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APPENDIX 3

EIAR ADDENDUM

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· **EIAR Addendum**

Kildare Bridge Planning
Application





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INTRODUCTION

This addendum provides an update to the Environmental Impact Assessment Report (EIAR) previously submitted as part of the planning application for the proposed Kildare Bridge. This addendum has been completed following the request for further information issued by the Planning Authority and the below sections accordingly update the text within the EIAR.

In order to aid the reader, the updated text has been indicated in red, with removed text indicated by a strikethrough.

DESCRIPTION

Invasive Species

The introduction and/or spread of invasive species such as Japanese Knotweed and Himalayan Knotweed for example, could result in the establishment of the species and this may have knock on effects on the surrounding environs. No invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded during the initial dedicated invasive species survey. In response to a further information request a dedicated invasive species survey was carried out on the 23rd of January 2023 in line with NRA (2009) guidelines (Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes).

A single stand of Japanese Knotweed (*Fallopia Japonica*) was recorded on the northern bank of the Rye Water River, at the western boundary of the existing Kildare Bridge. A dedicated Invasive Species Management Plan (ISMP) is attached as Appendix 6 to the overall response document.

~~Appropriate control measures will be incorporated into the design and construction phase of the development to ensure that the relevant measures (outlined in the following section below) will be implemented.~~

Proposed Surface Water Drainage

Kildare Bridge Application

It is proposed that surface water run off on the **northern side of the** Kildare Bridge is to be captured by the proposed drainage features, proposed as part of the MOOR. Adequately spaced trapped road gullies, which connect to a main carrier drain under the road. The rainfall runoff on the **northern** aligning footpath and cycle track and bridge shall be intercepted by the dividing tree-lined grass verge, rainfall will be allowed to percolate to ground and/or flow via subsurface flow to the Rye Water River. Surface water attenuation will be used to control runoff from all hard surfaces in accordance with the GDSDS, with these being restricted to a maximum flow rate of 5.5 l/s/ha, which is less than the calculated greenfield runoff equivalent.

There are no proposed drainage systems proposed as part of the Kildare Bridge application. No works are proposed to the existing bridge or the existing road carriageway. The existing Kildare bridge, and R157 road to its south, is served by a series of road gullies that appear to discharge directly to a 600mm diameter public surface water sewer, which itself discharges to the Rye Water River adjacent to the Kildare Bridge.

The new section of footpath and cycle track that is to link the new bridge infrastructure to the existing pedestrian and cycle track shall drain towards the existing road and utilise the existing road drainage

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infrastructure. Initial rainfall runoff shall be intercepted by the new grass verge that is to be provided in-between.

The proposed new pedestrian / cycle track bridge that is to be provided adjacent to the upstream side of the existing Kildare Bridge shall be drained via a channel drain, such as a grated Aco Channel, concrete dish drain, or similar approved. This is achieved by super-elevating the bridge deck, with the channel drain at the lower end to convey the small volume of runoff from the new bridge deck (approx. 100m²) to the proposed filter drain that is to be provided to the north of the bridge that is to serve the realigned R157, as part of the Maynooth Outer Orbital Road (MOOR). This associated surface water drainage infrastructure (filter drain) is located on lands outside of Kildare County Council jurisdiction i.e., in County Meath and is part of the proposed surface water network that is to serve the proposed MOOR. It is noted from the new cycle/pedestrian bridge, that the filter drain provides at source pollution control, and interception of initial rainfall runoff, prior to discharging to the Rye Water River. Refer to Appendix 1 of the overall response document for drainage information.

BIODIVERSITY

Impacts during Construction

Assessment of potential effects on water quality and aquatic faunal species and habitats during construction (Section 6.7.5 of Chp.6)

Table 3-1 Assessment of the potential impact on water quality and aquatic fauna and habitats during the construction of Kildare bridge

