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Addendum to EIAR Chapter 17 Schedule of Mitigation Measures and Monitoring

Suir Island Infrastructure Links

Comhairle Contae Thiobraid Árann
Tipperary County Council

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17.1 Introduction

Tipperary County Council submitted the Planning Application for the proposed Suir Island Infrastructure Links development on 25th September 2023. An Bord Pleanála issued a Request for Further Information (RFI) on 9th July 2024 in accordance with Section 51(4) of the Roads Act 1993, as amended.

RFI No. 5 stipulates that the response documentation should be in addendum format. Thus, this addendum sets out to reflect the updates to the EIAR mitigation measures and monitoring which has been updated or amended during the Further Information Requestion. This addendum includes the following revisions or additions indicated by red text:

- Addition of mitigation measures to Section 17.2.1 Mitigation Outlines in NIS Table 17-1 (Mitigation Measures as set out in the NIS) described in the following sections of the Natura Impact Statement:
    - Section 7.0 Description & Evaluation of Mitigation Measures for the project; Appointment of ECoW and Pre-Construction Surveys;
    - Section 7.12 Site Hygiene
    - Section 7.13 Habitat Rehabilitation
    - Section 7.14 Riparian Woodland Habitat Enhancement
- Addition of mitigation measures to Section 17.2.1 Mitigation Outlines in NIS Table 17-1 described in the following sections of the Addendum to the Natura Impact Statement:
    - 3.1.1.2 Works at Back-Water Channel associated with the Installation of the Pre-Cast Box Culvert
    - 3.1.2.2 Works at Bridge Piers and Abutments
    - 4.1.3 Protection of River Channels and/or Riverbanks
    - 5.1.2.1 Control of Noise and Lighting on Otters during Construction Phase
    - 5.1.2.2 Control of Noise and Lighting on Otters during Operational Phase
- Addition of mitigation measures to Section 17.2.1 Mitigation Outlines in NIS Table 17-2 (Mitigation Measures as set out in the EIAR and OCEMP)

17.2.1 Mitigation Outlined in NIS, the EIAR and OCEMP

Table 17-1: Mitigation Measures as set out in the NIS

Project Phase	Mitigated By	Justification	Mitigation Measures
Pre-construction	Contracting Authority	Environmental Management	Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction. The ECoW will be an ecologist with experience of baseline ecological surveys, pre-construction surveys and construction phase supervision. The ECoW will be responsible for completing pre-construction surveys and supervising construction works and advising on the implementation of biodiversity enhancement measures that will be commenced during the construction phase. The ECoW will be required to have experience in monitoring construction phase surface water drainage infrastructure and water quality.
Pre-construction	Ecological Clerk of Works (ECoW)	Environmental Protection	Pre-construction surveys required in advance of the construction phase will include as a minimum: Otter surveys along the River Suir and Suir Island. Surveys to be completed will pay particular attention to identifying the presence/absence of otter holts/couches within 150m of piling locations. Non-native invasive plant species surveys: An up-to-date non-native invasive plant species survey of the project site and adjacent areas will be completed during the growing season immediately prior to the commencement of construction works.
Pre-construction	Ecological Clerk of Works (ECoW)	Environmental Protection	Protected Species Licencing In the preparation of this NIS, no requirement for protected species derogation licences have been identified for biodiversity receptors

			that may require such licences to permit disturbance to breeding or resting sites. The ECoW will be required to complete pre-construction surveys in advance of the commencement of construction works and based upon the results of these surveys the ECoW will establish whether or not there is a need, at that stage, for protected species licences.
Construction	Contractor and ECoW	Environmental Protection	Earthworks Site preparation, excavations and levelling works are required to facilitate the construction of the two pedestrian bridges, construction of path/ promenade, bike cycle path, road improvements, landscape works and associated works. Excavated soils will be disposed off-site to a licenced facility by a licenced contractor. Contractors shall be required to submit and adhere to a method statement indicating the extent of areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works. According to onsite investigations, the bedrock vulnerability is 'Moderate' to 'High' across the proposed development site. The deposition of infill soil would increase the overburden thickness and thus may even decrease the groundwater vulnerability. Furthermore, the proposed development will be covered by concrete and other impermeable material which will act as a protective layer to the underlying geology and bedrock. Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored within the temporary site compound on Suir Island, away from any open surface water drains and a minimum distance of 50m away from the River Suir. Movement of material will be minimised in order to reduce degradation of soil

			structure and generation of dust. All excavated material will be temporarily stored adjacent to the trench prior to disposal off-site. Although there is no evidence of historical contamination in the proposed development area, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Site investigations classified the subsoils as 'inert'. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor. Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of an earthworks handling protocol during construction. Any stockpiles will be formed within the boundary of the site and there will be no direct link or pathway from this area to any surface water body. Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.
Construction	Contractor and ECoW	Environmental Protection	Release Of Hydrocarbons To control and contain any potential hydrocarbon and other harmful substances spillage by vehicles during construction, it is proposed to refuel plant equipment off the development site, thus mitigating this potential impact by avoidance. If fuelling must occur on site, then a discrete "fuel station" will be designated for the purpose of safe fuel storage and fuel transfer to vehicles. This fuel station will be bunded to 110% volume capacity of fuels stored at the site. The bunded area will be drained by an oil interceptor and drainage of same will be controlled by a pent stock valve that will be opened to discharge

			storm water from the bund. A suitably qualified management company will take responsibility for management and maintenance of the oil interceptor and associated drainage on a regular basis, including decommissioning following construction. The plant equipment used on site will require regular mechanical checks and audits to prevent spillage of hydrocarbons on the exposed ground (during construction). Soils contaminated with hydrocarbons will be removed and stored in a temporary bund before being disposed of off-site in an appropriate manner. Oily or impacted runoff will be contained and pumped through a treatment tanks / settlement tank with in line GAC filters before treated water is discharged. In the event of an accidental spill during the construction or operational phase of the Development, contamination occurrences will be addressed immediately, including the cessation of works in the area of the spillage until the issue is resolved. Spill kits will be kept in each vehicle associated with the Development i.e. spill kits will be readily available to all operators. Spill kits will contain a minimum of; oil absorbent granules, oil absorbent pads, oil absorbent booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter). No materials contaminated or otherwise will be left on the Site. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the sheet piled area materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand. Both precautionary measures and emergency response protocols as specified in the OCEMP will be implemented on site.

Construction	Contractor and ECoW	Environmental Protection	Control Of Water During Construction All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. Soil material excavated on site will be transferred directly to a dumper truck. The excavated material will be stored temporarily on site with the main temporary site compound on Suir Island. The storage of excavated material will be positioned within the temporary site compound a minimum of 50m from the River Suir. Excavated made ground will be stored separately from soil material. During construction works there will be potential for the pooling of surface water or groundwater within excavations or with sheet piled working areas. On The Quay at the north side of the proposed development any surface water pooling within excavations or sheet piled areas will be pumped from these areas and discharged to the existing foul sewer system. The surface water will be pre-treated by passing the surface water through a mobile settlement and clarification treatment tank (e.g. a silt buster). The treated surface water will then be conveyed from the mobile silt tank via a lay flat hose that will be connected to the foul sewer system. This approach will eliminate the potential for discharge of surface water generated within excavation and sheet piled areas on The Quay to the River Suir. On Suir Island any surface water pooling within excavations or sheet piled areas will be pumped from these areas, via a lay flat hose to a mobile settlement and clarification treatment tank. The treated water will then be conveyed from the treatment tank, via a lay flat hose and discharged over level vegetated ground on Suir Island to the east of the flood berm. This will provide for the dispersal and attenuation of surface water over vegetated ground cover and will avoid the direct

			discharge of surface water from these working areas on Suir Island to the River Suir. On the south side of the proposed development site, adjacent to Raheen Road any surface water pooling within excavations or sheet piled areas will be pumped from these areas and discharged to the existing foul sewer system. The surface water will be pre-treated by passing the surface water through a mobile settlement and clarification treatment tank (e.g. a silt buster). The treated surface water will then be conveyed from the mobile silt tank via a lay flat hose that will be connected to the foul sewer system. This approach will eliminate the potential for discharge of surface water generated within excavation and sheet piled areas on Raheen Road and the Quays to the River Suir. Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction in accordance with the approach described in the above paragraphs. It is estimated that the inflow rate of groundwater will be moderate to fast according to the available field data logs. Extensive monitoring will be adopted to ensure that the water is of sufficient quality to discharge to the foul sewer network and vegetated ground on Suir Island. The use of additional settlement and silt traps and an oil interceptor (if required) will be adopted if the monitoring indicates the requirements for the same with no excess silt or contaminated water permitted to discharge to the sewer. Due to the very low permeability of the glacial subsoils and the relative shallow nature for excavations, infiltration to the underlying aquifer is not anticipated.
Construction	Contractor and ECoW	Environmental Protection	Release Of Sewage A self-contained port-a-loo system with an integrated waste holding tank will be used on site for toilet facilities. This will be maintained by

			the service contractor as required and will be removed from the site on completion of the construction phase. No wastewater will be generated as a result of the project during the operation phase.
Construction	Contractor and ECoW	Environmental Protection	Release Of Cementitious Pollutants The Contractor is obliged to implement the following control measures to avoid the release of cement-based pollutants • No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; • Where possible, pre-cast elements for culverts and concrete works will be used; • No washing out of any plant used in concrete transport or concreting operations will be allowed on-site; • Where concrete is delivered on site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be tanked and removed from the site to a suitable, non-polluting, discharge location; • Use weather forecasting to plan dry days for pouring concrete; • Ensure pour site is free of standing water, and plastic covers will be ready in case of sudden rainfall event. • Disposal of raw or uncured waste concrete will be controlled to ensure that watercourses or other sensitive areas will not be impacted

