interest groups and professional archaeologists to enhance the potential for positive benefits during and after the proposed scheme.

7 Recommended Mitigation Measures

7.1 Introduction

In light of the results of the desktop assessments of likely impacts on cultural heritage, as well as the results of the underwater surveys and site walkovers, this section presents recommendations for archaeological mitigation measures around the proposed scheme. These measures also follow the key principles of ensuring that any archaeology and other cultural heritage impacted by the proposed scheme are suitably protected. The default favoured approach is avoidance and preservation of all cultural heritage assets *in situ* where possible.

7.2 Recommendations

The following archaeological mitigation measures are recommended:

7.2.1 Preservation In Situ / Archaeological Recording of Historic Culverts and Bridges

All historic bridges and culverts at Sites 1, 3, 5–7, 9–11, 15 and 20 should be preserved *in situ*. If it is not feasible to avoid impacting these cultural heritage features in the course of open-cut trenching for the scheme, they should be archaeologically recorded (i.e., written descriptions, measured survey, photographic recording [see DAHG 2011]).

7.2.2 Archaeological Monitoring

Archaeological monitoring should be carried out for any open-cut trenching at Sites 2, 8, 14, 16, 18 and 19, where no historic culverts were identified/accessible but are likely to be there based on historical mapping. If historic culverts or other features of cultural heritage interest are uncovered in the course of trenching, they should be preserved *in situ*. If this is not feasible, they should be archaeologically recorded.

Archaeological monitoring should also be carried out for any open-cut trenching works at Site 4. Upcast riverbank and riverbed sediment from any open-cut trenching at Site 4 should be systematically spread (0.2m max. thickness) and searched (visually and using metal detector), with the location in the river from which each upcast heap was removed to be noted.

7.2.3 Toolbox Talk and Protocols for Unexpected Archaeological Discoveries

A toolbox talk should be given by a suitably qualified archaeologist to all proposed works contractors and management, laying out protocols and procedures in the event that unexpected cultural heritage remains or archaeological objects are uncovered in the course of the proposed works.

Recommendations are subject to the agreement of the National Monuments Service (Department of Housing, Local Government and Heritage), the National Museum of Ireland and the local planning authority where

required and should only be carried out in accordance with the necessary approvals. Please note that the statutory and local authorities may issue alternative and/or additional recommendations/conditions.

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Figures

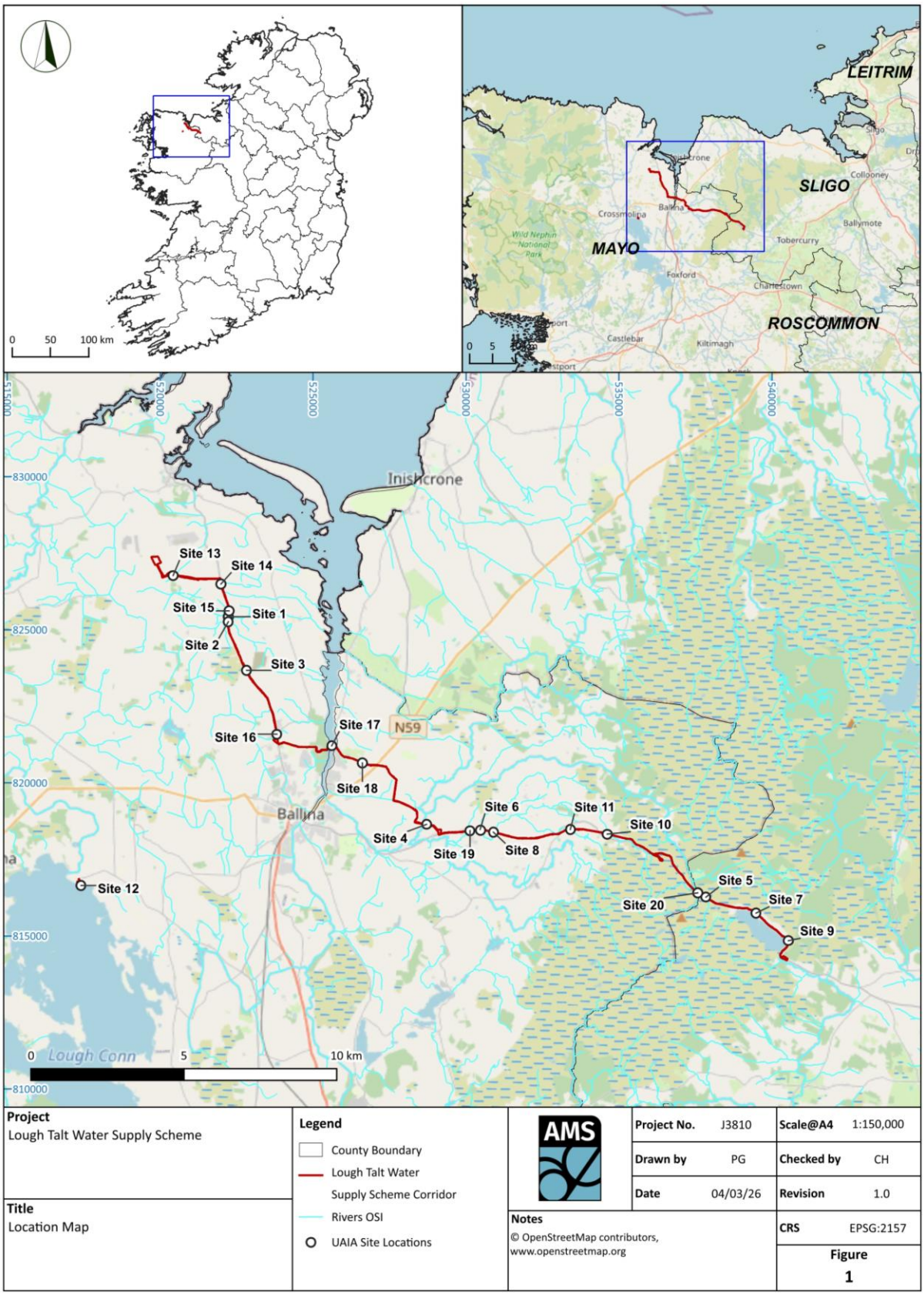


Figure 1: Location Map.



Figure 2: UAIA Site 1: overview of survey area at Abbeytown Stream (CH040)



Figure 3: UAIA Site 1: Abbeytown Stream survey area (CH040) overlaid on an extract of the first-edition six-inch OS map (1839)

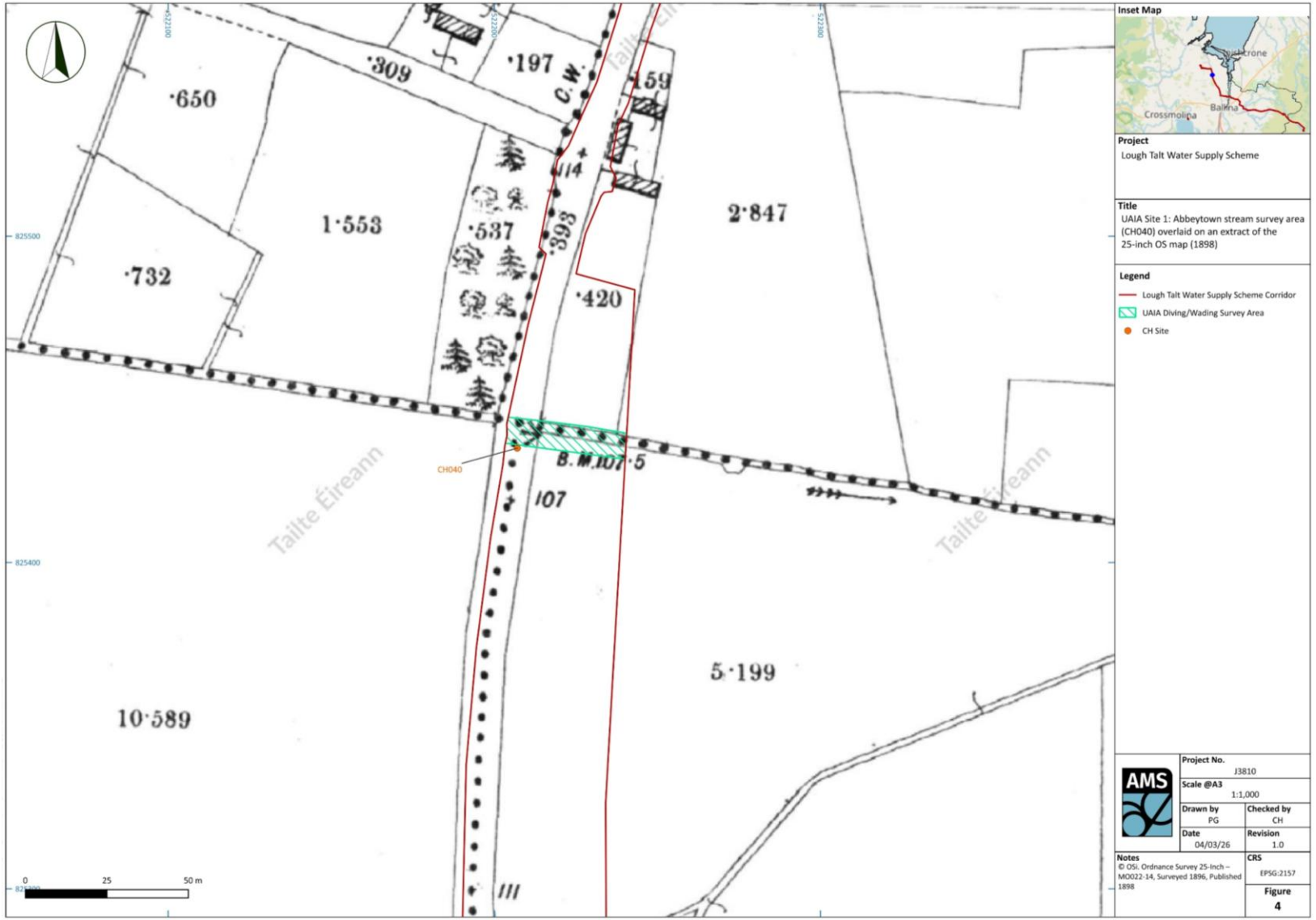


Figure 4: UAIA Site 1: Abbeytown Stream survey area (CH040) overlaid on an extract of the 25-inch OS map (1898)

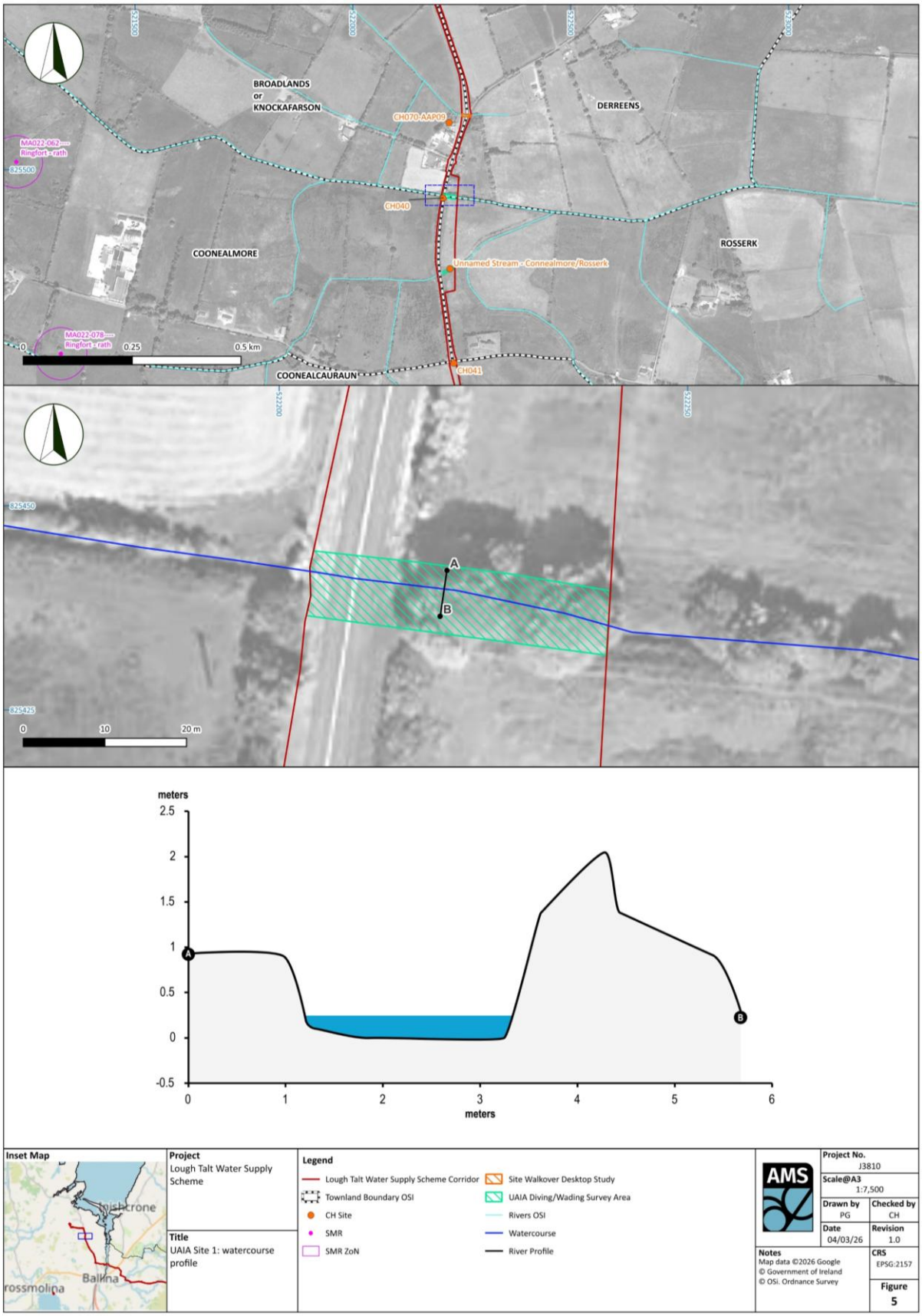


Figure 5: UAIA Site 1: watercourse profile.



Figure 6: UAIA Site 2: overview of survey area at unnamed stream (Coonealmore/Rosserk)



Figure 7: UAIA Site 2: survey area at unnamed stream (Coonealmore/Rosserk) overlaid on an extract of the first-edition six-inch OS map (1839)

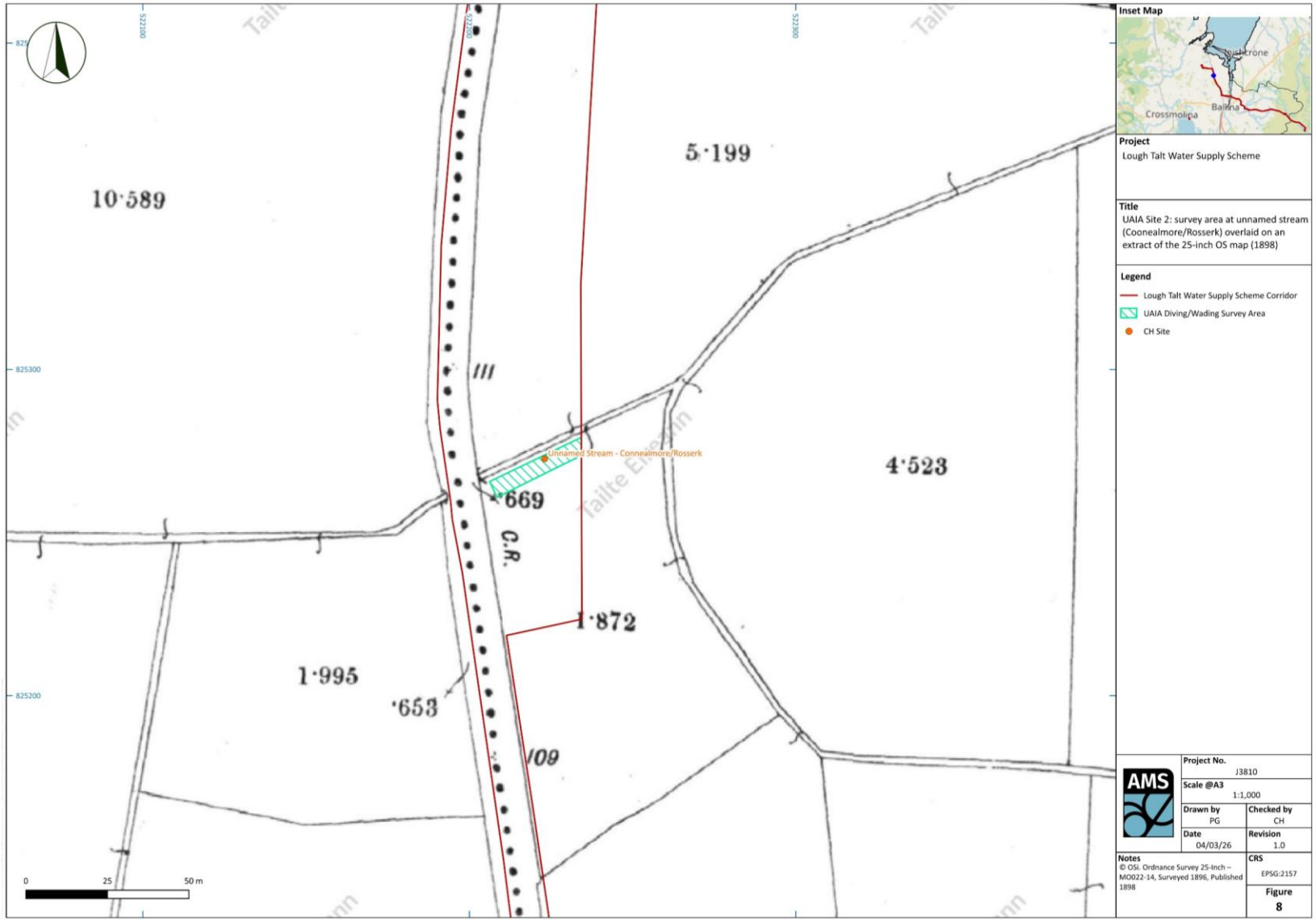


Figure 8: UAIA Site 2: survey area at unnamed stream (Coonealmore/Rosserk) overlaid on an extract of the 25-inch OS map (1898)



Figure 9: UAIA Site 3: overview of survey area at Coonealcauraun/Rathroeen unnamed stream (CH042, CH043, CH071)

