



Department for Infrastructure (DfI)

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## **A29 Cookstown Bypass**

Shadow Habitats Regulations Assessment  
(sHRA)







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Shadow Habitats Regulations Assessment (sHRA)

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# 1. INTRODUCTION

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## 1.1. PREAMBLE

- 1.1.1. This shadow Habitats Regulations Assessment (sHRA) considers the potential effects of the proposed A29 Cookstown Bypass (hereafter the 'Proposed Scheme') on European designated sites of nature conservation importance. It is to be submitted to the 'Competent Authority' (in this case Department for Infrastructure (DfI)) in order to inform the statutory assessments required under the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended<sup>1</sup>) (hereafter the 'Habitats Regulations') (UK Government, 2023). In Northern Ireland, the process is called Habitats Regulations Assessment (HRA). This report is called a sHRA as it does not, on its own, fulfil the requirements of the Habitats Regulations, rather it provides the information required by the Competent Authority to inform their formal HRA in order for them to discharge their duties under the Habitats Regulations.
- 1.1.2. The most recent amendment to the Habitats Regulations is the enactment of the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019 following the United Kingdom's (UK) departure from the European Union (EU). It is important to note here that these latest amendments primarily relate to the transition of roles and responsibilities and processes involved in the identification, classification and management of designated sites as well as reporting and future legislation amendments in respect of the Habitats Regulations. They have not changed the requirement for, or the way in which HRAs are carried out. Additionally, HRAs are still required to be carried out in accordance with rulings made by the European Court of Justice in regard to the Habitats Regulations up to the UK's departure from the EU.
- 1.1.3. European designated sites include confirmed and candidate Special Areas of Conservation (SACs/cSACs) designated for habitats and non-avian fauna under European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (hereafter the 'Habitats Directive') and confirmed and proposed Special Protection Areas (SPAs/pSPAs) classified for birds under the European Directive 2009/147/EC on the Conservation of Wild Birds (hereafter the 'Birds Directive'). Prior to the UK's departure from the European Union, they formed part of a network of ecologically important sites called 'Natura 2000 Sites'. Since the UK's departure from the European Union however, SACs/cSACs and SPAs/pSPAs in Northern Ireland now form part of the UK's National Site Network (Department of Agriculture, Environment and Rural Affairs (DAERA), 2020).
- 1.1.4. In addition to the above, it is the Northern Ireland Executive's policy that Wetlands of International Importance designated under the Ramsar Convention (1979) (Ramsar Sites) are also afforded the same level of protection in Northern Ireland (Department of the Environment Northern Ireland (DoENI), 2015). While Ramsar sites are not referred to under the Habitats Directive or their transposition into the Habitats Regulations, Planning Policy Statement 2 (PPS2) in Northern Ireland applies the same level of consideration and protection to them as to European sites. This is also referred to in the relevant Design Manual for Roads and Bridges (DMRB) standard (DMRB, 2020a).

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<sup>1</sup> As amended by The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2004, 2007, 2009, 2011 and 2012 and including the most recent amendment enacted by the Conservation (Natural Habitats, etc.) (Amendment) (Northern Ireland) (EU Exit) Regulations 2019 following the UK's departure from the European Union.

However, the consideration of Ramsar sites should typically only extend to the interest features which align with those of their corresponding European site.

## **PREPARATION OF THIS SHADOW HRA**

- 1.1.5. This sHRA has been prepared by Thomas Goater, BSc (Hons), MSc. Thomas is an Associate Ecologist with over 15 years of experience in environmental consultancy. He holds a BSc (Hons) in Marine Biology from the University of Stirling and an MSc in Aquatic Biodiversity: Conservation and Monitoring from the University of Hull and is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM).
- 1.1.6. Thomas has worked on various development projects including onshore wind farms, grid connections, overhead powerlines, power station life-extensions, housing developments, utilities and road schemes, including the A5 Western Transport Corridor in the west of Northern Ireland. He is experienced in the management, co-ordination and delivery of ecological support services and is competent at undertaking Ecological Impact Assessments (EclAs) and HRAs. His relevant project experience includes numerous renewable and non-renewable energy developments located adjacent to SPAs with overwintering wetland bird interests, or functionally linked land thereof.
- 1.1.7. This report has been reviewed by Caroline McParland, BSc (Hons) PhD CBiol MRSB CEnv MCIEEM and Claire Hopkins MSc., BSc. (Hons), MCIEEM.
- 1.1.8. Caroline has particular expertise in EclA and HRA and has broad experience of all forms of ecological assessment pertaining to infrastructure developments. She holds a PhD in Environmental Biology and Ecology from the University of Alberta, Canada, with a focus on wildfowl and wetland ecology, and a BSc (Hons. 1st Class) in Zoology from the University of Aberdeen. Caroline is a Chartered Biologist, Chartered Environmentalist, and a full member of CIEEM. She is currently Vice President of CIEEM for Scotland.
- 1.1.9. Caroline has practised for almost 20 years following a short period in academia, and has undertaken EclA, HRA and protected species assessments on road, rail, energy, water, education and healthcare projects. Experience in road schemes in the last five years alone includes coordinating EclAs for the entire southern section of Scotland's A9 Dualling Scheme. She has also contributed to updates to CIEEM's Guidelines for Ecological Impact Assessment in the UK and Ireland, and to development of similar guidelines for New Zealand. Currently she is an active member of WSP's HRA Technical Working Group, ensuring that quality and technical skills in HRA within WSP's 160-strong ecology team are of the highest standards.
- 1.1.10. Caroline's recent road projects include HRA of the A59 Kex Gill Diversion in North Yorkshire, a challenging project next to several European sites with a number of topographical and safety constraints to the final design, all of which posed challenges for the HRA. Caroline has also provided support to lead environmental witnesses on public examinations for a number of nationally significant infrastructure projects, providing clear and timely expert responses to examiners' queries as required.
- 1.1.11. Claire is an Associate Ecologist with 18 years' experience as an ecological consultant. Academically she has an MSc in Biodiversity and Conservation from the University of Leeds and an honours degree in Zoology from the University of Durham. Professionally Claire is a member of CIEEM. Claire has extensive experience of compiling HRA screening and reports to inform appropriate assessments through a career with large consultancy firms, primarily working on Scotland-based

projects. Claire has been involved in the preparation, or the review and authorisation of several HRAs and EclAs for nationally significant infrastructure projects and smaller-scale projects such as flood defence, housing development and renewable developments.

## 1.2. BACKGROUND TO THE PROPOSED SCHEME

- 1.2.1. The Proposed Scheme is for a new, 4km single carriageway road extending between the A29 Loughry Road roundabout to the south of Cookstown and a proposed new roundabout on the A29 Moneymore Road to the north, in the vicinity of the termination of the Moneymore Road dual carriageway. The Proposed Scheme also includes the upgrading of existing carriageway connecting the A505 Drum Road roundabout to Sandholes Road (referred to as Sandholes Link Road). The location and arrangement of the Proposed Scheme is shown in **Figure 1 (Appendix A)**.
- 1.2.2. The new carriageway aims to greatly improve journey times and journey time reliability for road users travelling within and through Cookstown, significantly improve road safety and traffic congestion, enhance connectivity and unlock the economic potential of the region.
- 1.2.3. The northern tie-in of the Sandholes Link Road section of the Proposed Scheme terminates at the Derryloran Bridge where the A505 passes over the Ballinderry River. The Derryloran Bridge marks the downstream extent of the Upper Ballinderry River SAC, a European site of conservation importance designated under European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (the 'Habitats Directive'). Further details relating to this site and its qualifying interests are provided in Sections 2 and 3. The Proposed Scheme also crosses the Ballinderry River further downstream but outwith the Upper Ballinderry River SAC.
- 1.2.4. Due to the close proximity of the Proposed Scheme to the Upper Ballinderry River SAC, a sHRA needs to be carried out in line with the provisions of the European Commission (EC) Habitats Directive. Broadly, the aims of the sHRA are to determine whether the Proposed Scheme, either alone or in combination with other plans or projects, may pose any likely significant effects on this or any other European designated site, and where such effects are identified, determine, through further assessment whether those effects may result in adverse impacts on the integrity of those designated sites in light of their conservation objectives. Further details on the HRA process are presented below.

## 1.3. HRA PROCESS

- 1.3.1. HRA is a multi-stage process as described below. A brief description of the policy and legislative context is also provided.

### STAGES OF HABITATS REGULATIONS ASSESSMENT

- 1.3.2. Guidance on the Habitats Directive (European Commission, 2018) sets out the step wise approach which should be followed to enable Competent Authorities to discharge their duties under the Habitats Regulations<sup>2</sup> and provides further clarity on the interpretation of Articles 6 (3) and 6 (4). The process used is usually summarised in four distinct stages of assessment.

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<sup>2</sup> Prior to the UK's departure from the EU, the duties which Competent Authorities were required to discharge were set out under the Habitats Directive.

- **Stage 1:** Screening: the process which identifies whether effects of a plan or project upon a European site are possible, either alone or in combination with other plans or projects, and considers whether these effects are likely to be significant (i.e. likely significant effects).
- **Stage 2:** Appropriate Assessment: the detailed consideration of the effects of the plan or project, either alone or in combination with other plans or projects, on the integrity of European sites, with respect to those site's conservation objectives and their structure and function. This stage allows for consideration of mitigation proposals designed to reduce impacts upon the European sites.
- **Stage 3:** Assessment of alternative solutions: the process which examines alternative ways of achieving the objectives of the plan or project that avoid adverse effects on the integrity of European sites.
- **Stage 4:** Assessment where no alternative solutions exist and where adverse effects remain: an assessment of whether the development is necessary for Imperative Reasons of Public Interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the National Site Network.

- 1.3.3. The precautionary principle has been applied at all stages of the HRA process. In relation to screening, this means that projects or plans where significant effects are considered likely, or where there is uncertainty as to whether effects are likely to be significant, must be subject to the second stage of the HRA process, i.e. Appropriate Assessment.

## LEGISLATIVE CONTEXT

- 1.3.4. Article 6 (3) of the Habitats Directive sets out the need for 'Appropriate Assessment' of plans or projects which have potential to affect the integrity of a European site such as those in proximity to the Proposed Scheme:

*'Any plan or project likely to have a significant effect on a European site, either individually or in combination with other plans or projects, shall undergo an Appropriate Assessment to determine its implications for the site. The competent authorities can only agree to the plan or project after having ascertained that it will not adversely affect the integrity of the site concerned' (Article 6.3).*

- 1.3.5. Regulation 43 (1) of the Habitats Regulations states that,

*'A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which -*

*(a) is likely to have a significant effect on a European site in Northern Ireland (either alone or in combination with other plans or projects), and*

*(b) is not directly connected with or necessary to the management of the site,*

*shall make an Appropriate Assessment of the implications for the site in view of that site's conservation objectives.'*

- 1.3.6. Regulation 43 (5) and (6) go on to state that,

*'43 (5) In the light of the conclusions of the assessment, and subject to Regulation 44, the authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site', and*

*'43 (6) In considering whether a plan or project will adversely affect the integrity of the site, the authority shall have regard to the manner in which it is proposed to be carried out or to any*

*conditions or restrictions subject to which it proposed that the consent, permission or other authorisation should be given.'*

## **1.4. STANDARDS AND GUIDANCE**

1.4.1. In undertaking this sHRA, the following standards and guidance was referred to:

- DMRB LA 115 Habitats Regulations assessment (DMRB, 2020a).
- 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 (European Commission, 2018);
- Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission, 2000a); and
- Communication from the Commission on the Precautionary Principle (European Commission 2000b).

## **1.5. INFORMATION CONSULTED FOR THIS REPORT**

1.5.1. Sources of data reviewed as part of the sHRA process for this project included:

- A29 Cookstown Bypass Environmental Impact Assessment (EIA) Report (WSP, 2023a);
- A29 Cookstown Bypass EIA Report, Chapter 12: Biodiversity, Appendix 12.1: Preliminary Ecological Appraisal (WSP, 2023b);
- A29 Cookstown Bypass EIA Report, Chapter 12: Biodiversity, Appendix 12.5: Otter Survey Report (WSP, 2023c);
- A29 Cookstown Bypass EIA Report, Chapter 12: Biodiversity, Appendix 12.6: Birds Report (WSP, 2023d);
- A29 Cookstown Bypass EIA Report, Chapter 12: Biodiversity, Appendix 12.7: Fisheries and Aquatic Ecology Baseline Conditions and Recommendations (WSP, 2023e);
- A29 Cookstown Bypass EIA Report, Chapter 12: Biodiversity, Appendix 12.8: Ecology Update Report 2022 (WSP, 2023f);
- A29 Cookstown Bypass EIA Report, Appendix 15.1: Road Drainage and the Water Environment Supporting Information (WSP, 2023g); A29 Cookstown Bypass EIA Appendix 15.2: Water Quality Calculations (WSP, 2023h);
- National Biodiversity Network (NBN) Species Distribution Maps (NBN, 2023);
- Upper Ballinderry River SAC – Conservation Objectives (Department of Agriculture, Environment and Rural Affairs (DAERA), 2015);
- Article 17 Habitats Directive Report 2019: Habitat Conservation Status Assessments (Joint Nature Conservation Committee (JNCC), 2019a);
- Article 17 Habitats Directive Report 2019: Species Conservation Status Assessments (JNCC, 2019b);
- Air Pollution Information System (APIS) website (APIS, 2023); and,
- Daily Flow Data for the Ballinderry River at Ballinderry Bridge (National River Flow Archive, 2023).

## 2. STAGE 1 - SCREENING OF EUROPEAN SITES FOR LIKELY SIGNIFICANT EFFECTS RESULTING FROM THE PROPOSED SCHEME

### 2.1. IDENTIFICATION OF RELEVANT EUROPEAN SITES

- 2.1.1. As The study area for the identification and assessment of European sites and Ramsar sites relevant to the Proposed Scheme has followed the DMRB standard regarding the assessment of road schemes on European designated sites (DMRB, 2020a).
- 2.1.2. In line with the DMRB (2020a), European designated sites and Ramsar sites with the potential to be affected by the Proposed Scheme were identified based on their proximity to the Proposed Scheme as well as their potential to be connected to it via 'effects pathways', either directly (e.g. via watercourses) or indirectly (e.g. whereby associated qualifying species use habitats within, or in close proximity to the Proposed Scheme for foraging or roosting). Such areas are termed 'functionally linked land'. This term refers to the role or 'function' that land, fresh waterbodies or sea beyond the boundary of a European designated site might fulfil in terms of supporting the features or populations of species for which the site was designated or classified. Such an area of land or sea is therefore 'linked' to the site in question because it provides a (potentially important) role in maintaining or restoring a protected feature or population at favourable conservation status (adapted from Chapmen and Tyldesley, 2016).
- 2.1.3. Searches identified all European designated sites and Ramsar sites within at least 2km of the Proposed Scheme. This was extended to up to 20km for sites designated for their ornithological interests based on the recognised upper range commuting distance of some species of geese (Scottish Natural Heritage (SNH), 2016), which are often qualifying interests of wetland sites. In addition, SACs designated for bats were considered up to 30km from the Proposed Scheme (DMRB, 2020a). These combined search areas make up the Proposed Scheme's Study Area for European designated sites and Ramsar sites.
- 2.1.4. Based on the above search radii, Table 1 lists the eight European sites which are located within 20km of, or which are hydrologically connected with the Proposed Scheme. The locations of these European sites in relation to the Proposed Scheme are shown on **Figure 2 (Appendix A)**. There are no SACs designated for bats in Northern Ireland within the relevant 30km study area.

**Table 1 – European and Ramsar sites within 20km of, or Hydrologically Connected with the Proposed Scheme**

Site Name	Distance from Proposed Scheme	Overview of Qualifying Features
Upper Ballinderry River SAC	0m-alongside	Watercourses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation, European otter <i>Lutra lutra</i> and freshwater pearl mussel <i>Margaritifera margaritifera</i> .
Teal Lough SAC	10.5km north west	Upland heath, bog and open water habitats.

Site Name	Distance from Proposed Scheme	Overview of Qualifying Features
Lough Neagh and Lough Beg SPA and Ramsar Site	11.4km due east	SPA: Breeding and overwintering waterbirds, and overwintering waterbird assemblage. Ramsar Site: Open water and wetland habitats and associated flora and fauna including invertebrates, breeding and overwintering waterbird populations and fish species.
Owenkillew River SAC	13.5km north west	Oak <i>Quercus spp.</i> woodland and freshwater habitats, European otter, Atlantic salmon <i>Salmo salar</i> , brook lamprey <i>Lampetra planeri</i> and freshwater pearl mussel.
Curran Bog SAC	14.8km due north	Bog habitats.
Black Bog SAC and Ramsar Site	16.4km due west	SAC: Bog habitats Ramsar Site: Bog habitats and associated flora.
Peatlands Park SAC	16.7km south east	Bog, bog woodland and oak woodland habitats.
Ballynahone Bog SAC and Ramsar Site	17.5km due north	SAC: Bog habitats Ramsar Site: Bog habitats and associated flora.