			• ~~No cement will be required for works associated with horizontal directional drilling under watercourses and no cement will be stored in the vicinity of watercourses during such works.~~
Construction	Contractor and ECoW	Environmental Protection	Release of Other Pollutants The following measures are proposed to prevent contamination of watercourses: • No refuelling of construction vehicles or plant will take place within the 50m surface water buffer zone. • Refuelling of plant, equipment and vehicles will only be undertaken on impermeable surfaces. • No maintenance of construction vehicles or plant will take place on-site, except in a case of emergency. • All potentially hazardous chemicals, fuel, hydraulic oils and lubricants will be stored in bunded areas (in accordance with established best practice guidelines) at the Contractor's Temporary Compound. • In order to reduce the risk of contamination arising as a result of spills or leakages, all fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces. • If there is a requirement to store hazardous chemicals on site, they will be stored within a bunded, locked COSHH container, with upkeep and security ensured by the contractor. • All tanks and drums are to be bunded in accordance with established best practice guidelines. • Re-fuelling of construction equipment and the addition of hydraulic oil or lubricants to vehicles / equipment will take place in designated

			bunded areas within the main construction compound and not on-site were reasonably practicable. If it is not possible to bring machinery to the refuelling point, fuel will be brought to site by a 4x4 in a double skinned bowser with drip trays. The bowser/4x4 will be fully stocked with spill kits and absorbent material, with delivery personnel being fully trained to deal with any accidental spills. The bowser will be bunded appropriately for the fuel usage volume for the time period of the construction. • Plant and machinery used will be regularly inspected for leaks and fitness for purpose. • Spill kits will be readily available to deal with accidental spillage at all times. • A segregated waste storage area will be available at the ~~substation~~ construction site. • All existing road drains/culverts will be temporarily blocked during the drilling works to ensure that sediment or accidental spills do not reach any local watercourses. • An inventory of all chemicals on site will be kept. It will include: - Procedures for storage of all materials listed - Location details of all materials listed - Volume and description of all substances stored on-site - Waste disposal records, including copies of all Waste Transfer Notes (WTN) detailing disposal routes and waste carriers used. Where waste is being shipped abroad, a copy of the Trans Frontier Shipping (TFS) document must be obtained from National TFS Office ~~Dublin City Council~~ and kept on site along with details of the

			final destination and any relevant permits, licences or other relevant documentation. • Chemical storage details will be part of routine site audits. • Only where absolutely necessary should any hazardous waste be stored on site. If so, Hazardous Waste should be stored in a COSHH store. Only trained operatives should handle hazardous substances. Please note that COSHH data sheets are NOT risk assessments and all risk assessment should be carried out separately. All stored hazardous waste will be clearly labelled. All of these will be regularly inspected for visual signs of leaks or something that would impact on their capacity – e.g. where a drip tray is full of rainwater.
Construction	Contractor and ECoW	Environmental Protection	Prevention of Adverse Impacts During Piling Works In order to avoid the potential for adverse impacts to instream habitats, spawning locations of sea lamprey, river lamprey, Atlantic salmon and other fish species and white-clawed crayfish during the operation phase the method of piling to be implemented will be based on rotary bored piling techniques. This approach to foundation piling will reduce the potential for high impact (noise and vibration inducing). Sheetpiling will be driven in by method of hydraulic pressure to avoid hammering and vibration. This coupled with the set-back distances of the pile locations from the river at all pier and abutment locations, as well as the presence of the bedrock and overburden between the river and the pile locations at piers and abutments, will ensure that no noise or vibration associated with the piling will have the potential to cause injury to fish (i.e. will not exceed the low guide value of the 183 dB within adjacent waters) within the river channel adjacent to the piling locations. All piling works will be timed to occur outside the most sensitive time of the year when Atlantic salmon and lamprey species spawn along

			the section of the River Suir at Suir Island. River lamprey spawn along this section of the River Suir during spring time, between March and April (Gallagher et al., 2022); sea lamprey usually spawns in late May or June, when the water temperature reaches at least 15ºC (Maitland, 2003) and surveys of sea lamprey spawning along this section of the River Suir coincides with this timeframe (Gallagher et al., 2019, 2020, 2022). Atlantic salmon spawn along this section of the River Suir during the winter and spring between November and March In view of these spawning timeframes and taking into account the time of year when river flows are typically low, all piling works will be timed to be undertaken between mid-July and September. In addition to the above the approach to the rotary bored piling will include a slow start-revving up procedure. This will involve slowly starting rotary piling and revving up the piling over a 30-minute period. This slow start period will allow noise-sensitive species to move away from the piling area and avoid injury. The use of rotary bored piling will also ensure that vibration levels associated with this piling will be low and will not present a risk of undermining the integrity of adjacent river banks and their collapse. In order to eliminate the potential for sheet piling installation works to result in riverbank instability and collapse, sheet piling, to consist of interlocking steel panels, will be driven through the overbank materials prior to any excavations occurring near the riverbanks. The interlocking/retaining nature of the sheetpiling will protect the riverbanks from destabilising during the sheetpiling operations and subsequent works within the sheet piled working area. With the implementation of the above measures and as imposed in any Conditions and/o Restrictions in any Approval by the Competent

			Authority, the piling works during the construction phase will not result in adverse effects to Annex 2 fish species, white-clawed crayfish or otter supported by the stretch of the River Suir surrounding Suir Island.
Construction	Contractor and ECoW	Environmental Protection	Prevent Adverse Impacts of Artificial Lighting During the Construction Phase All working hours will occur within daylight hours between the months of April to October. From late October to mid-March working hours will overlap with hours of darkness between 7am and 8am and between 5pm and 7pm. Outside of working hours all artificial lighting that as the potential to cast light on the river will be turned off. In addition, during the period from Mid-October to mid-March artificial lighting that casts light onto the river channel will not be used and will be turned off. In effect this will require any works in the ~~vicinity of the~~ river floodplain during these months to be completed during daylight hours. It is further noted that works near the river associated with the installation of piers and abutments and the landing of the bridge superstructures will be completed between the months of April to October, during the time of year when the risk of flooding is minimised.
Operational	Contractor and ECoW	Environmental Protection	Prevent Adverse Impacts of Artificial Lighting During the Operational Phase The following measures will be implemented to minimise the impact of artificial night lighting to light sensitive species which include Annex 2 fish species and aquatic fauna: The final lighting design will avoid light spill to the River Suir and the design will be required to demonstrate no change in light conditions on the river.

			The lighting for the bridge sections has been designed in accordance with the best practice guidelines for bats and lighting prepared by the Institute of Lighting Professionals and Bat Conservation Trust. The design of the lighting in line with these measures will also ensure that a sensitive approach to lighting has been adopted for all other light sensitive species, including Annex 2 fish species and white-clawed crayfish. The following key requirements will be incorporated into the lighting design: Lighting will be controlled via movement sensors which will be triggered by human activity as people walk or cycle by at night. This lighting regime will reduce the overall time that the lighting is in use which will in turn reduce impacts on light sensitive fauna including Annex 2 fish species. In addition to this a Central Monitoring System will be installed allowing lights to be monitored remotely and individually controlled. Bespoke dimming regimes can be installed or particular lighting units switched off or dimmed during periods of low-level use. All luminaires will lack UV elements and only LED luminaires will be used. Metal halide fluorescent have not been used in the design. A warm white spectrum light will be used to reduce blue light component The luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. Other features that have been incorporated into the public lighting design include the following:

			Lighting will be based on movement sensors and so will not be on all the time. The spacing between light columns has been maximised in order to avoid excessive illumination along the greenway. The height of lighting columns has been minimised to a height of 5m to reduce lighting within a great heights where foraging bats will be active. The lights have been designed to minimise light spill and no light will spill onto the river channel, ensuring the potential impacts of lighting to aquatic fauna are avoided. Only luminaires with an upward light ratio of 0% and with good optical control have been included in the lighting design All luminaires should always be mounted on the horizontal – no upward tilt.
Construction	Contractor and ECoW	Environmental Protection	Prevent the spread of non-native invasive species An Invasive Species Management Plan has been prepared for the project and is provided as Appendix 4 to this Natura Impact Statement. The following sub-sections summarise elements of this Invasive Species Management Plan.
Construction	Contractor	Environmental Protection	Cleaning & Decontaminating Vehicles & Equipment Onsite Pre-Cleaning Brushing (Physical Removal) Used in conjunction with another physical removal method such as vacuuming, or when in the field, this method is moderately effective in removing the majority of plant material from equipment and gear. Brushing will remove most surface soil, plant material, and foreign

			matter. If there is a nap to fabric, such as upholstery or carpeting, brush with the nap rather than against it. Brushing against the nap could further embed small seeds into the material. A combination of soft and stiff bristles of varying length is recommended for use on carpeting or components made of rubber, nylon, or plastic. Bristles of medium length and stiffness are desired for removal of soil and other matter from fabrics and upholstery. Stiff bristles are recommended for the tread of wheels that become encrusted with soil and mud. Metal bristles may also be used to remove soil or concrete in treads, but heavier wear and tear to the equipment will result. High-pressure compressed air blasting may be used to assist soil removal. Follow up with vacuuming, high-pressure air blasting, or high-pressure wash is recommended, as applicable. Vacuuming (Physical Removal) Vacuuming equipment with a brush attachment is suggested to remove most loose particle matter, but care should be taken because small seeds may become further embedded in materials. To prevent contained plant and soil matter from being re-deposited or re-dispersed following the cleaning process, collected matter should be double bagged and disposed of in a sanitary landfill. Follow up with water washing, high-pressure air blasting, or high-pressure wash is recommended as applicable. Water Washing with High-Pressure Wash and With or Without Thermal Treatment General water washing with high-pressure wash or thermal treatment is the most effective method for removing residual foreign

			materials, although small and embedded seeds are capable of persisting. Where known invasive materials are present, wastewater can be treated or filtered, and the waste materials double bagged and disposed of in a sanitary landfill. High-Pressure Wash Improvement in the design of high-pressure washing makes it the most effective means of cleaning heavily soiled and contaminated items. Not all items are capable of withstanding the pressure of this treatment, and it should only be used where applicable. There are many models of high-pressure washers, from simple hand-held nozzles to laser guided, robotic control systems. In some cases, containment and operation sheds are portable. The water systems can be fresh or recycled and use hot or cold water. Selecting a Wash down Location To avoid re accumulation of soil on cleaned vehicles, a paved area for washing, off-loading, and staging vehicle cleaning operations, with paved roads between should be used. This type of facility will often not be a viable option for activities in remote areas. Elevating the washing area enables cleaning personnel to access the underside of vehicles and equipment, where contaminants are otherwise difficult to reach. Water runoff, potentially carrying soil, seeds, animals and petroleum contaminants, must be managed with the use of berms or other containment. Silt fence installed along perimeters of work areas can also aid in preventing spread of contaminated materials outside of the washdown location.

			The area must be large enough to safely accommodate all vehicles and personnel before, during, and after cleaning operations.
Construction	Contractor and ECoW	Environmental Protection	Do not locate the cleaning site adjacent to storm water drains that allow untreated effluent to enter surface water bodies. General Standard Measures: • Set up the best staging area possible for cleaning operations. A paved area with accommodations to elevate vehicles or otherwise allow easy access to the undersides of vehicles and equipment is the best setting. Otherwise, using geotextile access and exit areas, bermed water recovery areas, and portable vehicle lifts are the next best option. • Equipment of all types should be cleaned at the location of last use. If this is not possible, arrange for cleaning at a facility that is specially designed for equipment cleaning. • Preclean equipment that contains heavy accumulations by hand to reduce water demand. • Make pressurized water available with pressure and nozzles capable of removing all soil and debris. • Do not allow wash waters to flow into storm drains because these drains often directly flow untreated into surface water bodies. • At remote sites, install silt fence or otherwise contain materials left behind. Monitor sites closely and eradicate exotic species. • Clean vehicles and equipment thoroughly and ensure that they remain clean when leaving the site. Follow up cleaning operations with final inspections. • Clean, drain, and dry all equipment.

			Plant Inspection All plant leaving site will be inspected to ensure it is clean. A record of all inspections will be maintained by the main contractor's Site Agent. Inspections will focus on identifying the presence or otherwise of fragment in the following locations of plant equipment. Rubber Tyred Vehicles • Crevices in upper surface and panels • Tyres, rims • Spare tyre mounting area • Bumpers • Front and rear quarter panels • Around and behind grills • Bottom of radiator vent openings • Brake mechanisms • Transmission • Stabiliser bar • Shock absorbers • Front and rear axles • Beds • Suspension units • Exhaust systems

			• Light casings and mirrors Tracked Vehicles • Crevices in upper surface and panels • Top of axles and tensioners • Support rollers • Between rubber or gridded areas • Beneath bumpers • Hatches • Under casings • Grills • Beneath seats • Beneath floor mats • Upholstery • Beneath foot pedals • Inside folds of gear shift cover
Construction	Contractor and ECoW	Environmental Protection and Rehabilitation	Habitat Rehabilitation Habitat reinstatement will be implemented in habitats that will be temporarily disturbed during the construction phase. These habitats comprise broad-leaved woodland/riparian woodland mosaic, dry meadows and grassy verges and reed and large sedge swamp. Once the temporary construction infrastructure that will result in the temporary land take in these habitats is removed, the contractor will be required to undertake reinstatement works so that these habitats

			can be reinstated over the short-term duration (i.e. up to 7 years). For the woodland habitats this will require the replanting of the temporary footprint with tree species typical of these habitats. Given that the areas of woodland to be reinstated will be located under the new bridge section shade tolerant species, which already occur in the woodland habitat, such as Ilex aquifolium, Sambuca nigra, and Salix aurita will be used to reinstate woodland. The area of dry meadows and grassy verges will be reinstated with a herb layer consisting of native species already occurring on the island. The construction phase landscaper will be required to collect seed from native herbs and grasses occurring within the dry meadows and grassy verges habitat and reseed this area of the site. The area of reed and large sedge swamp will be reinstated with a hydrophilous herb layer consisting of native species already occurring within the habitat along the southern bankside of the River Suir. The construction phase landscaper will be required to collect seed from native hydrophilous herbs and grasses occurring within the reed and large sedge swamp habitat and reseed this area of the site.
Operational Phase	Contracting Authority	Environmental Protection and Habitat Enhancement	As part of the overall management of Suir Island Tipperary County Council will undertake habitat management of the riparian woodland on the island. The extent of riparian woodland as mapped on Figure 4.3 Habitat Map will be managed as a Disturbance Sensitive Zone. Recreational use of this habitat will not be encouraged. Activities within this woodland will be confined to habitat management measures and the ongoing removal of non-native trees and their replacement with native, positive indicator species. Non-native trees will be selected for removal with Acer pseudoplatanus and Prunus laurocerasus being targeted for removal. Other non-

			native trees occurring in this habitat include Fagus sylvatica and Aesculus hippocastanum. These species are of cultural value owing to their origin as part of the landscaping of the island during the 1800's. Acer pseudoplatanus selected for removal will be hand cut into sections by a tree surgeon to prevent damage to the woodland ground layer. Cut wood will be left in log piles to limit damage to native ground flora. The removal of semi-mature to mature Acer pseudoplatanus will be undertaken over the longer term with the aim of avoiding large gaps in the canopy layer. The location and number of trees to be selected for removal on an annual basis will be overseen by personnel with expertise in landscaping and woodland management. As a guide a maximum of 4 – 5 isolated trees with diameter at breast height (dbh) >7cm and <30cm should be removed annually. Canopy layer regeneration in gaps will be established by replacing non-native trees removed with native positive indicator species in the form of alder or oak. Alder and oak seed will be collected from native woodland sites the wider locality. A nursery stock of alder and oak will be established. Seed for the nursey stock will be collected from the Alluvial woodland habitat occurring at Marlfield Lake pNHA, short distance to the west of Clonmel. This is the nearest example of an established Alluvial woodland to Suir Island. The Alluvial woodland at this location supports stands of alder and oak. Alder and oak seedlings from the nursery stock will be used for replanting. Holly and willows will be used for under planting in the shrub layer. All felling operations will be scheduled between the months of September to early November, outside the bird breeding season and at a time when disturbance to bats will be minimised.

Construction	Contractor and ECoW	Environmental Protection	Works at in the floodplain associated with the Installation of the Pre-Cast Box Culvert All works associated with the installation of the pre-cast box culvert and associated sheet piling will be completed during periods of normal or ebb flow conditions when the floodplain does not contain flowing water. • As highlighted in the EIAR Chapter 7 and associated hydraulic modelling report, only one pier shall be constructed at any one time, thus minimising the reduction in flow area in the floodplain and reduces the potential for adverse effects on the environment. • All plant, personnel and equipment shall be removed from these works' areas at the end of each working day (working hours stated in Section 5.3). • The contractor shall keep record of all rainfall forecasts to ensure works are completed, plant and equipment removed, and the works safeguarded 2-days prior to any major rainfall forecasts in the catchment area. • The contractor shall liaise with the Clonmel Flood Defence Scheme and Early Warning System personnel on all major rainfall events. • Method Statements and Procedures shall be compiled prior to the commencement of the works which shall be followed for each flood warning event. • All formwork for the pier construction shall be so designed to withstand any flood event up to the 1% AEP. • Standard formwork and scaffolding shall not be permitted within the floodplain works.