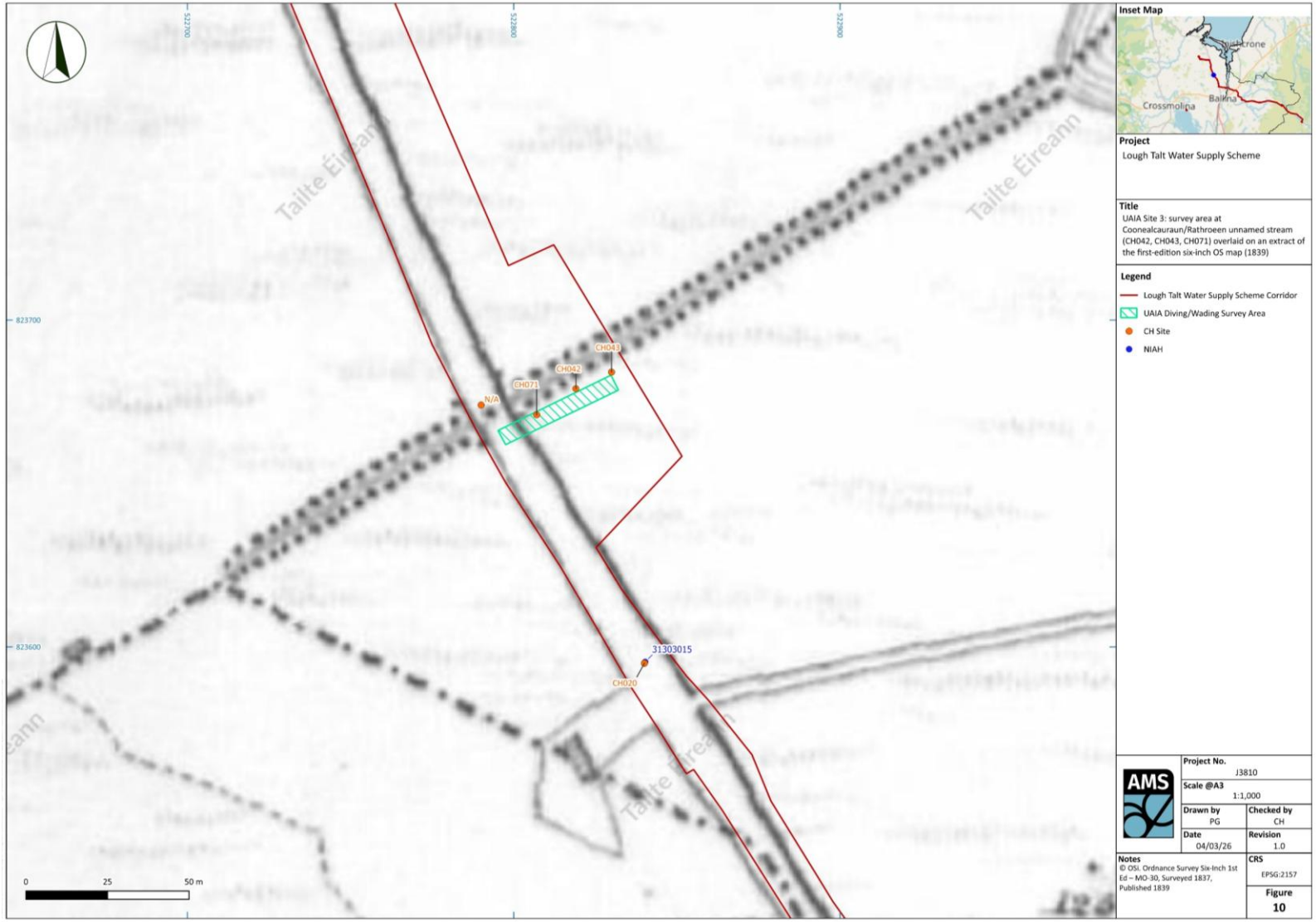


Figure 10: UAIA Site 3: survey area at Coonealcauraun/Rathroeen unnamed stream (CH042, CH043, CH071) overlaid on an extract of the first-edition six-inch OS map (1839)

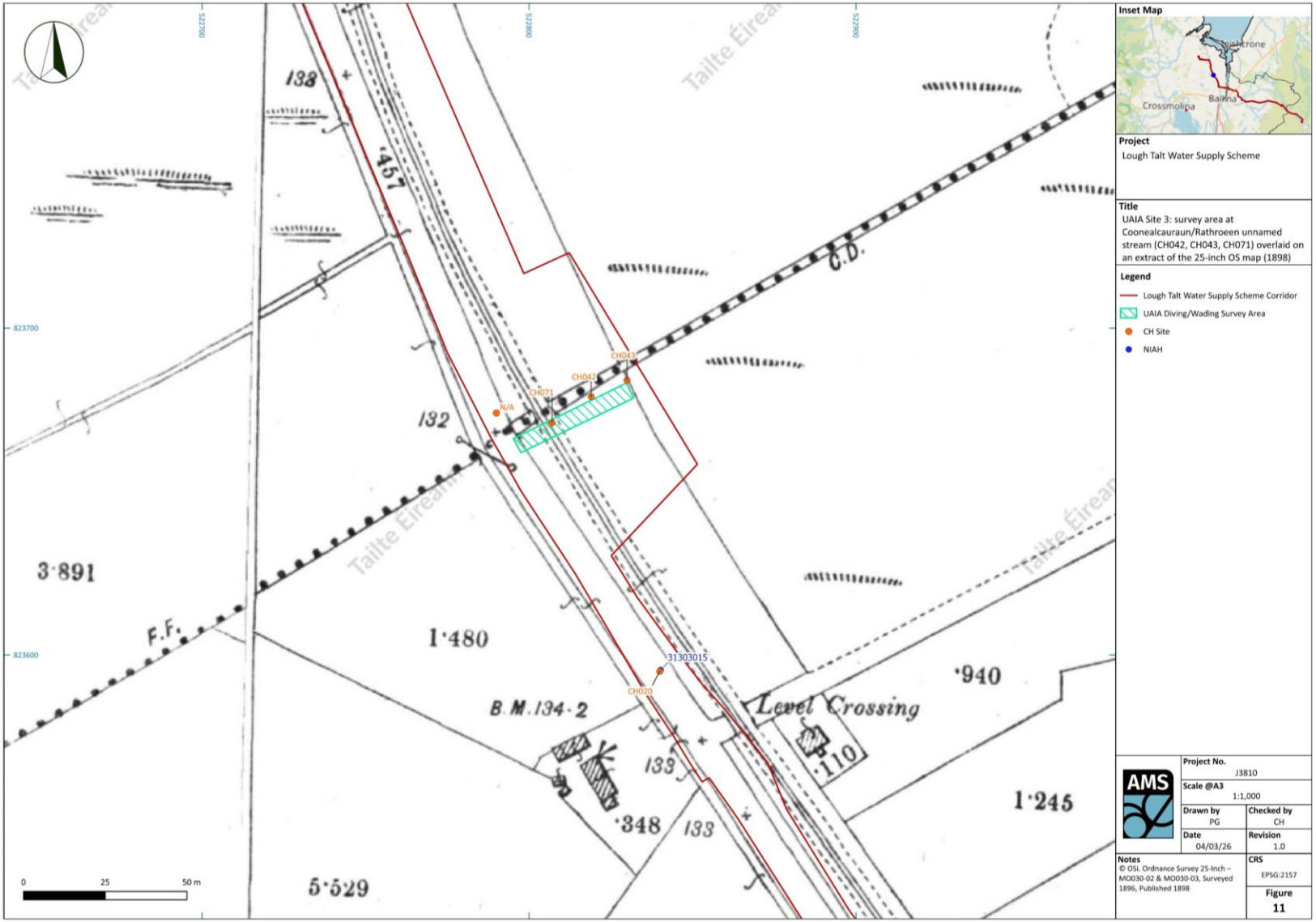


Figure 11: UAIA Site 3: survey area at Coonealcauraun/Rathroeen unnamed stream (CH042, CH043, CH071) overlaid on an extract of the 25-inch OS map (1898)

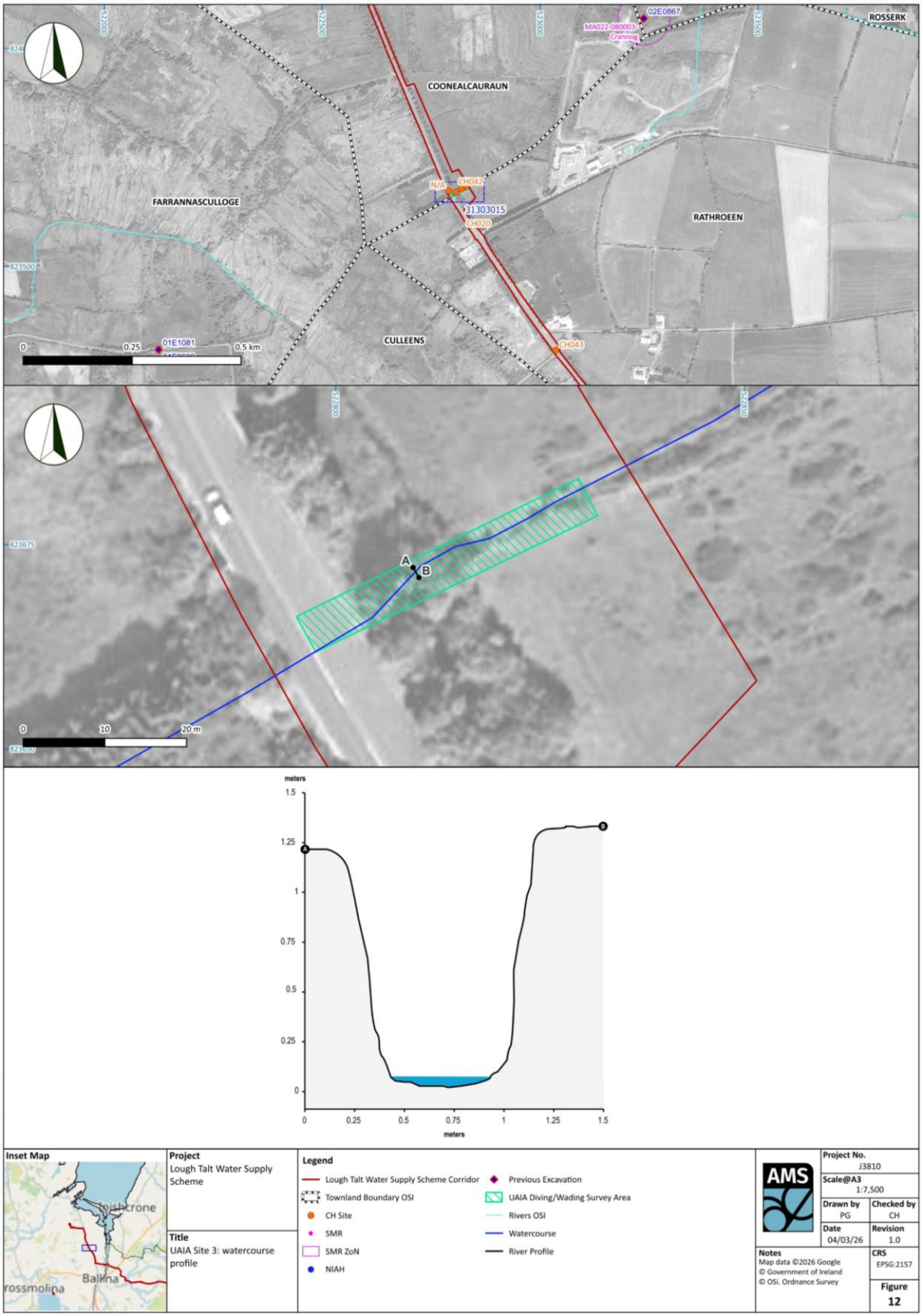


Figure 12: UAIA Site 3: watercourse profile



Figure 13: UAIA Site 4: overview of survey area at River Brusna (CH052, CH063, AAP02)



Figure 14: UAIA Site 4: survey area at River Brusna (CH052, CH063, AAP02) overlaid on an extract of the first-edition six-inch OS map (1839)

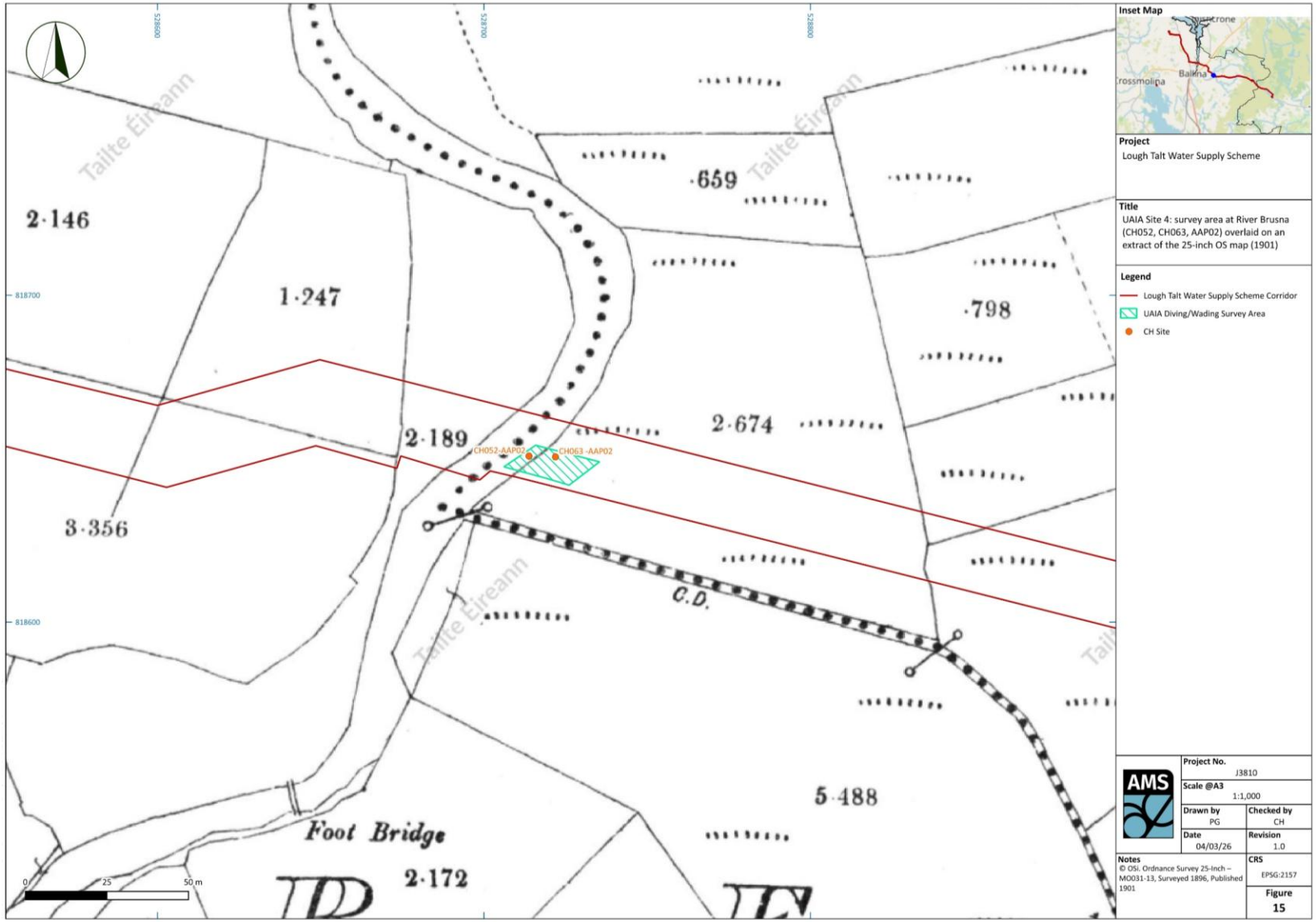


Figure 15: UAIA Site 4: survey area at River Brusna (CH052, CH063, AAP02) overlaid on an extract of the 25-inch OS map (1901)

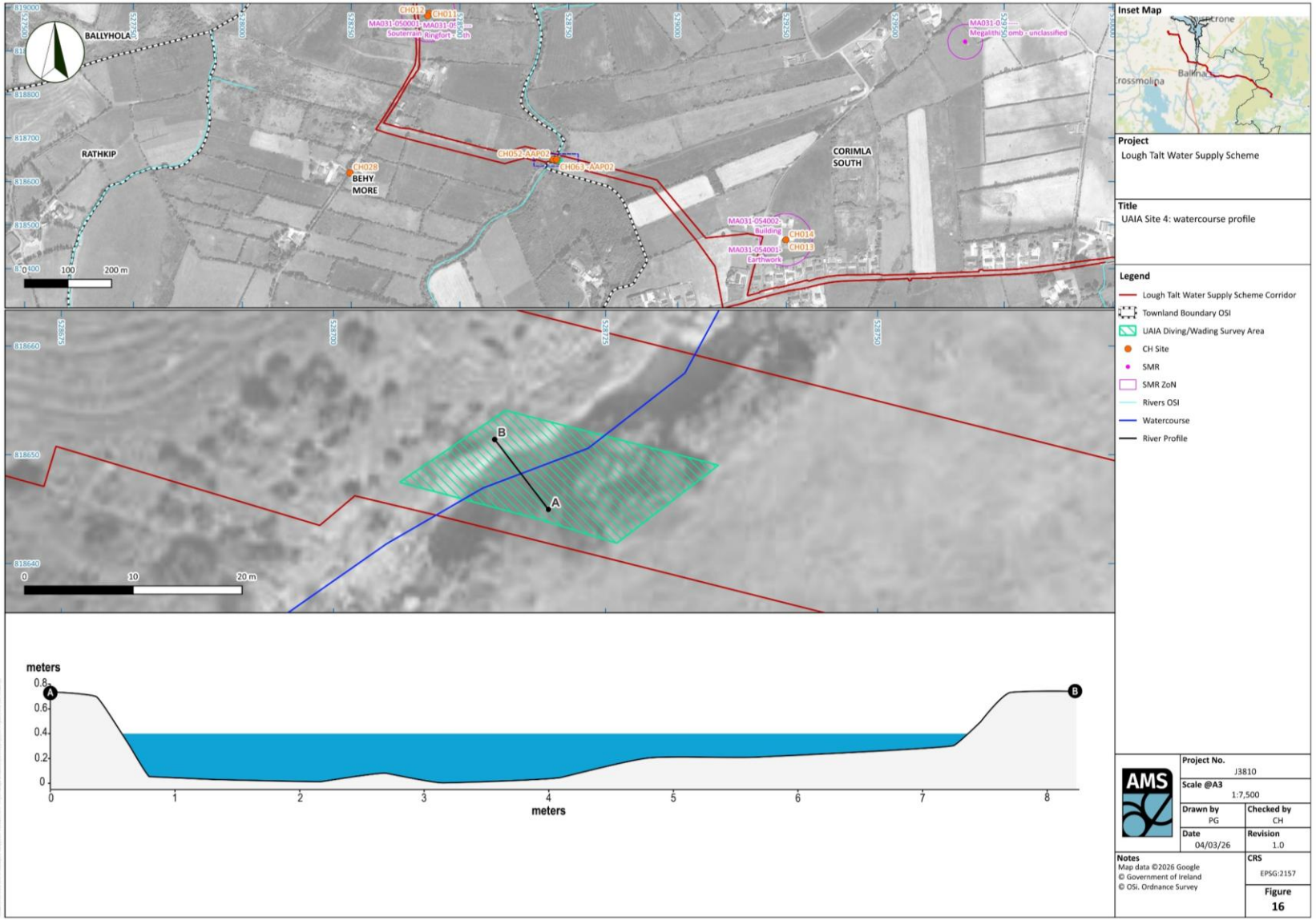


Figure 16: UAIA Site 4: watercourse profile

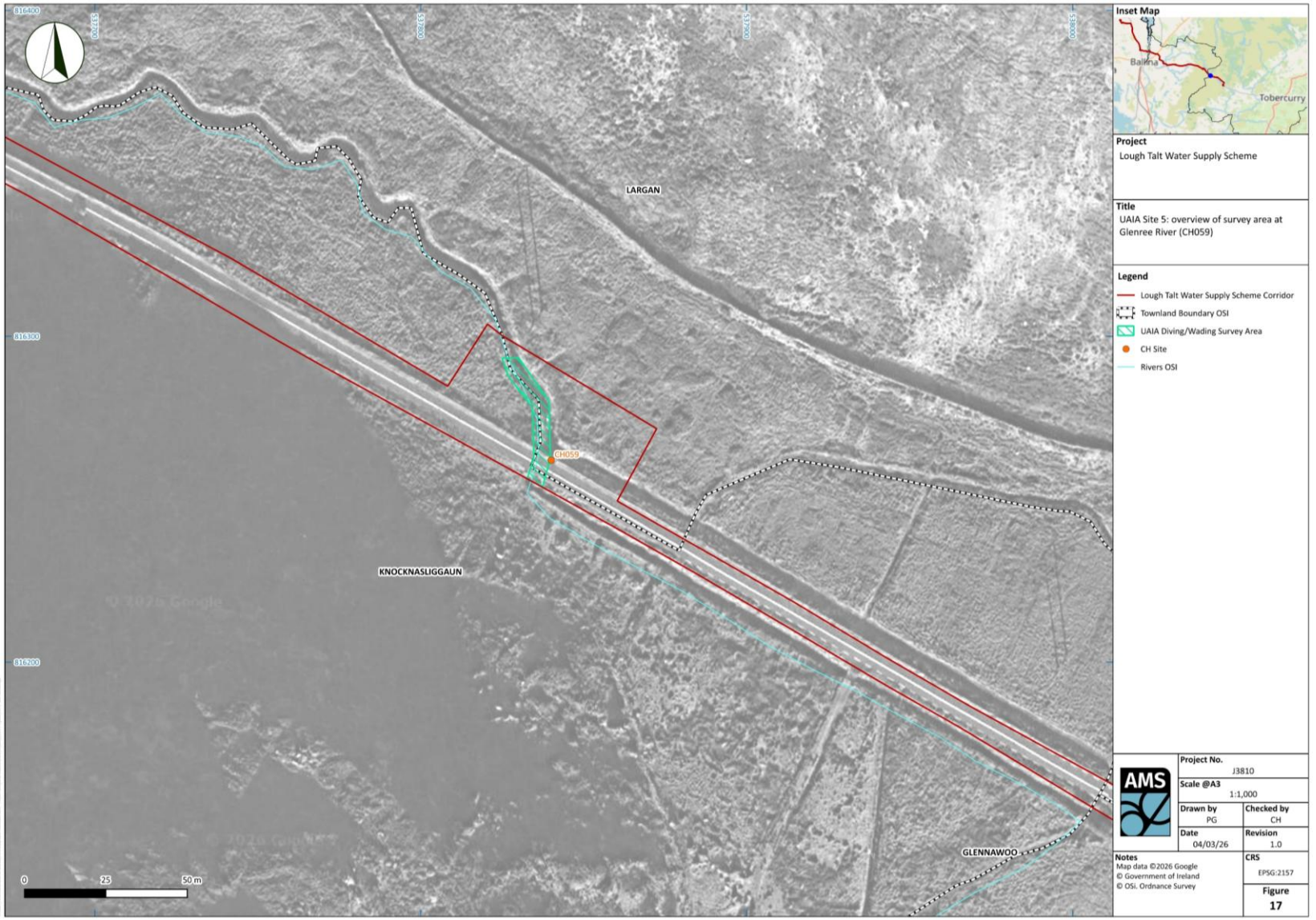


Figure 17: UAIA Site 5: overview of survey area at Glenree River (CH059)

