MOTT MACDONALD

Appropriate Assessment Screening and Natura Impact Statement

North Connacht 110 kV Project

May 2022

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Contents

Tables

Appendices

1 Introduction

1.1 Overview of North Connacht Project

The North Connaught Project ('The Proposed Development') comprises:

- Approximately 59 kilometres of new 110 kV UGC including communication links and fibre optic cables, between the existing Moy 110 kV substation, County Mayo, and the existing Tonroe 110 kV substation, County Roscommon.
- Upgrades to the existing Moy 110 kV and Tonroe 110 kV Substations.
- All associated and ancillary development, including temporary construction compounds and laydown areas, passing bays, temporary access tracks, and (at eight locations) permanent access tracks, site development, landscaping works, fencing and vegetation removal.

The majority of the UGC will be installed in the public road network, with approximately 5.5km routed off-road. Approximately 23 kilometres will be located in the N5, approximately 11 kilometres will be located in the N26 and approximately 17 kilometres will be located in the local road network.

1.2 Purpose and Scope of this Document

This report has been prepared to assist the relevant competent national authority (An Bord Pleanála) for the project (hereafter referred to as "The Proposed Development", to fulfil the requirements of Article 6(3) of the EU Habitats Directive 92/43/EEC ('The Habitats Directive').

1.3 Requirement for Appropriate Assessment

1.3.1 European Law

Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora ('the Habitats Directive') is European Community legislation aimed at nature conservation.

The Habitats Directive requires that where a plan or project is likely to have a significant effect on a European site (s), (and where the plan or project is not directly connected with or necessary to the nature conservation management of the European site), the plan or project will be subject to 'Appropriate Assessment' (AA) to identify any implications for the European site(s) in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.

Case law of the European Court of Justice (ECJ) has determined that AA is required, if likely significant effects cannot be excluded on the basis of objective information. Case law has also clarified that measures intended to avoid or reduce harmful effects on European sites, must not be considered when determining whether it is necessary to carry out an AA.

1.3.2 Irish Law

In the context of the Proposed Development, the Habitats Directive is transposed into Irish law by Part XAB of the Planning and Development Act 2000 (as amended) ('the Planning Acts'), and the Planning and Development Regulations 2001 as amended ('the Planning Regulations').

Under Section 177U (1) of the Planning Acts, a screening for AA of the Proposed Development shall be carried out by the competent authority (in this case, An Bord Pleanála) to assess in view of best scientific knowledge, if the Proposed Development, individually or in combination with another plan or project, is likely to have a significant effect(s) on any European sites.

Under Section 177U (4) of the Planning Acts, the competent authority (in this case, An Bord Pleanála) shall determine that an AA of a Proposed Development is required if it *cannot be excluded* [emphasis added], on the basis of objective information, that the Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site(s).

AA is the process provided for under Article 6 (3) of the Habitats Directive to determine whether a project or plan could 'adversely affect the integrity' of any European sites, either alone or in-combination with other plans or projects, in light of the conservation objectives of the European sites in question.

Under Section 177V (1), An appropriate assessment *shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or Proposed Development would adversely affect the integrity of a European site*

Under Section 177V (2), the competent authority (in this case, An Bord Pleanála) shall, in carrying out an appropriate assessment under subsection (1), "*take into account each of the following matters*:

a. the Natura impact report or Natura impact statement, as appropriate;
b. any supplemental information furnished in relation to any such report or statement;
c. if appropriate, any additional information sought by the authority and furnished by the applicant in relation to a Natura impact statement;
d. any additional information furnished to the competent authority at its request in relation to a Natura impact report;
e. any information or advice obtained by the competent authority;
f. if appropriate, any written submissions or observations made to the competent authority in relation to the application for consent for proposed development;
g. any other relevant information."

1.4 Definitions

1.4.1 European sites and features

A network of European sites of conservation importance has been identified by each Member State, hosting habitats and/or species identified in the Directives as needing to be either maintained at or returned to 'favourable conservation status'.

The sites of conservation importance known as European sites comprise the Natura 2000 network.

European sites comprise areas designated as Special Areas of Conservation (SACs) and/or Special Protection Areas (SPAs) in Ireland. The process of designating cSACs as SACs is ongoing in Ireland. Candidate sites (In Ireland, comprising cSACs) have the same legal protection as those whose designation is complete.

The designation features of SACs are referred to as Qualifying Interests (QIs), and these comprise both species (excluding birds), and habitats.

The designation features of SPAs are referred to as Special Conservation Interests (SCIs), and these comprise bird species, as well as wetland bird habitats.

The designation features of European sites are identified in the Statutory Instruments for European sites where such sites have completed the designation process. In all cases, designation features are also identified in Conservation Objectives published by the NPWS. Any Conservation Objectives referred to in this NIS are referenced to identify the date of publication and version number.

1.4.2 Statement of Competence

Authors

- **Dr Erin Johnston** BSc (Hons), MSc, PhD: (Senior Ecologist, Mott MacDonald). Erin is an Ecologist with nine years of post-graduate experience including three years in malacological (mollusc) research and five years in Ecological consultancy. She has prepared Ecological Impact Assessments, and Appropriate Assessments Screening Reports, and Natura Impact Statements for a variety of projects. Erin has experience carrying out field surveys for protected gastropods, along with vegetation, extended phase 1 habitat surveys, and targeted invasive species surveys. Other protected species surveys Erin has experience of include smooth newt, crayfish, badger, otter, marsh fritillary and bats.
- **Roger Macnaughton**: MSc, BSc (Hons), MCIEEM (Principal Ecologist. Mott MacDonald). Roger is a qualified and experienced environmental consultant specialising in ecology. He has over twenty year's professional experience in the environmental consultancy sector and an additional seven years of primarily research-based experience in freshwater and marine ecology. He specialises in the delivery of Ecological Impact Assessment (EcIA) and Appropriate Assessment (AA) for a broad range of projects potentially affecting; terrestrial, freshwater and marine ecology. His project related experience to date includes; two 400kV overhead lines, five 110kV overhead lines, overhead line up-rates, electricity substations, underground power cables, 35 terrestrial wind farms, two marine wind farms and five solar farms. Roger has extensive experience carrying out and co-ordinating walkover field surveys for protected species (birds, mammals, amphibians), along with Fossitt (2000) botanic/ habitat surveys, aquatic and fishery assessment, and targeted invasive species surveys.

Surveyors

- Walkover surveys, mammal, and bat roosts assessment surveys were conducted by Fintan Damer, Jason Lyne, Roger Macnaughton, and Dr Erin Johnston. All are competent experts in ecology surveys. Statements of authority for Roger Macnaughton and Dr Erin Johnston are as provided above.
- **Fintan Damer** (BSc) (Ecologist, Mott MacDonald). Fintan Damer is a qualified and experienced ecologist with twenty-five years of practical knowledge in undertaking ornithological field studies and surveys consisting of breeding bird surveys, winter wetland surveys and marine seabird surveys including a competent knowledge of ESAS (European seabirds at Sea) ship-based seabird survey methodologies. He has over two years full time experience in ecological consultancy. Fintan has conducted numerous baseline ecological surveys including those for otter, badger, invasive species, and terrestrial botanical surveys for a wide variety of projects. He also has good working knowledge for the baseline execution of freshwater aquatic surveys. He has been involved in preparation of Ecological Impact Assessments and Appropriate Assessments Screening Reports and well as more focused biotic Environmental Reports.

- **Jason Lyne** (BSc) is an Ecologist with three years of experience in ecological consultancy. Jason has worked on a variety of projects. He has prepared Ecological Impact Assessments, Environmental Reports and Appropriate Assessments Screening Reports. He has carried out ecological survey work including phase 1 habitat assessments and targeted invasive species surveys and has worked as an ecological clerk of works on large scale projects.
- The fisheries assessment was carried out by **Dr Ross Macklin** (BSc PhD MCIEEM) of Triturus Environmental Ltd. Ross is an environmental scientist who specialises in freshwater and fisheries ecology. He has over 17 years professional experience and his expertise includes aquatic invertebrate and macrophyte studies in addition to fisheries quantification in a variety of surface water habitats.
- Wintering and breeding bird field surveys were undertaken in 2020, 2021 and early 2022 by ornithologists from MKO consultants Andrew O'Donoghue and Colin Delahunt.
  - **Andrew O'Donoghue** is a senior Ornithologist with MKO. Andrew's key strengths and areas of expertise are in bird surveying techniques, species identification and data management.
  - **Colin Delahunt** is a professional ornithologist and qualified environmental scientist. He has two years (1500+ hrs) of best practice ornithological field surveys in a professional environment. Competent in ecological reports and GIS software.
  - Both are competent experts in bird surveying.

1.5 Structure of this Report

The structure of this report includes the following elements:

- Chapter 2: Screening for Appropriate Assessment
  - Section 2.1 Management of the European site(s)
  - Section 2.2 Overview of the Baseline Environment
  - Section 2.3: Description of the Proposed Development
  - Section 2.4 European sites in the Zone of Influence
  - Section 2.5: Plans and Projects Which Might Act in Combination
  - Section 2.6: Summary of Potentially Significant Effects
  - Section 2.7 Screening Outcome
- Chapter 3: Natura Impact Statement
  - Section 3.1 Description of the Development
  - Section 3.2 Description of the Receiving Environment
  - Section 3.3 Impact Prediction
  - Section 3.4 Potential for Adverse Effects on Site Integrity (including in-combination effects)
  - Section 3.6 Mitigation Measures

1.6 Methodology

This report has been prepared having regard to European Commission and Irish departmental guidance on AA methodologies including:

- EC (2021) Assessment of Plans and Projects in Relation to Natura 2000 Sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC
- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice C (2018) 7621

- DEHLG (2009) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities (Revised 2010).

This report has similarly been prepared with regard to relevant rulings by the CJEU, and the Irish courts.

1.6.1 Desktop Study

This assessment includes a desk-based review of available records of protected species and habitats including the following sources:

- Backing Documents and Maps prepared in accordance with Article 17 of the Habitats Directive;
- European site documentation including Conservation Objectives, National Parks and Wildlife Service (NPWS)
- NPWS Site Synopses , Natura Standard Data Forms available from NPWS;
- Published and unpublished NPWS reports on protected habitats and species including Irish Wildlife Manual reports, and
- Existing relevant mapping and databases e.g. waterbody status, species and habitat distribution etc. (sourced from the Environmental Protection Agency - http://gis.epa.ie/, the National Biodiversity Data Centre - http://maps.biodiversityireland.ie and the NPWS - http://www.npws.ie/mapsanddata/

1.6.2 Field Survey Data

1.6.2.1 Walkover Surveys

Field surveys were carried out subject to landowner agreement along the entire route of the proposed UGC. The surveys also included potential sensitive ecological habitat adjacent or in the vicinity of the route including river/ riparian areas (river crossings), overland sections, HDD locations, passing bays and other areas considered during the initial phases of the design. Walkover surveys were conducted on the following dates in 2021.

- The 11th and, 12th of March,
- The 27th, 27th and 30th of April, 2nd of June
- The 15th, 16th, 21st, 22nd, 23rd, 27th, 28th, and 29th of July,
- The 3rd, 4th, 5th, 9th, 11th, 13th, and 31st of August,
- The 2nd, 3rd, and 4th of November,
- The 9th, and 10th, of December

Habitat and plant surveys of the Proposed Development were carried out by Mott MacDonald. Habitats were classified to level three according to the scheme outlined in “A Guide to Habitats in Ireland” (Fossitt, 2000). Fit to European Annex 1 habitats was informed with reference to the EU Interpretation Manual for EU Habitats (European Commission, 2013) having regard to the Irish Vegetation Classification[1] where relevant.

Habitat survey methods in accordance with ‘Best Practice Guidance for Habitat Survey and Mapping’ (Smith et al., Heritage Council, 2011). During site walkovers searches were conducted for Invasive species listed under the Third Schedule to the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011), as amended.

[1] https://biodiversityireland.shinyapps.io/vegetation-classification/

Where access was not possible, assessment was carried out using available desktop resources including aerial photography of the relevant areas.

Key sensitive ecological receptors identified within the potential ZOI (as outlined in section 2.4) of the development that may potentially support QI or SCI of European Sites included;

- Aquatic species and habitats including Lamprey species, Freshwater Crayfish, Atlantic salmon and Fresh water Pearl Mussel and floating river vegetation refer to Section 1.6.2.2 below
- Sensitive wetlands and peat habitats including; blanket bog, cutover bog, transition mire and poor fen and flush.
- Semi natural woodland habitats including scrub, wet willow/ alder dominated woodland, bog woodland and oak woodland.
- Springs and localised flushes (adjacent to rivers, below hills and edge bogs)
- Marsh fritillary *Euphydryas aurinia*, since bespoke habitat surveys for the Proposed Development confirmed localised presence of the larval foodplant *Succisa pratensis* within the footprint and environs of the Proposed Development;

These were a focus of surveys.

Bespoke field surveys were not conducted for a variety of Annex II species who are absent from the ZoI of the Proposed Development (as defined in Section 2.4.1), either because suitable habitats were absent, or because the species have restricted distributions and are known not to occur based on desktop data (including Favourable Reference Range and Current Range in NPWS (2019a, 2019b). These species, for which field surveys were not required, were:

- Lesser horseshoe bat *Rhinolophus hipposideros*, whose populations are restricted to the western Atlantic seaboard, and whose nearest occurrence is 35 km west of the Proposed Development site. Noting also potential roost features and habitats are largely avoided.;
- Freshwater pearl mussel *Margaritifera margaritifera*, because the Proposed Development does not occur within any of the known catchments for the species identified by the NPWS
- Kerry slug *Geomaculosus maculosus*, whose distribution is the south west Ireland (NPWS, 2019a, 2019b) with localised outlier populations in Galway[2] and Tipperary[3];
- All other Annex II species whose Favourable Reference Range does not overlap the ZoI of the Proposed Development, as identified in NPWS (2019a, 2019b).

1.6.2.2 Aquatic Survey (Triturus Environmental Ltd 2022)

Aquatic and fishery surveys of watercourses within the footprint of the proposed development were carried out by Triturus Environmental Limited between the 11-14th September 2021 (inclusive) and 18th January 2022 by the aforementioned qualified and experienced specialist:

All freshwater watercourses crossed by the proposed cable route, by in-road and off-road construction methodologies, were surveyed and are considered as part of the current assessment. A total of 45 sites along the proposed cable route were selected for detailed aquatic assessment. These were the maximum number of rivers/ streams that intersected with the development during initial designs. The number of crossings reduced for the proposed development. The nomenclature for the watercourses surveyed is as per the Environmental Protection Agency's (EPA) online map viewer.

[2] Kearny (2010) Kerry slug (*Geomalacus maculosus* Allaman 1843) recorded at Lettercraffroe, Co. Galway. Irish Naturalists' Journal. 31: 68-69.

[3] Curtin, M. (2021) Discovery of Kerry Slug (*Geomalacus maculosus*) in Co. Tipperary. Irish Naturalists' Journal 38: 43-45.

Surveys at each of these sites included a fisheries habitat appraisal and (where suitable i.e. where there was a flow of water) biological water quality sampling (Q-sampling). White-clawed crayfish (sweep netting & hand searching) surveys were also undertaken at each site, in addition to macrophyte, visual assessment of fish habitat potential, and aquatic bryophyte surveys were undertaken. Electro-fishing surveys were only undertaken at those sites which were being considered for crossing by way of in-stream trenching (i.e. 23 sites at the time since reduced to two). Just two crossings with low/ negligible fisheries value are proposed for crossing by the proposed UGC via direct (not within road curtilage) trenching namely;

- Knocklehaugh (IE_WE_34T830920) between MT02 and MT03
- Tullyegan Stream (IE_WE_34T830920 - TULLYEGAN_010) between MT02 and MT03.

Biosecurity

A strict biosecurity protocol including the Check-Clean-Dry approach was adhered to during surveys for all equipment and PPE used. Disinfection of all equipment and PPE before and after use with Virkon™ was conducted to prevent the transfer of pathogens or invasive propagules between survey sites. Surveys were undertaken at sites in a downstream order to minimise the risk of upstream propagule mobilisation. Particular cognisance was given towards preventing the spread or introduction of crayfish plague (*Aphanomyces astaci*) given the known distribution of white-clawed crayfish in the wider survey area. Where feasible, equipment was also thoroughly dried (through UV exposure) between survey areas. Any aquatic invasive species or pathogens recorded within or adjoining the survey areas were geo-referenced.

Aquatic Site Survey

Survey effort focused on both instream and riparian habitats in the vicinity of each survey site. The watercourses at each survey site were described in terms of the important aquatic habitats and species. This helped to evaluate species and habitats of ecological value in the vicinity of each site.

A broad aquatic habitat assessment was conducted utilising elements of the methodology given in the 'River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003'[4] and the Irish Heritage Council's 'A Guide to Habitats in Ireland'[5]. All sites were assessed in terms of:

- Physical watercourse/waterbody characteristics (i.e., width, depth etc.)
- Substrate type, listing substrate fractions in order of dominance (i.e., bedrock, boulder, cobble, gravel, sand, silt etc.)
- River profile in the sampling area
- An appraisal of the macrophyte and aquatic bryophyte community at each site
- Riparian vegetation composition – to identify presence of Floating River Vegetation[6]

Electrofishing

As outlined previously, a catchment-wide electro-fishing (CWEF) survey of 23 instream watercourse crossings along the proposed cable route was conducted in September 2021, under the conditions of a Department of Communications, Climate Action & Environment (DECC) licence. The electrofishing survey targeted these 23 potential instream crossing locations (and subsequently reduced to 2 no, locations following design review), as well as

[4] Environment Agency (2003). River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003. Environment Agency, UK

[5] Fossitt, J. (2000) A Guide to Habitats in Ireland. The Heritage Council, Ireland

[6] Watercourses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation (3260)

downstream fisheries features at risk of indirect pollution impacts. The survey was undertaken in accordance with best practice and Section 14 licencing requirements as follows:

Salmonids and European eel

For salmonid species and European eel, as well as incidental species, electro-fishing was carried out in an upstream direction for a 10-minute Catch Per Unit Effort (CPUE), an increasingly common standard approach for wadable streams (Matson et al., 2018)[7]. A total of approx. 50-100m channel length was surveyed at each site, where feasible, in order to gain a better representation of fish stock assemblages. At certain, more minor watercourse sites or sites with limited access, it was more feasible to undertake electro-fishing for a 5-minute CPUE. Table 1.1 outlines the CPUE for electrofished watercourses. Relative conductivity of the water at each site was checked in-situ with a conductivity meter and the electro-fishing backpack was energised with the appropriate voltage and frequency to provide enough draw to attract salmonids and European eel to the anode without harm. For the moderate conductivity waters of the sites a voltage of 220-275v, frequency of 30-35Hz and pulse duration of 3-3.5ms was utilised to draw fish to the anode without causing physical damage.

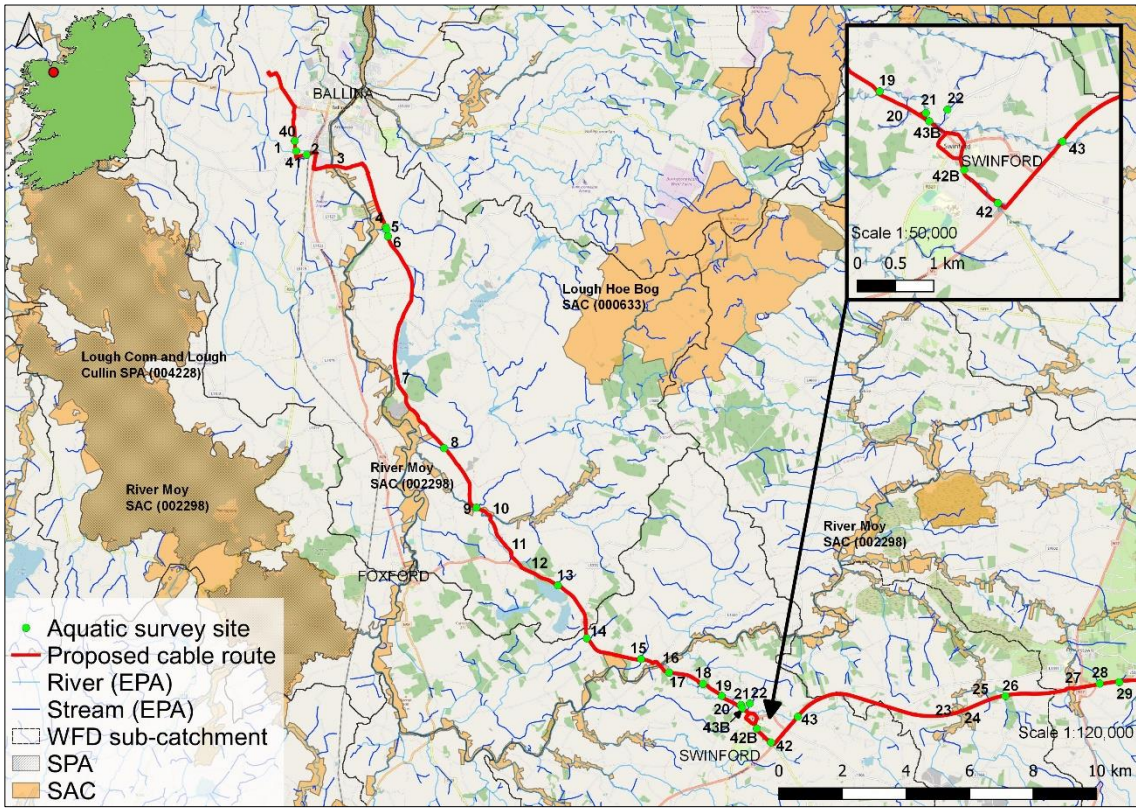
Table 1.1: Catch Per Unit Effort at Surveyed Streams

Site Number	Watercourse Name	CPUE (Elapsed Time)
2	Scotchfort River	5
4	Unnamed stream	n/a – 100% dry channel
5	Knocknagun River	5
6	Mullaghawny River	5
8	Treanoughter Stream	5
9	Roosky Stream	5
13	Unnamed stream	10
14	Lough Muck Stream	10
15	Cloonygown Stream	10
17	Swinford River	10
18	Cloongullaun Stream	n/a– 100% dry channel
19	Swinford River	10
21	Swinford River	10
22	Rathscanlan Stream	5
26	Hagfield River	5
28	Lowpark Stream	5
29	Lowpark Stream	n/a– 100% dry channel
30	Mullaghanoe River	10
33	Cloonmore River	n/a– 100% dry channel
36	Hawksford River	5
47	Unnamed stream	n/a– 100% dry channel
38	Unnamed river	10
39	Unnamed river	10

[7] Matson, R., Delanty, K., Shephard, S., Coghlan, B., & Kelly, F. (2018). Moving from multiple pass depletion to single pass timed electrofishing for fish community assessment in wadeable streams. Fisheries Research, 198, 99-108.

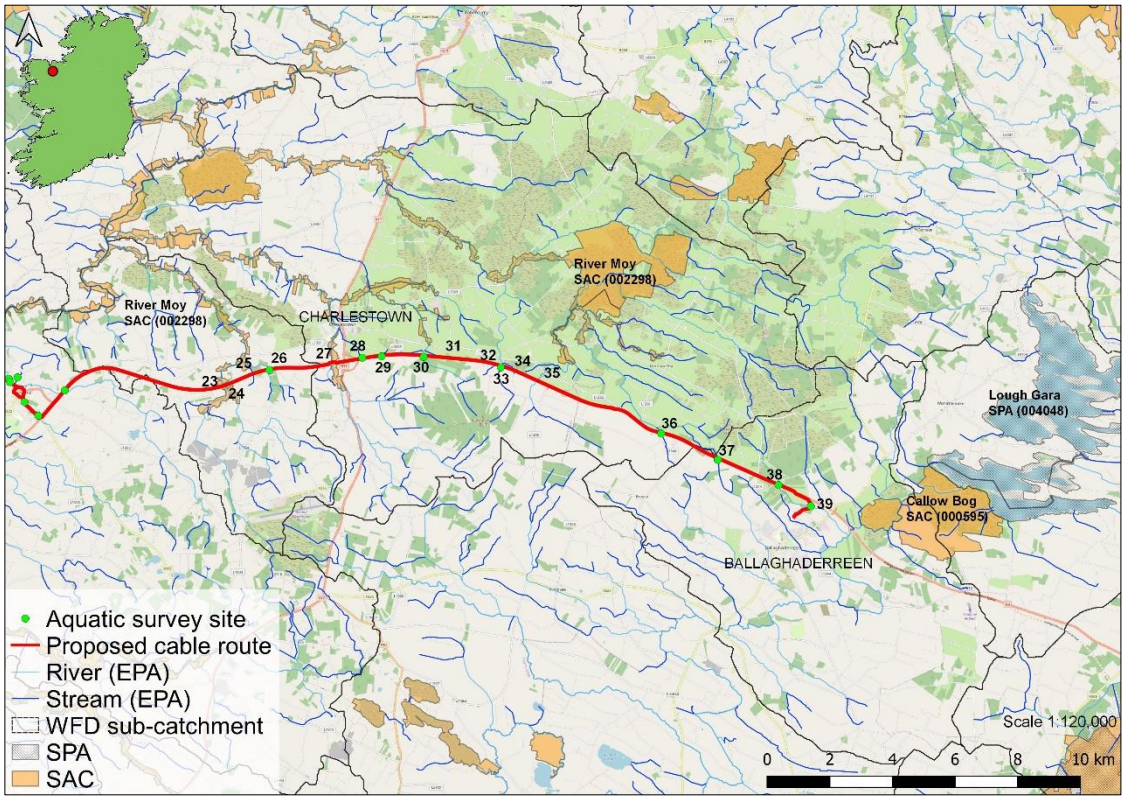
The sites outlined above are presented below in Figure 1.1 and 1.2. These are also presented at a closer resolution in Appendix A Habitat Map.

Figure 1.1: Overview of the aquatic survey site locations for the proposed North Connacht 110kV project (western extent)



Source: Triturus 2022

Figure 1.2: Overview of the aquatic survey site locations for the proposed North Connacht 110kV project (eastern extent)



Source: Triturus 2022

Lamprey

Electro-fishing for lamprey ammocoetes was conducted using targeted box quadrat-based electro-fishing (as per Harvey & Cowx, 2003)[8] in suitable areas of sand/silt, where encountered. As lamprey take longer to emerge from silts and require a more persistent approach, they were targeted at a lower frequency (30Hz) burst DC pulse setting which also allowed detection of European eel in sediment, if present. Settings for lamprey followed those recommended and used by Harvey & Cowx (2003), APEM (2004)[9] and Niven & McAuley (2013)[10]. Using this approach, the anode was placed under the water's surface, approx. 10-15 cm above the sediment, to prevent immobilising lamprey ammocoetes within the sediment. The anode was energised with 100V of pulsed DC for 15-20 seconds and then turned off for approximately five seconds to allow ammocoetes to emerge from their burrows. The anode was switched on and off in this way for approximately two minutes. Immobilised ammocoetes were collected by a second operator using a fine-mesh hand net as they emerged.

[8] Harvey, J. & Cowx, I. (2003). Monitoring the River, Sea and Brook Lamprey, Lampetra fluviatilis, L. planeri and Petromyzon marinus. Conserving Natura 2000 Rivers Monitoring Series No. 5, English Nature, Peterborough.

[9] APEM (2004). Assessment of sea lamprey distribution and abundance in the River Spey: Phase II. Scottish Natural Heritage Commissioned Report No. 027 (ROAME No. F01AC608).

[10] Niven, A.J. & McCauley, M. (2013). Lamprey Baseline Survey No2: River Faughan and Tributaries SAC. Loughs Agency, 22, Victoria Road, Derry.

Lamprey species were identified to species level, where possible, with the assistance of a hand lens, through external pigmentation patterns and trunk myomere counts as described by Potter & Osborne (1975)[11] and Gardiner (2003)[12].

Furthermore, a fisheries habitat appraisal of the watercourses in the vicinity of the proposed project was undertaken at all sites to establish their importance for salmonid, lamprey, European eel and other fish species. The baseline assessment also considered the quality of spawning, nursery and holding habitat for salmonids and lamprey within the vicinity of the survey sites.

Lamprey Habitat

Lamprey habitat evaluation for each survey site was undertaken using the Lamprey Habitat Quality Index (LHQI) scoring system, as devised by Macklin et al. (2018)[13]

White Clawed Crayfish Survey

White-clawed crayfish surveys were undertaken at the aquatic survey sites in September 2021 under a National Parks and Wildlife (NPWS) open licence (no. C145/2021), as prescribed by Sections 9, 23 and 34 of the Wildlife Act (1976-2021), to capture and release crayfish to their site of capture, under condition no. 6 of the licence. As per Inland Fisheries Ireland recommendations, the crayfish surveys started at the uppermost site(s) (upstream) of the catchment/sub-catchments in the survey area to minimise the risk of transfer of invasive propagules (including crayfish plague) in an upstream direction.

Hand-searching of instream refugia and sweep netting was undertaken according to Reynolds et al.[14]. Trapping of crayfish was not feasible given the small nature of most aquatic survey sites sampled. An appraisal of white-clawed crayfish habitat at each site was conducted based on physical channel attributes, water chemistry and incidental records in mustelid spraint. Additionally, a desktop review of crayfish records within the wider survey area was undertaken.

1.6.2.3 Wintering Bird Surveys

Following a comprehensive desk study by MKO, initial site visit and consultation (National Parks and Wildlife Service, Irish Whooper Swan Study Group, and the CABB project), a list of “Target species” likely to occur within the ZoI of the proposed development was compiled. The survey work carried out at the development site was specifically designed to survey for these identified target species following SNH guidance (2016)[15]. The target species list was drawn from:

- Annex I of the Birds Directive

[11] Potter, I. C., & Osborne, T.S. (1975). The systematics of British larval lampreys. Journal of Zoology, 176(3), 311-329.

[12] Gardiner, R. (2003). Identifying lamprey. A field key for sea, river and brook lamprey. Conserving Natura 2000 Rivers, Conservation techniques No. 4. Peterborough. English Nature.

[13] Macklin, R., Brazier, B. & Gallagher, C. (2018). Fisheries assessment of selected weir sites on the River Barrow, Counties Carlow & Kilkenny. Unpublished report prepared by Triturus Environmental Services for McCarthy-Keville O’ Sullivan on behalf of Waterways Ireland.

[14] Reynolds J, O’Connor W, O’Keeffe and Lynn D (2010). A technical manual for monitoring white-clawed crayfish *Austropotamobius pallipes* in Irish lakes. Irish Wildlife Manuals No. 45. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin.

[15] SNH. 2016. “Assessing connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage, Inverness, Scotland.”

- Red listed birds of Conservation Concern[16]
- Special Conservation Interests (SCI) of Special Protection Areas (SPA)
- Species protected under the fourth schedule of the Wildlife Acts 1976-2012.

Field Survey Methods

- MKO initially undertook surveys that focused on all proposed corridor options to ensure a continued survey presence within the study area and to inform the selection of the preferred route corridor. These wider surveys which included the proposed development site were conducted monthly between December 2019 to March 2020 inclusive. Winter bird surveys, focused on the proposed development site, were conducted monthly between September 2020 to March 2021 inclusive and monthly between October 2021 to March 2022 inclusive.
- Vantage point surveys and distribution and abundance surveys were undertaken during the migratory/wintering season 2020/21. These vantage point surveys were undertaken overlooking sensitive habitats along the proposed corridor options. Six-hour vantage point surveys were undertaken at three locations per corridor, i.e. twelve vantage point locations per month between September 2020 and March 2021. These surveys aimed to document bird flight activity and usage of the study area.

Initial Site Assessment

- The overall study area considered incorporated a number of potential route options, and so incorporated the wider landscape surrounding the proposed development, in addition to the proposed development footprint.
- Based on the results of the desk study and reconnaissance site visits, the likely importance of the study area for bird species was determined. Based on the collated information available from the above preliminary assessment and adopting a precautionary approach, a site-specific scope for the ornithological surveys was developed.

Vantage Point Surveys

Vantage point surveys were undertaken during surveys in 2019 and 2020 along route corridor options noting overhead line and underground cable options, were under consideration then. In the absence of national guidance on the bird surveying requirements for overhead power line surveys developments in Ireland, current industry best practice involves following guidance developed by Scottish Natural Heritage (2016)[17].

Targeted vantage point (VP) surveys were undertaken overlooking sensitive habitats for birds including wetlands/ bogs, river valleys and lakes.

These surveys aimed to document bird flight activity and usage of the study area. Data on bird observations and flight activity was collected from a scanning arc of 180° and a two-kilometre radius by an observer at each fixed location for three hours, twice per month. Surveys were orientated to provide a spread over the full daylight period including at dawn and dusk to coincide with the highest peaks of bird activity.

Hen Harrier Surveys

Suitable habitat for roosting hen harrier within the study area was surveyed for the presence of hen harrier. Survey work was undertaken following the methodology devised by Gilbert et al. (1998) and the '*Hen Harrier Roost Types and Guidelines to Roost Watching*' (unpublished guidance document by the Irish Hen Harrier Winter Survey, 2019).

[16] Gilbert G, Stanbury A , Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 43: 1–22

[17] Scottish Natural Heritage (2016) Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds

Breeding bird surveys conducted during 2020 included checks for evidence of breeding hen harrier and included surveys of bog and other possible habitat close to the development including large bogs in the townlands of Carrowkeribley and Curradrish.

Wildfowl Distribution and Abundance Surveys

Significant wetland sites (lakes, extensive bog, rivers and other wetlands) within the study area were surveyed monthly for waterbird populations during each winter season (2019/2020, 2020/2021 and 2021/2022). These surveys aimed to provide contextual information on the distribution and abundance of waterfowl species within the study area. The count methodology was in line with survey methodology guidelines issued by IWebs Ireland (2015). Counts were undertaken during daylight hours (dawn or before dusk) from suitable vantage points at the wetland sites.

1.6.2.4 Breeding Bird Surveys

Focused breeding bird surveys were conducted along the proposed development and a minimum 500m buffer (as recommended by SNH Guidance) monthly between April and August 2021.

Vantage Point Surveys

Methods were as per Wintering Bird Surveys, refer to Section 1.6.2.3 above.

Walkover Surveys

Breeding walkover surveys were undertaken to survey for SCI bird species and identify areas of possible, probable, or confirmed breeding territories. Survey methodology followed the adapted Brown and Shepherd survey methods, as outlined in Gilbert et al. (1998). The survey area extended 500m from the site on each side as recommended by SNH (2017). Certain areas within 500m of the site proved inaccessible due to landowner constraints or the presence of areas of dense forestry and vegetation. For these areas short VPs were carried out within the walkover survey. Transects were selected to survey every area of suitable breeding/ foraging habitat to within 100m, in areas where access was allowed. Target species were SCI species. Walkover surveys were carried out during daylight hours during the breeding season months of April, May, June, July, and August. Following all survey visits the field maps were analysed to determine the number and location of breeding territories. All non-breeding individuals and species encountered were also recorded.

1.7 Consultation

Pre-application consultations were carried out with prescribed bodies as detailed below.

1.7.1 National Parks and Wildlife Services (NPWS)

Written correspondence was sent to the Development Application Unit (DAU) for the attention of NPWS in September 2021 providing an overview of the Proposed Development and requesting any additional information on nature conservation and biodiversity within the receiving environment.

A meeting was held with NPWS on 5th November 2021.

The key points discussed in relation to the proposed development *are* outlined below

The key comments from NPWS are outlined below with relevance to Appropriate Assessment (NIS) outlined in **bold**.

NPWS comment 1

Primary concern is likely in relation to **water quality** and **habitat loss especially at passing bays**.

Response: This comment is relevant to the River Moy SAC crossings and crossings on non-SAC rivers hydrologically linked to the downstream River Moy SAC.

NPWS comment 2

NPWS noted there will be no direct impacts to designated sites or Annex 1 habitats. Outlined **need to identify reinstatement/ compensation measures in areas permanently impacted.**

Response: This comment is relevant to the EcIA presented in the PECR. No impacts are proposed to habitats of ecological value within European sites are proposed from the development. Any temporary works within agricultural lands located within or close to European sites will be reinstated post construction.

EirGrid noted at a small number of locations where Mayo County Council is seeking permanent road widening, permanent reinstatement of passing bays may not be feasible. For these areas, compensatory habitat could be created on existing lands at ESBN substations, or EirGrid can explore land acquisition. It was noted that lands around the existing Tonroe substation are species poor managed wet grassland and hence scope for habitat enhancement here.

Response: This comment is relevant to the Biodiversity Impact Assessment habitats of ecological value. No QI habitat loss is proposed within European site boundaries. No permanent road widening for passing bays is now required, and all passing bays will be reinstated post works. As outlined habitat enhancement is proposed in response to the permanent loss of species poor non QI habitat at substations and permanent access tracks

NPWS comment 4

Will seek **quantification of habitat loss and check/confirm no annex 1 habitat loss** in documents submitted. Site specific approaches to mitigation and monitoring required.

Response: This comment is relevant to the EcIA presented in the PECR. No QI habitat loss is proposed.

1.7.2 Inland Fisheries Ireland (IFI)

A written response was received from Inland Fisheries Ireland (IFI) on 12 October 2021 in response to Mott MacDonald's letter of 6 September 2021 describing the Emerging Best Preferred Option for the proposed development at that time.

IFI provided detailed fisheries sensitivities and designated nature conservation sites within the Moy and Lung catchments, which are crossed by 90 and 10% of the identified route respectively. IFI requested the following comments be addressed:

1. The Appropriate Assessment and Environmental Impact Assessment should assess all potential impacts including surface water hydrology, fish spawning and nursery areas, angling, sediment transport, damage to aquatic and riparian habitat, pollution, non-native species, interference with upstream and downstream movement of aquatic life. The assessment should include all aspects of the development,
2. IFI request all watercourse crossings are carried out by horizontal directional drilling as opposed to open cut trenching. An Emergency Response Plan and environmental control and mitigation measures must be agreed with IFI.

3. All instream works or other works which may impact directly on a watercourse should only be carried out during the open season (1st July to 30th of September) to avoid the spawning season.) This must be included in contract for construction.
4. Should works be approved a detailed method statement addressing the issues outlined above, including all mitigations measures, precautions, environmental monitoring and environmental incident procedures must be forwarded to and agreed with Inland Fisheries Ireland before works commence.
5. There must be no spread of invasive species as a result of the proposed development. A survey for the presence of invasive species should be carried out and a biosecurity and management plan put in place where found.
6. A suitably qualified person must be designated to oversee all environmental protection and mitigation measures and environmental monitoring for the duration of the project.
7. The IFI publication: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites should be followed. https://www.fisheriesireland.ie/documents/624-guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters/file.html
8. Oil or fuel storage in a bunded area (providing 110% capacity of the largest storage unit), 100m from any watercourse (on a 6" O.S. map). No Vehicle maintenance within 100m of any watercourse and all machinery in good working order,
9. During the construction period cement and wet concrete must be kept out of all watercourses and drains. Concrete trucks must not wash out on site. These materials are extremely toxic to aquatic life and the construction team must be made fully aware of this.
10. Sediment control measure such as silt fences, settlement ponds etc. must be put in place to ensure there is no discharge of silt to surface waters.

A meeting was subsequently held between EirGrid and Mott MacDonald and IFI on 7 January 2022 to discuss specific points raised.

Prior to the meeting, IFI was provided with a crossing schedule list including

- a one line summary for each watercourse crossing identifying fishery value (further to electrofishing surveys),
- potential crossing methods proposed at that time (including instream works required at open cut/trenched crossings)

At the 7 January 2022 meeting, the IFI made a number of comments (minuted and agreed with IFI)

- IFI concern with proposed 'Low fisheries' valuation of the Cooltanthe stream, listed as an unnamed watercourse reference 39 which is a salmonid tributary of Lough Gara, with good trout habitat which was fished by IFI previously downstream of the site and has 3 year classes of trout and dewatering risks if pursuing open cut trenching at site 39.
  - [Action taken: Open cut crossing of Cooltanthe stream subsequently amended to HDD, and fisheries value raised to moderate to accommodate IFI concerns].
- IFI potential concern with HDD Frac out risk in absence of Geotech data may drive IFI request for seasonal HDD works restricted to fisheries closed season
  - [Action taken: Programme cannot accommodate HDD closed season (resource limit of HDD rigs and specialist and competent contractors), but PECR mitigation confirms geotechnical data will verify post-consent detailed design of HDD mitigation].
- IFI requested revised crossing schedule capturing design changes, electrofishing data, and the aquatic ecology report by Triturus Ecology once available.
  - [Action taken: provided 25 April 2022, with amended mapping provided 10 May 2022].

- IFI requested Emergency Response Plan be included in the planning application and that IFI be notified in the event of any incident.
  - [Action taken: 'Contingency plan' documented in PECR includes IFI notification].
- IFI advised they would comment further once in receipt of the requested information, and following their own site surveys.

On 13 May 2022. IFI provided further written submission to EirGrid (following site walkovers, review of revised crossing data, and the Triturus aquatic ecology report).

In summary, when read with the design included in the planning application, the IFI recommendations are as follows:

- IFI would restrict open cut trenching of watercourse 2 (Scotchfort River) to closed season (July to September inclusive).
  - [Action taken: Restriction committed in PECR to Watercourse 2 Scotchfort river and the other watercourse 40 Knocklehaugh crossing proposed via open cut trenching).
- IFI requested closed season restrictions on selected ducting within roads [crossings 4, 13, 18, 29, 33, 37] with no instream works
  - [Response: EirGrid willing accepts closed season restrictions on open cut works, but cannot do so on ducting works in roads, given the required pace of grid development for Ireland's renewable ambition However IFI will be consulted on method statement content for such works.
- IFI seeks agreement of method statements pre-construction, including crossings within the existing carriageway
  - [Action taken: method statement agreement committed in PECR]
- IFI seeks agreement of Construction and Environmental Management Plan pre-construction
  - [Action taken: advised IFI that CEMP typically agreed with local authority, but could additionally receive IFI input by condition]
- IFI states that in cases where HDD is not successful and alternative instream crossings are required this will be subject to the closed season for salmonid watercourses.
  - [Response: The crossing method is integral to the proposed development as described and assessed, and any such design changes arising would initiate fresh planning and environmental assessments, to include IFI consultation].

1.7.3 Irish Hen Harrier Winter Survey (IHHWS)

MKO contacted IHHWS as part of scoping for winter Hen Harrier roosts during the route options selection stage of the project when the study area included most of North east Mayo and west Roscommon. A response received 17th March 2021 outlined 8 – 9 known winter hen harrier roosts generally in the area. This information informed the route option selected and areas to target surveys by MKO.

1.8 Limitations

All areas within the footprint of the proposed development were accessed for survey.

All river crossings including riparian areas upstream and downstream were also surveyed as required. No significant limitations to the surveys arose.

2 Screening for Appropriate Assessment

2.1 Management of European Sites

The Proposed Development is not directly connected with or necessary to the 'management' of European sites within the Natura 2000 Network having regard to Article 6 of the Habitats Directive. As such it is appropriate that the Proposed Development is subjected to screening for AA.

This screening assessment investigates, in view of best scientific knowledge, whether the Proposed Development, individually or in combination with other plans and projects, would be likely to have a significant effect on European sites. This report considers the likelihood of significant effects on European sites from the construction, operation, and decommissioning of the Proposed Development.

A summary of the proposed development has been described in Section 1.1. The location of the Proposed Development in relation to European sites is presented in Appendix B.

For ease of reporting the route has been divided into sections as outlined below in Table 2.1.

Table 2.1: Route Sections

Route Section	Townland	County
Moy Substation	GORTEEN	Mayo
MT01-MT02	GORTEEN to GORTEEN (Moy Substation to Junction of Crossmolina Road (N59) / Gurteens)	Mayo
MT02-MT03	GORTEEN to BEHYBUAN [Junction of Crossmolina Road (N59) / Gurteens to Foxford Road (N26) junction with Hollister manufacturing plant entrance]	Mayo
MT03-MT04	BEHYBUAN to CARROWCUSHLAUN [Junction of Foxford Road (N26) and Hollister manufacturing plant entrance to unnamed public at Carrowcushlaun (via crossing of the River Moy)]	Mayo
MT04-MT05	CARROWCUSHLAUN to CARROWKERIBLY (One section of unnamed local road to southernly section of same road - north of Carrowkeribly Lough)	Mayo
MT05-MT06	CARROWKERIBLY to BOHERHALLAGH (Section of unnamed road, north of Carrowkeribly Lough to section of the L1321 north of the Yellow [Foxford] River)	Mayo
MT06-MT07	BOHERHALLAGH to CUILLONAGHTAN (L1321 north of the Yellow [Foxford] River to the junction of the L1321 with Swinford Road (N26))	Mayo
MT07-MT08	CUILLONAGHTAN to POLLSHARVOGE (Junction of L1321 and Swinford Road (N26) to section of N26 west of Cloonygoawn River)	Mayo
MT08-MT09	POLLSHARVOGE to CLOONGULLAUN (Section of N26 west of Cloonygowan River to section of N26 south of River Moy and north of Swinford River)	Mayo
MT09-MT10	CLOONGULLAUN to LAGCURRAGH (Section of N26 south of River Moy and north of Swinford River to Ballina Road (N26))	Mayo
MT10-MT11A	LAGCURRAGH to CLOONLARA Ballina Road (N26) / Circular Road / Station Road / junction of Davitt Place and Kilkenny Road (R375) / junction with R375 and Swinford Bypass (N5) to a section of N5 adjacent the junction with L5346).	Mayo
MT10-MT11B	CLOONLARA to MULLENMADOGE (Section of N5 Swinford Bypass, to section of N5 Charlestown Bypass)	Mayo

Route Section	Townland	County
MT11-MT12	MULLENMADOGE to BALLYGLASS EAST (Section of N5 Charlestown Bypass to northern junction with N17)	Mayo
MT12-MT13	BALLYGLASS EAST to CASHELDUFF (Junction of N5 Charlestown Bypass and N17 to easterly section of N5 Charlestown Bypass)	Mayo
MT13-MT14	CASHELDUFF to BOHALAS (Section of N5 Charlestown Bypass to section of N5 Ballaghaderreen Bypass)	Mayo
MT14-MT15	BOHALAS to BALLYOUGTHER (Section of N5 Ballaghaderreen Bypass / field access track / L55016 / Off road until Tonroe Substation	Mayo and Roscommon
MT15-MT16	BALLYOUGHTER	Roscommon
Tonroe Substation	GORTEEN	Roscommon

2.2 Overview of the Baseline Environment

A summary description of the different sections of the Proposed Development and the habitats encountered therein is provided below in Table 2.2. The location references correspond to sections of the proposed cable route and are provided along with habitat maps of the Proposed Development in Appendix A.

Table 2.2: Habitat types within the Footprint of the Proposed Development

Location/Section of Proposed Cable Route	Habitats Within Footprint of the Proposed Development.	SAC overlap within Footprint of the Proposed Development	QI Habitats Within Footprint of the Proposed Development
Moy Substation	● The existing substation footprint is comprised of existing hardstanding (BL3) and grassy verges (GS2) with boundary planting of alder trees and hedgerow (WL1)	● No overlap	No QI habitats within the footprint of the proposed development
MT01-MT02	● The cable route is entirely within the road (BL3) and in some places adjacent grassy verge (GS2). ● Two passing bays with footprints within improved agricultural grassland (GA1) and hedgerow habitat (WL1).	● No overlap	No QI habitats within the footprint of the proposed development
MT02-MT03	● The cable route requires one passing bay in a hedgerow (WL1) before leaving the road (BL3), crossing a hedgerow (WL1), and entering into a mosaic of semi improved wet grassland (GS4), marsh (GM1) and neutral grassland (GS1). The route then crosses one hedgerows (WL1) a drainage ditch/ hedgerow (WL1/FW4), the River Knocklehaugh (FW2) (via open cut), and the existing road (BL3) entering back into a field containing improved agricultural grassland (GA1) grazed by horses. ● The cable route then crosses beneath the River Tullyegan (FW1) (via HDD) into an area of agricultural grassland (GA1). The route leaves the field crossing a hedgerow (WL1) and enters back into the existing road. The cable route briefly leaves the existing road, crosses a hedgerow (WL1) to cross the River Scotchfort (via open cut), crosses a hedgerow (WL1) again before re-entering the existing local road before turning onto the N26 road. ● Two passing bays were identified in this section with footprints within improved agricultural grassland (GA1) and hedgerow habitat (WL1).	● No overlap	No QI habitats within the footprint of the proposed development
MT03-MT04	● The cable route progresses off the N26 road along a private access road (BL3) before crossing a scattered treeline (WL2) and entering into an area of amenity grassland (GA2). The cable route then crosses beneath an area of plantation deciduous woodland (WD1) and a narrow bankside strip of alder woodland (WN6) and the River Moy (FW2) (via HDD). The cable route passes under scrub (WS1) before emerging on the eastern bank of the River Moy in an area of managed wet grassland (GS4). The UGC proceeds overland through areas of agricultural grassland (GA1) bordered by drainage ditches (FW4) and hedgerows (WL2) before re-entering the existing local road (BL3). ● One construction compound was identified in this section, located within an area of existing hardstanding surface (BL3). ● A permanent access track is required to access a joint bay in farmland on the eastern side of the River Moy (outside the SAC boundary).	● 36m within an existing local road ● 83m where cable route runs below River Moy SAC	No QI habitats within the footprint of the proposed development

Location/Section of Proposed Cable Route	Habitats Within Footprint of the Proposed Development.	SAC overlap within Footprint of the Proposed Development	QI Habitats Within Footprint of the Proposed Development
MT04-MT05	● The UGC starts off in roadside verge. ● A passing bay at Carrowcushlaun is located within hedgerow (WL1) and adjacent to relatively unimproved wet grassland (GS4) grading into poor fen (PF2) further to the west. ● The cable route progresses within the existing road and crosses three watercourses (FW) within the curtilage of the existing road (no instream works). ● There are an additional 4 passing bays. Three being located within hedgerow (WL2) and managed farmland (GA1). One is located in disturbed cutover bog (PB4) with wet acid grassland (GS4) vegetation	● 0.7km where cable is within the existing roadway. ● One passing bay on the edge of an agricultural field.	No QI habitats within the footprint of the proposed development
MT05-MT06	● The cable route progresses within the existing road before crossing a hedgerow (WL1) and entering an area of improved agricultural grassland (GA1). The cable route crosses a hedgerow (WL1) and enters a second area of improved agricultural grassland (GA1). The cable route then crosses beneath a treeline (WL2) and the Carrowkeribly Lough (Stream) (FW1) (via HDD) into improved agricultural grassland (GA1) before crossing a hedgerow (WL2) back into the existing roadway. The route progresses within the existing roadway for a considerable distance. ● The cable runs adjacent to farmland included in River Moy SAC in the townland of Drumscoba ● Nine passing bays were recorded along this section of the cable route. – Eight with footprints within agricultural grassland and hedgerow (WL1) including one passing bay within Moy Valley pNHA – One with footprint within an area of scrub (WS1) ● One construction compound was identified within an unused section of an existing quarry (ED4).	● 0.25km where cable is within existing roadway	No QI habitats within the footprint of the proposed development
MT06-MT07	● The cable route leaves the existing road, crosses a hedgerow (WL1) and enters into an area of improved agricultural grassland. ● A permanent access road and hardstanding is proposed at a joint bay here in the townland of Boherhallagh. ● The cable route then crosses beneath a series of Hedgerows (WL1), the existing road (BL3) and the River Roosky (FW2) (via HDD) into another field of agricultural grassland (GA1). The route crosses another hedgerow (WL1) before re-entering the road (BL3). ● The route continues within the road (BL3) crosses a hedgerow (WL1) and enters into a field of agricultural grassland (GA1). ● A second permanent access road and hardstanding is proposed at a joint bay here in the townland of Boherhallagh.	● 0.06km where cable route is installed via HDD and runs below the existing road and the River Roosky ● 0.04km where the cable is routed Via HDD below the river River Yellow.	No QI habitats within the footprint of the proposed development

Location/Section of Proposed Cable Route	Habitats Within Footprint of the Proposed Development.	SAC overlap within Footprint of the Proposed Development	QI Habitats Within Footprint of the Proposed Development
	● The cable route then crosses beneath the River Yellow (Foxford) (FW1) – River Moy SAC, and two treelines (WL2) (via HDD). The cable emerges into a field of agricultural grassland (GA1), crosses through a strip of Scrub (WS1) before re-entering into the existing road. ● The route then leaves the existing roadway once more, crosses a grassy verge (GS2) and enters a field of agricultural grassland (GA1) and wet willow alder ash woodland (WN6). The cable crosses beneath the woodland and the Carrow Loughs (stream) (FW2) via HDD. It emerges into a historically cleared area comprising bare ground, and re-colonising bare ground (ED2 and ED3). The cable then crosses through a small patch of scrub (WS1) with adjacent species rich wet grassland (GS4) back into the existing road. ● Four passing bays were identified on this section. – Two with footprints within agricultural grassland and hedgerow (WL1) – One within semi-improved grassland (GS1 / GS4) – One within an area of scrub/ wet grassland (WS1/ GS4) ● One construction compound was identified within an existing active quarry (ED4).	● 0.03km where the cable intersects the SAC boundary in an area of scrub and the existing road.	
MT07-MT08	● The cable route along this section is entirely within the existing road (BL3) ● The cable route crosses three watercourses (FW) within the curtilage of the existing road (no instream works).	No overlap	No QI habitats within the footprint of the proposed development
MT08-MT09	● The cable route enters an agricultural field (GA1) and hedgerow (WL1) gap. ● A permanent access road and hardstanding is proposed at a joint bay here in the townland of Pollsharvoge. ● The UGC crosses beneath (HDD) wet willow-alder-ash woodland adjacent to the River Moy (FW2), under the River Moy and a small deciduous woodland (WD1) into a field (GA1). The UGC will be located within a new road (separate development) before entering the existing N26 road (BL3).	● 0.1km where the cable route crosses below the River Moy	
MT09-MT10	● The cable route along this section is entirely within the existing road (BL3) ● The cable route crosses three watercourses (FW) within the curtilage of the existing road (no instream works).	● No overlap	No QI habitats within the footprint of the proposed development
MT10-MT11A	● The cable route along this section is entirely within the existing road (BL3) ● The cable route crosses two watercourses (FW) within the curtilage of the existing road (no instream works). ● One construction compound is proposed identified within existing hardstanding surfaces (BL3)	● No overlap	No QI habitats within the footprint of the proposed development

Location/Section of Proposed Cable Route	Habitats Within Footprint of the Proposed Development.	SAC overlap within Footprint of the Proposed Development	QI Habitats Within Footprint of the Proposed Development
MT10-MT11B	● The cable route along this section is entirely within the existing road (BL3)	● No overlap	No QI habitats within the footprint of the proposed development
MT11-MT12	● The cable route along this section is entirely within the existing road (BL3)	● No overlap	No QI habitats within the footprint of the proposed development
MT12-MT13	● The cable route crosses two watercourses (FW) within the curtilage of the existing road (no instream works). ● The cable route continues along the existing road (BL3), crosses through a hedgerow (WL1) and enters into an agricultural field (GA1). The cable route crosses beneath the River Lavy Beg (FW2) (via HDD), within River Moy SAC, then into a field of agricultural grassland (GA1) and re-enters the road (BL3). ● Two construction compounds are proposed both within areas of farmland grassland (GA1).	● 0.26km where the proposed development crosses the SAC within the existing road	No QI habitats within the footprint of the proposed development
MT13-MT14	● The cable route along this section is entirely within the existing road (BL3)	● No overlap	No QI habitats within the footprint of the proposed development
MT14-MT15	● The vast majority of the section is entirely within the existing road (BL3). The cable briefly crosses into a grassy verge (GS2), before re-emerging into the road (BL3). ● The cable route crosses seven watercourses (FW) within the curtilage of the existing road (no instream works).	● No overlap	No QI habitats within the footprint of the proposed development
MT15-MT16	● The cable route continues along within the existing road before entering into an area of agricultural grassland (GA1). The route crosses back into an existing access track and continues along before re-entering another field of agricultural grassland (GA1), crosses a hedgerow (WL1) entering into a field of wet grassland (GS4). ● A permanent access road and hardstanding is proposed at a joint bay here in the townland of Magheraboy. ● The cable route then bisects a field, and under an unnamed stream (FL2) (via HDD) into a field of improved grassland (GA1). The route continues across the existing road and crosses through an area containing pockets of remnant field boundaries (FW4, WL1), wet grassland (GS4), and young conifer plantation (WD4). The cable route then traverses two fields of agricultural grassland (GA1), two hedgerows (WL2), entering into a field of species poor wet grassland (GS4).	● No overlap	No QI habitats within the footprint of the proposed development
Tonroe Substation	● The majority of the extension to the Tonroe substation is located within the footprint of the existing substation. Where the footprint is extended works will take place within areas of planted broadleaf woodland (WD1) and species poor wet grassland (GS4). ● A hardstanding is proposed at a joint bay here adjacent to the substation.	● No overlap	No QI habitats within the footprint of the proposed development

2.3 Description of the Proposed Development

The proposed development (the North Connacht 110 kV project) includes approximately 59 kilometres of new underground cable (UGC) between the existing Moy Substation and the existing Tonroe Substation and extensions to both substations.

