

AtkinsRéalis



# Construction Environmental Management Plan

Mayo County Council

July 2025

# N5 KNOCKAVRONY BRIDGE REHABILITATION WORKS



Comhairle Contae Mhaigh Eo  
Mayo County Council



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# 1. Introduction

AtkinsRéalis were appointed by Mayo County Council (MCC) for Eirspan Task Order 315 – Mayo Bridge Assessments and Strengthening 2023, comprising the assessment and rehabilitation of 10no. bridges in County Mayo. Knockavrony Bridge (MO-N05-013.00) lies within the scope of this task order.

This Construction Environmental Management Plan (CEMP) was prepared by AtkinsRéalis on behalf of MCC as part of the planning application for the proposed rehabilitation of Knockavrony Bridge, Knockavrony, County Mayo (Figure 1-1). This report has been prepared to support MCC in their Section 177AE application to An Coimisiún Pleanála in relation to the proposed works.

AtkinsRéalis were appointed to prepare a Natura Impact Statement on behalf of MCC for the proposed works at Knockavrony Bridge (“the proposed works”). AtkinsRéalis were also appointed to prepare an Environmental Impact Assessment Screening Report, a Construction Environmental Management Plan (this report), and a Resource Waste Management Plan for the proposed works (these documents are accompanying the planning application for the proposed works).

## 1.1 Overview

The proposed works are located ca. 1.4km east of Ballyvary village, Co. Mayo on a bridge at the border of the Knockavrony and Redhill townlands. The existing bridge structure carries the N05 National Primary Road across the Strade River (Figure 1-1).



Figure 1-1 - Location of Knockavrony Bridge near Ballyvary, Co. Mayo on the N05 road

Knockavrony Bridge comprises a single span corrugated steel pipe extended to the north by a reinforced concrete deck slab supported on mass concrete abutments. The corrugated steel arch structure has a width of 25.2m and the concrete deck slab section has a width of 7.5m, giving an overall width out to out of 32.7m

along the centreline of the structure. The structure has a square span of 2.6m and a maximum skew span of 3.99m with a skew of 40 degrees. The structure carries a single carriageway measuring 10.15m wide with raised concrete rubbing strips located on both sides of the carriageway. A 500mm high 300mm wide concrete parapet is located at the north elevation with a vehicle safety barrier provided along the south elevation.

## 1.2 Purpose of the CEMP

The purpose of this CEMP is to provide recommended measures to avoid, minimise and control adverse environmental impacts associated with the construction of the Proposed Works. The CEMP 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 Proposed Works.

The works Contractor will undertake the works in accordance with the provisions of the CEMP. This may be added to, to address other detailed construction matters. The CEMP will be updated by the Contractor to address any subsequent planning conditions relevant to the proposed Works.

The CEMP aims to define good practice as well as specific actions required to implement mitigation requirements as identified in the following environmental reports and documents reviewed by AtkinsRéalis:

- AtkinsRéalis, (2025), *Knockavrony Bridge Hydraulic Assessment*, Mayo Bridge Assessment and strengthening;
- AtkinsRéalis, (2025), *Environmental Impact Assessment Screening*, T0315 Mayo Bridges – Knockavrony Bridge; and,
- AtkinsRéalis (2025) *Natura Impact Statement*, T0315 Mayo Bridges – Knockavrony Bridge.

This document has also been informed by key findings from site visits carried out by an experienced AtkinsRéalis Ecologist and Environmental Consultant on the 7<sup>th</sup> May 2025.

The party responsible for the preparation of the CEMP is likely to change over the life of a project. In the absence of Irish guidelines, the UK guidelines LA 120 Environmental management, March 2020 for CEMP were followed.

## 1.3 Structure

This CEMP has been structured as follows:

- Section 1 outlines the purpose of the CEMP and introduces the proposed works/project;
- Section 2 describes in detail the proposed works/project;
- Section 3 outlines the minimum standards, legislation and guidance required of the Contractor during the development of the CEMP;
- Section 4 identifies the relevant roles and responsibilities for developing, implementing, maintaining and monitoring environmental management;
- Section 5 sets out the mechanisms through which environmental requirements would be managed;
- Section 6 sets out the general requirements of the CEMP.
- Section 7 provides a summary of minimum requirements that should be implemented by the Contractor; and,
- Section 8 sets out the procedures for the Emergency Response Plan.



## 2. The Proposed Works

### 2.1 Site History and Surrounding Land Use

MO-N05-013.00 Knockavrony Bridge comprises a single span corrugated steel pipe extended to the north by a reinforced concrete deck slab, carrying the N5 National Primary Road over the Strade River. The corrugated steel arch structure has a width of 25.2m and the concrete deck slab section has a width of 7.5m, giving an overall width out to out of 32.7m along the centreline of the structure. The structure has a square span of 2.6m and a maximum skew span of 3.99m with a skew of 40 degrees.

The area surrounding the proposed works is agricultural in nature with the site located within the confines of the road network. There are no historical monuments including SMRs and NIAHs within the Proposed Works site. The closest is Enclosure MA070-161---- which is located ca. 0.76km west of the proposed Works.

### 2.2 Proposed Works

The proposed works to the existing Knockavrony Bridge structure comprise the installation of a 150mm thick concrete invert throughout the length of the corrugated pipe section of the structure to prevent further corrosion of the existing corrugated steel. The purpose of the concrete invert is to protect the steel section from further corrosion, with surface corrosion evident along both side walls of the pipe. If not protected, the steel corrosion would continue with section loss eventually occurring which could result in the failure of the structure (AtkinsRéalis, 2025a). In addition, the north embankment over the reinforced concrete slab section of the structure requires to be excavated to apply waterproofing to the concrete slab. Works also include the repair to minor areas of spalling within the reinforced concrete slab section of the structure and installation of fencing across the north elevation to increase the parapet containment height.

Installation of the concrete invert requires full dewatering of the river channel with an over pumping mechanism.

See Figure 2-1 and 2-2 overleaf for the proposed layout plan and elevations and section for the works

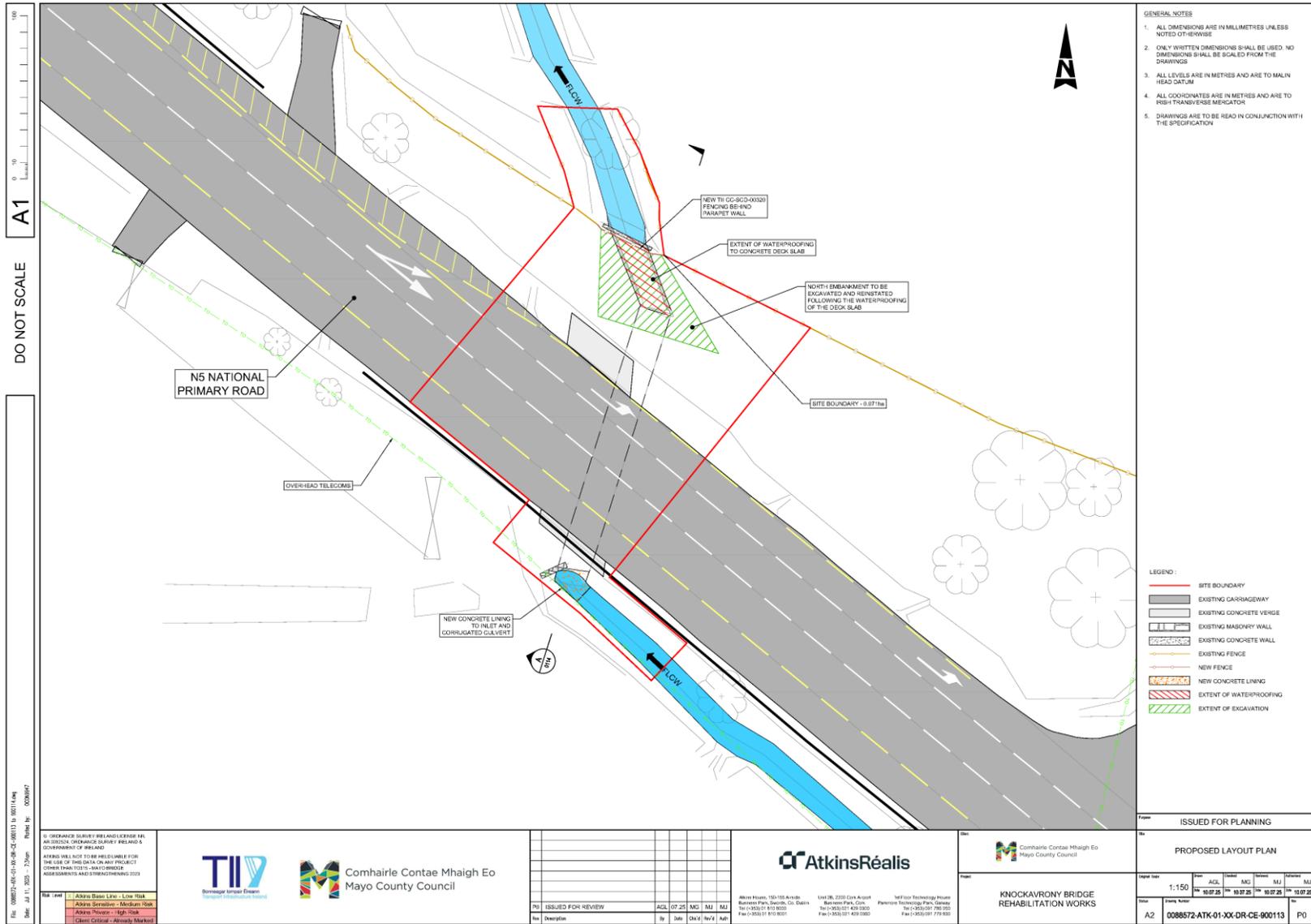


Figure 2-1 – Proposed Layout Plan



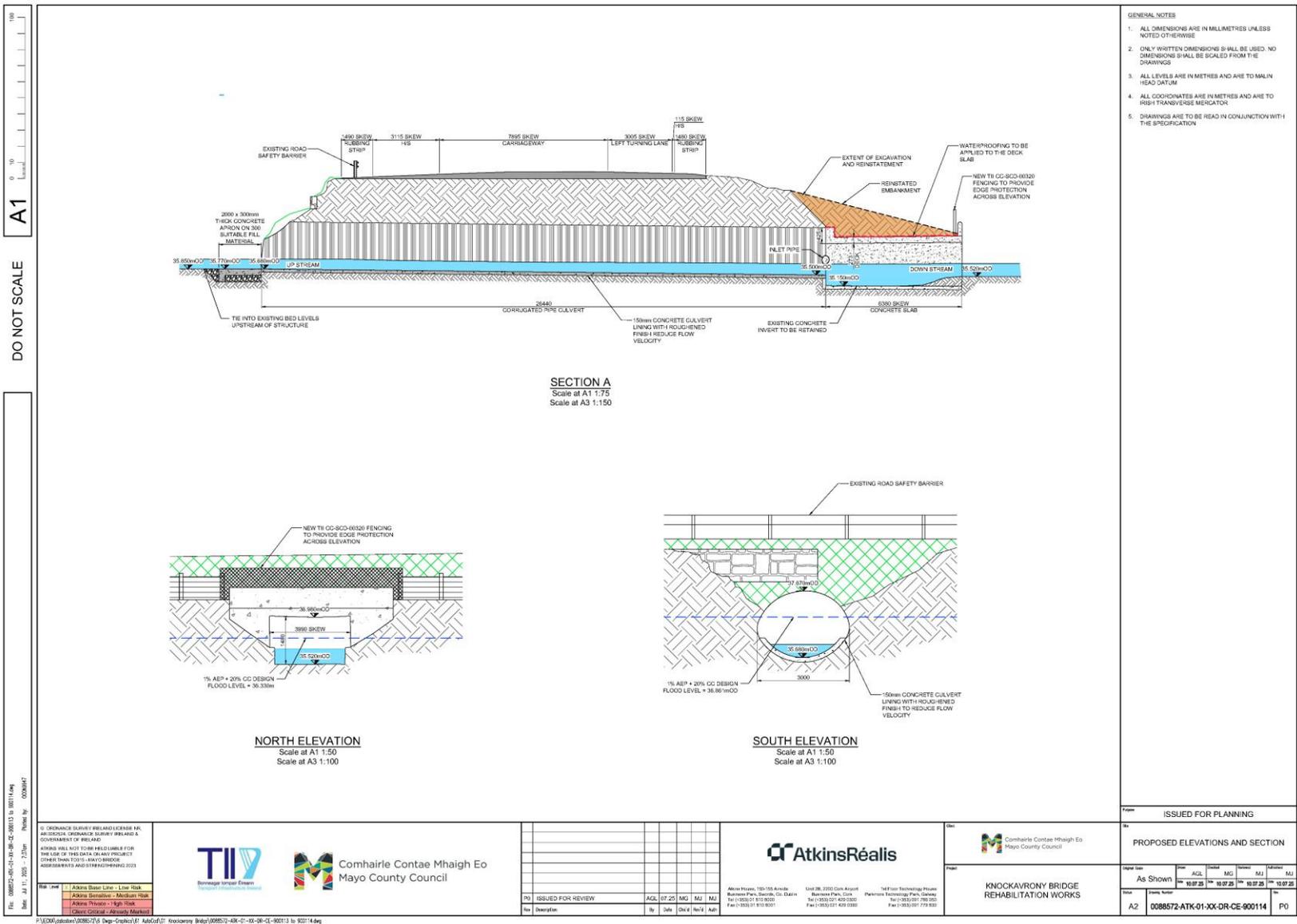


Figure 2-2 – Proposed Elevations and Section



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No	Description	By	Date	Rev	Rev	App
01	ISSUED FOR REVIEW	AGL	07/25	MJ	MJ	MJ



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KNOCKAVRONY BRIDGE REHABILITATION WORKS

Form		ISSUED FOR PLANNING				
Rev		PROPOSED ELEVATIONS AND SECTION				
Version	Issue Date	AGL	MJ	MJ	MJ	MJ
As Shown		10/07/25	10/07/25	10/07/25	10/07/25	10/07/25
A2	0088572-ATK-01-XX-DR-CE-000114					P0

## 2.3 Key Stages

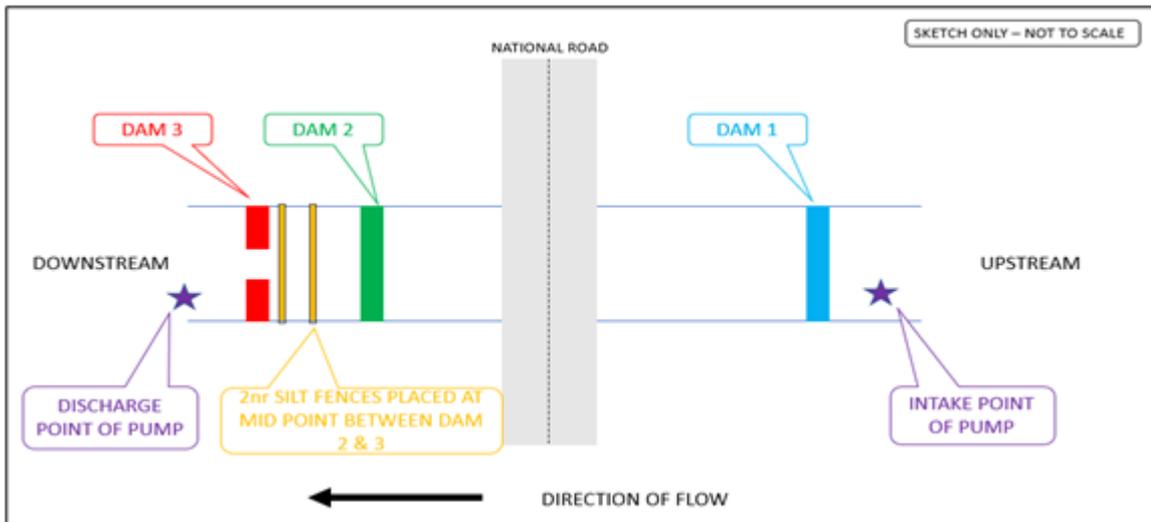
The proposed works will involve the following key phases:

- Detailed design stage
- Tender Stage
- Procurement and Appointment of a Contractor
- Site preparatory works, including the preparation of all required detailed Safety and Health and Environmental Management
- Site mobilisation
- Construction Stage
- Completion; and,
- Operational Stage.