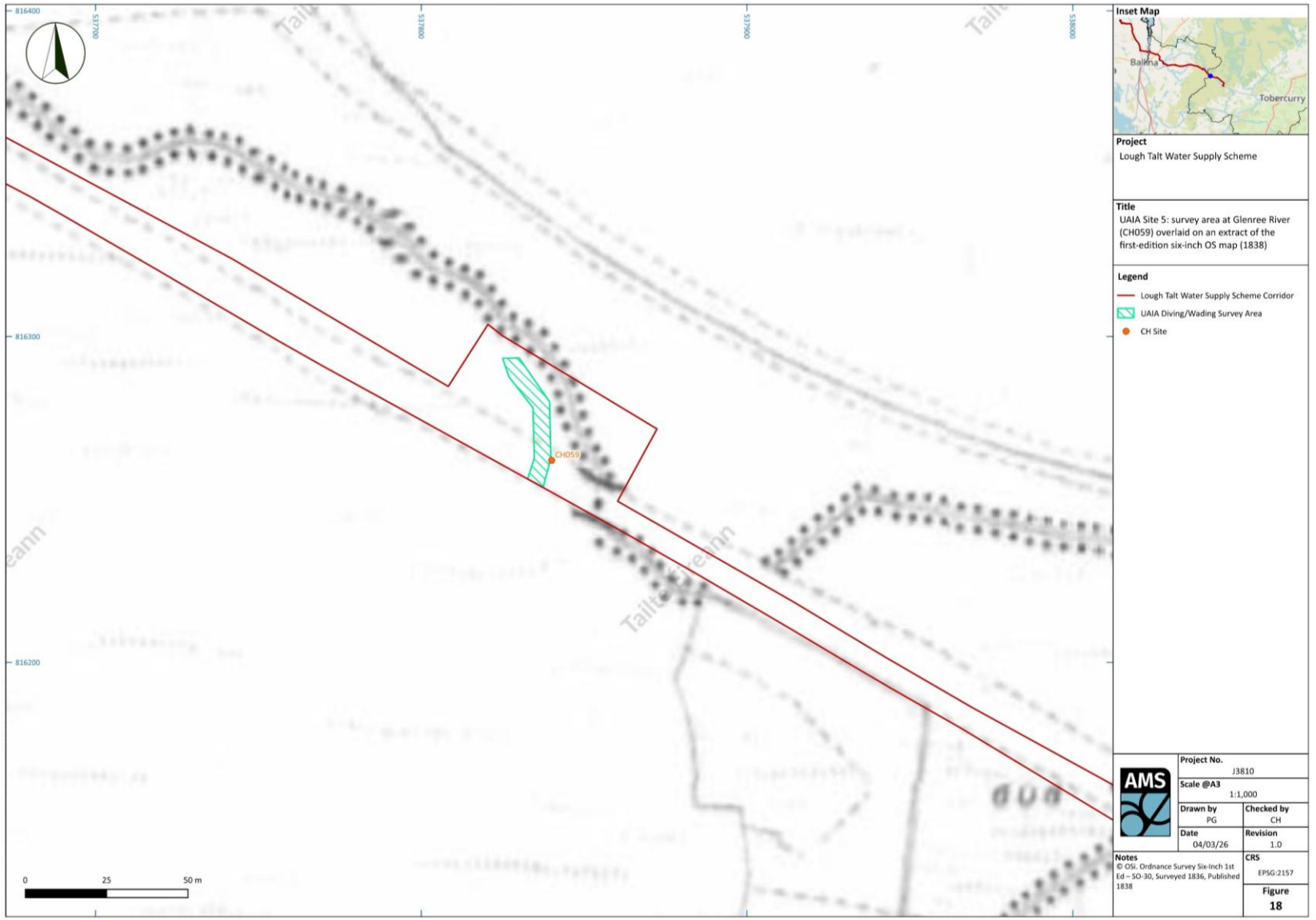


Figure 18: UAIA Site 5: survey area at Glenree River (CH059) overlaid on an extract of the first-edition six-inch OS map (1838)

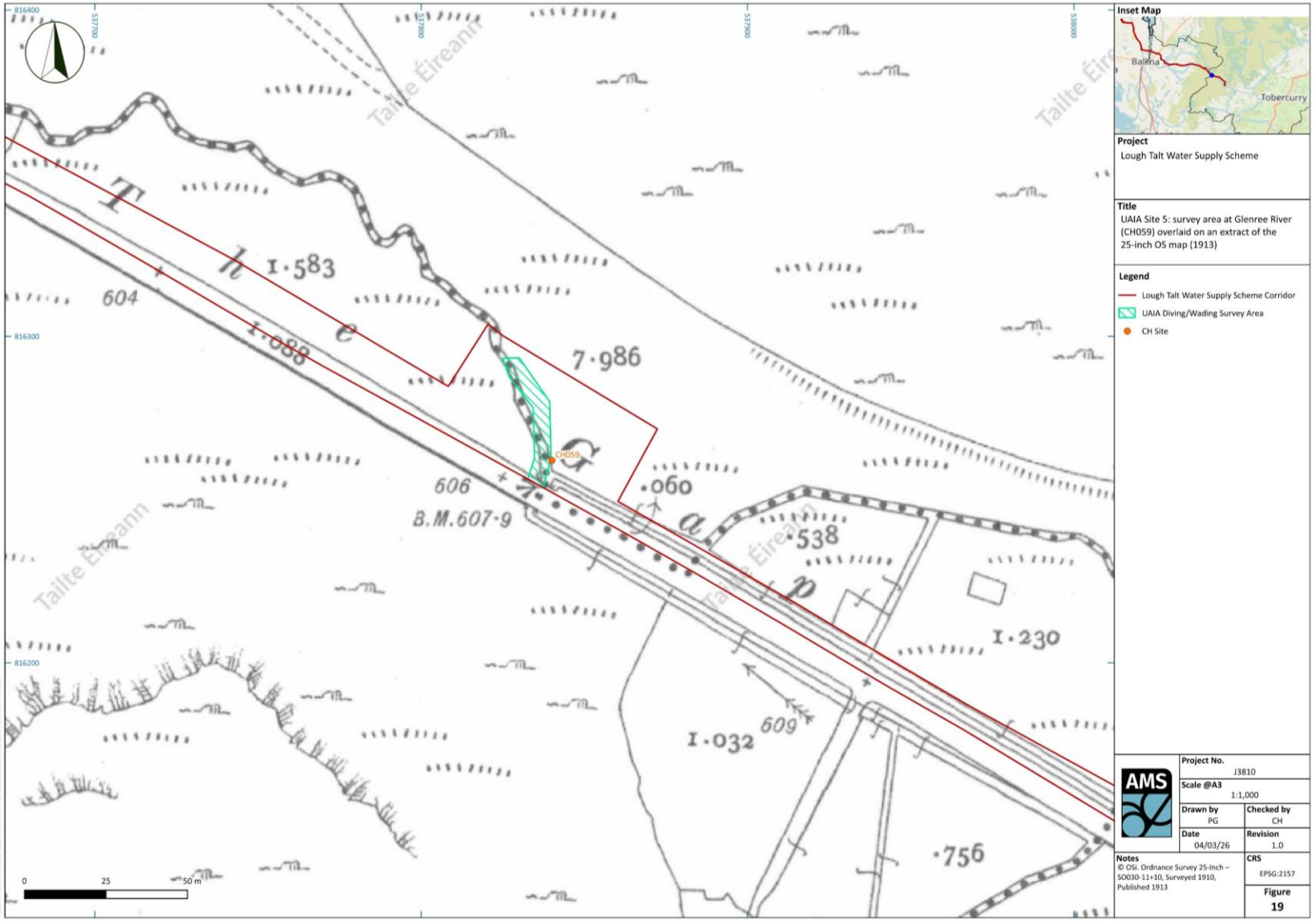


Figure 19: UAIA Site 5: survey area at Glenree River (CH059) overlaid on an extract of the 25-inch OS map (1913)

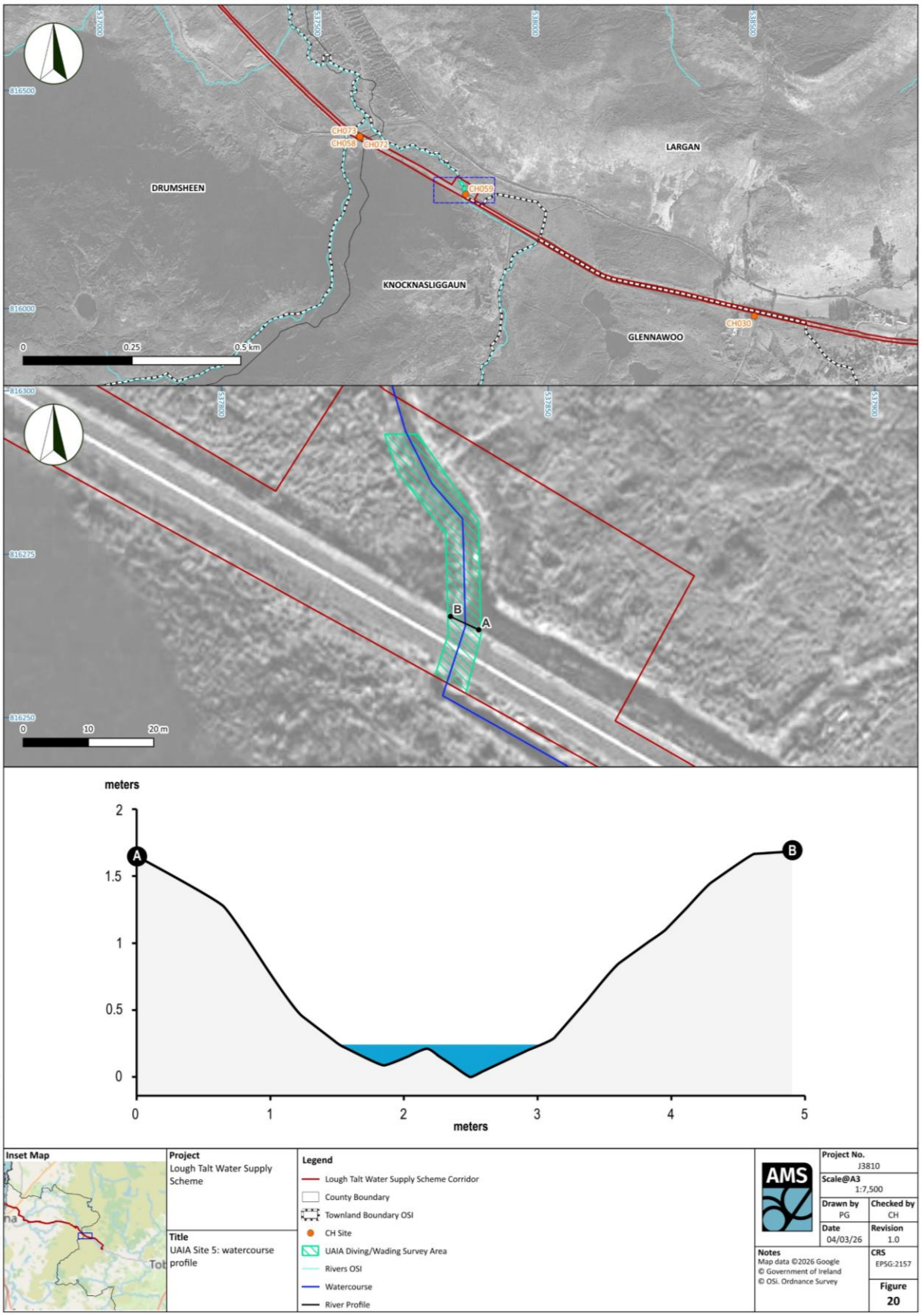


Figure 20: UAIA Site 5: watercourse profile



Figure 21: UAIA Site 6: overview of survey area at Fiddaun River (CH054, CH065, AAP04)



Figure 22: UAIA Site 6: survey area at Fiddaun River (CH054, CH065, AAP04) overlaid on an extract of the first-edition six-inch OS map (1839)



Figure 23: UAIA Site 6: survey area at Fiddaun River (CH054, CH065, AAP04) overlaid on an extract of the 25-inch OS map (1898)

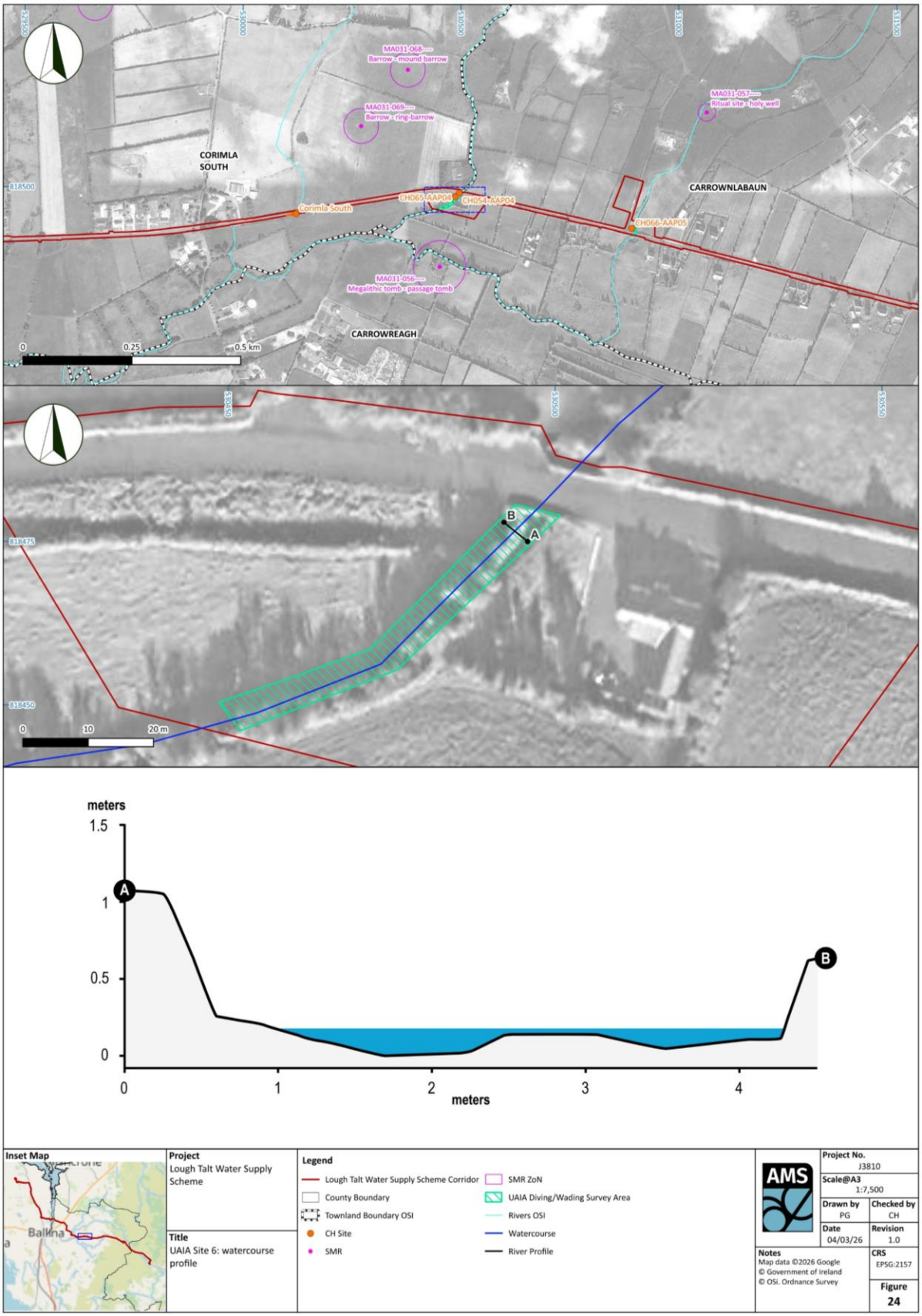


Figure 24: UAIA Site 6: watercourse profile

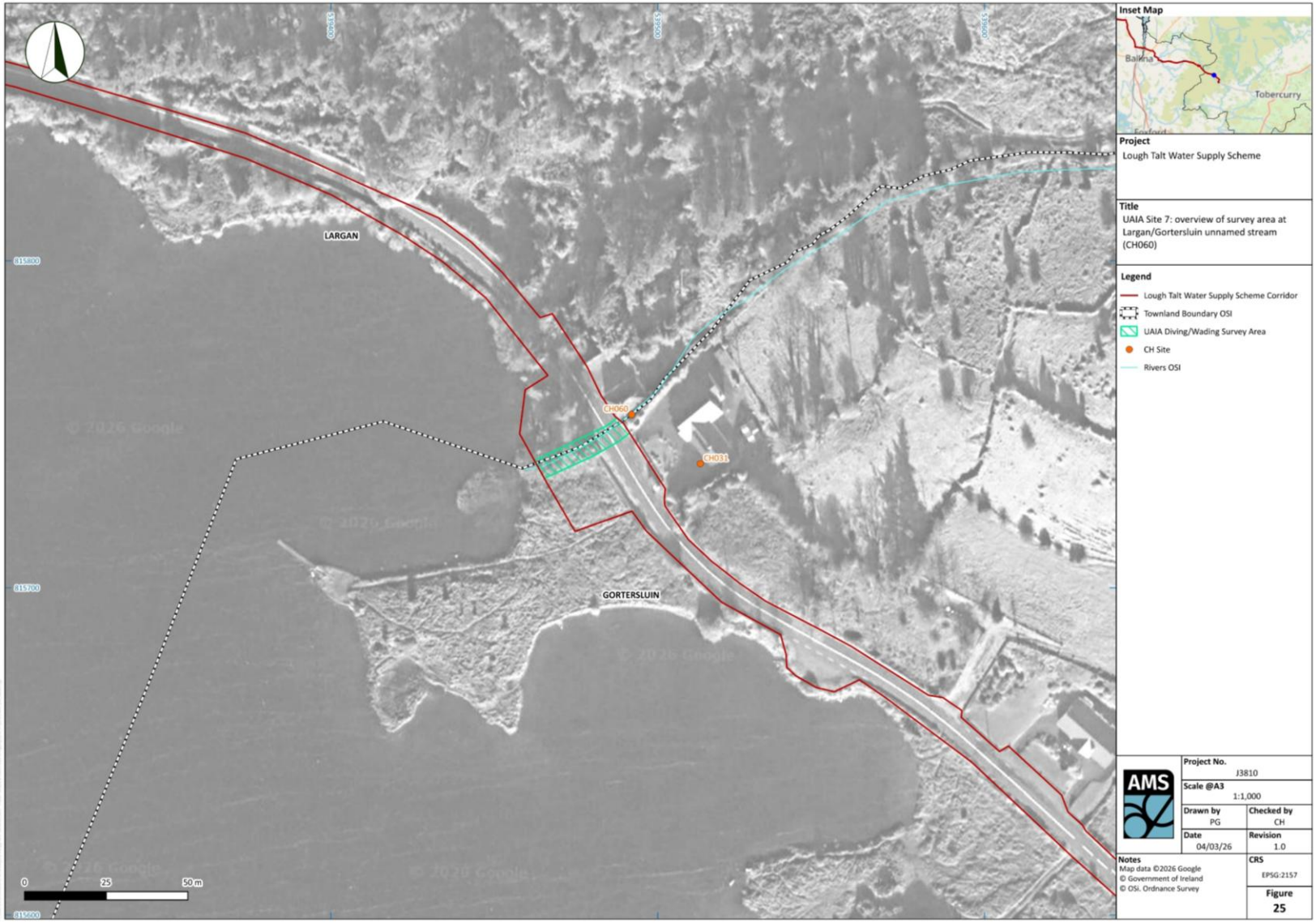


Figure 25: UAIA Site 7: overview of survey area at Largan/Gortersluin unnamed stream (CH060)