Approximately 50 kilometres of the proposed UGC is located in County Mayo and approximately 9 kilometres of the proposed UGC is located in County Roscommon. Moy Substation is located in County Mayo, near Ballina, and Tonroe substation is located in County Roscommon, near Ballaghaderreen.

The proposed development consists of the following principal elements:

- Installation of an UGC, approximately 59 kilometres, connecting Moy 110 kV Substation in the townland of Gorteen in County Mayo, and Tonroe 110 kV Substation in the townland of Ballyoughter in County Roscommon. The UGC will incorporate the following:
  - Communication links and fibre optic cables between both substations, running in the same trench as the UGC;
  - Joint bays, communication chambers and link boxes along the UGC alignment (approximately every 850m);
  - Temporary laydown areas, passing bays and water and utility crossings. The works will include five crossings (using HDD) of the River Moy Special Area of Conservation (SAC, site code. 002298);
  - Upgrading of existing access tracks to facilitate access to the UGC; and
  - Eight new access tracks to off-road joint bays.
- Upgrade and extension to the existing Moy 110 kV substation to provide for additional electrical equipment and apparatus, similar to the existing. This will require the extension of the substation compound by approximately 0.16ha. Electrical equipment and apparatus to include
  - A new 110kV bay; an air insulated shunt reactor comprising three reactors and four current transformers; insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors and approximately 15m high lightning masts;
  - All ancillary site development works including site preparation works, site clearance and levelling; hardstanding, internal access tracks and temporary construction compound; and
  - Underground cabling and earthgrid; palisade fencing (approximately 2.6m in height, and 3.5m in height including anti-climb device) and gates; lighting poles and landscaping as required.
- Upgrade and extension to the existing Tonroe 110 kV substation to provide for additional electrical equipment and apparatus, similar to the existing. This will require the extension of the substation compound by approximately 0.77ha. Electrical equipment and apparatus to include:
  - A shunt reactor comprising three reactors and four current transformers;
  - A communication and protection equipment control building (approximately 450m2 and 8m high);
  - Associated 110 kV electrical equipment including, insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors and approximately 15m high lightning masts. and
  - All ancillary site development works including site preparation works, new wastewater treatment system; surface water attenuation system (SuDS) and altered drainage layout, site clearance and levelling; hardstanding, internal access tracks and temporary

construction compound; underground cabling and earthgrid, surface water drainage network including attenuation tank; palisade (approximately 2.6m in height, and 3.5m in height including anti-climb device) fencing and gates; lighting poles and landscaping as required to facilitate the development.

- 11 no. temporary construction compounds of approximately 1ha each, including associated site works and ancillary staff facilities and parking.
- All associated and ancillary above and below ground site development works, including works comprising or relating to permanent and temporary construction and roadworks and excavation (including HDD) and vegetation clearance.

It is anticipated that the construction phase for the UGC will last up to approximately 26 months.

Construction activities will gradually phase out from pre-construction to predominantly civil activities followed by commissioning and testing.

The majority of the proposed UGC will be installed within the existing public road network. Off-road (cross-country) routes are proposed at particular locations when on-road solutions have been investigated and are not considered feasible.

Further detail of the proposed development and proposed construction phase activities are provided hereunder, and in Chapter 6:

For ease of reference, route section nomenclature has been assigned to the UGC route for consistent use throughout this report, as detailed in Table 2.3

Table 2.3: Route Sections (Proposed UGC)

Route Section	Townland	County	Approximate Distances (metres)
Moy Substation	GORTEEN	Mayo	Not Applicable
MT01-MT02	GORTEEN to GORTEEN (Moy Substation to Junction of Crossmolina Road (N59) / Gurteens)	Mayo	1373 m In-Road 0 m Off Road
MT02-MT03	GORTEEN to BEHYBUAN [Junction of Crossmolina Road (N59) / Gurteens to Foxford Road (N26) junction with Hollister manufacturing plant entrance]	Mayo	1844 m In-Road 1139 m Off Road (incl. ca. 36m private access road
MT03-MT04	BEHYBUAN to CARROWCUSHLAUN [Junction of Foxford Road (N26) and Hollister manufacturing plant entrance to unnamed public at Carrowcushlaun (via crossing of the River Moy)]	Mayo	561 m In-Road, 1106 m Off Road (incl. ca. 33 m and ca.424 m private access tracks)
MT04-MT05	CARROWCUSHLAUN to CARROWKERIBLY (One section of unnamed local road to southernly section of same road - north of Carrowkeribly Lough)	Mayo	5209 m In-Road 0 m Off Road
MT05-MT06	CARROWKERIBLY to BOHERHALLAGH (Section of unnamed road, north of Carrowkeribly Lough to section of the L1321 north of the Yellow [Foxford] River)	Mayo	6557 m In-Road 323 m Off Road
MT06-MT07	BOHERHALLAGH to CUILLONAGHTAN (L1321 north of the Yellow [Foxford] River to the junction of the L1321 with Swinford Road (N26))	Mayo	2075 m In-Road 639 m Off Road (incl. ca. 23 m and ca. 19 m private access tracks)
MT07-MT08	CUILLONAGHTAN to POLLSHARVOGE (Junction of L1321 and Swinford Road (N26) to section of N26 west of Cloonygoawn River)	Mayo	5070 m In-Road 0 m Off Road
MT08-MT09	POLLSHARVOGE to CLOONGULLAUN	Mayo	278 m In-Road

Route Section	Townland	County	Approximate Distances (metres)
	(Section of N26 west of Cloonygowan River to section of N26 south of River Moy and north of Swinford River)		1059 m Off Road (incl. ca. 38m private access road
MT09-MT10	CLOONGULLAUN to LAGCURRAGH (Section of N26 south of River Moy and north of Swinford River to Ballina Road (N26))	Mayo	2294 m In-Road 0 m Off Road
MT10-MT11	LAGCURRAGH to CLOONLARA Ballina Road (N26) / Circular Road / Station Road / junction of Davitt Place and Kilkenny Road (R375) / junction with R375 and Swinford Bypass (N5) to a section of N5 adjacent the junction with L5346).	Mayo	3729 m In-Road 0 m Off Road
MT11-MT12	CLOONLARA to MULLENMADOGE (Section of N5 Swinford Bypass, to section of N5 Charlestown Bypass)	Mayo	4099 m In-Road 0 m Off Road
MT12-MT13	MULLENMADOGE to BALLYGLASS EAST (Section of N5 Charlestown Bypass to northern junction with N17)	Mayo	4783 m In-Road 256 m Off Road
MT13-MT14	BALLYGLASS EAST to CASHELDUFF (Junction of N5 Charlestown Bypass and N17 to easterly section of N5 Charlestown Bypass)	Mayo	5070 m In-Road 0 m Off Road
MT14-MT15	CASHELDUFF to BOHALAS (Section of N5 Charlestown Bypass to section of N5 Ballaghaderreen Bypass)	Mayo and Roscommon	5762 m In-Road 75 m Off Road
MT15-MT16	BOHALAS to BALLYOUGTHER (Section of N5 Ballaghaderreen Bypass / field access track / L55016 / Off road until Tonroe Substation	Roscommon	4541 m In-Road 850 m Off Road (incl. ca. 44 m and ca. 38 m private access tracks)

2.3.1 Underground Cable

2.3.1.1 Overview

The cable will be delivered to site on drums. Joint bays will be required to be installed along the cable route to join consecutive lengths of cable and to facilitate cable pulling. These are underground chambers which are used as the location to pull the various lengths of UGC through pre-installed ducts, and to connect (“Joint”) together those lengths of UGC into a single overall circuit.

Provision will also be made for the installation of (C2) communications chambers and link box chambers at various joint bay locations. The C2 chamber is used to join the fibre optic communications cable and the link box chambers are used to accommodate the link box, which earths the outer sheaths of the power cables. Similar to any telecommunications facilities, the chambers are provided with removable lids to facilitate access for maintenance.

Joint bays are not readily accessible during operation as there is no ongoing maintenance required; however, they need to be immediately accessible in the unlikely event of cable failure requiring cable replacement.

An image of a typical joint bay is presented in Figure 2.1. An image of a reinstated road at a joint bay is provided in Figure 2.2. To facilitate traffic management at locations where joint bays are located within the carriageway, the use of temporary passing bays is proposed. A typical passing bay is shown in Figure 2.3.

Further detail on the construction of passing bays and joint bays is provided in Section 2.3.5.

Figure 2-1: Typical joint bay

Source: EirGrid

Figure 2-2: Reinstated road at joint bay (darker tarmac) with communications chamber

Source: EirGrid

Figure 2-3: Typical passing bay around a joint bay

Source: EirGrid

2.3.1.2 UGC Route Description

The majority (92%) of the proposed UGC between the existing Moy substation and the existing Tonroe substation will be installed within the existing public road network.

Off-road (cross-country) routes are proposed at particular locations to avoid constraints. Eight permanent private access tracks between existing tracks / entrances and off-road joint bays will also be required. The intensity of use of these tracks will be minimal as they are required for maintenance access only during the operational phase. The locations, as detailed in Table 2.4, will equate to approximately 4,576m^2 of permanent loss / landtake:

Laydown areas, where construction materials can be temporarily stored, and construction compounds, where vehicle parking and welfare facilities can be provided, will also be required along the route. These are discussed in Chapter 6.

Table 2.4 describes specific proposals along the route. Mapping of the proposed UGC route is provided in Planning Drawings 229100591-MMD-01-XX-DR-E-1100 to 229100591-MMD-01-XX-DR-E-1142.

2.3.1.3 Operation and Maintenance

The cable will require routine maintenance along the cable route. Access to link boxes and communications chambers, will be required on an annual basis for inspection and for any necessary maintenance. ESB will undertake maintenance of the proposed development as electricity transmission asset owner, through its business unit ESB Networks.

Cable crew size is expected to be three persons for inspection of the cable joint bays and associated communications chamber and link box.

Table 2.4: Route Sections (Proposed UGC)

Route Section	Townland	Crossings (Known Utilities / Water Crossings)	HDD Crossing Methodology	Open Cut Trench Crossing Methodology	No. of Joint Bays	No. of Passing Bays
Moy Substation	GORTEEN	Not Applicable	Not Applicable	Not Applicable	0	0
MT01-MT02	GORTEEN to GORTEEN (Moy Substation to Junction of Crossmolina Road (N59) / Gurteens)	13 / 0	0	0	2	2
MT02-MT03	GORTEEN to BEHYBUAN [Junction of Crossmolina Road (N59) / Gurteens to Foxford Road (N26) junction with Hollister manufacturing plant entrance]	12 / 2	1	1	4	2
MT03-MT04	BEHYBUAN to CARROWCUSHLAUN [Junction of Foxford Road (N26) and Hollister manufacturing plant entrance to unnamed public at Carrowcushlaun (via crossing of the River Moy)]	8 / 2	1	1	2	0
MT04-MT05	CARROWCUSHLAUN to CARROWKERIBLY (One section of unnamed local road to southernly section of same road - north of Carrowkeribly Lough)	7 / 1	0	1	6	6
MT05-MT06	CARROWKERIBLY to BOHERHALLAGH (Section of unnamed road, north of Carrowkeribly Lough to section of the L1321 north of the Yellow [Foxford] River)	11 / 2	1	1	9	9
MT06-MT07	BOHERHALLAGH to CUILLONAGHTAN (L1321 north of the Yellow [Foxford] River to the junction of the L1321 with Swinford Road (N26))	11 / 6	3	3	5	3
MT07-MT08	CUILLONAGHTAN to POLLSHARVOGE (Junction of L1321 and Swinford Road (N26) to section of N26 west of Cloonygoawn River)	15 / 0	0	0	8	0
MT08-MT09	POLLSHARVOGE to CLOONGULLAUN (Section of N26 west of Cloonygowan River to section of N26 south of River Moy and north of Swinford River)	8 / 2	1	1	3	0
MT09-MT10	CLOONGULLAUN to LAGCURRAGH (Section of N26 south of River Moy and north of Swinford River to Ballina Road (N26))	17 / 0	0	0	3	2
MT10-MT11	LAGCURRAGH to CLOONLARA	22 / 0	0	0	5	0

Route Section	Townland	Crossings (Known Utilities / Water Crossings)	HDD Crossing Methodology	Open Cut Trench Crossing Methodology	No. of Joint Bays	No. of Passing Bays
	Ballina Road (N26) / Circular Road / Station Road / junction of Davitt Place and Kilkenny Road (R375) / junction with R375 and Swinford Bypass (N5) to a section of N5 adjacent the junction with L5346).					
MT11-MT12	CLOONLARA to MULLENMADOGE (Section of N5 Swinford Bypass, to section of N5 Charlestown Bypass)	4 / 0	0	0	5	0
MT12-MT13	MULLENMADOGE to BALLYGLASS EAST (Section of N5 Charlestown Bypass to northern junction with N17)	14 / 2	1	1	6	0
MT13-MT14	BALLYGLASS EAST to CASHELDUFF (Junction of N5 Charlestown Bypass and N17 to easterly section of N5 Charlestown Bypass)	9 / 0	0	0	6	0
MT14-MT15	CASHELDUFF to BOHALAS (Section of N5 Charlestown Bypass to section of N5 Ballaghaderreen Bypass)	7 / 0	0	0	8	0
MT15-MT16	BOHALAS to BALLYOUGTHER (Section of N5 Ballaghaderreen Bypass / field access track / L55016 / Off road until Tonroe Substation	10 / 2	1	1	7	0
Tonroe Substation	BALLYOUGHTER	Not Applicable	Not Applicable	Not Applicable	0	0

2.3.2 Substations

Upgrades and extensions are required to Moy 110 kV and Tonroe 110 kV substations to provide for additional electrical equipment and apparatus similar to existing. This is required in order to connect the 110 kV UGC (between Moy and Tonroe).

2.3.2.1 Moy 110 kV Substation

An extension of the existing Moy Substation is necessary to allow the connection of the new 110 kV circuit. The existing substation has a total size of approximately 1.23 ha, located within ESB's overall landholding of approximately 2.18 ha. The proposed works will take place within and immediately adjacent to the existing substation and will include:

- An eastern extension of the existing compound to facilitate the installation of a new 110 kV AIS bay.
- An extension to the existing 110kV busbar to accommodate a new 110kV bay;
- An air insulated shunt reactor comprising three reactors and four current transformers;
- Associated 110 kV electrical equipment including, insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors and lightning masts;
- All ancillary site development works including site preparation works, site clearance and levelling; hardstanding, internal access tracks and temporary construction compound; and
- Underground cabling and earthgrid; palisade fencing (up to approximately 2.6m in height, up to 3.5m in height including anti-climb device) and gates; lighting poles and landscaping as required.

Table 2.5: Equipment List (Moy 110 kV Substation)

Item	No. of Items	Approx. Height (m)
Shunt Reactor	3	6
Surge Arrestor	6	5
Circuit Breaker (3-Phase)	1	6
Post insulator	5	7
Disconnect Earth Switch (3-Phase)	3	5
Current Transformer	7	5
Lightning Monopole	7	15
Traffic Bollards	4	1
Cable Sealing End with Surge Arrestor	1	7
Combined CT/VT	3	6
Busbar Support (3-Phase)	2	7

The proposed electrical equipment at Moy substation is free-standing with minimal surface area and does not require dedicated storm water drainage infrastructure as runoff can drain directly to ground via the permeable stone surfacing within the compound. Foul water at the existing Moy substation is discharged to a septic tank, located west of the control room. The proposed development will not result in any additional staff over and above that of the existing substation. Therefore an increase in loading on the foul system is not anticipated nor will any of the proposed works impact on existing foul drainage infrastructure.

The existing foul drainage system will continue to undergo regular maintenance and servicing during the operational phase. During the construction phase temporary facilities will be provided within the ESB ownership boundary as illustrated in Planning Drawing Number 229100591-MMD-01-XX-DR-E-1611. Any discharges from the temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by an appropriately licensed / permitted contractor.

2.3.2.2 Tonroe 110 kV Substation

The upgrading of Tonroe 110 kV substation requires the redevelopment of the existing substation to an AIS enhanced "C-Type" Outdoor substation. The existing substation has a total size of approximately 0.76 ha, located within ESB's overall landholding of approximately 3 ha. The proposed works will take place within and immediately adjacent to the existing substation and will include:

- A northern, eastern and western extension of the existing compound;
- A shunt reactor comprising three reactors and four current transformers;
- A communication and protection equipment control building (approximately 450m^2 and 8m high);
- Associated 110 kV electrical equipment including, insulators, instrument transformers, overhead conductors, disconnectors, circuit breakers, surge arrestors and lightning masts. and
- All ancillary site development works including site preparation works, site clearance and levelling; hardstanding, internal access tracks and temporary construction compound; underground cabling and earthgrid, surface water drainage network including attenuation tank; palisade (up to approximately 2.6m in height, up to 3.5m in height including anti-climb device) fencing and gates; lighting poles and landscaping as required to facilitate the development.

During the construction phase temporary facilities will be provided within the ESB ownership boundary as illustrated in Planning Drawing Number 229100591-MMD-01-XX-DR-E-1512.

The equipment list for Tonroe substation is provided in Table 2.6 and Table 2.7.

Table 2.6: Equipment List (Tonroe 110kV Substation-Permanent)

Item	No. of Items	Approx. height
Shunt Reactor	3	6
Surge Arrestor	15	6
Circuit Breaker (3-Phase)	4	6
Post insulator	58	7
Disconnect Earth Switch (3-Phase)	3	5
Disconnect Earth Switch (1-Phase)	24	5
Current Transformer	19	5
Voltage Transformer	9	5
Lightning Monopole	9	15
Traffic Bollards	8	1
Busbar Support	17	8
Cable Sealing End	6	7

Table 2.7: Equipment List (Tonroe 110kV Substation-Temporary)

Item	No. of Items	Approx. height (m)
Surge Arrestor	3	5
Post Insulator	4	7
Traffic Bollards	4	1
Cable Sealing End	3	7

The proposed communication and protection equipment control building will be located on the existing wastewater treatment unit and percolation area. It is therefore proposed to remove the existing collection and treatment system and replace it with a new foul water drainage system to be installed to cater for discharge from both the existing and proposed control building. Flows

will be directed to a suitable sized and sealed holding tank with a high-level alarm link to a control system which will notify site operators when emptying is required.

A storm water drainage system incorporating SuDS (sustainable drainage systems) features will be constructed to manage the quantity and quality of runoff during rainfall events. Discharges will be restricted to pre-development 'greenfield' runoff rates in line with the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS Vol. 2 – New Development) which have generally been adopted by Local Authorities across the country.

2.3.3 Operation and Maintenance

The substations do not require any personnel for operation. Scheduled maintenance of the substations will continue to occur approximately once a year, in line with the current maintenance schedule. It is expected that approximately five persons would attend each of the substation sites.

2.3.4 Decommissioning

The operational life of the equipment and apparatus is expected to be 40 years. Thereafter, it is assumed that the equipment will be decommissioned and replaced with new equipment.

The cables will either be left in place or will be removed for recycling in accordance with the relevant waste management regulations in place when decommissioning takes place.

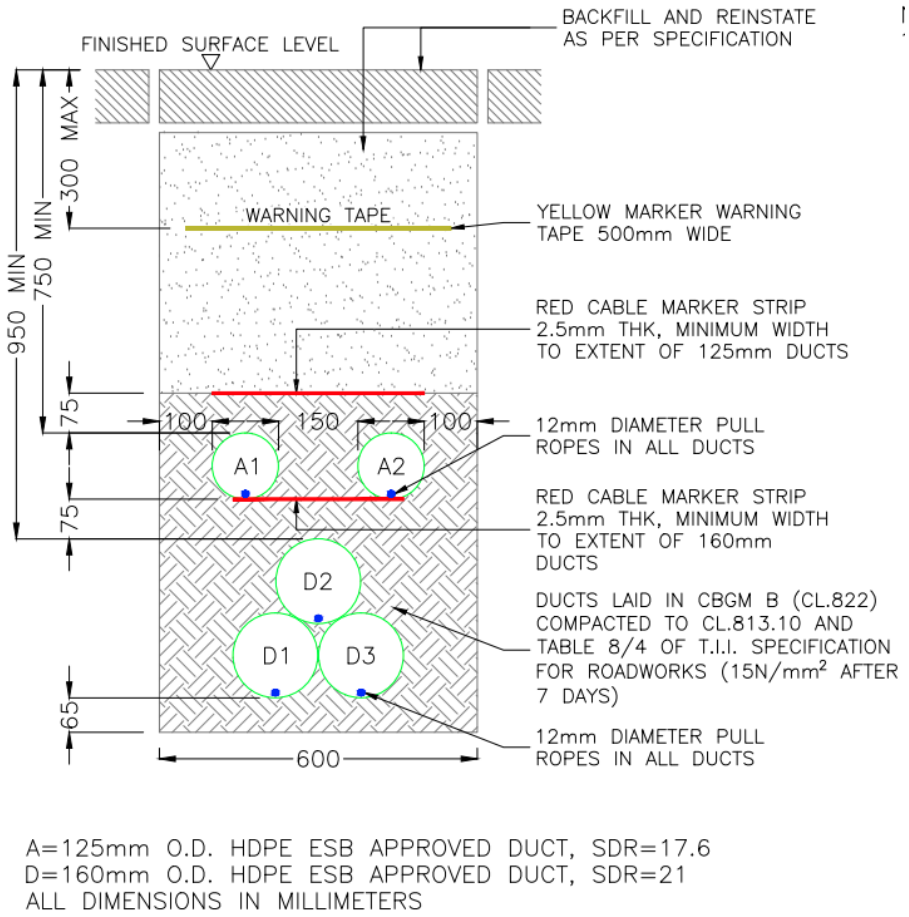
The activities associated with the decommissioning phase will be similar to those associated with the construction phase discussed in Section 2.3.5 *Construction Phase Activities*.

2.3.5 Construction Phase Activities

The following sections describe the proposed construction phase activities associated with the installation of the new UGC between the existing Moy Substation and the existing Tonroe Substation.

The UGC will be installed in either a flat or a trefoil formation, refer to Figure 2.4 Trench Cross Section for 160 mm Power Ducts in Trefoil Formation below in relation to a trefoil formation and to Figure 2.5: Trench Cross Section for 160 mm Power Ducts in Flat Formation below in relation to flat formation. This detail is also provided in Planning Drawing Numbers 229100591-MMD-01-XX-DR-E-2103 and 229100591-MMD-01-XX-DR-E-2104. For the avoidance of doubt, the assessments included in this NIS are based on a flat formation which has a wider trench width (approximately 930 mm cable trench for a flat formation and approximately 600 mm wide cable trench for a trefoil formation).

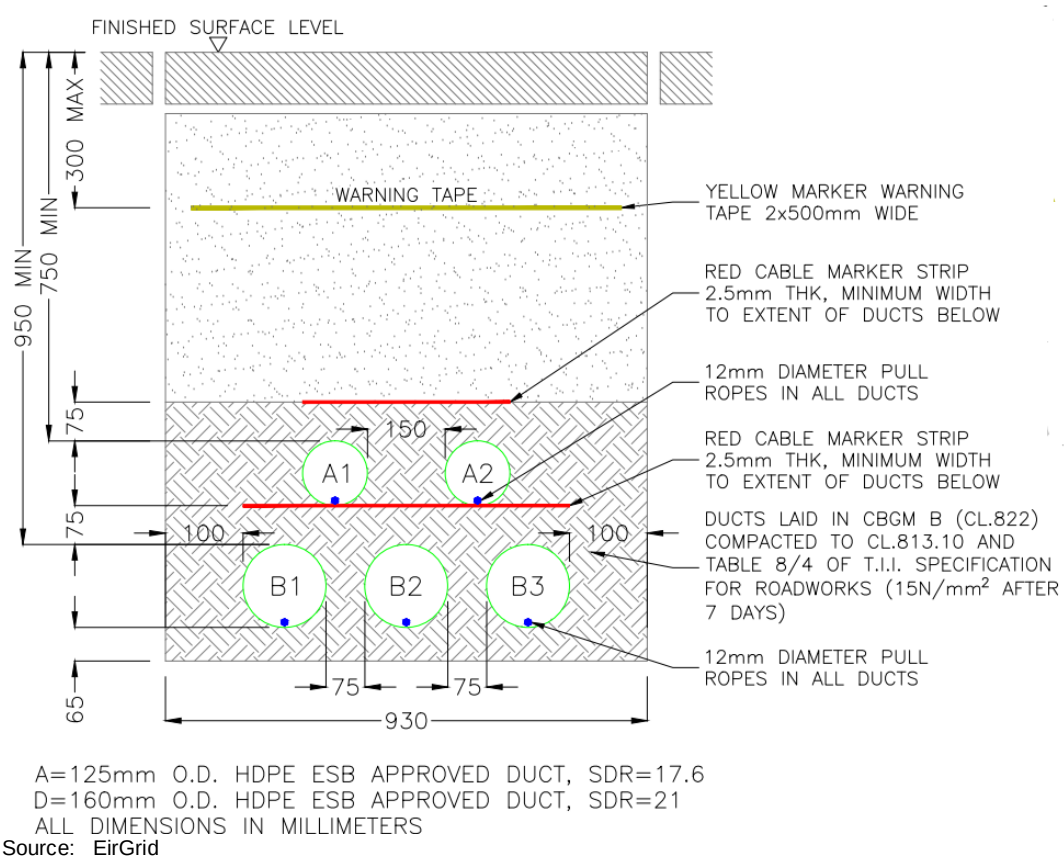
Figure 2.4: Trench Cross Section for 160 mm Power Ducts in Trefoil Formation



A=125mm O.D. HDPE ESB APPROVED DUCT, SDR=17.6
D=160mm O.D. HDPE ESB APPROVED DUCT, SDR=21
ALL DIMENSIONS IN MILLIMETERS

Source: EirGrid

Figure 2.5: Trench Cross Section for 160 mm Power Ducts in Flat Formation



Source: EirGrid

2.3.5.1 Laying of Underground Cable

The laying of underground cables is a standard construction technique undertaken by a range of utility and other services providers. Cables will typically be installed in two phases, as follows:

- Duct and joint bay installation; and
- Cable pulling and jointing.

Duct and joint bay installation are the most construction-intensive and invasive elements of cable route installation, as digging of a trench will be required. For on-road cable laying, this phase will have the largest impact on traffic disturbance, including the potential need for rolling road closures (to through traffic) and diversions. While the specifics of any cable laying schedule are dependent upon the nature and location of the project, it is generally the case that cable ducts can be laid in a road at a rate of approximately 50m per day although a rate of 20m-50m per day is anticipated in built up areas where utilities are more common. Joint bays, generally located at intervals of approximately 850 metres along the UGC route of the proposed development (shorter intervals occur where the route alignment is more complex), are typically installed in 3 days, with the road reinstated post installation.

Road reinstatement along the route of the cable trench follows the completion of the trenching and ducting as it moves in sequence along the route. Cable pulling and jointing, which commence when the trenching and ducting is well advanced along the route, is executed from the joint bay locations. Where this activity would likely require a road closure to be undertaken,

the provision of a passing bay at the location of the joint bay will facilitate through movement of traffic along the road by means of a single traffic signalled lane at the joint bay.

Figure 2-6 shows a typical cable trench in a public road after installation of ducts and prior to back fill. Marker boards can be seen within the trench prior to final reinstatement. Figure 2-7 presents a reinstated road following laying of UGC.

Figure 2-6: Typical Cable Trench in Road

Source: EirGrid

Figure 2-7: Reinstated road following laying of UGC

Source: EirGrid

2.3.5.2 Duct Installation

The UGC will be pulled into pre-installed ducts laid within a trench. When a trench length has been excavated and temporarily supported, a layer of bedding material (typically CBGM B (CL822)) will be laid onto the base of the trench.

The ducts will then be installed onto the bedding in the correct arrangement, and the trench will be backfilled and compacted with thermally suitable back-fill material (typically CMGM B) and marker boards for protection, refer to Figures 2.4 and 2.5 above. Following duct installation, the road above the trench will be reinstated to match the environment in which it is installed to the standard required by the relevant authority at that location, in this case Mayo County Council, Roscommon County Council and / or Transport Infrastructure Ireland (TII).

The duct installation will progress sequentially starting at one joint bay and moving towards the next joint bay along the route. The construction area moves along in tandem with the progress of the duct installation, with only the relevant portion of the section cordoned off while under construction.

2.3.5.3 Duct Installation in Roads

The primary difference between construction outside of road areas and those within road areas is that there is very little space within road areas for local storage of construction materials including excavated material and new fill material. This necessitates the requirement for designated laydown areas along the road bound cable route.

2.3.5.4 Excavation within Roads (Excluding Swinford)

For trench excavation works in roads where space is relatively unconstrained, Vac-Ex or an excavator are typically used to load a truck with excavated material. The truck will then extract the material away from site for appropriate remediation or storage.

An average rate of construction for the cable route is assumed to be 50m per day. In places it may be slower than this, particularly in built up areas where utilities are more common,

however, across the period of construction 50m a day is considered a representative average for the proposed works.

2.3.5.5 Excavation within Roads in Swinford (Heavy Utility Congestion)

Excavation in Swinford introduces a number of challenges when compared to the more standard approach described above as it is a built up area with existing utilities.

The excavation process will require numerous crossings and parallel runs of trenching and ducting with existing utilities already in the town. This will also require agreement on the method of crossing the utilities prior to excavation and may require supervision by a member of the utility provider. Hand digging and use of smaller excavators may also be required. Traffic management will be required to divert traffic and the working area is likely to be limited within the town where materials being transferred to and from the work area is likely to prove difficult.

For roads within Swinford, a progress rate for site preparation, excavation, cable duct installation and reinstatement is estimated at approximately 20m-50m per day.

2.3.5.6 Excavation on the Cloonislaun / Church Road (Subsidence)

Due to the type of soil, where the soil depth is deeper than 2.5m, the excavation on the Cloonislaun / Church Road will require additional membranes to sustain the trench and keep it linked to the road structure. The trench type will be that as shown previously with additional membranes that will spread across part of the road.

This special design will be installed in locations where subsidence is identified to protect the cable asset and the structural integrity of the road.

The excavation process will require a deeper and wider trench with a minimum membrane overlap and surface reinstatement. The trench will be approximately 1.18 m wide and 1.6 m deep with additional support for the cable and the road. There will likely be supervision required from Mayo County Council and any utility supplier in close proximity to the cable.

For roads with subsidence, a progress rate for site preparation, excavation, cable duct installation and reinstatement is estimated at approximately 20m per day.

2.3.5.7 Underground Cable Laying in Agricultural Lands

Underground cables laid within agricultural lands (grassland and tillage land) require the same essential components, and follow the same construction methodology, as for cable laying in public roads; including trenching and ducting, provision of joint bays, and cable installation and jointing.

For off-road or cross-country sections, a temporary working strip of 30m in width is proposed. While the cable trench is approximately 1m in width, the 30m working strip is required for the following reasons;

- To facilitate the storage of topsoil which must be removed from;
  - The footprint of the temporary construction access track (typically up to 5m in width).
  - The footprint of the cable trench.
  - A buffer strip between the temporary access track and the trench (for safety).
  - Subsoil storage area.
  - Materials storage areas.
- To facilitate the laying of the temporary construction access track alongside the cable trench to allow for the movement of construction equipment and materials along the section of the route on the farmland.

- To facilitate the excavation of the cable trench and the installation of the cable ducting.
- To facilitate the storage of distinct layers of subsoils excavated from the cable trench in segregated piles for later reinstatement to the original soil profile.

Figure 2-8 shows a typical temporary working strip on agricultural land for electricity cable installation. Stripped topsoil can be seen stored to the left of the strip, temporary construction access road in the centre right with subsoil stripped areas either side for trench installation, materials storage and sub-soil storage.

As noted above, where cables are placed in a public road, the road itself serves to facilitate the movement of vehicles, and the material excavated from the trench is removed off site and so no soil storage areas are required. Similarly, when trenching, ducting and joint bay installation has been completed on a given section of public road, the road can be reinstated for full public use. Cable pulling and jointing works, which may occur months after ducting, trenching and joint bay installation, are serviced with materials and equipment by the public road itself.

On agricultural land however temporary access tracks and designated work areas must remain in place until cable pulling and jointing works have been completed, as it is required to facilitate the movement of materials, equipment and personnel to and from the joint bay locations sited on the land during the construction phase. For this reason, it is anticipated that for the proposed development any off-road working strip will be unavailable to an affected landowner for a period of up to approximately 18 months from initial fencing-off to removal of the fence following establishment of grass on the reinstated strip.

As discussed previously, eight permanent private access tracks between existing tracks / entrances and off-road joint bays will also be required for infrequent use during the operational phase to allow access to off-road joint bays.

Usually, a cross-country cable alignment seeks to follow field boundaries so as to minimise impact on farm operations. There will however be a requirement to cross a number of fields, ditches, hedgerows, or other features as necessary.

Usually, a cross-country cable alignment seeks to follow field boundaries so as to minimise impact on farm operations. There will however be a requirement to cross a number of fields, ditches, hedgerows, or other features as necessary.

Where HDD under an obstacle, such as a watercourse, is necessary, temporary use of an off-road area (approximately 50 x 60m), of land at either side of the crossing is required. The area is to establish reception and launch pits for the cable, and to facilitate other works, construction access, turning, storage etc.

For other / minor watercourses, where HDD is not employed, watercourse crossings employ an open trench method, which requires removal of field boundaries in the area of the cable alignment, with associated culverting of drainage ditches etc.

The demarcation of the works area with construction fencing will ensure that no works will occur outside this area. Further detail of HDD and open cut crossings are provided below.

Figure 2-8: Typical underground cable construction in agricultural lands (220 kV Double Circuit)

Source: EirGrid

2.3.5.8 Cable Installation

The cables will be brought to site on cable drums which will then be placed into position by tractor and trailer. Once the drum is set up, a winch system at the remote joint bay including pulling cable will be attached to the nose of the cable and rollers will be used to guide the cable end towards the duct. The cables will then be pulled into the duct with lubrication being applied to the cable and duct throughout the process in order to control pulling tensions.

A bend radius of typically 20m or greater is used to navigate changes in direction for the cable route. The bend radius can be reduced to 6m to navigate very tight corners however as this introduces increased pulling tensions when installing the cable, it is used sparingly and only where required.

2.3.5.9 Cable Jointing

As detailed previously, joint bays will be required to be installed along the cable route to join consecutive lengths of cable and to facilitate cable pulling.

The cable jointing process is labour intensive, technically demanding and essential to the effective operation of the cables. For this reason, a temporary waterproof shelter system is either placed or constructed around the joint chamber to provide a clean environment in which the jointing process can be undertaken.

The width of the joint bays and the nature of the road network in the area means that road closures and diversions will be required in some areas along the route during construction and operation.

Joint bays generally consist of precast concrete walls and base located below ground with typical approximate dimensions of 6m long and 2.5m wide, with a joint bay dimension depth of

2.1 m and an overall depth of up to approximately 2.6m. Sand or lean mix concrete will be used as a blinding layer to the underside of the chamber. The ducts will be installed to each end of the chamber, then proven, cleaned and sealed.

The open concrete chamber will temporarily support the retained ground on the outside of the chamber during the ducting activities. Once these activities are completed, the open chamber will be temporarily backfilled with appropriate material and the road temporarily reinstated until such time as cable installation will occur.

During cable installation, the joint bay will be excavated, and material within the chamber removed, some of which may be stored adjacent to the excavation for use in the reinstatement.

The cables will be pulled into each end of the chamber and the cable ends jointed together within the chamber. Jointing is expected to take approximately one to two weeks per joint bay, during which time a shelter will be erected over the chamber to protect the cable from moisture and contamination during jointing.

Following jointing, the joint bay will be backfilled and the road surface permanently reinstated. An example of cable pulling is shown in Figure 2-9. An example of a sheltered joint bay used during jointing is provided in Figure 2-10.

Figure 2-9: Typical cable pulling at a joint bay

Source: EirGrid

Figure 2-10: Typical HVDC Cable Jointing Bay Shelter

Source: EirGrid

2.3.5.10 Passing Bays

During the construction phase of the proposed development where a joint bay is located in a road of a width requiring its closure to undertake joint bay construction /installation, the provision of a passing bay at the location of the joint bay will facilitate the through movement of traffic along the road by means of single traffic signalled lane at the joint bay.

The installation of the passing bay entails the removal of the top layer of ground to the side of the carriageway and temporarily storing it locally to the side for reinstatement following the works. Figure 2-10 and Figure 2-11 show passing bays that have been developed for other cable projects.

Where the road width is still not sufficient, a road closure may be required to undertake the work.

Figure 2.10: Passing Bay (on the Kilpaddoge Knockanure 220kV UGC Project, Co. Kerry – refer)

Source: EirGrid

Figure 2-11: Operational Joint Bay with Passing Bay (on the Kilpaddoge Knockanure 220kV UGC Project, Co. Kerry)

Source: EirGrid

2.3.5.11 Cable Crossings (Water, Utility etc)

A number of crossings will be required along the cable routes. These crossings will be facilitated by either open cut trenching or HDD which have been designed as appropriate. Location specific detail is provided in Table 2.4.

A description of open cut trenching and HDD methods is provided hereunder. All works will be preceded by detailed confirmatory utilities / services location assessments, and where existing utilities / services are identified, the works will be diverted around the service / utility depending on the level of complexity arising.

The identification of crossings along the proposed cable routes has been based on consultations with utility providers, site walkovers, field studies and reviews of publicly available datasets such as Environmental Protection Agency (EPA) datasets and mapping.

2.3.5.12 Open Cut Trenches at Water Crossings

Open cut trenching will be carried out on two watercourses. This will involve excavating a trench for the cable and placing the cable as described previously. Open cut water crossings have the potential to generate silt and suspended solids.

2.3.5.13 Open Cut trenches at Utility Crossings

There are a number of existing utility services of varying diameters and depths along the proposed UGC route as described in Table 2.4. At these locations, the following options are available:

- Locate below the existing service. The UGC would be positioned locally below the existing service keeping minimum allowed spacing limitations between both as agreed between service providers.
- Locate above the existing service. The depth to the top of the UGC ducts could be reduced to a minimum of 450mm below surface level as per the Health and Safety Authority's paper entitled, 'Code of Practice for Avoiding Danger from Underground Services[18]'. This depth would accommodate the required separation from the service being crossed and would provide sufficient mechanical protection to the UGC system. Steel plates and steel mesh would be installed above concrete encased ducts.
- Realignment of existing utility. The works required to do so will be coordinated with the service / utility provider and a complete coordinated methodology would be mutually agreed between all parties prior to commencement of any diversions taking place. All proposed work methodologies would aim to prevent any outages or loss of service. If the risk cannot be avoided, prearranged agreements on outages would be set in place prior to works commencement.

2.3.5.14 Horizontal Directional Drilling

HDD technology has been widely used in the oil and gas industries for several decades. It has become more commonplace in recent times in municipal engineering projects, such as for the installation of electrical cables, optical cables and potable water pipes.

The HDD compounds are approximately 50 x 60m.The launch and reception pits (approximately 3m x 5m) for the drilling rig requires the temporary installation of a level hardstanding area on a geotextile base. A pilot hole will be drilled from one side of the crossing to the other side while supporting the bored hole with bentonite. The drill bit will be oriented by the surveyor, and the

[18] Code of Practice for Avoiding Danger from Underground Services - Health and Safety Authority (hsa.ie) (HSA.ie, 2010)

driller will push the drill string into the ground to maintain the bore path. A steering system, guided by tri-axial magnetometers and accelerometers that provide real time directional information to the surveyor at the driller's console, will be used to navigate the bores.

The drilled cuttings will then be flushed back by the drill fluid flowing via nozzles in the drill bit, up the annulus to the surface, where they will be separated from the fluid fraction for disposal. A comprehensive closed-loop drilling fluid mixing and circulation system with recycling capability will be utilised. A typical HDD Drilling Rig is shown in Figure 2-12.

Figure 2-12: Typical HDD Drilling Rig

Source: EirGrid

After the initial pilot hole is completed, it will be reamed in a number of passes to reach the required bore size to enable the cable ducts to be pulled through.

On completion of the works, the stone and geotextile will be carefully removed using a back-hoe or 360^0 excavator and removed off-site to an appropriately permitted waste facility.

There are limitations in entry angle and radius of curvature for drilling and often accommodating these to match favoured ground conditions can be challenging. The advantage with this method is that a number of standalone cable ducts can be provided as required with suitable separation to meet the preferred requirement. Unlike other installation techniques, a key advantage of HDD is that shafts are not required, but only entry / exit transition pits.

2.3.5.15 Construction Traffic

The number of construction workers required during the construction phase at the substations is expected to peak at approximately 50 persons for each of the two substation sites.

Crew sizes for the installation of the UGC is estimated at approximately eight persons per crew with four crews (teams) working simultaneously.

The estimated traffic movements associated with installation of the land cable are presented in Table 2.7. No abnormal loads are anticipated to be required for the installation of the UGC.

Table 2.7: Approximate Estimates of Construction Vehicles

Task	Activity	HGV Movements Total	Approximate Duration (Days)	Approximate HGV Movements/ Day	Indicative Approach to Construction
Cable Trench	Cut	(10833x2) = 21666	311	(35x2) = 70	Four teams working simultaneously
	Fill	(9166x2) = 18332	342	(27x2) = 54	Four teams working simultaneously
Carriageway passing bays	Cut	0	0	0	Not applicable
	Fill	(468x2) = 936	97	(5x2) = 10	Four teams working simultaneously
Moy Substation	Cut	(235x2) = 470	15	(16x2) = 32	Four teams working simultaneously
	Fill	(91x2) = 182	5	(19x2) = 38	Four teams working simultaneously
Tonroe Substation	Cut	(790x2) = 1580	35	(23x2) = 46	Four teams working simultaneously
	Fill	(339x2) = 678	10	(34x2) = 68	Four teams working simultaneously

2.3.5.16 Outline Construction Schedule and Timing of Works

Subject to the grant of statutory approvals, it is anticipated that the construction phase will commence in Q4 2023 with the underground cable element of the project becoming fully operational by Q3 2026.

The works at the Moy Substation are expected to last approximately 10 months while the works at Tonroe Substation are expected to last approximately 18-24 months, commencing in Q4 2023.

Construction activities will gradually phase out from pre-construction to predominantly civil activities followed by commissioning and testing.

In general, it is anticipated that construction will occur during normal working hours i.e. Monday to Friday 7 am to 7 pm and Saturday from 7 am to 2 pm. There may be localised instances, in proximity to the Hollister manufacturing plant, where night-time working is required to facilitate traffic management, however, should working outside these hours / days be required they will only be undertaken with prior agreement with the planning authorities, in this instance Mayo County Council and Roscommon County Council.

Clearance of hedgerow, treeline and scrub vegetation will be required to facilitate the works.

Indicative durations for the proposed works are detailed in Table 2.8. Subject to the grant of consents, it is anticipated that installation of the UGC will take approximately 26 months Safety requirements for the installation operations / procedures and weather condition will however ultimately dictate the final programme.

The majority of the construction activities are not dependant on outages on the existing transmission system, however, specific activities associated with the connection at the existing Moy and Tonroe substations on to the existing transmission infrastructure will be planned and programmed into EirGrid's multi-year outage programme. This is because the existing live infrastructure will require to be switched off during such connection activities. EirGrid, as Transmission System Operator, develops a detailed plan for such outages each year to ensure the undertaking of the safe and efficient construction and maintenance activities involving or in proximity to existing infrastructure.

Table 2.8: Indicative Preliminary Construction Programme

Construction Element	Duration
Cable Trench Excavations, Construction of Joint Chambers and Cable Pulling and Jointing	Ca. 26 months
Carriageway Passing Bays Reinstatement	Ca. 4 months
Works at Moy substation	Ca. 10 months
Works at Tonroe substation	Ca. 18 months
Commissioning of UGC	Ca. 2 months

2.3.5.17 Temporary Construction Compounds

All temporary construction compounds will be secured with hoarding / fencing around their perimeter as appropriate. Temporary construction compounds will include facilities such as construction phase car parking and welfare facilities and temporary material storage areas as necessary. Any discharges from temporary welfare facilities will be connected to a sealed holding tank to be emptied and disposed of off-site by a licenced contractor to an approved licenced facility, located in the wider area.

Where an access road is required, engineering stone fill will be laid and compacted and maintained as required for the duration of the works. Once the works are completed, the engineered stone fill will be removed and the land will be reinstated to its original condition.

Security lighting will be required for health and safety.

2.3.6 Operational Phase Activities

Operational phase activities will include routine maintenance of substations and irregular access to areas of existing infrastructure.

Clearance of woody vegetation overgrowth on offline sections of the cable routes may be required periodically by ESB maintenance crews. Hedgerows will be retained

Effects on surface water features as a result of non standard maintenance works (if required) during the operational phase will be subject to AA screening.

Given the nature of the operations associated with the proposed development, no potential for significant adverse effects to most biodiversity receptors are identified.

2.3.7 Decommissioning Phase Activities

These would be comparable to the construction phase.

2.3.8 Summary of Potential Impacts

In the absence of mitigation measures, there is the potential for the following impacts.

Construction Phase:

- Potential for direct impact to habitats and species within the footprint of the Proposed Development.
- Potential for indirect impact to habitats and species within the vicinity / downstream of the Proposed Development.
- Potential for generation of dust
- Potential for generation of surface-water pollution/sedimentation.
- Potential for noise and vibration effects.

Operational Phase:

- Potential for a local increase in light levels anticipated.

Decommissioning phase:

- Comparable to the construction phase.

2.4 European Sites in the Zone of Influence

In the context of on ecological impact assessment generally (CIEEM, 2018) the zone of influence (ZoI) for a proposed development is defined as that:

"*the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries*" and that "*the zone of influence will vary for different ecological features depending on their sensitivity to an environmental change*."

The ZoI varies depending on the construction and operational activity and the sensitivity of the receptor (e.g., flora, birds, terrestrial mammals) to the effect encountered.

The ZoI identified for various ecological receptors, having regard to the potential for impact as outlined previously are as detailed below:

- 100m either side of the cable route midline for breeding passerines
- The footprint of the proposed development for direct damage to habitats
- A study carried out on the potential for effects via impacts on air quality and climate arising from the proposed development has been carried out as part of the PECR. Within this assessment the ZoI for dust effects to ecological receptors was identified as 50m. As such, the ZoI is taken as 50m for dust effects within this NIS.
- 26m for detectable noise effects[19] to wetland bird species, based on noise modelling carried out which indicates that the noise levels drop to below 70dB within 26m of the proposed development (worst case scenario based on noise levels at construction compounds).
- 8km for Marsh Fritillary (Zimmerman *et al. 2011*)[20]

[19] Cutts, N., Phelps, A., & Burdon, D. (2009). Construction and waterfowl: Defining sensitivity, response, impacts and guidance. Report to Humber INCA by the Institute of Estuarine and Coastal Studies, University of Hull. EN (2003) The Humber Estuary European Marine Site: English Nature's advice given under Regulation, 33(2).

[20] Zimmermann K, Fric Z, Jiskra P, Kopeckova M, Vlasanek P, Zapletal M, Konvicka M (2011) Mark-recapture on large spatial scale reveals long distance dispersal in the Marsh Fritillary, Euphydryas aurinia. Ecol Entomol 36:499–510

- 1km for hen harrier and merlin (Ruddock *et al*., 2007)[21]
- 150m for breeding otter holts, (NRA 2006) [22]
- Catchment wide ZoI for surface waterbodies
- 250m for groundwater dependant terrestrial ecosystems (GWDTEs)[23]

2.4.1 Source Pathway Receptor and Impact Assessment

Projects have the potential to impact on European sites beyond the footprint of the project itself. National Guidance[24] states that screening for AA should be carried out for any European site within the likely ZoI of a plan or project. For projects, the guidance recommends that ZoI must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, the sensitivities of the ecological receptors, and the potential for in-combination effects.

In order to establish the ZoI of the Proposed Development, desktop and field survey data on protected habitats and species was mapped using a Geographic Information System (GIS). This data was interrogated for source-pathway-receptor connectivity.

The source (potential impacts from the Proposed Development), pathways (hydrological, physical or ecological connectivity) and receptors (QIs and SCIs of the European sites) were identified through a combination of bespoke field survey, and desktop survey including use of GIS software and through examination of aerial photography. Any European sites identified to have a viable source-pathway-receptor link to the Proposed Development were then examined further to determine the potential for significant effects.

The potential environmental effects of the Proposed Development can be summarised as:

- Direct impact to mobile QIs/SCIs, and supporting habitat (direct damage to vegetation) for same
- Indirect impacts to QIs/SCIs via:
  - Dust deposition;
  - Noise and vibration;
  - Lighting (temporary and permanent);
  - Accidental release of pollutants into surface waters,
  - Introduction, dispersal or spread of invasive species; and,
  - Sedimentation of surface waters from site runoff and dewatering of excavations.

The location of the red line boundary for the Proposed Development in relation to European sites is provided in Appendix B.

Table 2.9 includes the source-pathway-receptor assessment for the Proposed Development. All European sites within the Natura 2000 network were considered in the course of compiling Table 2.9.

[21] Ruddock, M. and Whitfield, D.P. (2007). A Review of Disturbance Distances in Selected Bird Species. A Report from Natural Research (Projects) Ltd to Scottish Natural Heritage. Scottish Natural Heritage.