## 2.4 Construction Methodology – Detailed Description

The construction methodology and sequence of works are as follows:

1. The site compound will be located within the site boundary along the N05 national road. All machinery and plant will be stored on site for the duration of works within the site boundary.
2. Traffic Management will be installed at the works location; this will comprise of an alternating single lane closure installed at culvert location. A detailed Traffic Management Plan to be provided by the successful contractor once appointed.
3. Construction of a dry working area; this requires full dewatering of the channel and will occur prior to all works following site setup. The construction of the dry working area is as follows:
  - There will be three sandbag dams erected in the watercourse; Dam 1 upstream of the culvert and Dams 2 and 3 situated down-stream of the culvert. Dam 2 and Dam 3 will be erected first (300mm high on the riverbed). Dam 1 will then be erected (800mm high on the riverbed), and the river flow pumped downstream of Dam 3. Instream access by operatives is required for the installation of the sandbag dams and silt fences.
  - Dams will be constructed of small sandbags filled with pea gravel. Each bag will be double bagged and sealed thoroughly. The base of each dam will be three times the height. The dam will also be wrapped in 1000-gauge polythene. Dam height will depend on water levels at the time of erection and the 14-day predicted rainfall.
  - The sandbags for the dam will be carried by hand and placed into position within ten meters downstream of the structure, 500mm in height, across the full width to prevent downstream water returning into the work area. Dam 2 will be constructed by hand upstream of Dam 3; Dam 2 will be raised to 500mm in height. Dam 1 will then be placed within ten metres upstream of the structure on the upstream elevation; Dam 1 will be raised to full height (Dam 2 and Dam 3 are built up more gradually).



**Figure 2-3 - Schematic of three dam dewatering system proposed at Knockavrony Bridge.**

- The section of river between Dam 1 and Dam 2 is required to be electro-fished by a licensed operator. All fish will be relocated downstream of the works area and discharge point of pump. Upon completion of the electro-fishing, Dam 2 will be raised to full height (up to 800mm) and a silt fence will be erected between Dam 2 and Dam 3. A second silt fence will then be erected just upstream of Dam 3 (Figure 2-3). These two silt fences will act as a final filter for sediment within potential surface water run-off before it re-enters the live watercourse.
  - An over pumping pipe will be placed into a 225mm non-perforated pipe installed through the culvert at high level. It will be secured by temporary brackets that will be fixed along the existing abutment ledge wall. The pipe will be secured to allow for a gravity fall. The intake hose for over pumping will be positioned on the upstream side of Dam 1 and will be wrapped in a layer of silt fencing. The discharge hose will be position on the downstream side of Dam 3. A silt bag will be placed on the end of the discharge hose to prevent discharge of any suspended solids or unwanted material into the live watercourse.
  - The works area between Dam 1 and Dam 2 will be pumped out and discharged between Dam 2 and 3 and before the silt fences. A small natural sump is located within the works area (between Dam 1 and 2) and a submersible pump will be used to over pump any water collected.
  - All over pumping works will require the use of either a submersible pump or centrifugal dewatering pump which will be used to over pump any water collected. Collected water will be discharged to the upstream side of the silt fences between Dams 2 and 3.
4. A working platform will be installed upstream and downstream of the culvert once the dewatered area is dried out. The platform will consist of a layer of heavy-duty geotextile placed over the existing riverbed and a 250mm layer of washed, well graded clean aggregate placed on the geotextile to give a solid, clean base for operatives to access and work on the culvert concrete lining. The platform will cover the full width of the river and will be within 5m upstream and circa 5m downstream of the culvert. The aggregate will be placed using a 13-ton excavator placed on the embankments and verge that will reach the mouth of the culvert without entering the riverbed. On completion of the proposed works, the geotextile and aggregate will be removed and the riverbed reinstated. There is no excavation of the riverbed required for the installation of these upstream and downstream working platforms. The working platform is required for access to the inlet (requiring excavation; see Step 6 below) and for entry into the culvert to prevent damage to the riverbed.
  5. The circa 4m<sup>3</sup> of natural material (includes rocks and some gravels) within the pipe culvert will be removed by hand and stored for reinstatement post-works.

6. The existing riverbed at the south upstream elevation will be excavated to a depth of 600mm below the finished bed levels in order to construct the new concrete apron at the inlet, extending 2m upstream of the corrugated structure. The temporary working platform will be located upstream of this excavated area. The c. 5m<sup>3</sup> excavated material will be stored away from the watercourse, within the existing road 'site compound' for reinstatement of the riverbed following the works. Excavation works will be undertaken using a long reach excavator positioned on the embankment. For access, a smaller excavator (5-ton) may require to enter the works area via the temporary working platform; this as note, will be done within the dewatered area with no instream access required.
7. The existing steel culvert will be cleaned by pressure washing. The washing unit generator will be positioned on the carriageway above the south elevation with the lance hose running down the bank into the mouth of the culvert. The washing will commence on upstream side and washing in the downstream direction. The culvert will be cleaned using a 25,000 PSI Hydro Power Washer removing the loose material on the existing steel culvert. It is expected that the power washing will remove all loose material, but as necessary small handheld angle grinders and wire brushes will be used to clean the steel to the ST3 finish. These areas will then be pressure washed again to ensure it is completely clean. Water from pressure washing the steel culvert will be collected in a sump at the interface with the slab section and over pumped with a submersible pump to discharge upstream of the silt fences between Dams 2 and 3. Arisings from the cleaning of the culvert lining will be collected within the culvert and disposed off-site to an appropriately licensed waste facility.
8. The exposed steel of the culvert shall be treated with a corrosion inhibitor and primer. The specified products are the corrosion inhibitor Galvafruid manufactured by Fosroc and the anti-corrosion steel primer, Nitoprime Zincrich Plus by Fosroc. These works will be undertaken in the dry within the culvert structure and will be placed by hand.
9. The A393 stainless steel mesh reinforcement will be lifted to the inlet of the culvert using a mobile crane positioned on the carriageway verge above the south elevation due to the steep slope. Operatives will then carry the mesh to the point of placement and fix into position as required.
10. The shotcrete pump and concrete delivery lorries will be positioned on the N05 carriageway above the south elevation of the structure with hoses (delivering the concrete) to be placed down the bank to the mouth of the culvert. A layer of polythene will be placed at ground level beneath the concrete discharge point from the concrete truck to the trough of the pump to capture any spillages that may occur. All concrete pumping and shotcreting (sprayed concrete) works will be undertaken within the dewatered, dry working area.
11. The concrete shotcreting will begin on the downstream end of the culvert and work upstream. Once a section of the concrete has been completed it will be provided with a suitable roughened finish as according to '*Design Guidance For Fish Passage On Small Barriers*' (OPW, 2021). The estimated concrete quantity required is 22m<sup>3</sup>. Shotcreting works will be undertaken by personnel standing within the culvert operating the shotcreting gun.
12. Once concrete works have been completed and concrete has cured, the temporary working platform covering the existing riverbed will be removed from the river and any material removed from the riverbed to facilitate the level positioning of the geotextile membrane will be reinstated. The removal of the temporary working platform involves specifically the removal of the geotextile membrane and aggregate placed upon installation of the platform; no removal of existing riverbed material is required or permitted.
13. Localised reinstatement of the existing riverbed immediately upstream of the new concrete apron will then be undertaken to align with existing upstream bed levels using suitably sized clean gravel material. The downstream outlet of the pipe culvert currently sits 200mm above the riverbed of the adjacent slab section with this drop retained for hydraulic purposes. The drop post installation of concrete invert will be 350mm in height.

14. The localised concrete repairs to the concrete deck slab will be undertaken by hand using a specialist high strength rapid repair mortar within the dry working area. The total extent of areas requiring repair is less than 1m<sup>2</sup>.
15. Following the completion of works to the concrete invert and deck slab repairs, the dewatered channel will be demobilised. The removal of the dams will be completed on a two stage basis. The level of Dam 1 will be lowered to allow the area between Dam 1 and 2 to partially fill with water. The water within Dams 1 and 2 will be allowed to settle overnight and the remainder of the dams will then be removed completely the following morning to minimise any plumes of silt. The flow of the channel will return to existing condition.
16. The excavation of the embankment on the north verge of the structure will be undertaken to expose the full deck area of the concrete slab section of the structure. The works will be undertaken by a 13-ton excavator positioned on top of the embankment. The c. 30m<sup>3</sup> excavated material will be set aside on the embankment for reinstatement following the works. Excavation works to the north verge are over land close to the N05 set back from the watercourse. Access to the works area is from the embankment and contained behind the existing north parapet, no instream works or works over water are required for excavation of the verge.
17. Deck surface to be cleared of all dust and debris by sweeping with collected material removed from site to tip.
18. Spray applied epoxy waterproofing system to be installed by hand spraying to the deck surface and existing parapet upstand from on top of the deck surface. 30m<sup>2</sup> total area. A 100mm thick concrete screed protection layer is then to be installed to protect the deck waterproofing, pumped from a concrete truck positioned on the verge on top of the structure. Concrete pumping works here are set back from the watercourse contained on the existing parapet.
19. The embankment is then to be reinstated with the excavated material compacted in layers with additional imported topsoil provided as the surface layer and seeded.
20. Suitable fencing to TII standards is to be installed across the north elevation of the structure to increase the parapet containment height. Works here are adjacent to the N05 road and set back from the watercourse behind the existing north parapet.
21. Traffic management to be removed.

## 2.4.1 Demolition

There is no demolition works associated with the proposed works at Knockavrony Bridge. Works will be undertaken within the existing structure. Verge clearance is required above concrete deck however this will be reinstated upon completion of works.

## 2.4.2 Machinery

Machinery will be refuelled within the site area and away from the watercourse. No refuelling of heavy machinery is permitted at works site (adjacent to the river); all refuelling will be done within the site compound (i.e., within the single lane closure on the N05 road) Small jerry cans for usage for generators are permitted. Machinery required for the proposed works is as follows:

- 13-ton excavator (with long reach)
- 5-ton excavator
- Concrete lorry (and pump)
- Mobile crane

## 2.4.3 Programme

Works will take four weeks in total to complete and area anticipated to commence in Q3 of 2026 at the earliest. Works are limited to daytime working hours and follow the standard programme of 8am to 7pm midweek and 8am to 1pm on Saturdays. Instream works are permitted only between the 1<sup>st</sup> of July and 30<sup>th</sup> September.

## 2.4.4 Site Compound

As agreed with MCC, the successful Contractor will utilise the area within the site boundary as a site compound for the duration of works. The N05 national road is comprised of a wide carriageway and the northern embankment of the structure provides a suitable area for the works to be staged. There may be a requirement for temporary (mobile) lighting within the site compound area along the N05 should works extend to winter months, however this is not foreseen given the works window of July to September<sup>1</sup> required to facilitate instream works.

Upon completion of works the site compound area will cease to exist and will revert to fully operational road use.

## 2.4.5 Traffic Management

The proposed works at Knockavrony will require an alternating single lane closure of the N05 National Road for an estimated four weeks duration. There is no proposed traffic diversion route, only a single lane closure is required. The successful appointed Contractor will provide and implement a detailed Traffic Management Plan for the duration of works.

## 2.5 Environmental Constraints

This section summarises the main environmental constraints that relate to the construction phase.

### 2.5.1 Noise

A review of the Environmental Protection Agency (EPA, 2025) Noise Maps indicates Lden levels on the N5 located ca. 1km from the Proposed Works range between 60-64dB to >75dB. Lnight levels on the N5 range between 45-49dB to >70Db.

### 2.5.2 Air Quality

Dust arising from excavation and import of soil to the proposed sites, along with vehicle movement as well as emissions from construction vehicles and plant will contribute to reduced air quality. Some activities including infilling of soil, excavations, stockpiling and movement of materials, and construction vehicle movements may all contribute to generating ambient dust.

The Proposed Works are located within Air Quality Zone D – Rural Ireland, which is reported by the EPA, 2025 as having ‘Good’ ambient air quality, with the closest monitoring station; Castlebar Air Monitoring Site (Station Code: MO1) is located ca. 11.8km southwest of the Proposed Works and measures for PM<sub>10</sub>, Ozone and

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<sup>1</sup> <https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Guidelines%20Report%202016.pdf>

Oxides of Nitrogen. Data collected between February 1<sup>st</sup> 2025 and 29<sup>th</sup> April 2025 show that average concentrations of NO<sub>2</sub>, Ozone and PM<sub>10</sub> were 7.77µg/m<sup>3</sup>, 58.95 µg/m<sup>3</sup> and 15.79µg/m<sup>3</sup> respectively<sup>2</sup>.

## 2.5.3 Soils and Geology

Soils beneath the general vicinity of the Proposed Works include:

- Limestone till (Carboniferous);
- Karstified limestone bedrock as surface is located ca. 7.6 km west of the site.

The Proposed Works is underlain by Dark fine-grained limestone and shale of the Aille Limestone Formation (GSI, 2025). There are no karst features within the vicinity of the Proposed Works. The closest karst features; Spring (Karst ID: IE\_GSI\_40K\_17146) and Swallow Hole (IE\_GSI\_Karst\_40K\_12256) are located ca. 7.63km and 5.89km west respectively of the Proposed Works. Verified Borehole (ID: 2747) located ca. 3.7km from Proposed Works. Verified Borehole (ID: 2747) located ca. 3.7km from Proposed Works.

There are no wells within the project site, with the closest Spring (1127NEW006, Treanagleara, Kiltimagh PWS) located ca. 4.9km southeast of the site. The well use is reported by the GSI (2025) as Public Supply and is located to a 5km locational accuracy.

There are no recorded landslide events in the vicinity of the site. Landslide susceptibility within the site and surrounds is classified as 'Low' (GSI, 2025).

There are no Geological Heritage Areas within the Proposed Works. The closest is Castlebar Westport Drumlins (MO028) and River Moy (MO089) located ca. 5km southwest and ca. 5.27km northeast of the Proposed Works.

The GSI provides a methodology for aquifer classification based on resource value (regionally important, locally important and poor) and vulnerability (extreme, high, moderate or low). Resource value refers to the scale and production potential of the aquifer whilst vulnerability refers to the ease with which groundwater may be contaminated by human activities (vulnerability classification primarily based on the permeability and thickness of subsoils).

According to the GSI (2025) the underlying Aille Limestone Formation is classified as a regionally important karstified aquifer. Groundwater vulnerability underlying the site is classified as 'Extreme' and 'High' (GSI, 2025). The Pollavaddy Group Water Scheme is located ca. 7.75km south of the Proposed Works (GSI, 2025).