Description of Effect	The construction of the Kildare Bridge crossing has the potential to result in the deterioration of water quality. The Rye Water River flows into the River Rye/Carton Valley SAC, located east of the proposed development site boundary. The South Dublin Bay SAC, North Dublin Bay SAC, South Dublin Bay and River Tolka Estuary SPA and North Bull Island SPA are also hydrologically connected to the proposed development site via the Blackhall Little Stream, Rye Water River & River Liffey. Taking a precautionary approach, the proposed development has the potential, in the absence of mitigation, to impact on surface water quality through pollutants including hydrocarbons, fuel and cement during the construction phase. This section assesses the potential for likely significant effects on aquatic receptors including aquatic habitats (i.e. watercourses) salmonids, lamprey, coarse fish, European eel, aquatic invertebrates, molluscs and other aquatic species identified during the desk study as likely to occur downstream of the site.
Characterisation of unmitigated effect	In the absence of best practice design and mitigation the potential impact on water quality and aquatic species is considered to be a moderate negative effect.
Assessment of Significance prior to mitigation	Significant effects on water quality could occur at a local level as a result of the construction works, should mitigation measures not be installed.
Mitigation	Mitigation measures outlined to protect water quality during the construction of the main development areas have been outlined in section 8.6.3.9 of Chapter 8 of this EIAR and are fully described in the CEMP located in Volume 3.e, Appendix 4-3. The mitigation measures are summarised below.

- > Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats.
- > A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities.
- > The silt fence will comprise a geotextile membrane that will be buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated.
- > As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales into sediment bags prior to overland discharge allowing water to percolate naturally to ground;
- > Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing;
- > A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run-off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.
- > Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- > Daily monitoring and inspections of site drainage during construction will be completed;
- > No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- > All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland is incorporated into the design of the proposed Kildare Bridge pedestrian/cycle structure upgrade works, the Blackhall Little Bridge and the Moyglare Bridge;
- > Surface water outfalls will be constructed in accordance with the measures described in Chapter 6 and 8.6.3.4.4 and subject to agreement with IFI.
- > Good construction practices such as wheel washers and dust suppression on site roads, and regular plant maintenance, which will be implemented, will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.
- > Preventative measures during construction have been incorporated into the Construction and Environmental Management Plan, which will be updated upon grant of permission and to provide any additional measures required pursuant to planning conditions and agreements with the planning authority.

Mitigation for directional drilling

- > For directional drilling the area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages.
- > Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area;
- > Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized skip before being taken off-site;
- > The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e. Clear Bore Drilling Fluid or similar will be used);

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Residual Effect following Mitigation	> The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; > This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped; > Any frac-out material will be contained and removed off-site; In the event a water pollution event arises during the construction phase of the proposed bridge installation works, a detailed escalation process has been prepared: This has been fully described in section 5.3.1.2 of this EIAR addendum and is also contained within the revised CEMP. Prior to entering the works area, all machinery and personnel entering the works area will be thoroughly disinfected. As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the River Rye Water.
	Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage: Biotic and abiotic baseline data will be gathered on the Rye Water River both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.
	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
	Potential for Cumulative Effect The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Impacts during the Operational Phase

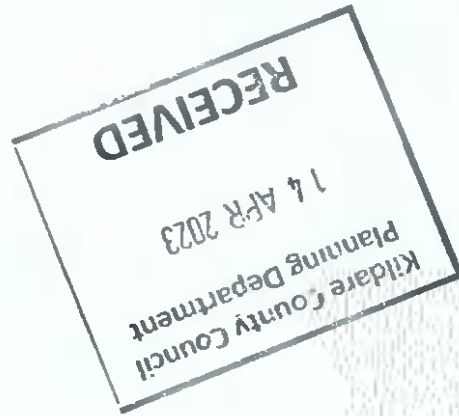
The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.5.1 of the EIAR. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. The exiting Kildare bridge is currently subject to artificial lighting via street light. As such, impacts on the local bat population as a result of lighting are not considered to be significant at any geographic scale.

Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

A full list of mitigation measures outlined to prevent surface and groundwater pollution during the operational phase of the Kildare bridge is described in section 8.6.4.13 of chapter 8.

The operational stage of Kildare Bridge application consists of the typical activities involved with public amenity along with the installation of a wastewater rising main. A full description of the mitigation measures that will be utilised to prevent pollution to surface and groundwater and aquatic fauna and habitats has been described in Section 5.3.2.1 of this document.