## 2.2. SCREENING OF EUROPEAN SITES FOR LIKELY SIGNIFICANT EFFECTS

- 2.2.1. As identified in Table 1, Upper Ballinderry River SAC is designated for its freshwater vegetation communities as well as the important populations of European freshwater pearl mussel and otter. The Ballinderry River rises in the Sperrin Mountains, located to the north west of Cookstown, and flows eastwards via Cookstown before discharging into Lough Neagh to the east of Cookstown. However, the section which is designated extends from its origin near the village of Creggan to Cookstown immediately upstream of the A505 crossing at the Derryloran Bridge. The northern tie-in of the Sandholes Link Road section of the Proposed Scheme terminates at the Derryloran Bridge, and thus the SAC is situated immediately adjacent to, and upstream of, the Proposed Scheme (see **Figure 3, Appendix A**). Consequently, there is potential for the Proposed Scheme to give rise to significant effects on Upper Ballinderry River SAC.
- 2.2.2. Teal Lough SAC is located approximately 10.5km north west of the Proposed Scheme and is designated for its upland heath, bog and open water habitats. Curran Bog SAC, Black Bog SAC and Ramsar Site and Ballynahone Bog SAC and Ramsar Site are located approximately 14.8km north, 16.4km west and 17.5km north of the Proposed Scheme respectively and are all designated for their bog habitats and associated flora. Peatlands Park SAC, which is located approximately 16.7km south east of the Proposed Scheme, is also designated for its bog habitats as well as its oak woodlands. All of these sites are located sufficiently far away that direct impacts can be ruled out. Furthermore, there is no hydrological connectivity between any of them and the Proposed Scheme.

Consequently, there are no conceivable effects on any of these SACs/Ramsar Sites resulting from the Proposed Scheme and as such they can all be screened out of the assessment.

- 2.2.3. Owenkilow River SAC is located approximately 13.5km north west of the Proposed Scheme and is designated for its woodland and aquatic habitats as well as the important Atlantic salmon, brook lamprey and freshwater pearl mussel populations it supports. However, as well as being over 10km from the Proposed Scheme, it is also not hydrologically connected to it via any watercourses. As such, there are no conceivable effects on this SAC resulting from the Proposed Scheme and it too can be screened out of the assessment.
- 2.2.4. Finally, Lough Neagh and Lough Beg SPA and Ramsar site is located approximately 11.4km east of the Proposed Scheme. Despite this large separation distance, the Proposed Scheme is connected to the SPA and Ramsar site via the Ballinderry River which flows directly into Lough Neagh, albeit over an even greater distance of approximately 21km due to the meandering of the river. As such, there is a credible risk that the Proposed Scheme could have significant effects on Lough Neagh and Lough Beg SPA and Ramsar site, by virtue of surface water contamination such as through the release of sediment, fuels, oils or chemicals, particularly during construction. This is discussed in more detail below.
- 2.2.5. There is also potential for qualifying bird species associated with the SPA and Ramsar site to use habitats within and immediately adjacent to the Proposed Scheme for foraging and/or roosting (i.e. functionally linked land), particularly greylag geese whose upper foraging range can extend up to 20km (SNH, 2016). Consequently, there is a theoretical potential for greylag geese, and possibly other wetland birds associated with this SPA, to be adversely affected by the Proposed Scheme.
- 2.2.6. With the possible exception of Upper Ballinderry River SAC, there is no risk that airborne emissions associated with the operation of the Proposed Scheme will pose any risk of adverse impacts to the above designated sites, based on the typical confinement of the majority of airborne contaminants within 200m of medium to large scale roads, as mentioned above (DMRB, 2019). This includes potential air quality impacts to the wider affected road network which are not expected to extend beyond 1km from Cookstown with the next nearest European designed site (Teal Lough SAC) being over 10km away from the Proposed Scheme.

## **FURTHER INFORMATION TO INFORM SCREENING OF LIKELY SIGNIFICANT EFFECTS ON LOUGH NEAGH AND LOUGH BEG SPA AND RAMSAR SITE**

### **Hydrological Connectivity and Potential for Surface Water Contamination**

#### **Establishing a Zone of Influence for Surface Water Contamination**

- 2.2.7. The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of a proposed development project and its associated activities. This is likely to extend beyond the proposed development site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018).
- 2.2.8. Considering the proximity of the Proposed Scheme to watercourses, namely the Ballinderry River and Fairy Burn, the release of contaminants into the water environment (without efforts to contain them) are considered likely. The distance travelled by water-borne contaminants is influenced by a number of factors, some of which are listed below:
  - Magnitude of contaminant release;

- Particle size of sediment;
- Flow rate and velocity;
- Morphology of the receiving waterbody – rocks, vegetation, meanders etc. provide opportunities for the attenuation of contaminants, and may also create localised areas of low flow, such that some sediment can fall out of suspension; and
- Solubility of contaminant.

#### Sediment

- 2.2.9. When considering the risks associated with sedimentation in the context of the Proposed Scheme, consideration was given to the following information, taken from Chapter 15: Road Drainage and the Water Environment of the A29 Cookstown Bypass EIA Report (WSP, 2023a).
- 2.2.9.1. The sediment regime of the lower stage reaches of the Ballinderry River is strongly influenced by the frequent occurrence of significant in-channel structures. These serve to limit the transfer of sediment from upstream reaches to downstream, thus disrupting the distribution of material throughout the system.
- 2.2.9.2. The channel appears to be suffering from considerable fine sediment issues at the interaction point of the crossings; probably in part due to the urban centre of Cookstown providing a source of fines carried amongst urban runoff; but also, there is evidence of active erosion on the left bank at the crossing location, that provides a source of clay and other fines. Furthermore, a succession of flow control structures (informal boulder weirs) creates ponded sections of channel that promote flow regulation and consequently, depositional processes.
- 2.2.9.3. The natural character of the channel is generally an actively meandering, pool-riffle system; however, approximately 250m downstream of the Proposed Scheme's crossing point of the Ballinderry River, the channel becomes defined by bedrock as it flows through a naturally confined section which limits lateral erosion. In addition, there is a large, formal weir structure approximately 400m downstream of the crossing point that controls the water level for some distance upstream, which disrupts the natural pool-riffle sequencing in the river.
- 2.2.9.4. Natural fluvial processes are suppressed by the succession of weir structures situated upstream and downstream of the point at which the Proposed Scheme would interact with the watercourse. The regulating influence of these structures is likely to disrupt the transfer and distribution of sediment through the system which, in addition to modification of water levels, influences the natural geomorphic functioning of the river. Lateral fluvial processes are similarly disrupted by local infrastructure. The river is artificially constrained through the urban centre of Cookstown, with artificial banks restricting lateral migration. In addition, there is little evidence of gravel features (side bars, middle channel bars etc.), which is thought to be a symptom of the modified flow and sediment regime as opposed an indicator of natural processes.

#### Hydrocarbons

- 2.2.10. Unlike suspended sediment, which (depending on particle size) can drop out of solution in areas of reduced flow velocities, petroleum-range hydrocarbons are largely insoluble in water and will float on the surface, thereby allowing for greater potential for downstream transport. Hydrocarbons may sorb onto soil particles on the bankside or riverbed, which can lead to delayed leaching into the environment and localised effects on soil-dwelling organisms.

### Dilution Factor

- 2.2.11. Further consideration was given to the degree to which any input from the Proposed Scheme into a watercourse would be diluted. The average Q95 flow<sup>3</sup> in the Ballinderry River (National River Flow Archive, 2022) (measured in Ballinderry) is 1.586m<sup>3</sup>/s. WSP's hydrological specialists have modelled average flow velocities at various flow rates. The lowest flow rate that was considered for the model was 7.8m<sup>3</sup>/s. At this rate, the average velocity was calculated to be 0.92m/s. At a velocity of 0.92m/s, it would take a particle of matter approximately 6.3 hours to travel 21km<sup>4</sup>; the distance downstream to the boundary of Lough Neagh and Lough Beg SPA and Ramsar site.
- 2.2.12. For the purpose of demonstration, the sudden emission of 70 litres of diesel into the Ballinderry River was considered, which may occur after the unlikely rupture of a vehicle/machine's fuel tank and the emptying of all its contents directly into the watercourse. In such an event (albeit unlikely), and considering the flow data mentioned above, 70 litres of diesel would be diluted to a concentration of 36.78 micrograms per litre (µg/L) after 20 minutes. After 6.3 hours, the concentration would be 1.95µg/L (see Table 2). For reference, the concentration limit for Polycyclic Aromatic Hydrocarbons in water for human consumption is 10µg/L<sup>5</sup>.
- 2.2.13. Using the flow conditions described above, 70 litres of diesel will dilute to 10µg/L after a distance of 4km. Compared to a moderate to large scale siltation event, this example represents a worst-case scenario, given that sediments will typically be expected to fall out of suspension more rapidly than hydrocarbons, particularly given the presence of weirs in the Ballinderry River downstream of the Proposed Scheme.
- 2.2.14. Based on the above, a precautionary zone of influence of 6km has been assigned for all surface water contamination events. For this reason, hydrological connectivity between the Proposed Scheme and Lough Neagh and Lough Beg SPA and Ramsar Site is deemed to be insignificant, such that significant effects from surface water contamination are unlikely.

**Table 2 - Dilution Factor Model**

Contaminant (litres)	Receiving Volume (m <sup>3</sup> )	Time Elapsed			Concentration (µg/L)
		Seconds	Minutes	Hours	
70	1.586	1	-	-	44136.19
70	95.16	60	1	-	735.60
70	951.6	600	10	-	73.56
70	1903.2	1200	20	-	36.78
70	2854.8	1800	30	-	24.52

<sup>3</sup> Q95 flow: The flow in cubic metres per second which was equalled or exceeded for 95% of the flow record. The Q95 flow is a significant low flow parameter, useful in this context as an indication of worst-case conditions where the dilution factor is at its lowest.

<sup>4</sup> It should be noted, that at the Q95 flow rate, velocity would be much lower, so it would take even longer to travel downstream.

<sup>5</sup> The Water Supply (Water Quality) Regulations (Northern Ireland) 2017 (S.R. No. 212 of 2017).

Contaminant (litres)	Receiving Volume (m <sup>3</sup> )	Time Elapsed			Concentration (µg/L)
		Seconds	Minutes	Hours	
70	3806.4	2400	40	-	18.39
70	4758	3000	50	-	14.71
70	5709.6	3600	60	1	12.26
70	7000.00	4414	73.6	1.2	10.00
70	11419.2	7200	120	2	6.13
70	17128.8	10800	180	3	4.09
70	22838.4	14400	240	4	3.07
70	28548	18000	300	5	2.45
70	34257.6	21600	360	6	2.04
70	35970.48	22680	378	6.3	1.95

### Occurrence of SPA Qualifying Species in the Vicinity of the Proposed Scheme

- 2.2.15. A programme of wintering bird surveys conducted over a four-month period over the winter of 2019-2020 and covering the Proposed Scheme corridor plus a surrounding buffer of 500m recorded only two qualifying species of Lough Neagh and Lough Beg SPA and Ramsar site; mallard and lapwing. However, these species were recorded infrequently and in very low abundance relative to their corresponding SPA qualifying populations (NIEA, 2015); lapwing were represented by a single flock of 16 birds, while the peak count for mallard was just seven. It is also unlikely that either of these species would commute significant distances (e.g. more than five kilometres) from their core wintering grounds and so it is unlikely that the birds recorded in the winter bird surveys area were directly associated with the SPA. On this basis, there are not predicted to be any significant effects on foraging populations of avian qualifying features of Lough Neagh and Lough Beg SPA and Ramsar site.

### Conclusion Regarding Likely Significant Effects on Lough Neagh and Lough Beg SPA and Ramsar Site

- 2.2.16. Based on the further information provided above to inform the screening of likely significant effects on Lough Neagh and Lough Beg SPA and Ramsar Site it can be concluded that the Proposed Scheme will not result in likely significant effects either through surface water contamination or impacts to qualifying species using functionally linked land in the vicinity of the Proposed Scheme. Consequently, Lough Neagh and Lough Beg SPA and Ramsar site can be screened out from further assessment in this sHRA.

## 2.3. EUROPEAN SITES WITH POTENTIAL FOR LIKELY SIGNIFICANT EFFECTS

- 2.3.1. Following the above screening process, Table 3 presents full details of the single European designated site upon which the Proposed Scheme may have likely significant effects; Upper

Ballinderry River SAC. This SAC has therefore been screened in and taken forward for further consideration in the Appropriate Assessment stage (Stage 2) of the sHRA process.

- 2.3.2. It should be confirmed here that there will be no direct loss of habitat from within the SAC. At the location where the Proposed Scheme comes into closest proximity with the SAC (i.e. at the Derryloran Bridge) there will be no direct interaction with the Ballinderry River; the only works proposed there will involve the tie-in of the road surface between the northern end of the Sandholes Link Road section and the Derryloran Bridge. Indeed, there will be no construction activity on the river's banksides either, which could otherwise contribute to adverse effects on the Ballinderry River or the qualifying interests of the SAC. In addition, the habitat suitability for freshwater pearl mussels in the sections of the Ballinderry River and Fairy Burn which are intersected by the Proposed Scheme are largely unsuitable, as explained in more detail in Section 3.2, under the baseline conditions for freshwater pearl mussel.
- 2.3.3. It should also be noted that since the Proposed Scheme is located downstream of Upper Ballinderry River SAC and will not directly interact with the watercourse where Derryloran Bridge spans the river at the designated site's downstream extent, there is no risk that SAC-designated populations of freshwater pearl mussel will be directly affected. Even if freshwater pearl mussels were to be located downstream of the Upper Ballinderry River SAC in the vicinity of the Proposed Scheme, these would not be considered as part of the SAC designated population. This is because unlike more mobile species of fauna associated with European designated sites which often move between the sites for which they are designated and undesignated habitats outside of them (i.e. functionally linked habitat), such as otters, freshwater pearl mussels are sedentary and cannot freely migrate throughout the rivers in which they live. Therefore, only freshwater pearl mussels located within the SAC are considered to be part of the SAC qualifying population. Nonetheless, the upstream SAC freshwater pearl mussel population may still be indirectly affected by the Proposed Scheme should there be any adverse effects on salmonids<sup>6</sup> which freshwater pearl mussels depend on for part of their life-cycle. Larval freshwater pearl mussels (called glochidia) attached onto the gills of salmonids for several years before dropping off in the hope of establishing in areas of suitable river substrate.
- 2.3.4. Additionally, significant effects on the Annex I freshwater habitats associated with Upper Ballinderry River SAC are not considered to be likely because the SAC, and hence its associated qualifying habitats, are located upstream of the Proposed Scheme with the only works occurring in the immediate vicinity of the SAC being the tie-in of the road surface between the northern end of the Sandholes Link Road section and the Derryloran Bridge, as detailed above.
- 2.3.5. It is also worth noting that while the effects from airborne emissions may occur within 200m of road developments (DMRB, 2019) airborne emissions of nitrogen which are deposited into watercourses are expected to be rapidly dispersed and diluted and are thus not possible to quantify. Furthermore, atmospheric pollution of watercourses, particularly through nitrogen deposition is not considered to have significant ecological impacts in agriculturally-dominated lowland catchments such as that of the Ballinderry River. This is because nitrogen inputs from the wider catchment land-use, especially through the long-term and widespread application of inorganic fertilisers, are likely to be much more significant than atmospheric contributions (Air Pollution Information System (APIS), 2023) and would

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<sup>6</sup> Fish relating to the salmon family, including salmon and trout.

not be anticipated to appreciably alter the nitrogen content of the watercourse. Hence, atmospheric pollution is not considered to pose a significant impact on the Annex I freshwater habitats of the Upper Ballinderry River SAC.

- 2.3.6. In accordance with Regulation 43 (1) of the Habitats Regulations (see Section 1.3.5), a determination needs to be made with regard to the Proposed Scheme's role in the management of Upper Ballinderry River SAC. The Proposed Scheme is broadly described in Section 1.2 and in more detail in Section 3.3 – it is not directly connected to, or necessary to the management of Upper Ballinderry River SAC. In this case, it is not an exempted development in terms of HRA, and Appropriate Assessment is therefore required.