## 2.5.4 Ecology

There are no Special Protection Areas (SPA) or Special Conservation Areas (SAC) within the immediate vicinity of the Proposed Works. The closest is the River Moy SAC (Site Code: 002298) located ca. 3.9km upstream of the Proposed Works (site code: 002298). Further downstream (> 30km) lies the Killala Bay/Moy Estuary SAC (000458) and Killala Bay/Moy Estuary SPA (004036). Lough Conn and Lough Cullin SPA (004228) lies ca. 5.2km over land from Knockavrony Bridge. There are no other Natura 2000 sites with connectivity to Knockavrony Bridge

Qualifying Interests of the River Moy SAC include Otter (*Lutra lutra*), Salmon (*Salmo salar*), White-clawed Crayfish (*Austropotamobius pallipes*), Sea Lamprey (*Petromyzon marinus*), Brook Lamprey (*Lampetra planeri*), Active raised bogs, Degraded raised bogs still capable of natural regeneration, Lowland hay meadows (*Alopecurus pratensis*, *Sanguisorba officinalis*), Alkaline fens, Depressions on peat substrates of the

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<sup>2</sup> Environmental Protection Agency, Air Quality available at: [Readings | AirQuality.ie](https://readings.airquality.ie)

Rhynchosporian, Old sessile oak woods with Ilex and Blechnum in the British Isles and Alluvial forests with Alnus glutinosa and Fraxinus excelsior (*Alno-Padion*, *Alnion incanae*, *Salicion albae*).

Knockavrony Bridge was most recently surveyed by Inland Fisheries Ireland (IFI) in 2023 at a site ca. 2.9km downstream from the structure as part of an IFI catchment-wide assessment (Fleming et al., 2024). Species recorded include White-clawed crayfish (*Austropotamobius pallipes*) (two individuals found at the site) as well as Atlantic salmon (*Salmo salar*), Brown trout (*Salmo trutta*), Minnow (*Phoxinus phoxinus*), and Stickleback (*Gasterosteus aculeatus*). At the surveyed site, numbers of salmon recorded exceeded twenty individuals per 5 minutes of electrofishing (Fleming et al. 2024).

The closest NHA to Knockavrony Bridge is Cunnagher More Bog NHA (site code: 002420) which lies ca. 7.5km northwest over land with no hydrological connectivity. The Moy Valley pNHA (site code: 002078) lies ca. 5.1km downstream from Knockavrony Bridge. Killala Bay/Moy Estuary is also designated as a pNHA for the same species and habitats as the SAC and SPA.

The downstream Killala Bay/Moy Estuary SPA is also internationally recognised as a Ramsar<sup>3</sup> site as it is considered a wetland of importance. Other wetlands in the vicinity of the Proposed Works include: Carrownaraha Ponds North located ca. 0.55km southeast (Site Code: MIW\_MA789), classified as '*F Rating: Unknown value, survey required*'. The Bellavary Lake South is located ca. 0.84km southwest of the Proposed Works and is classified as '*C+ Rating: County Conservation value - This site is split into two distinct habitats. A smaller eastern area of transition mire with a diverse assemblage of Carex spp. and larger western swamp area dominated by Equisetum spp. Whole area mapped as a Mill Pond on 1910s OS map*' (WSI, 2025).

The Breandrum stream runs ca. 26m from the Proposed Works and flows in a generally north direction where it connects to the Strade River (River\_Waterbody\_Code: IE\_WE\_34S040800). The Strade is classified as '*High*' under the River Waterbody WFD Status 2016-2021 and is '*Not at Risk*' of failing to meet WFD goals by 2027 (EPA, 2025).

### **Site Survey**

In a survey conducted by AtkinsRéalis Ecologists in 2025, there was no recorded evidence of Freshwater pearl mussel (via visual inspection and instream surveying) at the culvert (AtkinsRéalis, 2025).

There was no evidence of freshwater pearl mussel (*Margaritifera margaritifera*) or white-clawed crayfish (*Austropotamobius pallipes*) recorded within the vicinity of the culvert structure. The riverbed at the location of the culvert structure is generally poor given the presence of filamentous algae and is unlikely to support these species. No other aquatic species, particularly those of qualifying interest to the River Moy SAC were recorded during the site visit.

Dipper (*Cinclus cinclus*) was recorded within the vicinity of the culvert. A nest was recorded underneath the culvert structure, although the species to which it belongs is unclear. There were no other breeding bird species identified within the vicinity of the culvert structure during the site visit. Furthermore, there were no other terrestrial fauna recorded during the site visit.

There was no evidence of any protected or invasive alien species, either aquatic or terrestrial, within the vicinity of the culvert structure.

## **2.5.5 Landscape and Visual Amenity**

The Proposed Works are not located along any of the identified Scenic Routes or views as per the Mayo County Development Plan 2022-2028. The Proposed Works are not located along any of the identified Scenic

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<sup>3</sup> <https://www.irishwetlands.ie/irish-ramsar-sites/>

Routes or views as per the Mayo County Development Plan 2022-2028. It is classified as 'Area K: East-Central Drumlin Spine' under the Mayo County Development Landscape appraisal (2022), which states that:

*'This area is made up of glacial drumlins that are uniform at its western end near its transition with the distinct drumlins of Clew Bay. In the east, these become less uniform and severe, and the terrain merges into several sets of geologically distinct and isolated hills as the unit encapsulates the towns of Castlebar, Swinford, and Charlestown. The land cover is a mixture of bog/moorland, poor quality pasture and transitional woodland scrub with better quality pasture to the east and south.'*

*This area is characterised by a mixed land use pattern. Peat bogs and agricultural lands with significant areas of natural vegetation and transitional woodland scrub. There are also significant areas where pasturelands represent a major land use. Charlestown, Castlebar and Swinford towns display the significance of urban settlement areas in this region of the County.'*

The land surrounding the Proposed Works comprises the existing road network, few residential or agricultural buildings and agricultural lands.

## 2.5.6 Water Resources

The Proposed Works is located within the Moy & Killala Bay Water Framework Directive (WFD) Catchment area (no. 34) and Moy\_SC\_070 sub-catchment.

The Breandrum stream is crossed by the Proposed Works and flows in a generally north direction where it connects to the Strade River (River\_Waterbody\_Code: IE\_WE\_34S040800). The Strade is classified as 'High' under the River Waterbody WFD Status 2016-2021 and is 'Not at Risk' of failing to meet WFD goals by 2027 (EPA, 2025). The Strade River is an important tributary of the River Moy, the joining of which is located ca. 6.8km downstream (from the culvert). The River Moy rises in the Ox Mountains in Co. Sligo and flows in an anti-clockwise loop before heading northwards towards Ballina, Co. Mayo and into the sea at Killala Bay. It is considered to be one of Ireland's best salmon rivers and is known to provide good angling for sea trout (O'Reilly, 2002).

The Q-Value system is a biotic metric used by the EPA to categorise river water quality using macroinvertebrate assemblages as indicators of water quality. The closest records to Knockavrony Bridge lie ca. 3.17km downstream, where a sampling site last sampled in 1993 returned a Q-value of 4-5 which reflects 'High' water quality status. The Little River (EPA code 34L02) is a tributary of the Strade River and was sampled in 2022, achieving a Q-value of 4-5. This sampled site lies ca. 3.1km upstream from where it joins the Strade River (c. 1.5km upstream from Knockavrony Bridge). 'High' Q-values refer to unpolluted, satisfactory conditions at the site sampled. The Strade River is categorised as 'High' status under the Water Framework Directive (WFD) (2016-2021) both upstream and at Knockavrony Bridge, and transitions to 'Good' status downstream just before joining with the River Moy. High status as according to the EPA in terms of the WFD refers to 'No or only minor difference from reference condition – Normal community structure, sensitive species present. Ecological processes functioning normally'.

21% of rivers within the Moy and Killala Bay catchment are categorised as 'High' status while 49% are categorised as 'Good' status, under the WFD.

The Proposed Works is within the Swinford Groundwater Body and is currently 'Not at Risk' with respect to the WFD Groundwater Body Risk and is classified as 'Good' with respect of meeting WFD goals by 2027 (EPA Code: IE\_WE\_G\_0033) (EPA, 2025).

The Pollavaddy Group Water Scheme is located ca. 7.75km south of the proposed Works (GSI, 2025). There are no wells within the project site, with the closest Spring (1127NEW006, Treanagleara, Kiltimagh PWS) located ca. 4.9km southeast of the site. The well use is reported by the GSI (2025) as Public Supply and is located to a 5km locational accuracy.



## 2.5.7 Flood Risk

The site has been assessed in accordance with the “The Planning System and Flood Risk Management” Guidelines. As part of the sequential test, the OPW flood hazard maps have been consulted, as have the Catchment Flood Risk Assessment Maps produced by the OPW. The OPW (2025) Fluvial River Flood maps indicate Low and Medium probability of flooding on the Strade River.

Knockavrony Bridge and directly adjacent lands lie within the flood zone of the Strade River. In November 2024, Storm Bert caused flooding of the Strade River which saw inaccessible roads and minor damage to infrastructure along the N58 regional road<sup>4</sup>. The lands around Knockavrony Bridge have historically flooded as according to Flood Maps<sup>5</sup> and as according to National Indicative Fluvial Mapping, high flood levels are classed at ‘Medium’ probability (once in one hundred years) at Knockavrony Bridge.

### 2.5.7.1 Hydraulic Modelling

A hydraulic assessment for Knockavrony Bridge (AtkinsRéalis, 2025a) was done to evaluate the flow behaviour under the design flood conditions. The design flood flow, corresponding to a 1% AEP (1 in 100-year event) with climate change allowance, was determined as 5.795 m<sup>3</sup>/s (Q100CC) while QMED and Q100 were 1.97 m<sup>3</sup>/s and 4.829 m<sup>3</sup>/s respectively. The effects of the proposed concrete invert on hydraulic performance was done and two hydraulic models were developed. The base model represented the hydraulic behaviour of the existing culvert while the second model simulated the same structure but included a roughened 150mm thick lining in the corrugated section as per the proposed works. These models allow for a comparative analysis of the hydraulic performance with and without the lining as the lining can potentially alter flow characteristics, reduce roughness, and improve flow efficiency. This report (AtkinsRéalis, 2025a) described that:

*‘In the baseline model, which simulates the existing culvert, the culvert operates under free-flow conditions during the design flood, with a freeboard of 0.525m at the inlet (37.67m soffit level with 37.145m design flood level). The outlet velocity is 3m/s. The existing culvert has a significant 0.21m head loss at the inlet mainly due to the sharp change in direction of the watercourse. Additionally, the head loss through the culvert barrel is 0.19m, excluding the culvert gradient.’*

*To enhance the hydraulic performance at the culvert inlet and reduce head loss, it is proposed to provide a smoother transition of flow into the culvert by guiding the flow into the culvert with a new concrete invert upstream of the inlet. Bevelled edges would also be provided to the new concrete lining (referred to as ‘apron’ in this report) at the culvert inlet. The proposed works reduce the culvert inlet head loss to 0.09m. By improving flow entry these measures would help minimize turbulence and ensure more efficient water conveyance through the culvert.*

*The analysis model for the proposed culvert lining indicates that the culvert operates under free-flow conditions for the design discharge flow. During the design flood, the culvert maintains a freeboard of 0.809m at the inlet (37.67m soffit level with 36.861m design flood level) and 0.65m at the outlet (36.98m soffit level and 36.33m design flood level). The increased freeboard at the inlet compared to the existing structure is attributed to the improved hydraulic performance at the inlet. The outlet velocity is 3m/s, the same as the existing structure. The hydraulic loss through the culvert is determined to be 0.26m, excluding the culvert gradient.’*

#### 2.5.7.1.1 Low Flow Assessment

Additionally, the low flow values of the culvert were evaluated within the hydraulic assessment; to evaluate the availability of water in the culvert during low flow periods to further understand if depths are sufficient for fish passage within the structure. As a conservative measure, the lowest median annual maximum (QMED) was

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<sup>4</sup> <https://www.con-telegraph.ie/2024/11/23/storm-bert-leaves-mayo-flooding-problems-in-its-wake/>

<sup>5</sup> OPW floodmaps, available at: <https://www.floodinfo.ie/map/floodmaps/>

determined using the FSU2 7 variable equations, and the lower 95% confidence interval flow value was calculated as 0.885 m<sup>3</sup>/s. This assessment found that baseline hydraulic modelling, which simulates the existing culvert conditions, shows that the outlet of the culvert has a tailwater height of 0.25m with a velocity of 1.67 m/s downstream at the outlet. The inlet has a headwater height of 0.65m with an inlet velocity of 0.75 m/s. With the introduction of a concrete invert in the corrugated pipe section, modelling shows that the outlet conditions do not show any significant change from the base model. The inlet headwater height would reduce to 0.42m with an increased velocity of 1.48m/s which is less than the velocity at the existing outlet. The calculated water depths are in excess of the minimum 150mm recommended for fish passage (IFI, 2016).

## **2.5.8 Archaeology and Cultural Heritage**

There are no historical monuments including SMRs and NIAHs within the Proposed Works site. The closest Enclosure MA070-161 is located ca. 0.76km west of the Proposed Works.

## **2.5.9 Traffic & Transportation**

In relation to transport, the Contractor will develop the Traffic Management Control Plan to mark relevant identified receptors so that construction impacts on them can be considered. Mitigation will include traffic management measures and the use of signage with speed restrictions and diversions.

## **2.5.10 Local Amenities and Other Sensitive Receptors**

The Proposed Works is located ca. 1km from Ballyvary, Co. Mayo. There are few residential/ agricultural properties surrounding the Proposed Works, as well as the existing road network users.

## 3. Legislation and Guidance

All parties, contractors and consultants working on this project shall be subject to the laws of Ireland and the various international/regional protocols and agreements to which Ireland is a party. In the event that legislation is updated the latest version shall be followed. All relevant new legislation will be followed as appropriate. This document outlines most current legislation at the date of issue. It is the responsibility of the Contractor to ensure that they are up to date with the details of the latest iterations of legislation relevant to the project throughout the duration of the contract.

The Designer should be aware of all key environmental risks and associated measures set out within this CEMP, and the final detailed design should take due cognisance of these.

The Contractor should set out the detailed CEMP in a clear format and should address all key environmental risks and associated measures. The Contractor must be aware of and comply with the legislation and guidance set out in this document, any specific planning conditions which may be associated with the proposed works, and other relevant documentation as prescribed by the Employer and planning authority.

