Kilkenny County Council

N24 Carrick Road Improvement Scheme

Outline Construction Environmental Management Plan

April 2022

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Document Control Sheet

Client:	**Kilkenny County Council**
Project Title:	N24 Carrick Road Improvement Scheme
Document Title:	Outline Construction and Environmental Management Plan
File Name:	20408-BT-XX-XX-RP-Z-00013_CEMP

Table of Contents *(incl. Y/N)*	**List of Tables** *(incl. Y/N)*	**List of Figures** *(incl. Y/N)*	**Pages of Text** *(No.)*	**Appendices** *(No.)*
Y	N	N	31	N/A

Document Revision				**Document Verification**			
Issue Date *(DD/MM/YY)*	**Revision Code**	**Suitability Code**	**Author** *(Initials)*	**Checker** *(Initials)*	***Reviewer*** As Per PMP *(Initials)*	**Approver** *As Per PMP (Initials)*	**Peer Review** *(Initials or N/A)*
Add hyperlink to Verification Email on PIM Register for each issue							
05/08/22	C01	A1	NK / AS	JF	JF	PM	

Table of Contents

SECTION 1: Introduction

Barry Transportation have been appointed by Kilkenny County Council (KCC) as Consulting Engineers to prepare an Outline Construction Environmental Management Plan (OCEMP) for the N24 Carrick Road Improvement Scheme, Co. Kilkenny.

The principle objective of an Outline Construction Environmental Management Plan is to present recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the proposed road improvement scheme.

This document will provide a framework for recording environmental risks, commitments and other environmental constraints for the duration of the proposed project as a whole and will clearly identify the structures and processes that will be used to manage and control these aspects, whilst also seeking to ensure compliance with relevant environmental legislation, government policy objectives and project specific environmental objectives. This OCEMP will provide a mechanism for monitoring, reviewing and auditing environmental performance and compliance for the duration of the project.

1.1 Role of OCEMP

This Outline Construction Environmental Management Plan sets out the procedures, standards, work practices and management responsibilities to address potential environmental effects that may arise from construction of the proposed road development. A detailed Construction Environmental Management Plan (CEMP) will be prepared by the contractor based on the OCEMP.

The CEMP shall also comply with the requirements of the relevant authorities/environmental bodies.

The CEMP shall be updated as necessary during the course of the construction phase and will be reviewed on a regular basis by the project manager/environmental manager on site. As an absolute minimum requirement, the CEMP shall be reviewed by the Contractor every three months.

Notwithstanding the above requirements, the CEMP shall be reviewed by the Contractor and agreed with the Project Manager at least two weeks prior to the construction stages listed below:

- Setting-up the site compound; and
- Commencement of any site activity that may potentially have an effect on wildlife or the environment (in particular surface water drainage discharges).

Towards the end of the construction phase, the CEMP shall be further refined by the Contractor into a Handover Environmental Management Plan (HEMP) for the future maintenance and operation of the proposed development.

1.2 Objectives of OCEMP

The principle objective of this OCEMP is to present recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the proposed N24 Carrick Road Improvement Scheme, Co. Kilkenny.

This OCEMP will document the commitment to safeguarding the environment through the identification, avoidance and mitigation of the potential negative environmental impacts which are associated with the construction and operation of the proposed development.

The OCEMP aims to define good practice as well as specific actions or mitigation measures required to be implemented. This OCEMP is a live document which will be developed further and/ or amended where necessary, subsequent to any information that may be made available from additional consultations, ongoing monitoring on site etc. The OCEMP will form part of the Construction works Contract for the proposed project and will inform the preparation of method statements required for works associated with the proposed infrastructure project.

1.3 Relevant Legislation

It should be noted that the appointed Contractor will be required to be aware of their obligations under legislation. Such legislation, includes, but is not restricted, to:

- Planning and Development Act 2000 (as amended);
- Planning and Development Regulations 20012001 (as amended);
- The Birds Directive: Council Directive of 2 April 1979 on the conservation of wild birds (79/409/EEC);
- The Birds Directive: Council Directive 2009/147/EC on the conservation of wild birds;
- The Habitats Directive: Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora;
- The European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011), as amended, 2015 (S.I. No. 355 of 2015);
- Water Framework Directive (WFD): Directive 2000/60/EC of the European Parliament and Council establishing a framework for Community Action in the field of water policy, as amended;
- European Communities Environmental Objectives (Surface Waters) Regulations, 2009, S.I. No. 272 of 2009, as amended, 2012 (S.I. No. 327 of 2012), 2015 (S.I. No. 386 of 2015);
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9 of 2010, as amended, 2016 (S.I. No. 366 of 2016);
- European Communities (Environmental Liability) Regulations, 2008, S.I. No. 547 of 2008, as amended, 2011 (S.I. No. 307 of 2011), 2015 (S.I. No. 293 of 2015);
- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste;
- Waste Management Act of 1996, 2001 and 2003;
- The Water Pollution Acts of 1977 & 1990;
- The Wildlife Act 1976 & Wildlife (Amendment) Act, 2000;
- The Salmonid Regulations 1988, S.I. No. 293 of 1988;
- The Fisheries (Consolidation) Acts 1959 & 2001;
- Water Policy Regulations 2003, S.I. No. 722 of 2003, as amended, 2005 (S.I No. 413 of 2005), 2008 (S.I No. 219 of 2008), 2010 (S.I. No. 93 of 2010) and Amendment (No.2) Regulations, (S.I. 326 of 2010) & EU Water Policy Regulations 2014 (S.I 350 of2014);
- Water Conservation Regulations 2008, S.I. No. 527 of 2008;
- European Communities (Drinking Water) Regulations 2014, S.I. No. 122 of 2014;
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016);
- Litter Pollution Act of 1997, as amended, 2017;
- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011 (S.I. 355 of 2011), as amended 2011 (S.I. No. 397 of 2011), 2013, (S.I. No. 32 of 2013). 2014 (S.I. No. 149 of 2014);
- Waste Management (Facility Permit and Registration) Regulations 2007, S.I. No. 821 of 2007, as amended, 2008 (S.I. No. 86 of 2008), 2015 (S.I. No. 198 of 2015);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 821 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016);
- Waste Management (Miscellaneous Provisions) Regulations, 1998, S.I. No. 164 of 1998;
- Waste Management (Landfill Levy) Regulations 2008, S.I. No. 199 of 2008, as amended 2009, (S.I. No. 550 of 2009), 2010 (S.I. No. 31 of 2010), 2012 (S.I. No. 221 of 2012), 2013 (S.I. No. 194 of 2013), 2015 (S.I. No. 189 of 2015);
- Waste Management (Hazardous Waste) Regulations, 1998, as amended, 2000 (S.I. No. 73 of 2000);
- Waste Management Shipment of Waste Regulations 2007, S.I. No. 419 of 2007;
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- Waste Management (Tyres and Waste Tyres) Regulations 2007, as amended, 2017 (S.I. No. 400 of 2017);
- European Union Batteries and Accumulators Regulations 2014, S.I. No. 383 of 2014, as amended, 2014 (S.I. No. 349 of 2014), 2015 (S.I. No. 347 of 2015);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008, SI No.113 of 2008;
- Waste Management (Prohibition of Material Disposal by burning) Regulations 2009;
- S.I No. 286 of 2009, as amended, 2015 (S.I. No. 538 of 2015);

- European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011, as amended, 2016 (S.I. No. 315 of 2016);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015);
- Protection of the Environment Act 2003;
- European Union (Properties of Waste which Render it Hazardous) Regulations 2015, S.I. No. 233 of 2015;
- Air Pollution Act, 1987 (Air Quality Standards) Regulations, 1987, as amended, 2011 (S.I. No. 180 of 2011);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990, S.I. No. 28 of 1990;
- EC (Control of Emissions of Gaseous & Particulate Pollutants from Non-Road Mobile Machinery) Regulations 2007, S.I. No.147 of 2007, as amended, 2011 (S.I. No. 263 of 2011), 2012 (S.I. No. 407 of 2012), 2013 (S.I No. 417 of 2013);
- The EU Regulation 2037/2000 (CFC's, HCFC's, Halons) - Ozone Depleting Substances. Control of Substances that Deplete the Ozone Layer Regulations 2006, S.I. No 281 of 2006, as amended, 2011 (S.I. No. 465 of 2011);
- EU F Gas Regulations 2006, as amended, 2015, S.I. No. 517 of 2015;
- Environmental Protection Agency Act 1992 (Noise) Regulations, 1994 S.I. 174 of 1994;
- Environmental Noise Regulations 2006, S.I. No. 140 of 2006;
- European Communities (Noise Emission by Equipment for use Outdoors) Regulations, 2001, S.I No. 632 of 2001, as amended, 2006 (S.I No. 241 of 2006);
- European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Amendment Regulations 1996, S.I No. 359 of 1996 and 2001, S.I No. 632 of 2001);
- Local Government (Planning and Development) Act 1963, S.I. No. 28 of 1963;
- Wildlife Act, 1976 (Protection Of Wild Animals) Regulations, 1990, S.I. No. 112 of 1990 and Wildlife Amendment Act, 2000 (S.I. No. 38 of 2000);
- European Communities Conservation of Wild Bird Regulations 1985, S.I. No. 291 of 1985, as amended, 1986 (S.I. No. 48 of 1986), 1995 (S.I. No. 31 of 1995), 1997, (S.I. No. 210 of 1997), 1998 (S.I. No. 154 of 1998), (S.I. No. 131 of 1999), 2005 (S.I. No. 716 of 2005), 2010 (S.I. No. 65 of 2010), 2011 (S.I. No. 626 of 2011), 2012 (S.I. No. 84 of 2012);
- Noxious Weed Act, 1936, S.I. No. 38 of 1936;
- Flora (Protection) Order, 2015, S.I. No 356 of 2015;
- The Forestry Act, 1946, S.I. No. 13 of 1946, as amended, 2009 (S.I. No. 40 of 2009) & Forestry Act, 2014, S.I. No. 31 of 2014;
- The National Monuments Act 1930, S.I. No. 2 of 1930, as amended, 2004 (S.I. No. 22 of 2004); and
- European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations, 2013, S.I. No. 403 of 2013.

1.4 Methodology

This document has been prepared in accordance with relevant best practice guidance of Construction Industry Research and Information Association's (CIRIA) *Environmental Good Practice on Site Guide* (C741, 2015) and CIRIA's Guidance *Control of Water Pollution From Construction Sites* (C532, 2001). This Plan aims to define good practice as well as specific actions required to implement mitigation requirements at the site of the proposed development.

All available information of the proposed project has been incorporated into this OCEMP. This document provides a detailed overview of key environmental considerations for the project as a whole, while also allowing for further refinement as the project progresses through to the construction stage. This OCEMP identifies the key environmental considerations to be adhered to and delivered during the site construction and operation phase.