**Table 3 - Relevant European Sites, Associated Qualifying Features and Impacts with the Potential for Likely Significant Effects**

European Site Name (Site Code) and Area	Qualifying Features	Conservation Objectives	Potential for Likely Significant Effects
<b>Upper Ballinderry River SAC</b> (UK0030296) 58.8ha	<b>Annex I habitats:</b> <ul style="list-style-type: none"> <li>Water courses of plain to montane levels with the <i>Ranunculus fluitans</i> and <i>Callitriche-Batrachion</i> vegetation.</li> </ul> <b>Annex II species:</b> <ul style="list-style-type: none"> <li>Freshwater pearl mussel - primary reason for selection; and,</li> <li>European otter - secondary reason for selection.</li> </ul>	To maintain (or restore where appropriate) the Qualifying Features listed to favourable condition (defined as "the target condition for an interest feature in terms of the abundance, distribution and/or quality of that feature within the site").	Damage and/or destruction of otter habitat, including resting sites. Visual and auditory disturbance of otters. Injury or mortality of otters. Damage and/or destruction of salmonid habitat and visual and auditory/vibrational disturbance of salmonids, which are critical in the freshwater pearl mussel life-cycle <sup>7</sup> . Deterioration in water quality giving rise to negative effects on otters and indirectly on freshwater pearl mussel through effects on salmonids, either through reduction in habitat condition or prey resource availability.

- 2.3.7. Concluding this section, the potential impacts from the construction and operation of the Proposed Scheme have been considered in the context of European sites located in close proximity, or hydrologically or ecologically connected to the Proposed Scheme. Through this process, it has been concluded the Proposed Scheme is not connected with or necessary to the management of the Upper Ballinderry River SAC and that there is potential for likely significant effects a result of the Proposed Scheme cannot be ruled out for the following qualifying interests:

- Otter, by way of:
  - Damage and/or destruction of habitat, including resting sites;
  - Visual and auditory disturbance;

<sup>7</sup> Larval freshwater pearl mussels (called glochidia) attached onto the gills of salmonids for several years before dropping off in the hope of establishing in areas of suitable river substrate.

- Injury or mortality; and
- Habitat degradation through adverse impacts on water quality.
- Freshwater pearl mussel, by way of:
  - Impacts to salmonids, which are critical in the freshwater pearl mussel life-cycle, through;
    - Auditory/vibrational disturbance;
    - Damage and/or destruction of salmonid habitat; and
    - Habitat degradation through adverse impacts on water quality.

2.3.8. In accordance with the Habitats Regulations, the potential for likely significant effects from the Proposed Scheme triggers the requirement for an Appropriate Assessment by the Competent Authority. To facilitate this, a sHRA has been prepared and is presented in the following sections of this report.

### 3. INFORMATION TO INFORM STAGE 2 - APPROPRIATE ASSESSMENT

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#### 3.1. INTRODUCTION

- 3.1.1. This section provides further information on the qualifying interests of the Upper Ballinderry River SAC relevant to the Proposed Scheme and relevant details of the Proposed Scheme upon which the assessment of likely significant effects (identified in Section 2 above) and their potential to give rise to adverse impacts on the integrity of the SAC (i.e. the Appropriate Assessment) can be based.

#### 3.2. BASELINE CONDITIONS

##### FRESHWATER PEARL MUSSEL

- 3.2.1. According to the mapping service provided by the NBN (2022), there are no historical records of freshwater pearl mussel in the vicinity of the Proposed Scheme and only two records downstream of the Proposed Scheme. These are both from 2007 in the Irish Grid 10-km square H98<sup>8</sup> (over 12km downstream of the Proposed Scheme, see **Figure 4 (Appendix A)** – precise coordinates are withheld). Despite the low precision of the record locations, it can be assumed that both of these records were from the Ballinderry River. Indeed, the Ballinderry River is one of only six rivers west of Lough Neagh in which populations of freshwater pearl mussel are known to exist (Reid *et al.*, 2013). However, these records are considered sufficiently far downstream of the Proposed Scheme to not be adversely affected.
- 3.2.2. The A29 Aquatic Ecology report by Paul Johnston and Associates states that freshwater pearl mussels are known to be present in the Ballinderry River downstream of Derryloran Bridge, but well-defined mussel beds are lacking.
- 3.2.3. Surveys of the Ballinderry River and Fairy Burn were undertaken by Paul Johnston and Associates in 2020 and 2021 respectively. The survey of the Fairy Burn involved an initial habitat suitability assessment an extended from approximately 100m upstream of the existing crossing of the Sandholes Road to the confluence with the Ballinderry River. Upon inspection it was concluded that the Fairy Burn was unsuitable for supporting freshwater pearl mussels based on a lack of suitable sand patches within stable cobble and boulder substrate in which freshwater pearl mussels could embed, along with high levels of bed silt, turbidity and effluent input.
- 3.2.4. Surveys of the Ballinderry River were undertaken 100m upstream and 500m downstream of two locations: the Derryloran Bridge which represents the northern extent of the Sandholes Link Road section of the Proposed Scheme and the downstream extent of the Upper Ballinderry River SAC, and the Proposed Scheme's new crossing point at the confluence of the Fairy Burn. During the surveys however, it was found that for 100m upstream and 324m downstream of the Derryloran Bridge (to the Glenavon Weir), the water was deep and habitat conditions were unsuitable for freshwater pearl mussels with flow rates being too low to sustain oxygenation while those areas of the bed that could be viewed, were extensively covered by a thick layer of brown periphyton mats and long green filamentous algae. There were also high levels of deposited silt, all of which are conditions which are unsuitable for supporting freshwater pearl mussels. Downstream of the

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<sup>8</sup> Data from Northern Ireland Environment Agency (NIEA) Collated Species Records.

Glenavon Weir, the remainder of the 500m downstream survey section (a length of approximately 170m) the flow velocity was higher and the substrate was more readily comprised of boulders and large cobbles with small patches of shallow sand. However, the underlying substrate was largely bedrock and was therefore unsuitable for freshwater pearl mussel establishment since no available bed purchase was available. Indeed, no adult freshwater pearl mussels were observed during the survey of this downstream section. A single empty half shell was recorded within the surveyed reach but it is not possible to attribute this to the presence of the species in the immediate vicinity since it could have originated and been washed from many hundreds of metres upstream.

- 3.2.5. In the survey area associated with the Proposed Scheme's new crossing point, the habitat was largely unsuitable. The section from 100m upstream to approximately 250m downstream was relatively shallow and characterised by high levels of filamentous and mat-forming algae and silt covering the cobble and boulder substrate. Areas of coarse and fine sand were very patchy and occurred largely downstream of three rock weirs which occur successively along this section. Beyond 250m downstream of the new crossing point the river channel was deeper and highly turbid and the bed was dominated by boulders and bedrock with high silt deposition, presenting conditions which are highly unsuitable for supporting freshwater pearl mussels. From the survey of the shallower upstream section of this survey reach no freshwater pearl mussels were found and although several individual empty shells were present on the bed it is not possible to attribute this to the presence of the species in the immediate vicinity as mentioned above.
- 3.2.6. Based on the surveys it was concluded that the sections of the Ballinderry River and Fairy Burn which are intersected by the Proposed Scheme are unsuitable for supporting freshwater pearl mussels and no live mussels were recorded.

## **SALMONIDS**

- 3.2.7. The Ballinderry River supports an indigenous stock of Atlantic salmon, but definitive data on stock status and recruitment are not available. A recent assessment of stock status by the DAERA Standing Scientific Committee (Kennedy *et al.*, 2019) indicated that the river management target for salmon (based on juvenile stock surveys and total ova expected per suitable habitat area) was not achieved over the period 2014-2018.
- 3.2.8. A salmonid habitat suitability assessment was carried out by Woodrow during the Preliminary Ecological Appraisal in 2019 on the two sections of the Ballinderry River which interact with the Proposed Scheme; the Derryloran Bridge at the northern extent of the Sandholes Link Road and the Proposed Scheme's new crossing point at the confluence of the Fairy Burn. The assessment considered the watercourse for at least 100m up- and downstream of these two locations. Subsequently, Paul Johnston and Associates carried out juvenile salmonid stock surveys (specific to the Proposed Scheme) in July 2020 on the Ballinderry River and August 2021 on the Fairy Burn. The surveys also comprised a habitat suitability assessment of Fairy Burn.
- 3.2.9. On the Ballinderry River, the habitat either side of the Derryloran Bridge, was considered to represent suitable holding habitat for salmonids only, being particularly deep and slow flowing. Further downstream, at the Proposed Scheme's new crossing point, the habitat comprised a variety of suitable holding, nursery and spawning habitat. The dedicated fish surveys undertaken downstream of the Derryloran Bridge (it was too deep in the vicinity of the bridge itself) and at the Proposed Scheme's new crossing point recorded no salmon of any age class, although moderate to good abundance of brown trout fry (*Salmo trutta*) were recorded in both surveyed sections based on

the abundance indices devised by Crozier and Kennedy (1994). Despite the absence of salmon during the surveys, it was noted that adult salmon would still navigate this stretch of the Ballinderry River during upstream spawning migration.

- 3.2.10. On the Fairy Burn, the area immediately downstream of the Loughry Roundabout was found to contain potentially suitable spawning, nursery and holding habitat for salmonids. Immediately upstream of the Loughry Roundabout culvert the habitat was also found to contain suitable nursery habitat, albeit reduced in quality, though no suitable spawning habitat was present. Progressing further upstream towards the intersection of Sandholes Road, the habitat conditions were generally poor for salmonids being slow flowing, more heavily silted and highly turbid. Upstream of Sandholes Road the channel was highly modified and remained unsuitable comprising gabion baskets, sheet piling and a smooth concrete base. Dedicated fish surveys on the Fairy Burn recorded four salmon fry and eight brown trout fry in the section downstream of the Loughry Roundabout to the confluence with the Ballinderry River. This corresponds to poor abundance for salmon fry and moderate abundance for trout fry according to the abundance indices devised by Crozier and Kennedy (1994). No salmonids were recorded elsewhere on the other surveyed section of the Fairy Burn in the vicinity of Sandholes Road and it was considered unlikely that many adult salmon were able to navigate much further upstream than the Loughry Roundabout.

## OTTER

- 3.2.11. According to the mapping service provided by the NBN (2022), numerous otter records exist within the vicinity of the Proposed Scheme and downstream towards Lough Neagh (see **Figure 5, Appendix A**<sup>9</sup> – note the precision is limited to 1km grid squares).

## 2019 and 2021 Surveys

- 3.2.12. Otter surveys were first conducted by Woodrow Sustainable Solutions Ltd. during the Preliminary Ecological appraisal in 2019 and only focussed on the Ballinderry River. Subsequent dedicated otter surveys were conducted on all watercourses intersected by the Proposed Scheme were surveyed by AECOM in 2021, although only the Ballinderry River and Fairy Burn were considered to represent suitable otter habitat. All surveys extended to at least 200m up- and downstream of the Proposed Scheme's intersection points.
- 3.2.13. Substantial evidence for the presence of otters was identified in the immediate vicinity of the Proposed Scheme during both sets of surveys, most notably including the following holts and couches, as shown in **Figure 6 (Appendix A)**:
- Ballinderry River
    - 1x confirmed (active) holt located on the northern bank, approximately 350m downstream of the Proposed Scheme's new crossing point and overlapping with the Proposed Scheme Boundary.
    - 3x potential holts, all located between 300m and 350m downstream of the Proposed Scheme's new crossing point.

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<sup>9</sup> Data from Northern Ireland Environment Agency (NIEA) Collated Species Records and Biological Records Centre: Irish Otter Dataset (1980).

- 2x confirmed couches; one located on the south bank approximately 50m downstream of the Proposed Scheme's new crossing point; the other on the north bank approximately 550m downstream of the Proposed Scheme's new crossing point.
- Fairy Burn
  - 1x potential holt, located over 180m upstream of the Loughry Roundabout.
  - 1x potential couch, located approximately 175m upstream of the Loughry Roundabout.

## 2022 Surveys

- 3.2.14. An ecological update walkover survey was conducted in October 2022 and included reinspection visits of the Ballinderry River and Fairy Burn. Signs of otter were observed on the Ballinderry River and near the confluence of the Fairy Burn just east of the Loughry Roundabout. A well-marked mammal path was identified through the field in the bend where the Ballinderry River meanders immediately downstream of the Proposed Scheme's new crossing point, with evidence that otters regularly, and had recently, used this to crosscut the river. An otter slide and several grass heaps containing spraint were identified along the path on the west and two slides into the river and several grass heaps with some sprainting were identified at the eastern end of the path. The update walkover survey did not however yield any evidence of the presence of the confirmed holts or couches identified by AECOM in 2021.

## SUMMARY OF BASELINE CONDITIONS REGARDING QUALIFYING FEATURES OF UPPER BALLINDERRY RIVER SAC IN THE CONTEXT OF THE PROPOSED SCHEME

- 3.2.15. Based on the information provided above, the following conclusions can be made:
- While freshwater pearl mussels are known to be present in the Ballinderry River downstream of Derryloran Bridge, the habitat conditions in the locations which are intersected by the Proposed Scheme are typically unsuitable for the species. Indeed, no evidence of the species presence was identified during surveys.
  - The presence of juvenile salmonids (salmon and trout), which are critical in the freshwater pearl mussel life-cycle, is confirmed in the Ballinderry River at the Proposed Scheme new crossing point and in the Fairy Burn between the Loughry Roundabout and the confluence with the Ballinderry River. Adult salmon are also expected to navigate this stretch of the Ballinderry River during upstream spawning migration.
  - The presence of otters is confirmed in Ballinderry River and Fairy Burn adjacent to the Proposed Scheme with several confirmed and potential resting sites being identified along both watercourses.

## 3.3. PROPOSED SCHEME DESCRIPTION RELEVANT TO THE UPPER BALLINDERRY RIVER SAC

- 3.3.1. The following provides a description of the Proposed Scheme with particular emphasis on the key features associated with those sections which interact with the Ballinderry River and Fairy Burn. The key locations and components of the Proposed Scheme relative to the Ballinderry River and Fairy Burn are shown in **Figure 3 (Appendix A)**.

The Proposed Scheme is for a new, 4km single carriageway extending between the A29 Loughry Road roundabout to the south of Cookstown and a proposed new roundabout on the A29 Moneymore Road to the north, in the vicinity of the termination of the Moneymore Road dual

carriageway. The Proposed Scheme also includes the upgrading of existing carriageway connecting the A505 Drum Road roundabout to Sandholes Road (referred to as Sandholes Link Road).

### **COOKSTOWN BYPASS**

- 3.3.2. The southern end of the Cookstown Bypass section of the Proposed Scheme commences at the Loughry Roundabout. The Proposed Scheme will involve reconfiguration of the roundabout in order facilitate a fifth arm for the bypass itself. The Fairy Burn is already culverted under the Loughry Roundabout via a corrugated steel arch and this will be retained with no modification other than to construct a new headwall at the culvert outlet.
- 3.3.3. Downstream of Loughry Roundabout to the confluence with the Ballinderry River, the terminal section of the Fairy Burn is overlapped by the footprint of the Proposed Scheme, and hence will need to be diverted to the north of the bypass.
- 3.3.4. From the Loughry Roundabout the route continues north-east and within approximately 175m crosses the Ballinderry River (Chainage (Ch.175). This will involve construction of a clear span bridge structure which will span the river at an approximate height of 8.1m. The abutments of the bridge will be set back from the river margins thereby retaining the existing natural banksides. No bankside protection or reinforcement measures are proposed (e.g. rip-rap or gabion baskets).
- 3.3.5. Approximately 100m upstream of the Ballinderry River crossing a flood defence wall is proposed along the northern bank of the river, adjacent to Otter Lodge.
- 3.3.6. After crossing the Ballinderry River the route passes through agricultural fields, but approximately 175m after the bridge, the route passes in close proximity to the river again where the watercourse meanders. Due to the steepness of the slope down to the river at this location an approximately 160m long retaining wall is required to support the road between approximately Ch.280 and Ch.440. At its closest point this comes to within 10m of the river margins.
- 3.3.7. From there the route continues northwards, crossing Castle Road, Killymoon Road, Killymoon Golf Course, Cloghog Road and then through an agriculturally dominated landscape crossing Coagh Road and Old Coagh Road, all the way to the northern extent of the Proposed Scheme at the intersection with Moneymore Road. Meanwhile, shortly after the retaining wall section the Ballinderry River bends and continues eastwards away from the Proposed Scheme and the two do not interact or come into close proximity with each other again. There are however, three minor roadside and agricultural drains along the remainder of the route, and although these ultimately discharge into the Ballinderry River they have limited suitability for fish or otter use. Nonetheless, mammal ledges are proposed to be incorporated into the box culverts which will be installed at the crossings of these minor watercourses.