### 3.1 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 and subsequent amendments, 2000- 2024;
- Planning and Development Regulations 2001 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), 2019 (S.I. No. 77 of 2019), 2021 (S.I. No. 659 of 2021), 2022 (S.I. No. 288 of 2022), 2023 (S.I. No. 410 of 2023), 2025 (S.I. No. 50 of 2025);
- European Communities Environmental Objectives (Groundwater) Regulations 2010, S.I. No. 9 of 2010, as amended, 2016 (S.I. No. 366 of 2016), 2022 (S.I. No. 287 of 2022);
- 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);
- European Communities (Shipments of Hazardous Waste Exclusively within Ireland) Regulations 2011, S.I. No 324 of 2011;
- European Communities (Transfrontier Shipment of Waste) Regulations 1994 (S.I. No. 121 of 1994);
- European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014), as amended 2019 (S.I. No. 233 of 2019);
- European Union (Drinking Water) Regulations, 2014, S.I. No. 122 of 2014, as amended 2017 (S.I. No. 464 of 2017), as amended (S.I. No. 286 of 2022), 2023 (S.I. No. 99 of 2023);

- Waste Framework Directive 2008/98/EC of the European Parliament and Council on waste, as amended 2018 (S.I. No. 851 of 2018);
- Waste Management Acts of 1996 to 2021;
- The Water Pollution Acts of 1977 & 1998;
- 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;
- The Wildlife Acts 1976 to 2023;
- 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 of 2014), 2018 (S.I. No. 261 of 2018), 2022 (S.I. No. 166 of 2022), 2025 (S.I. No. 52 of 2025);
- Water Conservation Regulations 2008, S.I. No. 527 of 2008;
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016);
- Litter Pollution Act of 1997, as amended, 2017 (Bill 58 of 2017);
- Litter Pollution Regulations 1999, S.I. No. 359 of 1999);
- 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), 2019 (S.I. No. 250 of 2019), 2023 (S.I. No. 471 of 2023);
- Waste Management (Collection Permit) Regulations 2007, S.I. No. 820 of 2007), as amended, 2015 (S.I. No. 197 of 2015), 2016 (S.I. No. 24 of 2016), 2023 (S.I. No. 63 of 2023 & S.I. No. 104 of 2023);
- Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended 2010 (S.I. No. 350 of 2010);
- Environment (Miscellaneous Provisions) Act 2011, as amended 2015;
- 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), 2019 (S.I. No.182 of 2019), 2023 (S.I. No. 398 of 2023), 2024 (S.I. No. 442 of 2024);
- 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;
- Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998);
- Waste Management (Transfrontier Shipment of Waste) Regulations 1998, as amended, 2014 (S.I. No. 861 of 2014);
- Waste Management (Tyres and Waste Tyres) Regulations 2007 (S.I. No. 664 of 2007), 2017, as amended (S.I. No. 400 of 2017) and 2018 (S.I. No. 96/2018);
- European Union Batteries and Accumulators Regulations 2014, S.I. No. 283 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 2013 (S.I. No. 504 of 2013), 2017 (S.I. No. 599 of 2017), 2019 (S.I. No. 684 of 2019), 2022 (S.I. No. 51 of 2022), and 2023 (S.I. No. 16 of 2023);
- European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011, as amended 2016 (S.I. No. 315 of 2016) and (S.I. No. 323 of 2020);
- European Waste Catalogue (EWC) and Hazardous Waste List 2002, 2015 and 2018;
- Waste Management (Food Waste) Regulations 2009, S.I. No 508 of 2009, as amended, 2015 (S.I. No. 430 of 2015), 2024 (S.I. No. 294 of 2024);
- Protection of the Environment Act 2003;
- European Union (Properties of Waste Which Render It Hazardous) Regulations 2015, S.I. No. 233 of 2015, as amended, 2018 (S.I. No. 383 of 2018);



- Air Pollution Act, 1987 (Air Quality Standards) Regulations, 1987, as amended, 2002 (S.I. No. 271 of 2002), 2011 (S.I. No. 180 of 2011), 2016 (S.I. No. 659 of 2016), 2022 (S.I. No. 739 of 2022);
- Air Pollution Act, 1987 (Emission Limit Values for use of Asbestos) Regulations, 1990 (S.I. No. 28 of 1990);
- European Communities (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), 2016 (S.I. No. 2016/1628);
- 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);
- European Communities 2008/50/EC -Ambient Air Quality and Cleaner Air for Europe (CAFE) Directive, 2008;
- Air Quality Standards Regulations 2011, S.I. No. 180 of 2011.
- EU Directive 2008/50/EC – Ambient air quality Directive European Communities (Ambient Air Quality Standards Regulations), 2022 (S.I. No. 739 of 2022);
- EU F Gas Regulations 2006, as amended, 2014, S.I. No. 517 of 2014, 2019 (S.I. No. 367 of 2019);
- Environmental Protection Agency Act 1992 (Noise) Regulations, 1994 S.I. 174 of 1994;
- Environmental Noise Regulations 2006, S.I. No. 140 of 2006, as amended 2018 (S.I. No. 549 of 2018), 2021 (S.I. No. 663 of 2021);
- 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), as amended 1993 (S.I. No. 12 of 1993);
- 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), 2013 (S.I. No. 281 of 2013), 2019 (S.I. No. 178 of 2019);
- Noxious Weed Act, 1936, S.I. No. 38 of 1936;
- Noxious Weed Order, 1937, S.I. No. 103 of 1937;
- Flora (Protection) Order, 2015 (S.I. No 356 of 2015), 2022 (S.I. No. 235 of 2022);
- 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);
- Forestry Regulations, S.I. No. 191 of 2017, as amended 2020 (S.I. No. 31 of 2020, S.I. No. 39 of 2020 & S.I. No. 416 of 2020), 2023 (S.I. No. 445 of 2023);
- The National Monuments Act 1930, S.I. No. 2 of 1930, as amended, 2004 (S.I. No. 22 of 2004);
- European Union (Environmental Impact Assessment and Habitats) (Section 181 of the Planning and Development Act 2000) Regulations, 2013 (S.I. No. 403 of 2013), 2015 (S.I. No. 301 of 2015), 2019 (S.I. No. 418 of 2019);
- European Union (Environmental Impact Assessment and Habitats) (Environmental Impact Assessment) Regulations, 2018, S.I. No. 296 of 2018; and,
- Safety, Health and Welfare at Work (Exposure to Asbestos)(Amendment) Regulations 2006 (S.I. No. 386 of 2006), 2010 (S.I. No. 589 of 2010).

## 3.2 Industry Guidance

The Contractor should take due consideration of, and incorporate best practice guidance, including but not limited to the following:



- BS 5837/2012. Trees in relation to design, demolition and construction;
- BS 3998; 2010. Tree Work. Recommendations;
- CIRIA (2001). C532. Control of water pollution from construction sites. Guidance for consultants and contractors;
- CIRIA (2006). C648. Control of water pollution from linear construction projects. Technical Guidance;
- CIRIA (2008). C679. Invasive species management for infrastructure managers and the construction industry;
- CIRIA (2015). C741. Environmental Good Practice on Site;
- CIRIA (2015). C753. The SuDS Manual;
- Environmental Protection Agency (2021). 'Best Practice Guidelines for the preparation of resources & waste management plans for construction & demolition projects';
- Invasive Species Ireland (2016). Best Practice Management Guidelines. Japanese knotweed;
- National Roads Authority (NRA) (2008). Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes;
- NRA (2005). Guidelines for the Treatment of Badger Prior to the Construction of National Road Schemes;
- NRA (2008). Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes;
- NRA (2006). Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes;
- NRA (2010). Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (Revision 1); and,
- Sustainability & Environmental Appraisal (March 2020) LA 120 Environmental management.

## 4. Project Roles and Responsibilities

For the purposes of clarity, the roles and responsibilities of the project team for the Proposed Works should be determined at the very outset of the Construction Stages of this project. Key roles are listed below. These are typically performed by the Client, Engineer, and Contractor as presented below. Specific details will be determined upon the Detailed Design and Contract Stage.

**Table 4.1 - Roles and Responsibilities**

<b>Employer</b>		<b>Planning Agents</b>	
The Client:	Mayo County Council	The Planner:	AtkinsRealis
Tel:	094 906 4000	Tel:	01 810800
Contact:	Kieran Irwin	Contact:	Mark Gilsenan
<b>Employers Representative</b>		<b>Civil, Structural and Environmental Team</b>	
The Engineer:	AtkinsRéalis	Consultant:	AtkinsRéalis
Tel:	01 8108000	Tel:	01 8108000
Contact:	Mark Gilsenan	Contact:	Mark Gilsenan / Deirdre Larkin
<b>Project Supervisor for the Design Process (PSDP)</b>		<b>Contractor</b>	
The Engineer:	AtkinsRéalis	The Contractor:	to be confirmed
Tel:	01 8108000	Tel:	to be confirmed
Contact:	Richard Joyce	Contact:	to be confirmed
<b>Project Supervisor Construction Stage (PSCS)</b>			
The Contractor:		to be confirmed	
Tel:	to be confirmed		
Contact:	to be confirmed		

### 4.1 The Client/Employer

Mayo County Council will be responsible for ensuring that competent parties are appointed to undertake the construction and that sufficient resources are made available to facilitate the appropriate management of risks to the environment.

### 4.2 Environmental Manager

An Environmental Manager will be appointed by the Contractor to ensure that the CEMP is effectively implemented. The Environmental Manager will be a suitably qualified, competent and experienced professional that would perform the necessary tasks, review environmental procedures and consult with the members of the construction team and stakeholders as required. The Environmental Manager will be responsible for:

- Ensuring that the CEMP and all relevant documents such as environmental control plans are developed, implemented and maintained on site;

- Updated the CEMP to address any subsequent planning conditions relevant to the proposed works;
- Ensuring compliance with the Conditions of the Planning Permission and any other relevant permits/consents required;
- Ensuring that construction occurs in accordance with the relevant environmental requirements and that such compliance is adequately recorded and documented;
- Conducting regular environmental inspections and compiling an environmental compliance report on a monthly basis;
- Attending site and stakeholder meetings as required;
- Keeping up-to-date with relevant environmental best practice and legislative changes;
- Ensuring all staff have undertaken adequate environmental inductions, awareness briefings and training;
- Dealing with environmental complaints; and,
- Managing and responding to environmental incidents and ensuring that all incidents are recorded and reported in an appropriate manner.

### 4.3 Construction Director

The Construction Director will be responsible for the overall execution and organisation of all environmental related activities, as appropriate. Some responsibilities of the Construction Director will comprise the following:

- Overall responsibility for the implementation of the CEMP;
- Allocating the correct resources in order to ensure the successful implementation of the CEMP; and,
- Assisting in the management review of the CEMP for suitability and effectiveness.

### 4.4 Construction Manager

The Construction Manager is directly responsible to the Construction Director in assisting with the successful execution of the Proposed Works. The responsibilities of the construction manager in respect of the CEMP comprise the following:

- To report to the Construction Director on the on-going performance and development of the CEMP;
- To discharge his/her responsibilities as per the CEMP; and,
- To support and augment the Construction Management Team through the provision of adequate resources and facilities for the duration of the implementation of the CEMP.

### 4.5 Ecological Clerk of Works

The Ecological Clerk of Works (ECoW) will be appointed by the Contractor to ensure that the ecological plan is effectively implemented. The ECoW will be a suitably qualified, competent and experienced professional that would perform the necessary tasks, review ecological procedures and consult with the members of the construction team and stakeholders as required. The ECoW will be a full member of a relevant environmental institute, such as the Chartered Institute of Ecology and Environmental Management (CIEEM), the Institute of Environmental Management, or equivalent and have demonstrable experience with overseeing construction in European sites. The ECoW will be responsible for:

- Monitoring the construction works and identifying any additional or refined mitigation measures (i.e. 'adaptive management measures required), in relation to any ecology;
- Reporting the findings of monitoring, including any adaptive management measures recommended and the effectiveness of same;

- Delivering site induction and training on ecological aspects to all construction personnel prior to commencement of construction activities; and,
- The implementation of ecological mitigation measures.



# 5. Environmental Management Procedures

## 5.1 General

The Contractor will be required to have a recognised environmental management system such as ISO 14001:2015 or be able to demonstrate that they are actively working towards implementing such a system.

The works Contractor will undertake the works in accordance with the provisions of the CEMP. The CEMP will be updated by the Contractor to address any subsequent planning conditions relevant to the proposed works and will be reviewed by the Employer and/or the Employer's Representative. The Contractor will review and update the CEMP as appropriate and shall issue an updated CEMP. A record of the review and any recommendations will also provide (for review and approval by the Employer and/or the Employer's Representative) Environmental Control Plans (ECPs), which will be maintained and updated in accordance with the CEMP. ECPs will include (if applicable), but will not be restricted to:

- Air Quality Control Plan;
- Construction Noise and Vibration Control Plan;
- Pollution Prevention Control Plan;
- Water Resources and Energy Use Control Plan;
- Ecological Control Plan;
- Light Pollution Control Plan;
- Archaeological and Cultural Control Plan;
- Traffic Management Control Plan;
- Contamination Land Control Plan; and,
- Soil Erosion and Sedimentation Control Plan.

Guidance on the development of the Control Plans is located in Section 7 of this document.

## 5.2 Environmental Policy

Contractors shall have an environmental policy dated and signed by the most senior person in the company. The policy shall:

- Be appropriate to the nature, scale and environmental impacts of the organisations activities, products and services;
- Include a commitment to continual improvement in environmental performance;
- Include a commitment to comply with all applicable legislation and with other requirements to which the organisation subscribes which relate to its environmental aspects;
- Provide a framework for setting and reviewing objectives and targets;
- Be documented, implemented and maintained;
- Be communicated to all persons working for or on behalf of the organisation; and
- Be available to the public.



## 5.3 Environmental Aspects

Contractors are expected to use a qualitative approach to identify and evaluate potential environmental aspects along with any controls to prevent or mitigate environmental damage. A simple risk matrix (as follows) facilitates quick reference and assignment of risk levels for each environmental aspect:

- Extreme/serious risk;
- High risk;
- Moderate risk; and,
- Low risk.

All environmental aspects rated as High or Extreme/Serious will be classified as significant and will require control or mitigation measures to manage the risk. All environmental aspects covered by a legal requirement, for example an Environmental Permit condition will also be classified as significant even if the risk is low or moderate.

**Table 5.1 – Example of Qualitative Risk Matrix**

Severity	People	Assets	Environment	Reputation	Probability				
					Impossible / Rare	Improbable / Possible	Probable / Likely	Very Likely / Often	Certainty/ Frequent
<b>Catastrophic</b>	Multiple fatalities or permanent total disabilities	Extensive damage	Massive effects	International impact				Extreme / Serious Risk	
<b>Severe Major</b>	Single fatality or permanent total disability	Major damage	Major effect	National impact		High Risk			
<b>Critical Moderate</b>	Major injury or health effects	Local damage	Localized effect	Considerable impact					
<b>Marginal Minor</b>	Minor injury or health effects	Minor damage	Minor effect	Minor impact		Moderate Risk			
<b>Negligible / Insignificant</b>	Slight injury or health effects	Slight damage	Slight effect	Slight impact	Low Risk				

The Contractor shall record the results of the qualitative risk analysis in an Aspects and Impacts Register (Table 5.2).

**Table 5.2 – Example of Aspects and Impacts Register**



Environmental Aspect	Environmental Impact	Risk Rating	Control / Mitigation Measures	Risk Rating After Control
Use of fuel storage tanks on site	Potential contamination of water and land	High Risk	Double skinned tank, bunding, location on hard standing, emergency spill procedure and equipment and training	Moderate Risk

## 5.4 Training, Awareness and Competence

The Contractor (and their sub-contractors) would be selected with due consideration of relevant qualifications and experience. The Contractor will be required to employ construction staff with appropriate skills, qualifications and experience appropriate to the needs of the works to be carried out during construction.

A site induction will be provided to all construction staff before they commence work on site. Where appropriate, the Contractor will identify specific training needs for the construction workforce and will ensure that appropriate training requirements are fulfilled. A baseline level of environmental awareness will be established through the site induction programme. Site inductions will cover the following as a minimum:

- Introduction to the Environmental Manager;
- The requirements of the CEMP and consequences of non-compliance;
- The requirements of due diligence and duty of care;
- Identification of environmental constraints and potential impacts of the work;
- Procedures associated with incident notification and reporting including procedures for dealing with damage to the environment; and,
- The benefits of improved environmental and sustainability performance; and the potential consequences of departure from specified procedures, work instructions and method statements.

## 5.5 Meetings

The Environmental Manager will be responsible for arranging and holding monthly meetings with the Employer and/or the Employer's Representative. The Environmental Manager would develop and distribute minutes on monthly meetings accordingly.

## 5.6 Monitoring and Inspections

For the duration of the contract, the environmental performance of the Contractor will be monitored through site inspections and audits. The programme for monitoring, inspections and audits shall be specified in the contract. The Contractor shall develop, implement and maintain an Environmental Inspections and Monitoring Plan.

Record of all inspections carried out should be recorded and all actions should be closed out in a reasonable time. If additional monitoring and inspections are required due to any subsequent planning conditions, these will be added to the CEMP.

## 5.6.1 Monitoring

Mitigation and monitoring will be carried out so that construction activities are undertaken in a manner that does not give rise to significant negative effects.

The results of all environmental monitoring activities would be reviewed by the Environmental Manager on an ongoing basis to enable trends or exceedance of criteria to be identified and corrective actions to be implemented as necessary.

## 5.6.2 Inspections

Inspections of construction activities will be carried out by the Environmental Manager on a daily basis to ensure all necessary environmental measures relevant to the construction activities are being effectively implemented by construction staff, ensuring legal and contractual conformity.