[22] National Roads Authority (2006). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes.

[23] Kilroy G, Dunne F, Ryan J, O'Connor A, Daly D, Craig M, Coxon C, Johnston P and Henning M (2008). A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive. Environmental Research Centre Report. Environmental Protection Agency Ireland.

[24] Appropriate Assessment of Plans and Projects in Ireland, Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government, 2009

Table 2.9: Source Pathway Receptor Assessment

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Special Area of Conservation (SAC)				
River Moy SAC (002298) [25]	Intersects with Proposed Development	• Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] • Active raised bogs [7110]* • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150] • Alkaline fens [7230] • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]* • *Austropotamobius pallipes* (white-clawed crayfish) [1092] • *Petromyzon marinus* (sea lamprey) [1095] • *Lampetra planeri* (brook lamprey) [1096] • *Salmo salar* (salmon) [1106] • *Lutra lutra* (otter) [1355]	The proposed development intersects the SAC at the following route sections: • MT03-MT04 • MT06-MT07 • MT08-MT09 • MT12-MT13 (two crossings) The cable route runs immediately adjacent to the SAC boundary for a total of approximately 1.1km. Additionally, numerous watercourses which intersect with the Proposed Development have connectivity to the SAC. Given the location of the SAC in relation to the Proposed Development, there is potential for both direct and indirect impacts to QIs of the River Moy SAC.	**There is a potential for significant effects to the River Moy SAC. This is identified via direct and indirect impacts to QI of the River Moy SAC.**

[25] NPWS (2016) Conservation Objectives: River Moy SAC 002298. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Killala Bay/Moy Estuary SAC (000458) [26]	1.6km	• Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Annual vegetation of drift lines [1210] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • Salicornia and other annuals colonising mud and sand [1310] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Embryonic shifting dunes [2110] • Shifting dunes along the shoreline with Ammophila arenaria (white dunes) [2120] • Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]* • Humid dune slacks [2190] • *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] • *Petromyzon marinus* (Sea Lamprey) [1095] • *Phoca vitulina* (Harbour Seal) [1365]	The closest extent of the Proposed Development is Section MT01-MT02. Hydrological connectivity has been identified via the River Moy and tributaries thereof which outflow through the River Moy into the Killala Bay/Moy Estuary SAC. In addition, QI species such as sea lamprey and harbour seal have potential to occur outside of the boundary of the European site and within the ZoI of the Proposed Development upstream. In the absence of mitigation, there is potential therefore for degradation of QI habitats and supporting habitats for QI species downstream of the proposed development. In addition, there is potential for disturbance impacts to species such as seal should the occur outside of the site boundary. Given the source pathway receptor link identified there is potential for indirect impacts to the European site, and for direct impacts to Ex situ QIs.	**There is a potential for significant effects to the Killala Bay/Moy Estuary SAC identified via direct impacts to *ex situ* QIs, and indirect impacts through surface water run-off.**

[26] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Tullaghanrock Bog SAC (002354) [27]	1.6km	• Active raised bogs [7110]* • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]	The closest extent of the Proposed Development to the SAC is MT15-MT16. The River Lung runs along the eastern boundary of the SAC. Water crossings are required of the river lung itself, and its tributaries. Given the location of the proposed development relative to the European site (i.e. outside of the ZoI for GWDTE), and the nature of the QIs for which the site is designated, no viable source pathway receptor links exists.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded
Callow Bog SAC (000595) [28]	2.6km	• Active raised bogs [7110]* • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]	The closest extent of the Proposed Development to the SAC is MT15-MT16. The River Lung runs along the western boundary of the SAC. . Numerous water crossings are required of tributaries of the River Lung, and the River Lung itself. Given the location of the proposed development relative to the European site and the nature of the QIs for which the site is designated, no viable source pathway receptor links exist.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded

[27] NPWS (2015) Conservation Objectives: Tullaghanrock Bog SAC 002354. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[28] NPWS (2016) Conservation Objectives: Callow Bog SAC 000595. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Lough Hoe Bog SAC (000633) [29]	4.8km	• Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110] • Blanket bogs (* if active bog) [7130] • *Vertigo geyeri* (Geyer's whorl snail) [1013] • *Austropotamobius pallipes* (white-clawed crayfish) [1092]	Lough Hoe Bog is located a significant distance, 4.8km, from the proposed development to the east in an upland area.. Hydrological connectivity, albeit upstream, is present to the proposed development. As such, the SAC is not within the ZoI of the proposed development. The populations of Geyer's whorl snail and white clawed crayfish are noted in the site synopsis as being associated with Lough Talt, which is on the eastern edge of the SAC[30]. Given the location of the European Site relative to the proposed development, and the nature of the QIs for which it is designated, no viable source-pathway receptor links exist.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded
Bellanagare Bog SAC (000592) [31]	10.8km	• Active raised bogs [7110]* • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]	Bellanagare Bog SAC is located 10.8km from the closest section of the Proposed Development. Hydrological connectivity was identified via the Carricknabraher_020 River, however the SAC is located upstream of the proposed development.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded

[29] NPWS (2017) Conservation Objectives: Lough Hoe Bog SAC 000633. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

[30] NPWS (2013) Site Synopsis: Lough Hoe Bog SAC Site Code 000633

[31] NPWS (2015) Conservation Objectives: Bellanagare Bog SAC 000592. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			Given the location of the European Site relative to the proposed development, and the nature of the QIs for which it is designated, no viable source-pathway receptor links exist.	
Derrinea Bog SAC (000604) [32]	10.3km	• Active raised bogs [7110]* • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150]	Derrinea Bog SAC is located a significant distance from the closest section of the Proposed Development. No downstream hydrological connectivity was identified to Derrinea Bog SAC from the Proposed Development. Given the location of the European Site relative to the proposed development, and the nature of the QIs for which it is designated, no viable source-pathway receptor links exist.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded

[32] NPWS (2015) Conservation Objectives: Derrinea Bog SAC 000604. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
Cloonshanville Bog SAC (000614) [33]	12km	• Active raised bogs [7110]* • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the *Rhynchosporion* [7150] • Bog woodland [91D0]*	Cloonshanville Bog SAC is located a significant distance (12km) from the closest section of the Proposed Development. Given the location of the European Site relative to the proposed development, and the nature of the QIs for which it is designated, no viable source-pathway receptor links exist.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded
Urlaur Lakes SAC (001571) [34]	10.7km	• Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140]	Urlaur Lakes SAC is located a significant distance from the closest section of the proposed development. No downstream hydrological connectivity was identified to Urlaur Lakes SAC from the Proposed Development. Given the location of the European Site relative to the proposed development, and the nature of the QIs for which it is designated, no viable source-pathway receptor links exist.	Given no source pathway receptor link exists to the SAC, the potential for likely significant effects can be excluded
Errit Lough SAC (000607) [35]	13km	• Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. [3140]	Errit Lough SAC is located a significant distance from the closest	'Given no source pathway receptor link exists to the SAC, the potential

[33] NPWS (2016) Conservation Objectives: Cloonshanville Bog SAC 000614. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[34] NPWS (2017) Conservation Objectives: Urlaur Lakes SAC 001571. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

[35] NPWS (2017) Conservation Objectives: Errit Lough SAC 000607. Version 1. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			section of the proposed development (13km). No downstream hydrological connectivity was identified to Errit Lough SAC from the proposed development. Given the location of the European Site relative to the proposed development, and the nature of the QIs for which it is designated, no viable source-pathway receptor links exist.	for likely significant effects can be excluded
Special Protection Area (SPA)				
Killala Bay/Moy Estuary SPA (004036) [36]	3.1km	• Ringed plover (*Charadrius hiaticula*) [A137] • Golden plover (*Pluvialis apricaria*) [A140] • Grey plover (*Pluvialis squatarola*) [A141] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed godwit (*Limosa lapponica*) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Wetland and waterbirds [A999]	Downstream hydrological connectivity has been identified to the Killala Bay/Moy Estuary SPA via the River Moy and other tributaries thereof. On this basis, a viable source pathway receptor link is identified in terms of surface water pollution. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. There is potential for SCIs associated with the SPA to occur outside of the site boundary and in proximity to the proposed development.	Given the hydrological connectivity the SPA, a pathway for surface water pollutants to enter into the European site has been identified. This has potential to result in a degradation of supporting habitat (SCI Wetlands) for the SCIs associated with the SPA. Further, where SCIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the proposed development.

[36] NPWS (2013) Conservation Objectives: Killala Bay/Moy Estuary SPA 004036. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			As such, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the proposed development. Viable source-pathway-receptor link is identified in terms of direct impact and noise and vibration effects on *ex situ* SCI species.	**On this basis the potential for significant effects to Killala Bay/Moy Estuary SPA has been identified.**
Lough Gara SPA (004048) [37]	3.9km	• Whooper swan (*Cygnus cygnus*) [A038] • Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395]	Downstream hydrological connectivity has been identified to Lough Gara SPA. On this basis, a viable source pathway receptor link is identified in terms of surface water pollution. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. There is potential for SCIs associated with the SPA to occur outside of the European site boundary and in proximity to the proposed development. As such, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the proposed development.	Given the hydrological connectivity the SPA, a pathway for surface water pollutants to enter into the European site has been identified. This has potential to result in a degradation of supporting habitat for the SCIs associated with the SPA. Further, where SCIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the proposed development. **On this basis the potential for significant effects to Lough Gara SPA has been identified**

[37] NPWS (2021) Conservation objectives for Lough Gara SPA [004048]. Generic Version 8.0. Department of Housing, Local Government and Heritage.

Site Name (Code), and Conservation Objectives	Distance between the Proposed Development and European site (straight line) at closest point	Qualifying Interests / Special Conservation Interests (SCI) of the European site (* denotes priority habitat, breeding birds only noted otherwise wintering)	Source-Pathway-Receptor Assessment	Potential for Significant Effects
			Viable source-pathway-receptor link is identified in terms of direct impact and noise and vibration effects on *ex situ* SCI species.	
Lough Conn and Lough Cullin SPA (004228) [38]	4.3km	• Tufted duck (*Aythya fuligula*) [A061] • Common scoter (*Melanitta nigra*) [A065] • Common gull (*Larus canus*) [A182] • Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] • Wetland and Waterbirds [A999]	No downstream hydrological connectivity has been identified to the SPA. There is potential, however, for SCIs associated with the SPA to occur outside of the Europeansite boundary and in proximity to the proposed development. As such, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the proposed development . Viable source-pathway-receptor link is identified in terms of direct impact and noise and vibration effects on *ex situ* SCI species.	Where SCIs may occur outside of the site boundaries, there is potential for temporary disturbance/ displacement effects due to noise and vibration associated with the proposed development. **On this basis the potential for significant effects to Lough Conn and Lough Cullin SPA has been identified**

[38] NPWS (2021) Conservation objectives for Lough Conn and Lough Cullin SPA [004228]. Generic Version 8.0. Department of Housing, Local Government and Heritage

2.5 Plans and Projects Which Might Act in Combination

Article 6(3) of the Habitats Directive requires that:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

It is therefore required that the potential impacts of the Proposed Development are considered in combination with any other relevant plans or projects.

An assessment of plans and projects with the potential for in combination effects in association with the proposed development was undertaken.

A search of planning applications[39] in the vicinity of the proposed development was undertaken in February 2022 to examine projects with potential for in combination effects. Applications which were made typically consisted of extensions, demolitions and renovations to existing houses and agricultural buildings, and retention of existing developments.

Given the location of these works in relation to the European sites, and the Proposed Development there is no potential for in-combination effects.

In addition to database searches, EirGrid was also consulted for information on proposed electricity transmission projects within the potential ZoI of the proposed development.

Other, larger scale, projects, and electricity transmission projects which were identified are outlined hereunder:

Flagford-Tonroe 110 kV Line Site Investigation Works –

EirGrid intends to progress site investigation works at six structures on the existing Flagford-Tonroe 110kV line.

A screening determination for these works has been published[40] which stated:

"*There are no works within or adjacent European sites. The proposed development is not located within or near any European site; the closest such site is the Tullaghanrock Bog Special Area of Conservation (SAC; site code 2354) 1 located c. 0.8 km from the proposed development site.*

This determination has had regard for these and any other relevant European sites. In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence. This determination is based on the location, scale, extent and duration of the proposed development, including temporary works, and has not taken account of measures intended to avoid or reduce significant effects on European sites"

Given the location of these SI works (i.e. to the east of Tonroe substation), the nature and scale of the works (small scale SI works at six tower locations) no potential for in combination effects is identified.

[39] Planning Websites: Cork County Council, Waterford County Council and An Bord Pleanála.

[40] https://www.eirgridgroup.com/site-files/library/EirGrid/CP0816-Tonroe-to-Flagford-SI_-AAS-Determination_PA-issue.pdf

Flagford to Tonroe Overhead Line Uprate Works

EirGrid intend to progress uprate works to approximately 32.5km of overhead line and associated wood poles and towers on the existing Flagford to Tonroe 110 kV overhead line (OHL).

The works to be undertaken to facilitate the uprate are:

- The replacement of certain wooden polesets and steel angle towers. Poleset / Tower replacement works include;
  - 54 intermediate wood polesets to be replaced with new intermediate polesets.
  - 87 intermediate wood polesets to be retained.
  - 16 existing angle towers to be replaced with new angle towers.
  - Tower 163 to be replaced with a line cable interface mast (identified as tower 162A).
- The replacement of the existing conductor along the entire length of the line between Tonroe 110kV substation and Flagford 220/110 kV substation in Flagford, County Roscommon. Structures 150-157 were previously subject to an uprate and will not require a new conductor but will require new fibre. The conductor will be fibre wrapped.
- Tie ins to the Moy and Tonroe substations
- Replacement of crossarms, insulators and the installation of suspension clamps, stay wires, anti-climbing guards and dampers (where required).

The replacement/repair of earth-wire (where required). No additional sections of shield wire are proposed, to what is currently present. Minor repairs are proposed at 4 site locations.

The Flagford to Tonroe OHL works are located entirely outside of the River Moy SAC Catchment, and predominantly within the wider River Shannon catchment including Lough Gara SPA which is the closest hydrologically linked European site. No instream or other works are required at streams/ rivers. The works required consist of alterations to existing OHLs and associated structures. An appropriate assessment screening report was written for these works which determined that the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites.

Given the nature, scale and location of these works relative to the proposed development no potential for in combination effects is identified.

North Connacht 110kV Bathymetry Survey

As part of the design of the project, bathymetric surveys are required to ascertain the riverbed profile in three locations along the River Moy. These works were brief in nature, comprising instream surveys via motorised canoe. An Appropriate Assessment Screening Determination has been published for these works[41]

The screening determination concluded that

"*In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.*

This determination is based on the location, scale, extent and duration of the proposed development, including temporary works, and has not taken account of measures intended to avoid or reduce significant effects on European sites."

In addition to the above, these works have already been completed.

North Connacht 110kV Topographical Survey

As part of the design of the North Connacht 110kV project, topographical surveys are required. These works are brief in nature, and non-intrusive comprising walkovers with survey equipment. These works will be completed in advance of the proposed development.

An Appropriate Assessment Screening Determination has been published for these works[42].

The screening determination concluded that

"*In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.*

This determination is based on the location, scale, extent and duration of the proposed development, including temporary works, and has not taken account of measures intended to avoid or reduce significant effects on European sites."

In addition to the above, works are complete, there is no potential for in combination effects identified.

Proposed Flagford Sliabh Bawn 110 kV Line Uprate (County Roscommon).

EirGrid's AA determination[43] conducted for this project was as follows.

In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with

[41] https://www.eirgridgroup.com/site-files/library/EirGrid/CP0816-Advance-Bathymetric-and-Topographic-Surveys-North-Connacht-110-kV-Project.pdf

[42] https://www.EirGridgroup.com/site-files/library/EirGrid/CP0816-Advance-Bathymetric-and-Topographic-Surveys-North-Connacht-110-kV-Project.pdf

[43] CP0817-Flagford-Sliabh-Bawn-AAS-Determination_PA-issue.pdf (EirGridgroup.com)

other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.

The works areas associated with the proposed Flagford Sliabh Bawn 110 kV line uprate are not in proximity to the works areas, as the line is located c. 28 km from the proposed development at its nearest point, and is predominantly in a different Water Management Unit (Lung) to the proposed development. Given the location of these works, there is no potential for cumulative effects.

N5 Ballaghaderreen to Scramoge Road Development

The scheme involves the construction of 34km road upgrade to new Type 1 single carriageway; 15.4km of realignment of existing roads; five roundabouts; 16 'T' junctions; three road under bridges; one road overbridge; four river bridges and 14 culverts**.** The closest extent of the project is located approximately 5km to the east of the Tonroe Substation.

An NIS was produced for these works which identified the potential for impact to the following European sites

- Annaghmore Lough (Roscommon) SAC (001626)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105) (004105)
- Cloonshanville Bog SAC (000614)
- Lough Forbes Complex SAC (001818)
- Lough Gara SPA (004048)

Mitigation measures were specified in relation to water pollution control. The NIS concludes:

- "*The proposed road development, by itself or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of any European Site and no reasonable scientific doubt remains as to the absence of such effects*."
- Construction for the road improvements commenced in October 2021, with a programme of three years to completion. As such, there is potential for the construction phases of the UGC, and the road improvements to run concurrently. While the NIS has prescribed measures to control surface water run-off, there is potential for in combination effects through noise and vibration to *ex situ* SCI species given the proximity and timing of the works.

Glenree- Moy 110 kV Uprate

The development is located on lands immediately adjoining the Moy substation in the townland of Gorteen, Ballina, Co. Mayo. The project comprises the uprating of the line to refurbish the condition of the existing line, and accommodate higher rated conductors, which requires significant structure replacements.

Environmental assessments are ongoing to inform the planning application, and it is anticipated that Mayo County Council may consent the Glenree to Moy 110 kV Uprate project only after determining it will not adversely affect the integrity of European sites, alone or in combination with other plans or projects (including the proposed development).

As such, no significant in-combination effects are predicted with the proposed development.

Castlebar-Cloon 110 kV Uprate

The Castlebar-Cloon 110kV uprate is an uprate along a 110 kV line running from the Castlebar 110kV Substation in the townland of Aghalusky Co. Mayo to the Cloon 110 kV Substation in the townland of Cloonascragh, Tuam, Co. Galway. The Castlebar-Cloon 110kV uprate project is located c. 18km from the proposed development at its nearest point, and in a different Water

Management Unit (Conn WMU) to the proposed development. The Castlebar-Cloon 110kV uprate project oversails (and includes structures with potential to be replaced within) the River Moy SAC. EirGrid will oversee the planning application for the Castlebar-Cloon 110kV uprate project, which will have due regard for the ecological protection principles within EirGrid's Ecology Guidelines for Electricity Transmission Projects (EirGrid, 2020). With the exception of the River Moy SAC, the Castlebar-Cloon 110kV uprate project, and proposed development do not jointly overlap any shared pNHA, NHA, or other known site of nature conservation interest.

Mayo County Council may consent the Glenree to Moy 110 kV Uprate project only after determining it will not adversely affect the integrity of European sites, alone or in combination with other plans or projects (including the proposed development).

As such, no significant in-combination effects are predicted with the proposed development

2.6 Summary of Potentially Significant Effects

In the absence of mitigation, the potential for likely significant effects on European sites has been identified from the Proposed Development alone. In the absence of mitigation (at AA Screening Stage), potentially significant in-combination effects have been identified to Lough Gara SPA associated with N5 Ballaghaderreen to Scramoge Road Development. No other significant in-combination effects have been identified.

2.7 Screening Outcome

The current assessment investigates the potential for the Proposed Development to have significant effects on the following European sites within the Natura 2000 network, alone and in combination with other plans or projects:

- River Moy SAC
- Killala Bay/Moy Estuary SAC
- Killala Bay/Moy Estuary SPA
- Lough Gara SPA
- Lough Conn and Lough Cullin SPA

This AA Screening report concludes that likely significant effects on these five European sites cannot be excluded on the basis of objective evidence, from the Proposed Development alone, and in combination with other plans or projects.

3 Natura Impact Statement

This Natura Impact Statement (NIS) has been produced in support of the Appropriate Assessment of the Proposed Development to be undertaken by the competent authority. The NIS considers the likely or possible significant effects of the proposed development. Mitigation measures are identified to avoid adverse effects on the integrity of European sites.

3.1 Description of the Development

The development is described in detail in Section 2.3 of this report as follows;

- Construction phase activities are outlined in Section 2.3.5
- Operational phase activities are outlined in Section 2.3.6
- Decommissioning phase activities are outlined in Section 2.3.7

3.2 Description of the Receiving Environment

3.2.1 Habitats Within the Footprint of the Proposed Development

The habitat types associated with the footprint of the Proposed Development are described in Section 2.2. The majority of the proposed development lies within existing roadways and improved agricultural grassland.

As previously noted, the cable route crosses through the boundary of the River Moy SAC. The locations of these crossings relative to the UGC are provided below in Table 2.2. Further details on the potential for these crossings to support QI species of the River Moy SAC is provided in Section 3.2.2. The corresponding survey site number is also provided below.

The potential for habitats within the ZoI, beyond the footprint, to offer habitat for mobile species is captured in Table 2.9 of this document.

Table 3.1: Crossings of the River Moy SAC

Route Section	Crossing Methodology	Aquatic Survey Site Number
MT03-MT04	HDD	3
MT06-MT07	HDD	10
MT08-MT09	HDD	16
MT12-MT13	Within the existing roadway	23 and 24
MT12-MT13	HDD	27

Details on the crossing methodology is provided in Section 2.3.5

The proposed development also runs directly adjacent to the River Moy SAC boundary within the existing roadway at MT05-MT06, and MT07-MT09.

3.2.2 Watercourses

Table 3.2 presents an overview of WFD surface waterbodies within or in close proximity to the Proposed Development, as detailed on EPA datasets and mapping, and ground-truthed by field surveys. The following detail is provided:

- WFD surface waterbody water crossings (denoted as 0m distance) and WFD surface waterbodies within the wider landscape (500 metres) of the Proposed Development (closest distance provided);

- River waterbody WFD status 2013-2018;
- Connectivity to European sites
- Summary of aquatic ecology evaluation as it relates to QIs

Table 3.2 describes, for each watercourse, potential connectivity with European sites downstream and identifies crossings of the River Moy SAC.

Table 3.2 Watercourses in the Wider Area Surrounding the Proposed Development

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
Moy Substation	IE_WE_34T830920 - TULLYEGAN_010	Moderate	200m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	-	-
MT01-MT02	IE_WE_34T830920 - TULLYEGAN_010	Moderate	457m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	-	-
	IE_WE_34M021100 - Moy_120	Moderate	340m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to	-	--

[44] EPA (2022) https://gis.epa.ie/GetData/Download

[45] Findings in relation to QI species.

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					Killala Bay/ Moy Estuary SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SPA		
MT02-MT03	IE_WE_34T830920 - TULLYEGAN_010	Moderate	0m	Yes – Three crossings. Two via open cut (direct stream impacts) and one via HDD.	● Downstream connectivity to River Moy SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 1, 2, 40 and 41.	Aquatic site 1 (upstream of HDD location) ● Good quality salmonid spawning habitat ● Suitable lamprey spawning habitat Aquatic Site 2 (open cut): ● No QI species recorded Aquatic site 40 (open cut): ● Potential as a spawning and nursery habitat for lamprey. Noted that potentially dries out in summer. Aquatic site 41 (HDD): ● Good quality salmonid nursery ● Some suitability for white-clawed crayfish
	IE_WE_34M021100 - Moy_120	Moderate	484m	No	● Designated as part of River Moy SAC ● Downstream connectivity to	-	-

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					Killala Bay/ Moy Estuary SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SPA		
MT03-MT04	IE_WE_34M021100 - Moy_120	Moderate	0m	Yes – Via HDD	● Designated as part of River Moy SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 3	● Moderate quality salmonid nursery ● Excellent holding habitat for adult salmonids ● Supporting habitat for lamprey ammocoetes ● Suitability identified for white clawed crayfish
MT04-MT05	IE_WE_34M021100 - Moy_120	Moderate	0m	Yes – Three crossings via open cut within the existing road. (direct impacts to stream avoided)	● Downstream connectivity to River Moy SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SAC ● Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 4, 5, and 6	Aquatic site 4: ● Site was dry, no QI species recorded Aquatic site 5: ● Poor value overall for salmonid and lamprey spawning ● Some low value habitat for lamprey ammocoetes ● Otter spraint recorded Aquatic site 6: ● Poor value for salmonid nursery and holding habitat

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
							• Low value for lamprey ammocoetes
MT05-MT06	IE_WE_34M021100 - Moy_120	Moderate	50m	No	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	-	-
	IE_WE_34C070600 - CARROWKERIBLY LOUGH STREAM_010	Poor	0m	Yes – via open cut within existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 7	• Good quality salmonid nursery and spawning habitat • Good holding habitat for adult salmonids
	IE_WE_34M020850 - Moy_110	Good	0m	Yes - via open cut within existing road. (direct impacts to stream avoided)	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC	Aquatic Site 8	• Moderate-quality salmonid nursery. • Moderate-quality salmonid nursery • Low value for Lampetra sp. ammocoetes

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					• Downstream connectivity to Killala Bay/ Moy Estuary SPA		
MT06-MT07	IE_WE_34Y010400 - Yellow (Foxford)_020	High	0m	Yes- Two crossings via HDD	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 9 and 10	Aquatic site 9: • Supports a low density of juvenile Atlantic salmon • Lamprey ammocoetes and supporting habitat for same recorded • Good quality salmonid nursery • Moderate salmonid and lamprey spawning habitat Aquatic site 10: • Excellent quality salmonid nursery and spawning habitat • Good quality salmonid holding habitat
	IE_WE_34C080300 - Callow Loughs Stream_010	High	0m	Yes – Via HDD	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 11	• Good quality salmonid nursery • Low spawning value for salmonids • Moderate holding value for salmonids

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
MT07-MT08	IE_WE_34C080300 - Callow Loughs Stream_010	High	0m	Yes – Two crossings via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 12 and 13	Aquatic site 12: • Poor quality salmonid nursery • Good holding area for salmonids • Good lamprey nursery potential Aquatic site 13: • Low quality salmonid quality nursery, spawning and holding habitat
	IE_WE_34L050600 - Lough Muck Stream_010	Good	0m	Yes – via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 14	• Low quality salmonid nursery, spawning and holding habitat • Suitable habitat for lamprey species • Two white clawed crayfish recorded
	IE_WE_34M020650 - Moy_080	Good	340m	No	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to	-	-

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					Killala Bay/ Moy Estuary SPA		
MT08-MT09	IE_WE_34M020650 - Moy_080	Good	0m	Yes – Two crossings, one open cut within the existing road (direct impacts to stream avoided), and one via HDD	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic sites 15 and 16	Aquatic Site 15: • Good-quality salmonid nursery • Good quality salmonid and lamprey spawning habitat • Low suitability for white clawed crayfish Aquatic Site 16: • Good quality salmonid nursery and spawning habitat • Excellent holding habitat for adult salmonids • Suitable spawning habitat for lamprey
	IE_WE_34S050300 - Swinford_010	Good	0m	Yes – via open cut within existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic Site 17	• High densities of Atlantic Salmon parr • Very good quality salmonid nursery • Moderate salmonid spawning habitat • Moderate salmonid holding habitat

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
MT09-MT10	IE_WE_34S050300 - Swinford_010	Good	0m	Yes – Three crossings open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic sites 18, 19, and 20	Aquatic Site 18: • No inherent fisheries or aquatic value given its dry, modified nature. Aquatic site 19: • Moderate-quality salmonid nursery • Spawning habitat for salmonids and lamprey was considered of good quality • Holding habitat for adult salmonids was present • Low numbers of white-clawed crayfish (two juveniles) were recorded. Aquatic Site 20: • The site was not considered of fisheries value given its heavily modified, silted nature and lack of flows.
MT10-MT11A	IE_WE_34S050300 - Swinford_010	Good	0m	Yes – Two crossings via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to	-	-

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					Killala Bay/ Moy Estuary SPA		
MT10-MT11B	IE_WE_34S050300 - Swinford_010	Good	0m	Yes – Two crossings via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	-	-
MT11-MT12	IE_WE_34S050300 - Swinford_010	Good	350m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	-	-
	IE_WE_34M020500 - Moy_070	High	350m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC	-	-

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					• Downstream connectivity to Killala Bay/ Moy Estuary SPA		
	IE_WE_34S020100 – Sonnagh (Moy)_010	Poor	350m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	-	
MT12-MT13	IE_WE_34S020100 - Sonnagh (Moy)_010	Poor	0m	Yes – Four crossings via open cut within the existing road (direct impacts to stream avoided)	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic sites 23, 24, 25, and 26	Aquatic Site 23: • Good-quality salmonid nursery habitat • Salmonid and lamprey spawning habitat was of moderate quality • Some larval lamprey habitat was present in depositing areas near the culvert Aquatic site 24: • Good quality salmonid nursery habitat • Salmond and lamprey spawning was considered of good quality

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
							• Holding habitat was moderate • Moderate-suitability for lamprey ammocoetes
	IE_WE_34C280100 - Charlestown Stream_010	Moderate	0m	Yes – One crossing via HDD	• Designated as part of River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 27	• High value for salmonids • Good quality nursery and spawning habitat (particularly for Atlantic salmon) • Holding habitat for adults was also of good-quality, albeit more localised
MT13-MT14	IE_WE_34C280100 - Charlestown Stream_010	Moderate	0m	Yes – Two crossings via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic sites 28 and 29	Aquatic Site 28: • Some moderate value as a salmonid nursery • Salmonid and lamprey spawning habitat was present but the value was significantly reduced by siltation • Holding habitat, by way of deeper glide and pool, was present but limited • Moderate suitability for white-clawed crayfish Aquatic site 29: • The channel had no inherent fisheries or

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
							aquatic value given its dry, modified nature. However, the fisheries and aquatic value improved downstream.
	IE_WE_34B120180 - Black (Sligo)_010	Moderate	0m	Yes – Two via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic sites 30 and 31	Aquatic site 30: • Moderate value as a salmonid nursery and spawning habitat, with poor holding opportunities • Low suitability for white clawed crayfish Aquatic site 31: • Poor fisheries value Low suitability for lamprey
	IE_WE_34O030100 - Owengarve (Sligo)_020	High	0m	Yes – Three via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic sites 32, 33, and 34	Aquatic site 32: • Moderate value as a salmonid nursery and spawning habitat Aquatic site 33: • No inherent fisheries or aquatic value Aquatic site 34: • Poor value as a salmonid habitat • Very low suitability for white-clawed crayfish

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
MT14-MT15	IE_WE_34O030050 - Owengarve (Sligo)_010	Good	0m	Yes – Via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 35	• Moderate-quality salmonid nursery and spawning habitat
	IE_WE_34O040200 - Owenlobnaglaur_010	Good	0m	Yes – Via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to Killala Bay/ Moy Estuary SPA	Aquatic site 36	• Low densities of Lamprey sp. ammocoetes present • Poor value as a salmonid nursery and holding habitat. • Localised poor-quality spawning habitat • A single white-clawed crayfish was recorded
MT15-MT16	IE_WE_34O040200 - Owenlobnaglaur_010	Good	68m	No	• Downstream connectivity to River Moy SAC • Downstream connectivity to Killala Bay/ Moy Estuary SAC • Downstream connectivity to	-	-

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					Killala Bay/ Moy Estuary SPA		
	IE_SH_26L030275 - Lung_030	Unassigned	0m	Yes – One crossing via open cut within the existing road (direct impacts to stream avoided)	• Downstream connectivity to Tullaghanrock Bog SAC • Downstream connectivity to Callow Bog SAC • Downstream connectivity to Lough Gara SPA	Aquatic site 37	• No inherent fisheries or aquatic value given its dry, modified nature.
	IE_SH_26L030400 - Lung_050	Good	0m	Yes – One crossing via open cut within the existing road (direct impacts to stream avoided), one via HDD	• Downstream connectivity to Tullaghanrock Bog SAC • Downstream connectivity to Callow Bog SAC • Downstream connectivity to Lough Gara SPA	Aquatic site 38, and 39	Aquatic site 38: • Moderate value only as a salmonid nursery • Poor holding habitat for adult salmonids • Spawning habitat was also of poor quality Aquatic site 39: • Moderate value as a salmonid nursery • Moderate-quality salmonid spawning habitat • Some suitability for white clawed crayfish
Tonroe Substation	IE_SH_26L030400 - Lung_050	Good	80m	No	• Downstream connectivity to Tullaghanrock Bog SAC	-	-

Route Section	WFD Waterbodies within 500m of the cable route	WFD Status 2013-2018[44]	*Distance between watercourse and proposed development	Watercourse Crossing (Yes/No)	Connectivity to European Site	Aquatic Ecological Evaluation Reference	Aquatic Ecology Site Survey Summary Findings on QI species[45]
					• Downstream connectivity to Callow Bog SAC • Downstream connectivity to Lough Gara SPA		

3.2.3 Mammals

Signs of otter were limited during the field surveys. This is likely a reflection of the nature of the proposed development, with the majority of the cable route located within the existing roadway. Otter tracks were noted at the crossing of the Moy (MT03 – MT04) (Figure 3.1), and an otter spraint was identified during aquatic surveys on the River Knocknagun (MT04-MT05).

No holts were identified and all crossing areas were surveyed.

Historic records from the NPWS for otter within the last 50 years within 150m (per worst case ZoI for breeding holts[46]) of the proposed development were interrogated. Three records were identified:

- MT05-MT06: Record in field close to the Moy 110 watercourse.
- MT08-MT09: Record on the bank of the River Moy
- MT14-MT15: Record on the Owenlobnaglaur River

The records for otter, both current and historic, with the exception of the MT14-MT15 record, were generally located within, or along tributaries for the River Moy.

The otter track was recorded within the SAC boundary, while the spraint was recorded on a tributary of the SAC, approximately 60m outside of the SAC boundary at its closest point. As such, it is likely that the otters recorded form part of the SAC population.

Figure 3.1: Otter Track

Source: Mott MacDonald 2021

[46] NRA (2006) Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes

3.2.4 Invasive Species

The following Third Schedule invasive species were recorded:

- Low numbers (two recorded) of the invasive zebra mussel (*Dreissena polymorpha*) were recorded on the Carrowkeribly Lough Stream (Bunnafinglas River) (MT05-MT06) during macroinvertebrate surveying. The species is listed as an invasive species on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011) (under Regulations 49 & 50). HDD is proposed at this watercourse crossing i.e. no instream or riparian habitat disturbance.
- No other scheduled invasive species were recorded within the ZoI of the proposed development.
- The location of this record is presented in Appendix A Habitat Map.

3.2.5 Wintering Birds

The scope of the initial winter bird surveys (monthly between December 2019 to March 2020 inclusive) was such that in addition to the lands within which the proposed development is located, a wide study area of approximately 1,080km^2 was assessed. Winter bird surveys, focused on the proposed development site, were conducted monthly between September 2020 to March 2021 inclusive and monthly between October 2021 to March 2022 inclusive

The wider landscape surrounding the proposed development is comprised of a myriad of wetland and peatland habitats. The distribution of the records relating to the bird surveys reflects the presence of these supporting habitats for wintering wildfowl.

The majority of the records identified during the survey was associated with SPA sites in the wider landscape namely:

- Killala Bay / Moy Estuary SPA (approximately 3.1km from the UGC),
- Lough Conn and Lough Cullin SPA (approximately 4.5km from the UGC), and
- Lough Gara Bog (approximately 3.9km from the UGC).

Additionally, clusters of records were noted associated with:

- Urlaur Lakes SAC,
- Cloonakilla Lough SAC,
- Doocastle Turlough SAC,
- Turloughmore (Sligo) SAC,
- Lands adjacent to Callow Bog SAC.

Numerous records were associated with the River Moy SAC both near to the proposed development and further afield.

Within the ZoI of the proposed development the following areas were identified as potential key locations for wintering birds:

- Peatland habitat to the west of the proposed development between MT04 and MT06
- Carrowkeribly Lough east of the proposed development between MT05 and MT06
- Bunnfinglas Quarry (ponds) between MT05 and MT06
- Peatland habitat east and west of the proposed development and River Moy adjacent fields between MT05 and MT06.
- The River Moy and nearby peatland habitat north of the proposed development between MT08 and MT10

- Peatland habitat north of the proposed development adjacent to the River Moy between MT11 and MT12

Twelve target species were identified in lands adjacent to, and within the ZoI of the proposed development. Of these, 5 were SCI species of nearby European sites. Details of these species and their locations in relation to the proposed development are provided below in Table 3.3.

Table 3.3: Summary of Winter Bird Survey Results

Species	BoCCI Status	SCI Species	Location of Records in Proximity to Proposed Development
Common gull (*Larus canus*)	Amber List	• Lough Conn and Lough Cullin SPA	The majority of records for common gull were located at nearby SPAs namely Lough Conn and Lough Cullin SPA, and Killala Bay/Moy Estuary SPA. Only one record of common gulls was noted within the ZoI of the proposed development, with eight common gulls roosting at Carrowkeribly Lough.
Curlew (*Numenius arquata*)	Red listed	• Killala Bay/Moy Estuary SPA	The majority of records for curlew were associated with nearby SPAs. Three records were identified in peatland habitat to the west of the proposed development between MT04 and MT06. Included in this is the notable peak count of 63 (17% of figure of national significance) recorded foraging west of the UGC.
Golden plover (*Pluvialis apricaria*)	Red listed	• Killala Bay/Moy Estuary SPA	A single record of golden plover was made within the ZoI of the proposed development. This record was associated with cutover bog and wet grassland to the west of the UGC between MT04 and MT05.
Tufted duck (*Aythya fuligula*)	Amber List	• Lough Conn and Lough Cullin SPA	The majority of records of this species during the wintering surveys were associated with Lough Gara SPA, Lough Conn and Lough Cullin SPA and other lake habitats located a significant distance from the proposed development. Records of tufted duck in closer proximity to the cable route were associated with lake habitats in the wider area as follows: • Lough Muck approximately 1km west of the proposed development between MT07 and MT08. • Killaturly Lough approximately 1.6km south of the cable route at MT11-MT12 These records are outside of the ZoI of the Proposed Development as outlined in Section 2.5.
Whooper swan (*Cygnus cygnus*)	Amber List	• Lough Gara SPA	As in the case of tufted duck, records of whooper swan were largely associated with the wider study area outside of the ZoI of the proposed development. • Records between MT04 and MT06 associated with agricultural grassland along the River Moy, with flight lines extending over farmland, and peatland habitat to lake habitats (Carrowkeribly Lough and Ballymore lough) east of the proposed development. Counts in this area were notable with a peak count recorded of 26 (17% of figure of national significance) individuals foraging approximately 1km west of the proposed development. • Two records between MT08 and MT10 with a peak count 39 (26% of figure of national significance), one crossing the river Moy, the second north of the cable route associated with peatland habitat.

3.2.6 European Sites

3.2.6.1 Summary of Relevant European Sites

The Proposed Development intersects with the River Moy SAC.

Viable source pathway receptor links were also identified to the following European sites

- Killala Bay/ Moy Estuary SAC
- Killala Bay/ Moy Estuary SPA
- Lough Gara SPA
- Lough Conn and Lough Cullin SPA

3.2.6.2 River Moy SAC

As previously noted, the Proposed Development crosses the River Moy SAC. The site synopsis for the River Moy SAC [47] describes the site as comprising "*almost the entire freshwater element of the River Moy and its tributaries including both Loughs Conn and Cullin*", draining a catchment area of 805 sq. km.

The Natura 2000 Standard Data Form for the River Moy SAC[48] identifies the following most important impacts and activities with high negative effect on the site:

- Agricultural Intensification
- Diffuse pollution to surface waters due to agricultural and forestry activities
- Peat extraction
- Aerodrome, heliports
- Use of fertilisers (forestry)
- Forest planting on open ground
- Invasive non-native species

As previously noted, the scheduled invasive non-native species zebra mussel has been recorded during the field surveys for the Proposed Development and may be impacted by the construction phase. In addition, welfare facilities will be required for the construction phase of the Proposed Development. The potential for impact on the River Moy SAC associated with this invasive species, and welfare activities is discussed further in Section 3.3.

The QIs for which the SAC is designated, the conservation objectives identified for the QIs, and their current national conservation status and trend are outlined in Table 3.4.

[47] NPWS (2020) Site Synopsis River Moy SAC. Site Code: 002298

[48] NPWS (2020) Natura 2000 Standard Data Form. IE0002298 River Moy SAC.

Table 3.4: Qualifying Interests for River Moy SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective[49]	National Conservation Status and Trend[50] [51]
Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510]	Not listed in the conservation objective document. However, specific conservation objectives are available for the habitat in other European Sites [52] and will be used in this instance. On a precautionary basis, the CO is presumed to be to r**estore** favourable conservation condition of the habitat.	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating.**
Active raised bogs [7110]*	To **restore** the favourable conservation condition of Active raised bogs in River Moy SAC.	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**.
Degraded raised bogs still capable of natural regeneration [7120]	The long-term aim for degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) (i.e. to r**estore**) and a separate conservation objective has not been set in River Moy SAC.	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating.**
Depressions on peat substrates of the *Rhynchosporion* [7150]	Depressions on peat substrates of the *Rhynchosporion* is an integral part of good quality Active raised bogs (7110) and thus a separate conservation objective has not been set for the habitat in River Moy SAC	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating.**
Alkaline fens [7230]	To **maintain** the favourable conservation condition of alkaline fens in River Moy SAC.	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**.
Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]	To **maintain** the favourable conservation condition of old sessile oak woods with Ilex and Blechnum in the British Isles in River Moy SAC.	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**.
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*	To **maintain** the favourable conservation condition of alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) in River Moy SAC.	The overall conservation status for the habitat is **bad** and the conservation status trend is d**eteriorating**.
Austropotamobius pallipes (white-clawed crayfish) [1092]	To **maintain** the favourable conservation condition of white-clawed crayfish in River Moy SAC.	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**.
Petromyzon marinus (sea lamprey) [1095]	To **maintain** the favourable conservation condition of sea lamprey in River Moy SAC.	The overall conservation status for the species is **bad** and the conservation status trend is **deteriorating**.
Lampetra planeri (brook lamprey) [1096]	To **maintain** the favourable conservation condition of Brook Lamprey in River Moy SAC.	The overall conservation status for the species is f**avourable** and the conservation status trend is **stable.**
Salmo salar (salmon) [1106]	To **maintain** the favourable conservation condition of Salmon in River Moy SAC.	The overall conservation status for the species is i**nadequate** and the conservation status trend is **stable**
Lutra lutra (otter) [1355]	To **maintain** the favourable conservation condition of Otter in River Moy SAC.	The overall conservation status for the species is **favourable** and the conservation status trend is i**mproving**

In summary, Table 3.4 indicates that:

- For nine QIs the conservation status is listed as bad, and the conservation trend is deteriorating
- Only two QIs have a favourable conservation status listed

The known extents of a number of the QIs of the River Moy SAC have been mapped in the Site-Specific Conservation objectives or referenced in the site synopsis. It is of note that some habitats and species may extend beyond and occur outside the European site boundary within the ZoI of the proposed development. The closest extents of these QIs inside of the SAC as mapped in the conservation objectives are outlined in Table 3.5 hereunder:

Table 3.5: Known Locations for Qualifying Interest in Relation to the Proposed Development

Qualifying Interest	Known Location in Relation to the Proposed development
Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510]	The site synopsis for the River Moy SAC[47] notes that just over 9ha of the habitat was recorded by the Grassland Monitoring Survey (2015-2017) within the River Moy SAC. Additional significant areas are also noted as occurring adjacent to the site. This habitat which can include road verges (refer to Table 3.6 below) was not identified within the footprint or the wider ZoI of the proposed development during field surveys within the SAC.
Active raised bogs [7110]*	The site synopsis for the River Moy SAC notes that there are a number of raised bogs associated with the site including those at Kilgarriff, Gowlaun, Derrynabrock, Tawnaghbeg and Cloongoonagh. The habitat has been mapped as part of the site-specific conservation objectives. The closest extent of QI habitat to the proposed development is located approximately 2.8km to the north of the UGC, and is outside of the ZoI.
Degraded raised bogs still capable of natural regeneration [7120]	The degraded raised bog habitat has not been mapped as part of the conservation objectives for the River Moy SAC. The habitat is likely found in association with the active raised bog habitat, the closest extent of which is located 2.8km to the north of the UGC and outside of the ZoI.
Depressions on peat substrates of the *Rhynchosporion* [7150]	The depressions on peat substrate habitat has not been mapped as part of the conservation objectives for the River Moy SAC. The habitat is found associated with the active raised bog habitat, the closest extent of which is located 2.8km to the north of the UGC.
Alkaline fens [7230]	The site-specific conservation objectives notes that "*The full extent of this habitat within the SAC is unknown. An extensive area is known to occur as part of a wetland complex on the Glore River, north-west of Ballyhaunis but there are likely to be other areas present in the SAC*" The habitat has not been mapped as part of the SSCOs and field surveys have confirmed it does not occur within the ZoI of the proposed development.
Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles [91A0]	The SSCOs note that the old sessile oak woodlands are likely to occur as mosaics with other woodland types within the SAC. Two areas of old oak woodland have been mapped. The closest extent of these to the

[49] NPWS (2016) Conservation Objectives: River Moy SAC 002298. Version 1.

[50] NPWS (2019) Article 17 Habitats Conservation Assessments 2019 Volume 2

[51] NPWS (2019) Article 17 Species Conservation Assessments 2019 Volume 3

[52] NPWS (2021) Conservation Objectives: Bricklieve Mountains and Keishcorran SAC 001656. Version 1.

Qualifying Interest	Known Location in Relation to the Proposed development
	proposed development is located 7km to the west, and outside of the ZoI of the proposed development
Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]*	The site-specific conservation objectives note that "*Total extent of this habitat within the SAC is unknown and it may occur in mosaics with other woodland types*." Two sites have been mapped within the SAC, with the closest extent located approximately 8.5km to the west of the proposed development. The two HDD crossings of the main River Moy channel pass underneath this habitat. The location of the proposed development relative to this habitat is such that it occurs within the ZoI (Surface water runoff and possible frac out in the absence of mitigation and monitoring).
Austropotamobius pallipes (white-clawed crayfish) [1092]	In relation to the distribution of white clawed crayfish the site-specific conservation objectives note that "*The general distribution of white-clawed crayfish in the SAC is that it is widespread in the upper tributaries of the River Moy and the rivers which feed Loughs Conn and Cullin*". The species, or suitable habitat to support same, was recorded within the ZoI of the proposed development during aquatic surveys at water crossings along the following route sections: ● MT02-MT03 ● MT03-MT04 ● MT07-MT08 ● MT08-MT09 ● MT09-MT10 ● MT13-MT14 ● MT14-MT15 ● MT15-MT16 Given the hydrological connectivity to the River Moy SAC these populations are all assumed to be QI populations within ZoI of the development.
Petromyzon marinus (sea lamprey) [1095] *Lampetra planeri* (brook lamprey) [1096]	The SSCOs note that there are no artificial barriers which would block lamprey migration up and downstream within the Moy catchment. Supporting habitat for lamprey (including spawning and nursery habitat suitable for juveniles) was recorded at water crossings throughout the proposed development and hence within ZoI of the development.
Salmo salar (salmon) [1106]	As with the lampreys, the site-specific conservation objectives notes in relation to salmon that there are no artificial barriers limiting salmon access to the catchment. Supporting habitat for salmon (including spawning, nursery and holding habitat) was recorded at water crossings throughout the proposed development and hence within ZoI of the development.
Otter (*Lutra lutra*)	The SSCO mapping indicates suitable commuting and supporting habitat for otters on watercourses throughout the proposed development. Historic records of otter, along with signs recorded during field surveys confirm the presence of otter, at least on occasion, on watercourses within the footprint of the proposed development. No confirmed or potential holts were identified during field surveys. There is potential for holts to occur on lands that have not been accessed, and become

Qualifying Interest	Known Location in Relation to the Proposed development
	established post survey prior to construction taking place and hence within ZoI of the development.

Non Qualifying Interest habitat within SAC

Temporary works areas are proposed to cross **non QI** habitats within the River Moy SAC at the locations in Table 3.6.

Table 3.6: Non-Qualifying Interest habitat in Relation to the Proposed Development

Non-Qualifying habitat description	Known Location in Relation to the Proposed development, and Potential to Correspond to QI Habitat	Supporting Value to QIs
Amenity grassland (GA2) adjacent to access road (BL3), included in SAC boundary.	Between MT03 and western side of the River Moy crossing the UGC is proposed to be located in amenity grassland immediately adjacent to an existing access road. This habitat is not QI habitat.	Does not comprise supporting habitat for QI species.
Existing road (BL3) and at passing bay improved road verge grassland (GA1) in Cloonislaun townland	Between MT04 and MT05 the UGC is proposed to be located entirely in the existing road. A temporary passing bay is proposed within the road verge (GS2) into the edge of a field (GA1). While some indicator species of lowland hay meadows such as *Plantago lanceolata*, *Alopecurus pratensis* and *Heracleum sphondylium* occur, these narrow roadside verges are not QI habitat [53].	Does not comprise supporting habitat for QI species.
Existing road (BL3) in Drumscoba, Curradrish and Boherhallag townlands	Between MT05 and MT06 the UGC is proposed to be located almost entirely in the existing road. The UGC passes through a raised grassy remnant field boundary at the edge of the road (within SAC boundary) into a managed field (HDD location – outside SAC boundary). This habitat is not QI habitat.The HDD works are all outside or beneath SAC QIs.	Does not comprise supporting habitat for QI species.
Existing road (BL3) in Craggagh and Bohersallagh	Between MT06 and MT09 the UGC is proposed to be located almost entirely in the existing road except for two HDD crossings in farmland outside the SAC boundary. The HDD works are proposed to pass under SAC river and adjacent lands within the SAC boundary.	River and riparian habitats comprise supporting habitat for QI species
Existing road (BL3) and farmland (GA1) in Renbrack, Pollsharvoge and Cloongullaun	Between MT07 and MT09 the UGC is proposed to be located almost entirely in the existing road except for one HDD crossing in farmland (GA1) outside the SAC boundary. The HDD works are proposed to pass under SAC river and adjacent lands within the SAC boundary.	River and riparian habitats comprise supporting habitat for QI species

[53] Martin, J., O'Neill, F., Daly, O., (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland Habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

Non-Qualifying habitat description	Known Location in Relation to the Proposed development, and Potential to Correspond to QI Habitat	Supporting Value to QIs
Existing N5 road (BL3) in Cuilmore and Ballyglass East	Between MT12 and MT13 the UGC is proposed to be located almost entirely in the existing road except for one HDD crossings in farmland at the Charlestown River crossing located within the SAC boundary. The HDD works are proposed to pass under the Charestown river within the boundary of the River Moy SAC and some adjacent lands within the SAC boundary. Grassland locations within the SAC boundary are managed reseeded farmland and not QI. lowland hay meadow.	River and riparian habitats comprise supporting habitat for QI species

3.2.6.3 Killala Bay/Moy Estuary SAC

As previously noted, the proposed development is located 1.5km from Killala Bay/Moy Estuary SAC, with hydrological connectivity identified via a number of watercourses which outflow through the River Moy into the Killala Bay/Moy Estuary SAC. The site synopsis for Killala Bay/Moy Estuary SAC[54] describes the site as comprising of "*an excellent range of good quality coastal habitats, including:*

- *Extensive sandflats and mudflats are exposed in the estuary and bay at low tide*
- *Dune systems at Bartragh Island, Inishcrone and Ross, to the north-west, are well-developed and constitute good examples of dunes with a rich and diverse flora*
- *Saltmarshes are present in sheltered parts of the site, some of which occur in association with the dune systems.*
- *Elsewhere along the coastline are sandy beaches, shingle beaches and some bedrock shores which are occasionally backed by clay sea-cliffs*"

The Natura 2000 Standard Data Form for Killala Bay/Moy Estuary SAC [55] identifies the following most important impacts and activities with high negative effect on the site[56]::

- Flooding and rising precipitations
- Camping and caravans
- Leisure fishing
- Walking, horse riding and non-motorised vehicles
- Urbanised areas, human habitation
- Diffuse pollution to surface waters due to household sewage and waste waters

Welfare facilities will be required for the construction phase of the Proposed Development. The potential for impact on the Killala Bay/Moy Estuary SAC associated with the proposed welfare activities is discussed further in section 3.3

The QIs for which the SAC is designated, the conservation objectives identified for the QIs, and their current national conservation status and trend are outlined in Table 3.7.

[54] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[55] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[56] Skiing complex (in the context of sports structures) was also listed among the impacts and activities, however given that this is not an activity carried out in the area it is removed.