SECTION 2: Proposed Project

2.1 Objectives of Proposed Development

The N24 is a National Primary Route located in County Waterford, County Kilkenny, County Tipperary and County Limerick, with an overall total length of approximately 116km. The proposed N24 Carrick Road Improvement Scheme is located near Mooncoin, Co. Kilkenny as shown in Figure 2-1. The section under consideration is a single carriageway of varying cross-section and is approximately 2.2km in length. The scheme is surrounded predominantly by agricultural land.

The scheme involves both offline and online works, approximately 950m of the road scheme will run along the existing N24 and the remaining 1.25km of the scheme requires realignment. The proposed scheme involves:

- Surface water drainage.
- Provision of 2no. attenuation pond, with 2m high palisade fencing, one on the western side of the scheme and other on the eastern.
- Provision of construction compound at the location of the proposed eastern attenuation pond.
- Proposed realignment of the Skelpstown 16 stream which flows through the site with box culvert for stream crossing.
- Provision of a combined underbridge and a cattle underpass.
- Provision of 1.5m footpath underneath the road at the location of underpass.
- Provision of a timber post and tension mesh fences along much of the scheme length, as well as 2.5m wide shared surface/ footpath either side of the carriageway.
- Provision of agricultural access tracks and adjacent field access tracks.

The purpose of the proposed scheme is to improve journey times and mainline speeds on the N24 Carrick Road. The provision of improved mainline speeds will maintain the existing collision rankings at below or twice below the national average rate. The scheme aims to improve the capacity and efficiency of the N24 by providing a suitable road alignment to meet current and future needs.

The scheme will provide for improved road based public transport journey time and complement wider government policy related to improved accessibility. It will also improve facilities for vulnerable road users and separation distances from vehicular traffic on the national road network. The scheme will also contribute to improved access and alleviate congestion and delays caused by the layout of the existing carriageway. The provision of cattle underpass will prevent significant queuing of the national road traffic. This will also maintain or reduce existing carbon dioxide and particulate emissions through a reduction in fuel consumption.

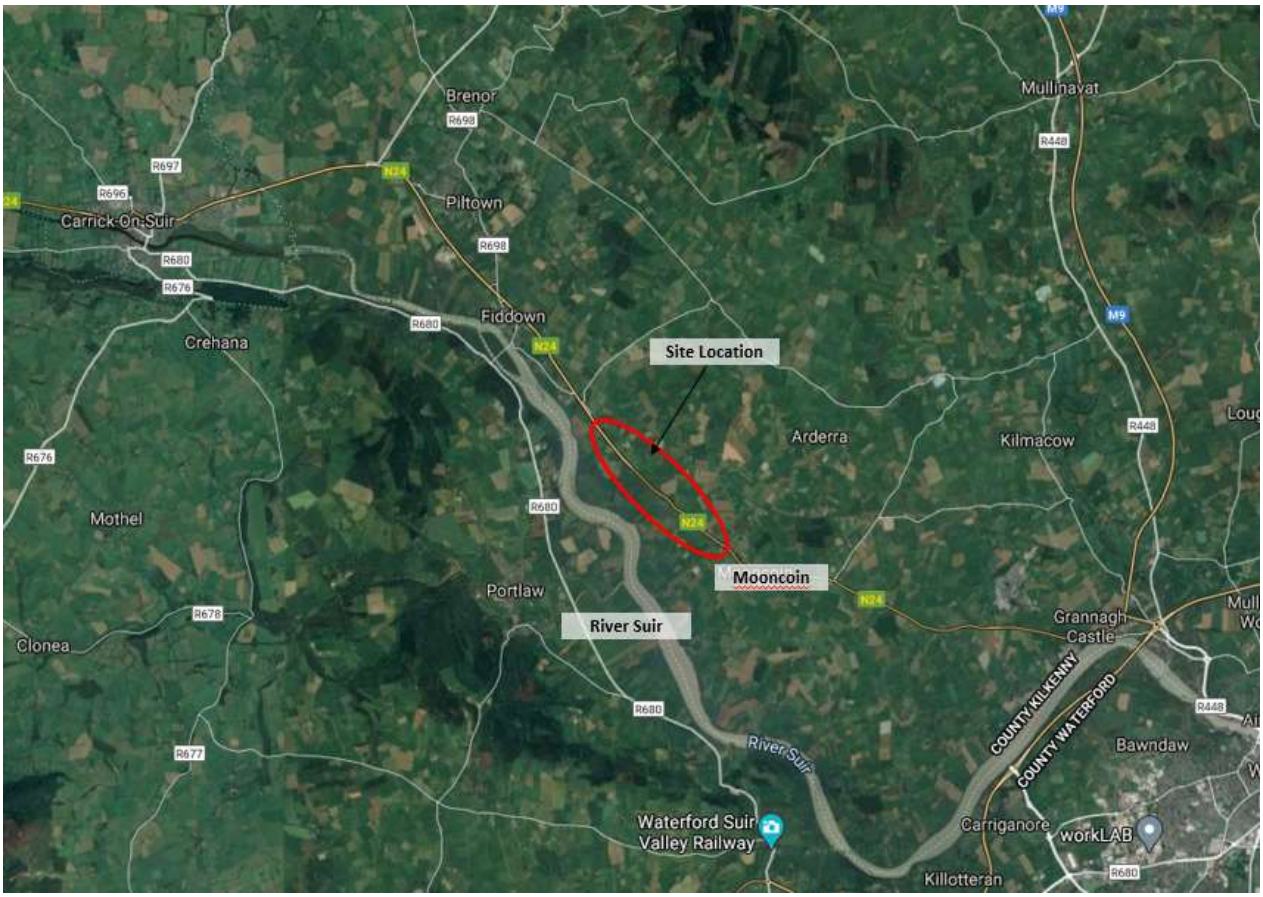


Figure 2-1: Proposed Development

2.2 Excavation Requirements

The majority of the scheme will be constructed along the existing road network with a portion located within agricultural lands. Within the proposed scheme there is one main embankment area along the route, with the largest located over the L7416 (Grange Road) extending to heights of approximately 9.1m (At Ch 1510). The maximum depth of excavation is anticipated to be 1.7m below ground level (bgl) (At Ch950). At the deepest area of cut the depth to bedrock is likely to be ca. 1.1m bgl (TP107). Therefore, localised rock is anticipated to be encountered during construction. A preliminary earthworks table outlining the materials to be excavated and the materials to be used during construction is included in Table 2-1 below.

Table 2-1: Preliminary Earthworks (THRDO, 2020)

Fill					Location	Excavation					
General	Selected										
						Acceptable		Unacceptable			
Embankments (class 1,2) (m^3)	Fill to Gabions (m^3)	6F2 Capping (m^3)	Limestone Quarry Dust (m^3)	Total Fill (m^3)	N24 Carrick Road Improvement Scheme	5A Topsoil (m^3)	Total Acceptable other than 5A (m^3)	U1 Hard Material (m^3)	U2 (m^3)	Total Excavation other than Class 5A (m^3)	Processing Hard Material to 6F2 (m^3)
7040	0	7854	0	14894	Mainline Ch 0 to 1220	3750	11358	3927	0	15286	1088
65509	0	4281	0	69790	Mainline Ch 1220 to 1760	3791	0	648	0	648	648
2474	0	2365	0	4839	Mainline Ch 1760 to End	632	1688	1244	0	2932	822
334	140	266	0	600	Attenuation Eastern	232	765	0	0	956	0
15154	0	326	178	15658	Attenuation Western	1452	0	0	0	0	0
0	0	2280	0	2280	Farm Access Roads	1328	1328	0	0	1660	0
90511	**140**	**17972**	**178**	**108061**	**Total (m^3)**	**11185**	**15139**	**5819**	**0**	**21484**	**2550**

SECTION 3: Regulatory & Policy Framework

3.1 Introduction

Throughout the lifecycle of any construction project, environmental management procedures are required to ensure that all appropriate legislation, policy and construction best practice are complied with, and the environmental effects of a development is minimised within best practicable means. Consideration is also given to relevant adjacent developments in the management of future construction activities on site.

The environmental legislation, policy and best practice guidance contained within this OCEMP are applicable at the time of writing. However, it is acknowledged that these can be subject to change. As such, the Contractor shall be responsible for complying with current legal, policy and best practice guidance requirements applicable to their scope of works through the design and during construction of the proposed development.

Through effective implementation of the CEMP, the Contractor shall demonstrate how construction activities and supporting design will properly integrate the requirements of environmental legislation, policy, good practice, and those of the environmental regulatory authorities and third parties.

3.2 Legislation

The Contractor must comply with and implement all relevant Irish and EU safety, health and environmental legislation. The Contractor shall be responsible for ensuring that any developments or changes to regulation and environmental legislation are complied with, even if they are not noted within this OCEMP.

Irish legislation is available from the http://www.irishstatutebook.ie.

3.2.1 Policy & Guidance

This OCEMP makes reference to various industry standard best practice guidance and policy documents that can be used to address significant environmental risks. In addition to Transport Infrastructure Ireland's (TII) Construction Guidance, the fourth edition of CIRIA's *Environmental Good Practice on Site Guide* (C741, 2015) and CIRIA's *Guidance on Control of Water Pollution From Construction Sites* (C532, 2001) should also be consulted for practical guidance about managing construction sites to control environmental impacts and how to deliver sustainable construction on site by effectively managing a range of environmental issues. At a minimum, the Contractor shall adhere to this guidance.

SECTION 4: Existing Environment and Sensitive Receptors

4.1 Air Quality and Climate

The receiving environment for air quality and climate is discussed in detail in Section 8 of the Planning Report and a summary is provided below.

The proposed scheme is within air quality zone 'D' as defined in Environmental Protection Agency's report *Air Quality In Ireland 2020* published in 2021. Zone D represents rural Ireland but also includes all towns with a population of less than 15,000. The construction phase of the proposed scheme is expected to result in GHG emissions from various sources. The TII carbon tool (v2, 2020) was used to account for the embodied carbon associated with the proposed scheme and it resulted in construction phase emissions of 116.1 tonnes CO_2e over the 15-month construction period.

4.2 Noise and Vibration

The receiving environment for noise and vibration is discussed in detail in Section 9 of the Planning Report and a summary is provided below.

Baseline noise monitoring survey has been undertaken in the vicinity of the proposed road development to measure the existing traffic noise levels at the closest properties within the study area and to determine the main contributors to the existing environment. The survey comprised of one unattended and five attended survey locations along the relevant portion of the existing N24. The results of the baseline survey confirm that properties along the existing road network experience traffic noise levels above 60 dB Lden. Road traffic noise from the existing N24 was the primary noise contributor. Minor noise from a nearby site was a secondary contributor.

4.3 Land, Soils and Geology

The receiving environment for land, soils and geology is discussed in detail in Section 10 of the Planning Report and a summary is provided below.