### 5.6.2.1 Daily Inspections

The daily inspections should include, but not be limited to, checking that:

- The site boundary is marked out and respected;
- All waste is appropriately stored and segregated;
- Waste skips are covered to prevent wind-blown litter;
- Drip trays are in place for all stored equipment and plant;
- All chemicals/fuels are stored with appropriate containment/bunds/cover;
- Construction noise is within permitted limits and does not create a nuisance;
- Dust does not create a nuisance; and,
- Fencing/hoarding is secure.

### 5.6.2.2 Weekly Inspections

The inspections should include, but not be limited to confirming that:

- Daily checklists have been completed;
- Waste storage areas have been checked and there is no build-up of waste materials;
- Spill kits have been checked and contain all relevant materials;
- The performance of all pollution control equipment has been checked and the equipment is working effectively;
- Noise reduction/monitoring equipment has been checked and is operating effectively;
- Septic tanks are not overfull/discharging; and,
- Special control measures identified in Permit/Planning Conditions and CEMP are adhered to.

## 5.7 Nonconformity and Corrective and Preventative Action

The Contractor shall establish, implement and maintain procedures to deal with actual and potential non-conformities and for taking corrective and preventative action.

Non-conformities may be identified through:



- Internal contractor audits;
- Audits by the Employer and/or the Employer's Representative;
- Audits undertaken by external certification bodies;
- Audits undertaken by regulatory authorities; and,
- General observations.

The Contractor procedures shall define the requirements for:

- Identifying and correcting non-conformities;
- Mitigating the environmental impacts of non-conformities;
- Investigating non-conformities including identify root causes and implementing appropriate actions to avoid their reoccurrence;
- Evaluating the need for actions to prevent non-conformities and implementing appropriate actions designed to avoid their reoccurrence;
- Setting realistic timeframes for undertaking effective corrective and preventative actions;
- Recording the results of corrective and preventative actions taken; and,
- Reviewing the effectiveness of corrective and preventative actions.

All actions identified should be appropriate to the nature and magnitude of the issue and the environmental impacts encountered.

## 5.8 Reporting

The Contractor will be required to submit a report, the frequency to be agreed with the Contractor and Employer and/or the Employer's Representative to the Employer and/or the Employer's Representative for review and approval. The report shall address the following as minimum:

- Summary of compliance with the CEMP including identification of any non-conformances;
- Interpretation of the result of ongoing monitoring;
- Detailed description of any issues and/or non-conformances identified during inspections and/or audits;
- Record of incidents and corrective actions (including Corrective Actions Reports as appropriate);
- Synopsis of environmental complaints received/queries raised by stakeholders; and,
- Records of environmental training undertaken (as appropriate).

## 5.9 Environmental Records

The Contractor shall maintain records of all environmental documentation including monitoring, test results, method statements and plans. All records will be kept up-to-date and be made available for audits, inspections and periodical reporting. The Contractor will maintain the following environmental records (as a minimum) that will be made available for inspection to the Employer and/or the Employer's Representative and the relevant authorities if required:

- Management plans;
- Records of environmental incidents;
- Environmental reports;
- Records of environmental training;
- Register of environmental complaints;
- Corrective Action Reports;



- Environmental inspection and audit reports;
- All monitoring data;
- Waste and chemical inventories; and,
- Health and Safety records.



## 6. General Requirements

The Contractor will be legally required to ensure compliance and to avoid and/or reduce significant adverse effects that have been identified where practicable. Where the Contractor intends to vary the methodologies and working areas outlined herein and/or defined in the granted planning consent and associated conditions that may be granted, it would be the responsibility of the Contractor to obtain the relevant licenses, permits and consents prior to implementing any such changes.

### 6.1 Good Housekeeping

The Contractor will employ a 'good housekeeping' policy at all times. This will include, but not be restricted, to the following:

- General maintenance of working areas and cleanliness of welfare facilities and storage areas;
- Provision of site layout map showing key areas such as first aid posts, material storage, spill kits, material and waste storage, welfare facilities etc;
- Maintain all plant, material and equipment required to complete the construction work in good order, clean and tidy;
- Keep construction compounds, access routes and designated parking areas free and clear of excess dirt, rubbish piles, scrap wood, etc. at all times;
- Details of site managers, contact numbers (including out of hours) and public information signs (including warning signs) will be provided at the boundaries of the working areas;
- Provision of adequate welfare facilities for site personnel;
- Installation of appropriate security, lighting, fencing and hoarding;
- Effective prevention of oil, grease or other objectionable matter being discharged from the working area;
- Provision of appropriate waste management at each working area and regular collections to be arranged;
- Excavated material generated during construction will be reused on site as far as practicable and surplus materials/soils shall be recovered or disposed of to a suitably authorised waste facility site;
- Effective prevention of infestation from pests or vermin;
- No discharge of site run-off or water discharge without agreement of the relevant authorities; and,
- Maintenance of public rights of way, diversions and entry/exit areas around working areas for pedestrians and cyclists where practicable and to achieve inclusive access;

### 6.2 Site Compound

As agreed with MCC, the successful Contractor will utilise the area within the site boundary as a site compound for the duration of works. The N05 national road is comprised of a wide carriageway and the northern embankment of the structure provides a suitable area for the works to be staged. There may be a requirement for temporary (mobile) lighting within the site compound area along the N05 should works extend to winter months, however this is not foreseen given the works window of July to September<sup>6</sup> required to facilitate instream works.

Upon completion of works the site compound area will cease to exist and will revert to fully operational road use.

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<sup>6</sup> <https://www.fisheriesireland.ie/sites/default/files/migrated/docman/2016/Guidelines%20Report%202016.pdf>

Site access for all personnel and visitors will be strictly controlled and all visitors will report to the site compound prior to entering the construction area. The site compound will be fenced to keep public out of working area and should be secured. Regular inspections of the hoarding will be undertaken to ensure that the safety of any vehicles or personal are not compromised.

## 6.3 Hours of Working

### 6.3.1 Core Working Hours

The timing of construction activities, core working hours and the rate of progress of construction works are a balance between efficiency of construction and minimising nuisance and significant defects. The core construction working hours for the proposed works will be:

- Monday to Friday: 08:00 to 18:00.
- Saturdays: 09:00 to 13:00,
- Sundays & Bank Holidays: No works activities shall take place on site.

### 6.3.2 Start-up and shutdown

The Contractor may require a period of up to one hour before and one hour after core working hours for start-up and shutdown activities in working areas. Activities permitted may include deliveries and unloading of materials, movement of staff to their place of work, maintenance and general preparation works. The use of plant machinery likely to cause disturbance, will not be permitted outside of the core working hours.

### 6.3.3 Additional working hours

It may be necessary in exceptional circumstances to undertake certain activities outside of the construction core working hours. Any construction outside of the construction core working hours will be agreed by the Contractor in advance with Mayo County Council and scheduling of such works shall have regard to nearby sensitive receptors.

In the case of work required in an emergency or which if not completed would be unsafe or harmful to workers, the public or local environment, Mayo County Council will be informed as soon as reasonably practicable of the reasons and likely duration and timing (outside of the core working hours).

## 6.4 Security

Security will be the responsibility of the Contractor who will provide adequate security to prevent unauthorised entry to or from the site. The following measures may be used to prevent unauthorised access:

- Install CCTV and security systems where required;
- Consult with neighbouring properties and local crime prevention officers including Mayo County Council and An Garda Síochána on site security matters where required;
- Prevent access to restricted areas and neighbouring properties by securing equipment on site such as ladders and scaffolding; and,
- When there is no site activity, close and lock site gates and set appropriate site security provisions as required.

## 6.5 Hoarding and Fencing

A site boundary in the form of hoarding or fencing will be established around each of the working areas before any significant construction activities commences in that working area. The hoarding/fencing shall provide a secure boundary to what can be a dangerous environment for those that have not received the proper training and are unfamiliar with construction operations.

Site hoarding also performs an important function in relation to minimising nuisance and effects including:

- Noise emissions (by providing a buffer);
- Visual impact (by screening the working areas, plant and equipment); and,
- Dust minimisation (by providing a buffer).

## 6.6 Services and Utility

Site services shall be installed as part of the works. Working areas will be powered by mains supplies or diesel generators where an electrical supply is not available.

The Contractor will be responsible for undertaking their own surveys to establish full extent of underground services prior to the commencement of construction to support any surveys already undertaken as part of early design work and statutory consent applications.

## 6.7 Lighting

Site lighting would typically be provided by tower mounted 1000 W metal halide floodlights during the construction stage. The flood lights would be cowled and angled downwards to minimise spillage to surrounding properties. The following measures will be applied in relation to site lighting:

- Temporary lighting may be required within the site compound on the N05 should works extend to winter months, however this is not foreseen given the works window of July to September required to facilitate instream works. Should temporary mobile lighting be required, it will be provided with a minimum luminosity sufficient for safety and security purposes. Where practicable, precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas;
- Motion sensor lighting and low energy consumption fittings will be installed to reduce usage and energy consumption; and,
- Lighting will be positioned and directed as not to unnecessarily intrude on sensitive receptors, ecological receptors and structures used by protected species, nor to cause destruction or confusion to pass motorists, river users or navigation lights for air or water traffic.

## 6.8 Reinstatement of Working Areas on Completion

The Contractor will reinstate all working areas as work proceeds during construction. All plant, equipment, materials, temporary infrastructure and vehicles will be removed at the earliest opportunity and the surface of the ground restored as near as practicable to its original condition.

On completion of construction works the Contractor will ensure that all waste and polluting material is removed from the site and is disposed of using appropriately authorised contractors. The Contractor shall, as appropriate, undertake visual and ecological rehabilitation of site compound and other areas no longer to be

used by the Contractor. Following site clearance and rehabilitation the Employer or Employer's Representative will undertake a final inspection of the site. Any environmental issues identified during the final inspection will be raised with the Contractor. Mitigation measures and timeframes for completion will be agreed between the Contractor and the Employer's Representative in line with agreed procedures prior to final sign off.

## 6.9 Health and safety

The Contractor will ensure all relevant health and safety, fire safety and security requirements are in place prior to the commencement of construction and in accordance with the relevant legislation requirements in addition to the specifications of Mayo County Council.

Relevant Irish and EU health and safety legislation would be complied with at all times by all construction staff and personnel during construction. Further, the Contractors would also have to ensure that all aspects of their works comply with good industry practice and all necessary consents, licenses and authorisations have been put in place for the proposed works.

# 7. Environmental Management and Controls

It should be noted that this section provides a summary of minimum requirements that should be developed by the Contractor when preparing the Detailed CEMP.

## 7.1 Waste Management

Construction activities produce a broad range of wastes, which will be outlined in the RWMP.

This section identifies the potential types of waste which may arise from construction and provides guidance on the management, control and disposal of waste.

### 7.1.1 Risk Identification

Contractors shall undertake a qualitative waste management risk assessment or appraisal prior to the commencement of construction activities. An example assessment is shown in Table 7.1

**Table 7.1 – Example of Waste Management Risk Assessment**

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan with the location of all adjacent housing/commercial centres, schools and educational establishments, agricultural land and other potential receptors.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high risk activities such as waste storage areas.
02	Identify the construction activities and sources that may result waste production and waste storage, segregation and disposal requirements.	These could include excavations, chemical and materials use, waste storage and bulking areas etc,
03	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage waste: Prevent - Do not generate the waste in the first place. Re-use – Can you re-use without treatment? Recycle – Make sure that wastes are properly segregated to aid recycling. Disposal with energy recovery. Disposal without energy recovery.

## 7.1.2 Waste Management

Contractors should develop, implement and maintain a Waste Management Plan that is in compliance with Mayo Council Development Plan 2022-2028, and EPA (2021) *'Best Practice Guidelines for the preparation of resource & waste management plans for construction & demolition projects'*. The plan should include but not be restricted to the mitigation measures below (Table 7.2).

**Table 7.2 –Waste Management Mitigation Measures**

Activity	Mitigation Measures
General	<p>An approved person, such as a site/contract/resource manager, will be given responsibility for good site practices and control, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site.</p> <p>Contractors will apply the waste prevention principles of the waste management hierarchy:</p> <ul style="list-style-type: none"> <li>▫ Prevent – Do not generate the waste in the first place.</li> <li>▫ Re-use – Can you re-use without treatment?</li> <li>▫ Recycle – Make sure that wastes are properly segregated to aid recycling.</li> <li>▫ Disposal with energy recovery.</li> <li>▫ Disposal without energy recovery.</li> </ul> <p>The Contractor will ensure that all construction staff are trained in good waste management practice and chemical handling procedures.</p>
Collection and Storage of Waste	<p>Contractors will provide designated waste storage areas for the bulk storage of waste prior to removal off-site. A site plan showing the designated site will be provided and approved by the Construction Manager.</p> <p>Only appropriately authorised contractors and sites will be used for the transport and disposal of waste.</p> <p>The Contractor will provide adequate facilities for the collection and storage of waste material including litterbins and waste skips.</p> <p>Waste containers/skips/bins will be provided with nets or lids to prevent waste being carried around by scavengers or by the wind.</p> <p>Waste containers will not be overfilled.</p> <p>Appropriate measures will be employed to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.</p> <p>Industrial and construction waste including redundant hazardous equipment, tyres, used oil cans/drums etc will be separated and put into segregated bins for removal and disposal by an appropriately authorised contractor.</p>
Waste Reduction and Sustainability	<p>Good management and control can prevent the generation of significant amounts of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices.</p> <p>Purchase materials in the quantity required for the project to minimise unused leftovers.</p> <p>Scheduling and planning the delivery of materials will be carried out on an 'as needed' basis to limit any surplus materials.</p> <p>Purchase materials that do not use excessive amounts of packaging to minimise the quantity of used packaging for subsequent disposal/processing.</p> <p>Segregate and store different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal.</p> <p>Collect and segregate waste metals including redundant plant and equipment, metal construction materials and cans.</p>

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Recycle unused chemicals or those with remaining functional capacity.

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Disposal of Wastes

All waste will be disposed of at approved sites using appropriately approved contractors - The Contractor must provide copies of valid EPA Waste licenses and Local Authority Waste Permits (including those relating to their subcontractors or brokers, where applicable) for collection and waste treatment/disposal/export facilities.

Records of waste disposal, recycling and recovery will be maintained.

The contractor will provide sufficient secure waste disposal points and regular collection for disposal.

No waste will be disposed of or buried on site.

Dumping of waste, including roadside dumping and filling on land not within a registered landfill area is prohibited.

Works that involve onsite filling with material other than virgin excavated natural material is encouraged where material is potentially suitable.

Burning any waste on site is prohibited.

Divert construction, demolition and land clearing debris from landfill disposal. Redirect recyclable recovered resources back to manufacturing process. Redirect reusable materials to appropriate sites.

Waste will be segregated in an onsite recycling centre and those components that are recyclable sent to appropriate facilities.

Consider recycling cardboard, metal, brick, acoustic tile, concrete, plastic, clean wood, glass, gypsum wallboard, carpet and insulation.

Identify approved haulers and recyclers to handle the designated materials.

All non-recyclable waste will be disposed of by an appropriately authorised waste contractor.

The contractor will follow approved procedures for the classification, sampling, transport and disposal of hazardous waste.

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Storage and Stocking of Material

Temporary stockpiling of native soils and imported materials onsite will require careful management in order to prevent the release of sediment into drainage ditches (and receiving water courses, and any temporarily exposed groundwater (in the event that groundwater is encountered).

Stockpiled materials will not be located immediately adjacent to or onsite drainage ditches, or any temporarily exposed groundwater (in the event that groundwater is encountered).

Stockpiled materials will be covered as required to prevent it spilling over/blowing onto areas of environmental interest or semi-natural vegetation outside the agreed lands.

Stockpile of materials will be kept to an absolute minimum, and where possible, stockpiled for as short a time as possible prior to use.