			• No concrete shall be cast if the forecast for the next 7-days would exceed or result in a 50% AEP flood event, thus allowing concrete to cure sufficiently. • No refuelling shall be permitted within the floodplain area. • Dewatering of working areas shall strictly be carried out in accordance with Section 5.8 of the outline OCEMP. • Sheetpiling and all formwork shall be inspected on regular basis by temporary works designers to ensure works are secure prior to forecasted rainfall events.
Construction	Contractor	Environmental Protection	Works at Bridge Piers and Abutments In order to minimise the risk of the release of excess sediment from working areas associated with these elements of the project the following approach will be implemented for the construction phase: Construction at Pier 01; Abutment 02; Abutment 03; Pier 02; and Pier 03 will be undertaken sequentially so that works are undertaken at each of these elements individually. This will minimise the footprint of the construction phase working area that will be susceptible to flooding in the event of a flood. Weather forecasting will be used to plan works at Pier 01; Abutment 02; Abutment 03; Pier 02; and Pier 03. Works will only be commenced during times when high rainfall events that could trigger flooding are not forecast. Upon commencement of works at each of Pier 01; Abutment 02; Abutment 03; Pier 02; and Pier 03 daily monitoring of the weather forecast will be undertaken. In the event that a high rainfall event is forecast during the working period, works will be discontinued and the ground within the working areas will be compacted to minimise

			the potential for mobilisation of sediment in the event of flooding and contact between the working area and flood waters. Works will only resume after flood waters recede and when no further high rainfall events are forecast. It is considered that this approach to the works to be carried in sequence and individually at Pier 01; Abutment 02; Abutment 03; Pier 02; and Pier 03 will minimise the potential for the release of sediment from the works area to flood waters and will ensure that perceptible and significant effects to the water quality of the river and instream habitats downstream are avoided.
Construction	Contractor	Environmental Protection	Protection of River Channels and/or Riverbanks Whilst the risk to ground instability and riverbank failure arising as a consequence of machinery movements and piling works at Pier and Abutment locations has been assessed to be negligible, mitigation measures will be incorporated into the construction phase to further reduce the already negligible risk of such an event occurring. This will be achieved by providing ground reinforcement at the Pier 1, Pier 2 and Pier 3 locations as well as at the Abutment 01 and 04 locations. The ground reinforcement will consist of temporary soil stabilisation materials/layers such as Reinforced and drainage trackbed separators and rock stability layers will be installed prior to traversing close to the bank. It should be noted that sheetpiling rigs will consist of tracked excavators with long-reach booms, and thus the equipment will be able to remain a safe distance from the riverbank edge. A sequential approach shall be adopted to access Pier 01 consisting of the muddy substrate and potentially saturated soils. The methodology shall broadly consist of; creating short sections of

			enclosed sheetpiling blocks to minimise the ingress of ground water; the removal of saturated material if present; laying of geotextiles and the deposition of temporary rockfill layers within the enclosed section to provide construction platforms of suitable bearing capacity; and rehabilitation and reinstatement of muddy substrate following the completion of the works. In addition it is further noted that the temporary access ramp to Pier 01 has been designed to cater for an excess of the maximum capacity of machinery that will use the access ramp during the construction phase. With respect to the piling operations to be undertaken at the pier and abutment locations it is noted that mitigation measures have been set out in Section 7.8 of the Natura Impact Statement. These mitigation measures are based on a piling method that will utilise rotary bored piling techniques. This approach to piling will eliminate the potential for high impact (noise and vibration inducing) strikes or hammering. This coupled with the set-back distances of the pile locations from the river at all pier and abutment locations, as well as the presence of the bedrock and overburden between the river and the pile locations at piers and abutments, will ensure that no noise or vibration associated with the piling will have the potential to cause injury to fish (i.e. will not exceed the low guide value of the 183 dB within adjacent waters) within the river channel adjacent to the piling locations. All piling works will be timed to occur outside the most sensitive time of the year when Atlantic salmon and lamprey species spawn along the section of the River Suir at Suir Island. River lamprey spawn along this section of the River Suir during spring time, between March and April (Gallagher et al., 2022); sea lamprey usually spawns

			in late May or June, when the water temperature reaches at least 15ºC (Maitland, 2003) and surveys of sea lamprey spawning along this section of the River Suir coincides with this timeframe (Gallagher et al., 2019, 2020, 2022). Atlantic salmon spawn along this section of the River Suir during the winter and spring between November and March In view of these spawning timeframes and taking into account the time of year when river flows are typically low, all piling works will be timed to be undertaken between mid-July and September. In addition to the above the approach to the rotary bored piling will include a slow start-revving up procedure. This will involve slowly starting rotary piling and revving up the piling over a 30-minute period. This slow start period will allow noise-sensitive species to move away from the piling area and avoid injury. The use of rotary bored piling will also ensure that vibration levels associated with this piling will be low and will not present a risk of undermining the integrity of adjacent river banks and their collapse. In order to eliminate the potential for sheet piling installation works to result in river bank instability and collapse, the sheet piling to be used will consist of interlocking steel panels, which will be driven through the overbank materials prior to any excavations occurring near the riverbanks. The interlocking/retaining nature of the sheetpiling will protect the riverbanks from destabilising during the rotary bored piling operations and subsequent works within the sheet piled working area.
Construction	Contractor	Environmental Protection	Noise and Lighting on Otters In order to avoid potential impact to otters during the construction phase all works to be carried out within 10m will be required to be completed during daytime hours only. No works will be completed in

			these areas during nighttime. No construction phase artificial nighttime lighting will be permitted to illuminate the River Suir or the 10m buffer zone adjacent to the River Suir. A lighting specialist will be engaged for the construction phase of the project. The lighting specialist will be responsible for assessing the zone of illumination associated with construction phase lighting and will, in collaboration with the project Ecological Clerk of Works and the Site Management, ensure that no construction phase lighting illuminates the River Suir and the 10m buffer area throughout the duration of the construction phase. Noise Control at Source: This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures shall be implemented: • The use of machinery for lifting bulky items, dropping, and loading of materials within work areas should be restricted to normal working hours. • For mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 1 0dB. Mobile plant shall be switched off when not in use and not left idling.

			• For compressors, generators, and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. • Demountable enclosures will be used to screen operatives using hand tools and will be moved around site, as necessary. • All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. • Care will be taken when cleaning augers of piling rigs. Shaking and banging of the auger to loosen earth will be avoided. • Use of pneumatic hand tools will be avoided at night-time and fixings should be manually tightened where possible. • Site compounds will be located in excess of 30m from noise sensitive locations within on-the-ground constraints.
Operational	Designer	Environmental Protection	Noise and Lighting on Otters The following measures will be implemented to minimise the impact of artificial night lighting to otters: The final lighting design will avoid light spill to the River Suir and adjacent bankside and the design will be required to demonstrate no change in light conditions on the river and adjacent 10m bankside with respect to baseline levels. The lighting for the bridge sections has been designed in accordance with the best practice guidelines for bats and lighting prepared by the Institute of Lighting Professionals and Bat Conservation Trust. The design of the lighting in line with these measures will also ensure that

			a sensitive approach to lighting has been adopted for all other light sensitive species, including otters. The following key requirements will be incorporated into the lighting design: Lighting will be controlled via movement sensors which will be triggered by human activity as people walk or cycle by at night. This lighting regime will reduce the overall time that the lighting is in use which will in turn reduce impacts on otters. In addition to this a Central Monitoring System will be installed, allowing lights to be monitored remotely and individually controlled. Bespoke dimming regimes can be installed, or particular lighting units switched off or dimmed during periods of low-level use. All luminaires will lack UV elements and only LED luminares will be used. Metal halide fluorescent have not been used in the design. A warm white spectrum light will be used to reduce blue light component The luminaires shall feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. Other features that have been incorporated into the public lighting design include the following: Lighting will be based on movement sensors and so will not be on all the time. The lights have been designed to minimise light spill and no light will spill onto the river channel and adjacent 10m bankside, ensuring the potential impacts of lighting to otters is minimised. Only luminaires

			with an upward light ratio of 0% and with good optical control have been included in the lighting design All luminaires should always be mounted on the horizontal – no upward tilt. The provision of these lighting requirements as part of the operation phase lighting design will ensure that the provision of nighttime lighting will not result in adverse residual impacts to otters.

Table 17-2: Mitigation Measures as set out in the EIAR and OCEMP

Project Phase	Mitigated By	Justification	Mitigation Measures
Construction	Management	Environmental Protection	A project-specific Construction Environmental Management Plan (CEMP) will be prepared and maintained during the construction phase of the project. The CEMP will include but not be limited to controls for dust, noise and vibration, waste management, protection of soils and groundwaters, protection of flora and fauna, site housekeeping, emergency response planning, site environmental policy, environmental regulatory requirements and project roles and responsibilities. The CEMP will also address extreme of weather (drought, wind, precipitation, flooding, temperature extremes) and the possible impacts on receptors and mitigation of same. The CEMP will be treated as a live document and communicated to all site personnel. The CEMP which will be prepared by the appointed contractor shall comply with all mitigation measures and monitoring set out in the NIS, EIAR, EIAR Addendums and Outline CEMP and any planning conditions imposed by the Planning Authority.