Figure 26: UAIA Site 7: survey area at Largan/Gortersluin unnamed stream (CH060) overlaid on an extract of the first-edition six-inch OS map (1838)



Figure 27: UAIA Site 7: survey area at Largan/Gortersluin unnamed stream (CH060) overlaid on an extract of the 25-inch OS map (1913)

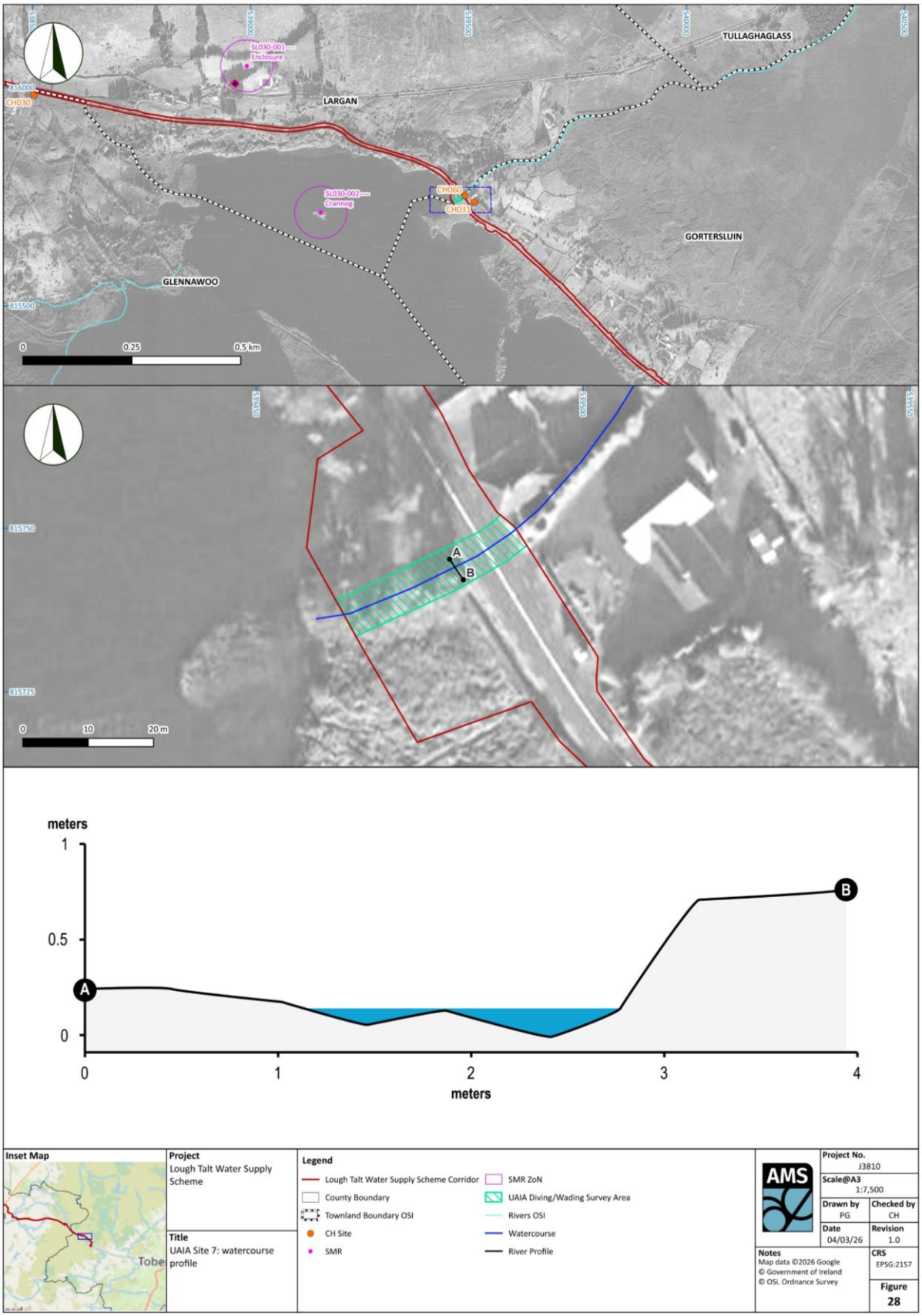


Figure 28: UAIA Site 7: watercourse profile



Figure 29: UAIA Site 8: overview of survey area at Srafaungal River (Carrownlabaun) (CH066, AAP05)



Figure 30: UAIA Site 8: survey area at Srafaungal River (Carrownlabaun) (CH066, AAP05) overlaid on an extract of the first-edition six-inch OS map (1839)

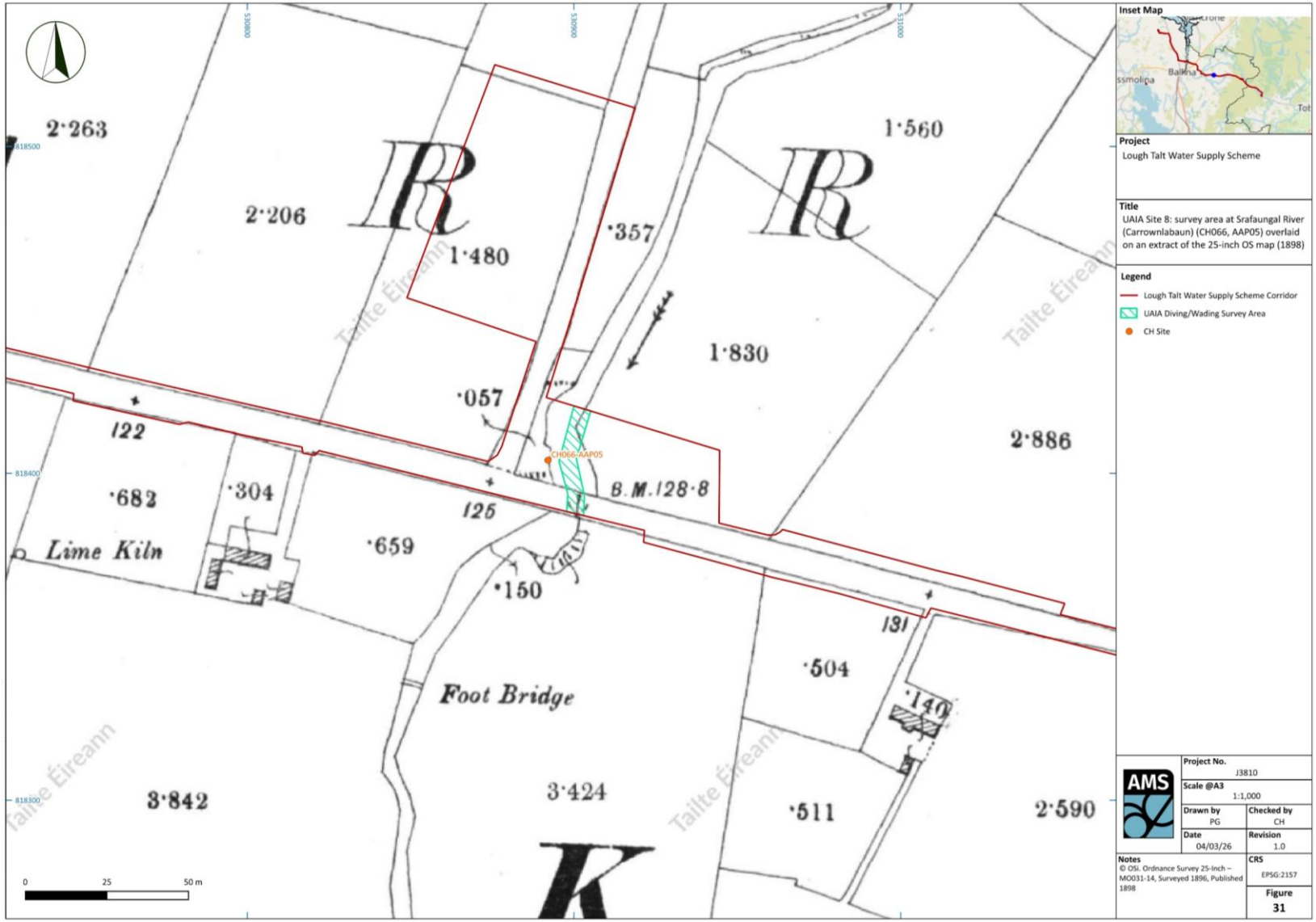


Figure 31: UAIA Site 8: survey area at Srafaungal River (Carrownlabaun) (CH066, AAP05) overlaid on an extract of the 25-inch OS map (1898)

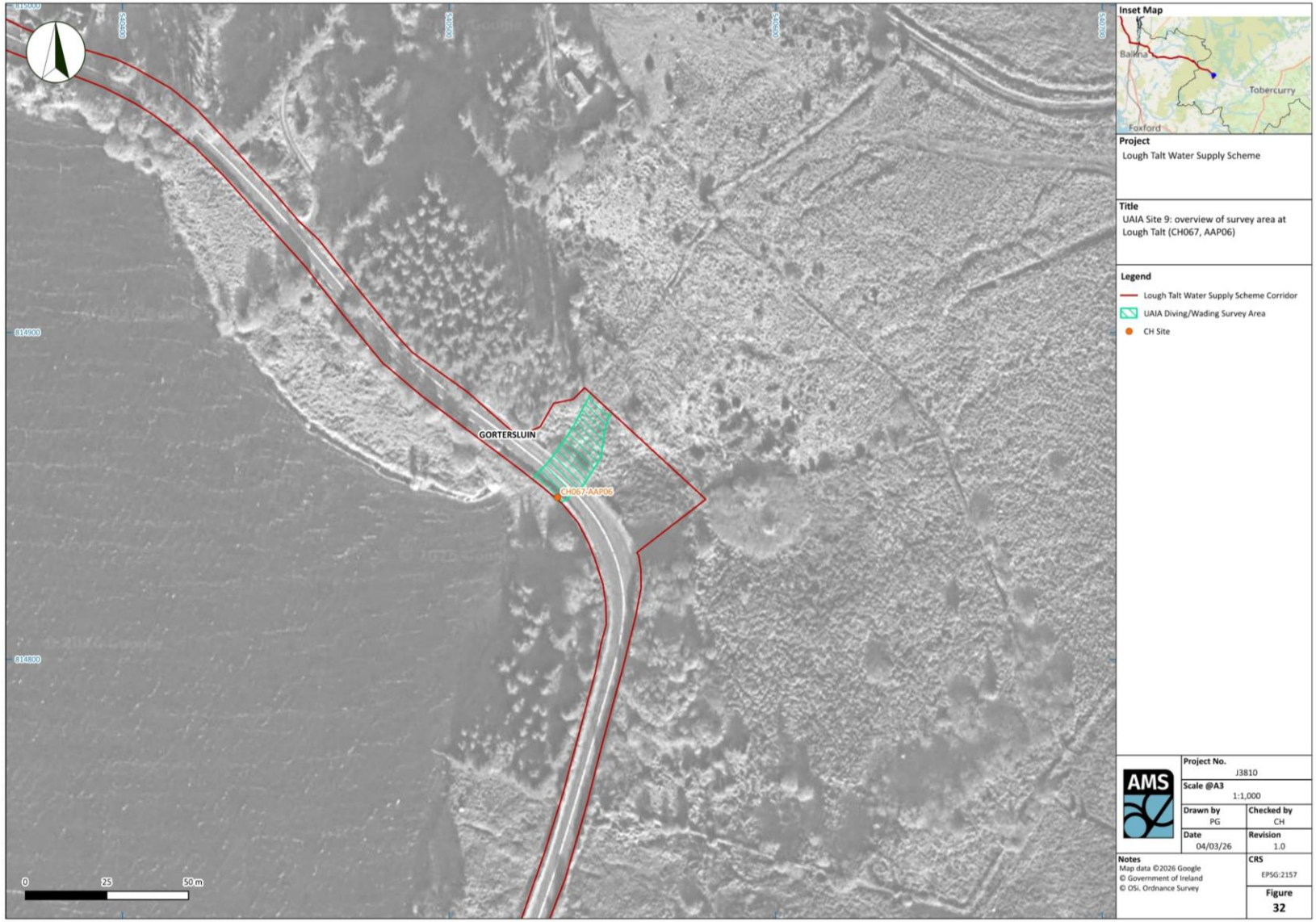


Figure 32: UAIA Site 9: overview of survey area at Lough Talt (CH067, AAP06)



Figure 33: UAIA Site 9: survey area at Lough Talt (CH067, AAP06) overlaid on an extract of the first-edition six-inch OS map (1838)

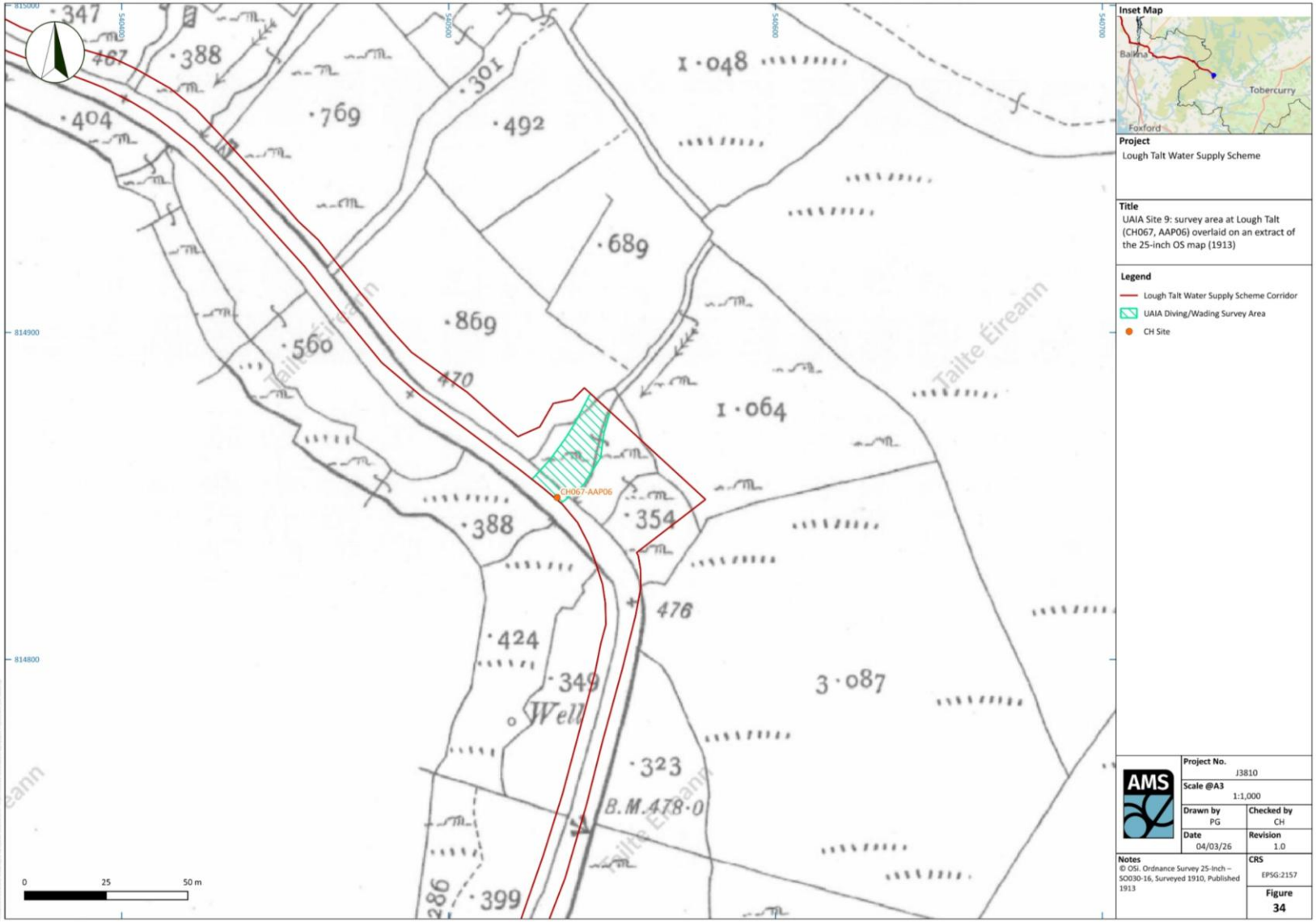


Figure 34: UAIA Site 9: survey area at Lough Talt (CH067, AAP06) overlaid on an extract of the 25-inch OS map (1913)

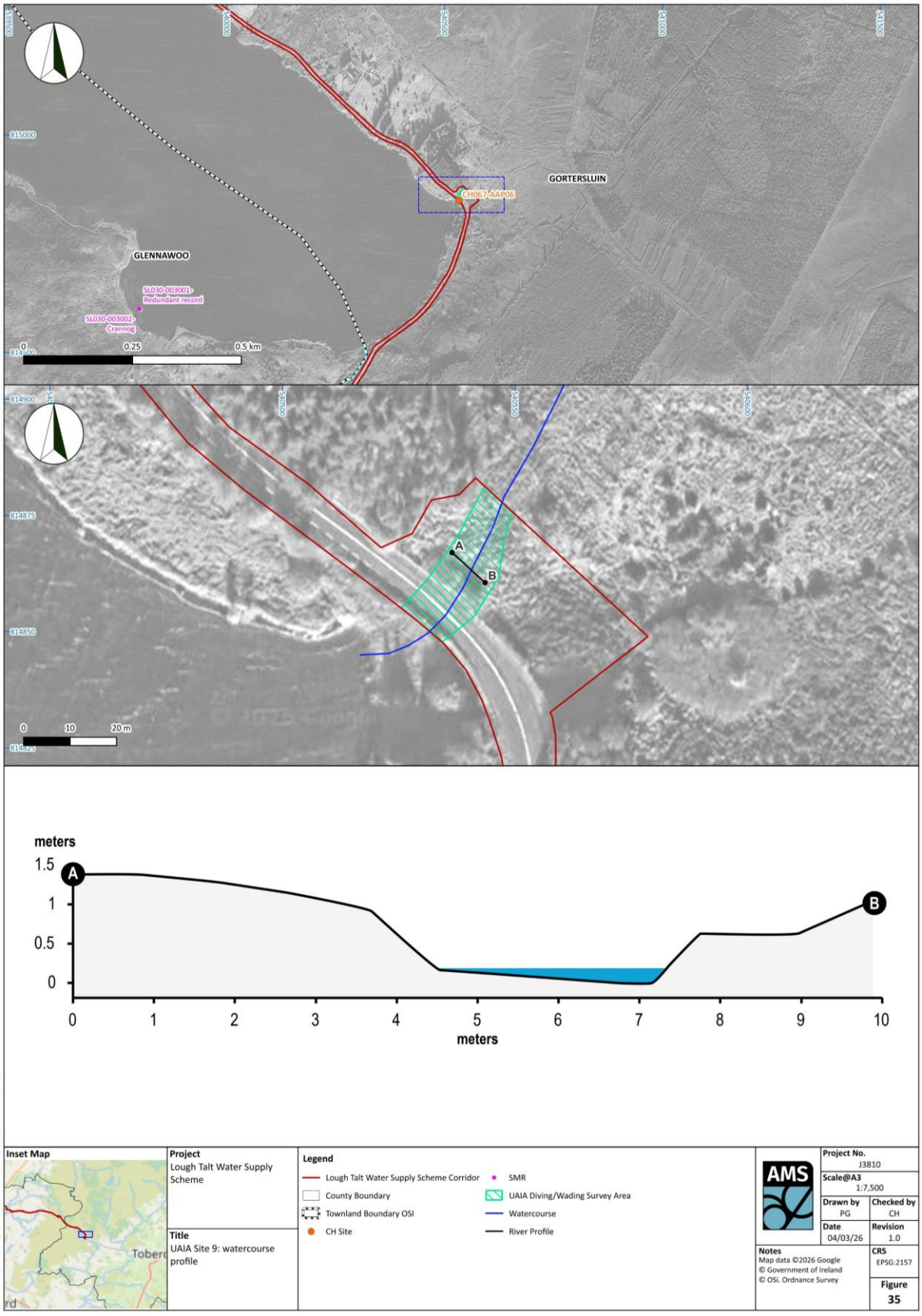


Figure 35: UAIA Site 9: watercourse profile



Figure 36: UAIA Site 10: overview of survey area at Srafaungal River (Drumsheen/Bunnyconnellan) (CH074, AAP13)