Any stockpiled materials will be stored in low mounds where possible.

Slopes of material will be stable, and the side slopes compacted down and stabilised, with regular checks by the Contractor;

The Contractor will examine the risk arising from storage areas and identify as appropriate the need for mitigation measures at the toe of slopes to reduce silt transport from areas of stockpiled material.

Stockpiles of materials not suitable for onsite re-use will be removed as soon as is practicable in accordance with applicable waste management legislation.

The Contractor will comply with best practice when sourcing imported materials for site works, including NRA (2006) A Guide to Landscape Treatments.

Imported material will be from a reputable source who can confirm that it has been screened for potential presence of invasive species.

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## 7.2 Air Quality

Construction activities have the potential to impact on air quality through the creation of dust and emissions to air from vehicles and plant, along with activities including infilling of soil, excavation of trenches, stockpiling and movement of materials may all contribute to generating ambient dust. This section identifies the potential causes of air pollution which may arise from construction and provides guidance on the management and control of emissions from site.

### 7.2.1 Risk Identification

Contractors shall undertake a qualitative risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.3.

**Table 7.3 – Example of Air Quality Risk Assessment**

	<b>Risk Assessment</b>	<b>Example Procedure</b>
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all adjacent housing/commercial centres, schools and educational establishments, agricultural land and other potential receptors.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as material storage areas, re-fuelling points and haul routes.
02	Identify the construction activities and sources of pollution that may result in emissions to air.	These could include excavations, concrete use, transport, materials storage, traffic management etc.
03	Evaluate the risk of the construction activities resulting in emissions to air.	Assess the likelihood of an activity causing pollution.  Assess the significance of the harm pollution would cause to a particular receptor. For example, the impact of dust in a populated urban area would be significantly greater than dust in an unpopulated rural area.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: Remove the risk (different construction methods/activities). Control the source (modify construction methods, covers for storage areas). Protect the receptor (provide hard standing and covering for compounds/storage areas, filter, control, contain emissions, ensure appropriate environmental permits are in place). Put emergency procedures in place.

### 7.2.2 Air Quality Management Plan

Contractors should develop, implement and maintain an Air Quality Management Plan. The plan should include but not be restricted to the mitigation measures below (Table 7.4).

**Table 7.4 –Air Quality Mitigation Measures**

Activity	Mitigation Measures
General	<p>The Contractor is required to implement the 'standard mitigation', as stated in the Transport Infrastructure Ireland (TII), (formerly the NRA)) (2011). Guidelines for the Treatment of Air Quality during the Planning and Construction of National Roads Schemes.</p> <p>Standard measures should be taken which will minimise dust from demolition and construction activities, at a minimum adhering to standard good practice which includes the Building Research Establishment (BRE) document entitled 'Control of Dust from Construction and Demolition Activities' and Institute of Air Quality Management document 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2014)</p>
Dust Suppression and Odour Management	<p>Minimise use of internal site roads to limit the ground area that is disturbed.</p> <p>Avoid excessive vehicular traffic and movement.</p> <p>Locate haul routes away from sensitive receptors.</p> <p>Pave heavily used areas.</p> <p>Plan vehicle movements to minimise duration of dust generation.</p> <p>Stockpiles of fine material such as sand, topsoil material, cement, excavated material etc. will be covered / protected from wind.</p> <p>Use dust suppression systems such as a rotary water atomizer (or equivalent) to damp down stockpiles and construction roads etc. during dusty conditions and to control dust from site-based activities. Due consideration should be given to use of appropriate water resources for use in dust suppression, see Section 7.4.</p> <p>Dust generating activities will cease during excessively windy periods.</p> <p>Construct dust screens/wind breaks as necessary.</p> <p>Fence off work areas with geotextile type liners.</p> <p>Encourage progressive rehabilitation of disturbed land or stockpiles by establishing temporary or permanent vegetation.</p> <p>Contractors will regularly inspect stockpiles; exposed work areas and construction works practices to ensure compliance.</p> <p>Vehicle speeds will be restricted on un-surfaced roads and tracks to less than 30km/hr to minimise dust.</p> <p>Cover and/or maintain appropriate freeboard (+ 0.3m) on trucks hauling any loose material that could produce dust when travelling.</p>
Traffic, Vehicle, Plant and Equipment Emissions	<p>Produce, implement and maintain a comprehensive Traffic Management Plan (TMP).</p> <p>Undertake regular construction vehicle, plant and equipment maintenance.</p> <p>Undertake regular maintenance on particulate traps/filters on trucks.</p> <p>Implement minimum exhaust requirements in line with national standards on equipment (including temporary power generators) and vehicles.</p> <p>Switch plant and vehicles off when not in use.</p> <p>Use public/shared transportation for workers.</p>
Other emissions	<p>No fires will be allowed on the construction site.</p> <p>Burning of waste materials on site will be prohibited.</p> <p>Limit volatile substance emissions/fine particle releases.</p> <p>Local sourcing of construction materials such as the recycling of material won on excavations for reuse on site.</p> <p>Reduce the idle times by providing an efficient material handling plan that minimises the waiting time for loads and unloads. Reducing idle times could save up to 10% of total emissions during construction phase.</p>



Activity	Mitigation Measures
	Turning off engines when not in use for more than five minutes. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons; and,  Regular maintenance of plant and equipment, and technical inspection of vehicles to ensure they will perform the most efficiently.

## 7.3 Construction Noise and Vibration

Construction activities can produce a significant amount of noise and vibration with the potential to impact adversely on a range of receptors. This section identifies the potential causes of noise and vibration which may arise from construction and provides guidance on management and control.

### 7.3.1 Risk Identification

An example risk assessment is shown in Table 7.5.

**Table 7.5 – Example of Noise and Vibration Risk Assessment**

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan the location of all nursing homes, housing/commercial centres, schools and educational establishments, agricultural land and other potential receptors.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for noisy activities or activities likely to cause vibration such as generators, compressors, haul routes and drilling.
03	Identify the construction activities that may affect the receptors identified.	These could include excavations, dewatering, traffic movements, warning sirens, use of machinery and plant etc.
04	Evaluate the risk of the construction activities impact on receptors.	Assess the likelihood of an activity causing noise pollution.  Assess the significance of the noise impact on particular receptors. For example, the impact of noise from construction activities adjacent to housing would be significantly greater than the impact of noise in an uninhabited rural area.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk:  22. Remove the risk (different construction methods, substitution of materials for less noisy options).  23. Control the source (modify construction methods, provide adequate baffling).  24. Protect the receptor using noise barriers, screening etc.  25. Put emergency procedures in place.

### 7.3.2 Noise and Vibration Management Plan

Contractors should develop, implement and maintain a Noise and Vibration Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.6).

**Table 7.6 –Noise and Vibration Mitigation Measures**

Activity	Mitigation Measures
General	<p>The contractor shall comply with the contents and recommendations of BS 5228 – 1:2009 + A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise &amp; Part 2: Vibration.</p> <p>The contractor shall also comply with the contents and recommendations of BS 6471:2008: Guide to Evaluation of Human Exposure to Vibration in Building, Part 1: Vibration Sources other than Blasting.</p> <p>The contractor shall ensure that each item of equipment complies with the noise limits quoted in the European Commission Directive 2000/14/EC.</p> <p>As far as practical construction methods that are likely to cause high levels of noise and vibration e.g. concrete and excavation work, will be restricted to daytime hours only.</p> <p>Approval from the local authority should be obtained prior to undertaking work at night.</p> <p>Local residents and people likely to be affected by noise and vibration should be informed prior to the commencement of work.</p> <p>Replace noisy plant with less noisy alternatives, shield/screen noise making plant especially during the evening and night periods or provide plant which is specifically designed with noise inhibitors such as generators and compressors with silencers and muffled jackhammers.</p> <p>Construct a solid barrier around the generators if required.</p> <p>Use plant in accordance with manufacturer's specifications.</p> <p>Orientate machinery away from noise sensitive residential areas.</p> <p>Where machines are fitted with engine covers these shall be kept closed.</p> <p>Ensure all stationary and mobile equipment, construction plant, machinery and vehicles are well maintained on a regular basis, and in good working order.</p> <p>Delivery routes used by trucks and lorries should avoid residential areas to prevent likely vibration impacts from construction traffic to and from the site.</p> <p>Vibrations must be minimised at any neighbouring premises. Residents of any neighbouring premises should be warned of possible vibrations prior to the commencing the activity, in the event that this is an identified risk.</p> <p>Complaints will be responded to within 24 hours and mitigation measures checked and improved within 48 hours.</p> <p>Should a substantiated noise complaint be received by the Contractor, an appropriate noise monitoring campaign shall be instigated by the Contractor to determine the noise source. If necessary, appropriate noise mitigation measures, such as noise barriers, will be implemented.</p>

## 7.4 Prevention of Soil and Water Pollution

Construction activities have the potential to cause pollution to groundwater and/or soils and surface water. This section identifies the potential causes of pollution which may arise from construction and provides guidance on the management and control.

### 7.4.1 Risk Identification

Contractors shall undertake a qualitative pollution risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is presented in Table 7.7.

**Table 7.7 – Example of Soil and Water Pollution Risk Assessment**

	<b>Risk Assessment</b>	<b>Example Procedure</b>
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	Mark up on a site plan with the location of all water courses, surface water features, boreholes, field drains, ecologically sensitive areas, surface and foul drainage systems and other potential receptors.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as chemical/fuel storage areas, refuelling points, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example, water courses, ecologically sensitive areas.	Undertake baseline assessment of water, ground and surface water quality prior to construction. Establish monitoring regime during construction as appropriate. Refer to Planning Environmental Considerations Report.
03	Identify the construction activities and sources of pollution that may affect the water receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff, chemical/fuel storage, wash down areas, fuelling areas and concrete use.
04	Evaluate the risk of the construction activities polluting the identified water receptors.	Assess the likelihood of an activity causing pollution.  Assess the significance of the harm pollution would cause to a particular water receptor. For example, the impact of polluting a water receptor used for potable water would be significantly greater than the pollution of a foul water system.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: <ol style="list-style-type: none"> <li>1. Remove the risk (different construction methods/activities).</li> <li>2. Control the source (change location, modify construction methods, provide adequate bunding for fuel and other storage areas, install measures such as silt fences or ditches to control runoff).</li> <li>3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place).</li> <li>4. Put emergency procedures in place.</li> </ol>

## 7.4.2 Pollution Prevention Management Plan

Contractors should develop, implement and maintain a Pollution Prevention Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.8).

**Table 7.8 –Soil and Water Mitigation Measures**

Activity	Mitigation Measures
General	<p>Ensure that appropriate permits/consents are in place prior to commencing any dewatering activities (if required).</p> <p>Sample collections as required, such as for wastewaters and discharges to the ground and surface waters to facilitate characterisation of contaminants in the event of a leakage or spill that may impact soil or groundwater quality.</p> <p>Appropriate sampling of discharges, if required, to include key parameters to ensure discharges meet appropriate criteria.</p> <p>Carry out regular inspections/audits of hazardous materials usage, handling and storage areas and regular/thorough maintenance of vehicles and hydraulic systems and sanitary/welfare facilities.</p> <p>Avoid impacting adjacent sites by ensuring all contractors activities, equipment and waste storage is confined to the approved site boundary.</p> <p>Where waste waters do not meet approved quality criteria they should be contained and disposed of via an approved disposal route.</p> <p>Ensure regular and controlled disposal of waste using appropriately authorised contractors.</p>
Storage and handling of hazardous substances	<p>Hazardous substances include, but are not limited to human excrement, fuel, lubrication oils, hydraulic and brake fluid, acids, paints, anti-corrosives, pesticides, detergents, cement etc. All hazardous material, including chemicals and fuels, will be stored at a designated site.</p> <p>Contractors should minimise the amount of diesel, oil, paint, thinners and other chemicals stored on site that pose potential spillage environmental hazards and use materials that minimise environmental impact such as lead-free paints, asbestos free materials etc.</p> <p>Contractors will keep a list of all hazardous substances present on site and the MSDS for these substances shall be readily available.</p> <p>Hazardous wastes are the by-products and wastes associated with the use of hazardous substances as well as potentially hazardous items such as spent batteries, used oil filters, light bulbs, circuit boards, sharp objects etc. which require special collection and handling.</p> <p>Each receptacle containing dangerous goods will be marked with the correct technical name of the substance it contains. All markings shall be legible and in appropriate language.</p> <p>Incompatible materials will not be placed in common containment.</p> <p>All refuelling and fuel drum loading operations will take place at a designated site and the ground under the refuelling and fuel drum loading areas will be protected against pollution caused by spills and/or tank overfills.</p> <p>Fill nozzles will be kept within the bunded area when not in use and padlocked.</p> <p>Collection systems will be provided/bunded if necessary, under machinery or equipment that may leak hydrocarbons/hazardous substances. Bunds should typically be provided at refuelling stations, under any container with hazardous substances (oil, fuel, paints, solvents etc.) or any piece of machinery (i.e. generators) which may leak fuel, lubricants or hydraulic fluids. It is good practice to provide drip trays under construction vehicles prone to leaking lubricants/and oil.</p> <p>Locate storage areas away from drains/trenches/wastewater collection devices. All hazardous liquids will be stored in an impervious bund area where the volume of the storage</p>

Activity	Mitigation Measures
	<p>bund is &gt;110% of the largest storage tank contained within the bund until collected for off-site disposal by an approved waste contractor at an approved site.</p> <p>All flammable liquids will be stored under cover and in well-ventilated areas. No electrical equipment will be used within 10 metres of the storage area.</p> <p>Cylinders of compressed gas or flammable gases will be stored upright in secure racks and out of direct sunlight or heat source.</p> <p>The contractor will ensure that there is adequate fire-fighting equipment at the fuel and hazardous materials storage area.</p> <p>Firefighting equipment should be well maintained and tested periodically in line with manufacturers recommendations.</p> <p>All contractors handling hazardous materials will keep appropriate spill cleanup material/spill kits adjacent to storage and maintenance areas and take immediate action to contain/clean up the spill using sand/suitable absorbent material. Contaminated soil, rags and other clean up material will be disposed of via an approved waste contractor at an approved site.</p> <p>Spill kits will be inspected on a regular basis.</p> <p>Used or waste fuel or other waste chemicals will be stored in a bunded area until collected for off-site disposal by an approved waste contractor at an approved site.</p> <p>Waste material or water containing waste chemicals such as thinners, oil, and mineral spirits will not be pumped or disposed of into storm water drains, sanitary sewers or into the ground.</p> <p>The contractor will comply with all permit conditions, environmental regulations and legislation with regards to the safe storage and handling of hazardous substances.</p> <p>The contractor is responsible for the training of all personnel on site who will be handling hazardous materials about its proper use, handling, disposal and spills procedures and to provide all staff with appropriate personal protective equipment.</p> <p>All plant and machinery will be serviced before being mobilised to each work areas.</p> <p>No plant maintenance will be completed at work areas; any broken-down plant will be removed from proposed works to be fixed.</p>
<p>Maintenance and wash down of vehicles and machinery</p>	<p>Ensure all equipment is well maintained and in good working order.</p> <p>A collection system shall be provided (i.e. trays or impervious linings) under machinery or equipment that may leak hydrocarbons/hazardous substances (e.g. generator and pumps).</p> <p>All routine truck and plant maintenance to be carried out off site at contractor depot.</p> <p>Vehicle/machinery repair whether minor or major on open ground or at the side of roads is forbidden. Emergency repairs, mechanical servicing and maintenance of Vehicles/equipment/site plant to be undertaken at designated workshop area designed to contain any spillage.</p> <p>Oil or lubricants only to be changed at designated workshops.</p> <p>The ground under the servicing areas shall be constructed of an impervious material and bunded as necessary.</p> <p>It is prohibited to allow wash water to cause pollution of the ground, surface water or ground water. Vehicle and equipment wash down shall only be undertaken at designated areas. The ground under the wash down area shall be impervious and designed to collect wash water. Install oil interceptors and silt traps where wastewater may be contaminated. Wash water will be re-used where possible (such as vehicle washing, dust suppression) and excess water collected and disposed of by an approved contractor to an approved site.</p>
<p>Sanitary facilities</p>	<p>Holding tanks will be fitted with overflow alarms and will be emptied on a regular basis at a frequency which ensures no overflow of sewage effluent by an approved waste disposal company to an approved site.</p>



Activity	Mitigation Measures
	<p>It is prohibited to discharge sewage onto the open ground.</p> <p>It is prohibited to use open ground for sanitary purposes including bathing, defecating, urination, cooking, washing (dishes or clothing).</p> <p>Disposal of settled solids in accordance with permit conditions. Sludge will also be disposed of on a regular basis in accordance with regulations.</p> <p>Confirmation of underground infrastructure such as sewage lines prior to excavation.</p>
Dewatering discharges	Dewatering of the excavation may be required. In the event that this is required, it will form part of the temporary works design to be undertaken by the Contractor during the construction phase.
Cementitious materials	<p>The production, transport and placement of all cementitious materials will be strictly planned and supervised. Site batching/production of concrete will not be carried out within works areas.</p> <p>Shutters will be designed to prevent failure. Grout loss will be prevented from shuttered pours by ensuring that all joints between panels achieve a close fit or that they are sealed.</p> <p>Any spillages will be cleaned up and disposed of immediately.</p> <p>Where concrete is to be placed by means of a skip, the opening gate of the delivery chute will be securely fastened to prevent accidental opening.</p> <p>Concrete skips, pumps and machine buckets will be prevented from slewing when placing concrete.</p> <p>Mixer washings and excess concrete will not be discharged directly into any drainage ditches, surface water bodies or exposed groundwater.</p> <p>Surplus concrete will be returned to batch plant after completion of a pour.</p>

## 7.5 Water Resources and Energy Use

Construction activities have the potential to use significant volumes of water and energy. This section identifies the potential impacts associated with water and energy use which may arise from construction and provides guidance on the management and control of water and energy on site.