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- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing;
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- Good construction practices such as wheel washers and dust suppression on site roads, and regular plant maintenance, which will be implemented, will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.
- Preventative measures during construction have been incorporated into the Construction and Environmental Management Plan, which will be updated upon grant of permission and to provide any additional measures required pursuant to planning conditions and agreements with the planning authority.

Mitigation for directional drilling

- For directional drilling the area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages.
- Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area;
- Spills of drilling fluid will be cleaned up immediately and stored in an adequately sized skip before being taken off-site;
- The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar) will be used;

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Residual Effect following Mitigation	➤ The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; ➤ This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped; ➤ Any frac-out material will be contained and removed off-site; In the event a water pollution event arises during the construction phase of the proposed bridge installation works, a detailed escalation process has been prepared: This has been fully described in section 5.3.1.2 of this EIAR addendum and is also contained within the revised CEMP. Prior to entering the works area, all machinery and personnel entering the works area will be thoroughly disinfected. As part of the application process, Inland Fisheries Ireland were consulted regarding the proximity of the works to the River Rye Water.
	Prior to the commencement of any construction work associated with the development, the following pre-construction survey work will be undertaken to satisfy the recommendations outlined by IFI during consultation stage: Biotic and abiotic baseline data will be gathered on the Rye Water River both close to the development site and at a distance away from the site. Gathering this data will allow for a comparison between the current situation and that which may develop during the construction or operational phase.
	With the implementation of the prescribed mitigation measures, no significant effects are predicted.
	Potential for Cumulative Effect The proposed development will not result in any significant effects to water quality. It therefore cannot contribute to any significant cumulative effect in this regard.

Impacts during the Operational Phase

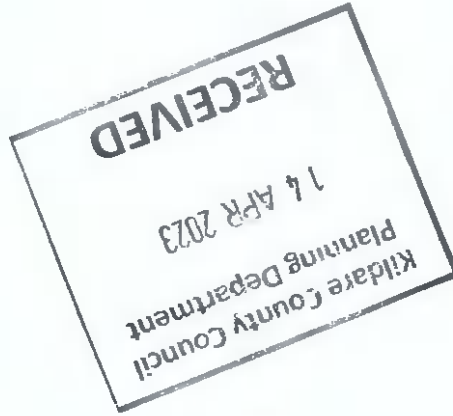
The surveys undertaken have identified that the site of the proposed development and the surrounding is used by a range of common bird species, small mammal and invertebrate species and provides biodiversity in the local context. Direct disturbance resulting from the operation of the proposed development has been assessed and the potential for effect is the same as for construction disturbance and thus the finding of the assessment is provided in section 6.7.5.1 of the EIAR. This assessment is not repeated here but the conclusion that, following the mitigation described, there will be no significant residual impacts on faunal species are anticipated as a result of disturbance.

Local faunal species are likely to be habituated to anthropogenic activity in the area, given the developments close proximity to busy local roads and nearby residential housing. The existing Kildare bridge is currently subject to artificial lighting via street light. As such, impacts on the local bat population as a result of lighting are not considered to be significant at any geographic scale.

Impacts on fauna as a result of disturbance during the operational phase are not considered to be significant at any geographic scale.

~~A full list of mitigation measures outlined to prevent surface and groundwater pollution during the operational phase of the Kildare bridge is described in section 8.6.4.13 of chapter 8.~~

The operational stage of Kildare Bridge application consists of the typical activities involved with public amenity along with the installation of a wastewater rising main. A full description of the mitigation measures that will be utilised to prevent pollution to surface and groundwater and aquatic fauna and habitats has been described in Section 5.3.2.1 of this document.



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LAND SOILS & GEOLOGY

Subsoil Excavation and Bedrock Excavation

Excavation of subsoil will be required for the installation of piled foundations and reinforced earth abutments. The excavation of bedrock will be required for the installation of the wastewater rising main beneath the Rye Water River.

The excavation of existing road materials will also occur in the installation of the wastewater infrastructure which will travel along the existing public road.

This will result in a permanent loss of subsoil excavation locations. The soil and subsoil deposits at the site could be classified as of "Low" importance as neither are unique nor abundant in the wider landscape.

Pathway: Extraction/excavation/drilling.

Receptor: Land, topsoil, subsoil, existing road network.

Potential Pre-mitigation Impact: Negative, slight/moderate, direct, likely, permanent impact on subsoil and bedrock.