- **Bedrock Geology:** The Geological Survey data base and 1:100,000 mapping (Sheet 25) indicates the site consists of 'massive unbedded lime-mudstone' of Waulsortian formation.
- **Soils:** Teagasc subsoil mapping indicates that the subsoil within the study area is predominantly Till derived from Devonian sandstones. Lands to 100 m east of the study area comprise Alluvium Sediments.
- **Karst:** There are no reported GSI karst features or potential landslide risk area along the proposed scheme. However, evidence of potential karst was identified during site investigation in 2020.
- **Land Use:** Historical land-use beneath the proposed scheme is largely agricultural in nature and more recently includes the existing N24 road.
- **Geological Heritage:** There are no reported Geological Heritage Sites along the proposed scheme.
- **Earthworks:** The N24 Carrick Road Improvement Scheme will involve an excavation volume of ca. 21,484 m^3 (not including 11,185m^3 Topsoil) and a fill volume of ca. 108,061 m^3. It is anticipated that ca. 15,139 m^3 of the excavated material is suitable for reuse onsite without further processing and therefore ca. 5,819 m^3 will require offsite disposal to a licensed facility or further processing to make suitable for on-site works.

4.4 Water

The receiving environment for water is discussed in detail in Section 11 of the Planning Report and a summary is provided below.

- **Hydrology:** The proposed scheme is located approximately 700m east of the River Suir and also crosses Skelpstown 16 stream which is an open watercourse and flows directly into the River Suir. The

Skelpstown Stream has been assigned an 'Unassigned' status under the Water Framework Directive (WFD) for 2013-2018 monitoring period and the waterbody risk status is also under review

- **Hydrogeology**: The proposed scheme is underlain by a 'Regionally important bedrock aquifer-karstified (diffuse)' (GSI, 2022). The national groundwater vulnerability mapping indicates the area is of low vulnerability.

4.5 Material Assets

The receiving environment for material assets is discussed in detail in Section 12 of the Planning Report and a summary is provided below.

- **Built Services:** Existing services within the proposed scheme extent include Eircom, ESB and Water services present within the existing road network. Eircom and water services are present along the verges of the existing N24, and ESB overhead cables are common along the scheme. Potential service conflicts will involve the maintenance and protection of these services with occasional diversions required.
- **Waste:** The maximum excavation depth of the proposed scheme is anticipated to be approximately 1.7m bgl. In addition to excavated soils, the construction phase of the development will generate waste such as construction and demolition (C&D) waste, Mixed Municipal Waste (MMW), Recyclables such as plastic wrapping, wooden pallets, paper and/or waste electrical and electronic equipment (WEEE).

4.6 Cultural Heritage (including Architecture & Archaeology)

The receiving environment for cultural heritage is discussed in detail in Section 13 of the Planning Report and a summary is provided below.

An assessment of heritage impacts was conducted (John Cronin and Associates, 2022) to identify potential impacts of proposed scheme on archaeological, architectural and cultural heritage. The Record of Monuments and Places (RMP) and Sites and Monuments Record (SMR) do not list any recorded archaeological sites within the reviewed study area. There are no Protected Structures or National Inventory of Architectural Heritage (NIAH) listed structures located within the study area.

The assessment identified certain undesignated Cultural Heritage Sites (CHS) within the study area. The CHS ID allotted to these sites with a description is listed below. These are depicted in Figure 4-1.

- **CHS-12 (Building):** Demolished, occupied by a modern dwelling and outbuildings. Elements of the easternmost building depicted on the historic mapping may be incorporated in one of the outbuildings. Located 15m outside of scheme boundary The assessment identified direct and indirect impacts on undesignated Cultural Heritage Sites.
- **CHS-13 (Buildings):** Demolished, occupied by the realigned N24 Clonmore Cross junction. Located 10m outside of scheme boundary.
- **CHS-15 (Bridge/ Culvert):** The N24 crosses the stream at the same location shown on 25-inch OS map. The culvert has a concrete parapet on its upstream side, this appears to be built over a masonry headwall. The downstream side was overgrown and could not be inspected. Located within scheme boundary.
- **CHS-16 (Buildings):** A derelict single-storey stone-built building located on the north side of the existing N24. Map regression analysis suggests that this is likely to be the building depicted on the historic mapping. Located 10m to south of scheme boundary.
- **CHS-17 (Buildings):** A derelict single storey stone-built building which map regression analysis suggested was the fourth building depicted on the historic mapping stood in field to the west of a modern dwelling. It has recently been demolished. A tubular metal gate indicates the former access on the roadside. Located 50m to south of scheme boundary.
- **CHS-19 (Building and buildings (site of)):** Demolished, occupied by a dwelling house and a ruined stone-built building to the east. Map regression analysis suggests that this may be the easternmost building depicted on the historic mapping. Located in private property immediately outside scheme boundary.

- **CHS-27 (Roadside memorial):** Roadside memorial on the north side of the N24, comprising a polished stone headstone on a cut limestone plinth erected in front of a rendered and painted concrete wall with painted concrete coping. It commemorates Linda Holden of Clonmore, Mooncoin, who died as a result of a road traffic accident on 04/03/1991. Located within scheme boundary.
- **CHS-28 (Historic Boundary):** Hedgerow along local road. It comprises a low earthen bank topped with trees and hedgerow and is flanked on both sides by shallow earth-cut drains. Located within scheme boundary.
- **CHS-29 (Historic Boundary):** N24 road centreline and field boundary (earthen bank and hedgerow). The field boundary section is formed by a straight earth/stone bank (c.0.8m to 1m high) topped with a well-maintained hedgerow. No surface traces of flanking ditch on either side. Extends for c. 12m into scheme boundary.
- **CHS-30 (Historic Boundary):** Stream (Skelpstown Stream). Averages 1m wide and the slow flowing water within the channel was 0.3m deep at the time of inspection. Earth-eroded sides and bed was covered in silts. Extends into scheme boundary.

The geophysical survey carried out in 2021 revealed a variety of anomalies of potential archaeological or agricultural origin as well as likely evidence for agricultural processes detected through soil disturbance, relict field boundaries, cultivation furrows and potential boundary ditches. Likely archaeological remains within the scheme boundary were also detected and include five potential ring-ditch sites.

A pre-construction programme of archaeological investigations will be carried out within the lands to be acquired for the proposed road development and will include test excavations, a wading survey of the Skelpstown Stream, including the adjacent culvert, and townland boundary surveys. Full provision will be made for the excavation leading to preservation by record of any archaeological features and / or deposits that may be identified, if that is deemed the most appropriate manner in which to proceed (subject to statutory approval).

Figure 4-1: Environmental Constraints – Cultural Heritage (Refer to Section 13 of Planning Report)

4.7 Traffic

The receiving environment for traffic is discussed in detail in Section 14 of the Planning Report and a summary is provided below.

There is no provision for cyclists or pedestrians on the existing N24, and it is considered that this section of road would be particularly hazardous for these vulnerable road users, due to the nature and geometry of the road and the exiting narrow cross section. The existing section of the N24 near Mooncoin is a narrow rural single carriageway road with varying verge widths and two different speed limits. There are numerous private property entrances and field accesses along the route. Visibility is also sub-standard for a considerable number of the existing private domestic and field accesses. The combined effect of these features results in collision, delayed journey times, slow travel speeds, poor driving quality experience, and overall lower level of safety.

4.8 Biodiversity with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC

The receiving environment for biodiversity is discussed in detail in Section 15 of the Planning Report and a summary is provided below.

The proposed scheme is located near Mooncoin, Co. Kilkenny. The field survey suggests that the majority of habitats encountered around the proposed development comprise of buildings and artificial areas, open spaces and grasslands. River Suir flows close to the western side of the scheme. A desktop review and field surveys (December 2017 and September – October 2020) were performed to undertake an initial assessment of the proposed project and to identify environmental constraints within the study area. These include:

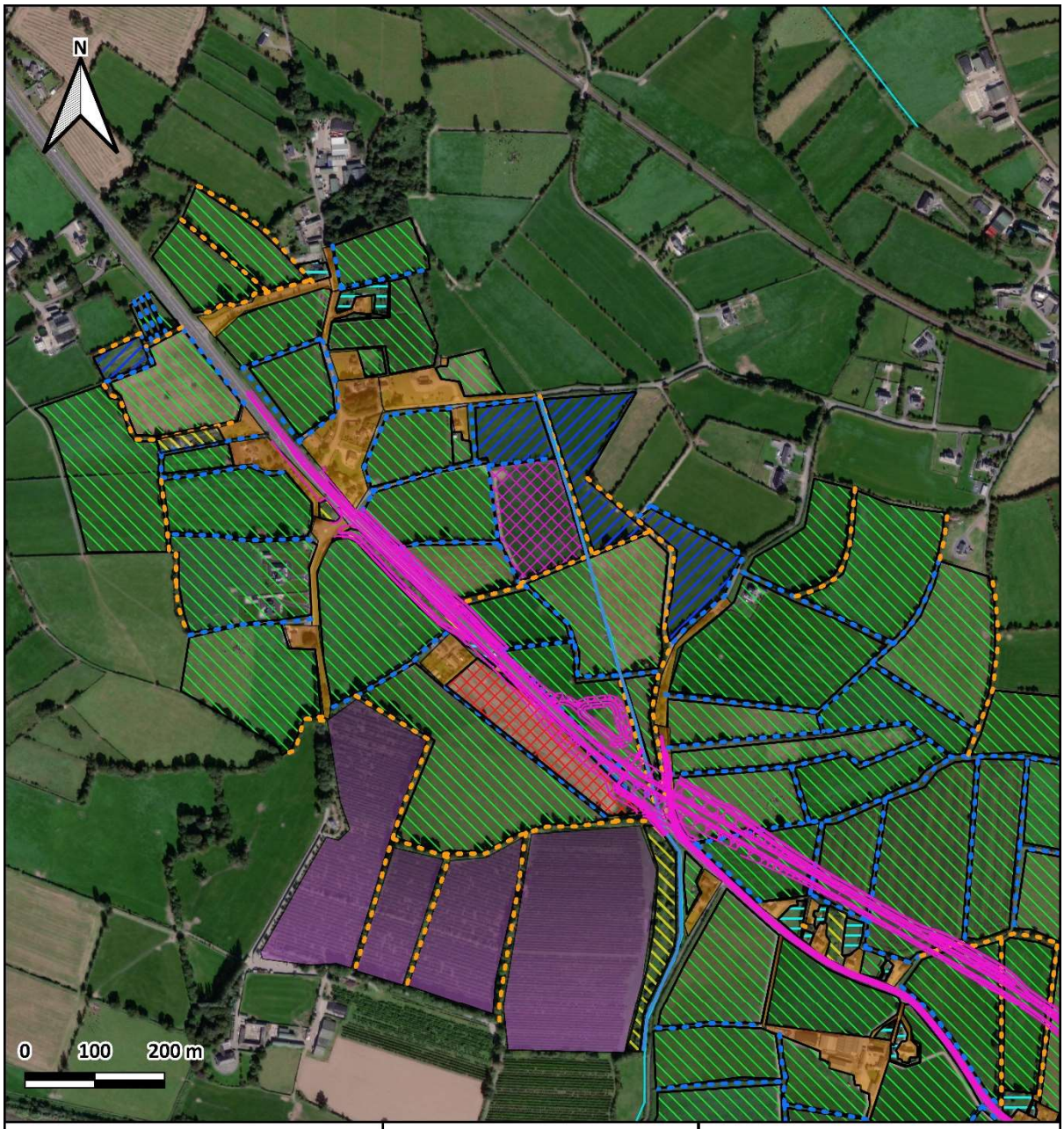
4.8.1 Fossitt Habitats

The proposed road improvement is located in County Kilkenny and to the northeast of the River Suir Middle Estuary. In general the habitats on the proposed development site are of Local Importance and are habitats that are widespread and common across Ireland. A total of 11 habitats were recorded on the proposed development site: Arable Crops (BC1), Wet Grassland (GS4), Amenity Grassland (improved) (GA2), Improved Agricultural Grassland (GA1), Buildings and Artificial Surfaces (BL3), Hedgerows (WL1), Mixed Broadleaved / Conifer Woodland (WD2), Horticultural Land (BC2), Treelines (WL2), Scrub (WS1), Eroding / upland Rivers (FW1). No records of Fossitt Wetlands are located within the study area. No Annex I Habitats occur within the proposed development site. Habitats present along the proposed N24 Carrick Road Improvement Scheme study area are illustrated in Figure 4-2 and Figure 4-3, for the northern and southern section of the scheme respectively.