### 7.5.1 Risk Identification

Contractors shall undertake a qualitative water resources and energy use assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.9.

**Table 7.9 – Example of Water Resources and Energy Use Risk Assessment**

	Risk Assessment	Example Procedure
01	Identify all items and activities on the construction site with high water and/or energy demands.	<p>Mark up on a site plan with the location of all items and activities with high water and/or energy demands.</p> <p>This will help the planning of the overall layout of the construction site and enable the identification of efficiency opportunities.</p>
02	Implement mitigation to eliminate or reduce water and/or energy demand.	<p>Use the following hierarchy promote water and energy efficiency:</p> <p>Remove the requirement (different construction methods, substitution of materials for that require less water and/or energy).</p>

Risk Assessment	Example Procedure
	Control the use (modify construction methods, monitoring, target setting, procedures, switch off, training).

## 7.5.2 Water Resources and Energy Use Management Plan

Contractors should develop, implement and maintain a Water Resources and Energy Use Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.10).

**Table 7.10 –Water Resources and Energy Use Mitigation Measures**

Activity	Mitigation Measures
General	<p>Reduce water consumption through recovery strategies.</p> <p>Conserve water by maximising opportunities for infiltration runoff.</p> <p>Conserve water by matching water quality with its intended use and using water saving devices.</p> <p>Contractors will carry out regular inspections/audits of water resource and energy use.</p> <p>In the event of excessive water use/leaking pipes etc, immediate action will be taken to repair equipment or reassess water needs.</p> <p>Use an irrigation system which utilises cooling water, condensate, TSE or another wastewater.</p> <p>Water arising from vehicle and equipment wash-down will be treated to remove silt and reused where possible. For example, wetting down roads and stockpiles.</p> <p>Turn out the lights at night and only light areas as required for safety and comfort (employment of lighting sensors).</p> <p>Ensure that the light source is the minimum intensity for the required purpose.</p> <p>Ensure that fittings are chosen that direct light accurately to where it is needed.</p> <p>Vehicles will not be allowed to idle for long periods.</p> <p>Machinery and generators shall be regularly maintained and operated in an efficient manner.</p> <p>The use of solar powered instruments/machines should be considered.</p> <p>Temporary site offices should be well insulated to retain heat or cool, utilise energy efficient bulbs and energy efficient cooling systems.</p> <p>Choose locally sourced building materials and products thereby reducing the environmental impacts from transportation.</p> <p>Choose rapidly renewable materials over finite raw and long cycle renewable materials.</p> <p>Use timber and wood, including that used in construction, from a certified sustainable source, or be postconsumer re-used timber, or similar.</p>

## 7.6 Ecology – Natural Habitats, Flora and Fauna

Construction activities can have adverse impacts on natural habitats, flora and fauna. This section identifies potential adverse impacts which may arise from construction and provides guidance on management and control.

## 7.6.1 Risk Identification

Contractors shall undertake a qualitative ecology risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.11.

**Table 7.11 – Example of Ecology Risk Assessment**

	<b>Risk Assessment</b>	<b>Example Procedure</b>
01	Identify the location of all sensitive ecological receptors within or adjacent to the construction site.	Mark on the site plan the location of all water courses, surface water features, ecologically sensitive areas and habitats. This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as chemical/fuel storage areas, refuelling points, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example, water courses, ecologically sensitive areas and habitats.	Undertake baseline assessment of water quality prior to construction. Establish monitoring regime during and post construction.
03	Identify the construction activities and sources of pollution that may affect the water/ecological receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff, fuel storage and concrete use.
04	Evaluate the risk of the construction activities polluting the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
05	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: <ol style="list-style-type: none"> <li>1. Remove the risk (different construction methods/activities).</li> <li>2. Control the source (modify construction methods, provide adequate bunding for fuel and other storage areas, install measures such as silt fences or ditches to control runoff).</li> <li>3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place).</li> <li>4. Put emergency procedures in place.</li> </ol>

## 7.6.2 Ecology Management Plan

Contractors should develop, implement and maintain an Ecology Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.12).

**Table 7.12 – Ecology Mitigation Measures**

<b>Activity</b>	<b>Mitigation Measures</b>
General	An Ecological Clerk of Works (ECoW) will be appointed and will supervise all aspects of the critical works on site, in particular initial site set up, dam/ silt fence installation, and pouring of concrete. The ECoW will be a suitably qualified and experienced ecologist, which will be

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appointed by the successful Contractor. The ECoW will ensure compliance of mitigation measures on site and liaise with IFI and NPWS staff where required.

All operations will be in accordance with, but not limited to, the following guidelines:

- C532 Control of water pollution from construction sites. Guidance for consultants and contractors (Masters-Williams et al., 2001),
- SP156 Control of water pollution from construction sites – guide to good practice (Murnane, 2002),
- C750 Groundwater control: design and practice (Preene et al., 2016)
- Guidance on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016).

The site manager will monitor the 10-day weather forecast. The works are not permitted take place during high river flows or prior to forecasts of heavy rainfall.

All site staff will be informed of best practice methodologies to be employed on site via the dissemination of a toolbox talk. This shall include the requirement for protection of aquatic habitats, the sensitivity of the SAC and the potential presence of invasive species pending a pre-construction survey.

Works will be carried out during standard working day-time hours.

Any chemical, fuel and oil stores will be located on an impervious base within a secured bund with a storage capacity 110% of the stored volume.

Only biodegradable oils and fuels are permitted to be used.

Drip trays will be placed underneath any standing machinery to prevent pollution by oil/fuel leaks. Refuelling of vehicles and machinery will be carried out on an impermeable surface in one designated area well away from any watercourse or drainage (at least 20m).

Emergency spill kits will be available on site and staff will be trained in their use. A reporting system will be established on site to record accidents and/or spillages on site and the resultant action taken to remedy the incident.

Operators will check all equipment, machinery and vehicles on a daily basis before starting work to confirm the absence of leakages. Any leakages should be reported immediately and addressed.

Daily checks will be carried out and records kept on a weekly basis and any items that have been repaired/replaced/rejected noted and recorded. Any items of plant machinery found to be defective will be removed from site immediately or positioned in a place of safety until such time that it can be removed. All items of plant will be checked prior to use before each shift for signs of wear/damage.

There shall be no excavation of the riverbed within the dry working area, nor is access to the riverbed permitted by heavy machinery at any stage.

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Protection for Fauna

- As there is no otter holt or other resting site near the culvert, no physical damage or disturbance to an otter holt shall occur. However, a pre-construction survey for otter is required to be carried out upstream and downstream of the culvert within one month of commencement of works on site. Should any otter signs be recorded, all works will be undertaken in accordance with the TII guidelines<sup>7</sup> (Guidelines for the treatment of otter prior to the construction of national road schemes).
- If a new otter holt is recorded during the pre-construction survey and is likely to be damaged or disturbed by the proposed works, a derogation licence will be applied for from NPWS. Any further mitigation measures required by the derogation licence shall be implemented.

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<sup>7</sup> <https://www.tii.ie/media/wsm/bxmv/guidelines-for-the-treatment-of-otters-prior-to-the-construction-of-national-road-schemes.pdf>

- To mitigate potential impacts to otter, working hours shall be restricted to standard working hours only and there shall be no overnight artificial lighting of the site.
- The river channel and riverbanks will not be artificially lit during hours of dusk and darkness.

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Watercourse Protection

- A dry working area will be achieved at the culvert site by setting up a dam system. There will be 3no. dams in total; one upstream of the culvert and two downstream of the culvert. Each dam will consist of tightly packed sandbags that are filled with pea gravel. The sandbags will be double lined and sealed by tying. Only sealed sandbags will be used to create the dams. No clay or soil material is permitted to 'seal' the sandbag dams. A geotextile membrane may be used to aid the creation of a watertight dam.
  - The integrity of the sandbag dams must be monitored to ensure that the works area is isolated from the live channel. This shall be monitored by the Site Manager twice daily; in the morning before the commencement of works and at the end of the day prior to leaving site.
  - Two silt fences shall be installed between the two sandbag dams situated downstream of the culvert. Any water pumped into this dammed area shall be in advance of the silt fences. Thus, all water pumped from the work area must pass through both silt fences before re-entering the river.
  - The pipe used to flume flows through the works area will be fitted with a filter to ensure no fish enter the pipe. The outfall of the pipe will be fitted with a silt sock. The silt sock shall be changed and/ or cleaned at regular intervals. The interval for replacing the silt sock will be dependent on the turbidity of the watercourse and therefore this shall be monitored by the site manager twice daily at a minimum; in the morning before the commencement of works and at the end of the day prior to leaving site.
  - The temporary working platform, i.e. heavy-duty geotextile layer and 250mm thick layer of granular capping, must be clean and free of any foreign debris before being installed on the existing riverbed gravels.
  - There can be no entry of debris and/ or waste material from the works area to the live channel. The debris must be collected within the dry work area, removed from the work area and disposed of appropriately off site at a licenced waste facility.
  - Any water arising in the work area, as seepage through the upstream dam, will be pumped from the working area into the area between the two downstream dams in advance of the silt fences. The pump will be located on the temporary working platform and fitted with a drip tray. All associated pipes will be fitted with a silt sock and/ or de-watering bag.
  - Primer products or products requiring curing shall be applied to surfaces in the morning of a workday. This is to ensure that the required 6-hour curing time can be achieved before leaving the site at the end of the day. Primer products shall not be applied to surfaces within 48 hours of a heavy rain forecast.
  - Only quantities of primer products required for use in that working day shall be available at the site. These shall be kept in a bunded container located at least 20m from the watercourse until required for use.
  - At no point will any equipment be washed out within the work area or adjacent to a watercourse.
  - Sandbag dam no. 3 (further downstream) and the silt fences shall be left in place until any unforeseen sediment plume has dissipated.
  - The gravel area on which the temporary working platform was located will be loosened, as it may have been compacted during the works. This area will be reinstated with washed and clean gravel. Gravel being sourced off site will be of the
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	<p>same type and pH as the existing gravel, as pH is an important factor in riverine environments.</p> <ul style="list-style-type: none"> <li>All material used on site, including the sandbags, silt fences and components of the temporary working platform, will be removed from site and disposed of at a licenced waste facility.</li> </ul>
Noise Control	<p>Construction works will give rise to noise disturbance, this example best practice mitigation measures to be considered are as follows:</p> <ul style="list-style-type: none"> <li>All plant and equipment to be switched off when idling.</li> <li>The use of white noise reversing alarms.</li> <li>Restriction on the dropping and loading of materials to less sensitive hours.</li> <li>The use of local screening for noisy activities or works with hand tools.</li> <li>Ensure all plant and equipment is well maintained and clean, all lubrication in line with manufacturers' guidelines.</li> </ul>

## 7.7 Light Pollution

Obtrusive light from a construction site is a form of pollution. Construction lights can cause glare and light trespass. These are forms of obtrusive light which may cause nuisance to others.

### 7.7.1 Risk Identification

Contractors shall undertake a qualitative light pollution risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.13.

**Table 7.13 – Example of Light Pollution Risk Assessment**

	<b>Risk Assessment</b>	<b>Example procedure</b>
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	<p>Mark a site plan with the location of all potential receptors including housing, schools, hospitals, roads and key wildlife populations.</p> <p>This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for lighting.</p>
02	Identify the construction activities and sources of light pollution that may affect the receptors identified.	These could include depots, storage areas, night working activities etc.
03	Evaluate the risk of the construction activities creating light pollution for the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	<p>Use the following hierarchy to manage the risk:</p> <ol style="list-style-type: none"> <li>1. Remove the risk (different construction methods/activities).</li> <li>2. Control the source (modify construction methods; provide adequate screening, directional light).</li> <li>3. Protect the receptor (screens).</li> <li>4. Put emergency procedures in place.</li> </ol>

## 7.7.2 Light Pollution Control Plan

Contractors should develop, implement and maintain a Light Pollution Control Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.14).

**Table 7.14 –Light Pollution Mitigation Measures**

Activity	Mitigation Measures
General	<p>Maintain levels of lighting acceptable for health and safety and avoid over lighting areas.</p> <p>Dim or switch off lights when task is finished.</p> <p>Minimise the spread/glare of light by assessing/managing direction.</p> <p>Lower the height of lights to minimise glare.</p> <p>Use screens, shields, baffles and louvers to help reduce light spill.</p> <p>Use specifically designed lighting equipment to minimise the upward spread of light near to and above the horizontal.</p>

## 7.8 Archaeology and Cultural Heritage

Heritage is an irreplaceable resource, so it is recognised that cultural resources must be safeguarded for future generations. Construction activities have the potential to impact on archaeology and heritage through the destruction or disturbance of sites or artefacts.

### 7.8.1 Risk Identification

Contractors shall undertake a qualitative archaeological and heritage risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.15.

**Table 7.15 – Example of Archaeology and Cultural Heritage Risk Assessment**

	Risk Assessment	Example Procedure
01	Identify the location of all sensitive receptors within or adjacent to the construction site.	<p>Mark a site plan with the location of all potential receptors including villages, forts, palaces, houses, and towers. The site plan must be updated and approved by the appointed project archaeologist.</p> <p>This will help the planning of the overall layout of the construction site.</p>
02	Identify the construction activities that may affect the receptors identified.	These could include depots, storage areas, excavation, waste storage, haul roads etc.
03	Evaluate the risk of the construction activities damaging the identified receptors.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	<p>Use the following hierarchy to manage the risk:</p> <p>Remove the risk (different construction methods/activities).</p> <p>Control the source (modify construction methods or operations - alternative haul roads).</p> <p>Protect the receptor (screens).</p> <p>Put emergency procedures in place.</p>

## 7.8.2 Archaeology and Cultural Heritage Management Plan

Contractors should develop, implement and maintain an Archaeology and Heritage Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.16).