Table 3.7: Qualifying Interests for Killala Bay/Moy Estuary SAC

Qualifying Interest (* indicates priority habitat)	Conservation Objective[57]	National Conservation Status and Trend [58] [59]
Estuaries [1130]	To **maintain** the favourable conservation condition of Estuaries in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**.
Mudflats and sandflats not covered by seawater at low tide [1140]	To **maintain** the favourable conservation condition of Mudflats and sandflats not covered by seawater at low tide in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is i**nadequate** and the conservation status trend is **deteriorating**.
Annual vegetation of drift lines [1210]	To **maintain** the favourable conservation condition of Annual vegetation of drift lines in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**.
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	This habitat is not included in the site-specific conservation objective document	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **stable**.
Salicornia and other annuals colonising mud and sand [1310]	To **maintain** the favourable conservation condition of Salicornia and other annuals colonizing mud and sand in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **favourable** and the conservation status trend is **stable**.
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	To **maintain** the favourable conservation condition of Atlantic salt meadows (*Glauco - Puccinellietalia*) in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**.
Embryonic shifting dunes [2110]	To **restore** the favourable conservation condition of Embryonic shifting dunes in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is i**nadequate** and the conservation status trend is **stable**.
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	To **restore** the favourable conservation condition of Shifting dunes along the shoreline with Ammophila arenaria (white dunes) in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **stable**.
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] *	To **restore** the favourable conservation condition of Fixed coastal dunes with herbaceous vegetation (grey dunes) in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **bad** and the conservation status trend is **deteriorating**.
Humid dune slacks [2190]	To **maintain** the favourable conservation condition of Humid dune slacks in Killala Bay/Moy Estuary SAC	The overall conservation status for the habitat is **inadequate** and the conservation status trend is **deteriorating**.
Vertigo angustior (narrow-mouthed whorl Snail) [1014]	To **maintain** the favourable conservation condition of Narrow - mouthed Whorl Snail in Killala Bay/Moy Estuary SAC	The overall conservation status for the species is i**nadequate** and the conservation status trend is **deteriorating**.

[57] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[58] NPWS (2019) Article 17 Habitats Conservation Assessments 2019 Volume 2

[59] NPWS (2019) Article 17 Species Conservation Assessments 2019 Volume 3

Qualifying Interest (* indicates priority habitat)	Conservation Objective[57]	National Conservation Status and Trend [58] [59]
Petromyzon marinus (sea lamprey) [1095]	To **maintain** the favourable conservation condition of Sea Lamprey in Killala Bay/Moy Estuary SAC,	The overall conservation status for the species is **bad** and the conservation status trend is **stable**.
Phoca vitulina (harbour seal) [1365]	To **maintain** the favourable conservation condition of Harbour Seal in Killala Bay/Moy Estuary SAC	The overall conservation status for the species is f**avourable** and the conservation status trend is **stable**.

In summary, Table 3.7 indicates that only two QI have a favourable conservation status listed

- For nine of QIs the conservation status is listed as inadequate. The conservation trend for six of these QI is deteriorating while the conservation trend for the remaining three is stable.
- Only two QI have a bad conservation status listed

The known extents of a number of the QIs of the Killala Bay/Moy Estuary SAC, have been mapped in the Site-Specific Conservation objectives or referenced in the site synopsis. It is of note that some habitats and species may extend beyond and occur outside the European site boundary. The closest extents of these QIs inside of the SAC as mapped in the conservation objectives are outlined in Table 3.8 hereunder:

Table 3.8: Known Locations for Qualifying Interest in Relation to the Proposed Development

Qualifying Interest	Known Location in Relation to the Proposed development[60][61]
Estuaries [1130]	Estuaries habitat has been mapped for the SSCOs for the SAC. The closest extent of this habitat to the proposed development is located 1.6km to the east, with hydrological connectivity via the River Moy and various tributaries. The transitional waters within the Moy Estuary have a water quality status of “Intermediate”. Given the hydrological connectivity to this habitat, it is within the ZoI of the works.
Mudflats and sandflats not covered by seawater at low tide [1140]	Mudflats and sandflat habitats have been mapped as part of the SSCOs for the SAC. The closest extent of this habitat to the proposed development is located 2.2km to the east, with hydrological connectivity via the River Moy and various tributaries. The transitional waters within the Moy Estuary have a water quality status of “Intermediate”. ”. Given the hydrological connectivity to this habitat, it is within the ZoI of the works.
Annual vegetation of drift lines [1210]	The site synopsis notes that the annual vegetation of drift line habitat is found along the coastline. The SSCO mapping for the habitat indicates that it is located a significant distance (approximately 10.5km to the north) from the proposed development. The transitional waters within the Moy Estuary have a water quality status of “Intermediate”.
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Vegetated sea cliff habitat has not been mapped for Killala Bay/Moy Estuary SAC. The site synopsis notes that the habitat is present along the coastline. The coastline is located a significant distance (10.5km) from the proposed development and outside of the ZoI.
Salicornia and other annuals colonising mud and sand [1310]	Salicornia mud has been mapped as part of the site specific conservation objectives for the Killala Bay/Moy Estuary SAC. The transitional waters within the Moy

[60] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[61] NPWS (2015) Site Synopsis. Killala Bay/Moy Estuary SAC

Qualifying Interest	Known Location in Relation to the Proposed development[60][61]
	Estuary have a water quality status of "Intermediate". The habitat is associated with the coastal front of the bay, located approximately 10.5km (straight line) to the north" The closest extent of the mapped habitat to the proposed development is in the western portion of the bay to the south of sandbanks. It is located approximately 2.9km west of the main water channel out of the bay. As such it is located outside of the ZoI of the works.
Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330]	Atlantic Salt Meadows has been mapped as part of the site-specific conservation objectives for the Killala Bay/Moy Estuary SAC. The habitat is associated with the coastal front of the bay, located approximately 4.7km to the north." The transitional waters within the Moy Estuary have a water quality status of "Intermediate". The habitat is mapped as fringing the edges of the River Moy. As such it is located within the ZoI of the works.
Embryonic shifting dunes [2110]	Embryonic shifting dune habitat has been mapped as part of the site-specific conservation objectives for the Killala Bay/Moy Estuary SAC. The habitat is associated with the coastal front of the bay, located approximately 10.5km to the north and outside of the ZoI of the proposed development.
Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120]	Shifting dune habitat has been mapped as part of the site-specific conservation objectives for the Killala Bay/Moy Estuary SAC. The habitat is associated with the coastal front of the bay, located approximately 9.5km to the north and outside of the ZoI of the proposed development.
Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Fixed dune habitat has been mapped as part of the site-specific conservation objectives for the Killala Bay/Moy Estuary SAC. The habitat is associated with the coastal front of the bay, located approximately 9km to the north and outside of the ZoI of the proposed development.
Humid dune slacks [2190]	Humid dune slack habitat has been mapped as part of the site-specific conservation objectives for the Killala Bay/Moy Estuary SAC. The habitat is associated with the northern extent of the SAC, located approximately 13km to the north of the proposed development and outside of the ZoI.
Vertigo angustior (Narrow-mouthed Whorl Snail) [1014]	An exact location of the population of narrow mouthed whorl snails is not provided within the site specific conservation objectives, given the sensitive nature of this species. The rough location is provided, located a minimum of 5km north (to edge of mapped grid square containing record) of the proposed development. The site synopsis notes that the snail has "*been known at this site for over 100 years. It occurs in an area of wet marsh and this site represents one of the few remaining examples of Vertigo angustior in its marsh "phase*"". The location of the record is significantly outside of the ZoI for this species.
Petromyzon marinus (sea lamprey) [1095]	The site-specific conservation objectives note that "*This SAC only covers the estuarine portion of the River Moy. The adjacent River Moy SAC (site code: 2298) encompasses the freshwater elements of sea lamprey habitat.*" The estuarine proportion of the habitat is located approximately 2.3km north east, with hydrological connectivity via the River Moy and within the ZoI of the proposed development

Qualifying Interest	Known Location in Relation to the Proposed development[60][61]
Phoca vitulina (harbour seal) [1365]	Key habitat areas for harbour seal, namely breeding sites, moult haul out sites, and resting haul out sites, have been mapped as part of the site-specific conservation objectives. These areas are associated with the mouth of the bay. The closest site (a resting site) is located approximately 7km to the north of the proposed development. The site-specific conservation objectives also map suitable habitat for harbour seals. The closest extent of this habitat is 1.5km from the proposed development within the ZoI.

3.2.6.4 Killala Bay/Moy Estuary SPA

As previously noted, the Proposed Development is located 1.5km from Killala Bay/Moy Estuary SPA, with hydrological connectivity identified via a number of watercourses which outflow through the River Moy into the Killala Bay/Moy Estuary SPA.

The site synopsis[62] for the Killala Bay/Moy Estuary SPA notes in relation to the site:

"*This large site comprises the estuary of the River Moy and the inner part of Killala Bay, including Lackan Bay and Rathfran Bay, in Counties Mayo and Sligo. It is a funnel-shaped estuary, c. 7 km wide at its outer limit. It is very well sheltered by a sandy island, Bartragh, and by a sandy peninsula that extends from Enniscrone on the eastern side*."

The Natura 2000 Standard Data Form for Killala Bay/Moy Estuary SPA[63] identifies the following most important impacts and activities with high negative effect on the site:

- Fertilisation
- Urbanised areas, human habitation
- Walking, horse-riding and non-motorised vehicles
- Leisure fishing
- None of the impacts and activities as outlined above are linked to the Proposed Development.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current conservation status trends are outlined in Table 3.9.

Table 3.9: Special Conservation Interests for Killala Bay/Moy Estuary SPA

Special Conservation Interests	Conservation Objective[64]	22 Year Population Change[65]
Bar-tailed godwit (*Limosa lapponica*) [A157]	To **maintain** the favourable conservation condition of Bar-tailed Godwit in Killala Bay/Moy Estuary SPA	• Increase of 31%
Curlew (*Numenius arquata*) [A160]	To **maintain** the favourable conservation condition of Curlew in Killala Bay/Moy Estuary SPA	• Decrease of 41%

[62] NPWS (2014) Site Synopsis Killala Bay/Moy Estuary SPA.

[63] NPWS (2020) Natura 2000 – Standard Data Form Killala Bay/Moy Estuary SPA

[64] NPWS (2013) Conservation Objectives: Killala Bay/Moy Estuary SPA 004036. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[65] Lewis, L. J., Burke, B., Fitzgerald, N., Tierney, T. D. & Kelly, S. (2019) Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland..

Special Conservation Interests	Conservation Objective[64]	22 Year Population Change[65]
Dunlin (*Calidris alpina*) [A149]	To **maintain** the favourable conservation condition of Dunlin in Killala Bay/Moy Estuary SPA	• Decrease of 63%
Golden plover (*Pluvialis apricaria*) [A140]	To **maintain** the favourable conservation condition of Golden Plover in Killala Bay/Moy Estuary SPA	• Decrease of 43%
Grey plover (*Pluvialis squatarola*) [A141]	To **maintain** the favourable conservation condition of Grey Plover in Killala Bay/Moy Estuary SPA,	• Decrease of 62%
Redshank (*Tringa totanus*) [A162]	To **maintain** the favourable conservation condition of Redshank in Killala Bay/Moy Estuary SPA	• Increase of 11%
Ringed plover (*Charadrius hiaticula*) [A137]	To **maintain** the favourable conservation condition of Ringed Plover in Killala Bay/Moy Estuary SPA	• Decrease of 7%
Sanderling (*Calidris alba*) [A144]	To **maintain** the favourable conservation condition of Sanderling in Killala Bay/Moy Estuary SPA	• Increase of 91%
Wetland and waterbirds [A999]	To **maintain** the favourable conservation condition of wetland habitat in Killala Bay/Moy Estuary SPA as a resource for the regularly occurring migratory waterbirds that utilise it.	• Not applicable

In summary, Table 3.9 notes that three of the listed SCI species have a percentage increase over the 22 year timeframe, while the remaining five have shown a decrease.

SSCO mapping for the site has identified a number of roosting areas for birds associated with the SPA. The majority of these roosting sites are located within the mouth of the estuary, however a number of them extend out of the SPA boundary into the River Moy. The closest of these sites to the Proposed Development, which contains records of SCIs associated with Killala Bay/Moy Estuary SPA is located approximately 2.3km from the development.

The wintering bird surveys carried out for the Proposed Development identified the following SCI species within the potential ZoI of the proposed development.

- Curlew (peak count 63)
- Golden plover (one individual)

It is also of note that there is hydrological connectivity to the SPA via water crossings.

3.2.6.5 Lough Gara SPA

As previously noted, Lough Gara SPA is located 3.9km from the Proposed Development. Hydrological connectivity has been identified between to Lough Gara SPA via the River Lung.

The site synopsis for the SPA[66] notes that

- "*Lough Gara is located on the Co. Sligo/Roscommon border south-west of the Curlew Mountains and between the towns of Boyle and Ballaghaderreen. Most of the lake is in Co. Sligo, but two sections in the south and north-east lie within Co. Roscommon. It is a shallow (maximum depth 16 m), medium-sized lake, which overlies Carboniferous limestones and shales, and Devonian sandstone. The main inflowing river is the River Lung while the main outflow is the Boyle River*."

The Natura 2000 Standard Data Form for Lough Gara SPA[67] identifies the following most important impacts and activities with high negative effect on the site:

- Fertilisation
- Sylviculture, forestry
- The impacts and activities as outlined above are not linked to the Proposed Development.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current conservation status trends are outlined in Table 3.10. Generic conservation objectives are available which are to maintain or restore conservation condition of the bird species listed as Special Conservation Interests for this SPA. SSCOs Site specific conservation objectives for similar sites were reviewed. These are presented below in Table 3.10.

Table 3.10: Special Conservation Interests for Lough Gara SPA

Special Conservation Interests	Conservation Objective[68]	22 year Population Change[69]
Whooper Swan (Cygnus cygnus) [A038]	To maintain the favourable conservation condition of Whooper Swan	• Increase of 40%
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	To maintain the favourable conservation condition of Greenland White - fronted Goose	• Decrease of 21%, with indications more recently of the **population stabilising**[70]

In summary, Table 3.10 notes that for both of the listed SCI species their long-term conservation trends are increasing or stable.

No site-specific conservation objective mapping is available for this site.

The wintering bird surveys carried out for the Proposed Development identified Whooper swan and Greenland White Fronted Geese as potentially within the ZoI of the proposed development.

It is also of note that hydrological connectivity to the SPA has been identified through water crossings.

[66] NPWS (2014) Site Synopsis: Lough Gara SPA (004048)

[67] NPWS (2020) Natura 2000 – Standard Data Form Lough Gara SPA

[68] NPWS (2021) Conservation objectives for Lough Gara SPA [004048]. Generic Version 8.0. Department of Housing, Local Government and Heritage.

[69] Lewis, L. J., Burke, B., Fitzgerald, N., Tierney, T. D. & Kelly, S. (2019) Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland..

[70] NPWS (November 2020). Report of the 2019/2020 International Census of Greenland White-Fronted Geese https://monitoring.wwt.org.uk/wp-content/uploads/2020/12/Greenland-White-fronted-Goose-Study-report-2019-20.pdf

3.2.6.6 Lough Conn and Lough Cullin SPA

Lough Conn and Lough Cuillin SPA is located 4.3km from the proposed development. No downstream hydrological connectivity has been identified, however, the potential for SCIs of the SPA to occur within the ZoI of the proposed development was noted.

The site synopsis for the SPA notes the following:

"*Lough Conn and Lough Cullin are situated in north Co. Mayo and are connected by a narrow inlet near Pontoon. The main inflowing rivers to Lough Conn are the Deel, the Addergoole and the Castlehill while the main outflowing river from Lough Cullin is the River Moy*."

- The Natura 2000 Standard Data Form for Lough Conn and Lough Cuillin[71] identifies the following most important impacts and activities with high negative effect on the site:
- Fertilisation
- Sylviculture, forestry
- Fire and fire suppression
- Leisure fishing

The impacts and activities as outlined above are not linked to the Proposed Development.

The SCIs for which the SPA is designated, the conservation objectives identified for them, and their current conservation status trends are outlined in Table 3.11. Generic conservation objectives available to maintain or restore conservation condition of the bird species listed as Special Conservation Interests for this SPA. Site specific conservation objectives for sites with similar SCIs were reviewed. These objectives are presented below.

Table 3.11: Special Conservation Interests for Lough Conn and Lough Cullin SPA

Special Conservation Interests	Conservation Objective[72]	22 year Population Change[73]
Tufted Duck (*Aythya fuligula*) [A061]	To **maintain** the favourable conservation condition of tufted duck	Decrease by 28%
Common Scoter (*Melanitta nigra*) [A065]	To **maintain** the favourable conservation condition of common scoter	No trend information provided as they are often undetected or underestimated during counts
Common Gull (*Larus canus*) [A182]	To **maintain** the favourable conservation condition of common gull	Not calculated but data suggests there may be an increase in recent years.
Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	To **maintain** the favourable conservation condition of Greenland white-fronted goose	Decrease of 21%
Wetland and Waterbirds [A999]	To **maintain** the favourable conservation condition of wetland habitat as a resource for the regularly occurring migratory waterbirds that utilise it	Not applicable

In summary, Table 3.11 notes that for two SCI species their populations are showing decreases, and for two SCI species the population change has not been calculated.

[71] NPWS (2020) Nature 2000 – Standard Data Form. Lough Conn and Lough Cuillin SPA

[72] NPWS (2013) Conservation Objectives: Killala Bay/Moy Estuary SPA 004036. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

[73] Lewis, L. J., Burke, B., Fitzgerald, N., Tierney, T. D. & Kelly, S. (2019) Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland..

No site-specific conservation objective mapping is available for this site.

The wintering bird surveys carried out for the Proposed Development identified the following species within the ZoI of the proposed development.

- Common gull
- Tufted duck

3.3 Impact Prediction

The potential for impacts on the QIs/SCIs of European sites, as outlined above, associated with the construction, operational and decommissioning phases of the Proposed Development are discussed hereunder.

3.3.1 Construction Phase Impact Types

The layout of the section is such that the overarching potential for impact types is outlined first and initially in greater detail in Section 3.3.1. Site impacts to specific European sites are then outlined in Section 3.4.

3.3.1.1 Direct Impact to Qualifying Interests/Special Conservation Interests

The potential for direct impact to QIs within the River Moy SAC boundary has been identified.

The potential for mobile QIs/SCIs to occur outside of European site boundaries has been identified. As such, there is potential for direct impacts to these QIs/SCIs or their supporting habitats.

The potential for direct impacts to specific QIs/SCIs is discussed below in the context each European site.

3.3.1.2 Noise and Vibration

Construction phase of the proposed development will result in elevated noise levels associated with the Proposed Development. A number of QIs/SCIs associated with European sites in the vicinity of the proposed development have the potential, as outlined previously, to occur within the ZoI of the proposed development. Noise modelling for the proposed development has been carried out. The extent of the ZoI is variable dependant on the location where works are to be carried out. The baseline noise levels were calculated as 67.9 $L_{Aeq,1hr}$ dB at Bunnyfinglas the closest receptors to potentially sensitive bird locations at Carrowkeribley Lough and Bunnyfinglas Quarry. These relatively high noise levels are likely due to the existing road and are where most project works will be located i.e. installation of the UGC in road. These UGC in road installation works are relatively minor and will not add significantly to baseline noise also noting no piling or other high noise works are proposed (worst case scenario construction noise levels will return to below 70dB within 26m of the proposed development).

Predicted noise levels during the construction phase indicate the highest levels are associated with Construction compounds. These locations are removed from sensitive bird locations or have screening vegetation/ mounds between the compound and bird sites (Bunnyfinglas Quarry). As such, these sensitive bird sites are generally considered outside the ZoI of the project.

Vibration effects may be detectable to salmonids in relation to HDD crossings of water courses. No pile driving is proposed which may temporarily affect (disturb) fish through intense impulsive vibration/ noise impacts (Popper and Hawkins, 2019). No measurable effects are likely as HDD drilling will be well below riverbed level and at worst likely to lead to a mild avoidance reaction.

The potential for impacts to specific QIs/SCIs caused by noise is discussed below in the context of each European site.

3.3.1.3 Pollution/Sedimentation Associated with Construction

The proposed works require the excavation of the cable route, and during the construction of the substation extensions. Where excavations are within areas with high water tables there may be a requirement for pumping out of these excavations. There is potential, therefore, for the generation of sediment laden water associated with the construction phase of the works.

Works will require the general use of concrete. This will be at the substation extensions and along the cable route. There is potential for the accidental release of concrete due to these works into nearby drains or surface water features.

There is a risk of unintentional return of drilling fluids to the surface (frac out) during HDD works. This has potential to cause damage to the aquatic environment, including QI species.

The potential for impacts to specific QIs/SCIs caused by pollution and sedimentation caused by the works is discussed below in the context of each European site.

3.3.1.4 Human and Machinery Presence – Visual Disturbance

The presence of humans and machinery have potential to result in avoidance behaviours by wetland birds and otter. This may alter feeding behaviours and deter birds from utilising important foraging areas.

The potential for impacts to specific SCI species caused by human disturbance associated with the works is discussed below in the context of each European site.

3.3.1.5 Dewatering Associated with construction

There is potential for dewatering associated with construction to cause a localised draw down in groundwater. As outlined previously the ZoI for GWDTE from excavations deeper than 1m to be a 250m buffer around the proposed development. There are no GWDTEs associated with European sites located within 250m of the proposed development.

3.3.1.6 Introduction/Spread of Invasive Species

Low numbers (two) of the invasive zebra mussel (*Dreissena polymorpha*) were recorded on the Carrowkeribly Lough Stream (Bunnafinglas River) (MT05-MT06). This watercourse is proposed to be crossed via HDD methodology so disturbance is unlikely noting also any treated water that may contain larvae etc of this species will be returned to the same water body. There is risk that it could be transferred via machinery to other water bodies.

Zebra mussels have the potential to result in changes to nutrient cycling in waterbodies[74]. Further, there is potential for changes in fish populations along with alterations to macrophytic communities in lakes into which they are introduced [75].

The potential for impacts to specific QI/SCI species caused by spread of invasives associated with the proposed development is discussed below in the context of each European site

[74] Makarewicz, J.C., Bertram, P. and Lewis, T.W. (2000) Chemistry of the offshore surface waters of Lake Erie: Pre- and Post-Dreissena introduction (1983–93). Journal of the Great Lakes Research 26 (1),82–93.Minchin D., Maguire, C., Rosell, R., (

[75] William F. James, John W. Barko & Harry L. Eakin (1997) Nutrient Regeneration by the Zebra Mussel (*Dreissena polymorpha*), Journal of Freshwater Ecology, 12:2, 209-216, DOI: 10.1080/02705060.1997.9663528

3.3.1.7 Dust

The proposed construction works will include excavation activities, drilling, stripping of soil and the storing of spoil material. Breaking out of surfaces is required where the cable runs through existing hard standing surfaces. All activities have the potential to result in the generation of dust over the duration of the construction works.

As outlined previously the ZoI of dust is taken to be 50m from the proposed development. The proposed development crosses the River Moy SAC at a number of locations. There is potential for dust to deposit within the River Moy SAC, and other watercourses that are traversed by the Proposed Development.

The deposition of dust into a watercourse can increase suspended solid content of the watercourse which can result in a degradation of water quality and aquatic vegetation downstream. There is potential therefore, in the absence of mitigation for impacts to European Sites caused by dust deposition.

3.3.2 Effect Pathways During Construction

The potential for impacts to each European site is outlined in the relevant section hereunder. In-combination effects are provided in Section 3.3.8. Where the potential for impact is identified this is assessed against the conservation objectives in section 3.4.

3.3.2.1 River Moy SAC

Direct Impacts to Qualifying Interests

As previously noted, the proposed development crosses the boundary of the River Moy at a number of locations albeit all works are under the SAC (via HDD). The potential for direct impact to QIs in areas where the Proposed Development intersects with the SAC boundary is outlined below in Table 3.12.

Table 3.12: Intersections with the Moy SAC

Location	Type of Interaction	Potential for Qualifying Interests to Occur
MT03-MT04	Watercourse crossing of the River Moy. This crossing will be undertaken via HDD methodology reducing the potential for a direct impact to the aquatic habitats and QI species. There is potential (in the absence of suitable mitigation) for frac out to occur which has potential to effect aquatic species within the River Moy SAC.	Supporting habitat for salmonids, lamprey ammocoetes, and white-clawed crayfish identified at this location. QI wet willow alder ash woodland is crossed under via HDD. No direct impacts are proposed to habitats within SAC.
MT04-MT05	The UGC is entirely within the existing road, verge and within made ground at one passing bay at this location. The boundary of the River Moy SAC extends over the existing road for approximately 200m.	As the UGC is within the existing road at this location, there is no potential for direct impact to QIs. No direct impacts are proposed to habitats within SAC.
MT06-MT07	Two crossings of the SAC boundary These crossings will be undertaken via HDD methodology reducing the potential for a direct impact to the aquatic habitats and QI species. There is potential (in the absence of suitable mitigation) for frac out to occur which has potential to effect aquatic species within the River Moy SAC.	Juvenile Atlantic salmon recorded at this location along with lamprey ammocoetes and supporting habitat for same. Salmonid nursery, spawning and holding habitat recorded. No direct impacts are proposed to habitats within SAC.
MT08-MT09	Crossing of the River Moy via HDD. These crossings will be undertaken via HDD methodology reducing the potential for a direct impact to the aquatic habitats and QI species. There is potential (in the absence of suitable	Salmonid nursery, spawning and holding habitat recorded. Lamprey spawning habitat recorded.

Location	Type of Interaction	Potential for Qualifying Interests to Occur
	mitigation) for frac out to occur which has potential to effect aquatic species within the River Moy SAC.	Non QI wet willow alder ash woodland crossed under via HDD. No direct impacts are proposed to habitats within SAC.
MT12-MT13	The UGC bisects the SAC boundary at two locations within MT12-MT13. **Location 1:** The UGC is located within the existing road at this location. The UGC runs through the SAC boundary for approximately 260m at this location and crosses two watercourses within the road. No direct works are required to stream habitat under the existing road culvert. **Location 2:** The UGC crosses the Charlestown stream via HDD methodology reducing the potential for a direct impact to the aquatic habitats and QI species. Further, the HDD compounds both intersect with the SAC boundary.	**Location 1:** As the UGC is within the existing road at this location, there is no potential for direct impact to QIs. No direct impacts are proposed to habitats within SAC. **Location 2:** This location was noted as being of high value for salmonids, with good quality nursery and spawning habitat (particularly for Atlantic salmon), and with some good quality holding habitat. No direct impacts are proposed to QI habitats within SAC. Temporary HDD works areas proposed within managed farmland within SAC boundary.

A number of QI species associated with the River Moy SAC are mobile, namely:

- White clawed crayfish
- Sea lamprey
- Brook lamprey
- Salmon
- Otter

These species may therefore occur outside of the SAC boundary within the ZoI of the proposed development. There is potential therefore for direct impact to *ex situ* QIs, and to supporting habitat for same.

Potential for Noise and Vibration Effects

While no otter couches or holts were identified within 150m of the works areas, it is likely that otter commute and forage along watercourses that intersect with the UGC. Furthermore, not all lands away from the immediate crossing locations could be accessed (and could contain holts), also holts could also be become established between survey completion and construction.

There is potential therefore for disturbance of otter associated with the River Moy SAC.

Pollution Associated with Construction

Surface-water Emissions

As previously noted, the UGC crosses the River Moy SAC, and tributaries of the River Moy SAC in multiple locations. There is potential for the release of concrete, and sediment laden water into these waterbodies.

There is no potential for impact to habitats such as:

- Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis) [6510]
- Active raised bogs [7110]*

- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the Rhynchosporion [7150]
- Alkaline fens [7230]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0]*

This is due to the nature and location of such habitats in relation to the proposed works. Degradation in water quality has the potential to cause impacts to the following QIs and/or their supporting habitat.

- White clawed crayfish
- Sea lamprey
- Brook lamprey
- Salmon
- Otter

Dust

The deposition of dust into a watercourse can increase suspended solid content of the watercourse which can result in a degradation of water quality and aquatic vegetation downstream.

Potential for Introduction/Spread of Invasive Species

As previously noted, zebra mussels were recorded at a watercourse crossing at MT05-MT06. This watercourse will be crossed via HDD methodology hence no instream works are proposed. There is low potential for this species to be collected via instream overflow pipes and spread to other sites if machinery not cleaned.

While no other invasive species were identified during field walkovers, there is potential for these species to become established within the footprint of the proposed development prior to works commencing and be spread within the SAC boundary during works.

3.3.2.2 Killala Bay/Moy Estuary SAC

Direct Impacts to Qualifying Interests

The works are located outside of the European site boundary, and no habitats for which the site is designated (as outlined in Section 3.2) have been recorded within or adjacent to the Proposed Development. There is no potential, therefore for direct impacts to QIs within the boundary of the SAC associated with the works.

Two QIs for the Killala Bay/Moy Estuary SAC are mobile species which may occur outside of the SAC site boundary, namely sea lamprey and harbour seal. The conservation objectives for the SAC[76] notes that "*This SAC only covers the estuarine portion of the River Moy. The adjacent River Moy SAC (site code: 2298) encompasses the freshwater elements of sea lamprey habitat."* As such, given the location of the Proposed Development relative to the estuarine portion of the SAC, the potential for direct impacts to sea lamprey is, therefore, assessed under the River Moy SAC.

The location of the proposed development is 2km upstream of the southerly extent of the Killala Bay/Moy Estuary SAC. Key habitat areas associated with the SAC are located in the mouth of

[76] NPWS (2012) Conservation Objectives: Killala Bay/Moy Estuary SAC 000458. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht

the estuary and outside of the ZoI of the works. Harbour seals may occur along the River Moy at least on occasion; however the nature of the works along the River Moy (HDD crossings) is such that no direct impacts to the species will occur.

Potential for Noise and Vibration Effects

Guidance on managing the risk to marine mammals from man made sounds in Irish waters notes that sound exposure levels from drilling operations have the potential to cause disturbance effects to marine mammal species[77]. Given the location of the Proposed Development relative to the SAC, there is no potential for disturbance effects to core haul-out areas for the species. Harbour seal, as previously noted, may occur outside of the SAC boundary within the ZoI of the proposed works. However, given the location of the proposed development relative to coastal habitats, and nature and scale of works there will be no adverse effects.

Pollution Associated with Construction

Hydrological connectivity has been identified to Killala By/Moy Estuary SAC via the River Moy and a number of tributaries crossed by the proposed development. There is potential for the release of surface-water emissions into the SAC via these pathways.

There is potential for pollutant runoff to locally affect mobile fish prey species (e.g. mullet, flounder, brown trout, salmon and eel) of common seal, should a fish kill occur e.g. at two HDD river crossings of the main River Moy SAC. This is considered highly unlikely, even in a worst case scenario, given the relatively small amounts of bentonite required and large dilution capacity of the River Moy. However, on a precautionary basis this potential impact is considered further.

Estuary habitat and mudflats and sandflat habitats are associated with communities of invertebrates within the sediment. However, given the small scale of impacts if frac out or other pollutant runoff occurred, and distance upstream, measurable degradation of water quality caused by pollution of watercourses from the Proposed Development is not likely to damage to these invertebrate communities.

Atlantic salt marsh has been found to be impacted by changes in water quality. These changes are, however, associated with changes to vegetation structure caused by enrichment (Penk *et al.*2020)[78] as opposed to changes to pH or increases in sediment levels.

No other QI habitats have been identified with potential for impact via surface water emissions.

No potential impacts to estuary habitat, and mudflats and sandflats habitat associated with the proposed development given the location, nature, scale of localised potential impacts (HDD frac out and general; pollution).

Potential for Introduction/Spread of Invasive Species

As previously noted, zebra mussels were recorded at a watercourse crossing at MT05-MT06. This watercourse crossing is proposed to be undertaken via HDD methodology hence no instream works are proposed. There is low potential for this species to be collected via instream overflow pipes and spread to other sites if machinery is not cleaned.

[77] DAHG (2014) Guidance to Manage the Risk To Marine Mammals From Man-Made Sound Sources in Irish Waters.

[78] Penk, M.R., Perrin, P.M., Kelly, R., O'Neill, F., Waldren, S., 2020. Plant diversity and community composition in temperate northeast Atlantic salt marshes are linked to nutrient concentrations. Applied Vegetation Science 23, 3–13. https://doi.org/10.1111/avsc.12459

No other invasive species have been identified during the site walkovers; however invasive species may become established within the ZoI of the works prior to the commencement of the construction phase. Should this occur there is potential for spread of invasive species into the SAC boundary causing degradation to habitats therein.

3.3.2.3 Killala Bay/Moy Estuary SPA

Direct Impacts to Special Conservation Interests

The works are located entirely outside of the European Site boundary. However, the following SCIs associated with Killala Bay/Moy Estuary SPA have been recorded in proximity to the Proposed Development**:**

- Curlew
- Golden plover

No potential for damage to the foraging areas recorded for these species are likely based on winter bird surveys and the nature and scale of proposed works.

Potential for Visual Disturbance, Noise and Vibration Effects

The following SCIs associated with Killala Bay/Moy Estuary SPA have been recorded in proximity to the Proposed Development**:**

- Curlew
- Golden plover

The Institute of Estuarine and Coastal Studies[79] has reported on the differing sensitivity in terms of responses to disturbance stimuli, of different bird species. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The noise modelling carried out indicates that the noise levels is drop to below 70dB within 26m of the proposed development (worst case scenario based on noise levels at construction compounds). There is potential for visual disturbance to bird species caused by presence of machinery and humans albeit works areas are predominantly within existing roads with associated ongoing traffic noise and visual disturbance (people walking etc).

The disturbance caused by the noise impulses, and presence of humans and machinery, has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

Small flocks of Curlew and Golden Plover may use areas adjacent to Carrowkeribley Lake. Given the short term nature of any disturbance, largely within an already disturbed area (road near adjacent housing), disturbance impacts to SCIs associated with Killala Bay/ Moy Estuary SPA during the construction phase are not considered likely. Precautionary mitigation is outlined to minimise possible disturbance.

Pollution Associated with Construction

Hydrological connectivity has been identified to Killala Bay/Moy Estuary SPA via the River Moy and a number of tributaries crossed by the proposed development. There is potential for the release of surface-water emissions into the SPA via these pathways. This has potential to result

[79] Institute of Estuarine and Coastal Studies (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA.

in degradation of supporting wetland habitats within the SPA, and of supporting habitats for *ex situ* bird species outside of the SPA

Potential for Introduction/Spread of Invasive Species

As previously noted, zebra mussels were recorded at a watercourse crossing at MT05-MT06. This watercourse crossing is proposed to be undertaken via HDD methodology hence no instream works are proposed. There is low potential for this species to be collected via instream overflow pipes and spread to other sites if machinery not cleaned.

There is potential, however, for invasive species to become established within the footprint of the works prior to construction commencing. Depending on the species, for example if aquatic of riparian growing species, this may impact on habitats downstream within the SPA boundary.

3.3.2.4 Lough Gara SPA

Direct Impacts to Special Conservation interests

The works are located entirely outside of the European Site boundary. However, the following SCIs associated with Lough Gara SPA have been recorded in proximity to the proposed development**:**

- Whooper swan

The species was recorded utilising agricultural grassland along the banks of the River Moy, albeit not within the footprint of the works. Whooper swan also roost on Carrowkeribley Lough located within 100m of the development. However, based on available information on Whooper swan usage of farmland and wetlands in the area there is no potential identified, for direct impacts to *ex situ* SCIs and supporting habitat for same, associated with Lough Gara SPA caused by the proposed development during the construction phase.

Potential for Human Disturbance Noise and Vibration Effects

As outlined above, whooper swan which are SCIs of Lough Gara SPA have been recorded in proximity to the proposed development:

- The Institute of Estuarine and Coastal Studies (2009) [80] has found that waterfowl have differing sensitivity in terms of responses to disturbance stimuli. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. There is also potential for the presence of humans and machinery to cause disturbance effects.
- The disturbance has the potential to displace wintering birds away from foraging areas which are in proximity to the proposed development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.
- The main foraging areas for whooper swans are in the River Moy valley between Ballina and Foxford. These are > 500m from the proposed development and therefore noise and vibration impacts and not within the ZoI for disturbance related impacts
- Whooper swan were recorded roosting on Carrowkeribley Lough, within 100m of the development. There is low potential for temporary disturbance impacts to whooper swan at Lough Carrowkeribley, associated with Lough Gara SPA, caused by noise, vibration and visual disturbance associated with the Proposed Development during the construction phase

[80] Institute of Estuarine and Coastal Studies (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA.

and therefore possible adverse effects, if works are proposed at night between dusk and dawn in the winter.

Pollution Associated with Construction

Hydrological connectivity has been identified to Lough Gara SPA via the River Lung. There is potential for the release of surface-water emissions into the SPA via these pathways.

Deterioration in water quality associated with the works has the potential to result in a degradation of supporting lake habitats within the SPA. These habitats comprise key habitat for a large number of birds associated with the SPA. There is potential therefore, in the absence of mitigation, for indirect impacts to SCIs associated with Lough Gara SPA caused by surface-water run-off associated with the proposed development during the construction phase.

Potential for Introduction/Spread of Invasive Species

As previously noted, zebra mussels were recorded at a watercourse crossing at MT05-MT06.

Hydrological connectivity was identified between the UGC and Lough Gara SPA via the River Lung. Should zebra mussels become established in lake habitats, there is potential for the populations to cause significant alterations in water quality, changes in fish populations and alterations to macrophyte communities within the lake. This has potential in turn to cause a shift in the capacity of the habitat to support wetland bird species.

The water-crossing at the point at which the population of zebra mussels was recorded will be undertaken via HDD. As such, the zebra mussels and their habitat will not be directly interfered with. However, zebra mussels readily colonise plant species which may fringe river edges, including exposed roots, submerged branches of trees, leaves, grasses and reeds such as common reed (*Phragmites australis*)[81]. Given this propensity, there is potential for such material to become caught in machinery should it enter the fringes of the river. This material may then become dislodged in other watercourses with downstream connectivity to Lough Gara SPA, such as the river Lung. As such, on a precautionary basis, the potential for impact to SCI supporting habitats within Lough Gara SPA caused by the introduction/spread of invasive species in the absence of mitigation exists.

3.3.2.5 Lough Conn and Lough Cullin SPA

Direct Impacts to Special Conservation Interests

The works are located entirely outside of the European Site boundary. There is no potential for direct impacts to core habitat within the SPA boundary itself.

Common gull, an SCI species associated with Lough Conn and Lough Cullin SPA was recorded in proximity to the proposed development at Carrowkeribly Lough.

The cable route runs adjacent to Carrowkeribly Lough and will not directly impact upon it. No potential for direct impact to SCI species or supporting habitat for same has been identified.

Potential for Human Disturbance, Noise and Vibration Effects

As previously noted, common gull have been recorded in proximity to the Proposed Development at Carrowkeribly Lough.

[81] Minchin, D., Lucy, F., Sullivan, M (2002) Zebra Mussel: Impacts and Spread Invasive Aquatic Species of Europe. Distribution, Impacts and Management pp 135-146

The Institute of Estuarine and Coastal Studies (2009)[82] has found that waterfowl have differing sensitivity in terms of responses to disturbance stimuli. The report notes that while birds can habituate to a low level of noise (below 50dB), irregular construction noise above 70dB can have a moderate to high effect. The disturbance caused by the noise impulses has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

The disturbance caused by the noise impulses, and presence of humans and machinery, has the potential to displace wintering birds away from foraging areas which are in proximity to the Proposed Development. This displacement if it is from a key foraging area in the absence of other suitable habitat has the potential to cause a loss in fitness of the species and reduce their capacity for migration at the end of the wintering season if noise impulses are ongoing throughout the winter.

Given the very low numbers of Common gull and short term nature of any disturbance, largely within an already disturbed area (road near adjacent housing), disturbance impacts to SCIs associated with Lough Conn and Lough Cullin SPA during the construction phase are not considered likely. Precautionary mitigation is outlined to minimise possible disturbance.

Pollution Associated with Construction

No downstream hydrological connectivity has been identified between the Proposed Development and Lough Conn and Lough Cuillin SPA. As such, there are no potential for impacts to the SPA caused by surface-water emissions has been identified.

Potential for Introduction/Spread of Invasive Species

As previously noted, zebra mussels were recorded at a watercourse crossing at MT05-MT06.

Given that no downstream hydrological connectivity has been identified between Lough Conn and Lough Cuillin SPA and the Proposed Development, no potential pathways for impacts via introduction/spread of invasive species.

3.3.3 Operation Phase Impact Types

There is potential for disturbance related effects associated with maintenance crews at the substations, and along the cable route.

3.3.4 Effect Pathways During Operation

Maintenance for the works will be largely restricted to works at the substations, and the joint bays along the cable route. Given the location of these works' areas, the nature of the works and the nature of the European sites, there is no potential for impacts caused by the operational phase of the development

3.3.4.1 Special Areas of Conservation

There is no potential for significant effects to SACs, because:

- Joint bays have removable lids and maintenance works will not result in the breaking of ground and/or generate significant volumes of water-borne silt, concrete washings or other pollutants; and,

[82] Institute of Estuarine and Coastal Studies (2009) Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance. Report to Humber INCA.

- Invasive species within the footprint and on roadsides will have been removed or will be under ongoing treatment by the local authority.

Routine Maintenance

There is potential for maintenance works along the HVDC cable route to result in SCI bird disturbance if carried out during the non-breeding season (September to March inclusive), potentially resulting in significant effects to:

- Wintering SCI birds of
- Killala Bay SPA
- Lough Gara SPA
- Lough Conn and Lough Cuillin SPA

Non-Routine Maintenance

As required under existing statute, EirGrid's Planning and Environmental Unit screen for Appropriate Assessment all non-routine works for Appropriate Assessment, and EirGrid will obtain all relevant consents where required. As such, there is no likelihood for significant effects.

3.3.5 Decommissioning Phase Impact Types

The impacts associated with decommissioning are assumed to be similar to those identified in the construction phase.

3.3.6 Effect Pathways During Decommissioning

The effect pathways during the decommissioning of the proposed development are assumed to be similar to those identified in the construction phase.

3.3.7 Summary

A summary of potential impacts identified in Section 3.3 is provided hereunder in Table 3.13.

Table 3.13: Potential for Impact in the Absence of Mitigation

European Site	Impact to QIs/SCIs Identified
River Moy SAC	– Potential for direct impact (both within and outside of the SAC boundary) to white-clawed crayfish, sea lamprey, brook lamprey, salmon, and otter.
	– Potential for noise and vibration impacts to otter
	– Potential for surface-water emissions to cause degradation to supporting habitat for white-clawed crayfish, sea lamprey, brook lamprey, Atlantic salmon, and otter
	– Potential for surface-water to cause damage to white-clawed crayfish, sea lamprey, brook lamprey, and salmon.
	– Potential for degradation in freshwater supporting habitats due to dust deposition
	– Potential for degradation to habitats caused by introduction of invasive species
Killala Bay/Moy Estuary SAC	– Potential for surface-water emissions to cause impacts to fish prey species of harbour seal.
	– Potential for degradation to habitats caused by introduction of invasive species
Killala Bay/Moy Estuary SPA	– Potential for noise and visual disturbance to curlew and golden plover

European Site	Impact to QIs/SCIs Identified
	– Potential for degradation to supporting habitats caused by surface water emissions
	– Potential for degradation to supporting wetland habitats caused by introduction of invasive species
• Lough Gara SPA	• Potential for noise disturbance impacts to whooper swan
	• Potential for degradation to supporting habitats caused by surface water emissions
	• Potential for degradation to supporting habitats caused by introduction/spread of zebra mussels
• Lough Conn and Lough Cuillin SPA	– Potential for noise disturbance impacts to common gull

3.3.8 Plans and Projects which Might Act In-combination

Article 6(3) of the Habitats Directive requires that:

Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives.

It is therefore required that the potential impacts of the Proposed Development are considered in combination with any other relevant plans or projects. A search of plans and projects in the vicinity of the proposed development was undertaken in April 2022 to examine projects with potential for in combination effects.

In addition to database searches, EirGrid was also consulted for information on proposed electricity transmission projects within the potential ZoI of the proposed development.

3.3.8.1 Plans

Mayo County Development Plan 2014-2020

The document includes objectives and policies which are associated within the protection of the natural environment. These are informed in part by an Appropriate Assessment which was undertaken to ensure that the plans' policies avoided any adverse effects.

The Natura Impact Report outlines European sites which were subject to policy requirements to maintain/restore site integrity. A summary of this assessment is provided in Table 3.18 in relation to European sites identified as within the ZoI for the Proposed Development

Draft Mayo County Development Plan 2021-2027

The document includes objectives and policies which are associated within the protection of the natural environment. These are informed in part by a draft Appropriate Assessment which was undertaken to ensure that any likely effects of the plans' policies were considered in order to avoid any adverse effects.

The Natura Impact Report identifies location specific impacts relating to settlements. The document notes that "*These could be related to potential impacts that may arise as a result of any of the outcomes of the Plan including retail development, settlement development, increase in tourism numbers, climate change etc.",* A summary of this assessment is provided in Table 3.14 in relation to European sites identified as within the ZoI for the Proposed Development. No potential impacts were specified in relation to Lough Gara SPA, Killala Bay/Moy Estuary SPA, or Lough Conn and Lough Cuillin SPA.

Table 3.14: Potential Impacts Identified in the County Development Plan

European Site Name	Potential Impacts Identified
River Moy SAC	Potential for impacts identified to the River Moy via surface water, groundwater, land and air pathways associated with the following settlements: • Balla • Charlestown • Crossmolina • Foxford • Kiltimagh • Knock • Swinford Specific QIs mentioned: otter, salmon, brook lamprey and sea lamprey

European Site Name	Potential Impacts Identified
Killala Bay/Moy Estuary SAC	Potential for impacts identified to Killala Bay/Moy Estuary SAC via surface water, groundwater and land and air pathways were identified to the Killala. Specific QIs mentioned: otter and harbour seal.

3.3.8.2 Planned and Permitted Development

Moy Arterial Drainage Scheme 2021

The Scheme consists of over 650 channels, with a total length of 1293km, in the River Moy catchment, covering counties Mayo, Roscommon and Sligo. The Scheme involves a range of standard maintenance activities, including in-channel vegetation management, silt removal, bridge/culvert maintenance and tree works.

An NIS was carried out for these works which determined the potential for adverse effects to European Sites including the River Moy SAC. The scheme covers works to be undertaken within the next 5 years and includes the River Moy and a number of tributaries thereof. As such,these works are assumed to be ongoing, and there is potential for works to be undertaken concurrently with those for the proposed development.

Given the nature of these instream works, and their location relative to the proposed development, the potential for in-combination effects is identified

3.3.8.3 Future Projects

Flagford-Tonroe 110 kV Line Site Investigation Works –

Eirgrid intends to progress site investigation works at six structures on the existing Flagford-Tonroe 110kV line.

A screening determination for these works has been published[83] which stated:

"*There are no works within or adjacent European sites. The proposed development is not located within or near any European site; the closest such site is the Tullaghanrock Bog Special Area of Conservation (SAC; site code 2354) 1 located c. 0.8 km from the proposed development site.*

This determination has had regard for these and any other relevant European sites. In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence. This determination is based on the location, scale, extent and duration of the proposed development, including temporary works, and has not taken account of measures intended to avoid or reduce significant effects on European sites"

Given the location of these SI works (i.e. to the east of Tonroe substation), the nature and scale of the works (small scale SI works at six tower locations) no potential for in combination effects is identified.

[83] https://www.eirgridgroup.com/site-files/library/EirGrid/CP0816-Tonroe-to-Flagford-SI_-AAS-Determination_PA-issue.pdf

Flagford to Tonroe Overhead Line Uprate Works

EirGrid intend to progress uprate works to approximately 32.5km of overhead line and associated wood poles and towers on the existing Flagford to Tonroe 110kV overhead line (OHL).

The works to be undertaken to facilitate the uprate are:

- The replacement of certain wooden polesets and steel angle towers. Poleset / Tower replacement works include;
  - 54 intermediate wood polesets to be replaced with new intermediate polesets.
  - 87 intermediate wood polesets to be retained.
  - 16 existing angle towers to be replaced with new angle towers.
  - Tower 163 to be replaced with a line cable interface mast (identified as tower 162A).
- The replacement of the existing conductor along the entire length of the line between Tonroe 110kV substation and Flagford 220/110kV substation in Flagford, County Roscommon. Structures 150-157 were previously subject to an uprate and will not require a new conductor but will require new fibre. The conductor will be fibre wrapped.
- Replacement of crossarms, insulators and the installation of suspension clamps, stay wires, anti-climbing guardsand dampers (where required).

The replacement/repair of earth-wire (where required). No additional sections of shield wire are proposed, to what is currently present. Minor repairs are proposed at 4 site locations.

A screening for appropriate assessment was carried out for the uprate works. The screening concluded that "*on the basis of objective scientific information following appropriate assessment screening, that the proposed survey works, individually or in combination with other plans or projects, will not have a significant effect on any European sites*."

The Flagford to Tonroe OHL works are located entirely outside of the River Moy SAC Catchment, and predominantly within the wider River Shannon catchment including Lough Gara SPA which is the closest hydrologically linked European site. No instream or other works are required at streams/ rivers. The works required consist of alterations to existing OHLs and associated structures. An appropriate assessment screening report was written for these works which determined that the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites.

Given the nature, scale and location of these works relative to the proposed development no potential for in combination effects is identified.

North Connacht 110kV Bathymetry Survey

As part of the design of the project, bathymetric surveys are required to ascertain the riverbed profile in three locations along the River Moy. These works were brief in nature, comprising instream surveys via motorised canoe. An Appropriate Assessment Screening Determination has been published for these works[84]

The screening determination concluded that

"*In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.*

This determination is based on the location, scale, extent and duration of the proposed development, including temporary works, and has not taken account of measures intended to avoid or reduce significant effects on European sites."

In addition to the above, these works have already been completed. There is therefore no potential for in combination effects.

North Connacht 110kV Topographical Survey

As part of the design of the North Connacht 110kV project, topographical surveys are required. These works are brief in nature, and non-intrusive comprising walkovers with survey equipment. These works will be completed in advance of the foundation assessment. An Appropriate Assessment Screening Determination has been published for these works[85].

The screening determination concluded that

"*In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.*

This determination is based on the location, scale, extent and duration of the proposed development, including temporary works, and has not taken account of measures intended to avoid or reduce significant effects on European sites.".

In addition to the above, works are complete, there is no potential for in combination effects identified.

Proposed Flagford Sliabh Bawn 110 kV Line Uprate (County Roscommon).

EirGrid's AA determination[86] conducted for this project was as follows.

In accordance with Regulation 42(7) of the European Communities (Birds and Natural Habitats) Regulations 2011 SI 477 as amended, EirGrid has made a determination following screening that an Appropriate Assessment is not required as the project individually or in combination with

[84] https://www.EirGridgroup.com/site-files/library/EirGrid/CP0816-Advance-Bathymetric-and-Topographic-Surveys-North-Connacht-110-kV-Project.pdf

[85] https://www.EirGridgroup.com/site-files/library/EirGrid/CP0816-Advance-Bathymetric-and-Topographic-Surveys-North-Connacht-110-kV-Project.pdf

[86] CP0817-Flagford-Sliabh-Bawn-AAS-Determination_PA-issue.pdf (EirGridgroup.com)

other plans or projects is not likely to have a significant effect on any European sites. The risk of likely significant effects on European sites can be excluded on the basis of objective evidence.

The works areas associated with the proposed Flagford Sliabh Bawn 110 kV line uprate are not in proximity to the works areas, as the line is located c. 28 km from the proposed at its nearest point, and is predominantly in a different Water Management Unit (Lung) to the proposed development. Given the location of these works, there is no potential for cumulative effects.

N5 Ballaghaderreen to Scramoge Road Development

The scheme involves the construction of 34km road upgrade to new Type 1 single carriageway; 15.4km of realignment of existing roads; five roundabouts; 16 'T' junctions; three road under bridges; one road overbridge; four river bridges and 14 culverts**.**

An NIS was produced for these works which identified the potential for impact to the following European sites

- Annaghmore Lough (Roscommon) SAC (001626)
- Bellanagare Bog SAC (000592)
- Bellanagare Bog SPA (004105) (004105)
- Cloonshanville Bog SAC (000614)
- Lough Forbes Complex SAC (001818)
- Lough Gara SPA (004048)

Mitigation measures were specified in relation to water pollution control. The NIS concludes:

- "*The proposed road development, by itself or in combination with other plans and projects, in light of best scientific knowledge in the field, will not, in view of the sites' conservation objectives, adversely affect the integrity of any European Site and no reasonable scientific doubt remains as to the absence of such effects*."
- Construction for the road improvements commenced in October 2021, with a programme of three years to completion. As such, there is potential for the construction phases of the UGC, and the road improvements to run concurrently. While the NIS has prescribed measures to control surface water run-off, there is potential for cumulative effects through noise and vibration to *ex situ* SCI species given the proximity and timing of the works.

Glenree- Moy 110 kV Uprate

The development is located on lands immediately adjoining the Moy substation in the townland of Gorteen, Ballina, Co. Mayo. The project comprises the uprating of the line to refurbish the condition of the existing line, and accommodate higher rated conductors, which requires significant structure replacements.

Environmental assessments are ongoing to inform the planning application, and it is anticipated that Mayo County Council may consent the Glenree to Moy 110 kV Uprate project only after determining it will not adversely affect the integrity of European sites, alone or in combination with other plans or projects (including the proposed development).

As such, no significant in-combination effects are predicted with the proposed development.