4.8.2 Designated Conservation Areas

River Suir SAC (Site Code 002137) and Hugginstown Fen SAC (Site Code 000404), designated European Sites under EU Habitats Directive, transposed into Irish law by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011), as amended, are located within 15 km of the site. River Suir SAC is located approximately 510m southwest of the site and Hugginstown Fen SAC is located approximately 13.2km to the northeast of the proposed scheme.

It is noted that few proposed National Heritage Areas (pNHA) exist in the near vicinity of the proposed development. They include Tibberaghny Marshes pNHA, Fiddown Island pNHA, Lower River Suir (Coolfinn, Portlaw) pNHA, River Suir Below Carrick-On-Suir pNHA, Portlaw Woods pNHA, Hugginstown Fen pNHA, Kilkeasy Bog pNHA, Lough Cullin pNHA, Grannyferry pNHA and Kilbarry Bog pNHA. These constraints are shown in Figure 4-4 and Figure 4-5.



Northern Section A Habitat Map of the Proposed N24 Carrick Road Improvement Scheme	Date: 18.2.2022	Drawn by: Amy Butler Checked by: William O'Connor

N24 Road Improvement Scheme	GA2
BC1	GS4
BC2	WD2
BL3	WL1
FW1	WL2
FW4	WS1
GA1	

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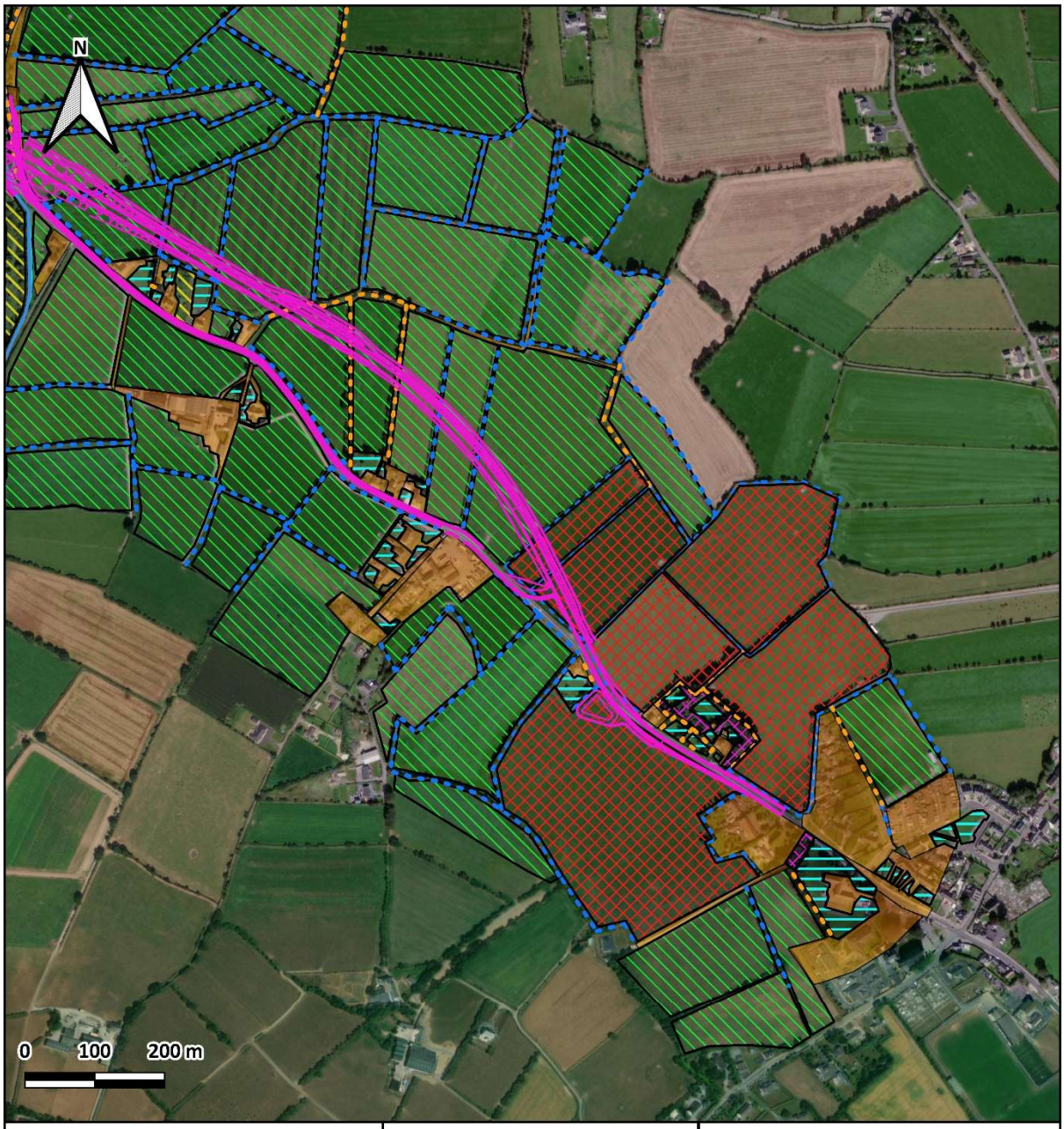
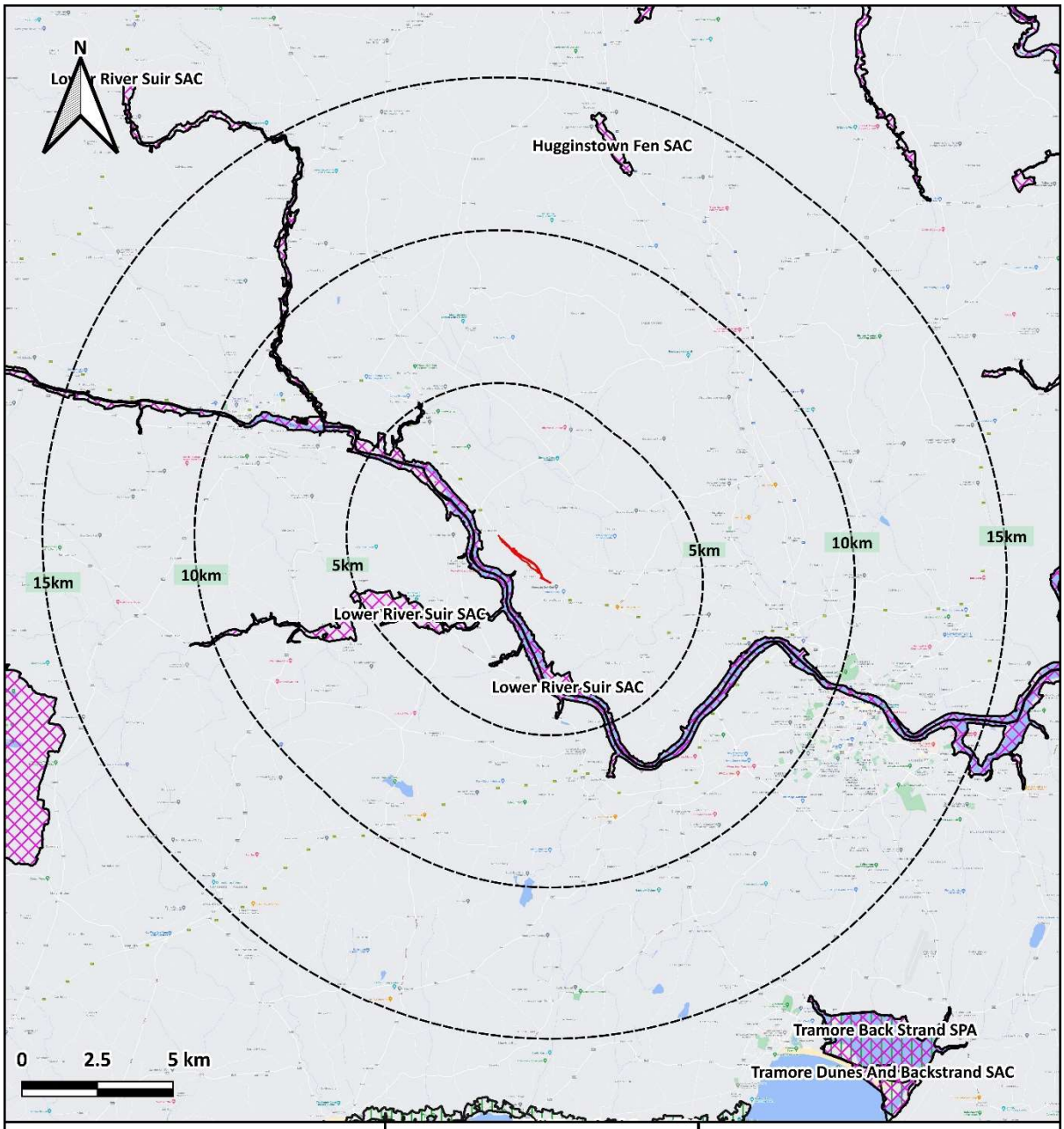
Figure 4-2: Northern Section Habitat Map (EcIA Ecofact, 2022)



Southern Section B Habitat Map of the Proposed N24 Carrick Road Improvement Scheme	Date: 18.2.2022	Drawn by: Amy Butler Checked by: William O'Connor
N24 Road Improvement Scheme BC1 BC2 BL3 FW1 FW4 GA1	GA2 GS4 WD2 WL1 WL2 WS1	ecofact Environmental Consultants

Figure 4-3: Southern Section Habitat Map (EcIA Ecofact, 2022)