Construction and Operation	Management	Environmental Protection	The applicant will, during both construction and operational stages, maintain a Complaints Register to record any complaints regarding but not limited to noise, odour, dust, traffic or any other environmental nuisance. The Complaint Register will include details of the complaint and measures taken to address the complaint and prevent repetition of the complaint.
Construction	Site Operator	Water Protection	Contractors for the proposed development will be contractually required to operate in compliance with the NIS, EIAR and addendums, planning conditions issued by Planning Authority and OCEMP which includes the mitigation measures outlined in this EIA report Chapter 17. All personnel working on the site will be suitably trained in the implementation of the procedures.
Construction	Management	Soil and Water Protection	Any material required to be removed from site will be stockpiled separately and subsequently sampled to ensure appropriate disposal. The surplus of excavated material from the excavations will be disposed off-site to licenced facility by a licenced contractor. Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a compound area to prevent contamination. Temporary storage of spoil will be managed to prevent accidental release of dust and uncontrolled surface water run-off which may contain sediment and solid matter. Materials will be sent off site for recycling where possible and, if not suitable for recycling, materials will be disposed of to an appropriate permitted/licensed waste disposal facility.

			Liquid materials i.e., fuel storage will be located within temporary bunded areas, doubled skinned tanks or bunded containers (all bunds will conform to standard bunding specifications - BS8007-1987) to prevent spillage. The removal of waste from the site will be carried out in accordance with Waste Regulations, Regional Waste Plan (Eastern Midland Region) and Waste Hierarchy/Circular Economy Principals. Cased piles will be used to prevent the use of bentonite and will be cast using ready-mix concrete trucks transported to site and pumped into the casings due to restricted access for concrete trucks. No batching plants will be allowed on site.
Construction	Management	Soil and Water Protection	All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the site and the direct link or pathway from this area to any surface water will be

			minimised through the use of silt fencing etc as appropriate. Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.
Construction	Management	Soil and Water Protection	All fill and aggregate for the proposed development will be sourced from reputable suppliers. All suppliers will be vetted for: - Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development; - Environmental Management status; and - Regulatory and Legal Compliance status of the Company.
Construction	Prevention	Soil and Water Protection	The following mitigation measures will be taken at the construction stage in order to prevent any spillages to ground of fuels and prevent any resulting soil and/or groundwater quality impacts: - Oil and fuel storage tanks will be stored in designated areas; - Designation of a bunded refuelling areas on the site, these areas will be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress); - Drainage from the bunded area(s) will be diverted for collection and safe disposal; - Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area – contractors' compound - (or where possible off the site) which will be away from surface water gullies or drains;

			- Provision of spill kit facilities across the site; - All relevant personnel will be fully trained in the use of this equipment; - All ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility offsite; - Containers shall be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.
Construction	Management	Soil and Water Protection	Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. Measures will include managing slope gradients, covering of soil stockpiles where necessary etc. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. Should any discharge of construction water be required during the construction phase, Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt or sediment traps, buffer zone between machinery and watercourses, refuelling of machinery off site) and hydrocarbon interceptors. All water runoff from car park areas will be channelled

			to an oil interceptor or an alternative treatment system prior to discharge. Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction.
Construction	Management	Soil and Water Protection	During construction phase the following monitoring measures will be adopted: - Regular inspection of surface water run-off and sediments controls e.g.; silt traps will be utilised during the construction phase. - Soil sampling to confirm disposal options for excavated soils. - Regular inspection of construction/mitigation measures will be undertaken e.g., concrete pouring, refuelling etc.
Construction	Management	Surface Water Run-off	Cognisance will have to be taken from the referenced guidance documents for construction near watercourse/bodies:
Construction	Management	Surface Water Protection	The duration and extent of in-stream works will be kept to a minimum to avoid disruptions to aquatic life and short-term changes to river morphology; Discharge of surface water from sumps, excavations and exposed soil surfaces will include the use of silt traps or settlement ponds; Silt traps, settlement ponds, hydrocarbon interceptors will be constructed in the early stages of the construction programme;

			Bare soil surfaces will be protected from erosion by placing granular material on the surfaces to prevent sediment transport to watercourses; Storage areas of fuel, oil and chemicals will be on impermeable surfaces and located away from drains and watercourses. Fuel storage areas will be bunded to provide adequate retention capacity in the event of a leak or spillage occurring; Refuelling of construction vehicles will take please on impermeable surfaces and located away from nearby drains and watercourses; Spill kits to be provided near all works areas on the North Plaza, Suir Island and Raheen Road.
Construction	Site Operator / Management	Surface and ground Water Protection	During the pouring of concrete for permanent structures (piles, piers and abutments), the operation and management of these activities will be carefully controlled to avoid spillage. As the use of concrete cannot be avoided the following control measures will be employed: - Quick-setting or rapid hardener add-mixtures will be used to promote early setting of concrete to ensure cementitious compounds are not absorbed by surface or groundwater; - Where concrete works are required near water sources, the used of biodegradable products will be used;

			- Any plant operating close to water sources will require special consideration and monitoring when on site; - Placing of concrete in or near watercourses will be carried out only under the supervision of the Ecological Clerk of Works (ECoW); - No cleaning or hosing of any concrete surfaces, plant or equipment will be permitted near surface water sources or drains. Designated impermeable areas to be prepared with sufficient settlement capacity and accidental spillage containment volume; - On-site concrete batching will not be allowed near the site.
Construction	Management	Surface and ground Water Protection	Construction of structures in the river floodplain requires temporary works such as localised sheet piling and excavation works which will be phased to minimise the reduction of flow area. The reduction of flow area increases scour potential of the river therefore the works should be phased to negate or minimise any increase in flow velocities arising from restricting the river flow area.
Construction	Management	Surface and ground Water Protection	River water levels and weather forecasts will be monitored for potential flood events during construction and temporary flood defences will be provided during construction where the existing flood defence wall will be altered.

Construction	Protection	Ecological Protection	The ECoW will be responsible for completing pre-construction surveys and supervising construction works during the construction phase.
Construction and Operation	Protection	Habitat Protection	Pre-construction surveys required in advance of the construction phase will include as a minimum: - Otter surveys along the River Suir and Suir Island. Surveys to be completed will pay particular attention to identifying the presence/absence of otter holts/couches within 150m of piling locations. -Non-native invasive plant species surveys: An up-to-date non-native invasive plant species survey of the project site and adjacent areas will be completed during the growing season immediately prior to the commencement of construction works. -Surveys for the presence of plant species of local conservation interest. These surveys will be completed during the growing season immediately prior to the commencement of the construction phase. The surveys will be completed to identify the stands of Symphytum officinale, Orobanche hederae and Aquilegia vulgaris occurring within the works area of the project site. The survey will also aim to confirm the presence/absence of Centaurea cyanus within the works area during the growing season immediately prior to the commencement of construction works.

Construction and Operation	Protection	Habitat Protection	The ECoW will ensure that best practice construction methods and mitigation measures detailed in this EIAR and accompanying planning documentation including the Construction Environmental Management Plan (OCEMP) and Natura Impact Statement are implemented in full. The ECoW will be responsible for ensuring that the construction phase contractor is aware of key biodiversity receptors, such as the Lower River Suir SAC, the presence of populations of white-clawed crayfish, spawning habitat for Atlantic salmon and lamprey, the presence of otters and high value bat foraging and breeding bird habitat. The ECoW will inspect the construction works throughout the construction phase and will pay particular attention to the implementation of all biodiversity related mitigation measures. The ECoW will provide monitoring inspection reports during the construction phase and will also provide a close-out report following the completion of the contract construction works. Where necessary the ECoW will liaise with relevant authorities such as Tipperary County Council, the IFI and the NPWS with respect to construction phase activities that relate to biodiversity. As part of the ECoW terms of appointment, the ECoW will be vested with the authority to stop works where activities have been identified on site that are not in accordance with the mitigation measures outlined in this EIAR, the Natura Impact Statement and/or the OCEMP prepared for the planning application for the proposed development.

Construction and Operation	Protection	Habitat Protection	The ECoW will be required to complete pre-construction surveys in advance of the commencement of construction works and based upon the results of these surveys the ECoW will establish whether or not there is a need at that stage for protected species licences.
Construction	Protection	Habitat Protection	Construction machinery will be restricted to site roads and the footprint of the proposed development and associated construction works area.
Construction	Protection	Habitat Protection	Plants of local conservation interest that are identified as occurring within the footprint of the construction works will be removed and translocated to an alternative suitable location on Suir Island outside the footprint of the project site. During the baseline surveys these plant species have been identified as Orobanche hederae, Aquilegia vulgaris and Symphytum officinale. The translocation of these plants will be undertaken under the supervision of the project ECoW. The project ECoW will direct the contractor to excavate the plants as turves that will be a minimum of 0.5m x 0.5m to a depth of 0.3m. The plants will be translocated to a suitable receptor location on the island with conditions similar to those occurring at the original site.
Construction	Protection	Habitat protection	Where possible vegetation to be cleared onsite will be completed outside the nesting bird season between March and August inclusive. Where it is not possible to time such works outside these months then a survey of hedgerow/treeline/grassland vegetation and habitats for the presence of nesting birds will be required.