Mitigation Measures

- > Excavated (existing) overburden material will be reused on site, where possible;
- > A minimal volume of topsoil and subsoil will be removed to allow for infrastructural work to take place due to optimisation of the layout by mitigation by design; and,
- > Construction of service trenching, and surface water attenuation features will generate excess material, and any excess material will be used locally within the site for achieving building formation levels and landscaping.
- > Any spoil generated which will be removed offsite will be done so in accordance with the relevant regulations and best practice including waste management legislation if the material is considered a waste or a by-product.
- > Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.
- > The area around the Clear Bore™ batching, pumping and recycling plants shall be bunded using terram and sandbags in order to contain any spillages;
- > One or more lines of silt fences shall be placed between the works area and adjacent rivers and streams on both banks;
- > The area around the Clear Bore™ batching, pumping and recycling plants shall be bunded using terram and sandbags in order to contain any spillages;
- > One or more lines of silt fences shall be placed between the works area and adjacent rivers and streams on both banks;
- > Accidental spillage of fluids shall be cleaned up immediately and transported off site for disposal at a licensed facility; and,
- > Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

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Residual Impact

Due to the shallow nature of the excavations, the design and mitigation measures to reuse excavated materials onsite and the 'low' value of the soil and rock resource the magnitude of the effect is considered to be a negative, direct, slight, likely, permanent impact on topsoil, subsoils.

Significance of Effects

For the reasons outlined above, no significant effects on land, topsoil, subsoils or bedrock will occur.

Operational Phase

Kildare Bridge Application

Due to the nature of the Kildare Bridge application, no impacts on soils and geology are anticipated during the operational phase. The operational stage of Kildare Bridge application consists of the typical activities involved with public amenity along with the installation of a wastewater rising main and will not involve further disturbance to the topsoil, subsoils and geology of the area.

Potential Impacts due to Rising Main Failure

The use of rising mains is standard common practice throughout the country for the carrying of wastewater.

A potential failure is the failure of the pump system. Pumping systems have standby capacity in order to ensure the discharge of wastewater can continue to occur. Wastewater will be contained within the rising main and therefore no pollution of watercourses would occur. Release of wastewater/effluent from the failure of the rising main has the potential to impact on bedrock geology if standards and conditions are not adhered to. Impacts on bedrock geology quality could affect fish stocks and aquatic habitats through contamination of the groundwater.

Pathway: Bedrock Geology.

Receptor: Down-gradient SAC, aquatic habitats and species, dependant ecosystems, bedrock geology.

Pre-mitigation Effect: The potential for a failure to occur is unlikely, however in the event of a failure there is the potential for a negative, significant, direct, temporary, likely effect to surface water quality. Negative, slight, direct, temporary, likely effect to local groundwater.

Mitigation by Design

The design and construction of the wastewater infrastructure at Kildare Bridge will be in accordance with Irish Water code of practice and standards as highlighted in Appendix 4-9 of the EIAR, which is likely to mitigate any potential impacts during the operational phase.

The installation of the rising main will result in a continuous, sealed high density polyethylene pipe which will include air valves and scour vales on either side of the river crossing, enabling the potential to flush the system.

The construction methodology proposed is aligned with Irish Waters proposals for Wastewater Below Ground Capital Maintenance programme, which is described as:



'Provision for Capital Maintenance programmes covering capital maintenance of collection system assets (sewers, rising mains and pumping stations). These programmes target the replacement of failing assets and interventions are prioritised based on outputs of a risk assessment process. The programme will reduce the incidents of equipment failures, blockages, pipe collapses and the resultant flooding and pollution incidents'

Post-Mitigation Residual Effect: Direct, negative, neutral, temporary, likely effect. Proven and effective design measures to ensure the quality and integrity of the rising main will be employed. The residual effect will be - Neutral, indirect, long term, likely effect on the bedrock.

Significance of Effects: No significant effects on soil, bedrock geology, associated aquatic habitats and species will occur during the operational phase of the Proposed Development.

No cumulative impacts on the land, soils and geology environment are envisaged during the operational stage.