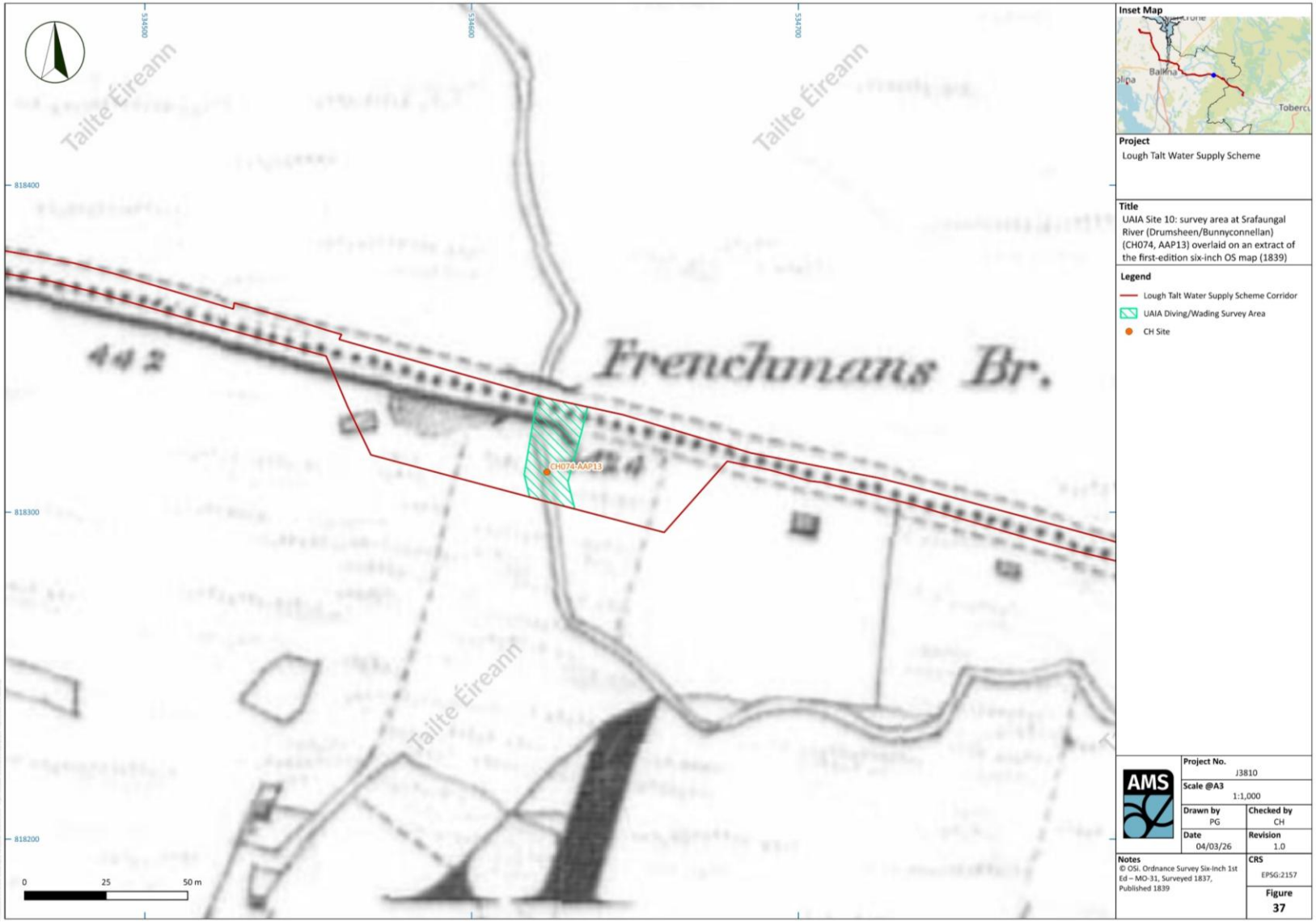


Figure 37: UAIA Site 10: survey area at Srafaungal River (Drumsheen/Bunnyconnellan) (CH074, AAP13) overlaid on an extract of the first-edition six-inch OS map (1838)

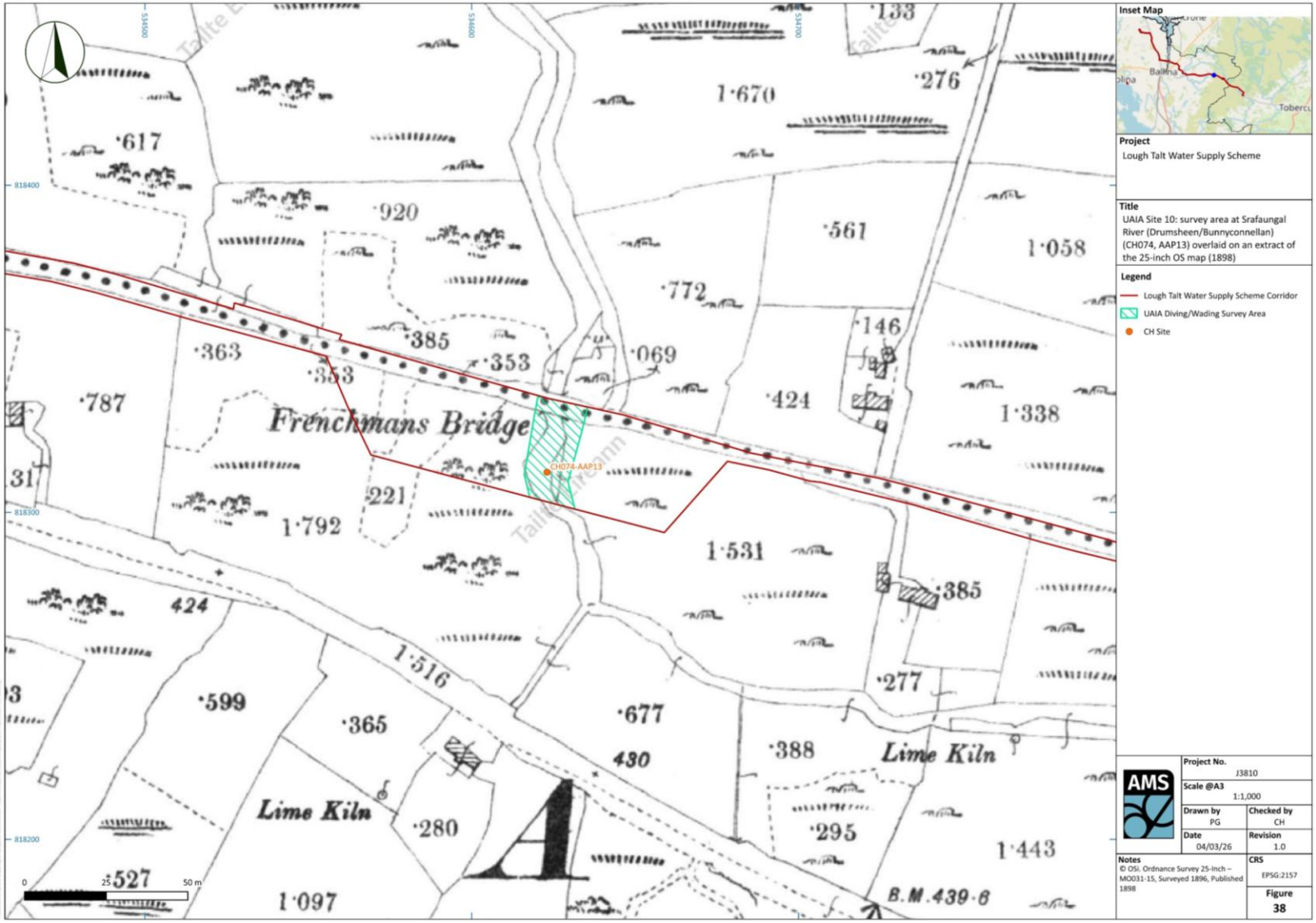


Figure 38: UAIA Site 10: survey area at Srafaungal River (Drumsheen/Bunnyconnellan) (CH074, AAP13) overlaid on an extract of the 25-inch OS map (1898)

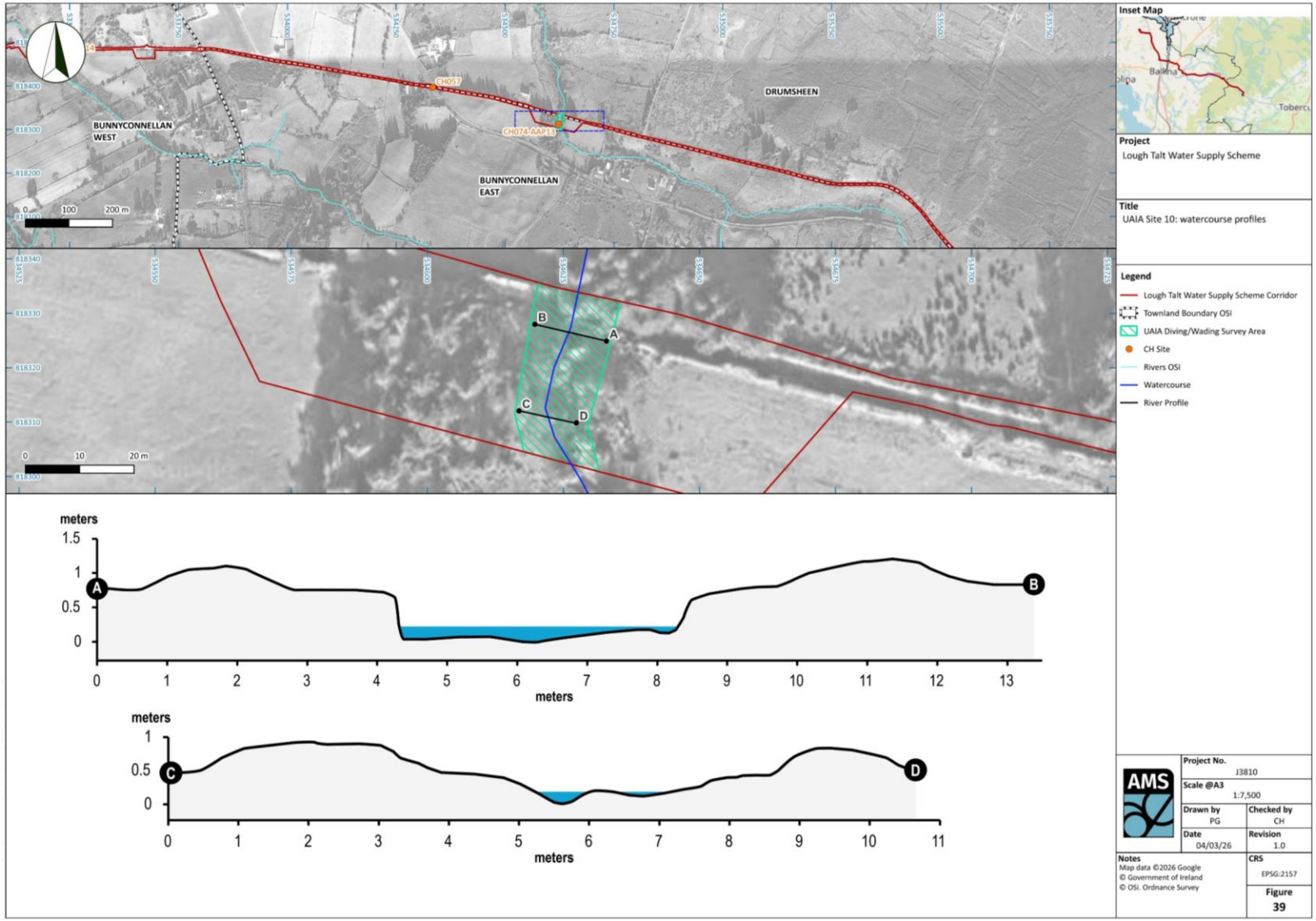


Figure 39: UAIA Site 10: watercourse profiles

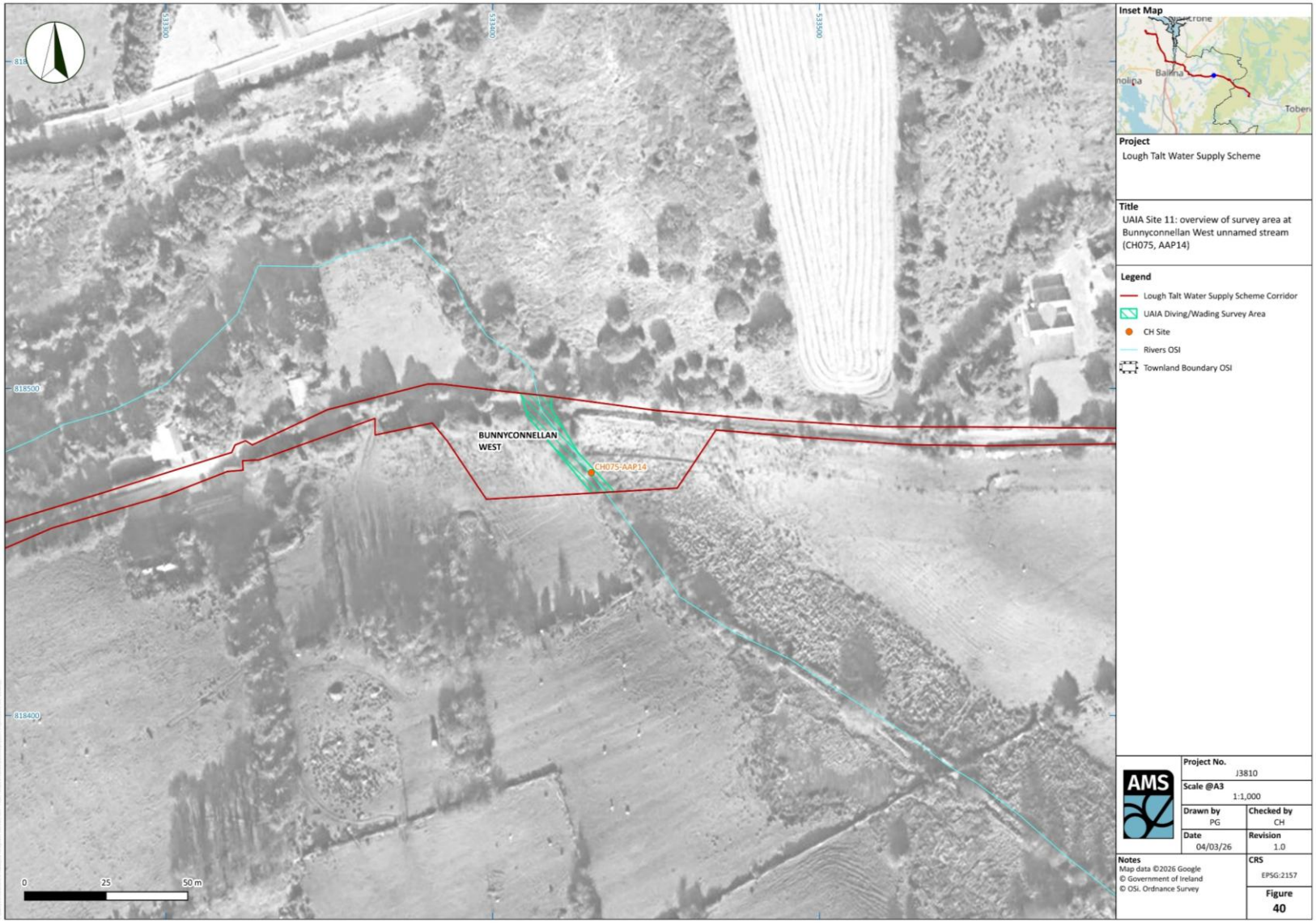


Figure 40: UAIA Site 11: overview of survey area at Bunnyconnellan West unnamed stream (CH075, AAP14)



Figure 41: UAIA Site 11: survey area at Bunnyconnellan West unnamed stream (CH075, AAP14) overlaid on an extract of the first-edition six-inch OS map (1839)

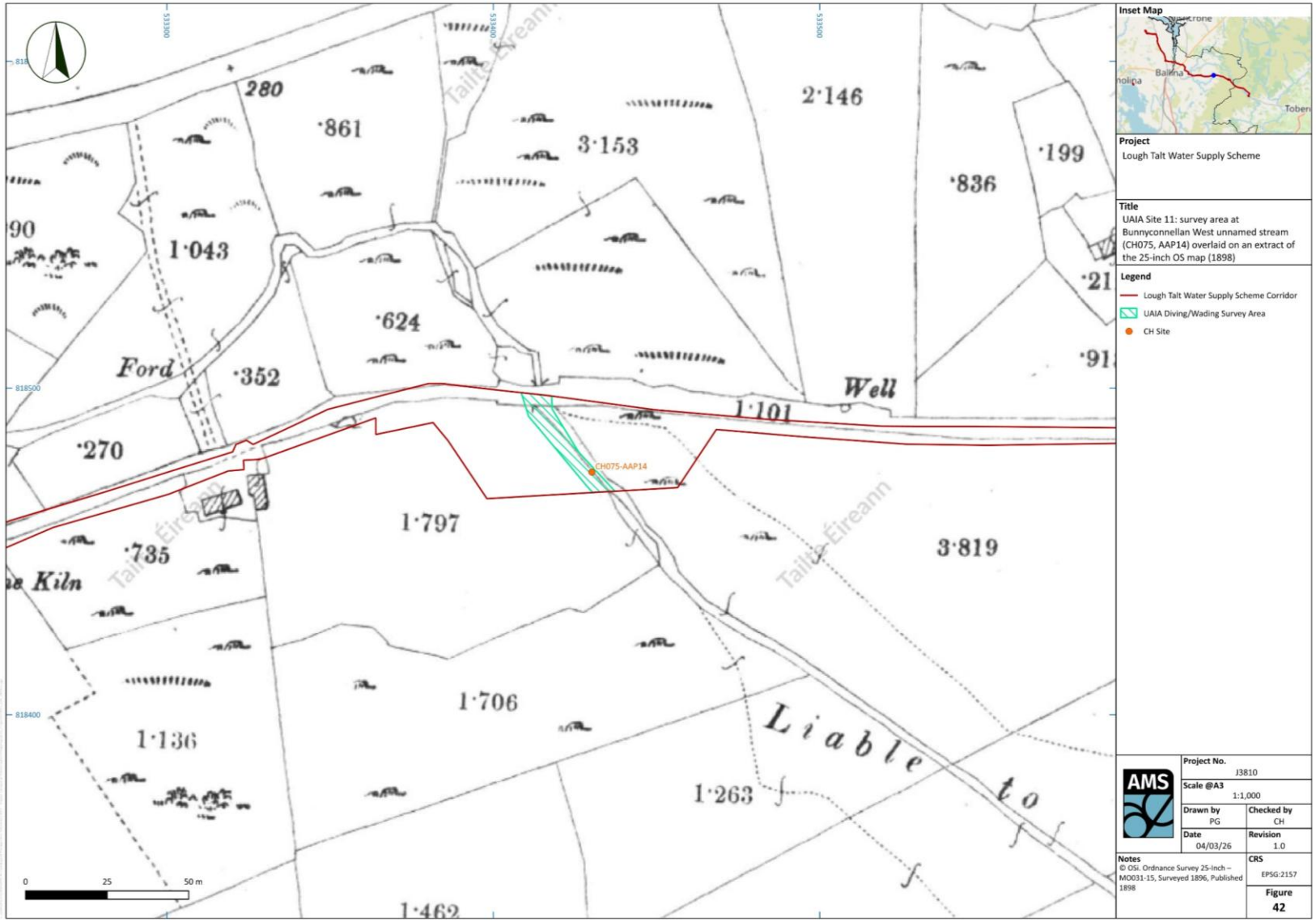


Figure 42: UAIA Site 11: survey area at Bunnyconnellan West unnamed stream (CH075, AAP14) overlaid on an extract of the 25-inch OS map (1898)