			Noise mitigation measures will be implemented during the construction phase to minimise the potential for noise disturbance to bird species and fauna.
Construction	Protection	Habitat Protection	All working hours will occur within daylight hours between the months of April to October. Outside of working hours all artificial lighting that as the potential to cast light on the river will be turned off.
Construction	Protection	Habitat Protection	The management of surface water during the construction phase will adhere to the recommendations of the CIRIA guides Control of Water Pollution from Construction Sites (2001) and Control of Water Pollution from Linear Construction Projects (2006). During construction key requirements for control of chemical pollution risk will include: - Storage – all equipment, materials and chemicals will be stored away from any watercourse. Chemical, fuel and oil stores will be sited on impervious bases and within a secured bund of 110% of the storage capacity, within the lay down area; - The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein will also be tested and demonstrated. - All fuel oil fill areas will have an appropriate spill apron.

			- Vehicles and refuelling – standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Where practicable, refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, well away from any surface watercourse; - Maintenance – maintenance to construction plant will not be permitted on site unless vehicles have broken down necessitating maintenance at the point of breakdown. All necessary pollution prevention measures will be put in place prior to commencement of maintenance in this instance; - Concrete - Wet concrete operations would not be carried out within watercourses or adjacent to watercourses. Runoff from wastewaters or contaminated storm water will be directed to drains installed as part of the surface water management plan - Mess, sanitation and welfare facilities will be required during construction and will be located at the construction compound. Foul effluent will make use of chemical facilities with periodic removal for offsite disposal.
Construction and Operation	Protection	Habitat Protection	The following measures will be implemented to minimise the impact of artificial night lighting to bats, other nocturnal species and aquatic fauna: - The final lighting design will avoid light spill to the River Suir and the design will be required to demonstrate no change in light conditions on the river.

			- The lighting design for the bridge sections will be based upon the best practice guidelines for bats and lighting prepared by the Institute of Lighting Professionals and Bat Conservation Trust. The following key requirements will be incorporated into the lighting design: - Lighting will be controlled via movement sensors which will be triggered by human activity as people walk or cycle by at night. - This lighting regime will reduce the overall time that the lighting is in use which could in turn reduce impacts on bats and insects. A Central Monitoring System will be installed allowing lights to be monitored remotely and individually controlled. Bespoke dimming regimes can be installed or particular lighting units switched off or dimmed during periods of low-level use. - All luminaires will lack UV elements and only LED luminaires will be used. - Metal halide fluorescent have not been used in the design. - A warm white spectrum light will be used to reduce blue light component. - The luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. Other features that have been incorporated into the public lighting design include the following:

			- Lighting will be based on movement sensors and so will not be on all the time. - The spacing between light columns has been maximised in order to avoid excessive illumination along the greenway. - The height of lighting columns has been minimised to a height of 5m to reduce lighting within a great heights where foraging bats will be active. - The lights have been designed to minimise light spill and no light will spill onto the river channel, ensuring the potential impacts of lighting to aquatic fauna are avoided. Only luminaires with an upward light ratio of 0% and with good optical control have been included in the lighting design - All luminaires should always be mounted on the horizontal – no upward tilt.
Operation	Protection	Habitat Protection	Ongoing monitoring of habitat reinstatement areas will be completed during the operation phase of the project.
Construction	Protection	Habitat Enhancement	In order to enhance the quality of habitat occurring within the project site and the adjacent Suir Island the following habitat enhancement measures are recommended: - Bird nest boxes will be erected on appropriately trees occurring within or adjacent to the project site. The trees that will support nest boxes will be selected by the construction phase ECoW.

			- Bat boxes will be erected on appropriately trees occurring within or adjacent to the project site. The trees that will support nest boxes will be selected by the construction phase ECoW
Construction	Management	Dust Management	The siting of activities and storage stockpiles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance. As prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage stockpiles downwind (to the east or north-east) of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.
Construction	Management	Air Quality	Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic. Any road that has the potential to give rise to dust must be regularly watered, as appropriate, during dry and/or windy conditions. Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph. Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary. Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting

			or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods. During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
Construction	Management	Dust Management	Adverse weather conditions will be responded to by either restricting operations on-site or quickly implementing effective control measures before the nuisance occurs. During periods of very high winds (gales), activities likely to generate significant dust emissions will be postponed until the gale has subsided. The following measures will be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions: - The Employer's Representative or equivalent must monitor the contractor's performance to ensure that mitigation measures are implemented; - Name and contact details of a person and head/regional office to contact regarding air quality and dust issues will be displayed on site boundary; - Community engagement will be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;

			- The development of a complaints register and effective measures to deal with any complaints received must be implemented. - It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein; - At all times, the procedures put in place will be strictly monitored and assessed.
Construction	Management	Dust Management	Plan site layout so that machinery and dust causing activities are located away from receptors. Erect solid screens or barriers around dusty activities or the site boundary that are least as high as any stockpiles on site. Specific operations where there is high potential for dust production and site is active for an extensive period will be fully enclosed. Avoidance site run off of water or mud. Site fencing, barriers and scaffolding will be kept clean using wet methods. Materials that have a potential to produce dust will be removed from site as soon as possible. Stockpiles will be covered, seeded or fenced to prevent wind whipping.

Operations	Management	Dust Management	Only cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems will be used. An adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water is to be supplied. closed chutes and conveyors and covered skips are to be used. Minimisation of drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and usage of fine water sprays on such equipment is to be implemented. Equipment will be readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after using wet cleaning methods.
Construction	Management	Dust Management	Scabbling (roughening of concrete surfaces) will not take place. Sand and other aggregates will be stored in bunded areas and not allowed to dry out. Bulk cement and other fine powder materials will be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. For smaller supplies of fine power materials bags will be sealed after use and stored appropriately to prevent dust.

Construction	Management	Dust Management	Site roads (particularly unpaved) can be significant source of dust from construction sites; A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles. Water-assisted dust sweeper(s) will be used on the access and local roads, to remove any material tracked out of the site. Dry sweeping of large areas will not take place. Vehicles entering and leaving sites are to be covered to prevent escape of materials during transport. On-site haul routes will be inspected for integrity and necessary repairs carried out to the surface as soon as reasonably practicable. All inspections of haul routes and any subsequent action will be recorded in a site logbook. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).

			Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access gates to be located at least 10 m from receptors where possible.
Construction	Management	Noise Pollution	The least noisy item in relation to static plant such as compressors and generators should be selected wherever possible. It is required that these units be supplied with manufacturers' propriety acoustic enclosers. Should a particular item of plant already on the site be found to generate high noise levels, the first action should be to identify whether or not said item can be replaced with a quieter alternative.
Construction	Management	Noise Pollution	Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures should be considered; Use of machinery for lifting bulky items, dropping, and loading of materials within work areas should be restricted to normal working hours. Mobile plant items such as dump trucks, excavators and loaders, the installation of an acoustic exhaust and/or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant should be switched off when not in use and not left idling.

			For compressors, generators, and pumps, these can be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation. Demountable enclosures will be used to screen operatives using hand tools and will be moved around site, as necessary. All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. Care will be taken when cleaning augers of piling rigs. Shaking and banging of the auger to loosen earth will be avoided. Use of pneumatic hand tools will be avoided at night-time and fixings should be manually tightened where possible. Site compounds will be located in excess of 30m from noise sensitive locations within on-the-ground constraints.
Construction	Management	Noise Pollution	Where required, the use of temporary hoarding or mobile screens will be used to aid in reducing noise levels from potential high levels of construction activity.
Construction	Management	Noise Pollution	A designated Environmental Liaison Officer will be appointed to site during construction works. Noise complaints should be logged and promptly followed up by Liaison Officer.

			Where noisy construction is expected to operate outside of normal working hours, the Liaison Officer will inform nearest noise sensitive locations of the time and expected duration.
Construction	Management	Noise Pollution	Monitoring typical levels of noise and vibration during critical periods and at sensitive locations Construction noise monitoring will be undertaken at critical periods at the nearest noise sensitive locations to the development works to check compliance with the construction noise criterion.
Construction	Management	Noise Pollution	The phasing programme will be arranged to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity.
Construction and Operation	Management	Landscape Protection	Where applicable a landscape drawing with notes indicating planting to be used as visual screening; retention of existing hedges/ trees; reconnection to severed hedges or foraging corridors as identified in Chapter 5 (Biodiversity); required maintenance access; boundary treatment; and architectural features, and signage compatible with the existing environment and the proposed development. Including avoiding or reducing inappropriate lighting. ~~Specification document -includes planting, post planting /maintenance~~

Construction and Operation	Management	Landscape Protection	Other aspects to be considered as mitigation measures in order to reflect the landscape character for the site and for each sub-area and consider human activity, the built and natural features and/ or processes are as follows; - Reducing the impact of hard features within the existing landscape - Orientation of receptor's circulation - Improving access with ramps and steps - Framing views or reinforce through formal planting a gateway - Creating a sense of place using planting - Considering existing landforms where appropriate, regrading to improve access such as appropriate slopes for ramps - Use of specimen plants as focal points and/or as landmarks. - Use plants as buffers or as screening and/or integrate the harder features proposed - Adjusting site levels and the layout to meet the design requirements while still mitigating impact
Construction and Operation	Management	Landscape Protection	The selection of appropriate hard finishes (i.e., paving, and stone finishes selected to match the palette of materials already in use throughout the historic town centre of Clonmel) and soft materials

			such as the proposed wildflower planting at the flood barrier berm and new trees at the Northern Bridge Plaza will be used as specific visual design solution to reduce the existing hardscape area. Native tree species tolerant to temporary tolerant flooding, the urban environment and compatible with the Floodplain landscape character of this area;(i.e., Alnus glutinosa-Common Alder; Betula pubescens -Down Birch; Salix-Willow spp.); and some non-native species will be included for their low maintenance characteristics, tolerance to flooding and pollinating/birdlife value, and seasonal aesthetic appeal.
Construction and Operation	Management	Landscape Protection	Landscape mitigation measure will include mitigating any impact on the existing trees to be retained as per standard practices during construction to prevent damage to existing trees identified for retention.
Construction and Operation	Management	Landscape Protection	The Tree Survey Report tree retention drawing indicates Root Protection Area, (RPA), this area around each tree cannot be disturbed or impacted upon during construction. This protection will be achieved by installing a temporary fence that will remain in place for the duration of construction activities, and any traffic (pass between the tree protection areas as indicated by arborist's Drawing No. 072921_TP_02. For further clarity refer to original drawings regarding the location of the trees with protective fencing.