### **SANDHOLES LINK ROAD**

- 3.3.8. The junction of Sandholes Link Road and Drum Road at the northern extent of the Sandholes Link Road is where the Proposed Scheme comes into closest proximity the Upper Ballinderry River SAC. However, while the Proposed Scheme will involve the construction of a new roundabout in place of the existing junction, this is set back from the river by approximately 50m. The only works which are proposed between the new roundabout and the river will involve the tie-in of the road surface with the existing Drum Road as it approaches the crossing of the Ballinderry River at Derryloran Bridge. The Proposed Scheme does not intersect with the river, its banks or the SAC.

- 3.3.9. The remainder of the Sandholes Link Road progresses further and further away from the Ballinderry River as it passes along the existing Sandholes Road between residential and industrial estates. Midway along the Sandholes Link Road the Proposed Scheme spans the Fairy Burn via an existing culvert, which is to be retained.

## **DRAINAGE**

- 3.3.10. The surface water drainage strategy for the Proposed Scheme has been designed following DMRB standards (DMRB, 2022). These include combinations of filter drains, kerbs and gullies, swales, 'enhanced' dry swales and retention ponds. These features are designed to collect and ameliorate surface water run-off before it is released into the natural water environment (i.e. the local watercourses).
- 3.3.11. The drainage design immediately associated with the Ballinderry River and Fairy Burn around the new crossing of the Ballinderry River primarily involves the initial interception of surface water runoff from the road by filter drains either via kerb grips (small, intermittent gaps into the kerb line via which run-off can be released from the carriageway) or receipt of direct run-off from un-kerbed carriageway margins. The filter drains will ameliorate the run-off by trapping sediment, organic matter and oil residues through natural percolation of the water through gravel before it is released. Surface water run-off from the Loughry Roundabout will be released into a vegetated swale where the run-off will be further ameliorated before being discharged into the Ballinderry River. On the north side of the new Ballinderry River crossing the ameliorated run-off from the northbound carriageway will be conveyed to the Ballinderry River via drainage channels where it will be discharged to the natural water environment via a naturalised and graduated outfall to reduce flow velocity and scour potential. Meanwhile run-off from the southbound carriageway will be captured by a retention pond (ML2), which will provide storage capacity as well as further amelioration of the run-off before it is released via a drainage channel to the Ballinderry River. There is one additional outfall to the Ballinderry River at approximately Ch.520 where surface water run-off is released from a drainage channel after having been passed through roadside filter drains.
- 3.3.12. Sandholes Link Road will maintain its the existing drainage strategy as there is limited scope to incorporate new sustainable drainage systems.
- 3.3.13. In relation to discharge of sediments and other road-related pollutants from the Proposed Scheme's drainage network, analysis and calculations have been undertaken using the Highways England Water Risk Assessment Tool (HEWRAT). The HEWRAT is an assessment tool recommended by the DMRB (DMRB, 2020b) which considers whether the design parameters of the Proposed Scheme's drainage networks will be likely to be achieved in respect of contaminants of the water environment. The assessment involves consideration of water quality and the ecological status of the relevant watercourses relative to sediments and other pollutants, such as metals and hydrocarbons, associated with road-related run-off. The outcome of the HEWRAT is that a discharge will either pass or fail in light of the predicted concentrations of sediments and other pollutants and the sensitivity of the receiving watercourses. Where the evaluation has indicated an outfall will fail, appropriate combinations of mitigation measures have been identified and the evaluation has been re-run until the outfall achieves a pass.
- 3.3.14. An assessment of the risk of spillage incidents on the water environment has also been undertaken in line with the DMRB (DMRB, 2020b). This assessment is based on the probability of a serious spillage incident occurring and of the resulting pollutant entering the water environment. Typically,

an annual probability of 1% (i.e. a 1 in 100 chance of a serious pollution incident occurring in any one year) is considered by DMRB as an acceptable risk. However, where a road drainage outfall discharges within 1km of a sensitive receptor, such as the Upper Ballinderry River SAC, a higher level of protection is required, such that the risk has no greater annual probability than 0.5% (i.e. a 1 in 200 chance of occurring in any one year).

## **LIGHTING**

- 3.3.15. During construction, night working may be required in the vicinity of the Ballinderry River and Fairy Burn. However, due to the presence of salmon and otter on these watercourses night-time working should be avoided wherever possible and otherwise mitigated as detailed in Section 5 in order to maintain a dark corridor along the river channels.
- 3.3.16. It is not proposed to provide street lighting along the bypass other than at the proposed junctions. This does however include lighting at, and associated with the Loughry Roundabout, which extends along the bypass and over the new crossing of the Ballinderry River.
- 3.3.17. The full extent of the Sandholes Link Road will remain illuminated as is currently the case.

## **LANDSCAPE DESIGN**

- 3.3.18. The landscape design for the Proposed Scheme seeks to integrate the development into the local landscape to minimise adverse landscape and visual impacts. It aims to achieve this by planting up the margins of the road corridor with habitats and vegetation which complement the existing character of the immediately surrounding area.
- 3.3.19. With regard to the landscape planting plans specifically in the vicinity of the Ballinderry River, the proposals involve a combination of amenity and species-rich grassland interspersed with mixed and broad-leaved woodland strips, scrub patches, hedgerows and scattered trees. They also include wet grassland and marginal planting around the retention pond ML2 which is to be split into a series of small ponds.
- 3.3.20. The area around retention pond ML2, which is located on the meander of the Ballinderry River, is to be developed into an environmental enhancement area and will also include species-rich grassland and scattered trees.
- 3.3.21. Wet grassland is also to be created along the margins of the realigned section of the Fairy Burn between the Loughry Roundabout and the confluence with the Ballinderry River.

## 4. STAGE 2 – APPROPRIATE ASSESSMENT

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### 4.1. INTRODUCTION

- 4.1.1. As described in Section 1.3.2, this stage considers in further detail the impacts of the Proposed Scheme which have been identified to have the potential to give rise to likely significant effects on the Upper Ballinderry River SAC and its designated interest features and whether those effects could impact the integrity of the SAC in light of its conservation objectives. Where there is the potential for adverse effects on site integrity, appropriate mitigation measures are identified. The assessment should consider the effects which the Proposed Scheme may have either alone or in combination with other projects or plans.
- 4.1.2. To recap, the screening process in Section 2 concluded that the Proposed Scheme could have the following likely significant effects on the Upper Ballinderry River SAC:
- Disturbance, injury or mortality of otters;
  - Damage and/or destruction of otter habitat, including resting sites;
  - Visual and auditory/vibrational disturbance to salmonids, which are critical in the freshwater pearl mussel life-cycle;
  - Damage and/or destruction of salmonid habitat; and
  - Deterioration in water quality giving rise to negative effects on otters and indirectly on freshwater pearl mussel through effects on salmon which are critical in the freshwater pearl mussel life-cycle, either through reduction in habitat condition or prey resource availability.
- 4.1.3. In light of the potential adverse effects to the conservation objectives of the qualifying features outlined in Table 3, the measures described in this section are proposed as mitigation, with a view to minimising the likelihood and significance of these effects.

### 4.2. OTTER

#### **DISTURBANCE AND HARM DURING CONSTRUCTION**

- 4.2.1. Sources of potential impact during construction include:
- Disturbance as a result of night-time working which could result in otters being discouraged from using their natural range. This risks consequent impact on the health of the animals through increased stress and reduced feeding efficiency, and separation of breeding males and females which could lead to a reduction in the density and distribution of the species;
  - Disturbance to movement along watercourses where work is being undertaken on or close to watercourses; and
  - Injury or mortality of individuals which may potentially venture into construction areas where they may be at increased risk either through vehicle collision or by becoming trapped in deep, steep-sided excavations.

#### **Night-time Working**

- 4.2.2. Night-time construction working may potentially be required in the vicinity of the Ballinderry River and Fairy Burn. This presents the potential for light to spill from the construction areas and onto the river below which may deter otters from progressing through the illuminated parts of the river.

- 4.2.3. **Mitigation:** due to the presence of otter (and salmon) on these watercourses the artificial lighting associated with any night-time works within 50m of these watercourses will be positioned/cowled to minimise light spill onto the watercourses and the duration will be kept to a minimum. This will help to maintain a dark corridor along these watercourses.

#### **Disturbance, Injury and/or Mortality**

- 4.2.4. The intersection of the Proposed Scheme with the Ballinderry River, Fairy Burn and potentially other more minor watercourses, poses a risk of otters being disturbed and potentially injured or killed as a result of construction activities.
- 4.2.5. **Mitigation:** The following good practice mitigation measures will be implemented in order to minimise disturbance of otters and the risk of individuals being injured or killed during construction.
- Construction compounds and storage of materials will be sited at least 50m away from watercourses;
  - Riparian habitat that is to be retained will be fenced off and clearly marked to prevent inadvertent access, damage and destruction/removal;
  - Vehicle speeds will be limited to no more than 15mph on site;
  - Fencing will be erected to exclude otters from works areas adjacent to the Ballinderry River and Fairy Burn (i.e. where otter activity has been recorded);
  - Excavations in excess of 2m depth located in the vicinity of near the Ballinderry River and Fairy Burn will be fenced around or covered over at night, or a suitable ramp will be provided to allow any trapped animals to escape; and
  - The continued passage of otters will be maintained along the Ballinderry River and Fairy Burn during the construction phase.
- 4.2.6. Additionally, the release of sediments and other pollutants into the water environment, particularly from spillages of fuel, oil or chemicals, could result not only in the degradation of the riverine habitat used by otters, but could also cause them to be poisoned and potentially killed should such contaminants be ingested.
- 4.2.7. **Mitigation:** The measures prescribed to prevent and control the release of sediments and other pollutants during construction, particularly into the water environment, are detailed below under Deterioration in Condition of Watercourse Habitat.

#### **DISTURBANCE AND HARM DURING OPERATION**

- 4.2.8. The main risks to otters during operation of the Proposed Scheme will be;
- Disturbance from traffic using the new carriageway;
  - Artificial illumination of the Proposed Scheme spilling onto watercourses used by otters;
  - Otters may potentially venture onto the carriageway where they may be at risk of injury or mortality through vehicle collision.

#### **Disturbance**

- 4.2.9. The main location where otters are most likely to experience disturbance from the operational road is at the new crossing of the Ballinderry River. However, as mentioned in Section 3.3 , the bridge will cross approximately 8.1m above the river providing some degree of separation between vehicles and any otters navigating along the river.

- 4.2.10. The new crossing of the Ballinderry River will also be illuminated from the southbound carriageway at either side of the river crossing. This presents the potential for light to spill from the roadway and onto the river below which may deter otters from progressing through the illuminated river crossing section.
- 4.2.11. **Mitigation:** In order to prevent light from spilling on to the river corridor and potentially presenting a barrier to the movement of otters, all new lighting in the vicinity of watercourses will involve the use of full spill cut-off luminaires which will contain the extent of light spill within the footprint of the road carriageway. This will help to maintain a dark corridor along these watercourses. Luminaires around the Loughry Roundabout (adjacent to the Fairy Burn) and on the existing Derryloran Bridge over the Ballinderry River will also be replaced with full spill cut-off units such that the extent of light spill at these locations will also be reduced.

### **Injury and/or Mortality**

- 4.2.12. The intersection of the watercourses by the Proposed Scheme introduces the risk that otters may potentially venture onto the carriageway where they may be at risk of injury or mortality through vehicle collision. As mentioned in the Section 3.3, the proposed new crossing of the Ballinderry River will be a clear span structure with the abutments set back from the river margins thereby retaining the existing natural banksides and allowing continued use and access by otters. This will provide continued safe passage of otters up and down the river, thereby reducing the risk of individuals being encouraged to cross over the road.
- 4.2.13. The existing culverts of the Fairy Burn under the Loughry Roundabout and Sandholes Road will not be replaced or modified as part of the Proposed Scheme other than to construct a new headwall at the outlet of the Loughry Roundabout culvert. Consequently, there are no proposals to improve the passability of these culverts for otters. By diverting traffic to the bypass section instead of passing through Cookstown, the Proposed Scheme will naturally result in an increase in traffic volume passing around Loughry Roundabout and hence over the Fairy Burn, potentially increasing the risk of disturbance, injury and mortality of otters. However, the otter surveys did not find any evidence of otter activity upstream of the Loughry Roundabout suggesting that otters rarely, if ever venture upstream of this point along the Fairy Burn and so there is anticipated to be a low risk of otter casualties at these crossing points.
- 4.2.14. Away from the Ballinderry River and Fairy Burn the Proposed Scheme crosses four minor drainage channels; Fountain Road Drain approximately a third of the way along the bypass route (Ch.1350) and three un-named field drains towards to northern end of the bypass route (Ch.3000, Ch.3150 and Moneymore Road Ch.50).
- 4.2.15. **Mitigation:** Although the minor watercourses were all deemed to be unsuitable for otters and no evidence of the species' presence was identified along them, the box culverts which are proposed at each of these crossing points will include a mammal ledge to facilitate the continued passage of otters should they venture along them. These features will provide safe passage for otters beneath the Proposed Scheme rather than encouraging them to cross the road. These otter ledges will be installed with a clearance that is 150mm above the 1 in 25 return period flood level whilst allowing for 600mm of headroom. The ledges will be pre-cast into the culvert and will be of 500mm width and positioned so as to be accessible from the bank and the water.

- 4.2.16. Permanent mammal fencing will be provided at the following locations along the Proposed Scheme to guide otters (and other wildlife) toward safe crossings (see Figures 1 and 3 for Chainage reference):
- Along the southbound carriageway between the new Ballinderry Bridge wing wall on the north bank (Ch.200) and the southern end of the Ballinderry River Retaining Wall (Ch.350);
  - Along the southbound carriageway between the northern end of the Ballinderry River Retaining Wall (Ch.500) and an acoustic barrier at Ch.700;
  - Along the southbound carriageway between the Fountain Drain culvert (Ch.1350) and a mammal underpass at Ch.1750, including tie-ins with railway bridge wing walls at Ch.1550 and Ch.1600; Ch.1750;
  - Along the north and southbound carriageways between Ch.2900 and Ch.3350 with tie-ins to the un-named field drain culverts at Ch.3000 and Ch.3150 and a disused railway embankment underpass at Ch.3100 and an underpass at Ch.3200.
- 4.2.17. Mammal fencing will be constructed using chain link or welded mesh attached to posts. Fencing will be a minimum 1m high above-ground with lower section of 600mm buried below ground and with 300mm turned away from the fence facing away from the road. On undulating ground or where the nearest safe crossing location is over 500m away fencing may need to be higher or be buried to deeper depths. Fencing will be angled or recessed to guide wildlife toward the crossing and will be securely fastened to the wing wall or adjacent feature (e.g. acoustic barrier) to prevent access. Acoustic (noise) barriers will provide an effective barrier to mammals getting onto the carriageway since these will also meet the minimum height/depth requirements as wildlife fencing, and where fencing is specified on only one side of the carriageway it is assumed that complementary acoustic barriers will prevent wildlife access on the opposite side.

### **DAMAGE AND DESTRUCTION OF HABITAT, INCLUDING RESTING SITES**

- 4.2.18. The main locations where the Proposed Scheme interacts with otter habitat are as follows (see Figure 3, unless otherwise stated);
- The proposed new Ballinderry River crossing;
  - Realignment of the Fairy Burn downstream of Loughry Roundabout to the confluence with the Ballinderry River;
  - The flood wall on the northern bank of the Ballinderry River adjacent to Otter Lodge; and
  - The retaining wall on the northern bank of the Ballinderry River downstream of the proposed new crossing;
  - Minor watercourse crossings along the wider Proposed Scheme (shown on Figure 1).

#### **Ballinderry River Crossing**

- 4.2.19. The proposed new crossing of the Ballinderry River will be a clear span structure with the abutments set back from the river margins thereby retaining the existing natural banksides and allowing continued use and access by otters. It will also provide continued safe passage of otters up and down the river, thereby reducing the risk of individuals being encouraged to cross over the road, where they would be at increased risk of collision with traffic. No otter resting sites were identified in close proximity to the proposed crossing point; the closest was a couch located approximately 50m downstream of the confluence with Fairy Burn. Consequently, there is no expectation that any resting sites will be lost to the Proposed Scheme from this location.

### Fairy Burn Realignment

- 4.2.20. The realignment of the Fairy Burn downstream of the Loughry Roundabout will involve the loss of the existing channel (a reach of approximately 170m) and replacement with a new channel below the embankment of the northern margin of the bypass carriageway. The realigned section of the watercourse, although meandering slightly, will be approximately 135m in length, thereby representing a 20% reduction in available watercourse habitat available to otters.
- 4.2.21. **Mitigation:** In order to minimise the impact that the realignment will have through the loss and damage of watercourse habitat along this section of the Fairy Burn, the realigned section will be reinstated to reflect the original channel section as closely as possible. This will involve the replication of the original bed and channel characteristics and will include translocation (where feasible) of original substrate and introduction of supplementary boulders and gravels of appropriate equivalent character as and where necessary. The landscape planting plans along the realigned section include re-seeding of the banksides with a species-rich grassland mix along with planting of mixed woodland, scrub and scattered trees to provide shade and shelter to otters and other riverine fauna.
- 4.2.22. It will also be a specific requirement of the contracts that construction of the new realigned section must be completed prior to the severance of the abandoned section.