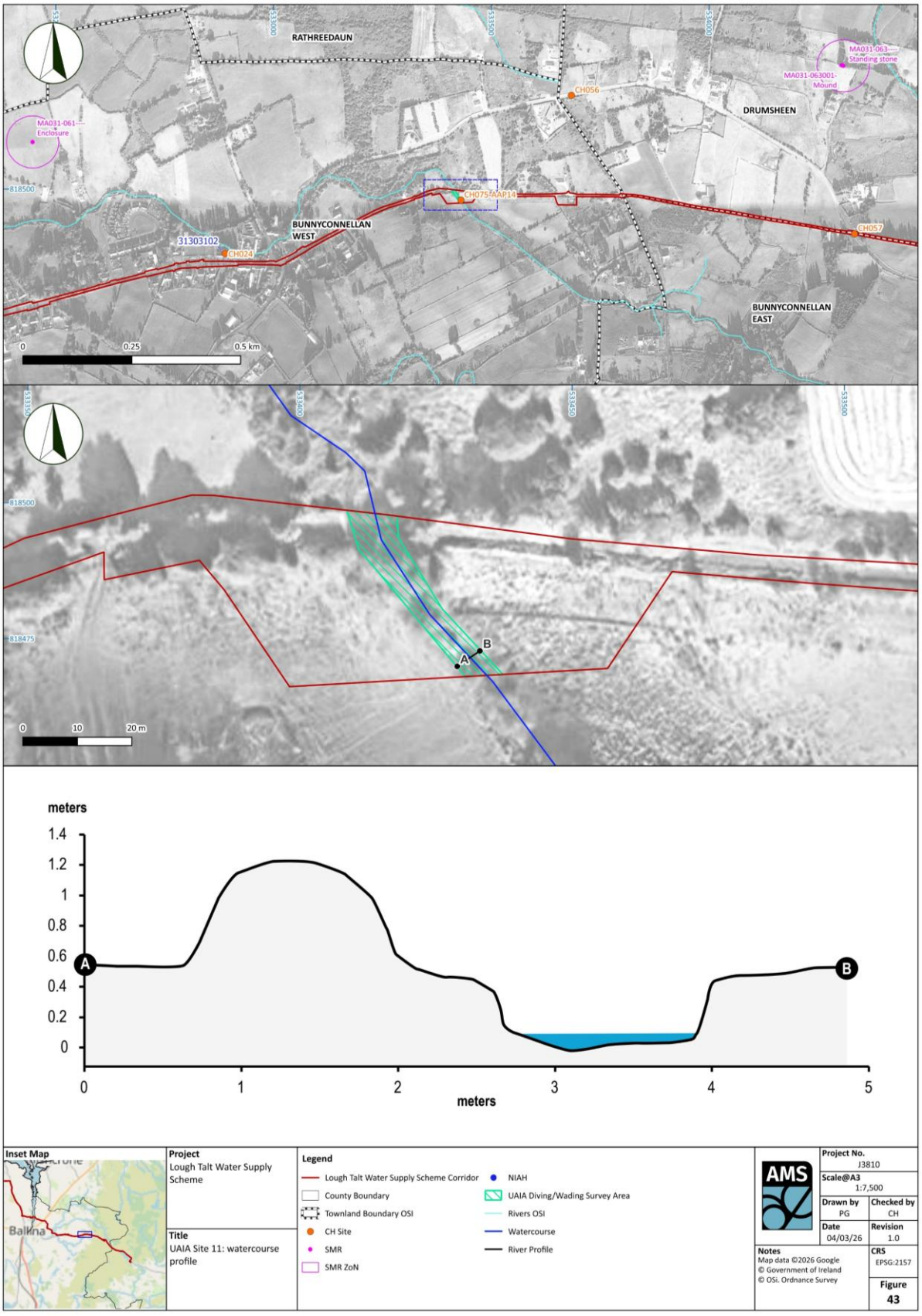


Figure 43: UAIA Site 11: watercourse profile



Figure 44: UAIA Site 12: overview of survey area at Lough Conn (CH076, AAP15)

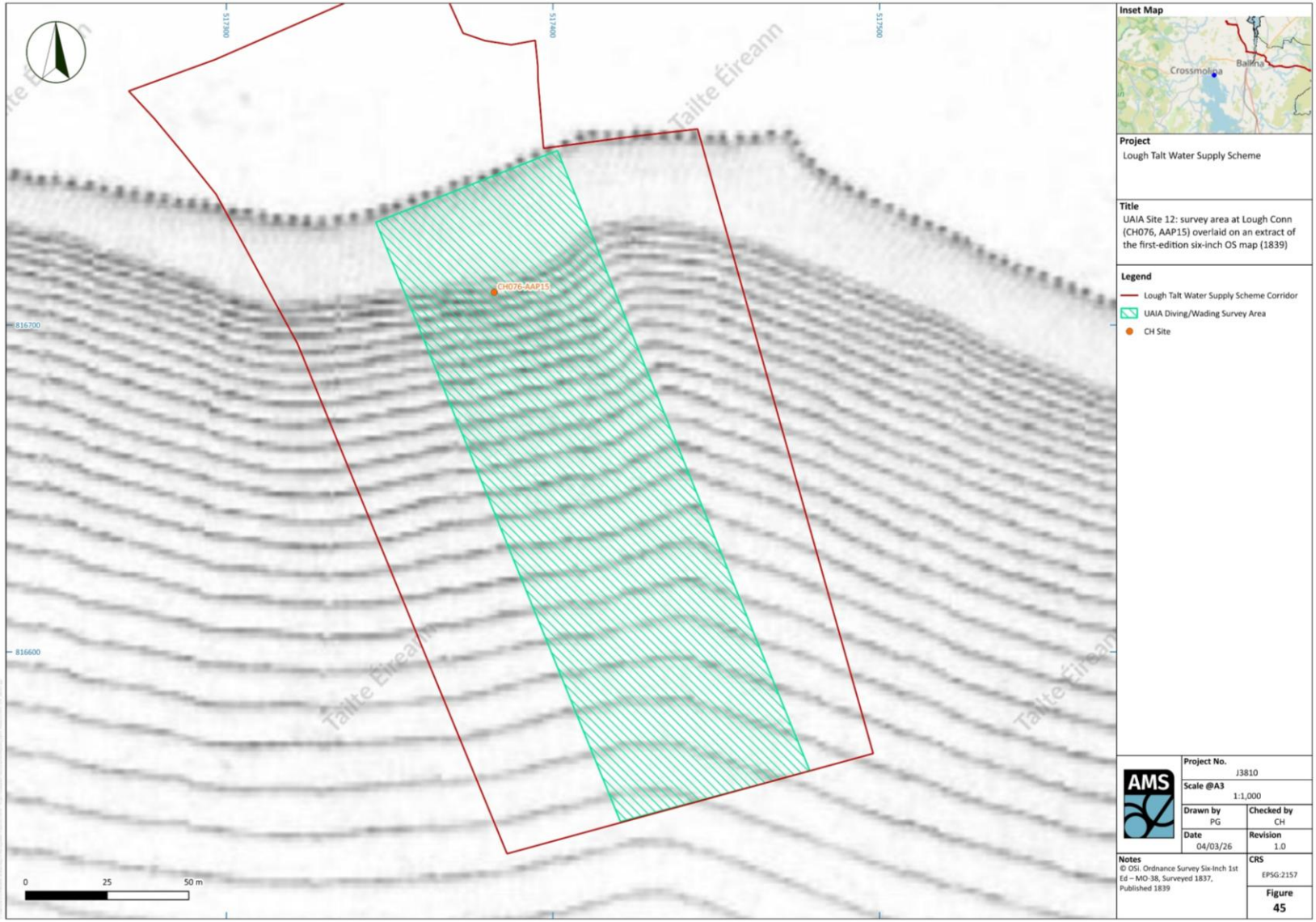


Figure 45: UAIA Site 12: survey area at Lough Conn (CH076, AAP15) overlaid on an extract of the first-edition six-inch OS map (1839)

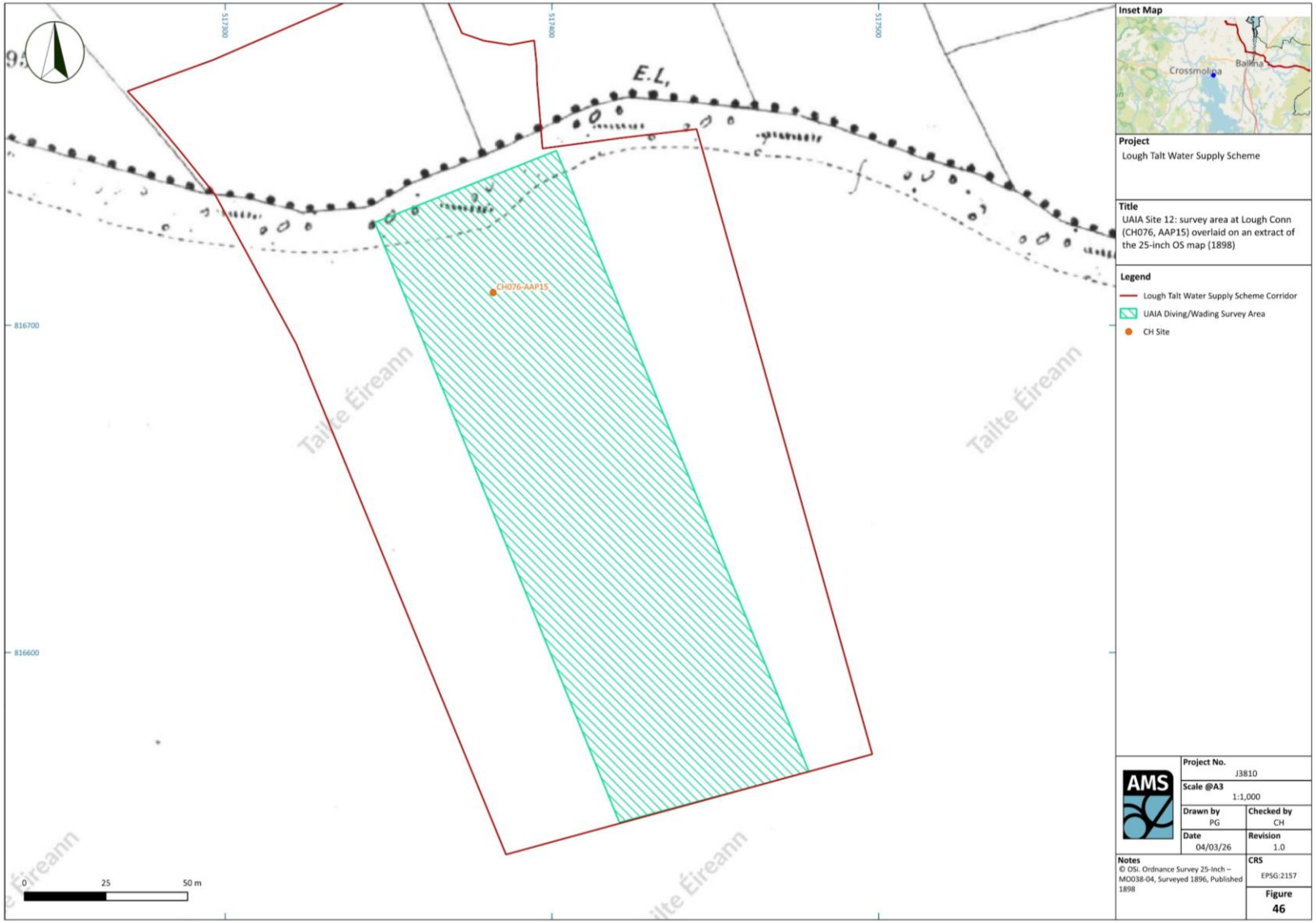


Figure 46: UAIA Site 12: survey area at Lough Conn (CH076, AAP15) overlaid on an extract of the 25-inch OS map (1898)



Figure 47: UAIA Site 13: unnamed stream (CH035, CH069) overview



Figure 48: UAIA Site 13: unnamed stream (CH035, CH069) overlaid on an extract of the first-edition six-inch OS map (1839)

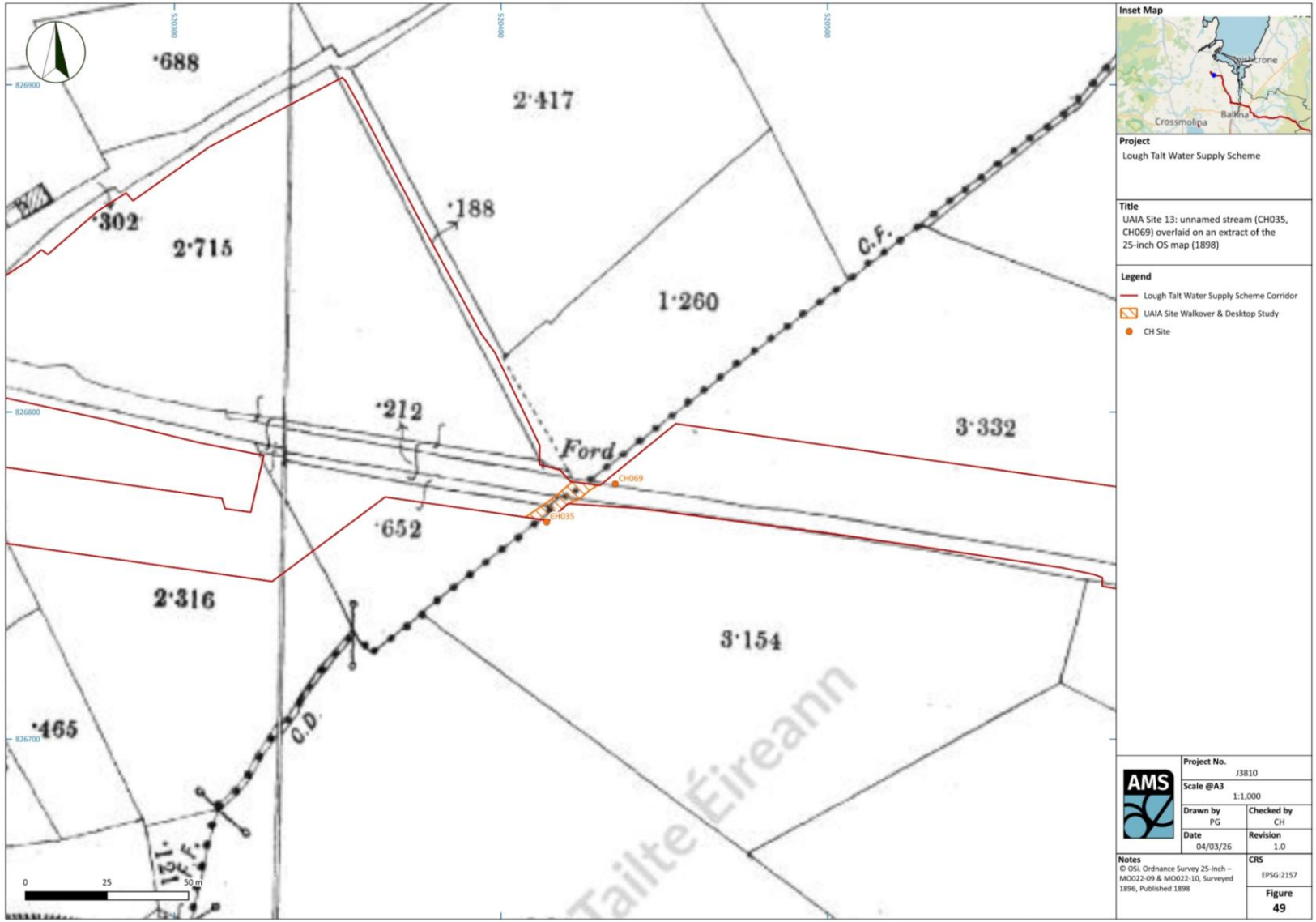


Figure 49: UAIA Site 13: unnamed stream (CH035, CH069) overlaid on an extract of the 25-inch OS map (1898)



Figure 50: UAIA Site 14: unnamed stream (CH027, CH038) overview



Figure 51: UAIA Site 14: unnamed stream (CH027, CH038) overlaid on an extract of the first-edition six-inch OS map (1839)

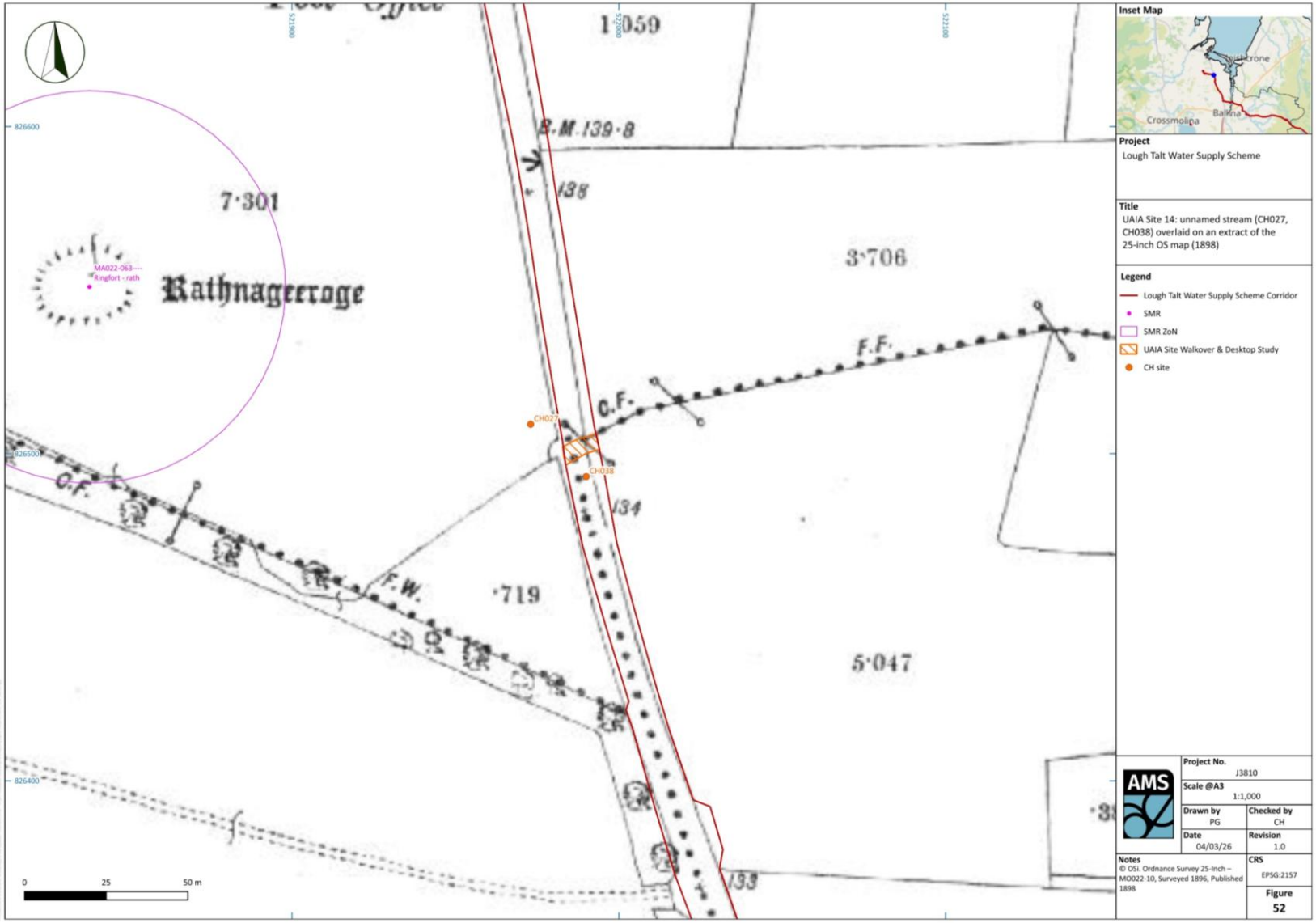


Figure 52: UAIA Site 14: unnamed stream (CH027, CH038) overlaid on an extract of the 25-inch OS map (1898)