Castlebar-Cloon 110 kV Uprate

The Castlebar-Cloon 110kV uprate is an uprate along a 110 kV line running from the Castlebar 110kV Substation in the townland of Aghalusky Co. Mayo to the Cloon 110 kV Substation in the townland of Cloonascragh, Tuam, Co. Galway.

The proposed development is likely to comprise

- the replacement of 53no. (wooden) Intermediate Polesets and 39no. (steel) Angle Masts
- Replacement of 1 or more crossarms at 35 No. Intermediate Polesets and components of hardware and insulators at every structure along the line route;
- all associated works within the Castlebar 110 kV substation and Cloon 110 kV substation to accommodate the uprated 110 kV overhead line include alterations to existing apparatus;
- all associated temporary site development works to gain access to the existing structures including clearance of vegetation, and boundary re-instatement
- other temporary associated and ancillary development works required for the purpose of the uprate of the existing circuit, including the installation of silt traps, silt fences, stone tracks, bog mats and temporary watercourse crossings.

The Castlebar-Cloon 110kV uprate project is located c. 18km from the proposed development at its nearest point, and in a different Water Management Unit (Conn WMU) to the proposed development. The Castlebar-Cloon 110kV uprate project oversails (and includes structures with potential to be replaced within) the River Moy SAC.

EirGrid will oversee the planning application for the Castlebar-Cloon 110kV uprate project, which will have due regard for the ecological protection principles within EirGrid's Ecology Guidelines for Electricity Transmission Projects (EirGrid, 2020). With the exception of the River Moy SAC, the Castlebar-Cloon 110kV uprate project, and proposed development do not jointly overlap any shared pNHA, NHA, or other known site of nature conservation interest.

Mayo County Council may consent the Castlebar-Cloon 110kV Uprate project only after determining it will not adversely affect the integrity of European sites, alone or in combination with other plans or projects (including the proposed development).

As such, no significant in-combination effects are predicted with the proposed development.

3.3.8.4 In-Combination Effects

River Moy SAC

The conservation objectives supporting documents for the River Moy SAC do not refer to specific historic activities which have caused loss or degradation to QIs. The Natura 2000 form, however, notes the following activities which have been identified as potential pressures and threats to the SAC:

- Agricultural Intensification
- Diffuse pollution to surface waters due to agricultural and forestry activities
- Peat extraction
- Aerodrome, heliports
- Use of fertilisers (forestry)
- Forest planting on open ground
- Invasive non-native species

These pressures and threats are identified as they are activities which are identified as having potential to cause impact to the SAC's integrity.

The Proposed Development requires welfare facilities during the construction phase. The discharge associated with any construction stage welfare facilities will be to a holding tank. This will be emptied to a WWTP with design capacity to treat the waste to licenced emission limit values. As such, there is no potential for in-combination impacts associated with enrichment of coastal waters.

As previously noted, zebra mussels have been identified during aquatic surveys. They were recorded at a crossing proposed to be undertaken via HDD. The potential has, however, been identified for the introduction of invasive species to the SAC should they become established prior to the construction phase of works commencing.

Killala Bay/Moy Estuary SAC/SPA

The conservation objectives supporting documents for Killala Bay/Moy Estuary SAC/SPA[87] note the following historic activities which have caused habitat loss and degradation in habitats associated with the European Site:

- Building of slips and piers
- Erosion caused by past physical changes
- On-going untreated wastewater being discharged into Killala Bay
- Disturbance caused by recreational activities

The Proposed Development requires welfare facilities during the construction phase. The discharge associated with any construction stage welfare facilities will be to a holding tank. This will be emptied to a WWTP with design capacity to treat the waste to licenced emission limit values. As such, there is no potential for in-combination impacts associated with enrichment of coastal waters.

Disturbance to SCI species has been identified as a potential impact associated with the Proposed Development. This disturbance is to *ex situ* populations of SCI species outside of the SPA boundary. Given that the potential for disturbance to SCI species has been identified there is potential for in-combination impacts.

Lough Gara SPA

No conservation objectives supporting documents are available for the Lough Gara SPA. The Natura 2000 form, however, notes the following activities which have been identified as potential pressures and threats to the SPA:

- Fertilisation
- Sylviculture, forestry

As noted above, fertilisation has been identified as a threat due to its potential to result in enrichment of the Lough Gara lake waters. The Proposed Development requires welfare facilities during the construction phase. The discharge associated with any construction stage welfare facilities will be to a holding tank. This will be emptied to a WWTP with design capacity to treat the waste to licenced emission limit values. As such, there is no potential for in-combination impacts associated with enrichment of waters.

Lough Conn and Lough Cuillin SPA

No conservation objectives supporting documents are available for the Lough Conn and Lough Cuillin SPA. The Natura 2000 form, however, notes the following activities which have been identified as potential pressures and threats to the SPA:

- Fertilisation
- Sylviculture, forestry
- Fire and fire suppression
- Leisure fishing

[87] NPWS (2016)

As noted above, fertilisation has been identified as a threat due to its potential to result in enrichment of the Lough Conn and Lough Cuillin lake waters. The Proposed Development requires welfare facilities during the construction phase. The discharge associated with any construction stage welfare facilities will be to a holding tank. This will be emptied to a WWTP with design capacity to treat the waste to licenced emission limit values. As such, there is no potential for in-combination impacts associated with enrichment of waters.

3.4 Potential for Adverse Effects on Site Integrity

3.4.1 Potential for Adverse Effects on the River Moy SAC

Pathways for adverse effects on the River Moy SAC have been identified. The potential for these pathways to result in adverse effects to the SAC is now assessed.

These potential effects are identified as follows:

- Potential for direct impact (both within and outside of the SAC boundary) to white-clawed crayfish, sea lamprey, brook lamprey, salmon, and otter.
- Potential for noise and visual disturbance impacts to otter
- Potential for surface-water emissions to cause degradation to supporting habitat for white-clawed crayfish, sea lamprey, brook lamprey, Atlantic salmon, and otter
- Potential for surface-water to cause damage to white-clawed crayfish, sea lamprey, brook lamprey, and salmon.
- Potential for degradation in freshwater supporting habitats due to dust deposition
- Potential for degradation to habitats caused by the spread of invasive species

SSCOs have been developed for River Moy SAC. These have been listed in section 3.3. An assessment of the potential for adverse effects on the integrity of the River Moy SAC is presented hereunder:

Table 3.15: Assessment of Potential for Adverse Effects on the site Integrity of River Moy SAC – White-Clawed Crayfish (*Austropotamobius pallipes*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution	Occurrence	No reduction from baseline	As previously noted, the watercourse crossings where white-clawed crayfish have been recorded, and suitable habitat for same, will be undertaken within the existing roadway. There is no potential for direct impacts to the riverbed. Emissions to watercourses can cause reduction in dissolved oxygen content in water. Further, excess siltation in streams can cause changes in the macrophyte growth, and in invertebrate communities. This may ultimately lead to a reduction in habitat suitability. Any emissions associated with the proposed development will be short-term in nature during the construction and or/decommissioning period. However, should habitat become unsuitable this has the potential to cause a reduction in the occurrence of the species.	Impacts on the distribution of white-clawed crayfish would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Population structure: recruitment	Occurrence of juveniles and females with eggs	Juveniles and/or females with eggs in all occupied tributaries	As outlined previously degradation of habitat due to surface-water emissions has potential to cause a reduction in suitability of habitat to support crayfish. This may also reduce the occurrence of juveniles and females with eggs, and ultimately the population structure of the species.	Impacts on the population structure of white-clawed crayfish would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Negative indicator species	Occurrence	No alien crayfish species	The works do not have the potential to cause the introduction of alien crayfish species into the River Moy SAC.	No potential for Adverse Effects on Site Integrity have been identified.
Disease	Occurrence	No instances of disease	As previously noted, there is no requirement for instream works at watercourse crossings where crayfish were recorded. There is potential, however, for the introduction of waterborne disease (such as crayfish plague) into the River Moy system due to instream works in other areas for example open cut in-stream crossings of river nos. 2 and 41.	Introduction of crayfish plague into the River Moy system would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Water quality	EPA Q value	At least Q3-4 at all sites sampled by EPA	As previously noted, surface water emissions to watercourses can result in impacts to macroinvertebrate communities within the stream. Any emissions as a result of the Proposed Development would be short-term during the construction and or/decommissioning phase. However, should these inputs to watercourses be significant there is potential for a long-term alteration in the macroinvertebrate communities, and therefore the associated Q values.	Impacts on the Q values would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Habitat quality: heterogeneity	Occurrence of positive habitat features	No decline in heterogeneity or habitat quality	Surface water emissions, as previously noted, have the potential to result in changes to habitat features. There will be no loss of features such as instream boulders or cobbles in areas where crayfish and suitable habitat has been recorded. There is potential, however, for these to become degraded due to sedimentation. This in turn, may result in a reduction in habitat quality.	Impacts on habitat quality would constitute an **adverse effect on the site's integrity** in the absence of mitigation.

Table 3.16: Assessment of Potential for Adverse Effects on the site Integrity of River Moy SAC – Sea lamprey (*Petromyzon marinus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	Percentage of river accessible	Greater than 75% of main stem length of rivers accessible from estuary	The proposed works along the cable route are entirely below ground. Where watercourse crossings are encountered, these are undertaken either via open cut, or HDD, with the cable ultimately buried in both scenarios. As such, there is no potential for barriers to migration for sea lamprey, or a reduction in river accessibility for the species.	No potential for Adverse Effects on Site Integrity has been identified.
Population structure of juveniles	Number of age/size groups	At least three age/size groups present	Suitable habitat for juvenile lamprey was recorded throughout the proposed development. Degradation in habitat due to surface-water emissions associated with the works has the potential to result in a loss of suitable habitat for juvenile lamprey. Further, low pH levels that may be caused by cement fines being released has potential to cause mortality of individuals. However, these impacts are short term, associated with the construction phase and decommissioning phases of the Proposed Development, and are not likely to result in a loss of age/size groups of the species within the River Moy SAC system as a whole.	No potential for Adverse Effects on Site Integrity has been identified.
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density at least 1/m²	As previously noted, suitable habitat for juvenile lamprey was recorded throughout the proposed development. Degradation in habitat due to surface-water emissions associated with the works has the potential to result in a loss of suitable habitat for juvenile lamprey. Further, low pH levels that may be caused by cement fines being released has potential to cause mortality of individuals. A loss of juveniles within the river systems has the potential to result in a reduction in the density of juvenile density.	A reduction in juvenile density would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	Suitable spawning habitat for lamprey was recorded throughout the proposed development. Degradation in habitat due to surface-water emissions associated with the works has the potential to result ultimately in a loss of suitable spawning habitat for lamprey. This in turn may result in a decline in the distribution of spawning beds.	A decline in spawning beds would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Availability of juvenile habitat	Number of positive sites in 3rd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Suitable habitat for juvenile lampreys was recorded throughout the proposed development. Degradation and reduction in suitable habitat for juveniles has the potential to result in a reduction in the number of positive sites. However, given the scale of the River Moy catchment relative to the proposed development, any loss is unlikely to result in a significant reduction of the overall percentage of positive sites such that less than 50% of sample sites across the system are positive.	No potential for Adverse Effects on Site Integrity has been identified.

Table 3.17: Assessment of Potential for Adverse Effects on the site Integrity of River Moy SAC – Brook Lamprey (*Lampetra planer*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution	Percentage of river accessible	Access to all watercourses down to first order streams	The proposed works along the cable route are entirely below ground. Where watercourse crossings are encountered, these are undertaken either via open cut, or HDD, with the cable ultimately buried in both scenarios. As such, there is no potential for barriers to migration for brook lamprey, or a reduction in river accessibility for the species.	No potential for Adverse Effects on Site Integrity have been identified.
Population structure of juveniles	Number of age/size groups	At least three age/size groups of brook/river lamprey present	Suitable habitat for juvenile lamprey was recorded throughout the proposed development. Degradation in habitat due to surface-water emissions associated with the works has the potential to result in a loss of suitable habitat for juvenile lamprey. Further, low pH levels that may be caused by cement fines being released has potential to cause mortality of individuals. However, these impacts are short term, associated with the construction and or/decommissioning phase of the Proposed Development, and are not likely to result in a loss of age/size groups of the species within the River Moy SAC system as a whole.	No potential for Adverse Effects on Site Integrity have been identified.
Juvenile density in fine sediment	Juveniles/m²	Mean catchment juvenile density of brook/river lamprey at least 2/m²	As previously noted, suitable habitat for juvenile lamprey was recorded throughout the proposed development. Degradation in habitat due to surface-water emissions associated with the works has the potential to result in a loss of suitable habitat for juvenile lamprey. Further, low pH levels that may be caused by cement fines being released has potential to cause mortality of individuals. Loss of juveniles within the river system has the potential to result in a reduction in the density of juvenile density.	A reduction in juvenile density would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Extent and distribution of spawning habitat	m² and occurrence	No decline in extent and distribution of spawning beds	As previously noted, suitable spawning habitat for lamprey was recorded throughout the proposed development. Degradation in habitat due to surface-water emissions associated with the works has the potential to result ultimately in a loss of suitable spawning habitat for lamprey. This in turn may result in a decline in the distribution of spawning beds.	A decline in spawning beds would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Availability of juvenile habitat	No. positive sites in 2nd order channels (and greater), downstream of spawning areas	More than 50% of sample sites positive	Suitable habitat for juvenile lampreys was recorded throughout the proposed development. Degradation and reduction in suitable habitat for juveniles has the potential to result in a reduction in the number of positive sites. However, given the scale of the River Moy catchment relative to the proposed development, any loss is unlikely to result in a significant reduction of the overall percentage of positive sites such that less than 50% of sample sites across the system are positive.	No potential for Adverse Effects on Site Integrity has neen identified.

Table 3.18: Assessment of Potential for Adverse Effects on the site Integrity of River Moy SAC – Salmon (*Salmo salar*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution: extent of anadromy	Percentage of river accessible	100% of river channels down to second order accessible from estuary	The proposed works along the cable route are entirely below ground. Where watercourse crossings are encountered, these are undertaken either via open cut, or HDD, with the cable ultimately buried in both scenarios. As such, there is no potential for barriers to migration for salmon, or a reduction in river accessibility for the species.	No potential for Adverse Effects on Site Integrity have been identified.
Adult spawning fish	Number	Conservation Limit (CL) for each system consistently exceeded	Suitable habitat for salmon was recorded throughout the proposed development at water crossings. Low pH levels that may be caused by cement fines being released within surface water emissions has potential to cause mortality of adult salmon. A loss of adult salmon has the potential to result in a reduction in the number of adult fish.	A reduction in the number of adult salmon would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Salmon fry abundance	Number of fry/5 minutes electrofishing	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value.	Suitable habitat for salmon was recorded throughout the proposed development at water crossings. Low pH levels that may be caused by cement fines being released within surface water emissions has potential to cause mortality of salmon fry.	A reduction in the number of salmon fry would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Out-migrating smolt abundance	Number	No significant decline	Suitable habitat for salmon was recorded throughout the proposed development at water crossings. Low pH levels that may be caused by cement fines being released within surface water emissions has potential to cause mortality of out-migrating smolts.	A reduction in the number of smolt would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Number and distribution of redds	Number and occurrence	No decline in number and distribution of spawning redds due to anthropogenic causes	Spawning habitat for salmon is present on watercourses throughout the proposed development. Degradation in water quality, and increased sedimentation has the potential to cause a reduction in the suitability of instream substrates for spawning salmon.	A reduction in the number and distribution of spawning redds would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Water quality	EPA Q value	At least Q4 at all sites sampled by EPA	As previously noted, surface water emissions to watercourses can result in impacts to macroinvertebrate communities within the stream. Any emissions as a result of the Proposed Development would be short-term during the construction and or/decommissioning phase. However, should these inputs to watercourses be significant there is potential for a long-term alteration in the macroinvertebrate communities, and therefore the associated Q values.	Impacts on the Q values would constitute an **adverse effect on the site's integrity** in the absence of mitigation.

Table 3.19: Assessment of Potential for Adverse Effects on the site Integrity of River Moy SAC - Otter (*Lutra lutra*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Distribution	Percentage positive survey sites	No significant decline	No otter holts or couches were recorded during field walkovers. The works are largely restricted to within the road curtilage and agricultural fields. There is potential at along water crossings, for holts and couches to become established prior to construction of the Proposed Development. There is also potential for otters to forage and commute in the vicinity of the works areas. As such, there is potential for the works to cause disturbance resulting in the avoidance of the Proposed Development by otter. As such this may, in a worst-case scenario, result in a reduction in the percentage of positive survey sites for otters associated with SAC.	Reduction in the percentage survey sites would constitute an **adverse effect on the site's integrity** in the absence of mitigation.
Extent of terrestrial habitat	Hectares	No significant decline. Area mapped and calculated as 1068.8ha	With the exception of the substation extensions, the proposed is entirely below ground. No suitable habitat for otter was recorded at the substation extensions. As such, there is no potential for a loss of terrestrial habitat for otters.	No potential for Adverse Effects on Site Integrity have been identified.
Extent of freshwater (river) habitat	Kilometres	No significant decline. Length mapped and calculated as 479.4km	The proposed works along the cable route are entirely below ground. Where watercourse crossings are encountered, these are undertaken either via open cut, or HDD, with the cable ultimately buried in both scenarios. As such, there is no potential for a loss of habitat for otters.	No potential for Adverse Effects on Site Integrity has been identified.
Extent of freshwater (lake) habitat	Hectares	No significant decline. Area mapped and calculated as 1248.2ha	The proposed works will not cause a decline in freshwater lake habitat.	No potential for Adverse Effects on Site Integrity has been identified.
Couching sites and holts	Number	No significant decline	The works are largely restricted to within the road curtilage and agricultural fields. No otter holts or couches were recorded during field walkovers. There is potential, however along water crossings, for holts and	Impacts on the number of couching sites and holts would constitute an **adverse effect on the site's integrity i**n the absence of mitigation.

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
			couches to become established prior to construction of the Proposed Development. As such there is potential for the works to result in a decline in the number of couching sites and holts for otter associated with the SAC.	
Fish biomass available	Kilograms	No significant decline	There is the potential for the accidental release of cement fines into watercourses. The associated changes in pH have the potential to result in mortality to fish upon which otters might prey.	Impacts on the fish biomass available to otter **would constitute an adverse effect on the site's integrity** in the absence of mitigation.
Barriers to connectivity	Number	No significant increase.	The proposed works along the cable route are entirely below ground. Where watercourse crossings are encountered, these are undertaken either via open cut, or HDD, with the cable ultimately buried in both scenarios. As such, there is no potential for barriers to connectivity for otter, or a reduction in river accessibility for the species.	No potential for Adverse Effects on Site Integrity has been identified.

3.4.2 Potential for Adverse Effects on Killala Bay/Moy Estuary SAC

Pathways for adverse effects on the Killala Bay/Moy Estuary SAC have been identified. The potential for these pathways to result in adverse effects to the SAC is now assessed. These are identified as:

- Potential for noise impacts to ex situ harbour seals
- Potential for surface-water emissions to cause degradation of estuary habitat, and sandflat and mudflat habitat.
- Potential for degradation of habitats caused by introduction of invasive species.

SSCOs have been developed for Killala Bay/Moy Estuary SAC. These have been listed in section 3.3 An assessment of the potential for adverse effects on the integrity of the Killala Bay/Moy Estuary SAC is presented hereunder:

Table 3.20: Assessment of Potential for Adverse Effects on the site Integrity of Killala Bay/Moy Estuary SAC [000458]- Estuaries

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes	The proposed works will not intersect with the estuary habitat directly and there are no works proposed within the habitat. The closest extent of the estuaries to the proposed development is 1.6km to the north There is potential for surface water pollution to enter into the habitat. However, this does not have potential to cause an alteration to the extent of estuary habitat within the SAC.	No potential for Adverse Effects on Site Integrity has been identified.
Community extent	Hectares	Maintain the extent of the Zostera-dominated community, subject to natural processes.	As previously noted, the works will not intersect with the estuary habitat, and there will be no direct loss of zostera dominated communities. There is potential for surface water pollution to enter into the habitat. A number of invertebrate species are associated with the zostera dominated community[88]. Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities. However, any impacts are unlikely to cause a change in the extent of zostera within the SAC.	No potential for Adverse Effects on Site Integrity has been identified.
Community structure: Zostera density	Shoots per m^2	Conserve the high quality of the Zostera-dominated community, subject to natural processes	As previously noted, the works will not intersect with the estuary habitat, and there will be no direct loss of Zostera dominated communities. As previously noted, there is potential for surface water pollution and invasive species to enter into the habitat. Impacts to the communities associated with surface water pollution have potential to result in a die-off among the invertebrate communities. There is no potential, however for impacts to the surface water to result in a loss of the density of Zostera within the habitat or a reduction in shoots per m^2. As noted previously there is potential for spread of invasive species associated with the works. Invasive species have potential to result in a degradation of the Zostera dominated community within the habitat.	Impacts on the quality of Zostera community **would constitute an adverse effect on the site's integrity** in the absence of mitigation.
Community distribution	Hectares	Conserve the following community types in a natural condition: Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex; Estuarine muddy sand dominated by *Hediste*	As previously noted, the works will not intersect with the estuary habitat, and there will be no direct loss of invertebrate communities. There is potential, for surface water pollution to enter into the River Moy well upstream of this SAC. Temporary changes in pH which are associated with the release of cement fines into watercourses have the potential to cause very localised die off among in river invertebrate communities, and an associated	Impacts on the community types **would constitute an adverse effect on the site's integrity** in the absence of mitigation.

[88] NPWS (2012) Killala Bay/Moy Estuary SAC (Site code:458). Conservation Objective Supporting Document – Marine Habitats and Species.

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
		diversicolor and *Heterochaeta costata* community complex; and Fine sand dominated by *Nephtys cirrosa* community complex.	change in the community distribution upstream of this SAC. These effects are unlikely to affect the Killala Bay/ Moy estuary SAC. As noted previously there is potential for spread of invasive species associated with the works. Invasive species have potential to result in a degradation of the habitat and associated community types	

Table 3.21: Assessment of Potential for Adverse Effects on the site Integrity of Killala Bay/Moy Estuary SAC [000458] - Mudflats and sandflats not covered by seawater at low tide

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent habitat area is stable or increasing, subject to natural processes.	The proposed works will not intersect with the mudflat and sand flat habitat directly and there are no works proposed within the habitat. The closest extent of the estuaries to the proposed development is 1.6km to the north There is potential for surface water pollution to enter into the habitat. There will be no changes to the hydrological process which govern the sediment processes within the SAC. As such, there will be no alteration to the extent of mudflats and sand flats within the SAC	No potential for Adverse Effects on Site Integrity have been identified.
Community extent	Hectares	Maintain the extent of the Zostera-dominated community, subject to natural processes.	As previously noted, the works will not intersect with the estuary habitat, and there will be no direct loss of Zostera dominated communities. There is potential for surface water pollution to enter into the habitat. A number of invertebrate species are associated with the Zostera dominated community[89]. Changes in pH which are associated with the release of cement fines into watercourses have the potential to cause die off among invertebrate communities. However, any impacts are unlikely to cause a change in the extent of Zostera within the SAC.	No potential for Adverse Effects on Site Integrity have been identified.
Community structure: Zostera density	Shoots per m^2	Conserve the high quality of the Zostera-dominated community, subject to natural processes	As previously noted, the works will not intersect with the estuary habitat, and there will be no direct loss of Zostera dominated communities. As previously noted, there is potential for surface water pollution to enter into the habitat. Impacts to the communities associated with surface water pollution have potential to result in a die-off among the invertebrate communities. There is no potential, however for impacts to the surface water to result in a loss of the density of Zostera within the habitat or a reduction in shoots per m^2. As noted previously there is potential for spread of invasive species associated with the works. Invasive species have potential to result in a degradation of the Zostera dominated community within the habitat.	Impacts on the quality of Zostera community **would constitute an adverse effect on the site's integrity** in the absence of mitigation
Community distribution	Hectares	Conserve the following community types in a natural condition: Muddy sand to fine sand dominated by *Hydrobia ulvae*, *Pygospio elegans* and *Tubificoides benedii* community complex; *Estuarine muddy* sand dominated by *Hediste diversicolor* and	As previously noted, the works will not intersect with the mudflat and sand flat habitat, and there will be no direct loss of invertebrate communities. There is potential, for surface water pollution to enter into the River Moy well upstream of this SAC. Temporary changes in pH which are associated with the release of cement fines into watercourses have the potential to cause very localised die off among in river invertebrate communities, and an associated change in the community distribution upstream of this SAC. These effects are unlikely to affect the Killala Bay/ Moy estuary	Impacts on the community types **would constitute an adverse effect on the site's integrity** in the absence of mitigation

[89] NPWS (2012) Killala Bay/Moy Estuary SAC (Site code:458). Conservation Objective Supporting Document – Marine Habitats and Species.

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
		Heterochaeta costata community complex and Fine sand dominated by *Nephtys cirrosa* community complex	SACAs noted previously there is potential for spread of invasive species associated with the works. Invasive species have potential to result in a degradation of the habitat and associated community types	

Table 3.22: Assessment of Potential for Adverse Effects on the site Integrity of Killala Bay/Moy Estuary SAC [000458] - Harbour Seal (*Phoca vitulina*)[90]

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Access to suitable habitat	Number of artificial barriers	Species range within the site should not be restricted by artificial barriers to site use.	The proposed works are located entirely outside of the Killala Bay/Moy Estuary SAC. As such, there will be no impact to core habitat within the SAC boundary. Harbour seals may occur outside of the boundary of the SAC upstream within the River Moy. The proposed works along the cable route are entirely below ground. Where watercourse crossings are encountered, these are undertaken either via open cut, or HDD, with the cable ultimately buried in both scenarios. As such, there is no potential for barriers to migration, or a reduction in river accessibility for the species.	No potential for Adverse Effects on Site Integrity have been identified.
Breeding behaviour	Breeding sites	Conserve the breeding sites in a natural condition	Key habitat areas for harbour seal, including breeding sites, have been mapped as part of the site-specific conservation objectives for Killala Bay/Moy Estuary SAC. These areas are associated with the mouth of the bay. The closest breeding site to the proposed development is located approximately 8km north of the Proposed Development. This it outside the ZoI of the works. There is no potential identified for direct or indirect impacts to breeding sites.	No potential for Adverse Effects on Site Integrity have been identified.
Breeding behaviour	Moult haul-out sites	Conserve the moult haul-out sites in a natural condition.	Key habitat areas for harbour seal, including moulting sites, have been mapped as part of the site-specific conservation objectives for Killala Bay/Moy Estuary SAC. These areas are associated with the mouth of the bay. The closest moulting site to the proposed works is located 7.5km north, outside of the ZoI of the works. There is no potential for direct or indirect impacts to moulting sites.	No potential for Adverse Effects on Site Integrity have been identified.
Resting behaviour	Resting haul-out sites	Conserve the resting haul-out sites in a natural condition.	Key habitat areas for harbour seal, including resting sites, have been mapped as part of the site-specific conservation objectives for Killala Bay/Moy Estuary SAC. These areas are associated with the mouth of the bay. The closest resting site to the proposed works is located approximately 7km north, outside of the ZoI of the works. There is no potential for direct or indirect impacts to moulting sites.	No potential for Adverse Effects on Site Integrity have been identified.
Disturbance	Level of impact	Human activities should occur at levels that do not adversely affect the harbour seal population at the site	As previously noted, the Proposed Development is located such that the ZoI of the works does not extend into any core habitats for Harbour seals. Drilling has the potential to result in disturbance type effects to harbour seal. However, these impacts will be restricted to upstream along the River Moy and likely will only impact seals occasionally should they move further up the river channel. As such, this temporary disturbance, to an area outside of the core habitats will not cause an adverse impact to the harbour seal population within the SAC.	No potential for Adverse Effects on Site Integrity have been identified.

[90] Impacts on the fish biomass available are not identified as a potential for adverse effects on site integrity.

3.4.3 Potential for Adverse Effects on Killala Bay/Moy Estuary SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development has potential to impact the SCIs of the Killala Bay/Moy Estuary SPA due to impacts associated with the construction and or decommissioning phase of the Proposed Development as follows:

- Potential for noise and visual disturbance to curlew and golden plover
- Potential for degradation to supporting habitats caused by surface water emissions

Table 3.23: Assessment of Potential for Adverse Effects on the site Integrity of Killala Bay/Moy Estuary SPA - Curlew (*Numenius arquata*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The proposed works are outside of the SPA boundary. There will be no impact to core supporting habitat within the European site. A peak count of 63 curlew were recorded utilising peatland habitat to the west of the UGC between MT04 and MT06. The cable at this location will be within the existing road. There will be no loss of supporting habitat for *ex situ* populations of curlew. Disturbance will be short term in nature during the construction and or decomissioning phase of the Proposed Development, and limited to during the construction of the cable between MT04 and MT06. The extent of peatland habitat is such that birds would likely utilise the western extent of the peatland outside of the ZoI for noise impacts. No plans or projects have been identified which may interfere with the potential for these birds to relocate to this area (per section 3.3.8). As such, the short-term disturbance of curlew from this location will not result in long-term population trend reductions.	No potential for Adverse Effects on Site Integrity has been identified.
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by curlew, other than that occurring from natural patterns of variation	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, curlew were recorded in the vicinity of the works area. However, in the event of disturbance the curlew would likely move west and utilise the peatland habitat outside of the zone of disturbance. Abundant alternative areas are available during the temporary phase of construction, if localised disturbance arises to low numbers of curlew.	Impacts on the intensity of use of foraging habitat used by Curlew will not impact core foraging areas based on the nature and small scale of works. No potential for Adverse Effects on Site Integrity have been identified.

Table 3.24: Assessment of Potential for Adverse Effects on the site Integrity of Killala Bay/Moy Estuary SPA - Golden Plover (*Pluvialis apricari*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The proposed works are outside of the SPA boundary. There will be no impact to core supporting habitat within the European site. A single golden plover was recorded to the west of the UGC between MT04 and MT05 Disturbance will be short term in nature during the construction and or/decommissioning phase of the Proposed Development, and limited to during the construction of the cable at this location. As such, the short term disturbance of a single golden plover from this location will not result in long-term population trend reductions.	No potential for Adverse Effects on Site Integrity has been identified.
Distribution	Number, range, timing and intensity of use of areas	No significant decrease in the range, timing or intensity of use of areas by golden plover, other than that occurring from natural patterns of variation	As previously mentioned, a single golden plover was recorded in proximity to the Proposed Development. Given the low number recorded, this indicates that the habitat is not of particular significance for the species. The temporary disturbance of a single golden plover from the ZoI of the proposed works does not have potential to result in a significant decrease in the range, timing or intensity of use of areas by the species.	No potential for Adverse Effects on Site Integrity has been identified.

Table 3.25: Assessment of Potential for Adverse Effects on the site Integrity of Killala Bay/Moy Estuary SPA - Wetlands

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 3204 hectares, other than that occurring from natural patterns of variation	The Proposed Development has the potential to result in a deterioration in water quality caused by accidental pollution of surface waters. This has the potential to result in a degradation of estuarine, mudflat and sandflat habitats associated with the SPA. These habitats comprise key foraging habitat for a large number of birds associated with the SPA. As previously outlined, there is potential for spread of invasive species caused by the proposed development. This may cause a degradation in the wetland habitats. The associated reduction in wetland quality has the potential to result in a lowering of the carrying capacity for wetland birds. However, this will not constitute a reduction in the permanent area occupied by wetland habitats.	No potential for Adverse Effects on Site Integrity has been identified

3.4.4 Potential for Adverse Effects on Lough Gara SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development has potential to impact the SCIs of the Lough Gara SPA due to impacts associated with the construction and or/decommissioning phase of the Proposed Development as follows:

- Potential for noise and visual disturbance impacts to whooper swan
- Potential for degradation to supporting habitats caused by surface water emissions
- Potential for degradation to supporting habitats caused by introduction/spread of zebra mussels

No SSCOs are available for Lough Gara SPA. Generic conservation objectives have been set out and are as follows:

- To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA
- Favourable conservation status of a habitat is achieved when:
  - its natural range, and area it covers within that range, are stable or increasing, and
  - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
  - the conservation status of its typical species is favourable.
- The favourable conservation status of a species is achieved when:
  - population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
  - the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
  - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

SSCOs for sites with whooper swan and wetlands and waterbirds as SCIs were reviewed (for example Lough Swilly SPA). Having regard to these objectives, an assessment of the potential for adverse effects on the integrity of Lough Gara SPA is presented hereunder.

Table 3.26: Assessment of Potential for Adverse Effects on the site Integrity of Lough Gara SPA - Whooper Swan (*Cygnus cygnus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Notable counts were made of whooper swan between MT04 and MT06, and between MT08 and MT10. With the exception of passing bays and the crossing of the River Moy the works are within the existing road. There is potential for temporary disturbance of whooper swan at these locations from the ZoI associated with the works. • Whooper swans utilising these areas would likely move to habitat outside of the zone of disturbance. No plans or projects have been identified which may interfere with the potential for these birds to relocate to this area (per section 3.3.8). As such, the disturbance of whooper swan from these areas will not result in long-term population trend reductions given the amount of habitat available, and readily utilised by the species in the vicinity.	No potential for Adverse Effects on Site Integrity has been identified
Distribution	Number and range of areas used by waterbirds	Long term population trend stable or increasing	The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. As previously noted, small flocks of whooper swan were recorded in proximity to the works area. If localised temporary disturbance arises this species would likely utilise other, similar habitats in the vicinity outside of the zone of disturbance. No plans or projects have been identified which may interfere with the potential for these birds to relocate to this area (per section 3.3.8). The disruption of birds from these areas will not result in significant decrease in the use of ex situ habitat during construction.	No potential for Adverse Effects on Site Integrity has been identified

Table 3.27: Assessment of Potential for Adverse Effects on the site Integrity of Lough Gara SPA - Wetlands

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Habitat area	Hectares	The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 3204 hectares, other than that occurring from natural patterns of variation	The Proposed Development has the potential to result in a deterioration in water quality caused by accidental pollution of surface waters. This has the potential to result in a degradation of wetland habitats associated with the SPA. These habitats comprise key foraging habitat for a large number of birds associated with the SPA. Further, accidental translocation of invasive species has the potential to cause significant alterations in water quality, changes in fish populations and alterations to macrophytic communities within the lake The associated reduction in wetland quality has the potential to result in a lowering of the carrying capacity for wetland birds. However, this will not constitute a reduction in the permanent area occupied by wetland habitats.	No potential for Adverse Effects on Site Integrity has been identified

3.4.5 Potential for Adverse Effects on Lough Conn and Lough Cuillin SPA

It has been determined through desk-based assessment and ecological field surveys that the Proposed Development has the potential to impact the SCIs of Lough Conn and Lough Cuillin SPA due to impacts associated with the construction and or/decommissioning phase of the Proposed Development as follows:

- Potential for noise and visual disturbance impacts to common gull

No site specific conservation objectives are available for Lough Conn and Lough Cuillin SPA. Generic conservation objectives have been set out and are as follows:

- To maintain or restore the favourable conservation condition of the bird species listed as SCIs for this SPA
- Favourable conservation status of a habitat is achieved when:
  - its natural range, and area it covers within that range, are stable or increasing, and
  - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
  - the conservation status of its typical species is favourable.
- The favourable conservation status of a species is achieved when:
  - population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
  - the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
  - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis

Site specific conservation objectives for sites with common gull and wetlands and waterbirds as SCIs were reviewed (for example Cork Harbour SPA). Having regard to these objectives, an assessment of the potential for adverse effects on the integrity of Lough Conn and Lough Cuillin SPA is presented hereunder.

Table 3.28: Assessment of Potential for Adverse Effects on the site Integrity of Lough Gara SPA - Common Gull (*Larus canus*)

Attribute	Measures	Targets	Potential Impact	Potential for Adverse Effects on Site Integrity
Population trend	Percentage change	Long term population trend stable or increasing	• The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. Eight common gulls were recorded at Carrowkeribly Lough (MT05-MT06). The cable route at this location is within the existing roadway with the exception of two passing bays which fall within agricultural grassland adjacent to the lake. There will be no direct impact to Carrowkeribly Lough. However, there is potential for disturbance to common gulls within the zone of disturbance. Common Gulls are opportunistic feeders. This means that they are willing to feed in a broad range of habitats, and disturbance of the species from the ZoI will not result in a lack of key foraging options for the species. There is, therefore, no potential for a long-term decrease in the population trend for the species caused by the works.	No potential for Adverse Effects on Site Integrity has been identified
Distribution	Number and range of areas used by waterbirds	Long term population trend stable or increasing	• The works locations are such that there will be no noise impacts to core roosting or foraging areas within the SPA boundary. • As previously noted, the opportunistic nature of common gulls is such that they are unlikely to be significantly impacted by the Proposed Development. • As such, disturbance of common gulls from the works locations will not result in a significant decrease in the range, timing or intensity of use of areas by common gulls.	No potential for Adverse Effects on Site Integrity has been identified

3.5 Mitigation Measures

Mitigation is prescribed hereunder to address the impacts identified such that adverse effects on site integrity of the European site do not occur.

Mitigation measures are set out in accordance with the European Commission guidance on the: '*Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, (2001).* And '*Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive* (2018).' Mitigation is described with respect to:

- How the measures will avoid / prevent / reduce the adverse impacts on the site to an acceptable level;
- The degree of confidence in their likely success;
- The timescale, relative to the proposed development, when they will be implemented;
- How and when the measures will be monitored.

All mitigation prescribed in this NIS must be implemented by the appointed Contractor for the works, in consultation with the Developer's Ecologist, and the relevant statutory bodies identified hereunder. The Contractor will incorporate the mitigation measures being outlined below into a Construction Environmental Management Plan (CEMP) for the Proposed Development and agree the CEMP with the Developer and the local authority in advance of mobilisation.

An outline CEMP has been produced for this project which includes mitigation details outlined in Section 3.5 of this NIS.

A summary of mitigation measures outlined in this section and its application to each of the European Sites identified with potential for effects is outlined in Table 3.29 below.

Table 3.29: Mitigation Measure Summary

Measure	River Moy SAC	Killala Bay/Moy Estuary SAC	Killala Bay/Moy Estuary SPA	Lough Gara SPA	Lough Conn and Lough Cullin SPA
Mitigation for protection of water quality	✓	✓	-	-	-
Mitigate Disturbance to Wintering Birds	-	-	✓	✓	-
Mitigate Disturbance to Otter Couches/Holts (if present)	✓	-	-	-	-
Mitigate Spread of Invasive Species	-	✓	-	-	-

3.5.1 Pre-Construction Confirmatory Surveys

Given the dynamic distribution of species and habitats over time, changes may arise between baseline surveys informing this AA Screening and NIS (2019-2022), and construction (est. 2023). For example, otters may establish new holts, or occupy previously inactive holes excavated by other animals; invasive species distribution will change following treatment, or dispersal by humans, animals, or water.

In advance of enabling works, the Contractor's ECoW will conduct confirmatory otter surveys in advance of the commencement of any works within 150m of the works areas (where access is available from affected landowners) as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory otter survey will be conducted no more than 10-12 months prior to construction commencing.

Otter surveys will be carried out having regard to guidance of NRA (2006, 2009); invasive species will be carried out having regard to guidance of Transport Infrastructure Ireland (TII,2020a, b)

Invasive species (including aquatic species such as zebra mussel) pre-confirmatory surveys will be carried out to establish whether any new instances have become established within the ZoI of the proposed development.

The pre-construction invasive species survey will be carried out within the works areas, including compound locations and laydown areas, and along proposed access routes to identify the presence of all invasive species within and adjacent to works areas.

The invasive species survey will be carried out during the appropriate growing season (May – October). The findings of this invasive species survey will be incorporated into the measures below, by the Contractor's ECoW and any specialists.

Any stands of invasive species recorded within the ZoI will be clearly marked out as restricted areas. This exclusion zone will incorporate a buffer such that below ground growth is accounted for (4m for Japanese knotweed following Fennell et al., 2018; buffer not required for other species). No works will be carried out within the exclusion zones unless approved by the Contractor's ECoW.

Aquatic invasive species will be surveyed for by an experienced aquatic ecologist at the two river crossings proposed via open cut trenching including Watercourse 2 Scotchfort river and watercourse 40 Knocklehaugh.

The results of pre-construction confirmatory surveys will inform the refinement of mitigation measures (if required) in Contractor method statements, and all results will be incorporated into Contractor's constraint mapping.

Survey reporting and mapping will also be provided to the Employer's Representative team, to EirGrid's ecologist within EirGrid's Planning and Environmental Unit (Chief Infrastructure Office), and to local authority or other parties where required by condition

3.5.2 Ecological Supervision and Monitoring

An ECoW will be employed by the Contractor to oversee implementation of mitigation. This will include monitoring and auditing the works and contractor programmes and works method statements, to ensure mitigation is correctly implemented.

The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), and have demonstrable experience in ecological supervision and habitat restoration works.

The Contractor's ECoW will also ensure any disturbance licenses are arranged based on relevant details outlined in this PECR and any significant findings of confirmatory pre-construction surveys outlined above. The Contractor's ECoW will advise on mitigation measures implementation including the scheduling of works and will be included in regular liaison meetings between project teams to ensure that plans are co-ordinated and effects are minimised.

All monitoring reports will be provided to the Employer's Representative team, to EirGrid's ecologist within EirGrid's Planning and Environmental Unit (Chief Infrastructure Office), and to local authority or other parties where required by condition. An independent Environmental Clerk of Works (EnCoW) will be employed on behalf of the Employers Representative team (i.e. the Electricity Supply Board), who will review and comment on the pre-construction survey reports, mitigation proposals, monitoring and compliance reports generated by the Contractor's ECoW.

3.5.3 Mitigation Against Water Quality Impacts to Surface Water

The principle likely pollution sources from construction activities are from water crossings associated with the cable route. Other sources are contaminated site run-off, including silty water arising from exposed ground / stockpiles / and from accidental leaks / spills of oil / fuels from machinery or storage areas, and run off from areas where concrete pours are taking place.

The following is outlined following the consultation conducted with Inland Fisheries Ireland (IFI).

- The closed season restrictions requested by IFI have been implemented on both open cut crossings.
- IFI also sought a closed season restriction on certain crossings where sufficient road depth allows for ducts to be laid within the existing roadway [River Crossings 4, 13, 18, 29, 33, 37]. EirGrid considered this request carefully, noting there will no works within watercourses or riparian habitats. The potential for indirect impacts to fisheries from works entirely within the roadway was balanced against the constraint on project delivery from limiting such works to a three month window. The North Connacht project forms a key part of the necessary grid development to secure up to 80% renewable energy capacity. Notwithstanding EirGrid fully supports IFI statutory remit to protect and enhance fisheries interests.
- As such, EirGrid commits the Contractor's ECoW to agreeing the method statements with IFI for the laying of ducts in-road on crossings 4, 13, 18, 29, 33, 37, to ensure IFI are satisfied with the proposed approach to the storage of fuel and oils, and control and treatment of surface water contaminated with oils, suspended solids, or concrete washings.

Mitigation measures to avoid / prevent contaminated runoff and pollution from site are prescribed below.

Table 3.30: Mitigation Against Surface Water Pollution - General

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
At a minimum, all pollution control measures will be designed, installed, and maintained in accordance with measures outlined below and under the supervision of the Contractor's Environmental Clerk of Works (EnCoW). Prior to works pH monitoring will be conducted of watercourses 2 and 40 to inform the baseline levels for stop works authority **Concrete** The pouring of concrete will be required during the construction phase. To prevent the runoff of concrete into nearby watercourses and drains, the following will be implemented. • No on-site batching will be permitted at the proposed works areas. Concrete will instead be transported to the site within a concrete truck. • Quick setting concrete mixes will be used to reduce the risk of contaminated run-off to the nearby watercourses. • Concrete trucks will be washed down in a sealed mortar bin / skip which has been examined in advance for any defects. This requirement will be communicated to each concrete truck driver prior to entering into the works area. • Where concrete pours are to take place instream they will only take place within an isolated, dry, works area. • Where the isolated working area requires constant pumping to maintain a dry works area, pumps shall be turned off during the pour, and remain off until concrete has hardening negating a run-off risk; and such that the discharge will not result in a change in pH of +/-0.5 units.	Measures will prevent the uncontrolled releases of pollutants into the environment.	Measures prescribed as standard best practice and are aligned with CIRIA Guidelines C532	Pollution prevention measures will need to be in place before the enabling and construction works commence at each location.	Monitoring as part of the Emergency response plan will be subject to agreement with IFI. The Contractor's EnCoW will carry out ongoing monitoring of all pollution control measures. The Contractor EnCoW will report monitoring findings, and adaptive management actions taken in writing to • The independent EnCoW within the Employer's Representative Team • EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) In addition, any statutory bodies in compliance with planning conditions.	Measures will prevent and/or remedy the uncontrolled releases of pollutants into the environment. Contractor's EnCoW will monitor the pH of the watercourse during concrete works. Should any change in pH +/- 0.5 be detected concrete works shall immediately be ceased (handheld monitors will have maximum variance of +/- 0.1).

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
● Where concrete pours are required within a watercourse, the Contractor's EnCoW will regularly monitor the pH of the watercourse during concrete works. Should any change in pH +/-0.5 be detected concrete works shall immediately be ceased (handheld monitors will have maximum variance of +/- 0.1). The entry point to the watercourse will then be identified and implement appropriate measures to prevent further escape to the environment. An example of emergency response actions required, in the event of a spillage is as follows: – If safe, stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers. – If safe, contain the spill using the absorbent spills material provided. Do not spread or flush away the spill. – Cover or bund off any vulnerable areas where appropriate. – If possible, clean up as much as possible using the absorbent spills materials. – Do not hose the spillage down or use any detergents. – Contain any used absorbent material in weather tight containers bins/bags so that further contamination is limited. – Notify the Site Manager so that used absorbent material can be disposed of using a licensed Waste Contractor, and – An accident investigation should be performed in accordance with procedures and the report sent to the Site Manager. – The independent EnCoW shall be notified.					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• The Contractor's EnCoW will ensure that covers are available for freshly poured concrete to avoid wash off in the event of rain. • Waste concrete slurry will be allowed to dry and taken to a licensed waste depot for disposal. • The Contractor will schedule concrete works during relatively dry weather conditions (i.e. when there are no active Met Eireann yellow, orange or red warnings) to reduce the elevated risk of runoff. • The Contractor's EnCoW will notify the Independent EnCoW employed within the Employer's Representative Team. the NPWS and IFI immediately of any concrete spills into watercourses. Thereafter the Contractor's EnCoW will additionally notify in writing EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) **Hydrocarbons** Where mobile equipment is required e.g. generators, these will be housed in a suitably sized bund / plant nappy such that any leaks / spills are intercepted. All mobile equipment used will be stored within a plant nappy. Operators will regularly inspect the plant nappy, at a minimum on a daily basis, and replace it where it has become contaminated. Fuelling and lubrication of plant and equipment will be restricted to the construction compound sites, or laydown areas. All waste fuels, oils, and other hazardous wastes will be disposed of in accordance with the requirements of waste legislation. Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained					

Measure	How the measures will avoid / prevent / reduce impacts	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
during induction to site by the Contractor's EnCoW in the use of this equipment. Should use of a spill-kit be required it shall be immediately re-stocked by the Contractor. All spill-kits shall be inspected on a weekly basis by the SHEQ officer to ensure they are maintained as fit for purpose. Records relating to these inspections shall be kept. Welfare / hygiene facilities will be located within the construction compounds. All water from wheel washes will be removed from site and disposed of in line with Waste Legislation. No wheel wash water will be discharged into any watercourses or drainage ditches.					

Table 3.31: Mitigation Proposed for Watercourse crossings

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
Surface Water Protection for Open Trench Water Crossings Where open trench crossings are to be carried out (as outlined in section 3.2.2) there is a risk of downstream transportation of pollutants caused by the proposed development. The following measures shall be undertaken where trenchless construction methods are utilised for crossings ● A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works. ● The Contractor will schedule works during relatively dry weather conditions (i.e. when there are no active Met Eireann yellow, orange or red warnings) to reduce the elevated risk of runoff. Works will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016) and The IFI Biosecurity Protocol for Field Survey Works will be complied with. ● Pre works baseline turbidity monitoring will be conducted upstream and downstream of instream works areas to inform baseline turbidity levels using a calibrated hand held monitor. ● Instream works will be limited to between 1st July to 30th September. ● Prior to the works commencing, the measures prescribed in this section shall be installed to prevent the downstream transportation of surface water run off associated with vegetation clearance. This may be through the use of features like hay bales. Monitoring	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the construction works commence	Monitoring as part of the Emergency response plan will be subject to agreement with IFI. The Contractor's EnCoW will carry out daily monitoring of all pollution control measures including monitoring of pollution control measures such as silt fencing and compliance with restricted areas. Turbidity monitoring to be undertaken visually and with handheld meter. The Contractor EnCoW will report monitoring findings, and adaptive management actions taken in writing to ● The independent EnCoW within the Employer's Representative Team ● EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) ● In addition, any statutory bodies in compliance with planning conditions.	Measures will ensure all adverse effects associated with open trench construction are avoided

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
of these measures to ensure their continued effectiveness will take place on an on-going basis while the works are proceeding. ● Where watercourse crossings take place within the existing road curtilage, any drains connecting into the relevant watercourse will be identified and protected through use of sandbags or similar to ensure flows of contaminant laden water do not enter into the watercourse. ● The clearance of any riparian vegetation will be kept to the minimum required for the facilitation of the works such that no unnecessary exposure of riverbanks occurs. ● Works to clear vegetation shall take place from the bank with vegetation pulled back towards the land. The vegetation removed shall be transported off site and disposed of appropriately. ● Following the vegetation clearance, a dry works area shall be established. The measures required to achieve this will be appropriate for the size and flow associated with each watercourse. This may be achieved by: – Isolating the entire watercourse and over pumping the flow. The outflow of any over pumped river shall be placed such that there is no scouring of the riverbed. This will be monitored on an on-going basis by the Contractor's EnCoW. Should scouring (colouration of receiving water) be identified (visually and supported by handheld turbidity monitor readings) the Contractor's EnCoW will oversee the moving of the outflow such that scouring does not occur.				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
– Isolating half of the watercourse through the use of measures such as sandbags (double-bagged, containing only washed sand, from a licensed quarry) or aqua dams and diverting the flow around the works area. ● Following pollution control measure setup, but prior to instream works commencing, the isolated area shall be inspected by the Contractor's EnCoW to ensure that the watercourse is sufficiently protected. The contractor's EnCow shall monitor turbidity within the watercourses using a handheld turbidity meter. ● The Contractor's EnCoW shall direct the Contractor to take corrective actions required. The Contractor's will record all works authorisations, report these to the independent EnCoW within the Employers Representative Team, and maintain on file for inspection as required. ● Should pumping out of the isolated area be required to maintain the dry works area, it shall be ensured that any discharge is treated appropriately prior to entering the watercourse. This may be achieved by discharging to a treatment system such as a silt buster or similar, discharge to a silt bag, or discharging to an area of the watercourse that is protected by a silt boom. These measures shall be used in combination in cases where ground conditions are such that just one measure is not achieving sufficient protection. The success of these measures shall be monitored regularly by the Contractor's EnCoW as works proceed at the watercourse crossings. ● Where the implementation of these measures fail, or are inadequate, the Contractor will implement adapted measures (for example replacement sediment				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
treatment system) in agreement with the Contractor's EnCoW and the Employers Representative Team. ● Any diversion or over pumping of watercourses shall be sized such that they will accommodate a 1% AEP flood event over the period in question, so as to prevent the overtopping of work areas.				
Surface Water Protection for HDD Water Crossings Where trenchless crossings are to be carried out (as outlined in Section 2.3.1) there is a risk of pollution caused by run off and frack out associated with the works. The following measures shall be undertaken where trenchless construction methods are utilised for crossings. ● Only competent and experienced specialist contractors will be appointed to undertake the work. ● Works areas will be demarcated with construction fencing to ensure that no works occur outside these areas ● Drainage ditches and routes to water courses will be identified for silt controls / water retention within works areas, so that water conveyance (during rain events, and dewatering) in and around the work site is clearly understood ● Measures for the installation and inspection of silt fences will be as follows: – Silt fences will be installed downgradient of the potential source of the silt / sediment; – The silt curtain will contain the area where silted waters are being generated and shall terminate on high ground;	Measures prescribed as best practice and are proven technologies / methods.	Pollution prevention measures will need to be in place before the construction works commence	Monitoring as part of the Emergency response plan will be subject to agreement with IFI. The Contractor's EnCoW will carry out daily monitoring of pollution control measures such as silt fencing and compliance with restricted areas. Turbidity monitoring to be undertaken visually and with handheld meter. The Contractor EnCoW will report monitoring findings, and adaptive management actions taken in writing to • The independent EnCoW within the Employer's Representative Team • EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) • Any statutory bodies in compliance with planning conditions. The specialist drilling team will monitor parameters such as fluid volume pressure, pH, weight and viscosity. The volume of cuttings produced will also be monitored.	Measures will ensure all adverse effects associated with open trench construction are avoided

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
– They shall be constructed using permeable filter fabric (Hy-Tex Terrastop silt fence or similar) rather than a mesh material; – Its base shall be embedded at least 15cm into the ground and staked at 2m intervals; – The vegetated turves shall be peeled back and not detached from the ground, the materials inserted and the turves replaced to hold the base in place; – The silt fence will be inspected regularly by the EcCoW and contractor during the working day and weekly during construction, and in particular following heavy rainfall; – Silt fences shall remain in-situ until the vegetation on the disturbed ground is re-established; – The fence shall not be pulled from the ground, but cut at ground level and the stakes / posts removed; – Should water build up behind the fences, the sediment will settle to the bottom. Water can be released, but sediments will remain; – Two lines of silt fencing will be installed in sensitive areas. This will follow a judgement call by theEcCoW; – A record of its installation, inspection and removal must be maintained by the EcCoW. ● The likelihood of dewatering will be determined prior to commencement and silt controls such as additional silt fences, silt busters etc will be available for the HDD works. ● Sediment controls will be identified based on site specific detail gathered prior to the HDD set up to ensure all water runoff and bentonite is controlled,				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
treated (silt controlled) and retained within the HDD work area. ● Any dewatering discharge locations will be a minimum 30m from watercourses in well vegetated areas. These will be monitored to ensure no excessive untreated water reached water courses. ● Works will not be carried out during extreme rainfall or high flow events and works will be carried out in accordance with the guidelines set out by IFI in 'Guidelines on Protecting Fisheries During Construction Works in and Adjacent to Waters' (IFI, 2016) and The IFI Biosecurity Protocol for Field Survey Works will be complied with. ● Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the Contractor's EnCoW. The locations will have due regard to ground conditions and topography of the site. ● Constant monitoring by the specialist drilling team of fluid volume pressure, pH, weight and viscosity will be carried out. The volume of cuttings produced will also be monitored to ensure that no over cutting takes place and that hole cleaning is maintained. The mud returns will be pumped to the circulation system trailer by means of a bunded centrifugal pump. The nature of the cuttings will also be monitored to understand the ground conditions as the drilling progresses. ● After the initial pilot hole is completed, it will be reamed in a number of passes to reach the required bore size to enable the cable ducts to be pulled through. To ensure that the prevailing geological conditions have				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
suitable cohesion that can maintain the bore during the drilling and reaming process, close attention will be paid by the specialist drilling team to modelled drag forces during pullback with constant monitoring of load stress undertaken to ensure that modelled tensile stress, collapse pressures, hoop stress and buckling stress are not exceeded. In addition to the above measures, the rate of drilling progress will be monitored to assist with the identification of any voids or changes in strata. ● The Contractor will monitor river / stream flows upstream and downstream of any directional drilling of watercourse crossings. The flow monitoring will be undertaken on a daily basis for five working days prior to the directional drilling, during the directional drilling and for five working days following completion of the directional drilling. The Contractor will record the results of such monitoring and provide these to relevant parties identified in this table. If a measurable increase in losses from the watercourse to ground is observed in the reach where the directional drilling took place, IFI will be notified and consulted, and bed lining will be undertaken if required. ● An Emergency Incident Response Plan will be developed in consultation with IFI. This will be provided to effectively address inadvertent releases of sediment through frac-outs, or other releases of sediment laden water from the project site. The plan shall clearly outline the steps that the contractor is to take in the event of a sediment release or other type of spill. The plan will clearly outline the steps involved to mitigate an inadvertent return or frac out after it occurs and should not rely solely on the contractor to take all necessary steps to minimize the impacts. Contingency Plans may include the provision of a vacuum truck, or alternative				

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
means of containing or cleaning up a sediment release, at the time of construction in sensitive areas. If vacuum trucks are to be utilized, they should be on-site during construction, and be ready to contain any spill, as it occurs, before it enters a surface water feature. If a sediment spill occurs within the watercourse, adequate isolation of the release should be provided to contain the sediment, and the vacuum truck be ready to remove the drilling fluid and any other frac out soil. Additional measures may include having a supply of products that can be used to stop a frac-out, such as 'Poly Swell', or equivalent. This product can be mixed into both water and filling mud to seal or fill fractures. All products used on site are to be environmentally safe. Frac mitigation wells may also be considered to relieve drilling pressures. The Contingency Plan should indicate if, and when, HDD activities are to resume.				