### Ballinderry River Retaining Wall (Ch. 280-Ch.440)

- 4.2.23. Installation of the retaining wall on the northern bank of the Ballinderry River between approximate Ch.280 and Ch.440 will come to within 10m of the Ballinderry River channel. The installation of this feature is expected to require the removal of bankside vegetation including several mature broadleaved trees from the riparian corridor; vegetation which currently provides shelter to otters navigating along the river below. These works are also likely to result in the damage and potentially the destruction of a confirmed otter holt located on the river margin immediately below the retaining wall. Even if the works do not directly overlap with this resting site, they will be so close that any otters using this feature are expected to be so significantly disturbed that they would abandon it, at least temporarily. Although this otter holt was not refound during the ecological update walkover survey in October 2022, a precautionary approach is taken which assumes that this feature does still exist.
- 4.2.24. **Mitigation:** In order to mitigate for the potential damage, destruction and abandonment of this holt, an artificial holt will be created in order to provide a suitable alternative resting site for the displaced otters. This will be located between 100m and 300m further upstream on the meander of the Ballinderry River, and downstream of the new Ballinderry River crossing, where an environmental enhancement area will be established. This area will be developed in association with a surface water retention pond (ML2) in the vicinity of Ballinderry River floodplain. This will involve a series of ponds and wet grassland with marginal planting surrounded with species-rich grassland and scattered trees. The artificial holt will consist of a number of chambers (up to 1m<sup>2</sup>) and will be constructed from breeze blocks or log piles for walls and covered in logs with brash for the ceiling. There will be at least one chamber that has no external opening. There will be at least two concealed entrances, one down to the water's edge and one onto the bank, or an earth mound if there is minimal height to the riverbank. Mammal fencing will also be installed along the proposed road boundary at these locations as detailed in Paragraph 4.2.16.

### Flood Wall near Otter Lodge

- 4.2.25. Like most of the above works, the construction of the flood wall at Otter Lodge will involve the loss of a small, localised area of bankside habitat along the Ballinderry River, which predominantly comprises managed grassland along the front of riverside houses. While no evidence of otter activity has been recorded at this location specifically, it is almost certain that otters will occasionally use this section of the river and bankside habitat. However, the extent of riparian habitat lost at this location and its value to otters will be negligible when considering its managed nature and the extent of otter home ranges, which can extend over tens of kilometres (Chanin, 2003). In the context of the extent of the riverine habitat available to otters along the wider Ballinderry River this small, localised loss of habitat will not be detrimental to the species in terms of the availability and continuity of supporting habitat.

### Fragmentation of Watercourses through Installation of Culverts

- 4.2.26. The installation of watercourse crossing points results in the loss of riverine and bankside habitat and fragments the continuity of rivers and streams which represent commuting corridors for a variety of wildlife including otters.
- 4.2.27. **Mitigation:** As mentioned above the Proposed Scheme crosses four minor drainage channels along the length of the bypass route; Fountain Road Drain and three un-named field drains. These watercourse crossings will comprise the box culverts and include mammal ledges to facilitate the continues passage of otters should they venture along them, the details of which are provided in Paragraph 4.2.15. As stated above, the existing culverts of the Fairy Burn under the Loughry Roundabout and Sandholes Road will not be replaced or modified as part of the Proposed Scheme other than to construct a new headwall at the outlet of the Loughry Roundabout culvert. Consequently, there are no proposals to improve the passability of these culverts for otters.

### Measures to Account for Potential Changes in Baseline Conditions

- 4.2.1. It is possible that new otter resting sites may become established prior to the commencement of construction works. Therefore, pre- and during construction update surveys will be carried out to maintain and update the status of otter activity in the vicinity of the Proposed Scheme. Surveys should be conducted by an Ecological Clerk of Works (ECoW) or suitably qualified ecologist (the roles and responsibilities of which are detailed in the first iteration Environmental Management Plan (fiEMP) (WSP, 2023i). If any new or previously identified otter resting sites are found to be active prior to or during construction within or in close proximity to the Proposed Scheme footprint then works will require to be ceased within at least 30m of the resting site. The ECoW would conduct an assessment of the potential risks posed to the resting site and determine whether a European Protected Species (EPS) licence from DAERA and any mitigation would be required in order for works to proceed in that location. If evidence of breeding activity, or the care of young, is found during pre-construction surveys, no construction works will be permitted within at least 200m of these locations until the cubs have left the den, which can be up to ten weeks. When it can be ascertained that otters are not using the site for breeding or care of young, works may be permitted to proceed. Any otter resting sites which may be affected by the construction works will be subject to a specific mitigation strategy which will be developed in order to safeguard or compensate for any damage or destruction of resting sites or disturbance of otters. This will be submitted in support of any required EPS licence applications for otter.

- 4.2.2. Toolbox talks will be provided to site staff by the ECoW which will provide information on where otters may be found and how to avoid impacts on them. If otters are at risk of injury from the works, site staff would be instructed to cease working and contact the ECoW.

## DETERIORATION IN CONDITION OF WATERCOURSE HABITAT

### Release of Sediment and Other Pollutants during Construction

- 4.2.3. Construction related to earthworks and structures can involve in the release of sediments and other construction related pollutants into watercourses. Spillage of fuels and oils required for the operation of plant and other construction machinery could result in release of hydrocarbons into the Ballinderry River and other local watercourses as could the presence of cement both whilst in storage and when being poured during construction particularly when in close proximity to watercourses. These contaminants could result in the deterioration of water quality in the receiving watercourses potentially leading to habitat degradation, reduction in prey resource availability and direct injury or mortality of otters.
- 4.2.4. Works relevant to the potential release of sediment and other potential pollutants are:
- Earthworks in the vicinity of Ballinderry River, Fairy Burn and other minor watercourses;
  - Installation of the new bridge structure across the Ballinderry River;
  - Realignment of the Fairy Burn downstream of Loughry Roundabout;
  - Installation of new culverts on minor watercourses;
  - Roadworks associated with the existing Sandholes Road bridge over the Fairy Burn; and
  - Excavation of the proposed surface water retention pond (ML2) in the vicinity of Ballinderry River floodplain.
- 4.2.5. It is important to note that the risk of sediment and other pollutants being released directly into the Upper Ballinderry River SAC is negligible since the Proposed Scheme is located entirely downstream of it with the closest works simply involving the tie-in of the road surface at the northern end of the Sandholes Link Road section on the approach to the Derryloran Bridge. Therefore, the risk of sediment and other pollutant release concerns the downstream reaches of the Ballinderry River, the Fairy Burn and other minor watercourses.
- 4.2.6. The risk of release of sediments or other construction related pollutants into the Ballinderry River and other watercourses could occur where:
- Localised in-stream works and works on the bankside of watercourses will be required for the construction of temporary and permanent bridges, culverts, watercourse diversions and headwalls for drainage outfalls;
  - Construction of earthworks to establish the vertical alignment of the Proposed Scheme where it is located within 50m of the watercourses;
  - Construction of filter drains, ditches, swales, grassed channels and retention ponds required to attenuate and carry road related run-off which are located within 50m of the watercourses; and
  - Site compounds and materials storage areas located within 50m of the watercourses.
- 4.2.7. **Mitigation:** Measures focused on the avoidance and control of sediments and other construction related pollutants will be formalised in the contracts for the implementation of the Proposed Scheme by way of contract specific Environmental Management Plan (EMP) which the contractors will be required to prepare, and which will include as a minimum management roles and responsibilities, protocols, method statements and mitigation measures. This should detail sediment management

measures and a water quality monitoring plan, with particular focus on the most sensitive locations (i.e. works in close proximity to the Ballinderry River and Fairy Burn). The first iteration of the EMP (fiEMP) is provided as part of the A29 Cookstown Bypass EIA Report (WSP, 2023i).

4.2.8. As a minimum, pollution control measures during construction will be informed by the following guidance:

- Guidance for Pollution Prevention (GPPs) (NetRegs, 2023);
  - GPP1: Understanding your environmental responsibilities – good environmental practice;
  - GPP2: Above ground oil storage;
  - GPP5: Works and maintenance in or near water;
  - GPP6: Working at construction and demolition sites;
  - GPP8: Storage and disposal of used oils;
  - GPP21: Pollution incident response planning;
  - GPP22: Dealing with spills;
  - GPP26: Safe storage - drums and intermediate bulk containers;
- Environmental Good Practice on Site Guide (4<sup>th</sup> Edition) C741D (CIRIA, 2015); and
- Control of Pollution from Construction Sites C532 (CIRIA, 2001).

4.2.9. Excavated soils in the vicinity of watercourses will be temporarily set aside a minimum of 10m back from the watercourse banksides and surrounded by sediment interception measures (e.g. fencing and interceptor drains as required) to prevent sediment-laden run-off entering the watercourses during rainfall events. Excavated soils will be used for reinstatement and landscaping of the surrounding areas towards the end of the construction works.

4.2.10. Site compounds will be sited at least 50m away from watercourses in order to minimise the risk of pollution. Fuels and chemicals will be stored in bunded compounds, along with refuelling facilities so as to prevent the release of any spillages outwith the compound areas.

4.2.11. The diversion of the downstream section of the Fairy Burn and the installation of culverts on the minor watercourses along the wider bypass route will result in disturbance to watercourse channels and banksides and will likely result in the release of sediments into the associated watercourses. Completion of the diverted section of the Fairy Burn prior to abandonment of the original section of existing channel will substantially limit potential release of sediments into the watercourses. Similarly, for culverted section of minor watercourses, temporary diversion or over-pumping of the watercourses while culverts are being installed and gradual reinstatement of the channel with pumping out of sediment-laden water will reduce the quantities of sediments released into the watercourses.

### **Release of Sediment and Other Pollutants during Operation**

4.2.12. Once the Proposed Scheme is constructed and operational, there will be negligible risk of significant sediment release and other pollution events effecting the local watercourses. However, as with any road, a broad range of potential pollutants, such as hydrocarbons (i.e. fuel and lubricants), fuel additives, metal from corrosion of vehicles, de-icer and gritting material, can accumulate on road surfaces. These can subsequently be washed off the road during rainfall events, polluting the receiving water bodies. Routine runoff from road drainage networks can result in both acute and chronic impacts on water quality and subsequently on the biodiversity of the receiving watercourses, due to both soluble (in particular, dissolved copper and dissolved zinc) and sediment-bound

pollutants. Such contaminants could therefore be potentially harmful to habitats and species associated with the Upper Ballinderry River SAC.

- 4.2.13. There is also a risk that road traffic accidents or vehicle fires may result in spillage of potential pollutants on the road surface. These pollutants may then enter the road drainage network and subsequently be discharged to the water environment, causing an acute pollution event, with similar potentially harmful effects on habitats and species associated with the Upper Ballinderry River SAC.
- 4.2.14. The drainage design which has been developed for the Proposed Scheme, as described in Section 3.3, includes a combination of filter drains, swales and retention ponds. Of the six proposed mainline surface water outfalls, five<sup>10</sup> were subject to HEWRAT, Environmental Quality Standards (EQS) Assessment and Spillage Assessment (see Section 3.3 and A29 Cookstown Bypass EIAR Appendix 15.1: Road Drainage and the Water Environment Supporting Information (WSP, 2023g)), including cumulative assessments for outfalls within 100m distance. Two of these relate directly to the Ballinderry River; ML1 and ML2.
- 4.2.15. The results of the HEWRAT, EQS and Spillage assessments for ML1 and ML2 are provided in **Appendix B** and show that both outfalls passed all elements of the routine runoff and spillage assessments, individually and cumulatively with each other. (Other mainline surface water drainage outfalls, not directly connected to the Ballinderry River, failed the HEWRAT assessment with regards to annual average dissolved copper although this was due to the influence of the ambient background copper concentration within the catchment rather than through contributions from the Proposed Scheme itself).
- 4.2.16. Consequently, contamination of the Ballinderry River from the release of sediment and other pollutants or from spillage incidents during the operation of the Proposed Scheme is not anticipated to adversely affect the local otter population.

### 4.3. FRESHWATER PEARL MUSSEL: IMPACTS TO SALMONIDS AS HOST SPECIES OF LARVAL FRESHWATER PEARL MUSSELS

#### DISTURBANCE OR HARM DURING CONSTRUCTION

##### Contamination of Watercourses

- 4.3.1. The release of sediments and other pollutants into the water environment, particularly from spillages of fuel, oil or chemicals, could result not only in the degradation of the watercourses used by salmonids and other fish, but could also cause them to be poisoned and potentially killed should such contaminants be ingested.
- 4.3.2. **Mitigation:** The measures prescribed to prevent and control the release of sediments and other pollutants during construction, particularly into the water environment, are detailed below under Deterioration in Condition of Watercourse Habitat.

##### Noise and Vibrational Disturbance

- 4.3.3. Atlantic salmon are capable of detecting the pressure and particle motion components of sound; levels of anthropogenic noise and vibration may exceed the hearing threshold of Atlantic salmon

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<sup>10</sup> HEWRAT recommends undertaking groundwater assessments for watercourses with a Q95 of 0.001m<sup>3</sup>/s or less which one of the five outfalls (Outfall ML5) did not meet. This outfall was therefore assessed as a soakaway.

(Hawkins and Johnstone, 1978). This is due to their physiological makeup and the particle composition of water and soil, which facilitate propagation further than in air (Popper, 2008). The resulting potential impacts can be disorientation, hearing impairment (Nedwell *et al.*, 2005) or death, either directly from the noise generation or indirectly as a result of hearing impairment. Construction activities with the potential to pose such risks are blasting or piling particularly within or immediately adjacent to watercourses.

- 4.3.4. Construction works for the Proposed Scheme do not involve any blasting or piling within watercourses. The establishment of abutment foundations at the proposed River Ballinderry crossing will however involve piling close to the top of the bankside slopes. Additionally, the installation of the retaining wall on the steep embankment down to the Ballinderry River between Ch. 280 and Ch. 440 will involve significant excavation, compaction and potentially rock breaking with potential for high levels of vibrational disturbance, while piling may be required for the installation of the flood wall at Otter Lodge.
- 4.3.5. **Mitigation:** A restricted working window of May to September (inclusive) will be implemented for all construction works within 50m of the Ballinderry River or the Fairy Burn (i.e. those watercourses which are known to support salmonids). This represents the period outside the normal salmonid migration, spawning and incubation periods.
- 4.3.6. Mitigation to be incorporated in the construction procedure for all piling within 50m of a watercourse, will include a soft-start methodology. The soft-start methodology will involve a gradual increase in force and intensity of percussive piling or drilling, and hence, noise and vibration, over a 30-minute period to allow fish to move outside of the area of influence. The soft-start methodology would be required each time the machinery is started following a 30-minute rest period. Once the piling is in full operation, associated noise and vibration from the machinery will keep fish outside of the area of influence. This process will need to be repeated at the start of each day, as overnight working is not expected for construction works in close proximity to watercourses.

### Lighting

- 4.3.7. Artificial lighting at night has the potential to disrupt and disorientate fish, increase exposure to predation, alter light-sensitive endocrine systems and disrupt crepuscular and nocturnal mating, signalling and dispersal (Rich and Longcore, 2006). With regards to Atlantic salmon, the main impacts resulting from artificial lighting are disruption to migration behaviour (Thorpe *et al.*, 1988; Nemeth and Anderson, 1992) and increased mortality rates due to increased efficiency of predators (Tabor *et al.*, 2004; Kemp and Williams, 2009).
- 4.3.8. As discussed in relation to otter, night-time construction working may potentially be required in the vicinity of the Ballinderry River and Fairy Burn and this poses the potential for light to spill from the construction areas and onto the river below which may deter salmonids from progressing through the illuminated parts of the river.
- 4.3.9. **Mitigation:** due to the presence of salmon (and otter) on with these watercourses the artificial lighting associated with any night-time works within 50m of these watercourses will be positioned/cowled to minimise light spill onto the watercourses and the duration will be kept to a minimum. This will help to maintain a dark corridor along these watercourses.