N24 Road Improvement Scheme
Special Area of Conservation
Special Protection Area

Date: 19.1.2022

Drawn by: Amy Butler
Checked by: William O'Connor

Natura 2000 Sites within 15km of the Proposed N24 Carrick Road Improvement Scheme

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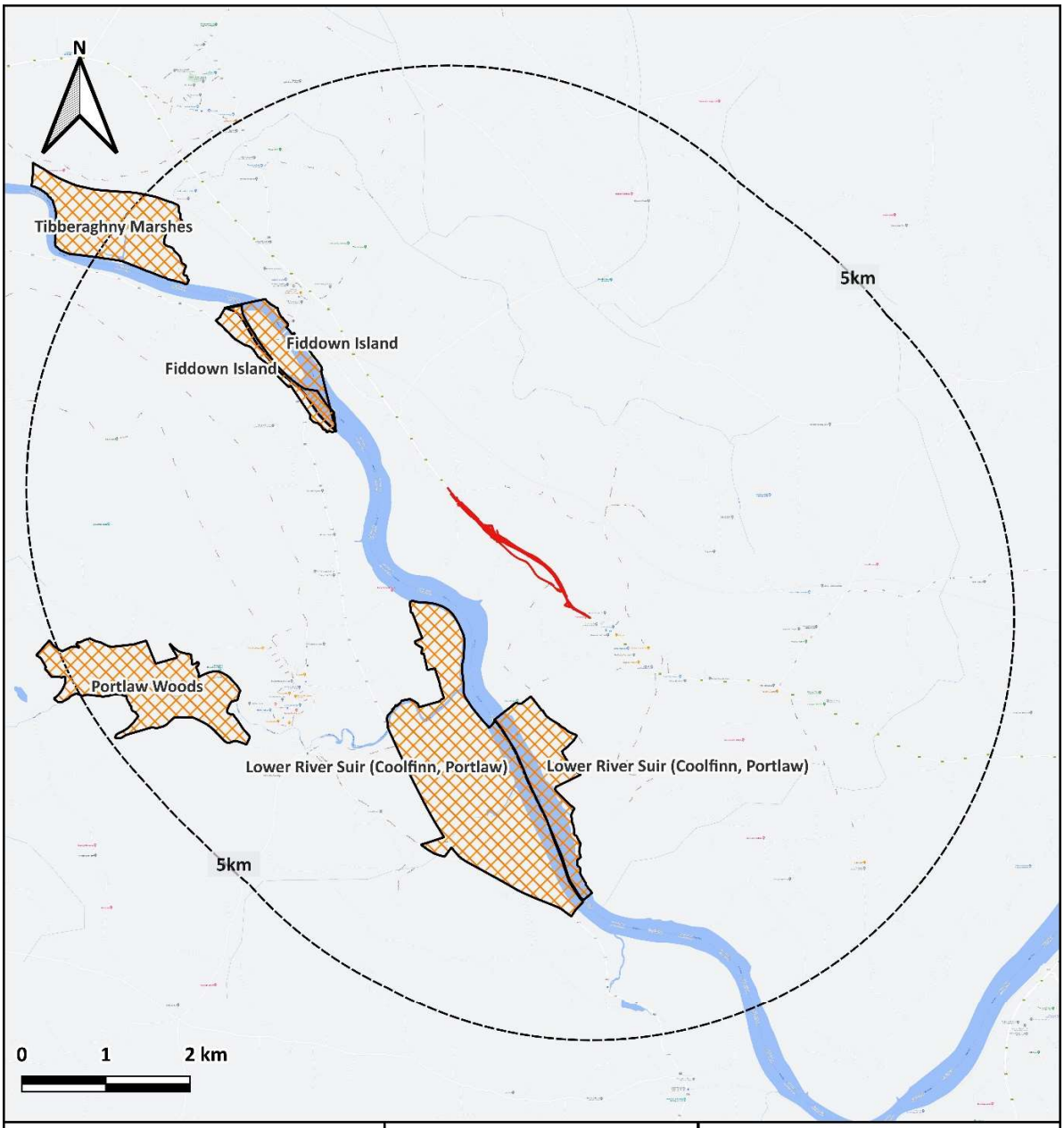
Figure 4-4: Natura 2000 Sites within 15km of the proposed scheme (EcIA Ecofact, 2022)



N24 Road Improvement Scheme
Proposed Natural Heritage Area
Natural Heritage Area

Date: 19.1.2022

Drawn by: Amy Butler
Checked by: William O'Connor

Natural Heritage Areas and Proposed Natural Heritage Areas within 5km of the Proposed N24 Carrick Road Improvement Scheme

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Environmental Consultants

Figure 4-5: Natural Heritage Areas (NHA and pNHA) within 5km of the proposed scheme (EcIA Ecofact, 2022)

4.9 Landscape and Visual

The receiving environment for landscape and visual is discussed in detail in Section 16 of the Planning Report and a summary is provided below.

The route corridor passes through one Landscape Character Area (LCA) 'G' and in close proximity, approximately 700m southwest, of LCA 'J'.

- **G-** South Kilkenny Lowlands is a Lowland Landscape Character Type
- **J-** The Suir Valley is a River Valley Landscape Character Type.

The River Suir Valley LCA is identified as 'highly scenic and visually pleasing' and described as having special scenic and landscape value, in particular to the west, near the towns of Mooncoin and Fiddown, and to the east around Glenmore (Kilkenny County Development Plan 2021-2027).

The Kilkenny Landscape Character Assessment also includes a Landscape Sensitivity Matrix which categorises the sensitively of the various landscape types within the study area, as listed below. The entire route will travel though the G- South Kilkenny Lowlands LCA, which it is judged would have high capacity to accommodate the proposed changes.

- **G-** Lowland type landscape is categorised as having normal (moderate) landscape sensitivity.
- **J-** River Valleys (Corridors) are categorised as having the most landscape sensitivity.

The visual receptors along the proposed scheme include public roads, settlements and industrial facilities.

4.10 Agronomy

The receiving environment for agronomy is discussed in detail in Section 17 of the Planning Report and a summary is provided below.

The proposed scheme impacts 15 individual agricultural landowners amounting to 7.383Ha agricultural land. There is no proposed acquisition of curtilage from a farm house or farm yard. There is 0.025Ha of temporary acquisition of agricultural land for this scheme. Land will be permanently acquired for the operation phase of the proposed scheme. A total of 37 No. individual agricultural land plots with a total area of 7.383Ha of land will be permanently acquired. From the permanent land acquired, approx. 16 No. land plots are used for dairy, approx.18 No. land plots are used for beef farming, 2 No. plots for tillage and 1 No. plot is an orchard.

4.11 Population

The receiving environment for population is discussed in detail in Section 18 of the Planning Report and a summary is provided below.

The proposed scheme is located partly within the Pollrone, Kilkenny electoral division. The population of this area in 2011 was reported as 1406. The population growth increased by 3.8% to 1461 in 2016 (CSO, 2020). Mooncoin is the nearest census town to the proposed scheme. It is located approximately 50km south of Kilkenny town. According to Census 2016, the population of Mooncoin is 1,175.

SECTION 5: CEMP – Key Environmental Considerations

The following topics and measures shall be incorporated in the detailed CEMP for the construction of the proposed road scheme.

5.1 Roles and Responsibilities

Table 5-1 is extracted from the UK Highways Agency Interim Advice Note on the preparation and implementation of Environmental Management Plans and illustrates the various stages of project delivery, the corresponding stages of a CEMP and identifies responsibilities for the preparation and implementation of a CEMP throughout the project lifecycle.

Table 5-1: Project Control Framework (PCF) 2 stages and CEMP stages

Project Stage (PCF Stages)	CEMP Stage	Responsibility
Strategy, Shaping and Prioritisation (PCF Stage 0)	None – but consider high level environmental objectives through Client Scheme Requirement	Client
Option Identification (PCF Stage 1)		
Option Selection (PCF Stage 2)		
Preliminary Design (PCF Stage 3)	CEMP	Designer
Statutory Procedures and Powers (PCF Stage 4)		
Construction Preparation (PCF Stage 5) CEMP (Detailed) Contractor	**CEMP**	**Contractor**
Construction Commissioning and Handover (PCF Stage 6)	Handover Environmental Management Plan. (HEMP)	Contractor
Close out (PCF Stage 7)		

The Project Manager/Environmental Manager appointed by the Contractor will oversee the development of the CEMP and the implementation of recommended mitigation measures, planning conditions and other environmental protection measures as required. The Project Manager shall set out the proposed approach and timeline for liaison and consultation with statutory agencies and other relevant bodies. They will act as the point of contact for all environmental matters for the Contractor and will be responsible for review and authorisation of all method statements and environmental plans for the proposed road improvement scheme on N24 Carrick Road. The Project Manager will be responsible for updating the CEMP and maintaining all environmental records relating to the works. The CEMP will detail the general tasks and communication lines for reporting procedures for all potential environmental risks, hazards or incidents which may relate to, but not be limited to, ecology, water / soils quality, dust, noise or archaeology.

A contact list with relevant details (including contact numbers / emergency numbers) for all relevant statutory bodies and agencies and relevant KCC departments, will be clearly tabulated within the CEMP and made available to all site personnel.

5.2 Training, Awareness and Competence

All site personnel shall receive environmental awareness information as part of their initial site briefing and this information will be updated within each Method Statement for the specific work element being undertaken. The detail of the information will be tailored to the scope of their work on site. This will ensure that personnel are familiar with the environmental aspects and impacts associated with their activities, that

appropriate procedures are in place to control these impacts and that they fully understand the consequences of departure from agreed procedures. Formal records of such training along with records verifying the competency of the trainer shall be maintained onsite for the duration of the project.

The CEMP will be posted on the main site notice board during the construction phase. The environmental performance at the construction site will be on the agenda of all project management meetings. Elements of the CEMP, such as objectives, targets and the effectiveness of environmental procedures will be discussed at these meetings. All personnel will be invited to offer their comments on environmental performance at the site. All site monitoring results shall be evaluated by the Environmental Manager. Key findings along with any mitigation measures as required shall be clearly communicated to the project team.

5.3 General Site Management

5.3.1 Working Hours/Periods

On-site construction works shall be permitted to take place between 07:00hrs and 19:00hrs Monday to Friday and between 08:00hrs and 13:00hrs on Saturdays. Works within 50m of the Skelpstown 16 stream shall be limited to daytime hours to avoid potential disturbance to Otters that may be commuting using this watercourse.

Working outside these hours will only take place in exceptional circumstances or when the Contractor is working adjacent to operational areas and disruption to sensitive receptors and sensitive core activities associated with operation of the other areas is kept to a minimum.