Figure 53: UAIA Site 15: unnamed stream (CH070) overview



Figure 54: UAIA Site 15: unnamed stream (CH070) overlaid on an extract of the first-edition six-inch OS map (1839)

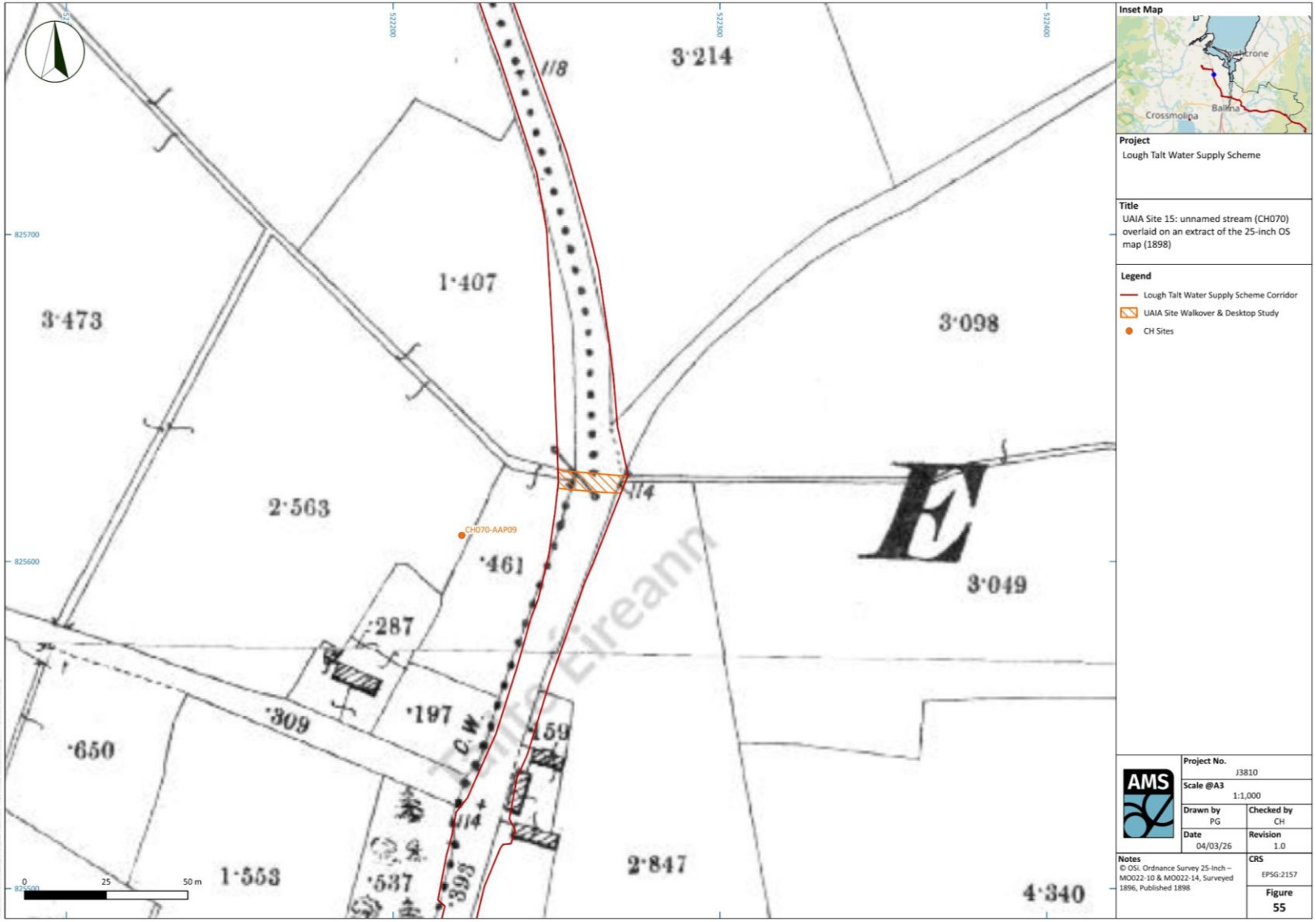


Figure 55: UAIA Site 15: unnamed stream (CH070) overlaid on an extract of the 25-inch OS map (1898)



Figure 56: UAIA Site 16: Illanmuck River overview



Figure 57: UAIA Site 16: Illanmuck River overlaid on an extract of the first-edition six-inch OS map (1839)

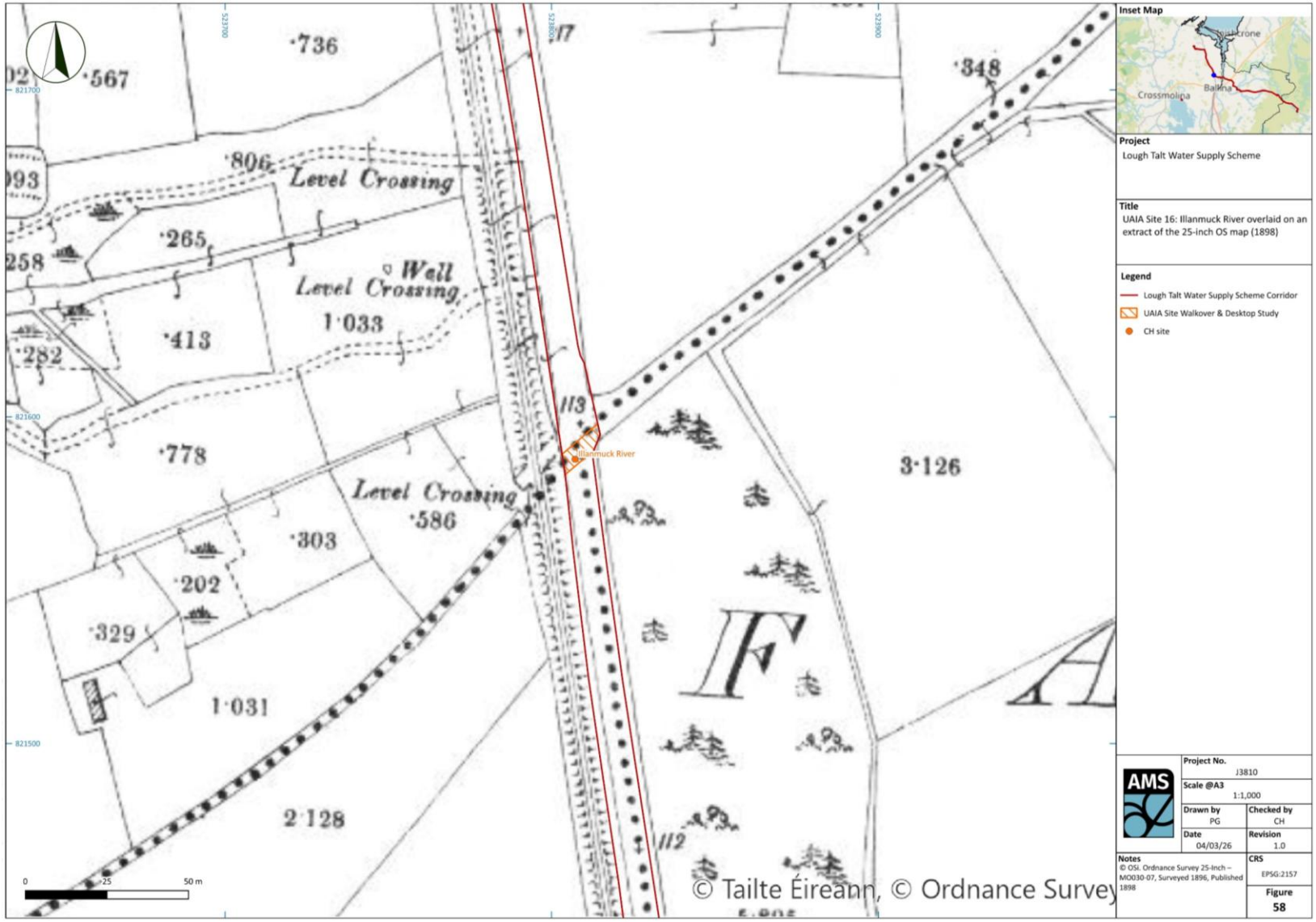


Figure 58: UAIA Site 16: Illanmuck River overlaid on an extract of the 25-inch OS map (1898)

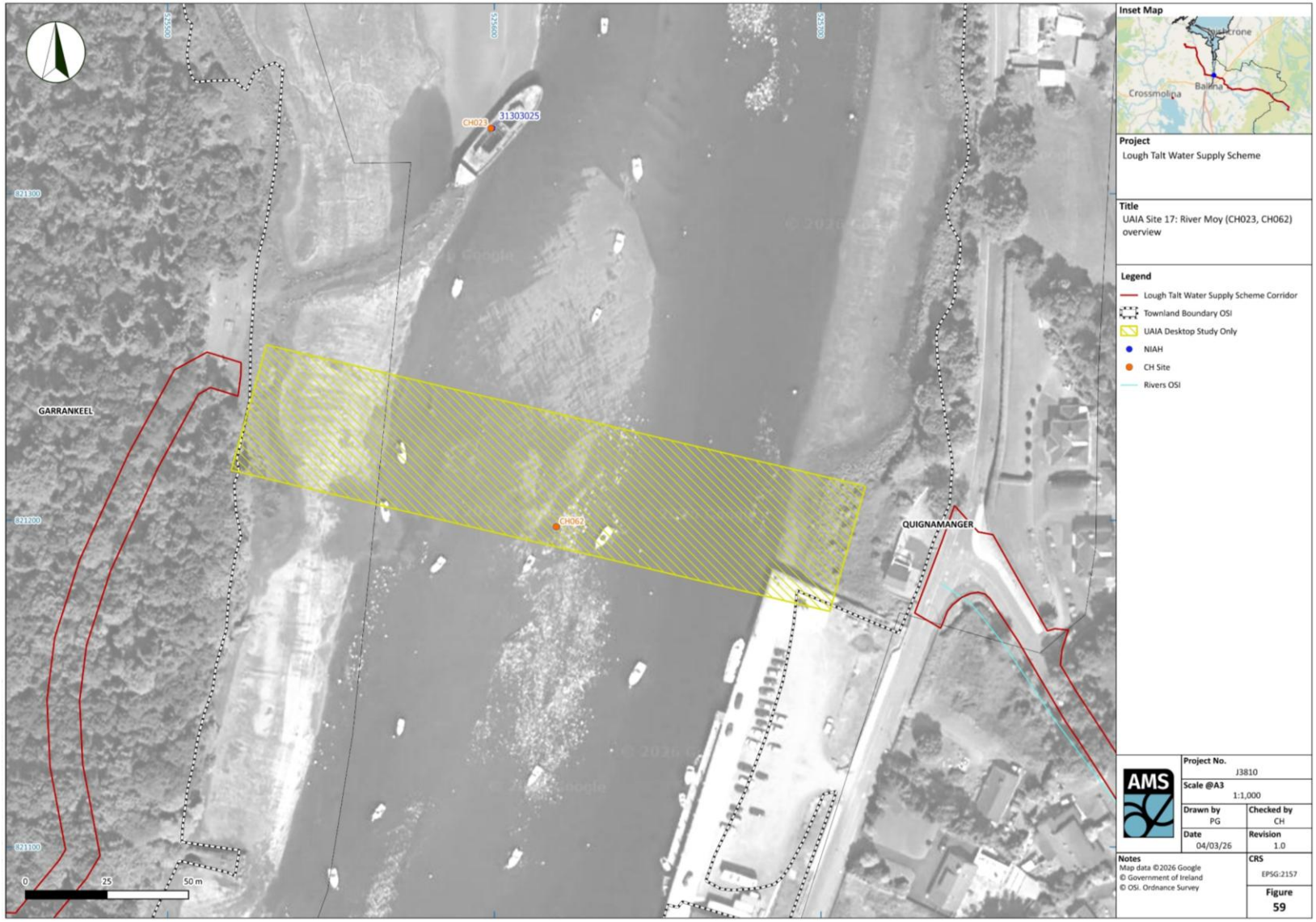


Figure 59: UAIA Site 17: River Moy (CH023, CH062) overview

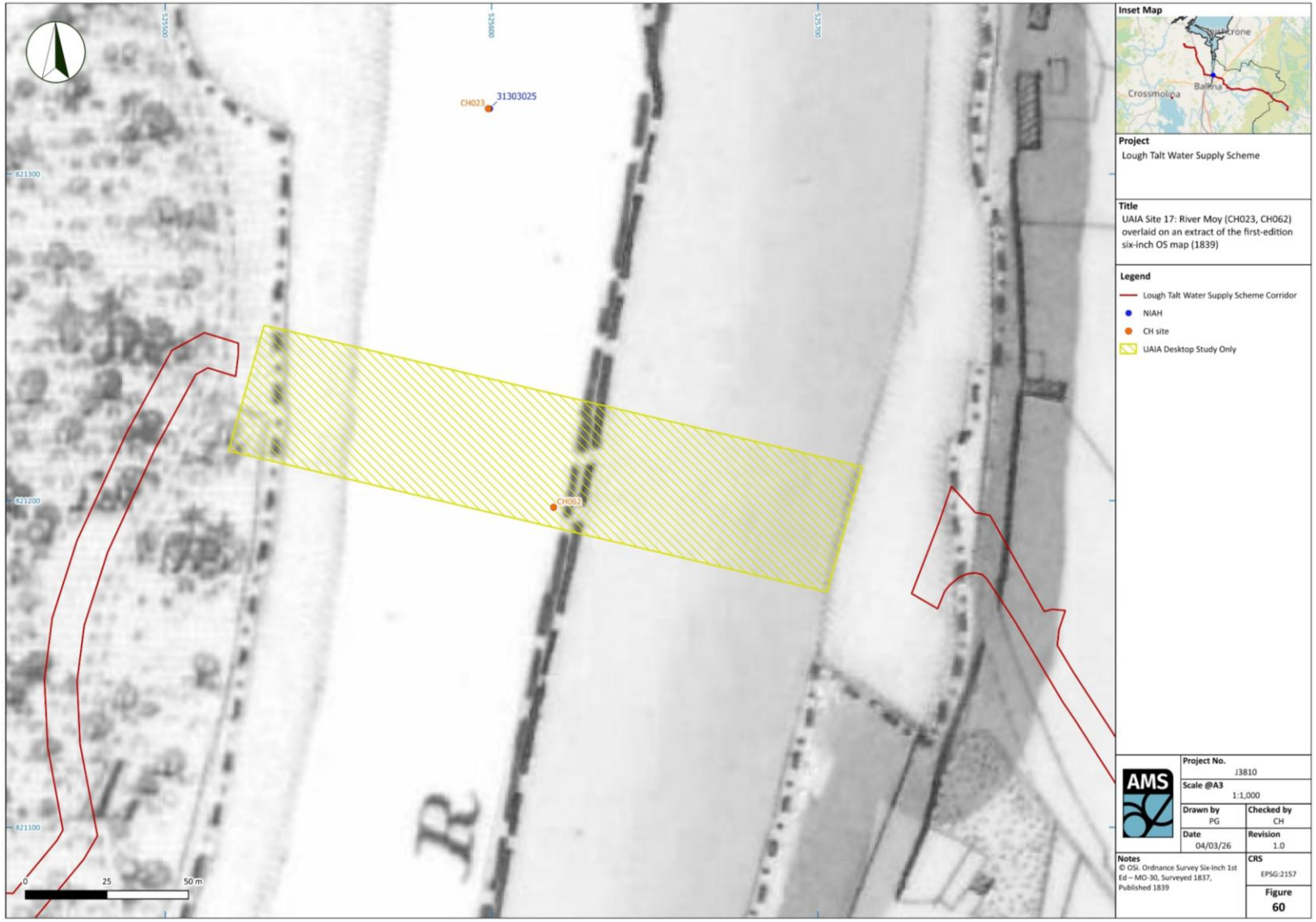


Figure 60: UAIA Site 17: River Moy (CH023, CH062) overlaid on an extract of the first-edition six-inch OS map (1839)

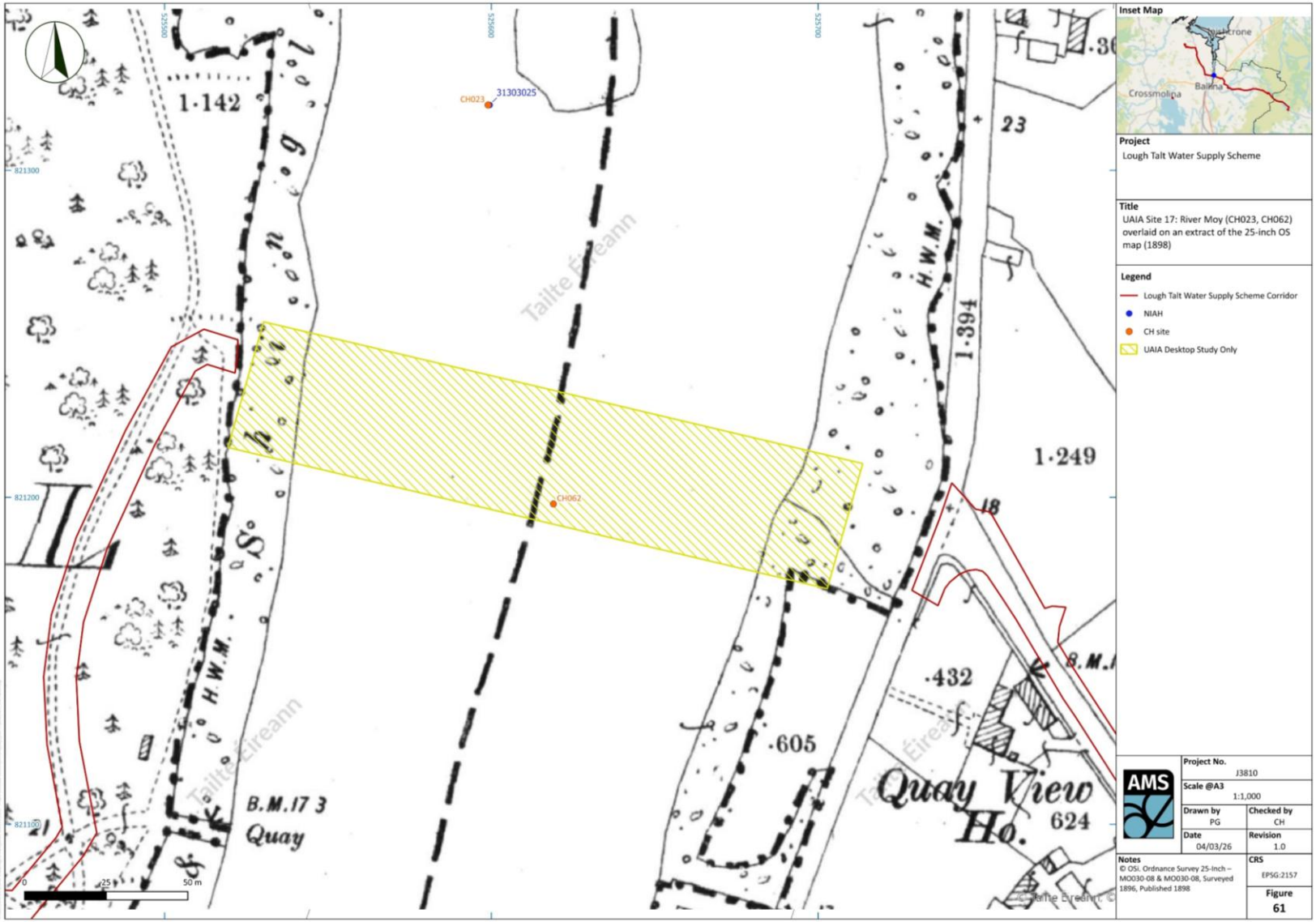


Figure 61: UAIA Site 17: River Moy (CH023, CH043 and CH062) overlaid on an extract of the 25-inch OS map (1898)