3.5.4 Mitigation Against Disturbance to Wintering Birds

The principle likely disturbance from construction activities are from works along the proposed UGC. Mitigation measures to avoid / prevent noise disturbance form works associated with the development are prescribed in below.

Table 3.32: Mitigation Against Disturbance to Wintering Waterfowl

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
● Prior to the commencement of the works, a sound reducing hoarding shall be placed along works areas adjacent to Carrowkeribly Lough at a proposed passing bay (Carrowkeribly townland) in consultation with the Contractor's EnCOW. Sound hoarding will help to reduce the noise impacts associated with the construction phase of the works. It will also reduce visibility of workers. ● The barrier material shall have a mass per unit area exceeding 7kg/m2 in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4. ● The EnCoW will undertake daily monitoring of the barrier to ensure installed correctly, and identify any defects for the contractor to remedy. ● All plant used during the construction phase shall be the quietest of its type practical for achieving the works, as demonstrated in writing by the Contractor to the local authority, with reference to other noisier models. ● All plant shall be operated and maintained in accordance with the manufacturer's recommendations including the use and maintenance of the specific noise reduction measures in the next bullet. ● The following will be incorporated to reduce the impact further:	Measures prescribed as standard best practice and are proven technologies / methods (sound hoarding and noise reduction measures are used generally to reduce noise impacts on projects).	Sound reduction hoarding will need to be in place before the construction works commence Implementation of plant specific noise reduction to take place on an ongoing basis.	The Contractor's EnCoW will carry out daily monitoring of noise reduction measures (i.e. visual checks of hoarding) and monitoring of noise levels on a continuous basis during works at Carrowkeribly Lough, The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to ● The independent EnCoW within the Employer's Representative Team ● EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) ● In addition, any statutory bodies in compliance with planning conditions.	Measures will ensure any adverse effects associated with noise disturbance are avoided.

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
– The use of mufflers on pneumatic tools – Effective exhaust silencers – Sound reducing enclosures – Machines in intermittent use shall be shut down during periods where they are not required ● During works at Carrowkeribly Lough noise monitoring will be undertaken. Should noise levels within these exceed 70dBA works will cease and measures taken to reduce sound levels to below this threshold. ● No works will take place at night between dusk and dawn when potentially roosting birds may use Carrowkeribley Lough. This will avoid risk of disturbance.				

3.5.5 Measures to Mitigate Against the Disturbance of Otter

Field surveys did not identify any holts or couches during field surveys. However, there is potential for otter holts and couches to become established prior to the commencement of construction. Mitigation to prevent impact to same is outlined hereunder.

Table 3.33: Mitigation Against Disturbance to Otter

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
As outlined previously The Contractor will ensure an initial confirmatory otter survey is undertaken in advance of the commencement of any works within 150m of the works areas (where access available on lands by affected landowners) as per Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes. This will allow for the identification of any holts have been established prior to commencement of works. The confirmatory pre-construction survey will be conducted no more than 10-12 months prior to construction commencing. Should holts be identified within 150m of the proposed development the following will, at a minimum, be employed, unless otherwise agreed with the NPWS in accordance with NPWS "Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland" (NPWS, 2021)[91]:: ● No works will be undertaken within 150m of holts where breeding females or cubs are present. ● Works within 150m of such a holt can only take place following consultation and in agreement with the NPWS ● No wheeled or tracked vehicles of any kind will be used within 20m of active but non breeding holts ● No light work such as digging by hand or scrub will take place within 15m of such holts	Measures prescribed as best practice and are proven technologies / methods.	Confirmatory surveys will be carried out prior to works commencing. Should any exclusion zones be identified these shall be established prior to works commencing and remain in place until such time as works are complete at the location, or otherwise agreed with NPWS	The Contractor's ECoW will undertake confirmatory survey. Should exclusion zones be established these will be monitored by the ECoW for compliance. The Contractor's EnCoW will report monitoring findings, and adaptive management actions taken in writing to ● The independent EnCoW within the Employer's Representative Team ● EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) In addition, any statutory bodies in compliance with planning conditions.	Measures outlined will ensure any adverse effects associated with potential disturbance to otter holts or couches are prevented.

[91] https://www.npws.ie/sites/default/files/files/strict-protection-of-certain-animal-and-plant-species.pdf

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• The identified exclusion zones will be fenced and clearly marked on site prior to any invasive works. • All contractors on site will be made fully aware or the procedures in relation to the holts by the EcoW • Holes and trenches near watercourses will be covered at night to minimise risk of otter mortality/ entrapment.				

3.5.6 Mitigation to Prevent the Spread of Invasive Species

Field surveys did not identify any invasive species which will be directly impacted by the works. However, there is potential for stands of invasive species to become established within the proposed development footprint prior to the commencement of construction.

It is an offence under Regulation 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended) to plant, disperse, allow, or cause to disperse, spread or otherwise cause to grow any plant species specified in the Third Schedule of the Regulations.

In the event that new invasive species locations are identified following pre-construction confirmatory surveys, in order to comply with the Regulations, the appointed Contractor will ensure biosecurity measures are implemented during the construction phase to ensure the introduction and/or spread of invasive species is prevented. Biosecurity measures which will be implemented during the construction phase are prescribed below.

Table 3.34: Mitigation Against Spread of Invasive Species

Measure	Confidence in the likely success of the measure	Timescale for Implementation	Monitoring requirements	How the measures will avoid / prevent / reduce impacts
• All machinery will be steam-cleaned prior to entering and before leaving site. • Biosecurity measures will be undertaken in accordance with IFI (2010) Biosecurity Protocol for Field Survey Work. • Instream works take place, any footwear and PPE will be inspected on leaving the watercourse each time. Any vegetation or debris found will be removed. • Machinery and equipment that has been working within the channel will be steam cleaned daily, on completion of the works and/or prior to machinery moving off site. • Any equipment not suitable for steam cleaning (e.g. PPE) which has been in contact with the watercourse will be dipped in or scrubbed with a disinfectant solution (e.g. 1% solution of Virkron Aquatic or similar product) and thoroughly dried afterwards. • Any sandbags placed instream will not be reused in other watercourses.	Measures prescribed as best practice and are proven technologies / methods.	Biosecurity measures will be implemented throughout the duration of the construction works.	The ECoW will inspect and monitor all biosecurity measures to ensure they are undertaken correctly. The ECoW will report monitoring findings, and adaptive management actions taken in writing to • The independent EnCoW within the Employer's Representative Team • EirGrid's Planning and Environmental Unit (Chief Infrastructure Office) • Any statutory bodies in compliance with planning conditions.	Biosecurity measures will ensure any adverse effects associated invasive species spread are avoided.

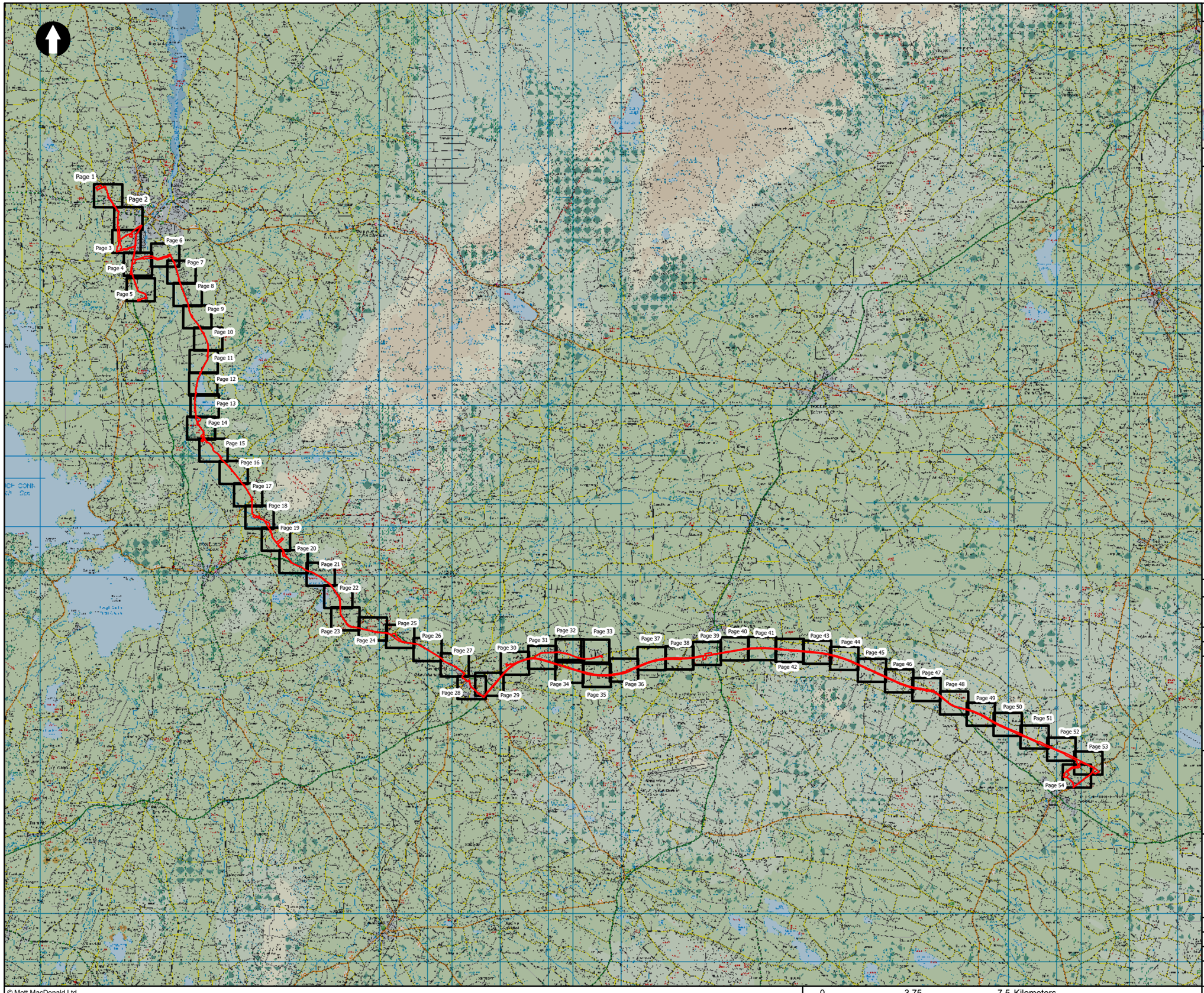
3.6 Conclusion

The mitigation measures detailed in Section 3.5 of this NIS will ensure no adverse effects on the integrity of any European sites in light of the site's conservation objectives

The NIS contains information which the Board, as competent authority, may consider in making its own complete, precise and definitive findings and conclusions and upon which the Board is capable of determining that all reasonable scientific doubt has been removed as to the effects of the proposed development on the integrity of the relevant Natura 2000 sites.

In the light of the conclusions of the assessment which it shall conduct on the implications for the European sites concerned, the Board is enabled to ascertain that the proposed development will not adversely affect the integrity of any of the European sites concerned.

A. Habitat Maps



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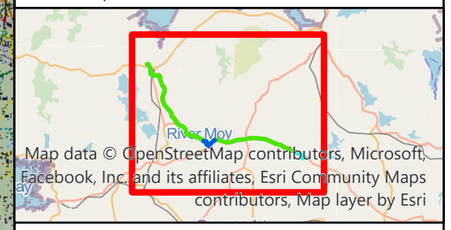

Key to Symbols

Page Layout

Red Line Boundary

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project
Habitat Mapping

Overview Map

Designed	E Tiri	ET	ENG Check	E Johnston	EJ
Drawn	E Tiri	ET	Coordination	E Johnston	EJ
GIS Check	E Tiri	ET	Approved	R McNaughton	RMcN
Scale at A3 1:150,000	Status INF		Rev P1	Security STD	

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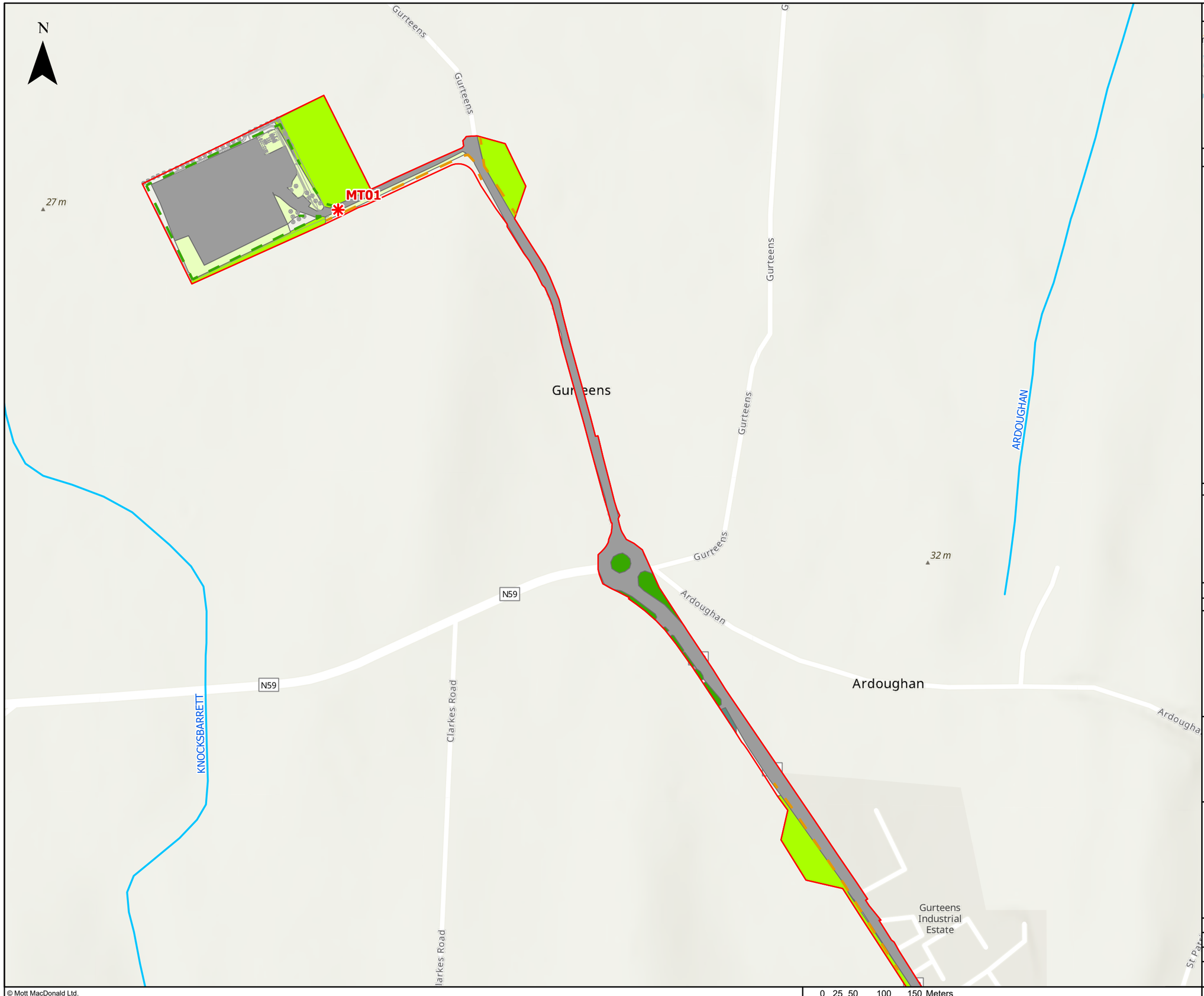

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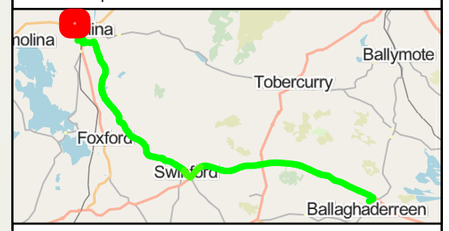

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Substation
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland

Habitat Line

- WL1 - Hedgerows
- WL2 - Treelines

Notes

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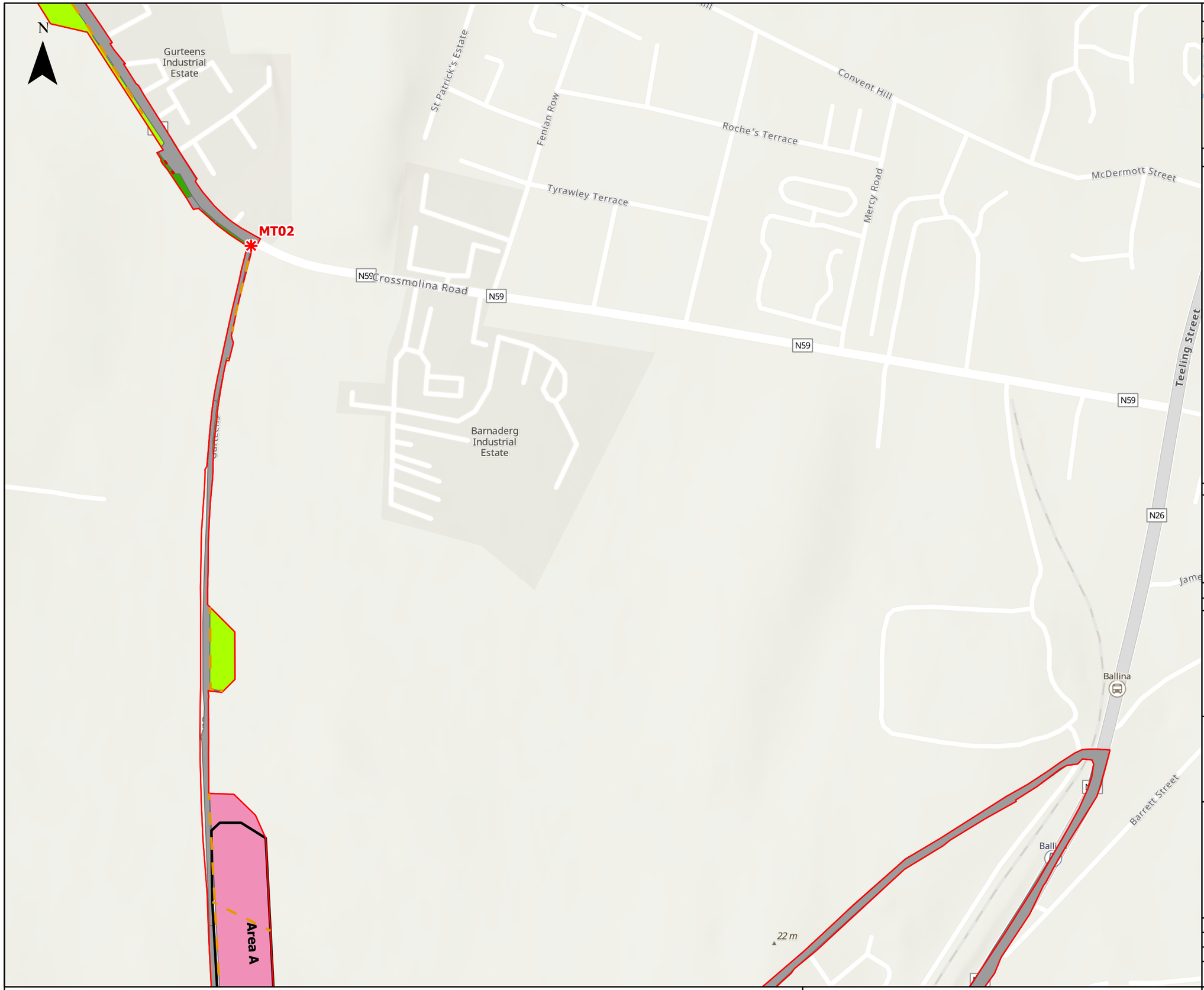

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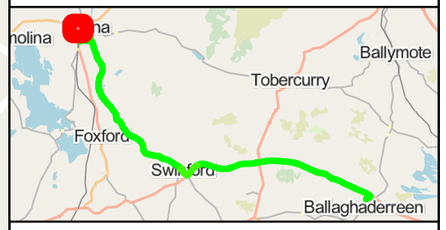

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS4 – Wet grassland
- GS4/GS1 GS1 – Wet grassland / Dry calcareous and neutral grassland mosaic

Habitat Line

- BC4 – Flower beds and borders
- WL1 - Hedgerows

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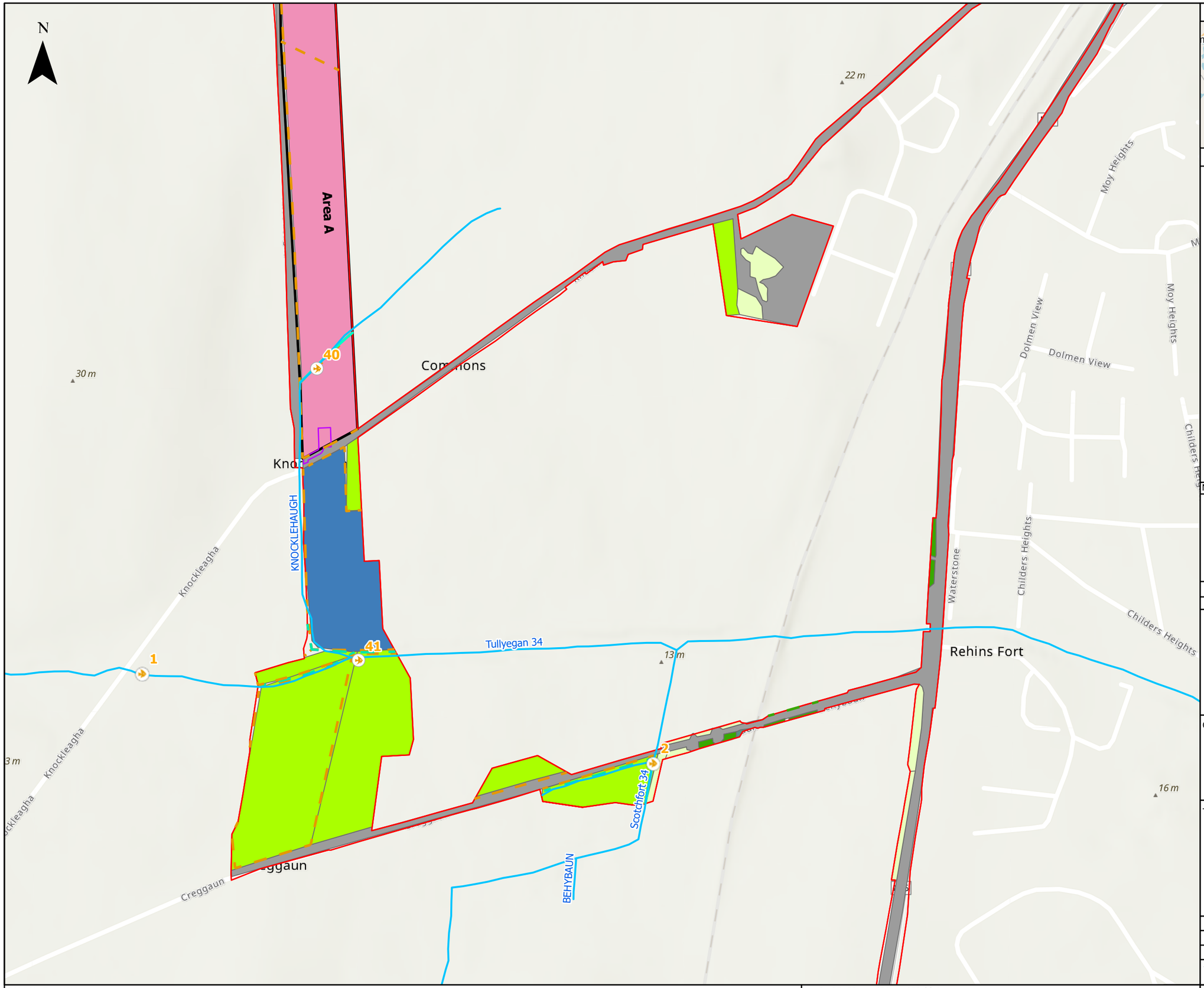

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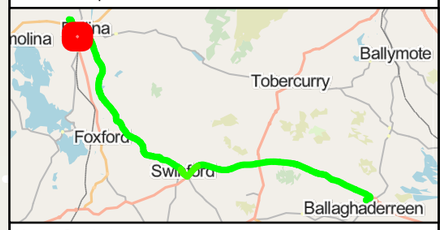

Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS1 - Dry calcareous and neutral grassland
- GS2 – Dry meadows and grassy verges
- GS4/GS1 GS1 – Wet grassland / Dry calcareous and neutral grassland mosaic
- WD1 – Broadleaf woodland

Habitat Line

- FW2 – Depositing/Lowland rivers
- FW4 – Drainage ditches
- WL1 - Hedgerows
- WL2 - Treelines

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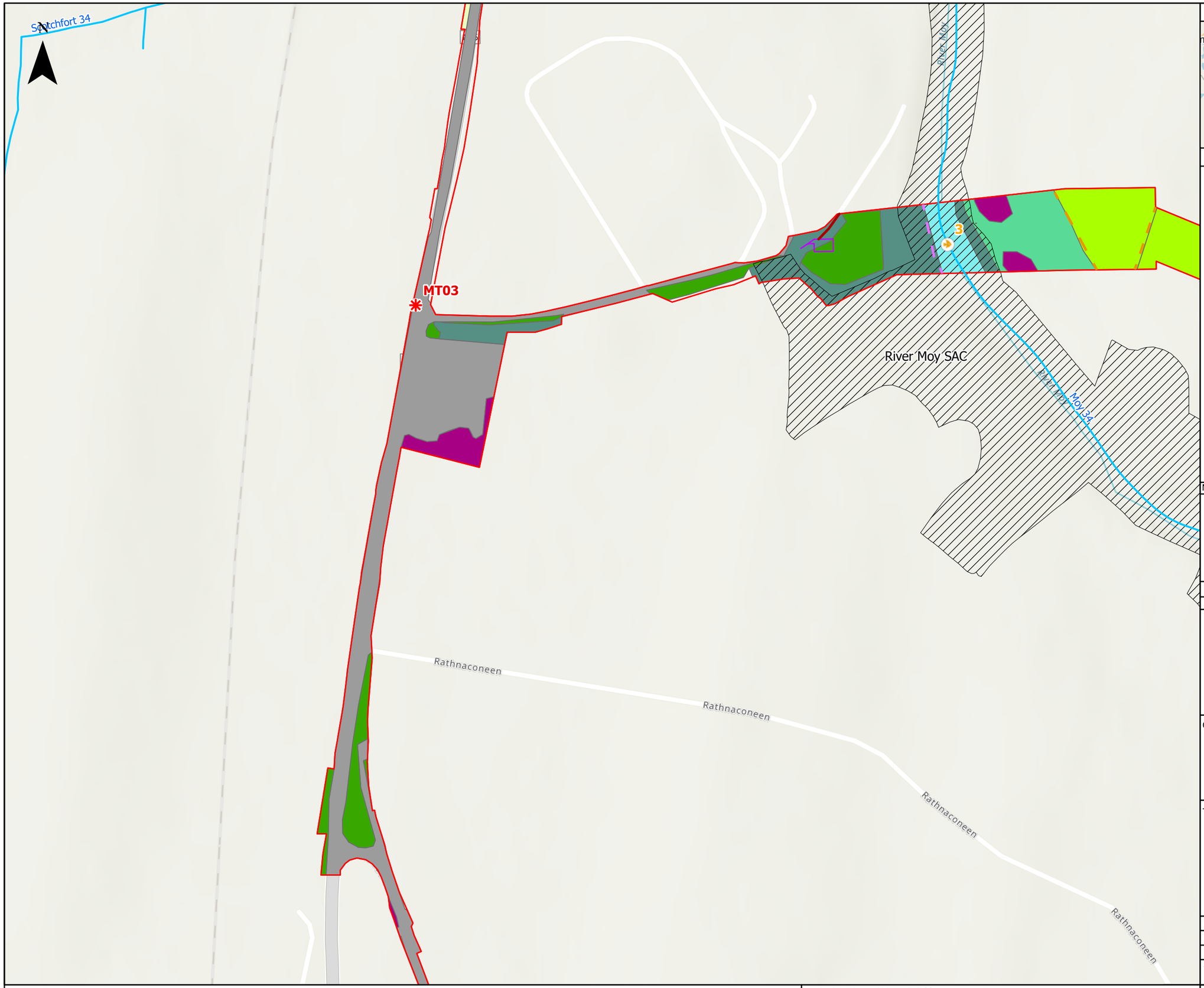
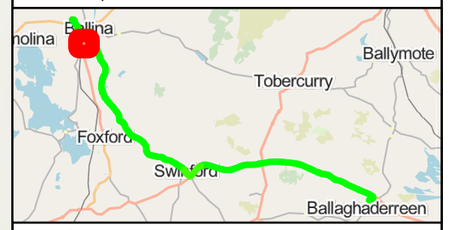


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- FW1 – Eroding /Upland Rivers
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- BL3 – Buildings and artificial surfaces
- WL1 - Hedgerows
- WN6 – Wet willow alder ash woodland

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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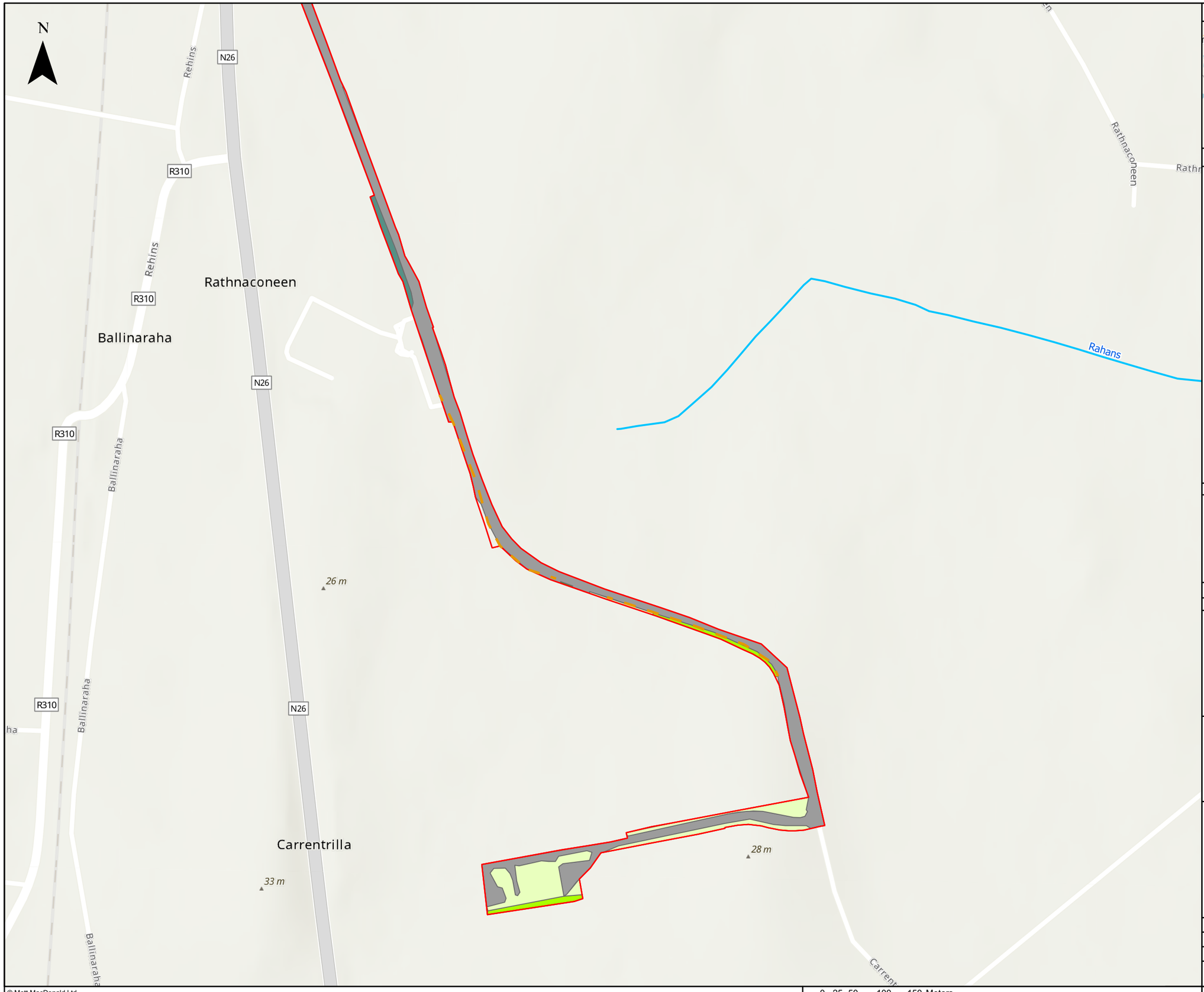
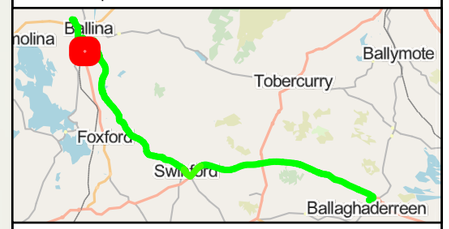
0 25 50 100 150 Meters

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-04



Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland

Habitat Line

- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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0 25 50 100 150 Meters

N

Church Road

Carrowcushlaun

17 m

Carrowcushlaun West

ARDNAREE 34

15 m

Carrowcus

21 m

MT04

25 m

21 m

Area B

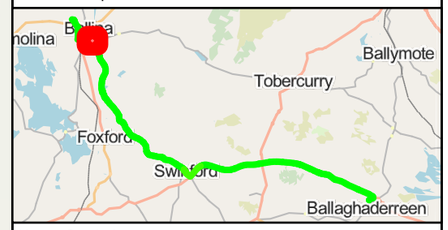
River Moy SAC

River Moy

Moy 34

0 25 50 100 150 Meters

Location Map



Key to Symbols

- Potential bat roosts
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Route Section
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WD4 – Conifer plantation
- WN7 – Bog woodland
- WS1 - Scrub

Habitat Line

- FW4 – Drainage ditches
- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Title

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Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-06

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N

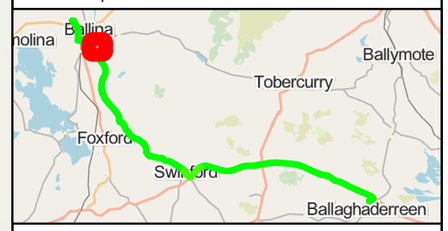
Area B

13 m

River Moy SAC

0 25 50 100 150 Meters

Location Map



Key to Symbols

- Potential bat roosts
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WD4 – Conifer plantation
- WN7 - Bog woodland
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows
- WL2 - Treelines

Notes

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P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-07

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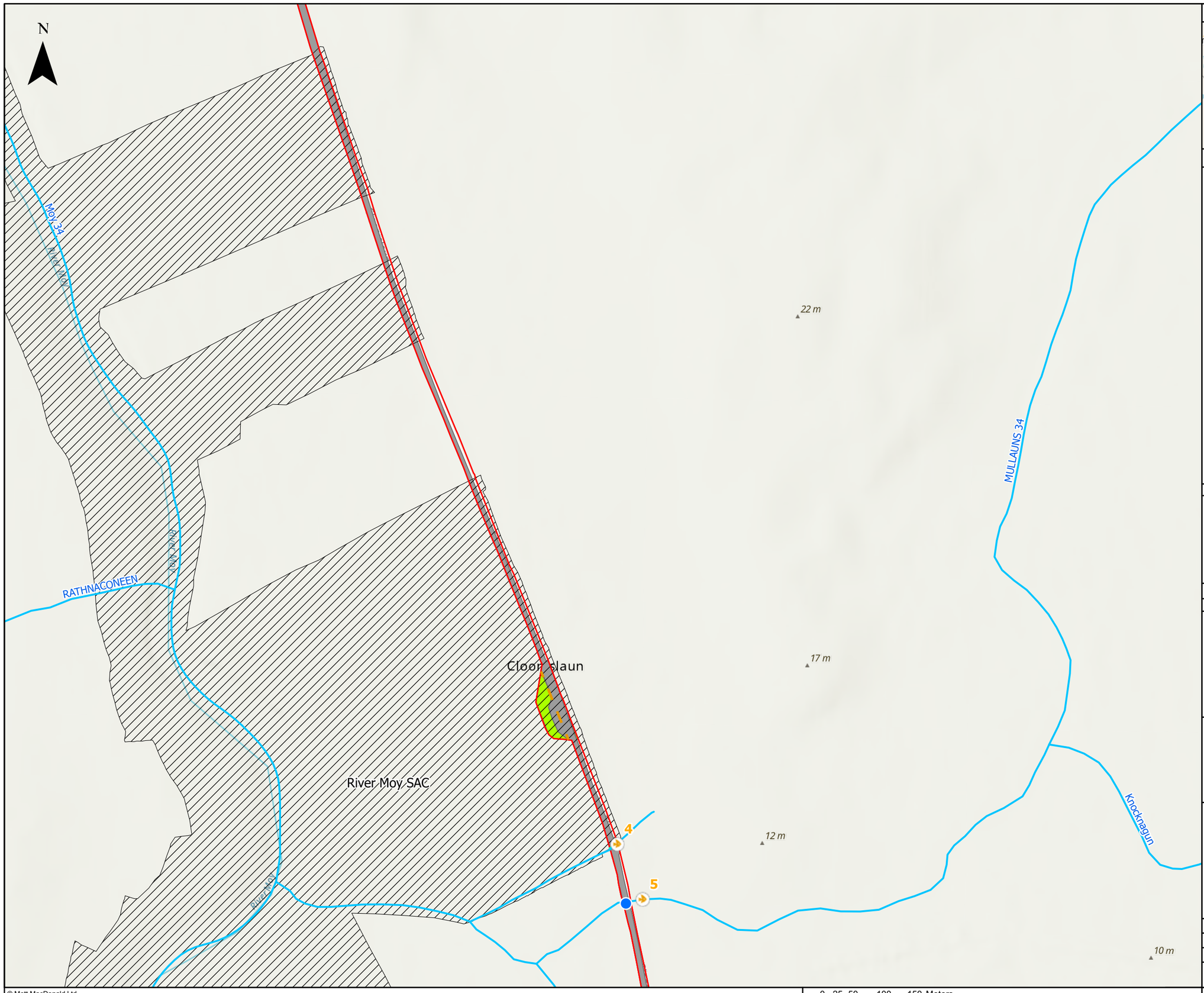
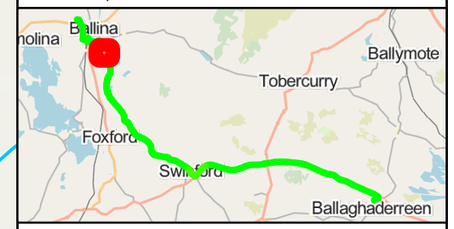


Location Map



Key to Symbols

- Otter signs
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW4 – Drainage ditches
- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
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EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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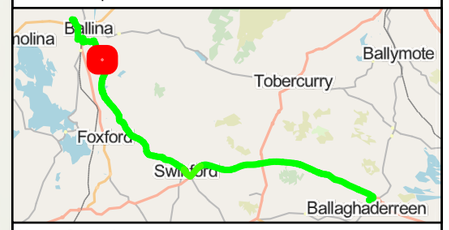
0 25 50 100 150 Meters

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-08

Location Map



Key to Symbols

- Otter signs
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW4 – Drainage ditches
- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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0 25 50 100 150 Meters

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-09

N

Area C

15 m

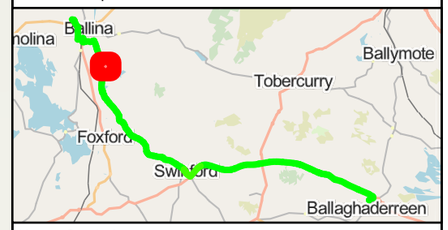
12 m

Breaffy

MULLAGHAWNIY

Mullaghowney

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS3 - Dry-humid acid grassland

Habitat Line

- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

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Title

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Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number 229100591-MMD-00-XX-DR-N404-0069-10

0 25 50 100 150 Meters

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N

11 m

Carrowkeribly

Breaffy

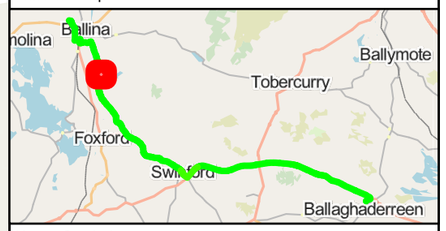
Ballycong

MULLAGHAWNY

MT05

Carrowkeribly

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Title

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number 229100591-MMD-00-XX-DR-N404-0069-11

0 25 50 100 150 Meters

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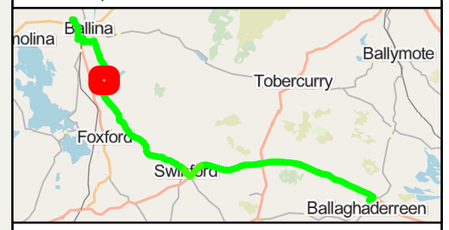
Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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0 25 50 100 150 Meters

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-12

N

Carrowkeribly Lough

17 m

Carrowkeribly Lough (Stream)

BALLYCONG

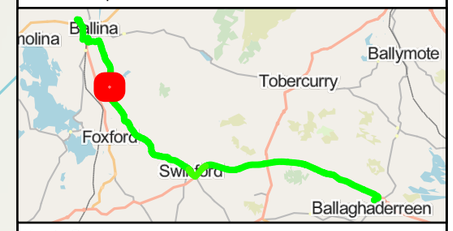
River Moy SAC

Moy 34

7

0 25 50 100 150 Meters

Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- BL1 – Stone walls and other stonework
- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows
- WL2 - Treelines

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Rev	Date	Drawn	Description	Ch'k'd	App'd
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EIRGRID

Title

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Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3	1:4,000	Status	INF	Rev	P1	Security	STD

Drawing Number

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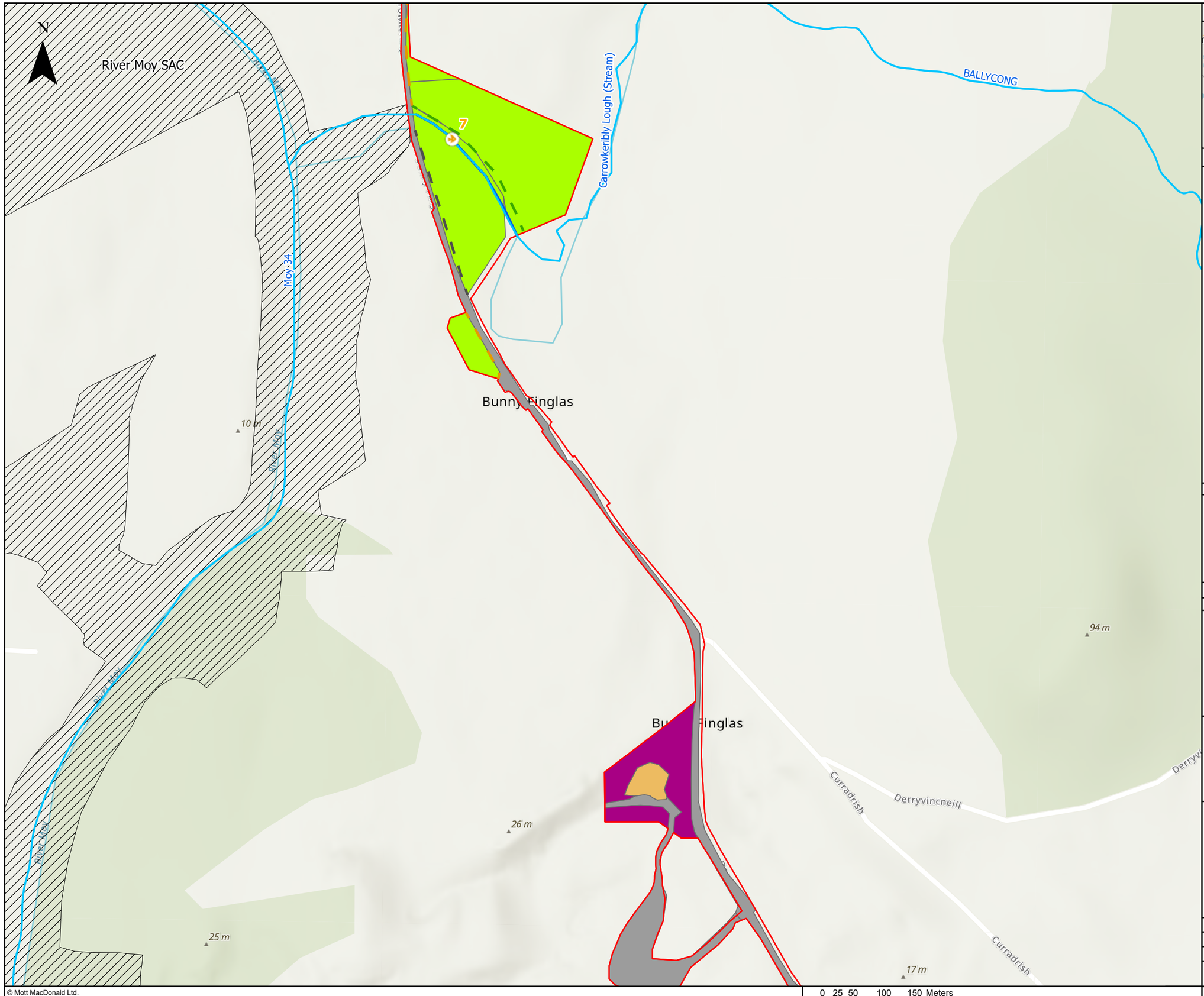
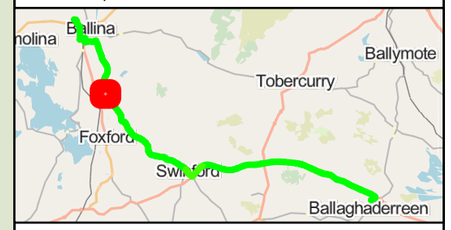


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- ED3 – Recolonising bare ground
- GA1 – Improved agricultural grassland
- WS1 - Scrub

Habitat Line

- BL1 – Stone walls and other stonework
- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows
- WL2 - Treelines

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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0 25 50 100 150 Meters

Drawing Number

229100591-MMD-00-XX-DR-N404-0069-14

N

17 m

17 m

Curradrish

Curradrish

Curradrish

Curradrish

Drumcroba

River Moy SAC

Moy 34

River Moy

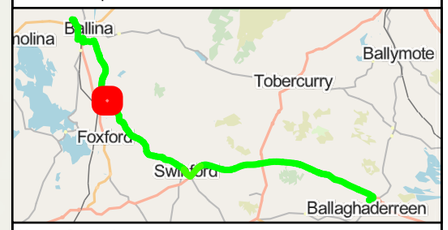
River Moy

Yellow (Foxford)

Area D

0 25 50 100 150 Meters

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA2 – Amenity grassland
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

Notes

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Habitat Mapping

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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N

Curradrish

TREANOUGHTER

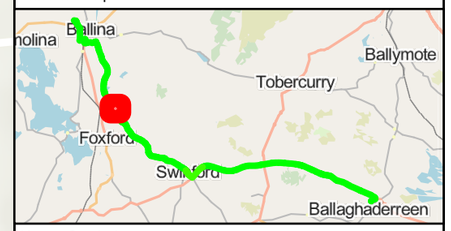
8

Curradrish

Yellow [Foxford]

River Moy SAC

Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- FW4 – Drainage ditches
- WL1 - Hedgerows

Notes

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number
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0 25 50 100 150 Meters

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N

14 m

River Moy SAC

12 m

Yellow (Foxford)