Construction	Management	Landscape Protection	Additional mitigation measures that are not specifically addressing the existing vegetation and/or landscape to protect and/or consider are the following: - Site lighting will be kept low with Lux levels to meet the minimum requirement to protect the flora and fauna as well as to minimise visual impacts of the site's presence from the town centre outside of working hours, but still provide security for at night-time access and circulation. - Construction of the proposed development will be progressed as a single construction contract with the construction phase potentially lasting approximately 24 months. As much as possible of the bridge elements will be constructed off-site with the site area being used for assembly prior to lifting into position. It is proposed that the construction period start in early summer (May), to ensure that foundations are constructed when the Suir River water-level is at its lowest, which will ensure safe access and minimise flood risk when constructing temporary sheet piling. The visual impacts of these works, including the presence of cranes, will be temporary, and will end with the completion of the works. - Storage areas will be confined to the eastern portion of the existing carpark area on the Island, from where the haul roads will provide access to the northern and southern Island bank locations of the bridge foundations. It is also likely that an area on the northern bank around the proposed plaza location, as well as a strip along the Raheen Road and the southern landing point will be required for site access during the construction period.

Operation	Management	Landscape Protection	Any trees identified as retained that are lost during construction will be replaced with same species in the original location to compensate for loss of existing vegetation. All landscape works will be established in accordance with the detailed plans and specifications provided by the landscape architects, and any breaches or defects in tree protection measures or site hoarding that might occur will be reinstated immediately.
Construction	Mitigation ~~Protection~~	Protection of Archaeological Heritage ~~Local Heritage~~	Archaeological monitoring will take place for any works requiring ground disturbance / excavation, including site preparation works and any ground disturbance works well in advance of development. The archaeologist will have provision to inspect all excavation to natural soil level and to temporarily halt the excavation work, if and as necessary. They will be given provision to ensure the temporary protection of any features of archaeological importance identified. The archaeologist will be afforded sufficient time and resources to record and remove any such features identified.
Construction	Mitigation ~~Protection~~	Protection of Archaeological Heritage ~~Local Heritage~~	Archaeological monitoring will be carried out under licence to the Department of Housing Local Government and Heritage (DHLGH) and the National Museum of Ireland (NMI), and will ensure the full recognition of, and the proper excavation and recording of, all archaeological soils, features, finds and deposits which may be disturbed below the ground surface. All archaeological issues will have to be resolved to the satisfaction of the DHLGH and the NMI.

Construction	Mitigation ~~Protection~~	Protection of Archaeological Heritage ~~Local Heritage~~	The enabling works for the piers in the floodplain be archaeologically monitored, as the riverine silts may have deeply buried deposits of archaeological potential.
Construction	Mitigation ~~Protection~~	Protection of Archaeological Heritage ~~Local Heritage~~	Should archaeological material be identified during the monitoring works, the remains will be preserved by record through archaeological excavation and/ or preservation of in-situ. If features associated with the town wall or medieval structural remains survive there may be a requirement for redesign and public display and works to be carried out under Ministerial Consent.
Construction	Mitigation ~~Protection~~	Protection of Archaeological Heritage ~~Local Heritage~~	Archaeological excavation ensures that the removal of any archaeological soils, features, finds and deposits is systematically and accurately recorded, drawn and photographed, providing a paper and digital archive and adding to the archaeological knowledge of a specified area (i.e. preservation by record). Post-excavation analysis, reporting and the creation of datasets is a critical component of preservation by record.
Pre-construction	Mitigation	Protection of Archaeological Heritage	A preconstruction underwater archaeological assessment/survey will be carried out in accordance with Department of Housing, Local Government and Heritage Development Applications Unit requirements.
Construction	Management	Continuation of Services	A Traffic Management Plan (TMP) will be compiled by contractor before construction activities commence and will be a stand-alone document forming part of the project Environmental Operating

			Plan. The TMP will address temporary disruption to traffic lanes, footpath access and the management of pedestrian crossing points. The contractor will provide an appropriate information campaign for the duration of the construction works.
Construction	Management	Continuation of Services	The following mitigation measures will be implemented during the construction phase of the proposed development: - The Contractor will implement the Resource and Waste Management Plan throughout the duration of the proposed excavation and construction phases
Construction	Management	Environmental Pollution	The following mitigation measures will be implemented: - Building materials will be chosen to 'design out waste'; - On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated: - Concrete rubble (including ceramics, tiles and bricks); - Plasterboard; - Metals; - Glass; and - Timber.

			- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials will be re-used on-site, where possible; - All waste materials will be stored in skips or other suitable receptacles in designated areas of the site; - Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required); - A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works; - All construction staff will be provided with training regarding the waste management procedures; - All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal; - All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and All waste leaving the site will be recorded and copies of relevant documentation maintained.

Construction	Management Control		Pre-construction surveys required in advance of the construction phase will include as a minimum: • Otter surveys along the River Suir and Suir Island. Surveys to be completed will pay particular attenuation to identifying the presence/absence of otter holts/couches within 150m of piling locations. • Non-native invasive plant species surveys: An up-to-date non-native invasive plant species survey of the project site and adjacent areas will be completed during the growing season immediately prior to the commencement of construction works. An Invasive Species Management Plan has been prepared for the proposed development and is provided as Appendix 4 to this Natura Impact Statement. During the pre-construction and construction phase the ECoW will be required to supervise the implementation of all measures set out in the Invasive Species Management Plan
Construction	Contractor	Traffic & Transportation	The contractor is required to implement the following minimum measures in relation to traffic and transportation during construction: • All trucks entering and exiting the site will be covered with tarpaulin; • Adequate parking will be provided near the contractor's compounds to avoid queuing at the site entrances and

			prevent disruption to neighbouring businesses/roads. Construction vehicles will not be allowed to park on the public road either outside the site or on any of the approach roads leading to the site; • All trucks entering the site will be restricted to suitable speed limits and will be directed to the relevant area by the Site Manager; • Trucks required to wait on site will switch off engines to avoid unnecessary fuel usage and noise; • All trucks exiting the site will be required to pass through a wheel wash. A lance will be provided to clean down the bodies and sides of the truck prior to leaving site; • Roads outside the site will be visually inspected on a daily basis and power swept and washed as and when required; • All site staff including truck drivers will be required to abide by the normal rules of the road; • The contractor shall prepare a Detailed Construction Traffic Management Plan (CTMP) covering all construction stages that takes into account other potential construction works in the area. The CTMP will demonstrate how pedestrians, cyclists and motorised vehicles are prevented from passing

			through the sites and that measures are in place which ensure traffic is not disrupted; • The CTMP will include a detailed consultation plan to deal with third party queries from both residents and commercial operators. The CTMP will require agreement with both Tipperary County Council and An Garda Síochána prior to the commencement of construction. • The contractor will appoint a single point of contact to facilitate the communication of the various traffic management plans and the preparation of a project specific website to aid communications would also be beneficial. • As part of the CTMP a Mobility Management Plan will be prepared to ensure access to the site by sustainable travel modes is encouraged. The following measures will need to be considered within the Mobility Management Plan: • The provision of facilities for construction staff; • The provision of cycle and parking for construction staff; • The promoting of car sharing among staff, including van pooling to travel between different work sections;

Construction	Contractor	Air Quality & Climate	The contractor is required to implement the following measures in relation to air quality and climate during construction: • Implementation of 'standard mitigation' measures as stated in the Transport Infrastructure Ireland (TII), (formerly the National Roads Authority (NRA) (2011)), Good Practice Guidance for the Treatment of Air Quality during the Planning and Construction of National Road Schemes: • Spraying of exposed earthwork activities and site haul roads during dry weather; • Provision of wheel washes at exit points; • Covering of stockpiles; • Control of vehicle speeds, speed restrictions and vehicle access; and • Sweeping of hardstand surfaces. • Erection of the hoarding will be provided around the working areas to minimise the dispersion of dust from working areas as per Section 5.5 of the OCEMP (EIAR Chapter 7); • Generators will be located away from sensitive receptors in so far as practicable;

			• Stockpiles will be located as far as possible from sensitive receptors, floodplains and covered/dampened during dry weather conditions; • Employee awareness shall be promoted by actively training staff on management of operations and dust suppression; • Where asbestos is uncovered on site, a competent contractor shall remove the ACM from site and disposed of in accordance with relevant procedures and legislations.
Construction	Contractor	Noise & Vibration	The Noise and Vibration Management Plan (NVMP) will outline how the appointed Contractor(s) will comply with the noise criteria set out in this section and will deal specifically with construction activities in a strategic manner to remove or reduce significant noise and vibration impacts associated with the construction of the proposed development. The NVMP will detail the provision and installation of localised acoustic screens, the best practice noise measures that the appointed Contractor(s) will be required to adhere to for construction activities and the noise and vibration monitoring programme that the appointed Contractor(s) will be required to undertake during the construction works. In addition, the appointed Contractor will prepare detailed method statements addressing the likely ground-borne noise and vibration levels that will be generated as a result of the construction activities once the specific details of the proposed plant items and construction methodologies are known.