HYDROLOGY & HYDROGEOLOGY

Scoping and Consultation

The scope for this chapter of the EIAR has also been informed by consultation with statutory consultees, bodies with environmental responsibility and other interested parties. This consultation process is outlined in Section 2.6 of this EIAR. Issues and concerns highlighted with respect to the hydrological and hydrogeological environment are summarised in Table 8-1 below.

Table 5-1 Summary of Water Environment related Scoping Responses

Consultee	Description	Addressed in Section
Geological Survey of Ireland (GSI)	Recommended use of Groundwater Data Viewer to identify areas of High to Extreme Vulnerability and 'Rock near or at surface'.	8.3.1 & 8.4.4 The Groundwater Data Viewer was used during the desk study of the and has been used for the assessment. As outlined in Section 8.3.1 below.
Health Service Executive (HSE)	- Any natural flood plains or wetlands on or in the vicinity of the Proposed Development should be identified and measures implemented to ensure they are protected from the development. - The impact the Proposed Development could have on watercourses further downstream should be identified and assessed. - An integrated approach to surface water management should be implemented on site. - It is recommended that green space and nature-based solutions are provided for the storage and conveyance of rainwater	8.4.3 & 8.5.1 The recommendations set out by the HSE have been taken into account in the project design and EIAR & NIS.

Consultee	Description	Addressed in Section
	on site to improve flood mitigation as outlined in the Greater Dublin Strategic Drainage Study (SUDS).	
Inland Fisheries Ireland (IFI)	- The Liffey Catchment is regarded as a very important fishery and so requests due consideration to the catchment area. - A buffer zone of 10 meters (minimum) is requested between the Rye Water River and the Proposed Development. - The Blackhall Little Stream which runs through the middle of the site should not be altered or disturbed, and again a buffer zone is requested. - Riparian vegetation should be left undisturbed as much as possible. - Best practice is recommended at all times in relation to activities that may impact surface waters. - Comprehensive surface water management measures must be implemented.	1. 8.4.3.2, 6.4.2& 8.5.1 The project design has taken account of and implemented the IFI requests.
Department of Agriculture, Food & the Marine	Following initial scoping and consultation the department made no observations or raised any concerns related to the Proposed Development	N/A
Irish Water (IW)	No response received at the time of report issue.	N/A
Meath County Council, Water Services	No response received at the time of report issue.	N/A
National Parks and Wildlife Services (NPWS)	No response received at the time of report issue.	N/A
Waterways Ireland	- Waterways Ireland were engaged in relation to the proposed development at the Moyglare Bridge in response to the FI Item 28. Details of the proposed development were presented to Waterways Ireland on the 20th February 2023, who were welcomed to comment on the proposed development, in particular the bridge design and clearance proposed. - Waterways Ireland responded to the request on the 23rd February 2023. Waterways Ireland noted that the proposed development is not within their	RFI Response Letter 

Consultee	Description	Addressed in Section
	zone of influence and will not be commenting.	

Proposed Development Services

Proposed Surface Water Site Drainage

The proposed surface water drainage layout and design details for the Proposed Development is shown on OCSC drawings, Engineering Services Report, See Volumes 3a, 3b & 3c(i) Appendix 4-9 and the MOOR Preliminary Design Report in Volume 3d, Appendix 4-6 of this ELAR.

Surface water management for the Proposed Development is designed to comply with the Greater Dublin Strategic Drainage Study (GSDSDS) policies and guidelines and the requirements of Meath County Council. The surface water design includes for a climate change factor of 20%

It is proposed that surface water within Site A (from roads, roofs and hardstanding areas) will drain via gravity, and via hydrocarbon interceptors, and infiltration area/attention storage areas, to an existing ditch along the southern boundary, which is to be replaced by a new filter trench as part of the upgraded and re-aligned R157. This drain conveys surface water runoff in a southerly direction, ultimately towards the Rye Water River at the proposed outfall location described below.

It is proposed that surface water within Site B (from roads, roofs and hardstanding areas) will drain via gravity, and via hydrocarbon interceptors, and infiltration area/attention storage (located in the shared carpark at Site B), to an outfall at the Rye Water River, just west of the Kildare Bridge.