**Table 7.16 – Example of Archaeology and Cultural Heritage Mitigation Measures**

Activity	Mitigation Measures
General	<p>An experienced archaeologist must be appointed by the contractor prior to the commencement of the construction stage. The project archaeologist will ensure that all proposed works are carried out appropriately and that any potential risk to archaeological / architectural features are minimised.</p> <p>In the event that intact and/or important archaeological or cultural items are identified during construction activities, work must stop and Mayo County Council and the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland should be notified immediately. Work should not recommence until authorised by Mayo County Council and the Department of Housing, Local Government and Heritage and the National Museum of Ireland.</p> <p>Demarcation and monitoring of access will be provided to prevent accidental damage in areas where gaining access for construction is deemed to have potential to impact the archaeological, architectural or cultural integrity of the site. Prior to commencement of construction works in the area, a buffer area will be demarcated by a suitably qualified archaeologist or architectural heritage specialist, and it shall be maintained throughout the construction phase. A specialist may be required to oversee the works as determined by the Project Archaeologist, to ensure protection for all features is maintained.</p> <p>Records should be maintained of all finds.</p> <p>Where practicable remains should be preserved in situ using appropriate engineering methods:</p> <ul style="list-style-type: none"><li>Raising ground levels</li><li>Using suitable materials and loading</li><li>Maintenance of Hydrological regimes.</li></ul>

## 7.9 Traffic Management

Accidents involving construction vehicles and/or mobile equipment have the potential to cause serious injury or death and damage to the environment. Work zones on construction sites are used to move traffic in an approved direction and are typically identified by signs, cones, barrels, and barriers.

### 7.9.1 Risk identification

Contractors shall undertake a traffic management risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.17.

**Table 7.17 – Example of Traffic Management Risk Assessment**

	<b>Risk Assessment</b>	<b>Example Procedure</b>
01	Identify the location of all traffic sensitive areas within or adjacent to the construction site.	Mark a site plan with the location of all potential traffic sensitive areas including villages, forts, palaces, houses, schools, shopping districts, commercial/leisure areas roads and other rights of way.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for vehicle/pedestrian entrances, storage areas etc.
02	Identify the construction activities may affect the traffic sensitive areas identified.	These could include depots, storage areas, excavation, waste storage, haul roads etc.
03	Evaluate the risk of the construction activities impacting on traffic sensitive areas.	Assess the likelihood of an activity causing harm or obstruction.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: Remove the risk (different construction methods/activities). Control the source (modify construction methods or operations - alternative haul roads). Protect the receptor (screens, signs, barriers). Put emergency procedures in place.

## 7.9.2 Traffic Management Control Plan

Contractors should develop, implement and maintain a Traffic Management Control Plan.

## 7.10 Contaminated Land

The term 'land contamination' covers a wide range of situations where land is contaminated in some way by previous use. This is often associated with industrial processes or activities that have now ceased, but where waste products or remaining residues present a hazard to the general environment.

### 7.10.1 Risk Identification

Contractors shall undertake a contaminated land risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.18.

**Table 7.18 – Example of Contaminated Land Risk Assessment**

	<b>Risk Assessment</b>	<b>Example Procedure</b>
01	Identify the location of contamination risks by undertaking site visits and desk-based studies of relevant documents - EIA etc.	Mark a site plan with the location of all potential contamination risks including waste deposits, petrol stations, oil stores etc.

	<b>Risk Assessment</b>	<b>Example Procedure</b>
02	Identify the construction activities may create ground contamination.	These could include depots, storage areas, waste storage, etc.
03	Evaluate the risk of the construction activities leading to ground contamination.	Assess the likelihood of an activity causing pollution, damage or harm.
04	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk: <ol style="list-style-type: none"> <li>1. Remove the risk (different construction methods/activities).</li> <li>2. Control the source (modify construction methods or operations)</li> <li>3. Protect the ground (screens).</li> <li>4. Put emergency procedures in place.</li> </ol>

## 7.10.2 Contaminated Land Control Plan

Contractors should develop, implement and maintain a Contaminated Land Control Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.19).

**Table 7.19 – Example of Contaminated Land Mitigation Measures**

<b>Activity</b>	<b>Mitigation Measures</b>
General	<p>The contractor will manage and control the potential contamination of land from construction activities through the implementation of the CEMP and method statements as appropriate.</p> <p>The contractor will notify Atkins immediately if contaminated land is discovered or suspected.</p> <p>The contractor will work with AtkinsRéalisis to:</p> <ul style="list-style-type: none"> <li>▪ Undertake a risk assessment of the potential contamination.</li> <li>▪ Evaluate options for remediation including: <ul style="list-style-type: none"> <li>▫ Containment</li> <li>▫ Monitoring</li> <li>▫ Treatment</li> <li>▫ Removal/Disposal</li> </ul> </li> </ul> <p>The contractor will implement remediation strategy and monitor as appropriate.</p>

## 7.11 Soil Erosion and Sedimentation

Soil eroded during land disturbance can wash away and contaminate storm water drains and nearby water bodies. The plan establishes a series of mitigation and management measures to control and minimise these issues if required. Water erosion potential depends on the intensity of the rainfall and/or construction discharges, the soil type and topography. This section identifies the potential causes of erosion and sedimentation which may arise from construction and provides guidance on the management, control and disposal of waste.

## 7.11.1 Risk Identification

Contractors shall undertake a qualitative soil erosion and sedimentation risk assessment or appraisal prior to the commencement of construction activities. An example risk assessment is shown in Table 7.20.

**Table 7.20 – Example of Soil Erosion and Sedimentation Risk Assessment**

	Risk Assessment	Example Procedure
01	Identify the location of all activities that could result in erosion and sedimentation, for example dewatering, and sensitive receptors within or adjacent to the construction site.	Mark a site plan with the location of all water courses, surface water features, boreholes, field drains, ecologically sensitive areas including surface and foul drainage systems and other potential receptors.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as dewatering, haul routes and wash out areas.
02	Identify sensitive receptors off site or downstream of the construction project that could potentially be affected by the works. For example, water courses and ecologically sensitive areas/nature reserves.	Mark a site plan with sensitive receptors outside the site boundary.  This will help the planning of the overall layout of the construction site and enable the identification of suitable sites for high-risk activities such as dewatering, haul routes and wash out areas.
03	Identify the construction activities and sources of sedimentation/erosion that may affect the water receptors identified.	These could include excavations, dewatering, water course crossings, as well as general sources of pollution such as surface water runoff and concrete use.
04	Evaluate the risk of the construction activities polluting the identified water receptors.	Assess the likelihood of an activity causing pollution.  Assess the significance of the harm sedimentation/erosion would cause to a particular water receptor.
05	Evaluate the risk of the construction activities contributing to and/or being affected by the groundwater table.	Assess the likelihood of an activity contributing to raised groundwater levels or being affected by these.  Assess the significance of the harm additional water would cause to groundwater or other projects/receptors and the significance of the high water table on construction.
06	Implement mitigation to eliminate or reduce risks.	Use the following hierarchy to manage the risk:  1. Remove the risk (different construction methods/activities).  2. Control the source (modify construction methods, provide adequate bunding for storage areas, install measures such as silt fences or ditches to control runoff).  3. Protect the receptor (provide hard standing for compounds/storage areas, filter, control, contain discharges, ensure appropriate environmental permits are in place).  4. Put emergency procedures in place.

## 7.11.2 Soil Erosion and Sedimentation Management Plan

Contractors should develop, implement and maintain an Erosion and Sedimentation Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 7.21).

**Table 7.21 –Soil Erosion and Sedimentation Mitigation Measures**

Activity	Mitigation Measures
Soil Erosion	<p>Methods to control erosion need to take into account the factors causing erosion – rainfall discharge intensity, soil type and topography. Possible erosion control measures may include, but are not limited to the following:</p> <ul style="list-style-type: none"> <li>▪ Avoid the creation of steep slopes. Consider implementing terraces instead of long steep slopes to avoid runoff from precipitation.</li> <li>▪ Do not release heavy discharges of water onto the soil.</li> <li>▪ Prevent over-watering of loose areas for dust suppression.</li> <li>▪ Keep site traffic to designated routes.</li> <li>▪ Consider covering temporary roads and routes within site with either asphalt or stone. Appropriate rehabilitation will need to be applied.</li> <li>▪ Undertake regular leak monitoring and maintenance of dewatering pipes.</li> <li>▪ Maintain recommended maximum vehicle weightings to avoid destabilization and subsequent erosion of soil surface.</li> <li>▪ Progressive rehabilitation of disturbed land or stockpiles by establishing temporary or permanent vegetation supported by irrigation.</li> <li>▪ Cover excess work areas with geotextile type liners.</li> <li>▪ Provide collection systems under machinery or equipment during wash down to prevent erosion from runoff.</li> </ul> <p>Flow attenuation - Employ mechanisms to control run off of precipitation such as temporary structures to slow running water to facilitate pollutant removal and infiltration and reduce runoff.</p>
Sediment Control	<p>Possible sedimentation control measures may include but are not limited to the following:</p> <ul style="list-style-type: none"> <li>▪ Place sediment traps on all drainage lines such as geotextile lining.</li> <li>▪ Construct collection channels capable of collecting all runoff water during storms if it contains fine clay particles.</li> <li>▪ Use contained concrete washout control facility.</li> <li>▪ Treat and discharge runoff water from retention basin at controlled flow rate through storm water discharge network.</li> <li>▪ Inspect and clean the collection channels and retention basin on regular basis to prevent sediment build up.</li> </ul> <p>Stabilise the site as soon as possible after construction</p>

## 8. Emergency Response Plan

The contractor shall establish, implement and maintain procedures to identify and manage potential environmental emergency situations and potential accidents. The contractor shall respond to actual emergency situations and prevent and mitigate adverse environmental impacts.

The contractor should periodically test, review and update emergency preparedness and response procedures.

### 8.1 Key Requirements

During construction accidents, incidents and emergencies that have an environmental impact may occur. In the event of an emergency, the first response is to locate the source of that which is giving rise to the environmental impact where appropriate and stop continuation of the situation, followed by the containment, control and mitigation of the situation.

For the construction site The Emergency Response Procedure will be displayed within the Site Office / compound.

A copy of the Material Safety Data Sheets for all the chemicals used on the project site will also be kept at the site office.

The main objectives of the Emergency Response Plan are to:

- Ensure that all means are available to contain the consequences of an accidental spill, fire or release of oil/fuel;
- Ensure that employees are suitably trained to respond to fire and spill;
- Ensure that proper reporting takes place; and
- Ensure that proper investigation is undertaken.

All contractor personnel and sub-contractors will be instructed and rehearsed, as appropriate, in the requirements of the emergency response procedure. Following control of an incident or emergency, an investigation will be conducted, and corrective actions identified and addressed. The Contractor's Environmental Manager will verify the close out of environmental related actions and notify the Employer and/or the Employer's Representative of any emergency.

### 8.2 Emergency Incidents

Emergency incidents are those occurring that rise to significant negative environmental effects including but not limited to the following:

- Any malfunction of any mitigation measure and/or environmental protection system;
- Any emission that does not comply with requirements of the contract and relevant licenses/permits;
- Any circumstance with potential environmental pollution; or
- Any emergency that may give rise to environmental effects (e.g. significant spillages or fire outbreak).

### 8.3 Spill Contingency Plan

The main causes of contamination can occur through:



- Spillage of hazardous material including fuel oils, waste materials or chemicals;
- Spillage of wastewater sewage and other liquid effluents; and
- Spillage of contaminated wash down water with oils, chemicals etc from vehicles, equipment and machinery.

Prior to commencing activities on site, Contractors should develop, implement and maintain a Spill Contingency Management Plan. The Plan should include but not be restricted to the mitigation measures below (Table 8.1).

**Table 8.1 –Spill Mitigation Measures**

Activity	Mitigation Measures
Mitigation Actions /Emergency Response	<p>Contractors will carry out regular inspections/ audits of hazardous materials usage, handling and storage areas and regular/thorough maintenance of vehicles and hydraulic systems and inspections of sanitary facilities and disposal.</p> <p>All contractors handling hazardous materials will keep appropriate spill cleanup material adjacent to storage and maintenance areas.</p> <p>Minimise the amount of diesel, oil, paint, thinners and other chemicals stored on site that pose potential spillage environmental hazards and use materials that minimise environmental impact such as lead-free paints, asbestos free materials etc.</p> <p>Storage areas will be located away from drains/trenches/wastewater collection devices in an impervious bund area (volume of the storage bund &gt;110% of the largest storage tank contained within the bund).</p> <p>Collection systems will be provided/bunded if necessary, under machinery or equipment that may leak hydrocarbons/hazardous substances.</p> <p>The contractor shall be responsible for training all staff in the procedures for handling spills and shall provide all staff with appropriate personal protective equipment.</p> <p>The contractor shall provide all staff with appropriate personal protective equipment.</p> <p>Avoid impacting adjacent sites by ensuring all contractors activities, equipment and waste storage is confined to the allocated site boundary.</p> <p>In the event of a spill:</p> <ul style="list-style-type: none"> <li>▪ Identify and stop the source of the spill and alert people working in the vicinity;</li> <li>▪ Notify the Environmental Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action;</li> <li>▪ If applicable, eliminate any sources of ignition in the immediate vicinity of the incident;</li> <li>▪ Contain the spill using spill control materials, track mats or other materials as required. Do not spread or flush away the spill;</li> <li>▪ If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses and/or sensitive habitats;</li> <li>▪ If possible, clean up as much as possible using the spill control materials;</li> <li>▪ Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with appropriate permits so that further contamination is limited;</li> <li>▪ The Environmental Manager shall inspect the site as soon as practicable and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.</li> </ul> <p>The Environmental Manager will notify the appropriate stakeholders such as Mayo Count Council, National Parks and Wildlife Service and/or the EPA.</p>



## 8.4 Emergency Incident Response Plan

The Contractor will be required to detail emergency incident procedures in the detailed CEMP and develop an Emergency Incident Response Plan. The Plan will contain emergency phone numbers and method of notifying local authorities, statutory authorities and stakeholder. The Plan will include contact numbers for key personnel. The Contractor will ensure that all staff and personnel on site are familiar with the emergency requirements.

In the case of work required in an emergency, or which if not completed would be harmful or unsafe to workers, the public to local environment, Mayo County Council will be informed as soon as reasonably practicable of the reasons and likely duration. Examples may include where the ground needs stabilising if unexpected ground conditions are encountered or equipment failure.

In the event of an emergency incident occurring, the Contractor will be required to investigate and provide a report to include the following, as a minimum:

- A description of the incident, including location, type of incident and the likely receptor;
- Contributory causes;
- Negative effects;
- Measures implemented to mitigate adverse effects; and
- Any recommendations to reduce the risk of similar incidents occurring.

Further, if any sensitive receptor is impacted, the appropriate environmental specialists will be informed and consulted with accordingly.

Any response measures will be incorporated into an updated Emergency Incident Response Plan.

## 8.5 Emergency Access

The Contractor will be required to maintain emergency access routes throughout construction and identify site access points for the working area.

## 8.6 Extreme Weather Events

The Contractor will consider the impacts of extreme weather events and related conditions during construction. The detailed CEMP should consider all measures deemed necessary and appropriate to manage extreme weather events and should specifically cover training of personnel and prevention and monitoring arrangements for staff. As appropriate, method statements should also consider extreme weather events where risks have been identified.

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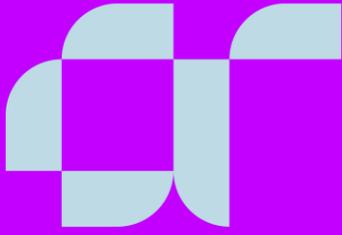
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