## DISTURBANCE OR HARM DURING OPERATION

### Noise and Vibrational Disturbance

- 4.3.10. It is not anticipated that the levels of noise and/or vibrational disturbance from traffic using the new Ballinderry River crossing will be sufficient to pose significant disturbance to fish to the extent that it may discourage them from migrating up or down the river.
- 4.3.11. Similarly, noise and/or vibrational disturbance from traffic using the reconfigured Loughry Roundabout is not anticipated to be significantly different to baseline levels. In any case, the fish surveys did not find any salmonids upstream of the Loughry Roundabout and it was considered unlikely that many adult salmon would be able to navigate much further upstream than the roundabout. Indeed, without modification of the existing culverts of the Fairy Burn under the Loughry Roundabout and Sandholes Road any operational disturbance at these crossing ponds is not expected to significantly affect the movement of salmonids along the Fairy Burn.

### Lighting

- 4.3.12. The new crossing of the Ballinderry River will be illuminated from the southbound carriageway at either side of the river crossing. This presents the potential for light to spill from the roadway and onto the river below which may deter salmonids from progressing through the illuminated river crossing section.
- 4.3.13. **Mitigation:** In order to prevent light from spilling on to the river corridor and potentially presenting a barrier to the movement of salmonids, all new lighting will in the vicinity of watercourses involve the use of full spill cut-off luminaires which will contain the extent of spill within the footprint of the road carriageway. Luminaires around the Loughry Roundabout (adjacent to the Fairy Burn) and on the existing Derryloran Bridge over the Ballinderry River will also be replaced with full spill cut-off units such that the extent of light spill at these locations will also be reduced.

## DAMAGE AND DESTRUCTION OF SALMONID HABITAT

- 4.3.14. The main locations where the Proposed Scheme interacts with suitable salmonid watercourses are as follows;
- The proposed new Ballinderry River crossing; and
  - Realignment of the Fairy Burn downstream of Loughry Roundabout to the confluence with the Ballinderry River.
- 4.3.15. The four minor drainage channels along the wider bypass route which are to be culverted, namely Fountain Road Drain and three un-named field drains, are not deemed to be suitable for salmonids and so are not considered here.

### Ballinderry River Crossing

- 4.3.16. The proposed new crossing of the Ballinderry River will be a clear span structure with the abutments set back from the river margins. Consequently, there will be no in-river works which will cause the direct damage or destruction of fish habitat at this location and the natural banksides and associated habitat will be retained. There may however, be an impact from the shade cast by the bridge on bankside and any in-stream vegetation which may provide shelter for salmonids (and other fish). Shading could reduce the ability of the vegetation to be sustained. In the context of the wider Ballinderry River catchment however, any adverse effects from shading on the habitat supporting salmonids will be negligible.

### Fairy Burn Realignment

- 4.3.17. The realignment of the Fairy Burn downstream of the Loughry Roundabout will involve the loss of the existing channel (a reach of approximately 170m) and replacement with a new channel below the embankment of the northern margin of the bypass carriageway. This section of the Fairy Burn was found to contain potentially suitable spawning, nursery and holding habitat for salmonids and both salmon and brown trout fry were recorded here during the dedicated fish surveys. The realigned section of the watercourse, although meandering slightly, will be approximately 135m in length, thereby representing a 20% reduction in available watercourse habitat available to salmonids and other fish within the affected stretch.
- 4.3.18. **Mitigation:** In order to minimise the impact that the realignment will have through the loss and damage of watercourse habitat along this section of the Fairy Burn, the realigned section will be reinstated to reflect the original channel section as closely as possible. This will involve the replication of the original bed and channel characteristics and will include translocation (where feasible) of original substrate and introduction of supplementary boulders and gravels of appropriate equivalent character as and where necessary. The landscape planting plans along the realigned section include re-seeding of the banksides with a species-rich grassland mix along with planting of mixed woodland, scrub and scattered trees which will provide shade and shelter to fish.
- 4.3.19. It will also be a specific requirement that construction of the new realigned section must be completed prior to the severance of the abandoned section. The de-watering of the abandoned section will be carried out under supervision of the ECoW or suitably qualified ecologist to ensure that any fish which may be present, including salmon, are safely removed. A fish screen will be fitted to any pump/s used and/or fish passage maintained.

## DETERIORATION IN CONDITION OF WATERCOURSE HABITAT

### Release of Sediment and Other Pollutants during Construction

- 4.3.20. The same construction activities and risks to pollution of the water environment during construction which were discussed for otters apply to fish.
- 4.3.21. **Mitigation:** The same mitigation measures detailed to prevent and manage pollution events in order to protect watercourse habitat for otters also apply to fish. In summary these include;
- Preparation of a contract specific EMP and Sediment Management Plan (SMP) which will include reference and adherence to industry standard pollution prevention guidance (i.e. GPPs and CIRIA Environmental Good Practice and Control of Pollution Guidance);
  - Temporary storage of excavated soils a minimum of 10m back from the watercourse banksides and surrounded by sediment interception measures;
  - Site compounds to be sited at least 50m away from watercourses with fuels and chemicals stored in bunded compounds, along with refuelling facilities;
  - Completion of the diverted section of the Fairy Burn prior to abandonment of the original section of existing channel; and
  - Temporary diversion or over-pumping of the watercourses to be culverted and gradual reinstatement of the channel with pumping out of sediment-laden water.

### Release of Sediment and Other Pollutants during Operation

- 4.3.22. The same risks to pollution of the water environment during operation as were discussed for otters apply to fish. In summary, while it is expected that a broad range of potential pollutants will be

washed off the road surface and ultimately end up in the Ballinderry River, the HEWRAT assessments for the two mainline outfalls directly related to the Ballinderry River (ML1 and ML2) passed all elements of the routine runoff assessment, both individually and cumulatively with each other.

- 4.3.23. Consequently, contamination of the Ballinderry River from the release of sediment and other pollutants during the operation of the Proposed Scheme is not anticipated to adversely affect salmon or hence the SACs freshwater pearl mussel population.

#### **4.4. IN-COMBINATION ASSESSMENT**

- 4.4.1. In accordance with the Habitats Regulations, as well as considering the potential for likely significant effects and adverse effects on site integrity from the Proposed Scheme in isolation, the HRA must also consider those effects in combination with effects associated with other plans or projects.
- 4.4.2. The potential impacts from the Proposed Scheme on the Upper Ballinderry River SAC are limited to water quality impacts up to 6km downstream (see Section 2.2.14), and noise/vibration impacts from construction works adjacent to watercourses. Consequently, this in-combination assessment has considered other plans and projects which either directly interact with, or are within 1km and hydrologically connected to the Ballinderry River and within 6km up and downstream of the Proposed Scheme<sup>11</sup>. The search considered planning applications that have been submitted over the last 5 years (i.e. since January 2018), since it is considered that the majority of applications submitted within that timeframe will have been decided upon and either completed or not progressed. This included searches for projects on the Northern Ireland and Mid Ulster Council Planning Portals (NIDirect, 2023 and Mid Ulster District Council, 2023 respectively) for new applications. A review was also conducted of planned developments referred to in the 2010 Cookstown Area Plan (DfI, 2023), which included land zoned for housing, industrial or recreational developments. However, the majority of the planned developments located in proximity, or with connectivity to the Ballinderry River were either not submitted, the affiliated planning applications had since expired, or they had long-since been completed.
- 4.4.3. The majority of proposed developments located within the search area and hydrologically connected to the Ballinderry River were minor, small-scale private residential, commercial and agricultural business property developments, local amenity facilities and access improvements. These projects are reasonably excluded from further consideration in this assessment based on their small scale and discrete nature and anticipated negligible and localised effects, as is implied by the absence of any detailed assessments of ecological impacts associated with these proposed projects (e.g. EIAs or HRAs). Furthermore, it is reasonably expected that the relevant Planning Authority for these proposed developments, will have assessed them in the context of the Habitats Regulations should they have been relevant. Consequently, there is not considered to be any credible risk of adverse impacts from these projects on Upper Ballinderry River SAC or its associated qualifying features which could conceivably contribute to the effects associated with the Proposed Scheme.

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<sup>11</sup> Projects up to 6km upstream of the Proposed Scheme have been included since any adverse effects to water quality from upstream projects may potentially extend downstream to contribute to effects from the Proposed Scheme.

- 4.4.4. The proposed developments considered to be of sufficient scale and/or nature and which either directly interact with, or are hydrologically connected to the Ballinderry River such that they could potentially contribute to likely significant effects from the Proposed Scheme were as follows;
- Proposed residential development comprising 48 dwellings and associated road access works at Old Rectory Park off Sandholes Road, Cookstown (south) (application number: LA09/2022/1094/F);
  - Proposed erection of 32 business/storage units and associated car parking and commercial spaces at Kilcronagh Business Park, Cookstown (south west) (application number: LA09/2022/0612/F);
  - Proposed fabrication and manufacturing workshop and associated site works at Kilcronagh Business Park, Cookstown (south west) (application number: LA09/2022/0127/F);
  - Proposed 9.5ha extension of Kilcronagh Business Park, Cookstown (southwest) (application number: LA09/2018/1361/O)/ Phase One of the Business Park development (application number: LA09/2023/0484/RM);
  - Alteration of 33kv distribution network involving recovery of 607m of existing overhead line and 7 existing wood poles and erection of 728m of proposed overhead line and 6 proposed wood poles between Pomeroy Road and Kilcronagh Road, Cookstown (south west) (application number: LA09/2022/1547/F); and
  - Proposed development of 52 housing units at 20 Dungannon Road, Cookstown (south) (application number: LA09/2017/1366/F).
- 4.4.5. When undertaking in-combination assessments the timing of the other projects relative to that of the Proposed Scheme is an important consideration. This is because it is predominantly only when the relevant corresponding impacts occur concurrently that they can act in-combination with one another to potentially give rise to significant adverse cumulative effects. In most cases, the impacts with the greatest potential to act in combination with those from other projects will be those occurring during the construction phase. The following in-combination assessment takes a precautionary approach and assumes the worst-case scenario that individually, the other projects and their associated impacts would occur at the same time as those associated with the Proposed Scheme, unless otherwise known or stated. However, the in-combination assessment also assumes that all projects will be implemented in accordance with, and successful application of the best practice constructions and/or mitigation measures proposed to avoid or minimise their respective ecological and environmental impacts.

### **OLD RECTORY PARK HOUSING DEVELOPMENT (48 HOUSES)**

- 4.4.6. This proposed development is located immediately adjacent to the northern end of the Sandholes Link Road section of the Proposed Scheme and involves the construction of 48 houses and associated access works at the Old Rectory Park in the southern part of Cookstown. The development site is located immediately adjacent to the Ballinderry River but is just downstream of the SAC. Nonetheless it has the potential to contribute to adverse effects on water quality through surface water run-off.
- 4.4.7. Upon review of the documents submitted in support of this proposed development NIEA's Natural Environment Division (NED) concluded in their planning response that they were content that it was unlikely to cause any negative impacts upon the designated features of the Upper Ballinderry River SAC subject to adherence to, and implementation of the following recommendations (as summarised);

- Completion of a pre-construction otter survey;
- Maintenance of a minimum 10m buffer between all construction works and the red line boundary;
- No direct discharge of untreated surface water into adjacent watercourses during both construction and operation;
- No creation of obstructions along the river bank;
- Provision of a means of escape from any excavations left open over night; and,
- Construction activities to be restricted to daylight hours.

## **KILCRONAGH BUSINESS PARK - MULTIPLE DEVELOPMENTS**

- 4.4.8. These multiple proposed developments are located within Kilcronagh Business Park to the south west of Cookstown. They are all situated within 500m upstream of the Sandholes Link Road section of the Proposed Scheme and are all immediately adjacent to the Fairy Burn and as such are discussed here collectively. The proposed developments involve;
- Construction of 32 business and storage units and associated car parking and commercial spaces;
  - Construction of a fabrication and manufacturing workshop and associated site works; and
  - A 9.5ha extension to the business park. Phase One of the extension, including three units for light industrial use, a security gatehouse building, and roadway has been taken forward through a 2023 reserved matters application.
- 4.4.9. Due to their immediate proximity to the Fairy Burn, these proposed development sites are all hydrologically connected to the Ballinderry River and hence have the potential to contribute to adverse effects, particularly relating to water quality through surface water run-off.
- 4.4.10. An Ecological Appraisal Report for the proposed business and storage unit development and a Preliminary Ecological Appraisal for the proposed business park extension both acknowledge connectivity with the Ballinderry River and potential effects on aquatic species, which are proposed/implied to be avoided through the application of standard pollution prevention measures.
- 4.4.11. In recognition of the connectivity between the proposed business and storage unit development, Shared Environmental Services (SES) undertook a HRA on behalf of Mid Ulster District Council. Subject to the installation of an oil interceptor to the site drainage layout, it was concluded that this proposed development would not have an adverse effect on the integrity of any European designated sites, either alone or in combination with other plans or projects.
- 4.4.12. On review of the applications for the proposed business and storage unit development and the proposed business park extension NIEA's NED concluded, based on the information provided, that they had no concerns regarding designated sites as it was unlikely that they would pose any significant adverse impacts. Additional confidence was provided in the environmental protection measures set out in Construction Environmental Management Plan submitted in support of Phase One of the proposed business park extension. Consequently, Mid Ulster District Council were satisfied that these developments were unlikely to cause any negative impacts upon any designated sites resulting in them being consented.
- 4.4.13. No consultation responses with NIEA's NED or SES were found on the planning portal for the proposed fabrication and manufacturing workshop, which was consented in June 2023. Nonetheless, it is wholly expected that Mid Ulster District Council will have assessed this proposal in the context of the Habitats Regulations should they have been relevant, and that consent will not

have been granted without being satisfied that this proposed development would not pose any likely significant effects or adverse effects on the integrity of the Upper Ballinderry River SAC, or any other European site.

#### **OVERHEAD POWER LINE REFURBISHMENT AND REPLACEMENT PROJECT**

- 4.4.14. This proposed development is located approximately 1km upstream of the Sandholes Link Road section of the Proposed Scheme to the west of Cookstown and intersects with the Fairy Burn. It involves refurbishment of the existing 33kv distribution network including recovery and replacement over 700m of existing overhead line (OHL) and wood poles. Given the distance of separation between this proposed OHL refurbishment project and the Proposed Scheme and its limited interaction with the Fairy Burn (i.e. a single intersection point) connectivity to the Ballinderry River is tenuous, making the risk of contributory impacts much reduced. Furthermore, once the replacement works are complete, there will be negligible operational impacts. Therefore, any potential in-combination effects are expected to be limited to during the construction (replacement) phase of the project and are most likely to involve impacts associated with surface water pollution. On review of the application for this proposed development, the Mid Ulster District Council Development Management Officer's Report concluded that they were content that the refurbishment works were 'able to avoid an area of nature conservation or archaeological interest' and that on the basis of planning policy and other material considerations they are 'of the opinion to approve' the proposed development. No other ecological appraisals such as an EclA or HRA were identified through searches of the planning portals.

#### **DUNGANNON ROAD HOUSING DEVELOPMENT (52 HOUSES)**

- 4.4.15. This consented development is located immediately adjacent to the southern end of the proposed Cookstown Bypass element of the Proposed Scheme and involves the construction of 52 housing units off Dungannon Road in the southern part of Cookstown. The development site is located within 100m of the Ballinderry River, near to the Proposed Scheme's new crossing point, but is just downstream of the SAC. As such it has the potential to contribute to adverse effects on the condition of the river and its associated qualifying interests. Subsequent to the submission of the application for this proposed development, NIEA's NED concluded on the basis of the information provided that they had no concerns with the proposal regarding designated sites (or other natural heritage interests) subject to certain conditions which they recommended to protect the qualifying interests of the Upper Ballinderry River SAC and other natural heritage interests. In light of this advice, Mid Ulster District Council approved this proposed development subject to following conditions (as summarised) in regard to the protection of natural habitats, including the features of the Upper Ballinderry River SAC:

- Condition 10 – A suitable buffer of at least 10m must be maintained between all construction works.
- Condition 11 – There shall be no direct discharge of untreated surface water run-off during the construction and operational phase to the Ballinderry River.

#### **CONCLUSION REGARDING IN-COMBINATION EFFECTS**

- 4.4.16. As discussed above, the above proposed developments have been assessed by the relevant environmental regulatory or advisory bodies who have concluded that they have no concerns with the various proposed developments regarding designated sites, albeit in some cases, subject to certain recommended conditions. Even in the case of the proposed Kilcronagh Business Park

fabrication and manufacturing workshop, it is expected that Mid Ulster District Council will have assessed this proposal in the context of the Habitats Regulations and that consent will not have been granted without being satisfied that this proposed development would not pose any likely significant effects or result in adverse effects on the integrity of the Upper Ballinderry River SAC, or any other European site.