5.3.2 Site Housekeeping

- Good housekeeping is an important part of good environmental practice and helps to maintain a more efficient and safer site. The site shall be tidy, secure, and have clear access routes that are well signposted. The appearance of a tidy, well-managed site can reduce the likelihood of theft, vandalism, complaints and/or specific hazards that could affect the safe operation of the other businesses in the area, such as bird hazards and wind-blown litter.
- As outlined in the fourth edition of CIRIA's *Environmental Good Practice on Site Guide* (C741, 2015), when considering good housekeeping, the Contractor will implement the following steps:
  - Adequately plan the site with designated areas of materials and waste storage;
  - Segregate different types of waste as it is produced and arrange frequent removal;
  - Keep the site tidy and clean;
  - Ensure that no wind-blown litter or debris leaves the site, use covered skips to prevent wind-blown litter;
  - Keep hoardings tidy – repair and repaint when necessary, removing any fly posting or graffiti;
  - Frequently brush-clean wheel washing facilities;
  - Keep roads free from mud by using a road sweeper; and
  - Ensure site is secure.

5.4 Establishment of the Site

The Contractor will establish the site area, including site compound, set down area for vehicles, works areas, temporary set-down areas for material removed etc. prior to commencing work on the proposed project. These areas will need to be fenced to keep the public out of the work area and shall be secured as appropriate to prevent pollution risk.

A suitable site compound and access route will be determined by the Contractor, which will be used throughout the construction period. The site compound will act as a storage centre for construction materials. The exact location of the site compound is not known at this time; however, it must be agreed with the Employers Representative and the Employer. If the working zone needs to be extended to accommodate machinery access the Project Manager must be notified before any extension of the works area can take place. No work shall take place outside the working zone until the Project Manager has identified the extent

of additional area required and confirmed works can occur in those areas in conjunction with the Employer. The CEMP developed by the Contractor shall consider any environmental implications of the proposed site compound and associated access points and transit routes.

These site-specific constraints shall be avoided by the Contractor when evaluating the optimum location for the site compound. The location of the site compound shall be selected in order to avoid any impacts to the environment. The exact location of the site compound must be agreed with the Employers Representative and the Employer.

5.5 Emergency Preparedness and Response

An emergency preparedness and response procedure will be required to prevent environmental pollution incidents. Suitable spill kits and absorbent material for dealing with oil spills will be maintained on site in the event of pollution or potential risk of pollution. The Project Manager will be responsible for preparation of an Environmental Incident Emergency Response Plan which must be made available to all relevant site staff in addition to being displayed on the main noticeboard within the Contractors compound. The emergency procedures shall include contact details of the local authority and statutory authorities including the National Parks and Wildlife Service (NPWS), Inland Fisheries Ireland (IFI), Environmental Protection Agency (EPA) and KCC. The contact details of key personnel will be included in the response plan. The CEMP developed by the Contractor shall consider any environmental implications of fuel storage, refuelling, casting of built elements on site etc.; including the preparation of method statements as appropriate.

5.6 Waste Management

The Contractor will ensure that all works are to be undertaken in compliance with best practice and national legislation, including the Waste Management Act 1996 (as amended) and *The Management of Waste from National Road Construction Projects* (TII, 2017). Waste prevention and minimisation shall be a primary driver of the waste management system during the construction phase.

A site-specific Resource and Waste Management Plan (RWMP) will be prepared by the preferred contractor in accordance with *Draft Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Projects* (EPA, 2021) and *The Management of Waste from National Road Construction Projects* (TII, 2017). The Guidelines provide a practical and informed mechanism to document the prevention and management of C&D wastes and resources from design to construction or demolition of a project. They provide a common approach to preparing and determining Resource and Waste Management Plans for the construction and demolition sector in Ireland. Given the nature and scale of the proposed scheme, it is likely this project will exceed the following threshold and therefore the Contractor will be obliged to prepare a bespoke Resource and Waste Management Plan (RWMP);

'Larger scale projects, above the thresholds…require a bespoke RWMP'. 'RWMP thresholds…New commercial, industrial, infrastructural, institutional, educational, health and other developments with an aggregate floor area less than 1,250m^2.'

5.7 Traffic Management

The purpose of this Outline CEMP is to provide a basis for the management of traffic during the execution of the construction works to be undertaken by the Project Supervisor for the Construction Stage (PSCS)/Contractor of the project. This plan must be further developed into a Construction Traffic Management Plan (CTMP) by the PSCS prior to commencing the works and shall not be implemented until it has been assessed and developed by the PSCS. The PSCS shall co-ordinate the implementation of the developed Traffic Management Plan during construction of the works.

All construction activities will be managed and directed by a CTMP. The details of the CTMP will be agreed with the roads department of the Local Authority in advance of construction activities commencing on-site. The objective of the CTMP is to ensure that the impacts of all related construction activities generated during the construction phase of the proposed development upon both the public off-site and internal on-site

construction workers environments are fully considered and proactively managed and scheduled with full consideration of the requirements of key stakeholders. This will ensure that the safety, health and well-being of both the public's and construction workers is maintained at all times.

The duration of the construction period is anticipated to be in the region of 15 months. The number of staff on site will fluctuate over the construction phase of the subject development. The levels of construction traffic will be greatest during the period when mass earthworks, structural works and pavement works are being undertaken.

In terms of deliveries to the site, these would likely be expected to arrive at a steady rate during the course of the day over the entire duration of the construction phase. The majority of deliveries would be expected to be rigid HGVs with inert material. The main haul routes for deliveries will generally arrive from the direction of the existing national or regional road network.

During construction, adequate land within the curtilage of the site will be allocated to accommodate temporary car and truck parking for construction staff and operations.

The anticipated hours of construction activity is likely to be 07:00hrs – 19:00hrs. Therefore, site operatives are projected to arrive before the AM Peak Hour (08:00 – 09:00) and depart after the PM peak hour (17:00 - 18:00). HGV trips are anticipated to arrive and depart the site at a uniform rate throughout the day, to avoid pressure on the morning and evening peak hour periods. Car sharing will be encouraged throughout the construction phase for site operatives, to reduce the traffic impact upon the surrounding road network.

5.8 Management of Key Environmental Risks

Based on available information the key potential environmental risks posed by the proposed road development are as follows:

- Dust nuisance;
- Noise and Vibration impacts;
- Pollution risk;
- Hydrogeological risk;
- Built Services;
- Waste Management;
- Invasive Species risk;
- Cultural heritage impacts;
- Ecology / Biodiversity impacts;
- Landscape and visual impacts;
- Agronomy; and
- Residents and properties impacts.

The following environmental management and mitigation measures provide a summary of key issues that will be addressed by the Contractor within the CEMP.

It is often the case that onsite conditions dictate the need to modify the approach to proposed works. In such cases, any changes to proposed works must be re-assessed and the environmental risk associated with same recorded and appropriate mitigation measures must be agreed in advance with the Employer and Employers Representative and subsequently must be put in place.

5.9 Air Quality and Climate

The greatest potential impact on air quality during the construction phase is from construction dust emissions and the potential for nuisance dust.

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared. These follow recommendations and guidance contained in the Institute of Air Quality Management

(IAQM) document *Guidance on the Assessment of Dust from Demolition and Construction* (2014). Provided the dust minimisation measures outlined below are adhered to, the air quality impacts during the construction phase will not be significant. The measures which will be implemented will include:

- Hard surface roads shall be swept to remove mud and aggregate materials from their surface while any un-surfaced roads shall be restricted to essential site traffic;
- Any road that has the potential to give rise to fugitive dust shall be regularly watered, as appropriate, during dry and/or windy conditions;
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads;
- Vehicles using site roads shall have their speed restricted, and this speed restriction shall be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates;
- Vehicles delivering material with dust potential (soil, aggregates) shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Before entrance onto public roads, trucks shall be adequately inspected to ensure no potential for dust emissions;
- Public roads outside the site shall be regularly inspected for cleanliness and cleaned, as necessary;
- Material handling systems and site stockpiling of materials shall be designed and laid out to minimise exposure to wind. Water misting or sprays shall be used as required if particularly dusty activities are necessary during dry or windy periods;
- Access gates to site shall be located at least 10 m from sensitive receptors where possible; and
- Vehicles shall have engines switched off when stationary – no idling. Similarly, the use of diesel or petrol powered generators shall be avoided, and electricity or battery powered equipment shall be used when practical.

At all times, these procedures will be strictly monitored and assessed by the site contractor. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust shall be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations. The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board shall also include head/regional office contact details. Community engagement before works commence on site shall be put in place, including a communications plan. All dust and air quality complaints shall be recorded and causes identified, along with the measures taken to reduce emissions.

The embodied energy of construction materials are expected to be the dominant source of greenhouse gas emissions as a result of the construction phase of the development. Good practice to ensure emissions are reduced where possible is the prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

5.10 Noise and Vibration

Appendix B of the Planning Report should be referred to for detailed mitigation measures. These are listed below.

During the construction phase of the project there will be short term moderate to major impacts on nearby residential properties due to noise emissions from site traffic and other activities. The application of noise limits, restricted hours of operation, along with implementation of appropriate noise control measures, will be designed in order to control noise emissions to within the noise limits for this phase.

The contract documents will clearly specify the construction noise criteria included in the Planning Report (Appendix B) which the construction works must operate within. The Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of *BS 5228-2009 +A1:2014 Code of Practice for Noise and Vibration Control on*

Construction and Open Sites, Parts 1 and 2 and the Noise and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001. These measures will ensure that:

- No plant used on site will be permitted to cause an ongoing public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract;
- Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers; and
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use.

During the course of the construction programme, the contractor will be required to manage the works to comply with the limits detailed in Table 5-2 in accordance with *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (NRA/TII, 2004) and *Good Practice Guide for the Treatment of Noise during the Planning on National Road Schemes* (NRA/TII, 2014).

Table 5-2: Maximum Recommended Noise Levels at the Façade of Nearby Dwellings during Construction

Days and Times	L_{Aeq} (1hr) dB	L_{Amax} dB(A)
Monday to Friday 07:00 to 19:00hrs	70	80
Monday to Friday 19:00 to 22:00hrs	60	65
Saturday 08:00 to 16:30hrs	65	75
Sundays and Bank Holidays 08:00 to 16:30hrs	60	65

5.10.1 Selection of Quiet Plant

The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether or not said item can be replaced with a quieter alternative.

For static plant such as compressors and generators used at work areas such as construction compounds etc., the units will be supplied with manufacturers' proprietary acoustic enclosures where possible.

The contractor will evaluate the choice of excavation, breaking or other working method taking into account various ground conditions and site constraints. Where possible, where alternative lower noise generating equipment that would economically achieve, in the given ground conditions, equivalent structural/ excavation/ breaking results, these will be selected to minimise potential disturbance.

5.10.2 General Comments on Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant, or the application of improved sound reduction methods in consultation with the supplier or the best practice use of equipment and materials handling to reduce noise.