Boherhallagh

Boherhallagh

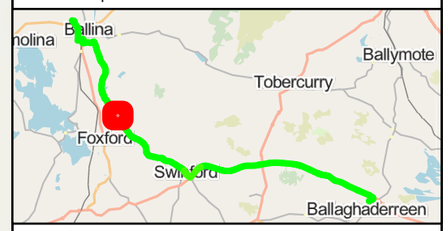
Boherhallagh

herhallagh

Roosky 34

0 25 50 100 150 Meters

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland

Habitat Line

- WL1 - Hedgerows

Notes

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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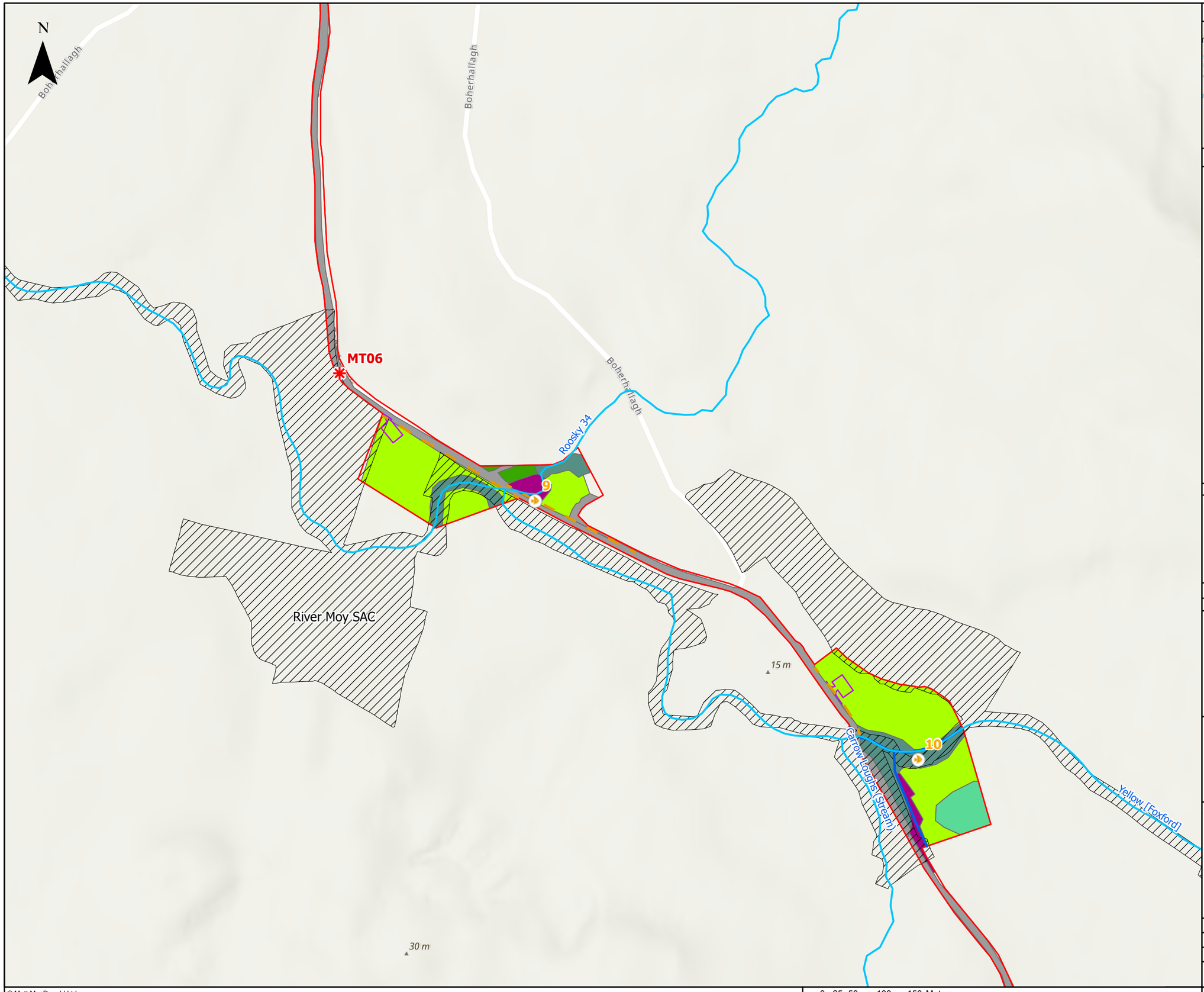
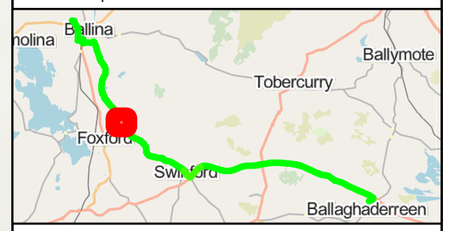


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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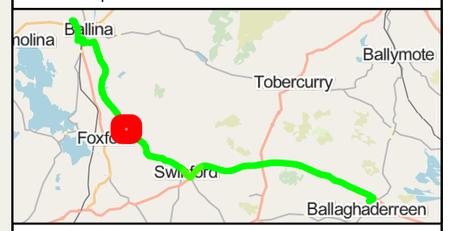
0 25 50 100 150 Meters

Location Map



Key to Symbols

- Potential bat roosts
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WD2 – Mixed broadleaved/conifer woodland
- WN6 – Wet willow alder ash woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows
- WL2 - Treelines

Notes

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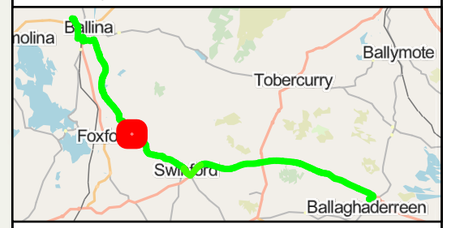
Location Map



Key to Symbols

- Potential bat roosts
- Aquatic sites
- Potential 6410 Annex 1 Molinia Meadow
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section
- Ecologically Sensitive Areas
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- ED3 – Recolonising bare ground
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WN6 – Wet willow alder ash woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW2 – Depositing/Lowland rivers
- GS2 – Dry meadows and grassy verges

Notes

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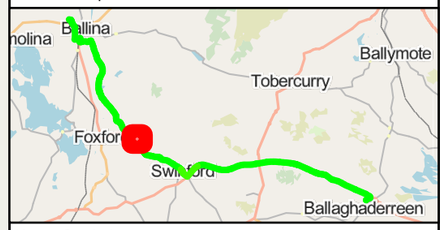
0 25 50 100 150 Meters

Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- GS2 – Dry meadows and grassy verges
- WL1 - Hedgerows
- WL2 - Treelines

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Drawing Number

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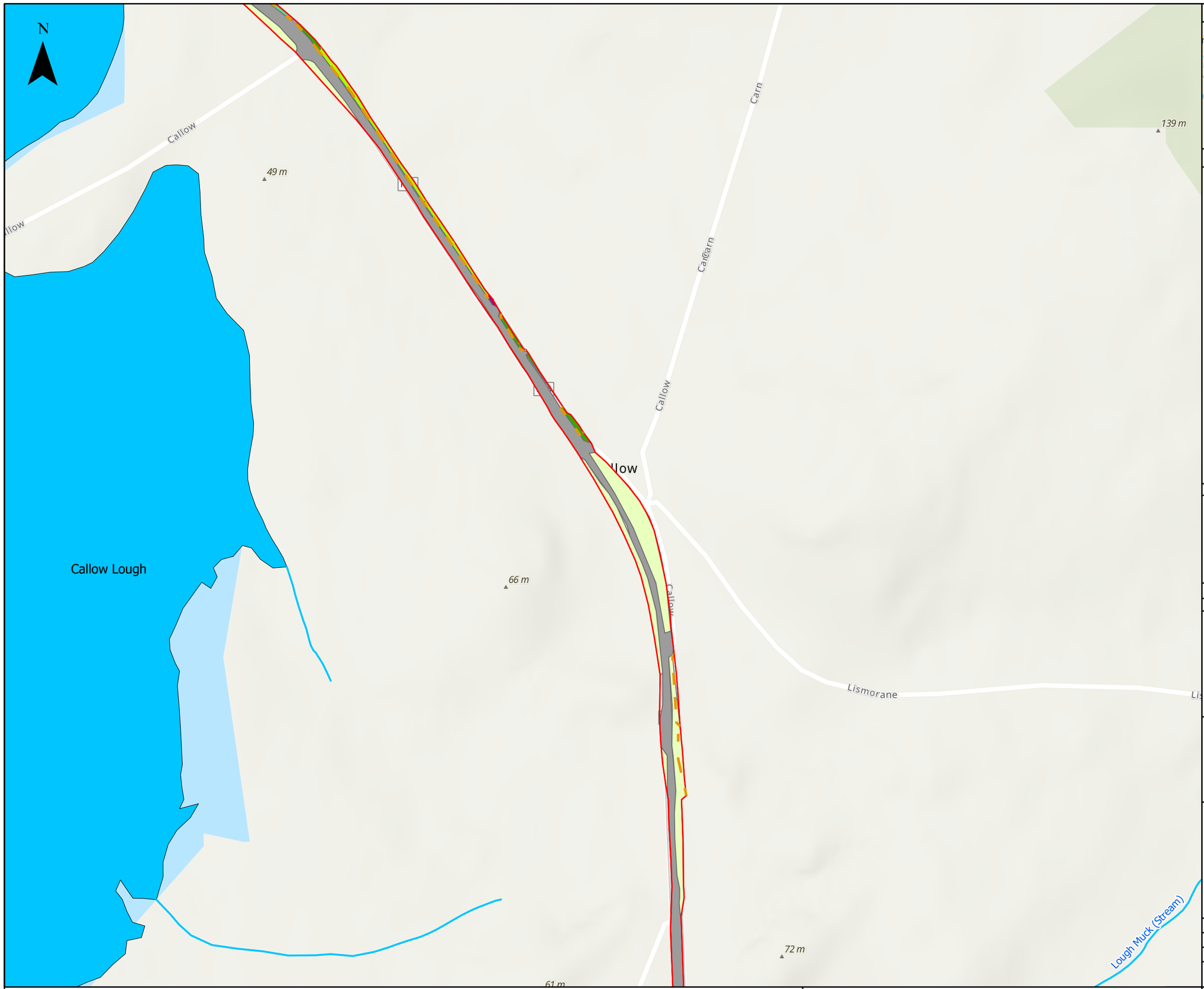
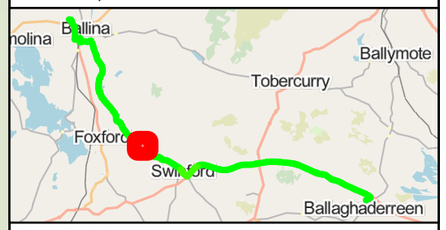


Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

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EIRGRID

Title

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Habitat Mapping

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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1:4,000	INF		P1	STD	

Drawing Number

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0 25 50 100 150 Meters

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N

Lismorane

72 m

61 m

52 m

Lough Muck (Stream)

14

82 m

67 m

53 m

52 m

52 m

Lismorane

LISMORAN

Lismorane

Cloonygowan

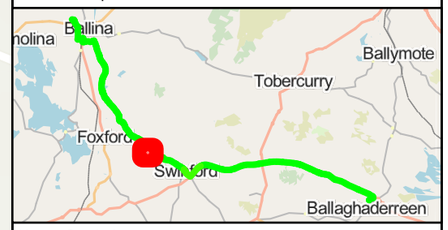
Renbrack

River Moy SAC

39 m

0 25 50 100 150 Meters

Location Map



Key to Symbols

- Potential bat roosts
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- PB1 – Raised bog
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number
229100591-MMD-00-XX-DR-N404-0069-23

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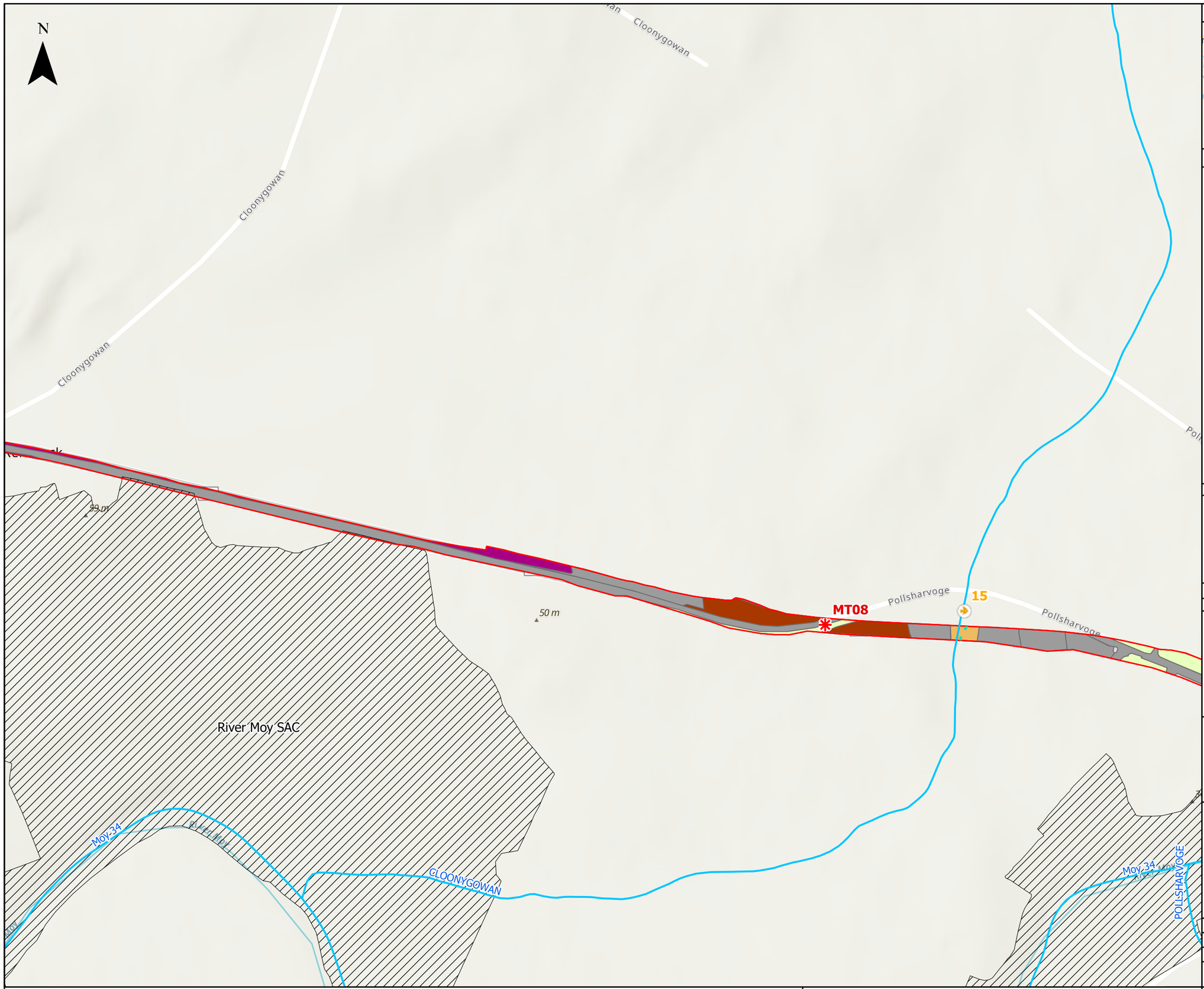
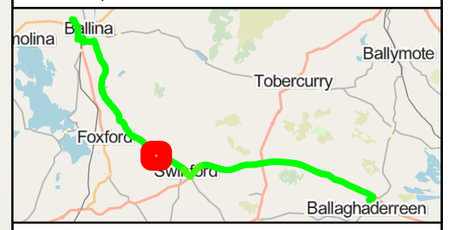


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- ED2 – Spoil and bare ground
- ED3 – Recolonising bare ground
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW2 – Depositing/Lowland rivers

Notes

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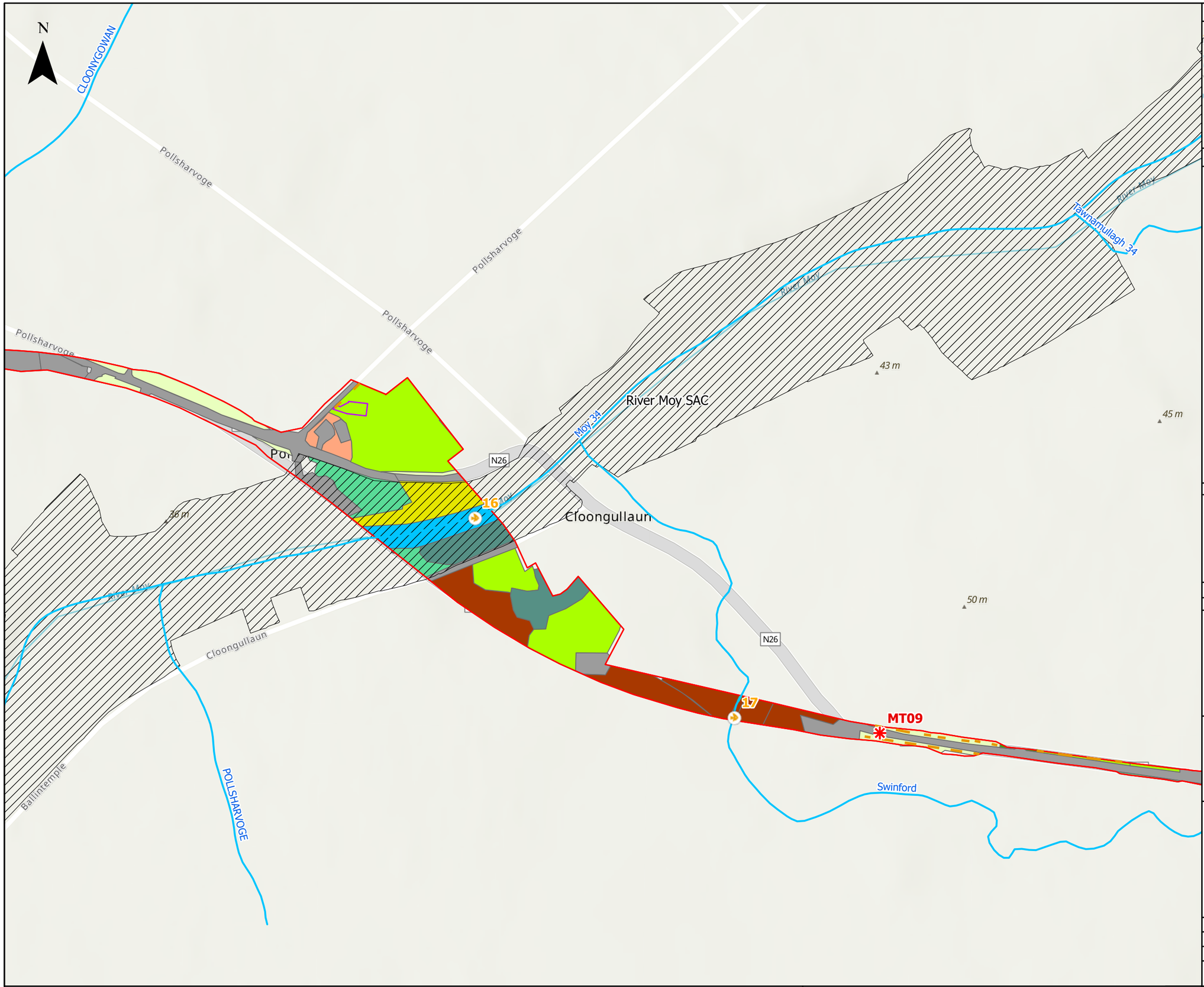
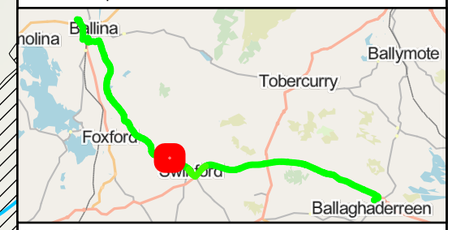


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Route Section

Fossit Code

- BC4 - Flower beds and borders
- BL3 – Buildings and artificial surfaces
- ED2 – Spoil and bare ground
- FW2 – Depositing/Lowland rivers
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WN6 – Wet willow alder ash woodland

Habitat Line

- FW2 – Depositing/Lowland rivers
- WL1 - Hedgerows
- WL2 - Treelines

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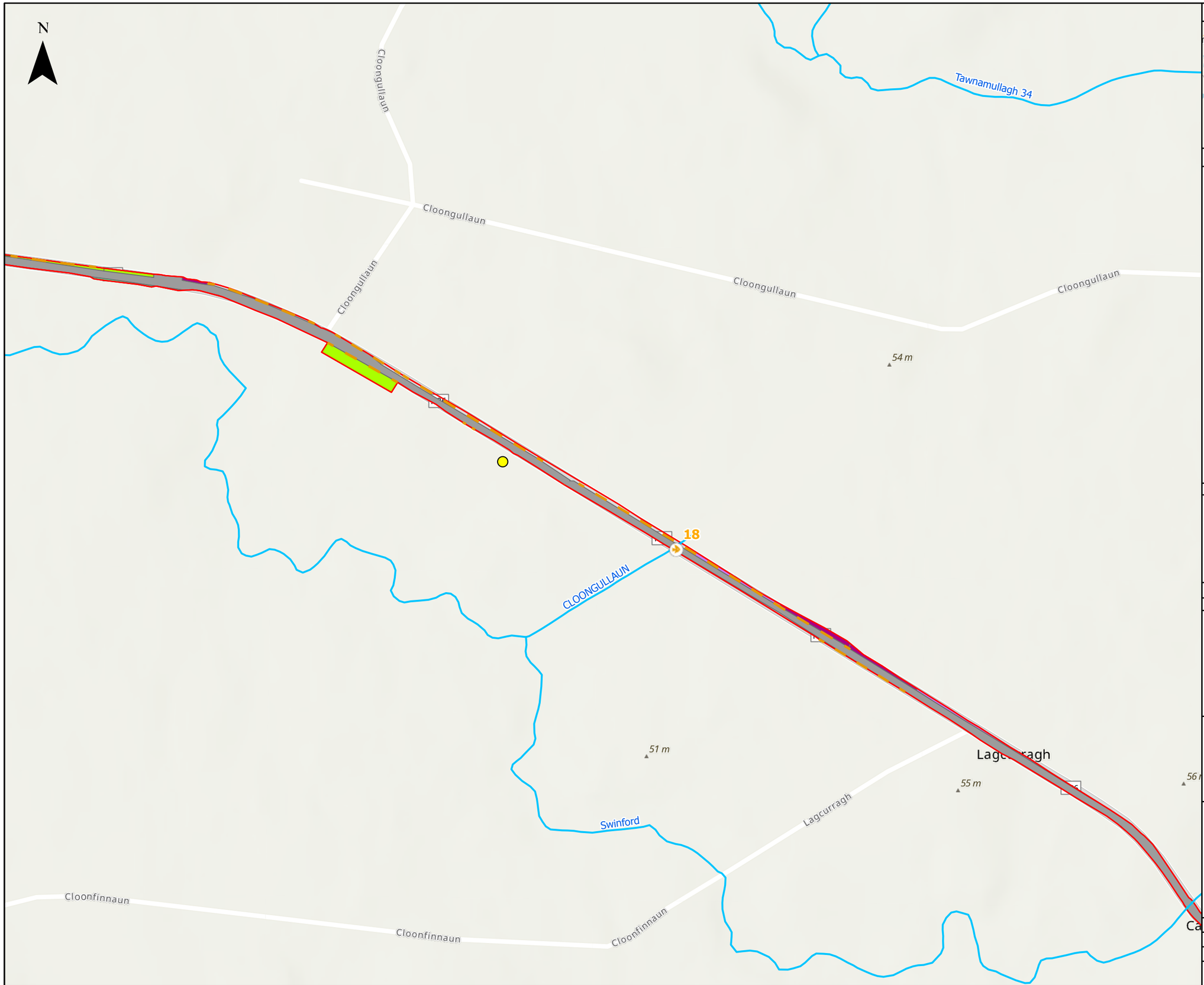
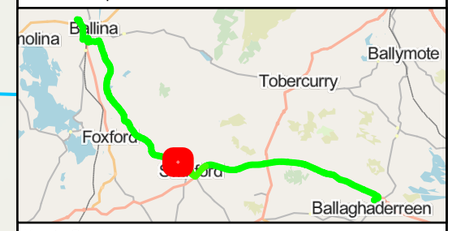


Location Map



Key to Symbols

- Potential bat roosts
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS4 – Wet grassland
- WD4 – Conifer plantation
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW2 – Depositing/Lowland rivers
- WL1 - Hedgerows
- WL2 - Treelines

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North Connacht 110 kV Project

Habitat Mapping

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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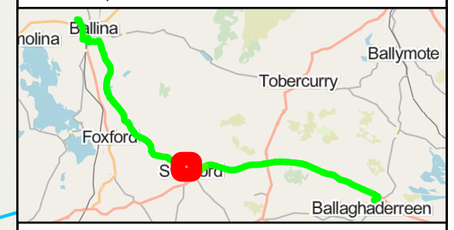
Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- WD4 – Conifer plantation

Habitat Line

- FW2 – Depositing/Lowland rivers

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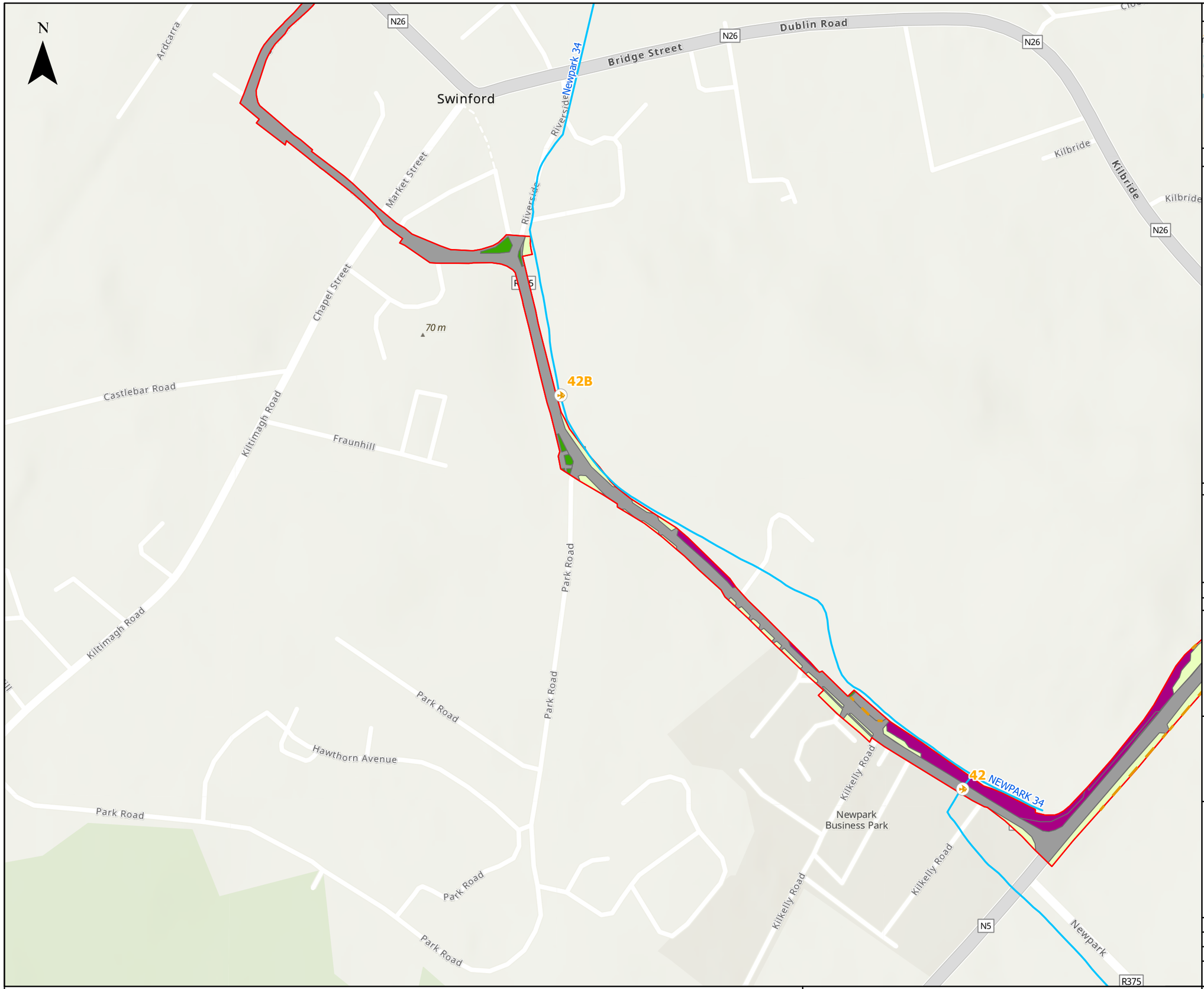
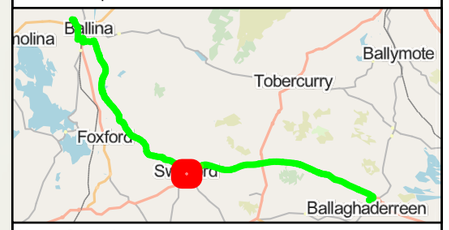


Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

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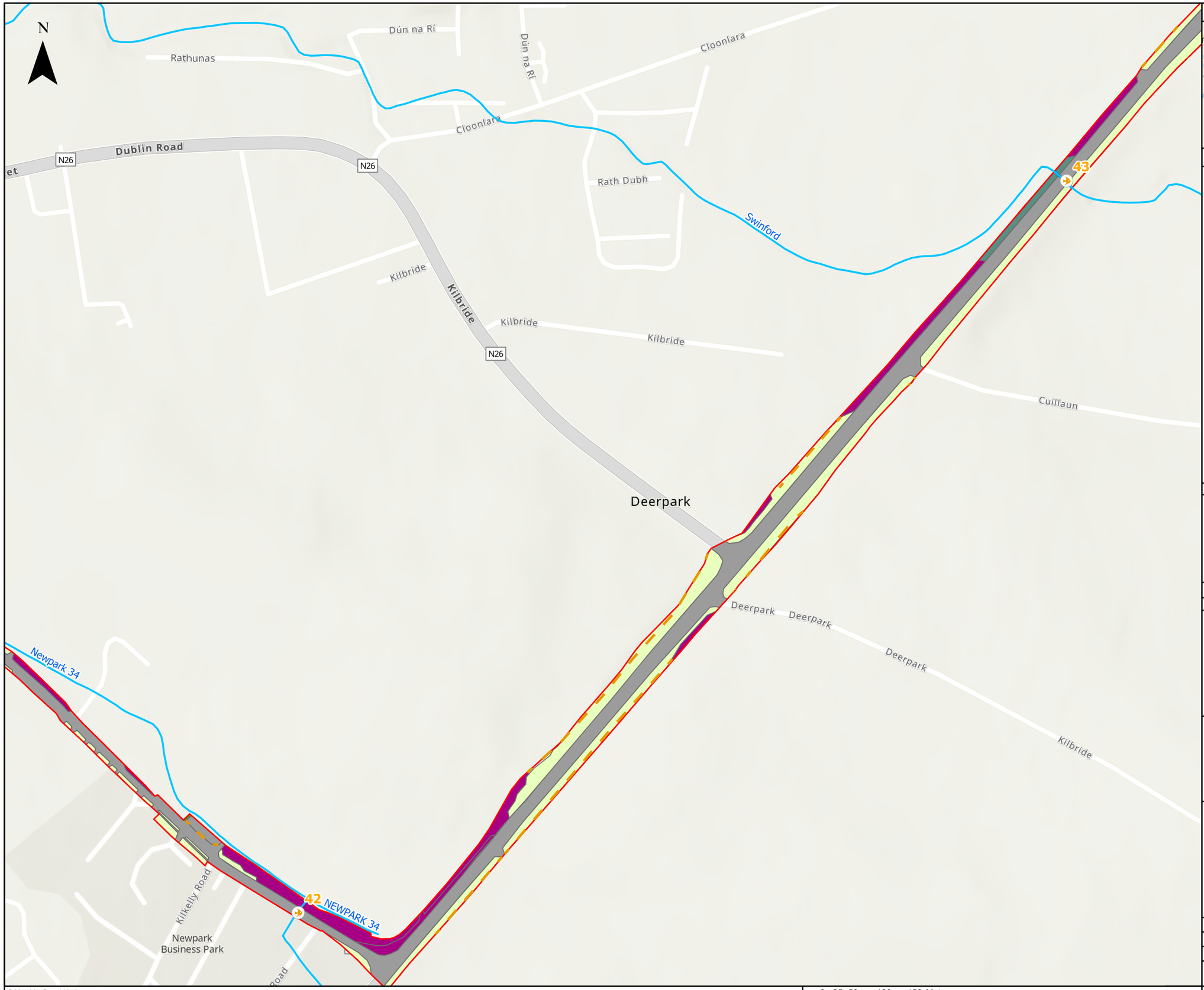
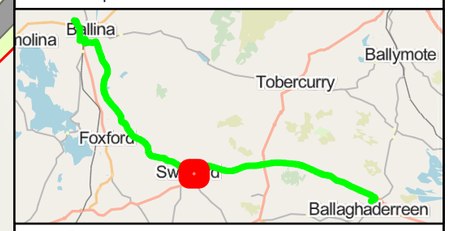


Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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N

MT11A/B

Cloonlara

70 m

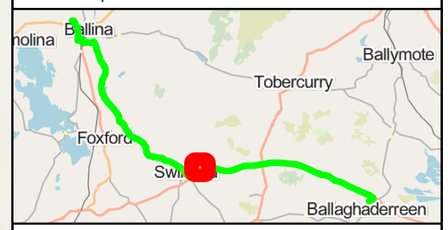
Swinford

80 m

43

0 25 50 100 150 Meters

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland
- WD3 – Mixed conifer woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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N

Esker_West

Esker 34

Cloonaghboy

Cloonlara

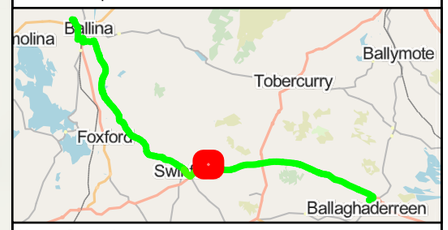
Cloonlara

82 m

Swinford

91 m

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- PB1 – Raised bog
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

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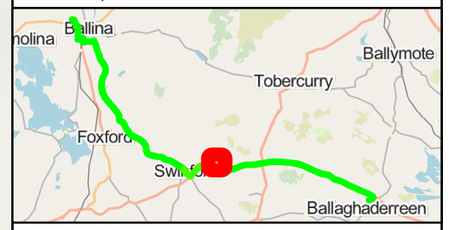
0 25 50 100 150 Meters

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

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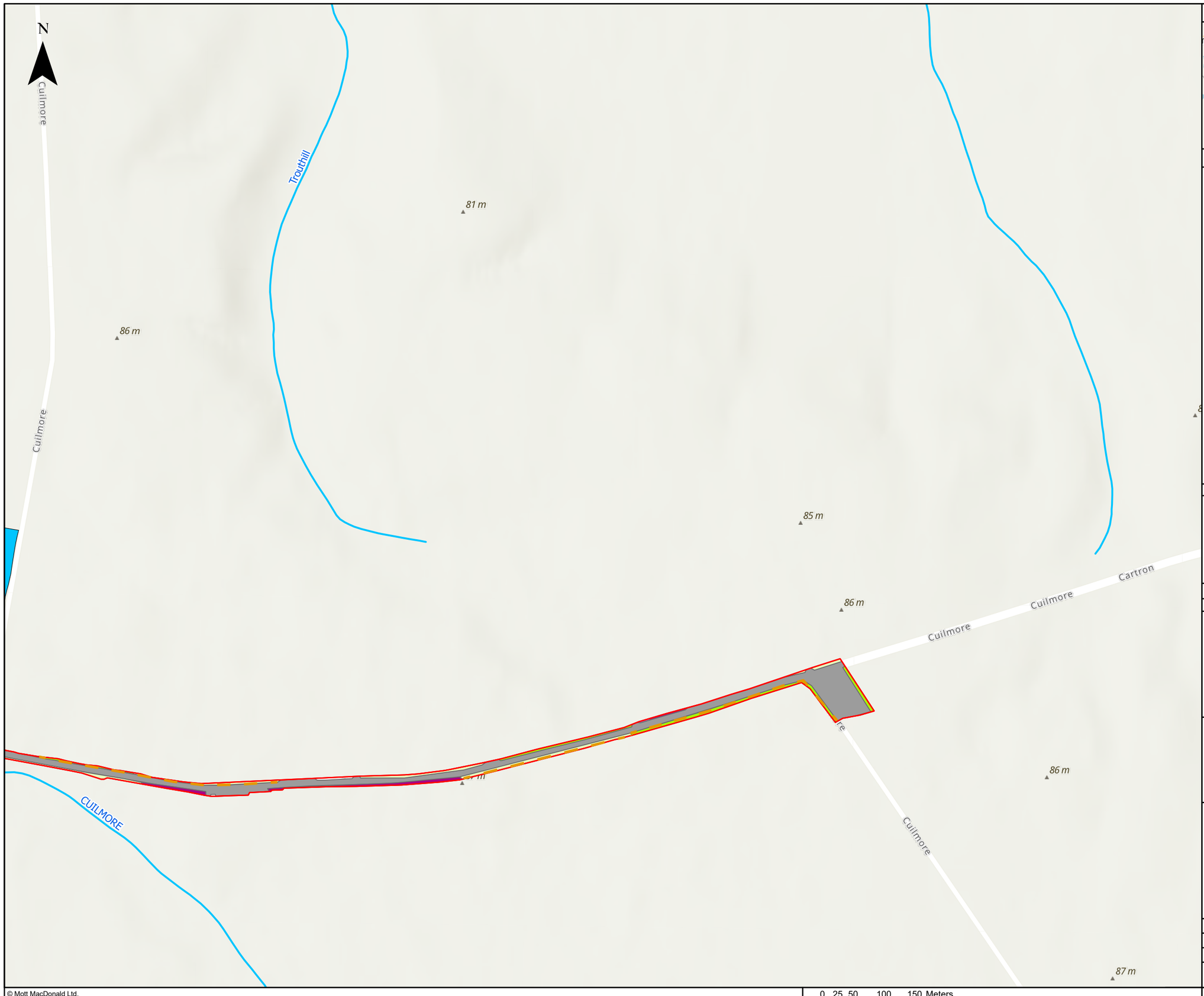
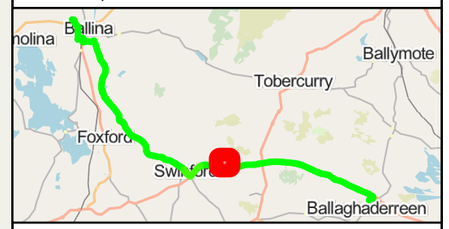


Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- WD4 – Conifer plantation
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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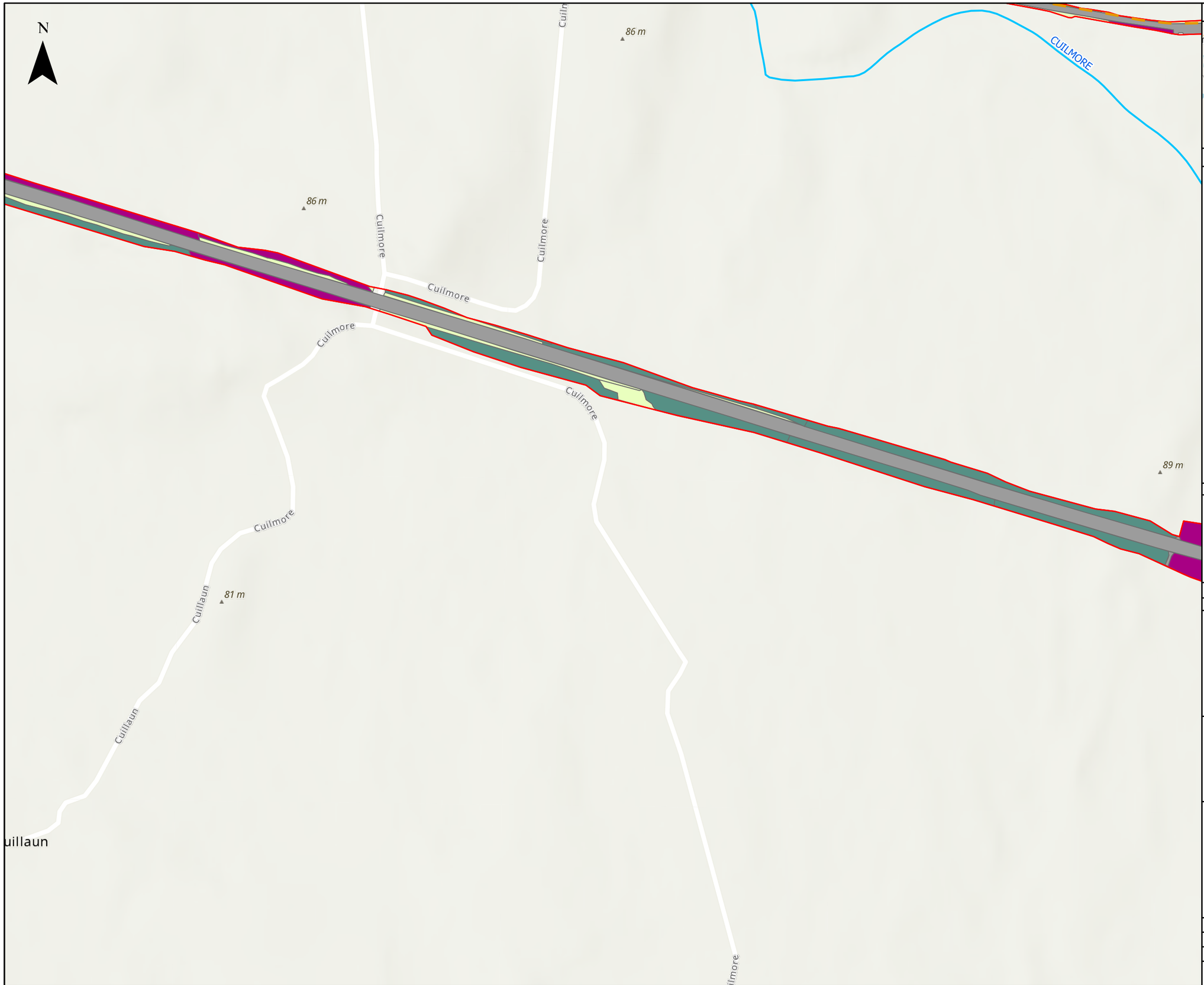
Drawing Number
229100591-MMD-00-XX-DR-N404-0069-33



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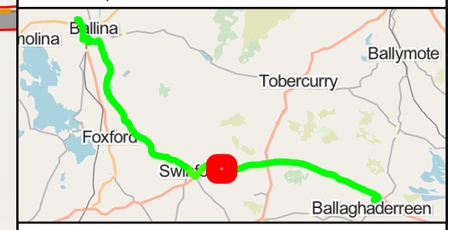

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

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Drawing Number
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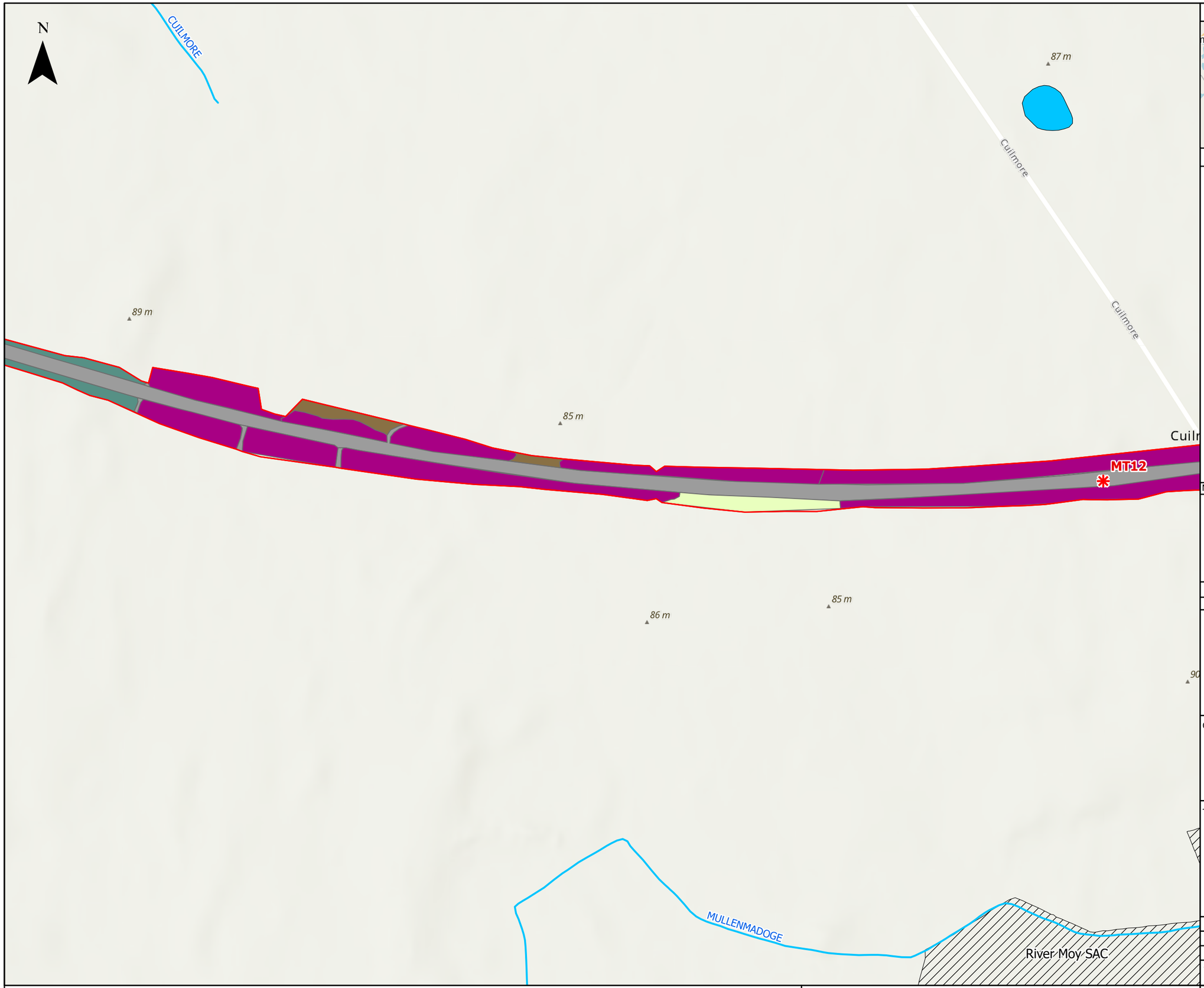

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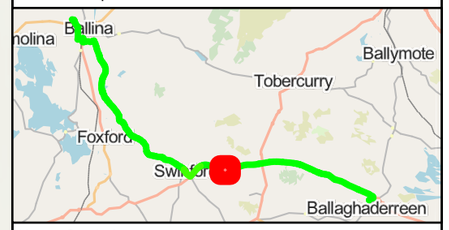

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- PB1 – Raised bog
- WD1 – Broadleaf woodland
- WS1 - Scrub

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	

Scale at A3	Status	Rev	Security
1:4,000	INF	P1	STD

Drawing Number

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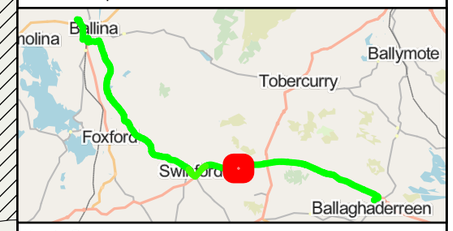
Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- PB1 – Raised bog
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers

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Drawing Number
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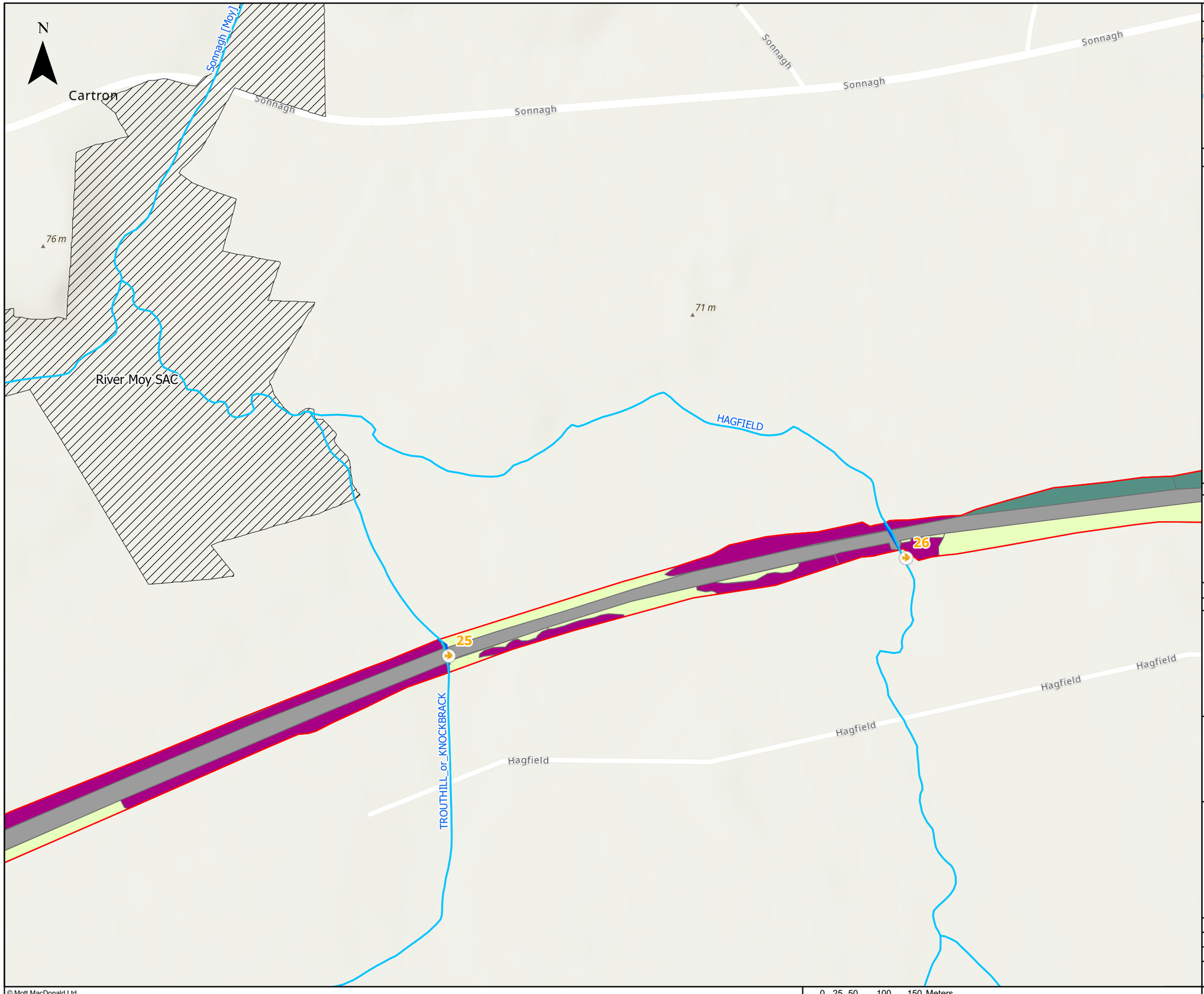
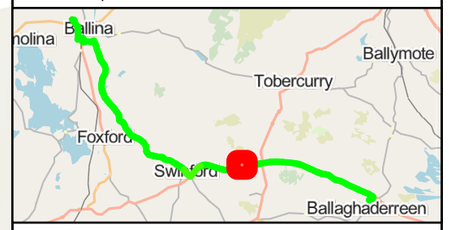


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers

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Drawing Number
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N

Sonnagh

Sonnagh

Sonnagh

Sonnagh

82 m

Hagfield

Hagfield

Hagfield

Hagfield

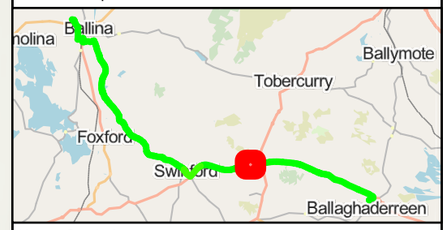
Hagfield

Hagfield

76 m

Hagfield

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WD1 – Broadleaf woodland
- WS1 - Scrub

Habitat Line

- FW4 – Drainage ditches

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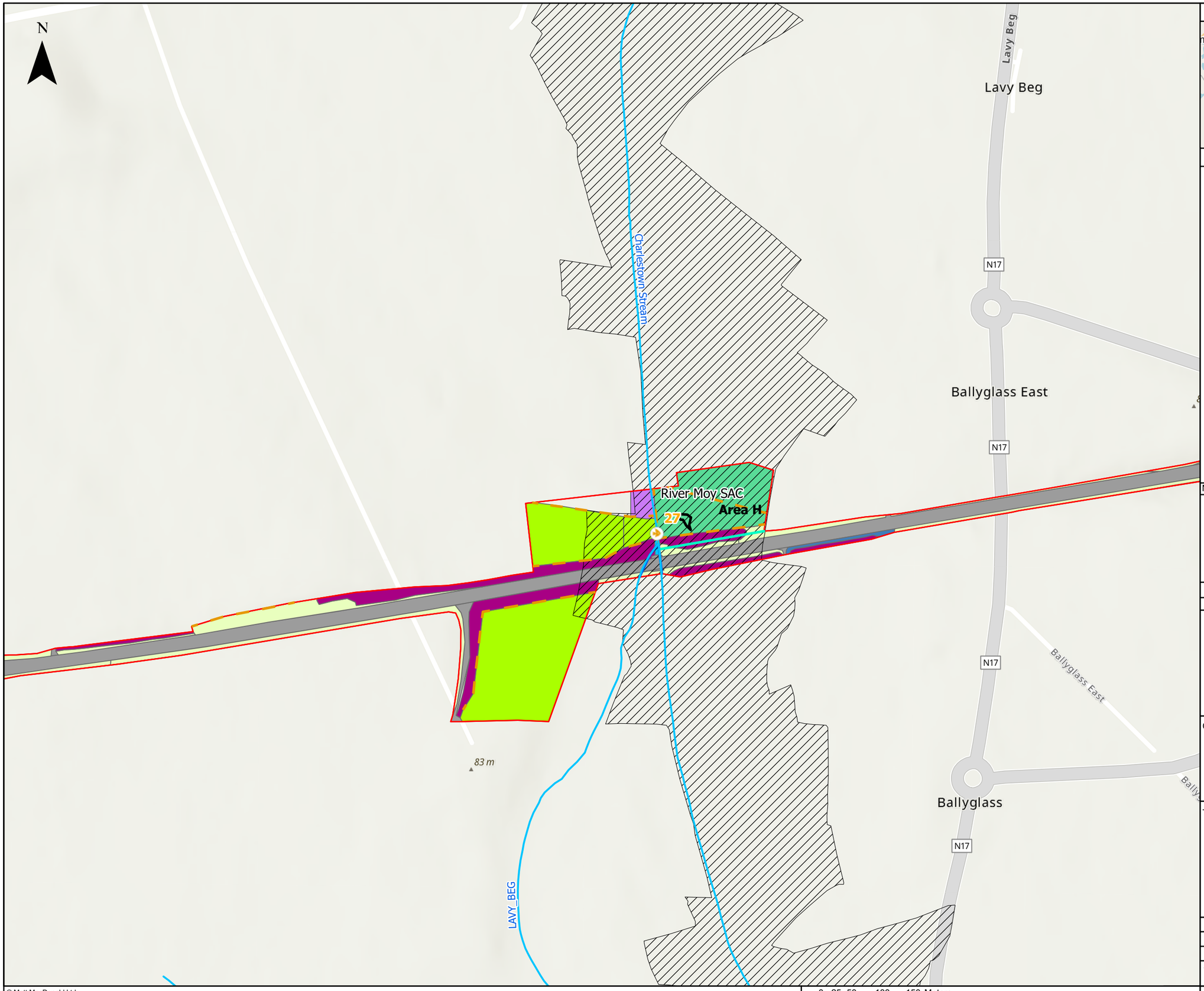