It is proposed that surface water within Site C (from roads, roofs and hardstanding areas) will drain via gravity to hydrocarbon interceptors, and infiltration area/attention storage. The surface water network is to be split into a number of catchments in order to best integrate Sustainable drainage Systems. Each sub-catchment will look to provide treatment to surface water runoff at source or through design. All runoff will be directed to the Blackhall Little and the Rye Water River.

The main Site A, Site B and Site C attenuation systems will comprise underground poly-tunnel systems, to be located within the Proposed Development's green spaces in Site A and within the shared carpark area of Site B and within the public open spaces in Site C with adequate drainage to maintain functionality.

The discharge rates for both Site A and Site B are to be restricted to a flow rate less than the current greenfield equivalent runoff rate, to ensure that there is no increase in flow rates and volumes to be discharged from the Proposed Development to the receiving infrastructure and waterbodies. Therefore, there will be no adverse impact on adjoining and other downstream properties.

The discharge rate for Site C is to be restricted to a maximum flow rate which is less than greenfield equivalent runoff rate, to ensure that there is no increase in flow rates and volumes to be discharged from the Proposed Development to the receiving infrastructure and waterbodies. Therefore, there will be no adverse impact on adjoining and other downstream properties.

It is proposed that surface water run off on the MOOR is to be captured by adequately spaced trapped road gullies, which connect to a main carrier drain under the road. The rainfall runoff on the aligning footpath and cycle track shall be intercepted by the dividing tree-lined grass verge, with excess runoff only being collected by the road's gully network. Surface water attenuation will be used to control runoff from all hard surfaces in accordance with the GSDSDS, with these being restricted to a maximum flow rate which is less than the calculated greenfield runoff equivalent.

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There are no proposed drainage systems proposed as part of the Kildare Bridge application no works are proposed to the existing bridge or road carriageway. The existing Kildare bridge, and R157 road to its south, is served by a series of road gullies that appear to discharge directly to a 600mm diameter public surface water sewer, which itself discharges to the Rye Water River adjacent to the Kildare Bridge.

The new section of footpath and cycle track that is to link the new bridge infrastructure to the existing pedestrian and cycle track shall drain towards the existing road. Initial rainfall runoff shall be intercepted by the new grass verge that is to be provided in-between.

The proposed new pedestrian / cycle track bridge that is to be provided adjacent to the upstream side of the existing Kildare Bridge shall be drained via a channel drain, such as a grated Aco Channel, concrete dish drain, or similar approved. This is achieved by super-elevating the bridge deck, with the channel drain at the lower end to convey the small volume of runoff from the new bridge deck (approx. 100m²) to the proposed filter drain that is to be provided to the north of the bridge that is to serve the realigned R157, as part of the Maynooth Outer Orbital Road (MOOR). This associated surface water drainage infrastructure (filter drain) is located on lands outside of Kildare County Council jurisdiction i.e., in County Meath and is part of the proposed surface water network that is to serve the proposed MOOR. It is noted that the filter drain provides at source pollution control, and interception of initial rainfall runoff from the new cycle/pedestrian bridge, prior to discharging to the Rye Water River.

Various other SuDS (sustainable drainage systems) have been incorporated into the surface water drainage design of the Proposed Development including permeable pavements, swales, hydrocarbon interceptors, rainwater harvesting systems, and downstream attenuation/infiltration.

The surface water network, attenuation storage and site levels are designed to accommodate a 100-year storm event and includes climate change provision. Floor levels of buildings are set above the 100-year flood levels by a minimum of 0.5m for protection.

Run-off rates from the site are controlled by vortex flow control devices. Surface water management proposals for the development also incorporate the following elements to reduce impacts on downstream water quality:

- The proposed drainage systems have been designed in accordance with GSDS requirements;
- The proposed drainage systems have incorporated
 - SuDS features, e.g. permeable paving in high risk parking areas;
 - Rainwater harvesting systems are also proposed at each office building to re-use the collected rainwater for welfare facilities, or landscaping purposes and reduce the overall volume of rainfall runoff entering the surface water network.
- On-line attenuation/infiltration facilities with a petrol separator prior to discharge to local watercourses and existing drainage network.