Proposed techniques will also be evaluated in light of their potential effect on occupational health and safety. The following outline guidance relates to practical noise control at source techniques which relate to specific site considerations:

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant will be switched off when not in use and not left idling;
- For percussive tools such as pneumatic concrete breakers, noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed and erection of localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries or other suitable forms of noise reduction;
- For all materials handling, the contractor will ensure that best practice site noise control measures are implemented including ensuring that materials are not dropped from excessive heights;
- Where compressors, generators and pumps are located in areas in close proximity to noise sensitive properties/ areas and have potential to exceed noise criteria, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation;
- Resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can be controlled by fixing resilient materials in between the surfaces in contact;
- Demountable enclosures can also be used to screen operatives using hand tools and may be moved around site as necessary; and
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

5.10.3 Screening

A small number of properties along the eastern end of the proposed road development are within 25m of the proposed works, hence the use of localised screening and the range of best practice mitigation measures set out below will be employed if required to ensure the construction noise limits are not exceeded along the length of the scheme.

Typically, screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver.

The length of the screen should in practice be at least five times the height, however, if shorter sections are necessary then the ends of the screen will be wrapped around the source.

BS 5228 -1:2009+A1 2014 states that on level sites the screen should be placed as close as possible to either the source or the receiver. The construction of the barrier will be such that there are no gaps or openings at joints in the screen material. In most practical situations the effectiveness of the screen is limited by the sound transmission over the top of the barrier rather than the transmission through the barrier itself. In practice, screens constructed of materials with a mass per unit of surface area greater than 10 kg/m2 will give adequate sound insulation performance. As an example, the use of a standard 2.4m high construction site hoarding will provide a sufficient level of noise screening once it is installed at a suitable position between the source and receiver.

5.11 General Pollution Prevention Measures

The employment of good construction management practices, will serve to minimise the risk of pollution from construction activities at the proposed development in line with the following guidance:

- Control of Water Pollution from Construction sites, Guidance for Consultants and Contractors – C532 (CIRIA, 2001);
- Control of Water Pollution from Linear Construction Projects, Site Guide – C649 (CIRIA, 2006); and

- Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA/TII, 2005).

5.11.1 Soils and Geology

Specifically, with regard to soils and geology, the following will be adhered to:

- Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, will be properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the scheme site for appropriate disposal;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the proposed development and properly disposed of;
- All site vehicles used will be refuelled in bunded areas in the construction compound;
- Strict supervision of Contractors will be adhered to in order to ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the site. This will minimise the risk of soils and bedrock becoming contaminated through site activity;
- Soils on the proposed development may become unnecessarily compacted by machinery during construction. In order to protect against this, accesses and haulage roads will be clearly defined;
- Should karst features be encountered during construction works, they shall be assessed by an appropriately experienced geologist / geotechnical engineer to determine suitable remedial actions (if required);
- In the event that contaminated ground (i.e. soils, perched water or weathered bedrock) is encountered during the construction works the following specific environmental management procedures will be adhered to:

  - Any contaminated material will be fully characterised by an appropriately qualified and experienced environmental consultant in terms of lateral and vertical extent, and a detailed assessment of the potential environmental and human health impacts will be undertaken in accordance with industry standard best practice; and,
  - All soil for offsite disposal will be tested prior to disposal offsite.

- The following general precautionary measures will also be implemented:

  - All excavated materials will be stored away from any excavations, in an appropriate manner at a safe and stable location; and,
  - A comprehensive monitoring and supervisory regime including monitoring of excavations and stability assessments as required will be put in place to ensure that the proposed construction works do not constitute a risk to the stability of the site.

All of the above mitigation measures will form part of a site-specific iteration of Construction Environmental Management Plan to be prepared by the Contractor in advance of commencing the works.

5.11.2 Hydrogeology

The following details the specific measures that are required for the protection of hydrogeological features.

- If groundwater is encountered during excavations, then mechanical pumps will be required to remove the groundwater from sumps. Sumps shall be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches;
- A pre-construction well survey will be carried out at all properties within 150m of the proposed scheme. Any wells which may potentially be at risk (via. resource / quality impacts) during the construction or operational phases will be identified and appropriate measures implemented in order to protect any vulnerable groundwater supplies within the vicinity;

- The construction management of the site shall take account of the recommendations of *Control of Water Pollution from Construction sites* (CIRIA, 2001) to minimise as far as possible the risk of pollution;
- In the unlikely event that contaminated shallow perched water / groundwater is encountered during the construction phase, works will immediately cease. Advice will be sought from a qualified environmental consultant regarding the appropriate management of contaminated water, and any emergency containment measures required. Appropriate measures as set out under Section 5.12.1 will be implemented;
- The following specific mitigation measures regarding temporary oil / chemical storage and refuelling shall be adhered to:

  - All oils, paints and varnishes stored on site will be kept in a locked and bunded area;
  - Generators, pumps and similar plant will be placed on drip-trays to prevent contamination by oil;
  - All site vehicles used will be refuelled in bunded areas at the site compound which is at least 50m from the Skeplstown stream;
  - All temporary construction fuel tanks will also be located in a suitably bunded area and all tanks will be double skinned. In addition, oil absorbent materials will be kept onsite in close proximity to any fuel storage tanks or bowsers during proposed site development works;
  - All deliveries to on-site oil storage tanks will be supervised;
  - Records will be kept of delivery dates and volumes;
  - Every piece of equipment associated with the storage of fuel on site will be designed and installed to recognised BS codes; and
  - All valves shall be of steel construction and the open and close positions shall be clearly marked.

- The production, transport and placement of all cementitious materials shall be strictly planned and supervised. Uncontaminated U1 material can be reprocessed on site, within areas designated appropriate for stockpiling of materials as above, for reuse; unacceptable U2 type contaminated material will either be removed directly from site and brought to an existing licensed waste facility or stored temporarily within areas designated appropriate for stockpiling of materials as above, and then removed and brought to an existing licensed waste facility;
- Any mixing of concrete / cement or other materials required for the works will also be undertaken within the site compound, with all wash water and waste / grey water stored securely on site; and
- Any stockpiling of materials will be 50m back from any watercourses, with bunding and silt fences, the location for stockpiling of materials will be agreed before the project is finalised.

These mitigation measures will form part of the site-specific iteration of Construction Environmental Management Plan which will be in operation during the construction phase. All mitigation measures as detailed in the Ecological Impact Assessment (Ecofact, 2022) which accompanies this planning application also apply with respect to minimising the potential for surface water or groundwater impacts and associated ecological impacts.

5.12 Material Assets – Waste and Built Services

A Project Resource and Waste Management Plan (RWMP) will be prepared by the preferred contractor in accordance with *Draft Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Projects* (EPA, 2021) and *The Management of Waste from National Road Construction Projects* (TII, 2017), in advance of commencing the works, as the proposed scheme likely exceeds the relevant thresholds for the preparation of such plans; and,

All waste soils / material removed from site will need to be classified in accordance with EPA guidelines (2015); soils testing will be required; the results of which shall inform the preparation of a waste classification tool (to determine the appropriate List of Waste (LoW) code), and then screened against relevant waste acceptance criteria (to determine the appropriate regulated disposal / recovery facility for each waste stream). All other construction waste shall be segregated and removed from site for disposal or recycling, in accordance with all relevant Waste Management Legislation.

All waste-related control measures set out in Section 5.11 will apply during the construction phase.

There will be a requirement to relocate occasional utility services within the proposed scheme extent. Potential service conflicts will involve the maintenance and protection of these services with occasional diversions required. Residual risks associated with utility diversions will be further developed at the detailed design stage.

5.13 Cultural Heritage

The roadside memorial (CHS-27) should be documented and reconstructed/reinstated during the construction phase. It is envisioned that following the successful implementation of the pre-construction mitigation measures, in combination with the absence of predicted impacts on the recorded and designated archaeological and architectural heritage resources, there will be no other required mitigation measures during the construction or operational phases for the archaeological, architectural and cultural heritage resource.

5.14 Invasive Species

Section 49 and 50 of Part 6 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. No. 477 of 2011) outlines the legal context for the prohibition of the introduction and dispersal of certain species. Specifically, Section 49, paragraph 2 states that any person without the required licence “who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow” any plant species listed in Part 1 of the Third Schedule (See Appendix 2.8) within the State shall be guilty of an offence.

Furthermore, under Section 50 paragraph 1, a person without the required licence “shall be guilty of an offence if he or she has in his or her possession for sale, or for the purposes of breeding, reproduction or propagation, or offers or exposes for sale, transportation, distribution, introduction or release” of any plant species listed in Part 1 of the Third Schedule (See Appendix 2.8) or anything from which "a plant referred to in Part 1 of the Third Schedule can be reproduced or propagated or “a vector material listed in Part 3 of the Third Schedule”. This vector material is defined as “soil or soil taken from places infested with Japanese knotweed (*Fallopia japonica*), Giant knotweed (*Fallopia sachalinensis)* or their hybrid Bohemian knotweed (*Fallopia x bohemica)*”.

The NBDC online mapping resource was accessed in September 2020 to identify recordings of invasive species in the area. No invasive species listed on the third schedule of the EC (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/ 2011 were recorded within the survey area. However, as noted in Section 15 of the Planning Report, a dead Greater White-toothed Shrew *Crocidura russula* was recorded during the October 2020 site visit. It is not a protected species; it is a non-native, medium impact, invasive species. Section 15 of the Planning Report also identifies the rare and protected species recorded within and around the proposed scheme. These include Badger (*Meles meles),* Irish Stoat (*Mustela erminea Hibernica),* Common Frog (*Rana temporaria),* Common Kingfisher *(Alcedo atthis)*, Common pipistrelle (*Pipistrellus pipistrellus),* Leisler’s bat (*Nyctalus leisleri),* Natterer’s bat (*Myotis nattereri),* Soprano pipistrelle (*Pipistrellus pygmaeus),* Brown long-eared bat (*Plecotus auratus),* Lesser horseshoe bat (*Rhinolophus hipposideros),* Whiskered bat (*Myotis mystacinus),* Daubenton's bat (*Myotis daubentoniid),* Nathusiius's pipistrelle (*Pipistrellus nauthusii),* Common Kingfisher *(Alcedo atthis),* Merlin (*Falco columbarius),* Peregrine Falcon (*Falco peregrinus),* Barn Owl *(Tyto alba),* Buzzards and a variety of common passerine species. Several butterfly species were also recorded within and around the proposed development.

Strict biosecurity measures shall be employed during the construction of the proposed scheme to avoid the introduction of any non-native invasive species on site. Any hired equipment and machinery used on site shall be treated with an approved biocide / cleaning agent prior to its arrival on site. The guidelines *The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* (NRA/TII, 2010) are considered to be sufficient for the current project as no non-native invasive species were recorded in the study area during the current surveys.

Good site hygiene is required to prevent the spread of non-native invasive species. Tracked equipment shall not be used in areas with non-native invasive species. Any areas adjoining the site that are contaminated with non-native invasive species, but where excavation works are not proposed, but which may have to be

accessed by machinery shall be protected to avoid spreading the non-native invasive species. This may be achieved using a layer of sand above and below a root barrier membrane which is capped by hardcore to allow vehicles to passage through the area without disturbing the soil. Vehicles entering and/or leaving the site shall be pressure washed in a designated wash down area. The debris from this area shall be collected and disposed of with other materials which have been contaminated with non-native invasive species.