- 4.4.17. Consequently, assuming thorough implementation of the recommended conditions, it is concluded that these other projects will not pose any likely significant effects or hence result in adverse effects on site integrity on the Upper Ballinderry River SAC, or any other European site, which could contribute to those associated with the Proposed Scheme. Therefore, there is no credible risk of adverse in-combination effects between these other projects and the Proposed Scheme on the integrity of the Upper Ballinderry River SAC.

## 4.5. SUMMARY OF MITIGATION MEASURES

- 4.5.1. Table 4 presents a summary of the likely significant effects which the Proposed Scheme was identified to pose upon Upper Ballinderry River SAC and/or its qualifying features and the mitigation measures detailed in the above sections, which will be implemented to minimise or avoid them. These mitigation measures correspond to those presented in Chapter 12: Biodiversity and Chapter 17: Schedule of Mitigation Measures of the A29 EIA Report.
- 4.5.2. The measures detailed in Table 4 will be contractual commitments placed on contractors by DfI and will be audited as part of DfI standard practice. These measures could only be changed with prior discussion and agreement from DAERA.

**Table 4: Summary Mitigation Measures**

Likely Significant Effects	Mitigation Measures
Disturbance and Harm During Construction	<p><u>Otter and Freshwater Pearl Mussel (Salmonids)</u></p> <ul style="list-style-type: none"> <li>Artificial lighting associated with any night-time works within 50m of the Ballinderry River and Fairy Burn will be positioned/cowled to minimise light spill onto the watercourses and the duration will be kept to a minimum.</li> </ul> <p><u>Otter</u></p> <ul style="list-style-type: none"> <li>Location of compounds and storage of materials at least 50m away from watercourses.</li> <li>Fencing off of riparian habitat that is to be retained with clear marking to prevent inadvertent access, damage and destruction/removal.</li> <li>Exclusion of otters from works areas adjacent to the Ballinderry River and Fairy Burn, using temporary fencing.</li> <li>Fencing or covering over of excavations in excess of 2m depth over-night in the vicinity of watercourses where use by otters has been established, or provision of a suitable escape ramp.</li> <li>Maintenance of the continued passage of otters along the Ballinderry River and Fairy Burn.</li> </ul>

Likely Significant Effects	Mitigation Measures
	<p><u>Freshwater Pearl Mussel (Salmonids)</u></p> <ul style="list-style-type: none"> <li>• Restriction of works within 50m of the Ballinderry River and Fairy Burn to between May and September (inclusive); outside the typical salmonid migration, spawning and incubation periods.</li> <li>• All piling within 50m of a watercourse will involve a soft-start methodology, with the force and intensity of percussive piling or drilling gradually increasing over a 30 minute period to allow any salmon present to move outside of the area of influence.</li> </ul>
Disturbance and Harm During Operation	<p><u>Otter and Freshwater Pearl Mussel (Salmonids)</u></p> <ul style="list-style-type: none"> <li>• All new lighting in the vicinity of watercourses will involve the use of full spill cut-off luminaires which will contain the extent of light spill within the footprint of the new road carriageway.</li> <li>• Luminaires around the reconfigured Loughry Roundabout and on the existing Derryloran Bridge over the Ballinderry River will also be replaced with full spill cut-off units.</li> </ul> <p><u>Otter</u></p> <ul style="list-style-type: none"> <li>• Provision of mammal ledges in all new culverted crossings of minor watercourses to facilitate the continued passage of otters should they venture along them and discourage them from attempting to cross over the road where they may be at increased risk of vehicle collision. Ledges will be installed with a clearance that is 150mm above the 1 in 25 return period flood level whilst allowing for 600mm of headroom. The ledges will be pre-cast into the culvert and will be of 500mm width and positioned so as to be accessible from the bank and the water.</li> </ul>
Damage/ Destruction of Habitat	<p><u>Otter and Freshwater Pearl Mussel (Salmonids)</u></p> <ul style="list-style-type: none"> <li>• Replication of the original bed and channel characteristics from the realigned section of the Fairy Burn including translocation (where feasible) of original substrate and introduction of supplementary boulders and gravels of appropriate equivalent character as and where necessary.</li> <li>• Completion of the new realigned section of the Fairy Burn prior to the severance of the abandoned section. The de-watering of the abandoned section will be carried out under supervision of a suitably qualified ECoW to ensure that any fish which may be present, including salmon, are safely removed. A fish screen will be fitted to any pump/s used and/or fish passage maintained.</li> <li>• Landscape planting along the realigned section of the Fairy Burn including re-seeding of the banksides with a species-rich grassland mix along with planting of mixed woodland, scrub and scattered trees.</li> </ul> <p><u>Otter</u></p> <ul style="list-style-type: none"> <li>• Creation of an artificial otter holt downstream of the new Ballinderry River crossing on the meander of the Ballinderry River in association with the environmental enhancement area. The artificial holt will consist of a number of chambers (up to 1m<sup>2</sup>) and will be constructed from breeze blocks or log piles for walls and covered in logs with brash for the ceiling. There will be at least one chamber that has no external opening and at least two concealed entrances, one down to the water's edge and one onto the bank, or an earth mound if there is</li> </ul>

Likely Significant Effects	Mitigation Measures
	<p>minimal height to the riverbank. Mammal fencing will also be installed along the proposed road boundary at these locations.</p> <ul style="list-style-type: none"> <li>• Provision of mammal ledges in all new culverted crossings of minor watercourses, as specified above, to facilitate the continued passage of otters should they venture along them.</li> <li>• Completion of pre- and during construction update surveys to maintain and update the status of otter activity in the vicinity of the Proposed Scheme. Surveys should be conducted by an ECoW or suitably qualified ecologist.</li> <li>• Cessation of works within at least 30m of any new or previously identified active otter resting sites (200m if suspected as a breeding holt). The ECoW would assess the potential risks posed to the resting site and determine whether an EPS licence and any mitigation would be required in order for works to proceed in that location. A specific mitigation strategy will be developed in order to safeguard or compensate for any damage or destruction of resting sites or disturbance of otters.</li> <li>• Toolbox talks will be provided to site staff by the ECoW which will provide information on where otters may be found and how to avoid impacts on them.</li> </ul>
Deterioration in Condition of Watercourse Habitat During Construction	<p><u>Otter and Freshwater Pearl Mussel (Salmonids)</u></p> <ul style="list-style-type: none"> <li>• Strict control of sediments and other construction related pollutants particularly fuels, oils and cement through best working practices and standard management and mitigation prescriptions to be detailed in a scheme-specific EMP (as outlined in the FIEMP (WSP, 2023i)), designed to avoid or minimise such impacts on designated and supporting habitat to a negligible level. This should detail sediment management measures and a water quality monitoring plan. The specifications provided within the FIEMP will be the minimum requirement that the contractor must meet or exceed and will be based upon industry standard GPPs and CIRIA pollution control guidance.</li> <li>• Siting of compounds at least 50m away from watercourses, with fuel and chemical storage and refuelling facilities sited in bunded compounds.</li> <li>• Completion of the diverted section of the Fairy Burn prior to abandonment of the original section of existing channel to limit potential release of sediments into watercourses.</li> <li>• Temporary diversion or over-pumping of watercourses where culverts are being installed and gradual reinstatement of the channel with pumping out of sediment-laden water to limit release of sediments into watercourses.</li> <li>• Temporary storage of excavated soils a minimum of 10m back from the watercourse banksides and surrounded by sediment interception measures to prevent sediment-laden run-off entering the watercourses during rainfall events.</li> <li>• Excavated soils will be used for reinstatement and landscaping of the surrounding areas towards the end of the construction works.</li> </ul>

Likely Significant Effects	Mitigation Measures
Deterioration in Condition of Watercourse Habitat During Operation	No specific mitigation prescribed.

## 4.6. CONCLUSION ON THE ASSESSMENT OF EFFECTS ON SITE INTEGRITY

- 4.6.1. Based on the detailed assessment of effects from the Proposed Scheme on the Upper Ballinderry River SAC and its associated designation interest features, Table 5 presents a conclusion on the assessment of those effects on the integrity of the SAC in respect of the conservation objectives for its relevant designation interests. There are no uncertainties or known gaps in information which may undermine these conclusions.

**Table 5: Summary Assessment of Effects on the Integrity of Upper Ballinderry River SAC in respect of its Conservation Objectives**

Conservation Objectives To maintain or restore the following features to favourable condition.	Conclusion
Watercourses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation	<p>Significant effects on the Annex I freshwater habitats associated with Upper Ballinderry River SAC are not considered to be likely because the SAC, and hence examples of this qualifying freshwater habitat, are located upstream of the Proposed Scheme with the only works occurring in the immediate vicinity of the SAC being the tie-in of the road surface between the northern end of the Sandholes Link Road section and the Derryloran Bridge.</p> <p>The effects from airborne emissions from traffic are expected to be rapidly dispersed and diluted with any contribution from vehicle emissions predicted to be negligible against the backdrop of nitrogen inputs from the agriculturally-dominated lowland catchment of the Ballinderry River.</p> <p>Consequently, the Proposed Scheme will not adversely affect the favourable condition this qualifying habitat, either alone or in combination with other plans or projects.</p>

<b>Conservation Objectives</b> To maintain or restore the following features to favourable condition.	<b>Conclusion</b>
Otter	<p>The Proposed Scheme has the potential to result in the disturbance and potential death or injury of otters and the damage/deterioration of their supporting habitat through the construction of bridges, watercourse diversions and general construction activities in close proximity to watercourses. However, through a combination of the Proposed Scheme's sensitive design around watercourses and the implementation of mitigation including the provision of an artificial holt, mammal ledges in culverts, installation of mammal fencing, pre-construction surveys, works exclusion zones around active resting sites and other protection measures during construction and standard pollution prevention measures the risk of such impacts are expected to be reduced to a negligible level.</p> <p>No likely significant effects (or adverse effects on site integrity where they were subject to HRA) on the Upper Ballinderry River SAC or hence its associated otter population were identified in relation to other plans or projects which could act in combination with those associated with the Proposed Scheme.</p> <p>Consequently, the Proposed Scheme is not predicted to adversely affect the favourable condition of otters associated with Upper Ballinderry River SAC either on its own or in combination with other plans or projects.</p>
Freshwater Pearl Mussel	<p>The Proposed Scheme will not directly affect freshwater pearl mussels or their supporting habitat within the Upper Ballinderry River SAC since it is located upstream of the Proposed Scheme. However, there is potential for adverse impacts to affect salmonids inhabiting the Ballinderry River and the Fairy Burn, which are critical in the freshwater pearl mussel life-cycle<sup>7</sup>.</p> <p>Potential impacts from the Proposed Scheme on salmonids include visual and auditory/vibrational disturbance particularly during migration and the damage/deterioration of their supporting habitat through construction activities in and/or in close proximity to watercourses. However, through a combination of the Proposed Scheme's sensitive design around watercourses and the implementation of mitigation including reinstatement of disturbed watercourse habitat and standard pollution prevention measures the risk of such impacts are expected to be reduced to a negligible level.</p> <p>No likely significant effects (or adverse effects on site integrity where they were subject to HRA) on the Upper Ballinderry River SAC or hence its associated freshwater pearl mussel population were identified in relation to other plans or projects which could act in combination with those associated with the Proposed Scheme.</p> <p>Consequently, the Proposed Scheme is not predicted to adversely affect salmonids or hence by extension the favourable condition of freshwater pearl mussel populations associated with the Upper Ballinderry River SAC either on its own or in combination with other plans or projects.</p>

## 5. SUMMARY

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- 5.1.1. Following the screening exercise to identify European designated sites with potential to be affected by the Proposed Scheme, only one, the Upper Ballinderry River SAC, has been identified. Consequently, likely significant effects on the Upper Ballinderry River SAC and its qualifying features required to be considered in the context of the Habitats Regulations.
- 5.1.2. The SAC has been subject to a process of Stage 1 screening based on the guidance provided in the DMRB (DMRB, 2020a), through which it has been concluded that:
- The Proposed Scheme is a project which is not connected with or necessary to the management of the SAC;
  - By virtue of the Proposed Scheme's proximity to and potential effect pathways (i.e. hydrological and/or ecological connectivity) between the SAC, the likelihood of the Proposed Scheme having a significant effect on the SAC cannot be excluded on the basis of reasonable scientific certainty and information; and that as such,
  - A Stage 2 Appropriate Assessment should be undertaken.
- 5.1.3. Following the Stage 2 Appropriate Assessment it is concluded that:
- The Proposed Scheme does not directly interact with the SAC and has been designed as far as possible to avoid disturbance to associated qualifying species or the supporting habitat thereof;
  - There is a high level of knowledge of the qualifying features (habitats and species) in the study area;
  - Mitigation, including best practice construction and pollution prevention methods as well as bespoke measures prescribed to minimise or avoid specific impacts associated with the Proposed Scheme will be put in place both during the construction and operational phases;
  - Based on the best scientific knowledge available, there will be no adverse effect on the conservation objectives of the SAC from the Proposed Scheme on its own; and
  - Other projects whose impacts could potentially act in combination with those from the Proposed Scheme are either documented, or expected, to have been assessed by the relevant environmental regulatory or advisory bodies. In each case these have been concluded not to have any concerns regarding designated sites, albeit in some cases, subject to certain recommended conditions. Consequently, it is concluded that these other projects will not pose any likely significant effects or hence result in adverse effects on site integrity on the Upper Ballinderry River SAC, or any other European site, which could contribute to those associated with the Proposed Scheme. Therefore, there is no credible risk of adverse in-combination effects between these other projects and the Proposed Scheme on the integrity of the Upper Ballinderry River SAC.
- 5.1.4. In light of the information provided in this report it is concluded that with the application of appropriate mitigation measures in which there is a high degree of confidence, the Proposed Scheme both on its own and in combination with other plans or projects will not adversely affect the integrity of the Upper Ballinderry River SAC. There are no uncertainties or known gaps in information which may undermine this conclusion.

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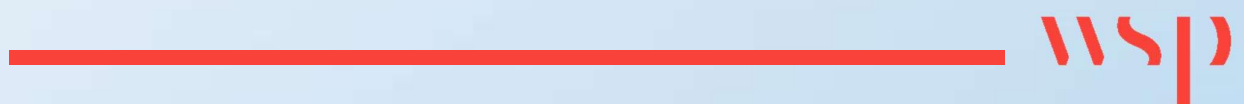
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# Appendix A

## FIGURES









- Legend**
- Proposed Scheme
  - European and Ramsar Sites
  - Special Areas of Conservation (SACs)
  - Special Protection Areas (SPAs)
  - Ramsar Sites
  - Scheme Proximity Zones
  - 30km Search Area for Sites Designated for Bats

By	Amendment	Checked	Approved	Date

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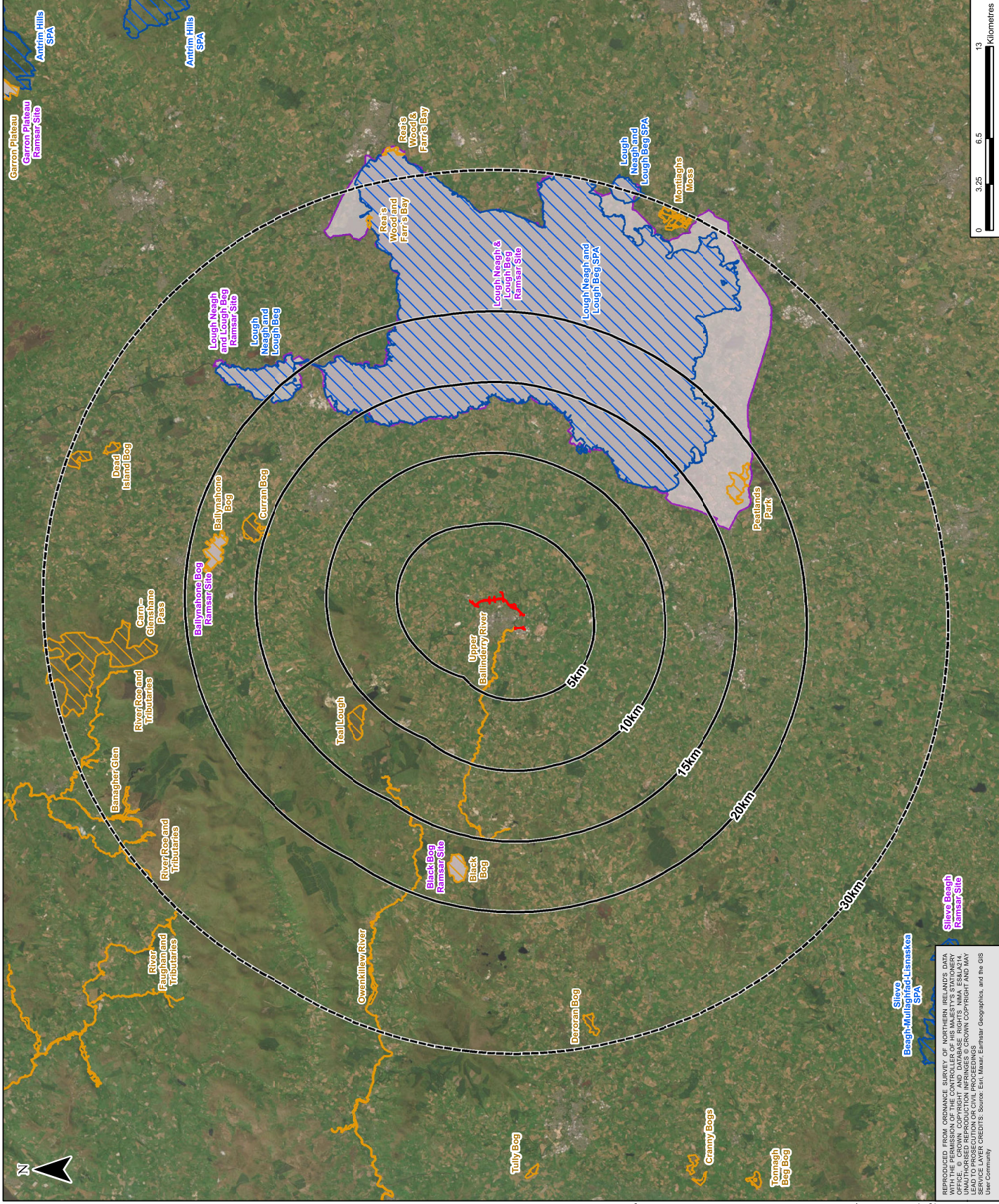
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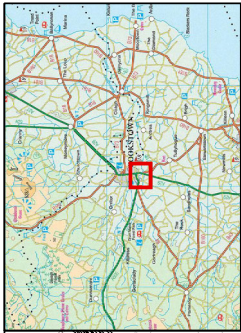
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<b>FIGURE 2: EUROPEAN AND RAMSAR SITES</b>			
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PROJECT NO. 718314	WSP	SC	10/01/24
<b>718314-WSP-B-D-3000-HRA-0002 1.0</b>			