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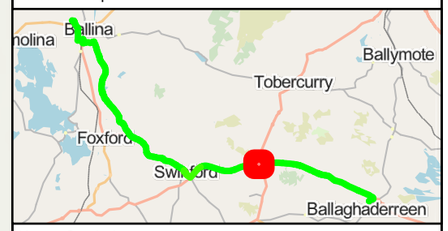

Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Ecologically Sensitive Areas

Fossit Code

- BL3 – Buildings and artificial surfaces
- FW2 – Depositing/Lowland rivers
- GA1 – Improved agricultural grassland
- GS1 - Dry calcareous and neutral grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD4 – Conifer plantation
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW4 – Drainage ditches
- WL1 - Hedgerows

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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0 25 50 100 150 Meters

N

Lavy Beg

LOWPARK

Lavy Beg

Lavy Beg

Lavy Beg

Lavy Beg

91 m

90 m

76 m

83 m

84 m

MT13

28

29

86 m

Bulcaun

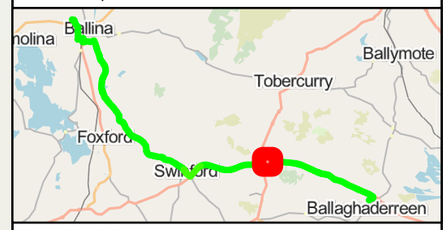
Bulcaun

Bulcaun

Ballyglass East

Ballyglass

Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers

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Drawing Number
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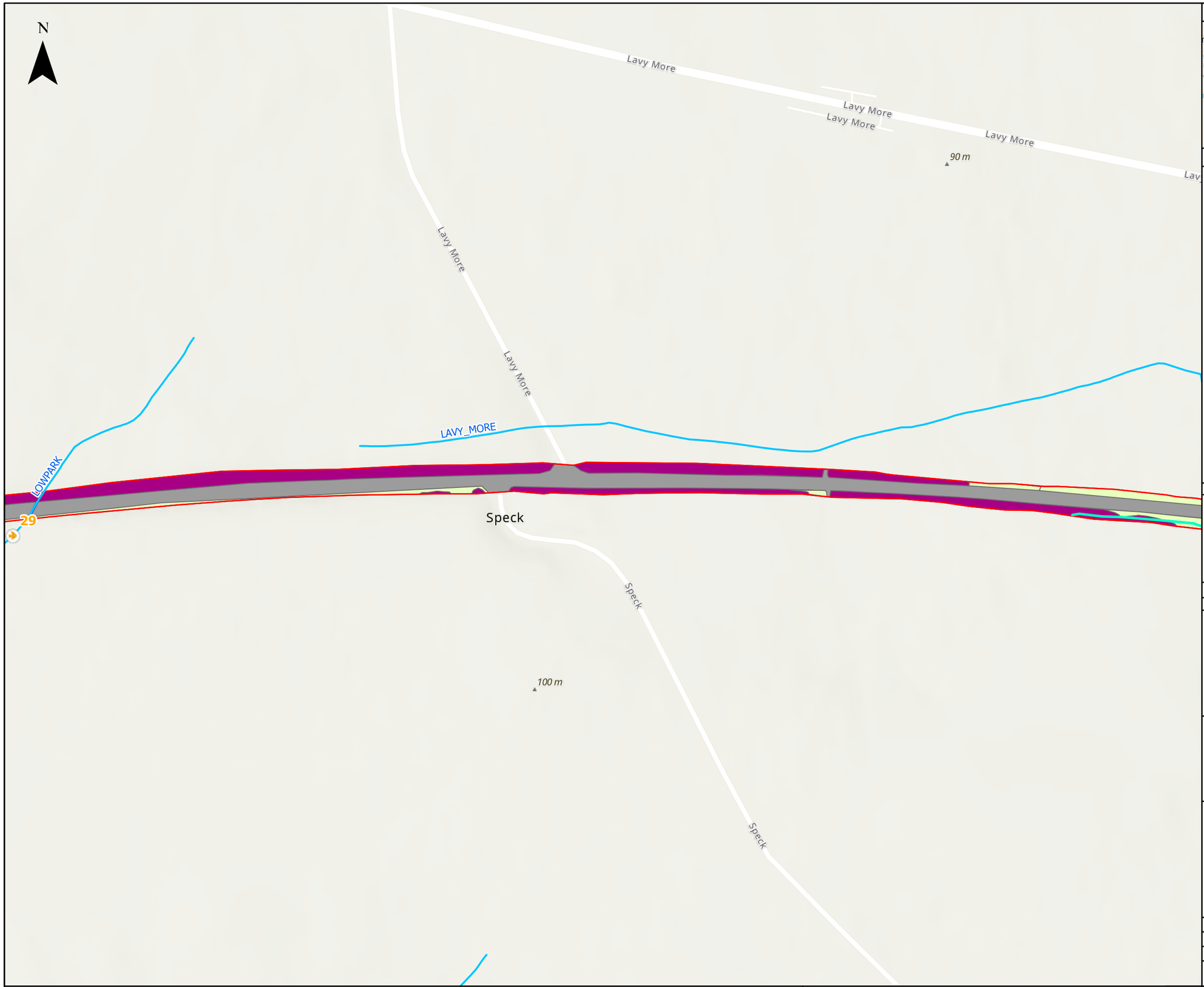
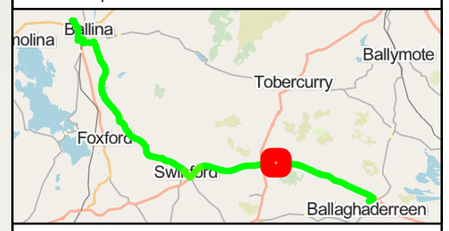


Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW4 – Drainage ditches

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GIS Check	E Tiri		Approved	R McNaughton	
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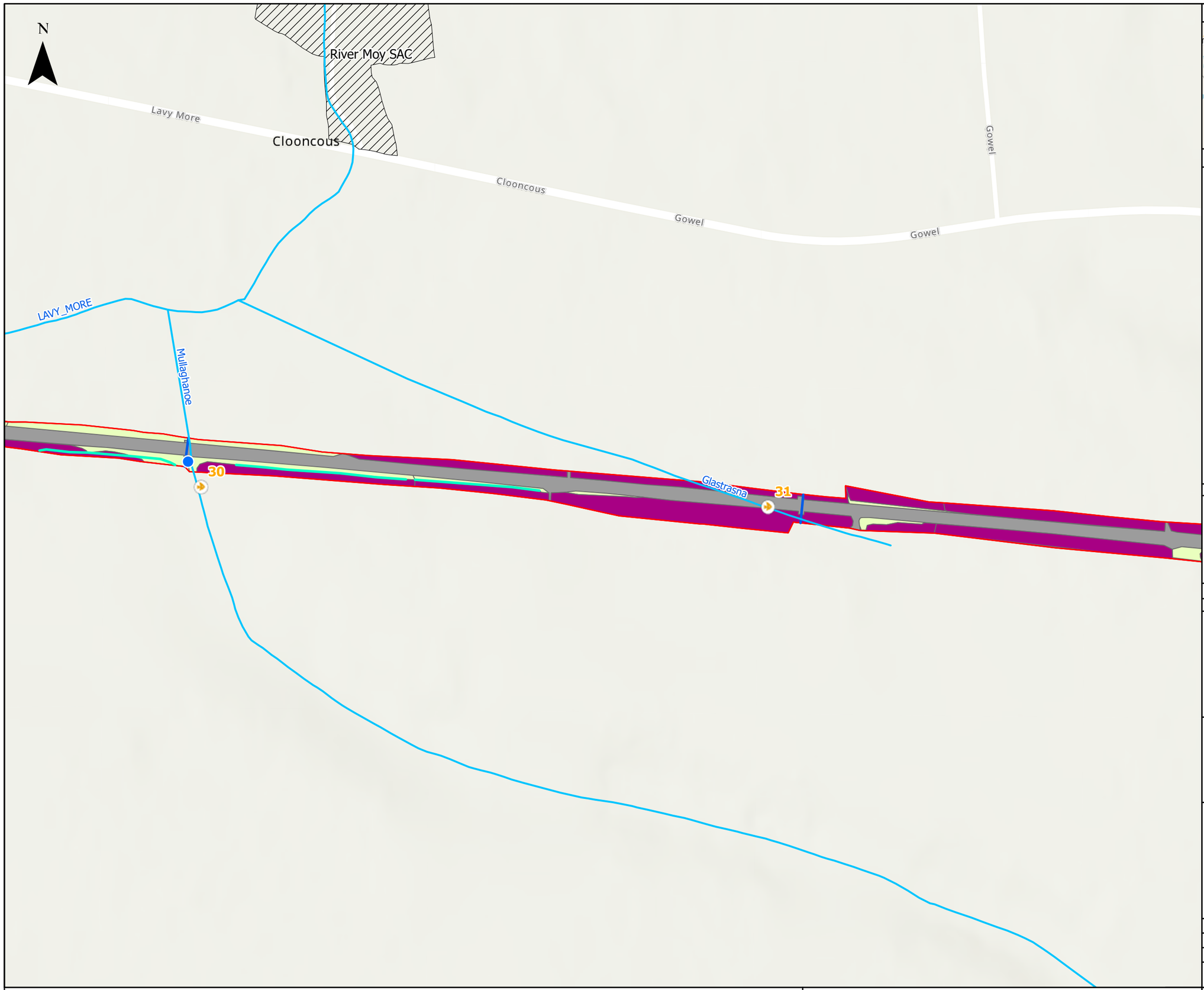
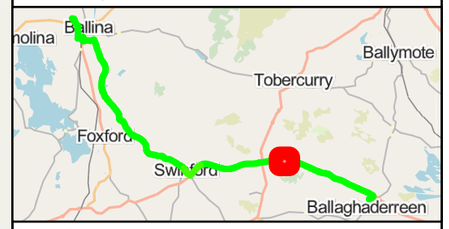
0 25 50 100 150 Meters



Location Map



Key to Symbols

- Otter signs
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- FW4 – Drainage ditches

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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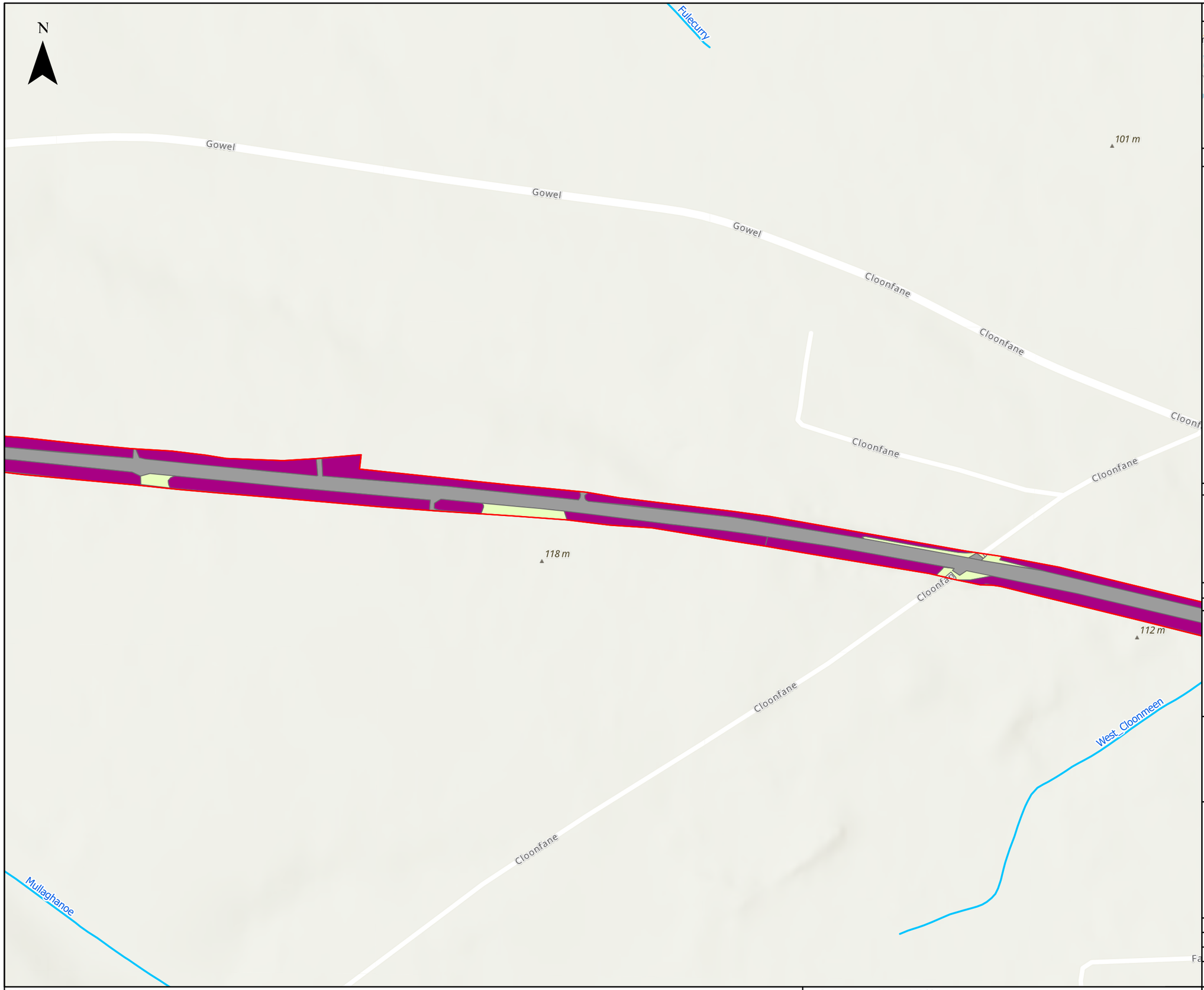

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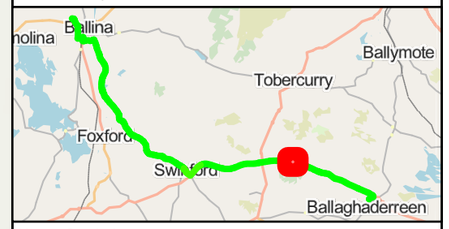

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Notes

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North Connacht 110 kV Project

Habitat Mapping

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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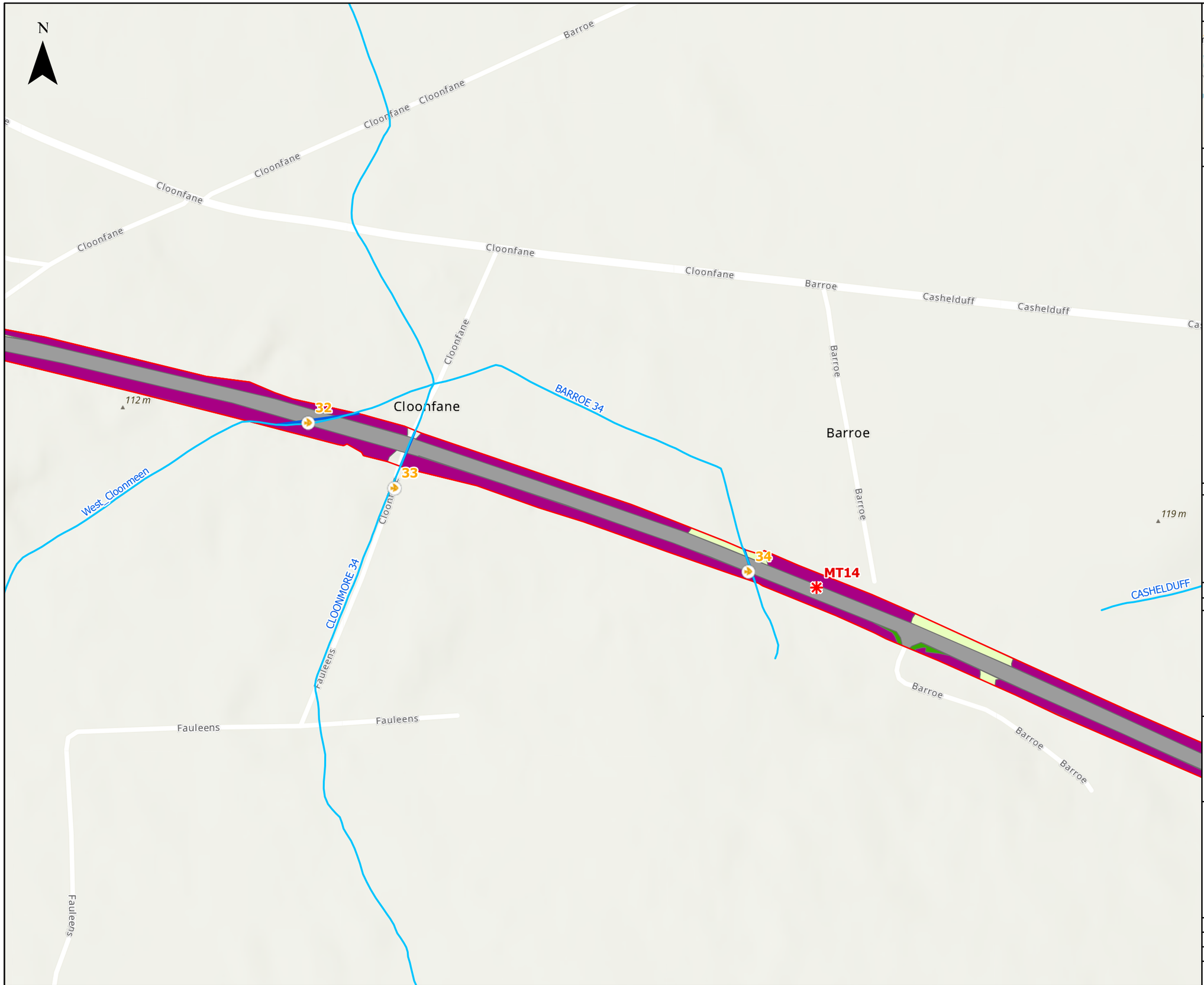

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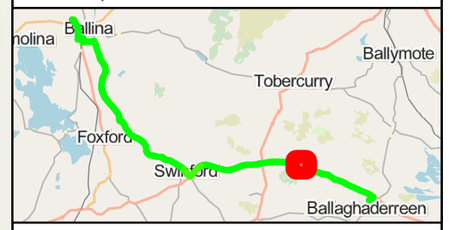

Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA2 – Amenity grassland
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers

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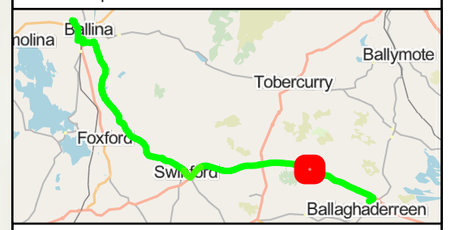
Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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Drawing Number
229100591-MMD-00-XX-DR-N404-0069-45

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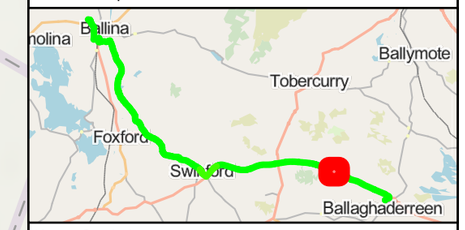

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WL1 - Hedgerows
- WS1 - Scrub

Habitat Line

- FW2 – Depositing/Lowland rivers
- WL1 - Hedgerows

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N

Derrynanaff

Gortanure

Gortanure

Gortanure

Gortanure

125 m

124 m

Currinah

GORTANURE 34

Owenlobnaglaur

124 m

Currinah

Currinah

Currinah

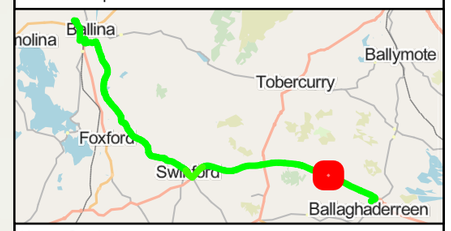
Currinah

Gortanure

Gortanure

145 m

Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- EPA Lakes

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- WL1 - Hedgerows

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Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
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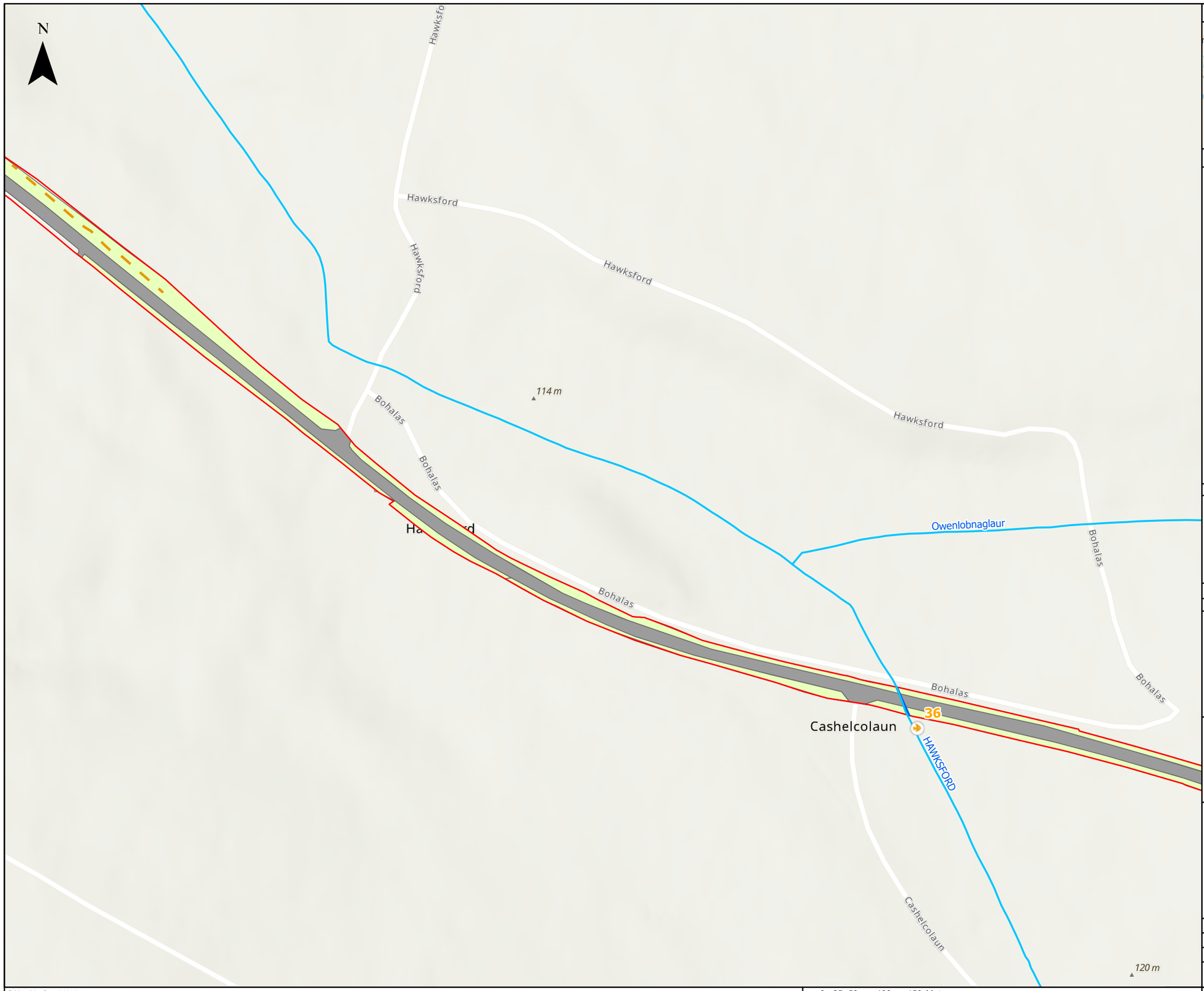

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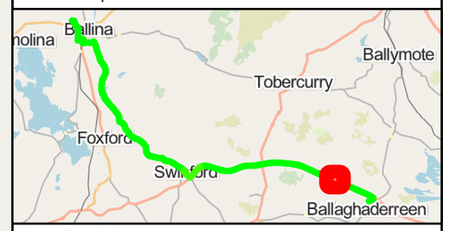

Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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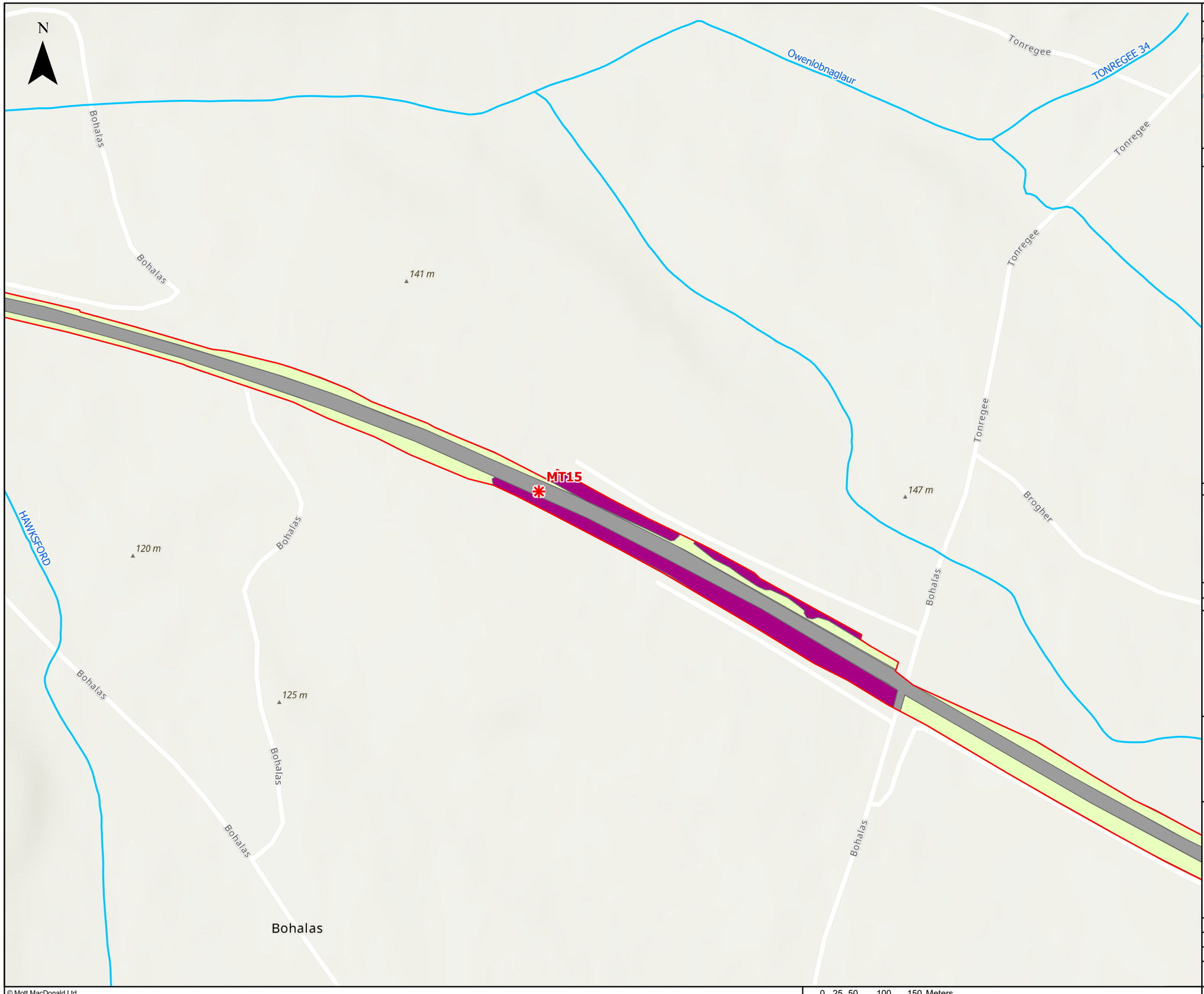

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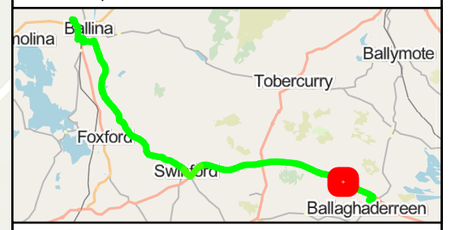

Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

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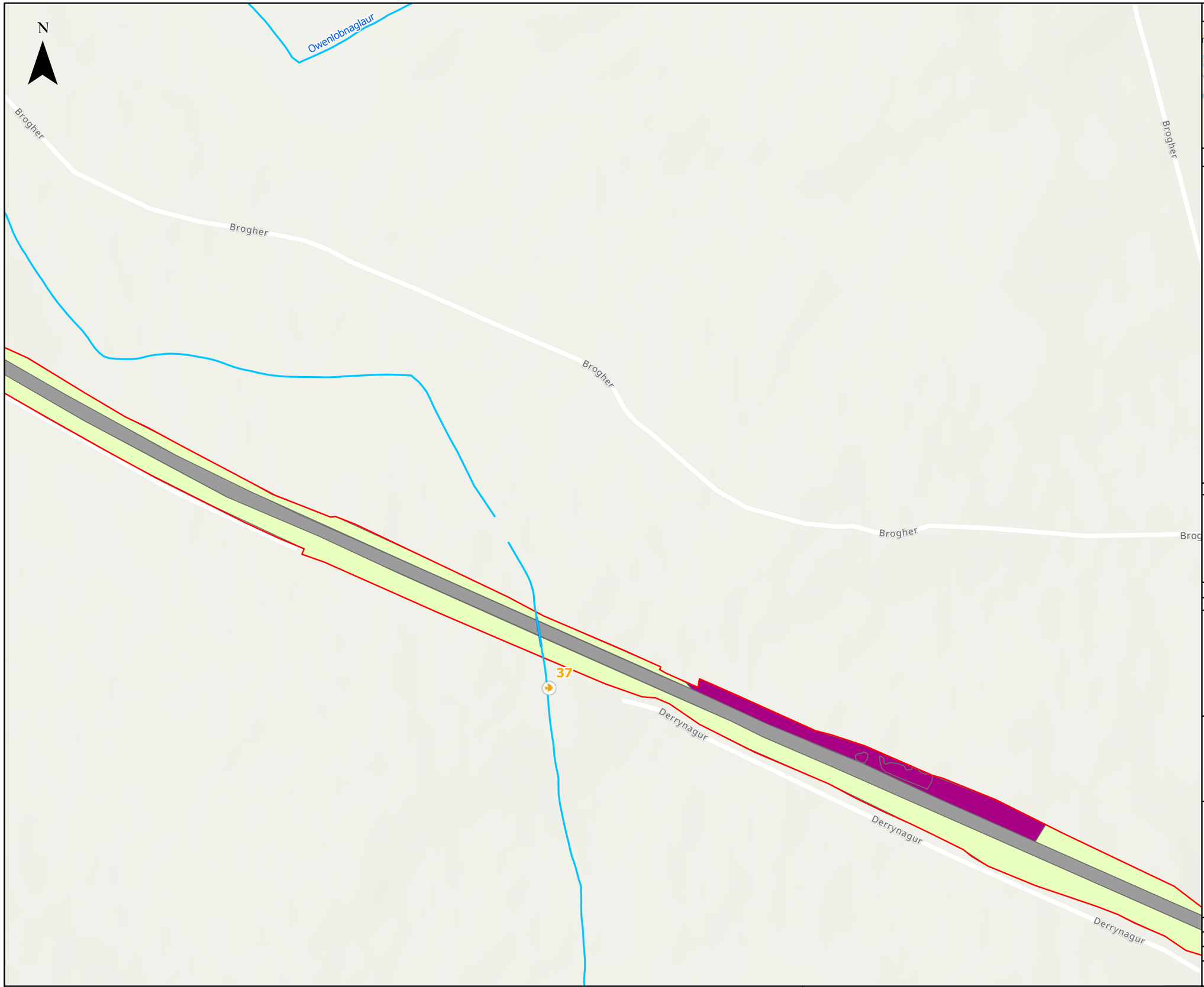

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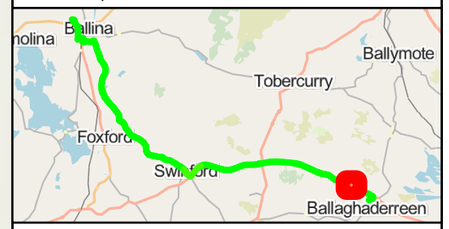

Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers

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GIS Check	E Tiri		Approved	R McNaughton	
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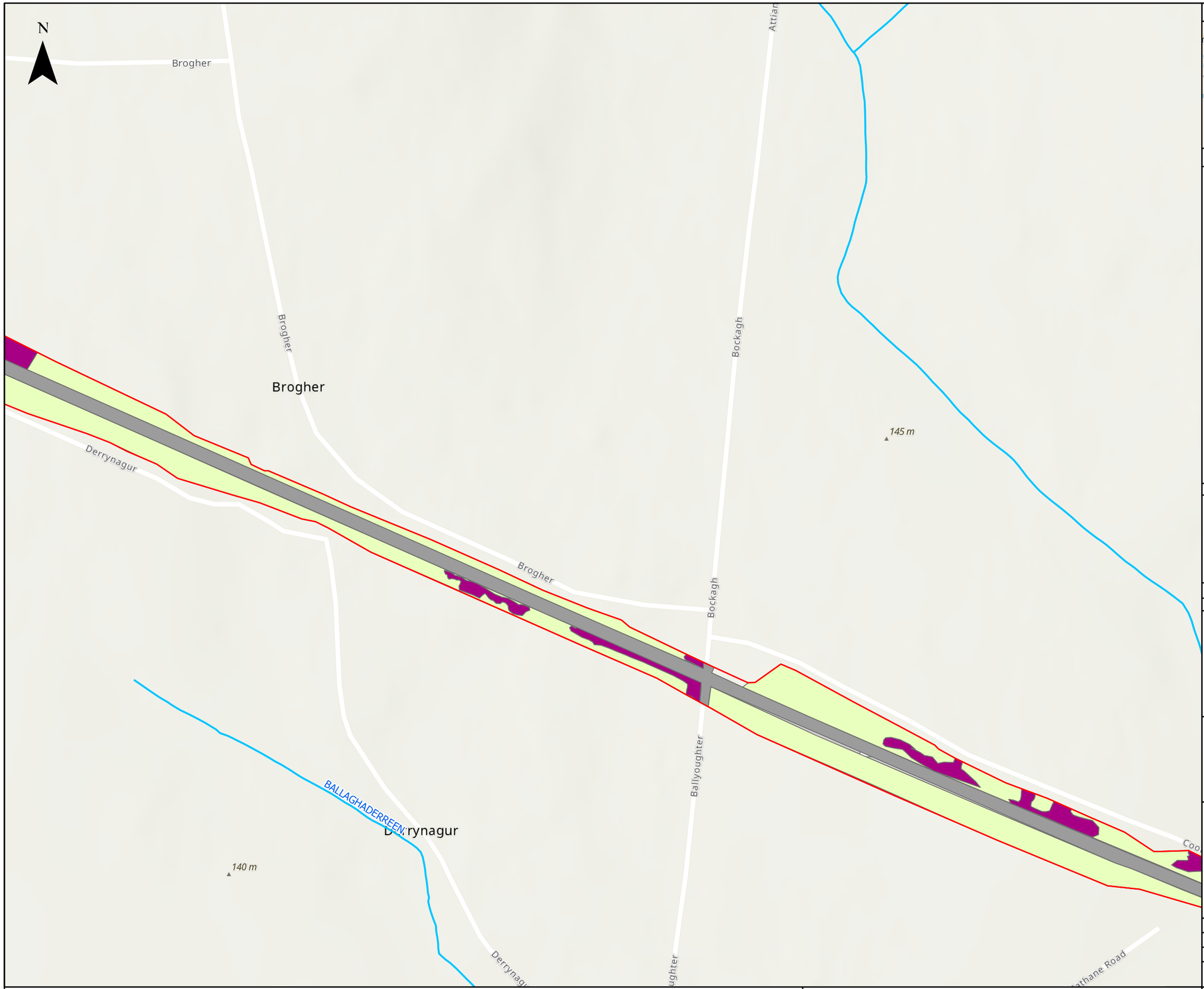
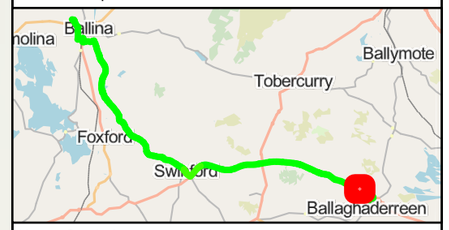


Location Map



Key to Symbols

- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GS2 – Dry meadows and grassy verges
- WS1 - Scrub

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GIS Check	E Tiri		Approved	R McNaughton	
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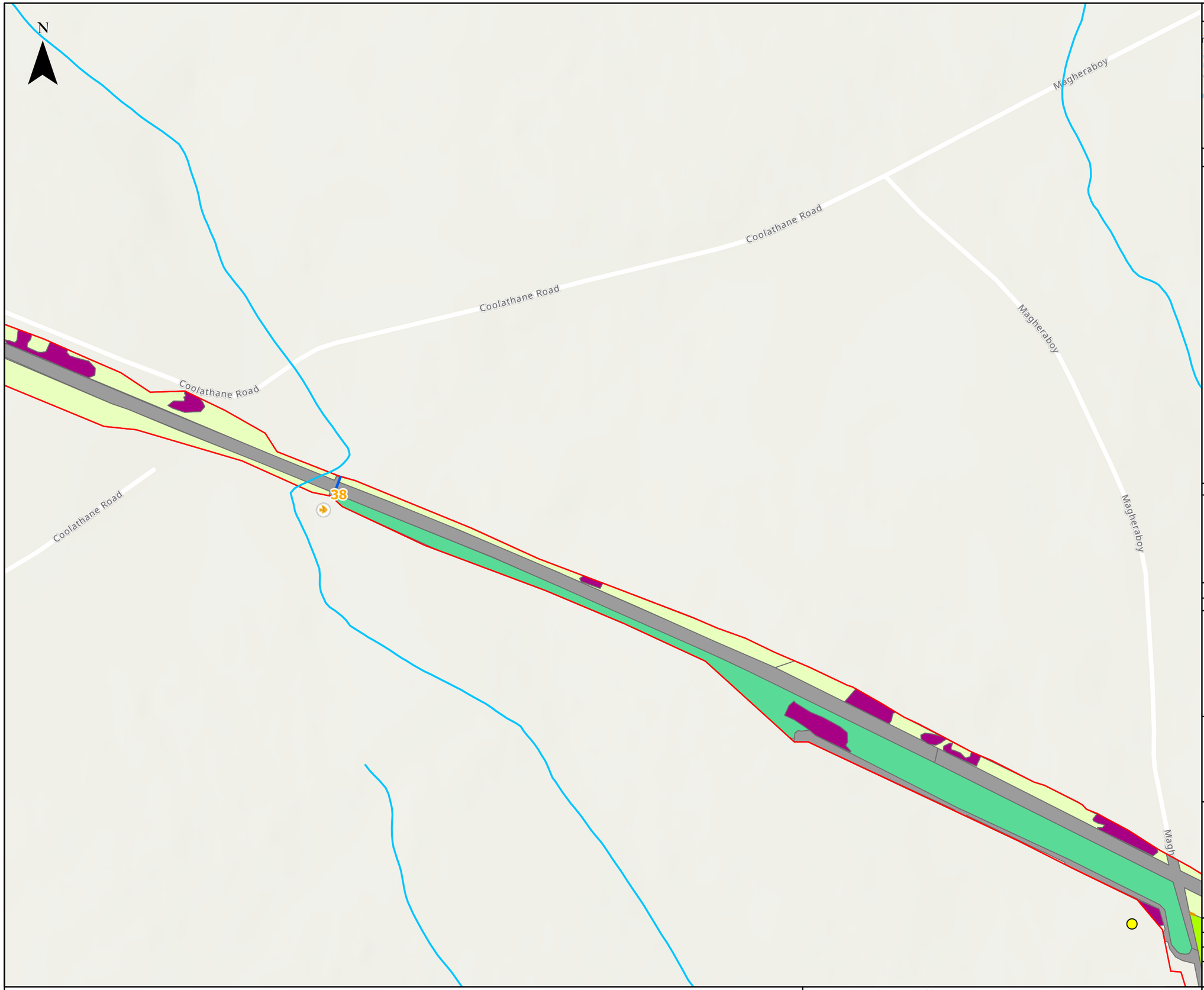

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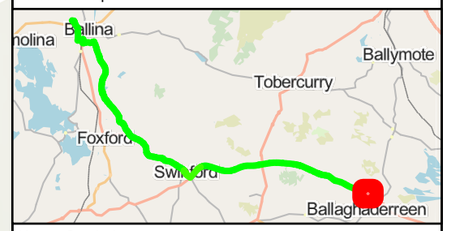

Key to Symbols

- Potential bat roosts
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Red Line Boundary

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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Client

EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

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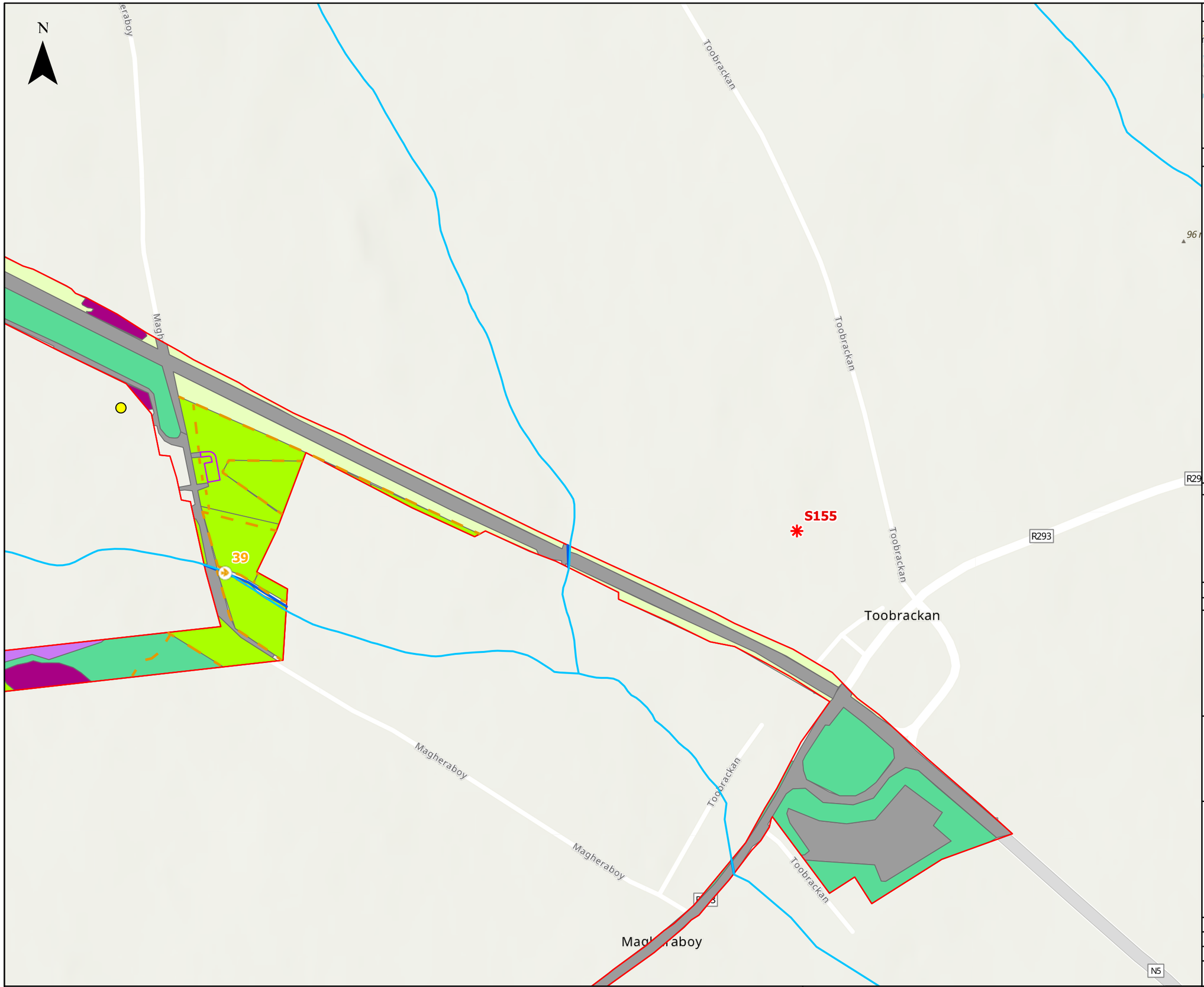
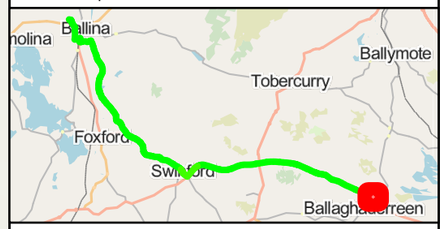
Drawing Number
229100591-MMD-00-XX-DR-N404-0069-52



Location Map



Key to Symbols

- Potential bat roosts
- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD4 – Conifer plantation
- WS1 - Scrub

Habitat Line

- FW1 – Eroding /Upland Rivers
- WL1 - Hedgerows

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3 1:4,000	Status INF		Rev P1	Security STD	

Drawing Number

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N

39

MT16

TS-S163

Magheraboy

Magheraboy

Toobrackan

Magheraboy

River Oak

Kilcolman

Woodlawn Close

Kilcolman

Kilcolman

Kilcolman Kilcolman

Abbeyfield

Shannon Valley

Park View

Dalton Terrace

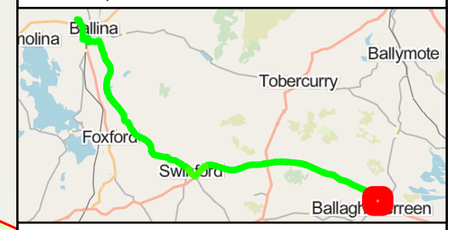
Cois Ráille

BALLAGHADERREEN

R293

0 25 50 100 150 Meters

Location Map



Key to Symbols

- Aquatic sites
- EPA River
- Special Area of Conservation (SAC)
- Permanent Access Track
- Red Line Boundary
- Route Section

Fossit Code

- BL3 – Buildings and artificial surfaces
- GA1 – Improved agricultural grassland
- GS2 – Dry meadows and grassy verges
- GS4 – Wet grassland
- WD1 – Broadleaf woodland
- WD4 – Conifer plantation
- WS1 - Scrub

Habitat Line

- BL3 – Buildings and artificial surfaces
- FW1 – Eroding /Upland Rivers
- FW4 – Drainage ditches
- WL1 - Hedgerows

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Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	24/05/2022	ET	Habitat Mapping	EJ	RMcN

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EIRGRID

Title

North Connacht 110 kV Project

Habitat Mapping

Designed	E Tiri		ENG Check	E Johnston	
Drawn	E Tiri		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	
Scale at A3	Status		Rev	Security	
1:4,000	INF		P1	STD	

Drawing Number

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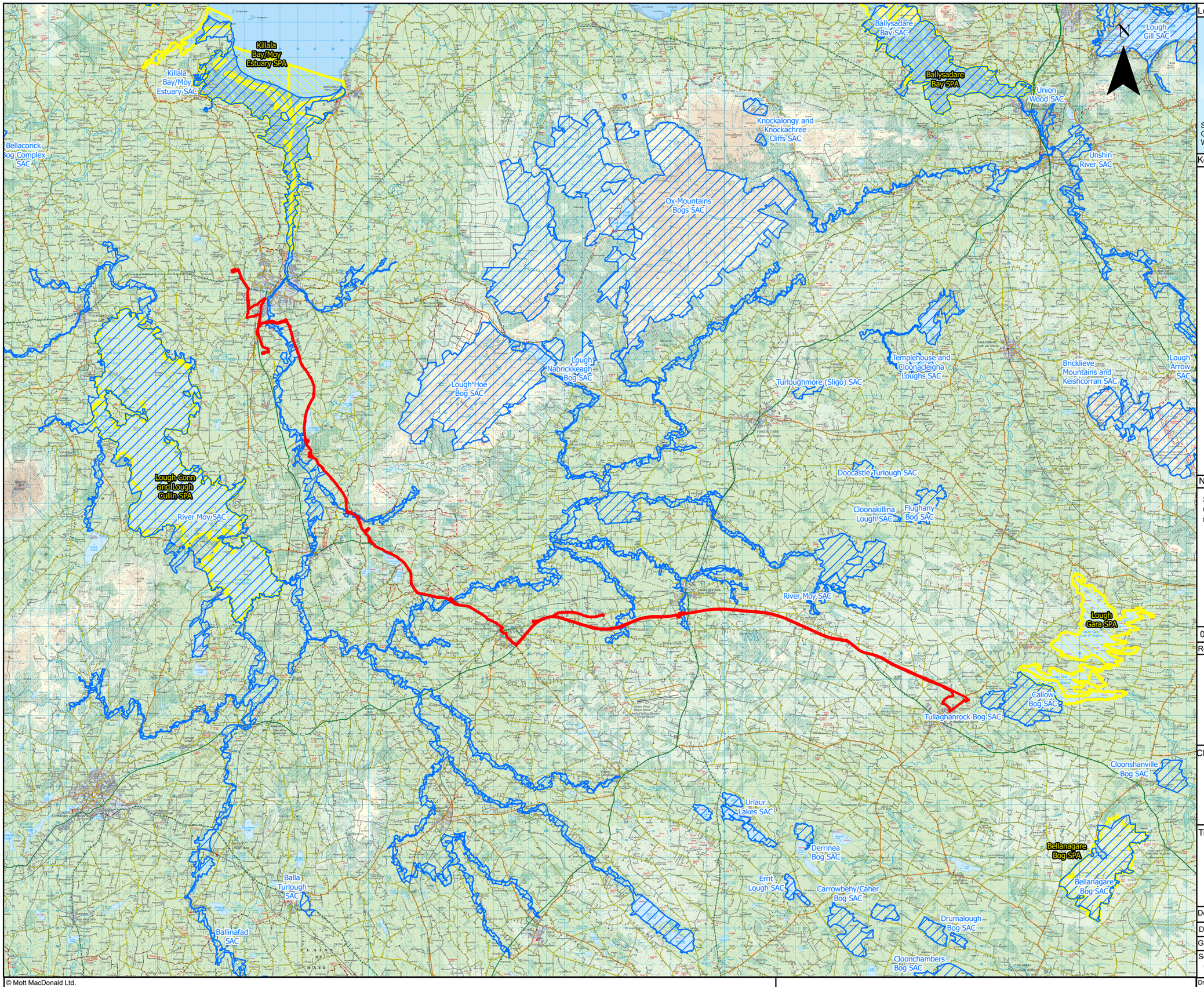
B. The location of the Proposed Development in relation to European sites



Location Map

Service Layer Credits: World Topographic Map: Esri UK, Esri, HERE, Garmin, FAO, NOAA, USGS
World Hillshade: Esri, USGS

Key to Symbols

- SAC
- SPA
- Red Line Boundary

Notes

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Rev	Date	Drawn	Description	Ch'k'd	App'd
01	25/05/2022	XW	Best Performing Options	ET	RMcN

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Title

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NIS Map

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Drawn	X Wan		Coordination	E Johnston	
GIS Check	E Tiri		Approved	R McNaughton	

Scale at A3	Status	Rev	Security
1:200,000	PRE	FIN	STD

Drawing Number
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