The detailed mitigation measures are discussed in Natura Impact Statement (Appendix F of the Planning Report).

5.15 Ecology

The mitigation measures include but are not limited to:

- Appointment of an Ecological Clerk of Works;
- Limiting works areas;
- Water Quality Protection measures;
- Air Quality Protection measures; and
- Biosecurity Protocols.

The following construction stage mitigation measures have been designed to reduce any potential ecological impacts as a result of the proposed road improvement scheme on the N24 and must be adhered to for the duration of the project. The detailed mitigation measures are provided in Natura Impact Statement (Appendix F of the Planning Report).

5.15.1 General Measures

The following general measures shall be implemented in order to further mitigate the potential for any ecological impacts.

- All mitigation included in the NIS and the EcIA will be implemented on site through a Detailed Construction Environmental Management Plan to be prepared by the Contractor, based on this Outline Construction Environmental Management Plan.
- An Ecological Clerk of Works (ECoW) will be appointed for the proposed works. The role of ECoW will be to approve the contractors CEMP, ensure the CEMP contains all mitigation in the NIS and this section and ensure that it is implemented on site. The ECoW will also ensure that the silt fences and bunding are in place and are effectively managed to ensure any run-off from these areas is intercepted
- The site compound shall be located at least 50m away from the Skelpstown 16 stream. The works area and site compound will also be fenced off and will also have security to deter theft, vandalism and unauthorized access. Machinery will not operate or be stored outside of delineated works area.
- Works within 50m of the Skelpstown 16 stream shall be limited to daytime hours to avoid potential disturbance to Otters that may be commuting in the Skelpstown 16 stream. The ECoW will ensure that these restrictions are adhered to.
- Silt fences will be erected around works adjacent to the Skelpstown 16 stream and the site compound (see Appendix N of the Planning Report). Terrastop Premium Silt Fences, or an equivalent alternative, will be used to intercept any run-off from these areas. Silt fencing will be used around the works area, silt fences will be placed on the outside of instream works areas first, with sand bags placed inside to ensure no impacts regarding suspended solids arise. Details of the sandbags, if required, will be included in the CEMP. The ECoW will ensure that any sand bags and silt fences are erected correctly, if required.
- Any oils or fuels that may be required for minor machinery used during the proposed works will be stored appropriately in bunded tanks in the site compound to ensure no spillages occur. Machinery will be well-maintained and checked for leaks prior to its use on site.
- Any tool washing and waste / grey water from the site will be stored securely until it can be removed from site. Contained portaloo toilets will be used and all sewage appropriately removed from the site to an authorised treatment plant.

- Any stockpiling of materials will be 50m back from any watercourses, with bunding and silt fences. The location for stockpiling of materials will be agreed before the project has commenced and to be agreed upon with ECoW .
- Storage areas for concrete / cement and grout required for the works will be included in the site compound. Waste from any site clearance works will be dealt with appropriately away, at least 50m from the Skelpstown 16 stream.
- No concrete / cement mixing will be carried out at the river bank area; mixing within a mixing area in the site compound will be controlled by the contractor, with all wash water, tool washings and any waste/grey water stored securely and removed; no waste will be stored beside the watercourse; concrete / cement work must be carried out behind the silt fencing and sandbags, in the dry works area. Storage areas for concrete / cement required for the works will be included in the site compound.

5.15.2 Site Clearance

The following site clearance measures shall be implemented in order to further mitigate the potential for any ecological impacts.

- Any excavated materials storage will be 50m back from any watercourses, with bunding and silt fences, the location for stockpiling of materials will be agreed upon with ECoW .
- The appointed contractor shall make reasonable efforts to avoid any vegetation clearance works or tree felling outside of the bird nesting season, which runs from the 1st of March to the 31st of August each year.
- The proposed tree-felling shall follow the procedures outlined in *Guidelines for the Treatment of Bats during Construction of National Road Schemes* (NRA/TII, 2006). The features identified as having bat roost potential shall undergo a close-up re-inspection immediately prior to the commencing of felling / removal. If no indications of bat presence are found, removal can commence. If bats are found, works may not commence and NPWS will have to be contacted. A derogation licence will likely then be required under Regulation 25 of the European Communities (Natural Habitats) Regulations 1997 to be obtained from NPWS in advance of any works.
- The waste from any vegetation removal and spoil will also have to be dealt with appropriately away from the stream. These works will take place during dry weather and low flow conditions to minimise run-off and water contamination / sedimentation.

5.15.3 Biosecurity

The following biosecurity measures shall be implemented in order to further mitigate the potential for any ecological impacts.

- Strict biosecurity measures will be employed during the construction of the proposed scheme to avoid the introduction of any non-native invasive species on site. Any hired equipment and machinery used on site will be treated with an approved biocide / cleaning agent prior to its arrival on site. The guidelines The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (NRA/TII, 2010) are considered to be sufficient for the current project as no non-native invasive plant species were recorded in the study area during the current surveys.

5.15.4 Air Quality

The following air quality measures shall be implemented in order to further mitigate the potential for any ecological impacts.

- Any road that has the potential to give rise to dust shall be regularly watered, as appropriate, during dry and/or windy conditions.
- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.
- Access gates to site shall be located at least 10m from sensitive receptors where possible.

- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph, and on hard surfaced roads as site management dictates.
- Vehicles delivering material with dust potential (soil, aggregates) will be enclosed or covered with tarpaulin at all times to restrict the escape of dust.
- Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Vehicles shall have engines switched off when stationary – no idling. Similarly, the use of diesel or petrol powered generators shall be avoided, and electricity or battery powered equipment shall be used when practical.

5.15.5 Landscaping

The following landscaping measures shall be implemented in order to further mitigate the potential for any ecological impacts.

- Any planting or re-planting will be done using native Irish species and shall adhere to the *A Guide to Landscape Treatments for National Road Schemes in Ireland* (NRA/TII, 2006).
- Native Irish hedgerow species shall be planted linearly along the road side to ensure habitat connectivity is not lost.
- Landscaping shall be included in the works on the proposed scheme. Planting of native trees and hedgerows along the boundaries will be of benefit to bats in the local area, by enhancing the commuting and foraging habitat. Some sections of existing hedgerows in the surrounds of the scheme, along field boundaries and local lanes etc., may also be reinforced with planting of a native mix to enhance these features for bat commuting in the area.

5.15.6 Lighting

The following lighting measures shall be implemented in order to further mitigate the potential for any ecological impacts.

- LED lighting is proposed for the improvement scheme extending from Mooncoin out to Store Road, a distance of c. 1.3km. Additional lighting shall follow *Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Ireland, 2010). Light spill shall be minimised by using shields, masking or louvres. Light columns shall be kept as low as possible, with low height bollards preferred. Some light restrictions may be considered during dark hours, especially during the summer months when bats are active Motion sensor lights may also be considered.

5.16 Landscape and Visual

Landscape mitigation measures will include continuous planting of native species hedgerows and hedgerow trees alongside new boundary fencing, woodland and species rich grassland while also taking particular regard for clear zones, sightlines and safety implications (including potential effects of lighting, leaf fall and shade) (refer to Appendix K of Planning Report).

The principal impacts on landscape will be localised impacts which will occur along the length of the proposed road development, particularly in the vicinity of the embankments located over the L7416 (Grange Road) extending to heights of approximately 9.1m (At Ch 1510). Additional illumination is not a major feature of the proposed road development, nevertheless, the introduction of the road and its associated traffic will bring permanent change to specific locations within the offline section of the landscape corridor.

The proposed road development will also result in visual impacts none of which however are deemed significant or profound.

To ensure successful establishment, a 5-year period of establishment landscape maintenance shall be undertaken after the installation of the capital works landscape scheme. If any plants die or are damaged during this period they shall be replaced.

5.17 Agronomy

The following mitigation measures shall be included within the design to ensure that all severed agricultural lands are catered for in terms of connectivity throughout entire land holdings. Where applicable, the following are recommended for all of the 37 No. land plots, used for dairy, beef farming, maize tillage, orchard, being severed by the proposed scheme.

- Provide suitable access to the severed areas which will include allowance for daily movement of the dairy herd (where applicable);
- The farm infrastructure including farm / dwelling house access and/or roadway, water and power supply will need to be maintained and restored on the severed areas;
- The land drainage will need to be maintained and restored if affected;
- Ensure all of the lands remain stock proof;
- Provide animal handling facilities on severed area where the existing is not sufficient; and
- Access to be maintained throughout the construction phase for all landowners.

In general roadside fencing will be passively safe fencing in accordance with CC-SCD-00320/21 (RCD-300-20/21).

5.18 Population Impacts

In order to minimise, as far as possible, potential impacts on population and human health the mitigation measures / recommendations set out in Section 5.9 to Section 5.11 shall be implemented in full during the construction and operational phases of the scheme.

SECTION 6: Environmental Monitoring

The Project Manager will be responsible for monitoring of pollution control during works. This shall include daily site inspection and collation of a daily monitoring log, with attention to be paid to onsite control measures for the protection of surface waters and groundwater within the vicinity of the proposed project.

Control measures to manage surface water ponding and overland flows shall follow best practice standards in order to minimise release of suspended solids from the site to nearby receiving waters. Measures undertaken in relation to pollution prevention shall be noted in the Project Managers Daily Record Sheet.

The daily record sheet shall include, but not be limited to, incidents such as the following:

- Incidents arising that may impact on ecological receptors with particular emphasis on watercourses;
- Condition and effectiveness of silt control measures, such as silt fencing;
- Condition and effectiveness of fuel, oil and chemical spill prevention measures;
- Condition of vegetation to be retained bordering the works area. Where any damage is noted remedial measures must be proposed and implemented;
- Consultations with organisations such as NPWS, IFI etc.;
- Any measures undertaken / considered for invasive species, including advice sought or obtained;
- In each case where specific remedial actions are required, measures taken and effectiveness must be recorded;
- Any residual impacts from implementation of mitigation measures;
- Any other relevant information, as appropriate.

Regular inspections and audits shall be conducted to ensure compliance with the measures set out in the CEMP. A checklist shall be prepared and form the basis for reporting. If the measures set out in the CEMP are not being met, corrective action must be taken such as alteration of work practices, additional pollution control measures, additional training etc.

Should a pollution event occur that may pose a risk to receiving waters the Project Manager shall advise IFI immediately in addition to implementing pollution control measures to contain the risk and notifying the Employer and Employers Representative.

6.1 Reporting

All relevant environmental documents including daily environmental audits, environmental monitoring results, inspection records, correspondence with relevant statutory bodies and records of any environmental incidents or issues shall be available onsite for the duration of the project. Upon completion of the proposed project the Contractor shall issue the Handover Environmental Management Plan (HEMP) to the Employer which shall include a copy of all such records.