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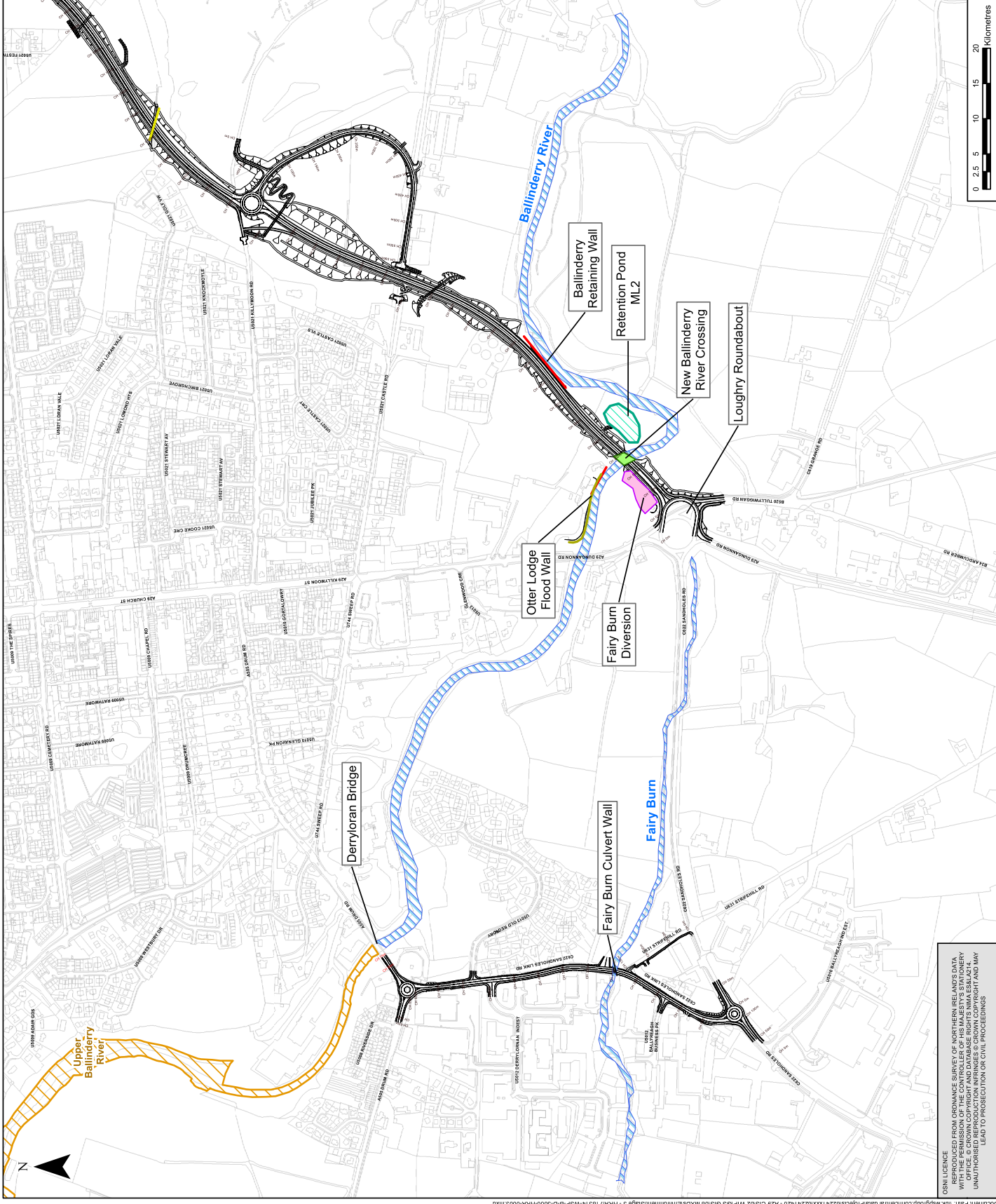


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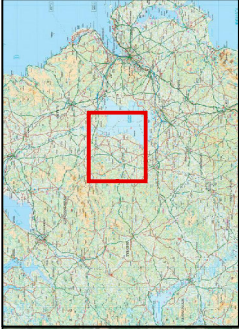


- Legend**
- Proposed Scheme
  - Proposed Flood/Retaining Wall
  - Otter Lodge Flood Wall
  - Proposed Culvert
  - Diversion
  - Proposed Bridge
  - Proposed Retention Pond
  - River Reach
  - Special Areas of Conservation (SACs)

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TITLE: <b>FIGURE 3: PROPOSED SCHEME RELATIVE TO THE UPPER BALLINDERRY RIVER SAC</b>					
SCALE & A3	COORDINATE	TT	14/02/24	AS	14/02/24
PROJECT NO:	718314	WSP	SC	ONE	14/02/24
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**Legend**

- Proposed Scheme
- Watercourse
- Special Areas of Conservation (SACs)
- Irish 10km Grid Squares with Freshwater
- Pearl Mussel Records (Source: NBN 2022)

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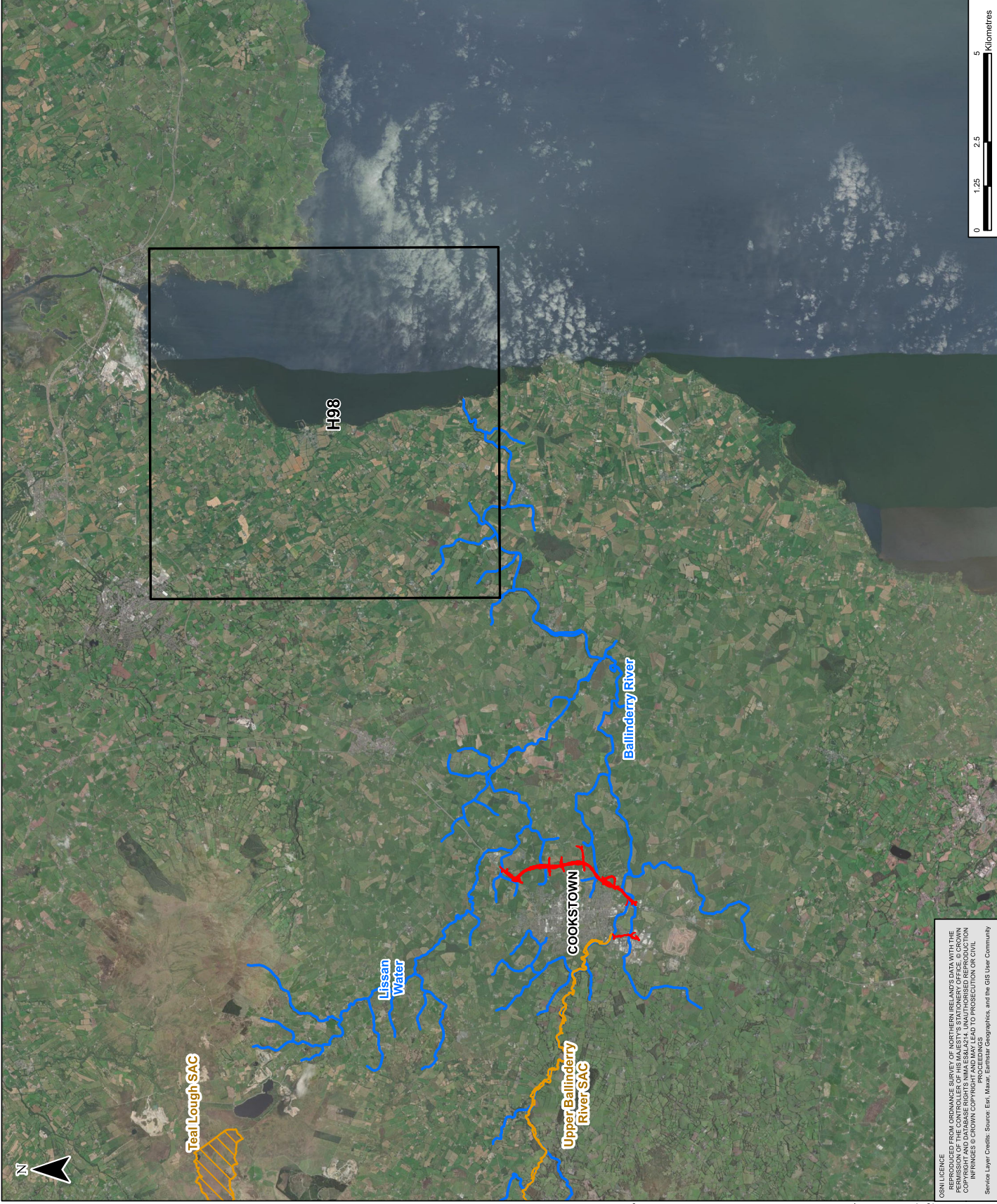
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**FIGURE 4:**  
**FRESHWATER PEARL MUSSEL RECORDS**

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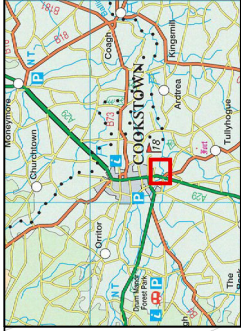
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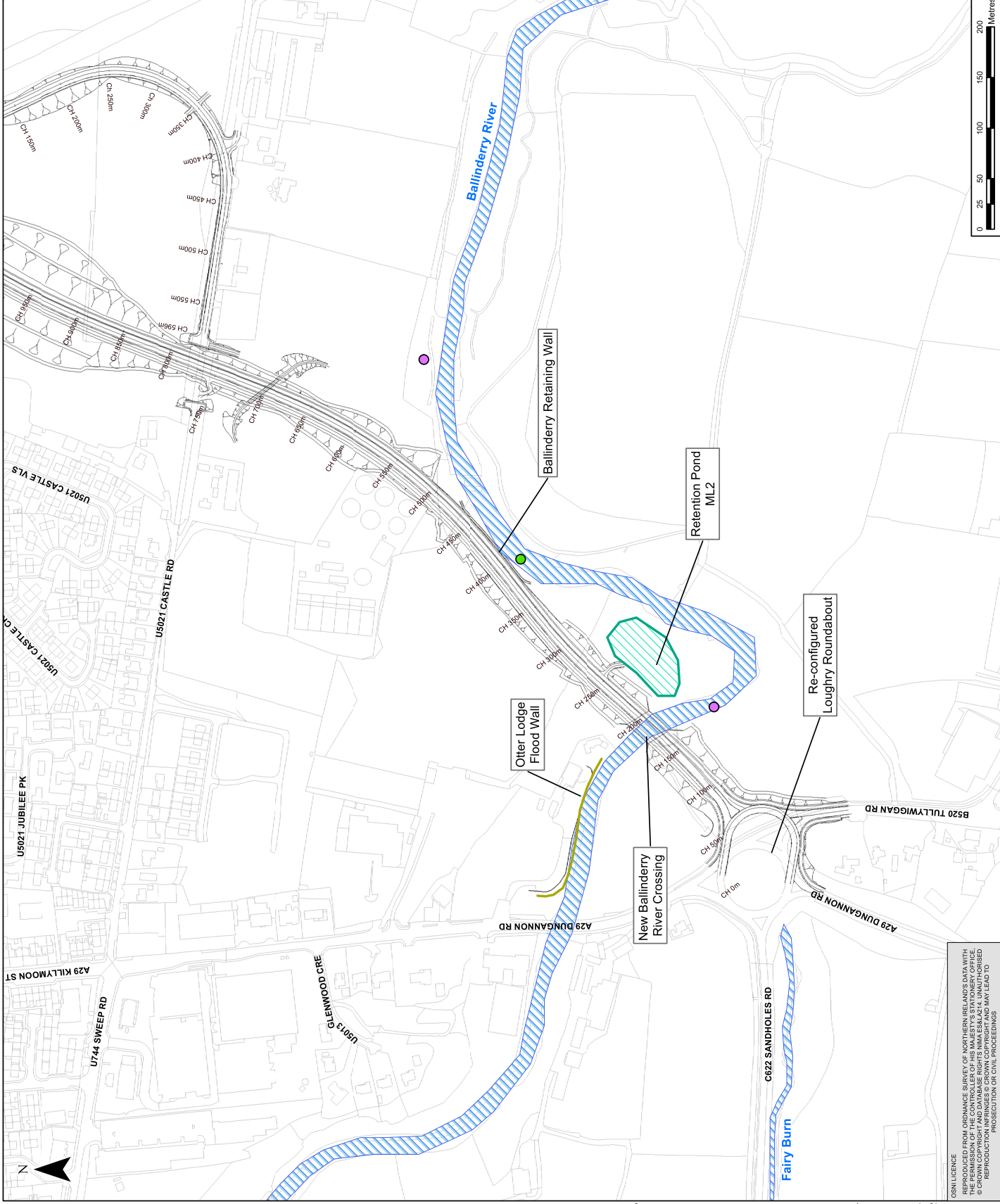




**Legend**

- Proposed Scheme
- Otter Lodge Flood Wall
- Otter Survey
- Confirmed Holt (AECOM, 2021)
- Confirmed Couches (AECOM, 2021)
- Proposed Retention Pond
- Watercourse

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FIGURE 6: A29 OTTER SURVEY RECORDS	
SCALE 1:1000	DATE 14/02/24
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# Appendix B

## **HEWRAT AND SPILLAGE ASSESSMENT RESULTS**





Table B-1: Summary of HEWRAT, EQS and Spillage Results for Mainline Outfalls Directly Relevant to the Ballinderry River

Drainage Network ID	Mitigation	Receiving Water body	HEWRAT Acute Impact Assessment		HEWRAT Chronic Impact Assessment			EQS Assessment				Spillage	
			Soluble Copper	Soluble Zinc	Sediment			Annual Average Dissolved Cooper		Annual Average Dissolved Zinc			
					Low Flow Vel. (m/s)	Depositi on Index	Pass / Fail	Value (mg/l)	Pass / Fail	Value (mg/l)	Pass / Fail		
ML1	Vegetated Filter Strips, Filter Drains and Swales/Grassed Channels	Ballinderry River	Pass	Pass	0.36	-	Pass	0.94	Pass	0.0	Pass	2,465	Pass / Fail in "x" Return Period 1
ML2	Vegetated Filter Strips, Filter Drains and Wet/ Retention Pond	Ballinderry River	Pass	Pass	0.36	-	Pass	0.94	Pass	0.01	Pass	4,771	Pass
CUMULATIVE ASSESSMENT													
ML1 and ML2	Vegetated Filter Strips, Filter Drains and Wet/ Retention Pond	Ballinderry River	Pass	Pass	0.36	-	Pass	0.94	Pass	0.01	Pass	1,626	Pass



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