			The contractor is required to implement the following measures in relation to noise and vibration during construction: • The contractor will take specific noise reduction measures and comply with the recommendations of the standards and the European Communities (Noise Emission by Equipment for Use Outdoors) Regulations, 2001 and 2016 so as to acknowledge the EC (Noise Emission by Equipment for Use Outdoors) (Amendment) Regulations 2006; • A site representative shall be appointed to be responsible for matters relating to noise and vibration; • Unnecessary revving of engines should be avoided and equipment should be switched off when not required; • Generators will be located away from sensitive receivers and will be enclosed; • Careful selection of equipment, construction methods and programming with the objective of reducing noise and vibration where possible. Only equipment, including road vehicles, conforming to relevant national or international standards, directives and recommendations on noise and vibration emissions, will be used;

			• Selecting electrically powered plant that is quieter than diesel or petrol-driven plant, if interchangeable; • Fitting suitable anti-vibration mountings where practicable, to rotating and/or impacting equipment; • Locating plant, as far as is reasonably practicable, away from receptors or as close as possible to noise barriers or hoardings where these are located between the source and receptor; • Regular and effective maintenance by trained personnel shall be carried out to reduce noise and/or vibration from plant and machinery; • Ensuring that all plant is maintained regularly to comply with relevant national or international standards and operation of plant and equipment that minimises noise emissions; • Ensuring that plant is shut down when not in use; • Ensuring that air lines are maintained and checked regularly to prevent leaks; • Designing all audible warning systems and alarms to minimise noise. Nonaudible warning systems can be used in preference, i.e. cab-mounted CCTV or the use of banksmen. If required, ensure that audible warning systems are switched to the minimum setting required by the Health and Safety Authority and where

			practicable use 'white noise' reversing alarms in place of the usual 'siren' style reversing alert; • A c. 2.4m hoarding shall be provided around construction works; • Handling all materials, particularly steelwork, in a manner that minimises noise. For example, storing materials as far as possible away from sensitive receptors and using resilient mats around steel handling areas; • During construction, regular inspections will be undertaken to ensure that the noise and vibration minimising methods, plant and mitigation identified in the specimen design stage are adopted on site and are working effectively. If applicable, it is proposed that construction method inspections be integrated into any health and safety or quality surveillance regime; • A Communications Management Plan shall be prepared to provide for effective community liaison to help ensure the smooth running of construction activities and to address any issues that may arise; • Noise monitoring should be undertaken at the start of each new activity to determine the compliance with limit values. This may involve monitoring on a daily basis initially (for the first three weeks), but subject to satisfactory results, this could be relaxed to once a

			week/twice-weekly depending upon the site activities. The frequency will be increased again if particularly noisy activities (piling) are undertaken; • Continuous noise and vibration monitoring will take place at three of the nearest sensitive receptors Environmental noise monitoring will be undertaken only by suitably-trained and experienced staff;
Construction	Contractor	Archaeology, Architecture and Cultural Heritage	The contractor is required to implement the following measures in relation to archaeology, architectural and cultural heritage during construction: • A suitably qualified and experienced archaeologist shall be appointed to be responsible for matters relating to Archaeology, Architectural and Cultural Heritage; • The contractor will be required to develop appropriate procedures as part of their detail CEMP(s) and the Environmental Manager will ensure that specialists (e.g. archaeologist) are facilitated to ensure management in accordance with industry best practice and effective compliance with the relevant legislation. All unexpected discoveries will be managed as per Section 6.6 of OCEMP. • Archaeological monitoring will be carried out under licence to the Department of Housing Local

			Government and Heritage (DHLGH) and the National Museum of Ireland (NMI).
Construction	Contractor	Hydrology & Water Quality	In general, all works will be subject to a specific method statement agreed in advance. The method statement will be specific to each construction area and activity but will incorporate the following points: • To avoid water laden with silt discharging to the river, toe boards will be required around all sites; • To avoid excessive silt runoff, site clearance is not to be undertaken during wet conditions, when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours or rainfall of more than 3mm/hour is forecast within the next five days in the catchment • No long-term soil storing will be allowed within 30 m of the open water bodies or within floodplains where sufficient working areas are available within the site boundaries, which is in line with Inland Fisheries Ireland guidelines. Temporary daily soil stores are allowable to facilitate works, however soil mounds to be removed daily to a safe distance or covered. • Fuels, lubricants and hydraulic fluids for equipment used, as well as any solvents and oils etc.are to be carefully handled to avoid spillage. Properly secured against unauthorised access or vandalism and

			provided with spill containment. All staff to be trained in management of chemicals and spill response. • As far as reasonably practicable, fuelling and lubrication of equipment is not to be carried out within 100m to the open water where sufficient working areas are available within the site boundaries. Fuelling should only be undertaken in compounds with spill control measures in place. All fuel storage areas should be bunded with 110 % containment volume and should be located on hardstand areas. These measures are in line with the Inland Fisheries Ireland guidelines. • Weedkillers are not to be used. • Any spillage of fuels, lubricants of hydraulic oils is to be immediately contained, and the contaminated soil removed from the site and properly disposed of. • The washing of any plant equipment will be carried out in designated areas to prevent potentially polluting material from contaminating aquifers and soils/subsoils. • Excavations will be backfilled (daily preferably) as soon as possible to prevent any infiltration of potentially polluting compounds. • Where feasible precast concrete should be used. Where necessary to pour concrete, a dry working

			area will be created for pouring of any concrete. Raw or uncured waste concrete is not to be disposed of within 50m of the river. No washing out of concrete tankers will be allowed on any of the construction areas. • A Siltbuster or similar approved will be used where there is insufficient space on site to achieve the required clearance distances between the works and river channel. • All vehicles will be regularly checked for oil leaks and ruptured hose pipes.
Construction	Contractor	Resource and Waste Management	The contractor is required to implement the following in relation to resource and waste management during construction: • The contractor is required to prepare, implement and maintain a Construction and Demolition Waste Management Plan throughout construction that addresses the following as a minimum: • Description of the proposed development; • Wastes arising including procedures for minimisation/reuse/recycling; • Estimated cost of waste management;

			• Roles including training and responsibilities for construction and demolition waste; • Procedures for education of workforce and plan dissemination programme; • Record keeping procedures; • Waste collectors, recycling and disposal sites including copies of relevant permits or licences; and • Waste auditing protocols. • The Contractor will minimise waste disposal so far as is reasonably practicable; • Waste from the proposed development will be transported by authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations 2007 to 2016 to take into account the Waste Management (Collection Permit) (Amendment) Regulations 2016. • Waste from the proposed development will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996-2011 and the Waste Management (Collection Permit) (Amendment) Regulations 2016; • Source segregation: Where possible metal, timber, glass and other recyclable material will be segregated

			during construction works and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding, and photographs of wastes to be placed in each container as required, will be used to facilitate segregation. Where waste generation cannot be avoided this will maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental impact; • Material management: 'Just-in-time' delivery will be used so far as is reasonably practicable to minimise material wastage; • Supply chain partners: The contractor will engage with the supply chain to supply products and materials that use minimal packaging, and segregate packaging for reuse; • Waste Auditing: The contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase; • Waste fuels/oils may be generated from equipment used on-site during construction and may be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by a contractor who holds the appropriate waste collection permit;

			• Possibilities for re-use of clean non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use. Where excavation material may not be re-used within the proposed works the contractor will endeavour to send material for recovery or recycling so far as is reasonably practicable; • The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered, and which is disposed of; and • The contractor(s) will ensure that any off-site interim storage or waste management facilities for excavated material have the appropriate waste licences or waste facility permits in place.
Construction	Contractor	Material Assets	The contractor is required to implement the following measures in relation to material assets during construction: • A Property Protection Scheme will be put in place by Tipperary County Council prior to works commencing on site. This will involve advance condition surveys prior to construction for all properties within the zone of influence of the proposed development. If it is determined that any reported minor cosmetic damage

			has been caused by construction of the proposed development, suitable remedial works will be undertaken to repair the damage to the properties with the use of the appropriate conservation technique. • Access to all existing properties will be maintained at all times during the construction of the proposed development.
Construction	Contractor	Major Accidents and Natural Disasters	The contractor is required to implement the following measures in relation to major accidents and natural disasters during construction: • A final CEMP will be prepared prior to the commencement of any works and implemented during the works. The CEMP will be a live document maintained by the contractor that would work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary.

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