Figure 62: UAIA Site 18: unnamed stream (CH047) overview



Figure 63: UAIA Site 18: unnamed stream (CH047) overlaid on an extract of the first-edition six-inch OS map (1839)

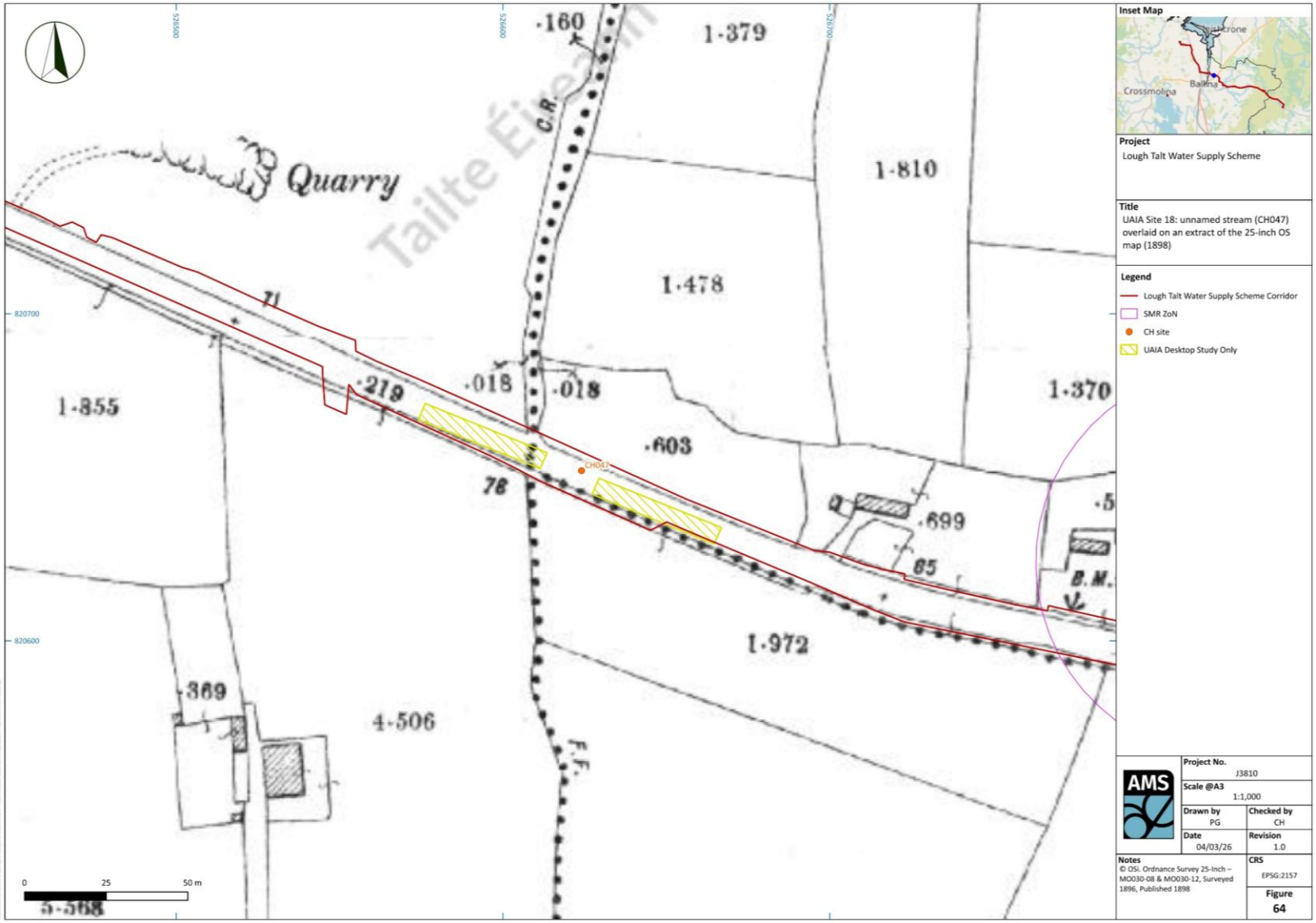


Figure 64: UAIA Site 18: unnamed stream (CH047) overlaid on an extract of the 25-inch OS map (1898)



Figure 65: UAIA Site 19: overview of unnamed stream in Corimla South



Figure 66: UAIA Site 19: unnamed stream in Corimla South overlaid on an extract of the first-edition six-inch OS map (1839)

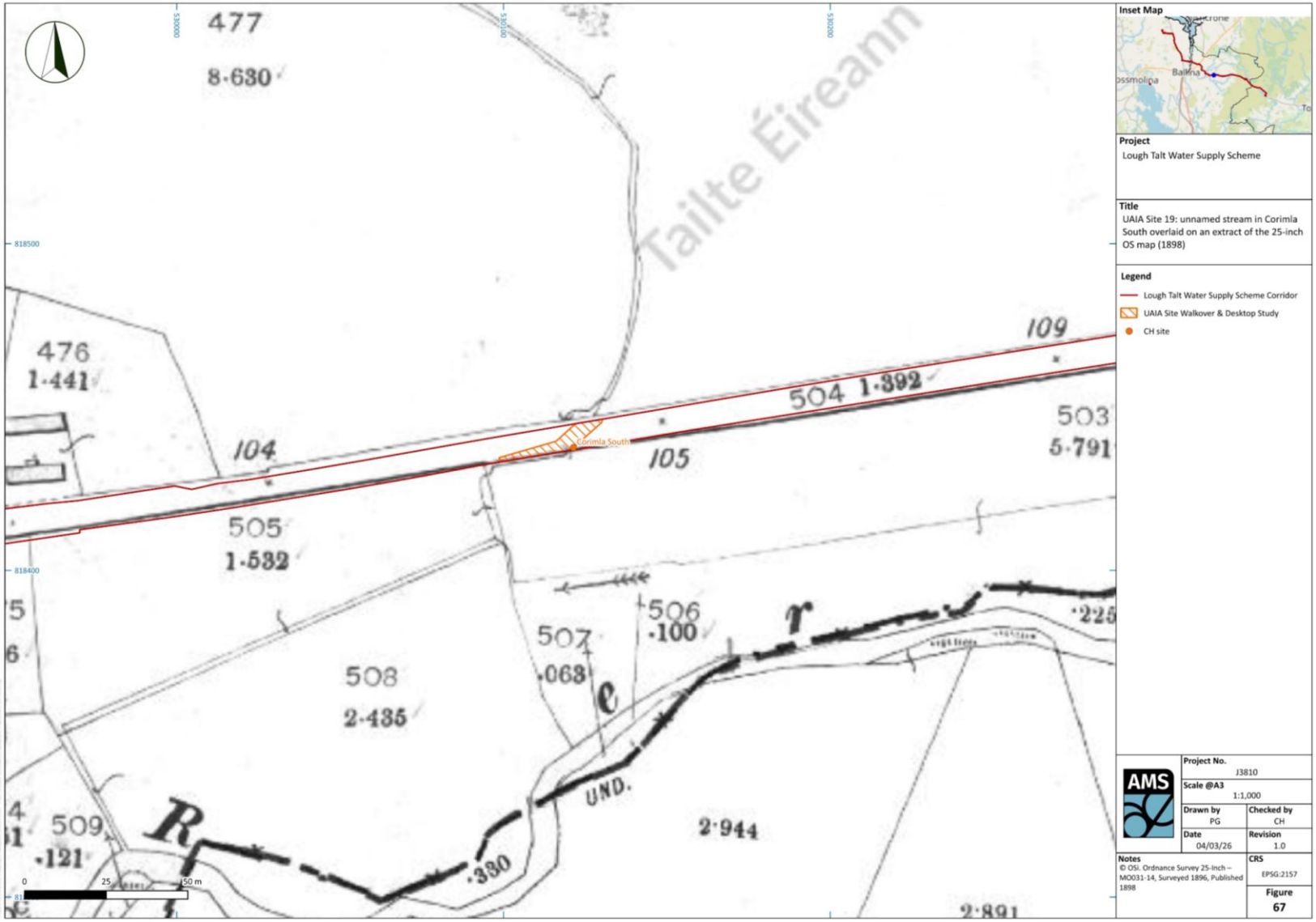


Figure 67: UAIA Site 19: unnamed stream in Corimla South overlaid on an extract of the 25-inch OS map (1898)

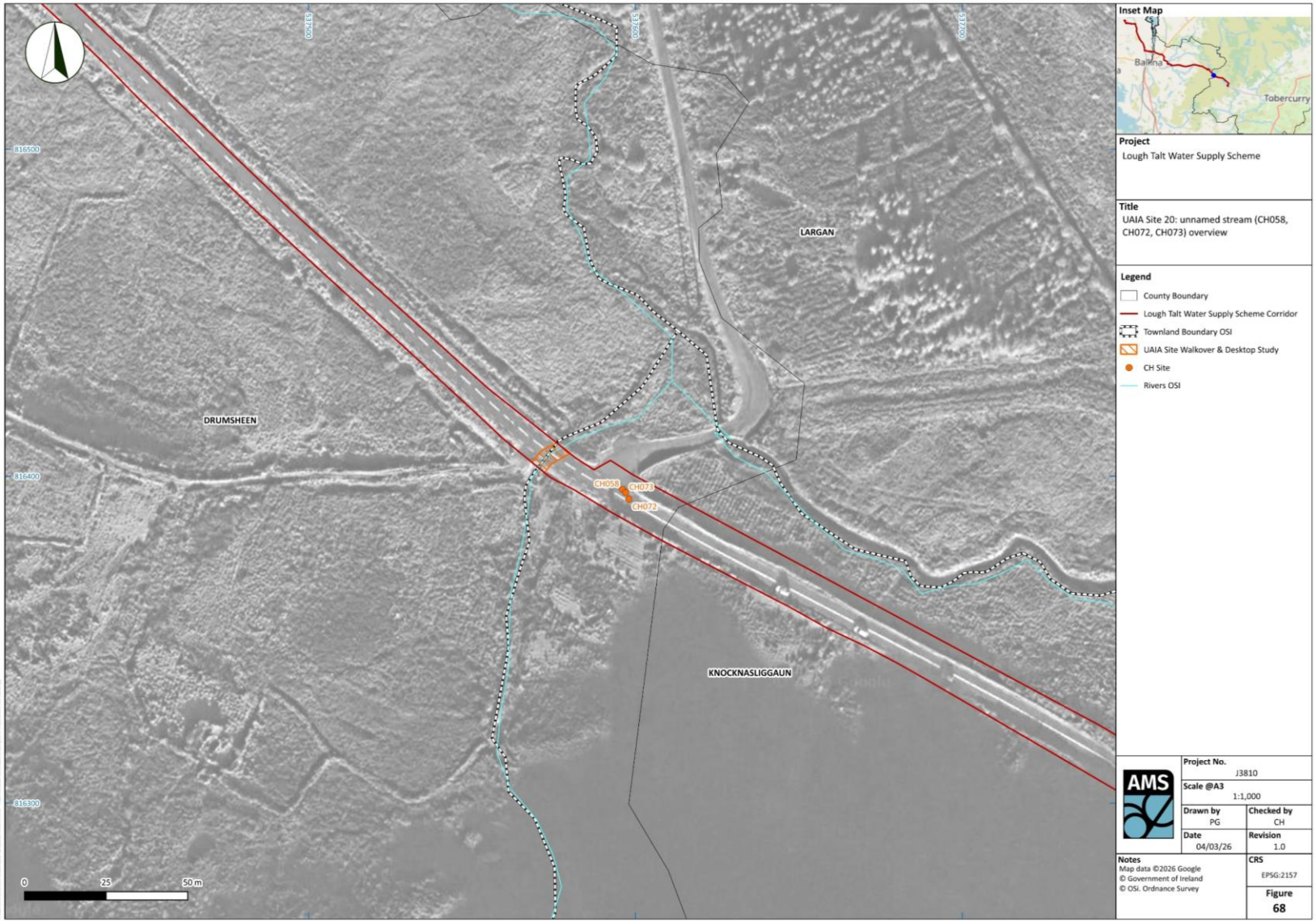


Figure 68: UAIA Site 20: unnamed stream (CH058, CH072, CH073) overview



Figure 69: UAIA Site 20: unnamed stream (CH058, CH072, CH073) overlaid on an extract of the first-edition six-inch OS map (1838)

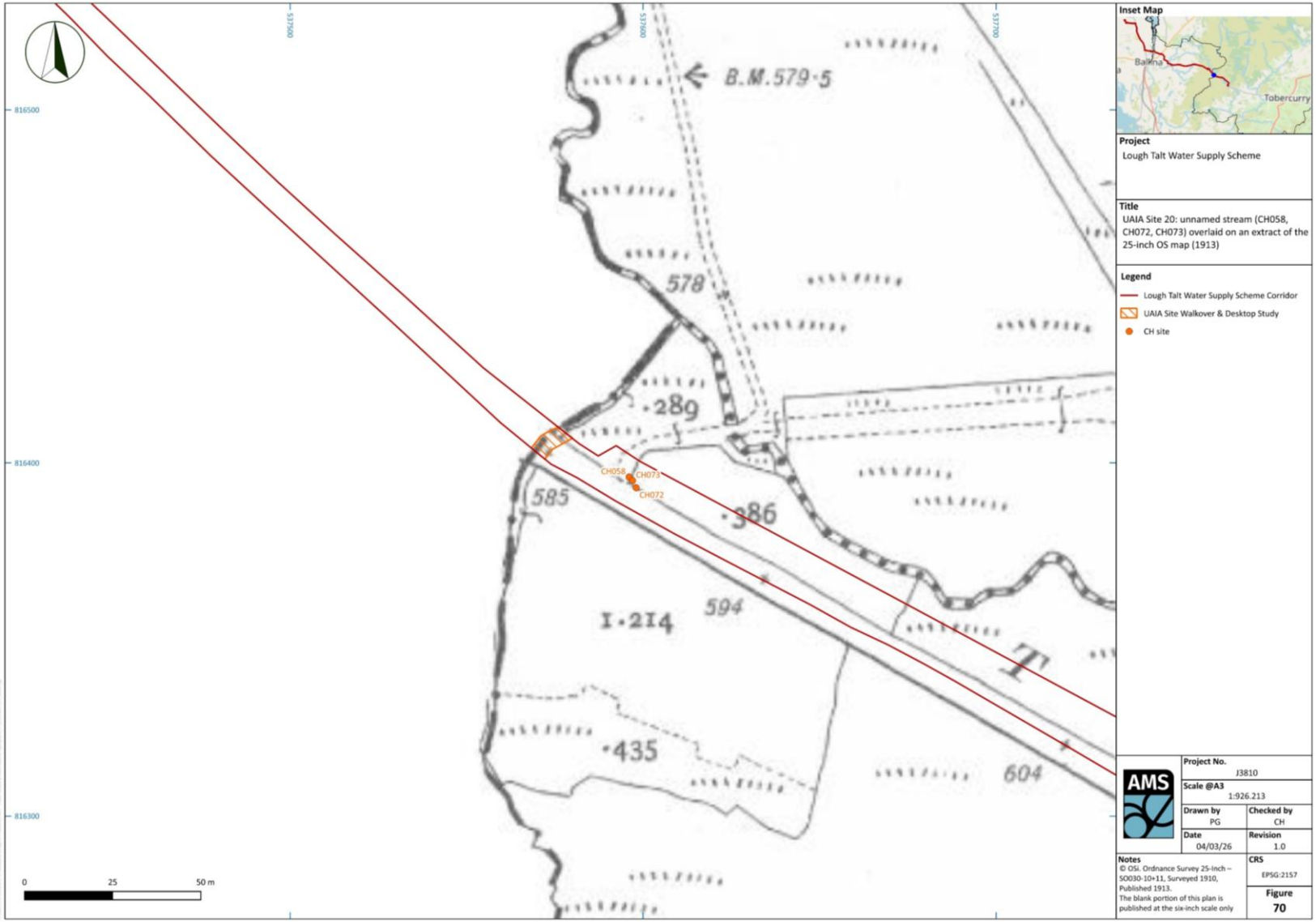


Figure 70: UAIA Site 20: unnamed stream (CH058, CH072, CH073) overlaid on an extract of the 25-inch OS map (1913)

Plates



Plate 1: Site 1 overview, looking east (scale: 1m)



Plate 2: Site 1 stone bridge, looking west with underwater archaeologist Dr Alexander von Lünen GPS surveying



Plate 3: Site 3 overview, looking northeast (scale: 1m)



Plate 4: Site 3 stone culvert at west end of survey area, looking southwest (scale: 1m)



Plate 5: Site 4 overview, looking northeast, with underwater archaeologist Dr Conn Herriott metal detecting



Plate 6: Site 5 overview, looking north-northwest



Plate 7: Site 5 culvert, looking southwest (scale: 1m)



Plate 8: Site 6 overview, looking southwest



Plate 9: Site 6 stone bridge at northeast end of survey area, carrying the R294 road over the Fiddaun River (scale: 1m)



Plate 10: Site 7 overview, looking west



Plate 11: Southern exterior wall of Site 7 culvert, looking northeast (scale: 1m x 1m)



Plate 12: Site 9 overview, looking southwest with underwater archaeologist Dr Alexander von Lünen GPS surveying the site and Lough Talt in background (scale: 1m x 1m)



Plate 13: North exterior wall of culvert at Site 9, looking west (scale: 1m)



Plate 14: Site 10 overview, looking north-northeast (scale: 1m)



Plate 15: Site 10 bridge, looking northeast (scale: 1m)



Plate 16: Site 11 overview, looking southeast



Plate 17: Site 11 culvert, with metal pipes running across the culvert roughly under the middle of the road, looking north



Plate 18: Site 12 overview during preparation for the dive survey, with standby diver Breffni Gray (left), underwater archaeologist Dr Alexander von Lünen (centre), and dive supervisor Cillian Gray (right), looking southwest



Plate 19: Lakebed composition and metal detector during dive survey at Site 12



Plate 20: Site 13 overview, looking west (scale: 1m)



Plate 21: Site 13, looking southwest from the road



Plate 22: Site 14 overview looking north, during visual inspection by archaeologist Niall Jones, with rath (MA022-063----) in the far-left background



Plate 23: Site 14 concrete culvert visible under west side of the road, looking northeast (scale: 1m)



Plate 24: Site 15 overview, looking southwest, with archaeologist Niall Jones inspecting the watercourse



Plate 25: Site 15 stone culvert opening on east side of road, looking west (scale: 1m)



Plate 26: Top of culvert exposed in grass on west side of road (R314) at Site 15, looking north-northeast (scale: 1m)



Plate 27: Site 16 overview, looking southwest



Plate 28: Site 16 overview on east side of road (R314), looking northeast



Plate 29: Site 19 overview on north side of road (R294), looking north (scale: 1m)



Plate 30: Site 19 watercourse location on south side of road (R294), where it appeared to comprise a shallow dry ditch, looking west



Plate 31: Closeup view of concrete culvert opening on north side of road (R294) at Site 19, looking south



Plate 32: Site 20 overview, with concrete culvert visible on northeast side of road (R294), looking west (scale: 1m)



Plate 33: Site 20 stone culvert opening on southwest side of road (R294), looking northeast (scale: 1m)