Likely, Significant Impacts and Mitigation Measures

Kildare Bridge (Construction Phase)

Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Waters

Construction phase activities including service trench construction, levelling/construction and bridge foundation excavation ~~as well as directional drilling which~~ will require earthworks resulting in removal of vegetation cover and excavation of any minor local pockets of organic soil/subsoils, and bedrock. Such excavations will be relatively shallow and temporary. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. ~~and free-out from directional drilling.~~

Much of the surface water generally percolates to shallow ground and discharges via shallow subsurface flow to the Rye Water River and this will likely continue during the construction phase. The construction activities have the potential to result in the release of suspended solids to this local drainage feature and could potentially result in an increase in the suspended sediment load, resulting in increased turbidity which, in turn, could affect the water quality and fish stocks of the Rye Water River and downstream water bodies, such as the Rye Water Valley/ Carton SAC. Potential impacts are potentially significant if not mitigated against.

Pathways: Drainage and surface water discharge routes.

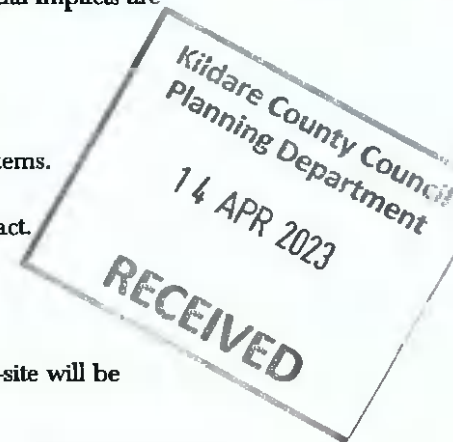
Receptors: Down-gradient watercourses (Rye Water River) and dependant ecosystems.

Pre-Mitigation Potential Impact: Direct, negative, moderate, short-term, likely impact.

Proposed Mitigation Measures

Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work as follows:

- Silt fencing will be constructed around the construction footprint, where there is a surface water receptor, in order to create a defined perimeter for the proposed works, leaving a natural vegetation buffer between the construction footprint (other than operational surface water outfall installations which are described below) and surface water receptors and associated riparian habitats.
- A silt fence will also be attached to solid boundary fencing where it is in place and where there is a surface water receptor. This will protect the stream from any potential sediment laden surface water run-off generated during construction activities.
- The silt fence will comprise a geotextile membrane that will be buried beneath the ground to filter any run-off that may occur as a result of the proposed works. The silt fence will be monitored throughout the proposed works and will remain in place after the works are completed and until the exposed earth has re-vegetated.
- As construction advances there may be a requirement to collect and treat surface water within the site. This will be completed using perimeter swales at low points around the construction areas, and if required water will be pumped from the swales



into sediment bags prior to overland discharge allowing water to percolate naturally to ground;

- Discharge onto ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge area from silt bags will be enclosed by a perimeter of double silt fencing;
- A suitably sized detention basin or settlement area will be installed at the lowest point before discharge to ground where excess run-off must leave the site. Silt curtains or earth berms will be used to channel run-off to locations where it can be controlled. These may take the form of an open detention area or, where the need arises, a portable skip/s, or similar, where inflow passes through straw bales, gravel etc.
- Any proposed discharge area will avoid potential surface water ponding areas, and will only be located where suitable subsoils are present;
- Daily monitoring and inspections of site drainage during construction will be completed;
- No instream works will take place outside the period July 1st – September 31st in line with Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland is incorporated into the design of the proposed Kildare Bridge pedestrian/cycle structure upgrade works;
- Surface water outfalls will be constructed in accordance with the measures described in Chapter 6 and 8.6.3.4.4 and subject to agreement with IFI.
- Good construction practices such wheel washers and dust suppression on site roads, and regular plant maintenance, which will be implemented, will ensure minimal risk. The Construction Industry Research and Information Association (CIRIA) provide guidance on the control and management of water pollution from construction sites ('Control of Water Pollution from Construction Sites, guidance for consultants and contractors', CIRIA, 2001), which provides information on these issues. This will ensure that surface water arising during the course of construction activities will contain minimum sediment.
- Preventative measures during construction have been incorporated into the Construction and Environmental Management Plan, which will be updated upon grant of permission and to provide any additional measures required pursuant to planning conditions and agreements with the planning authority.
- ~~➤ For directional drilling the area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages.~~
- ~~➤ Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area;~~
- ~~➤ Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off site;~~
- ~~➤ The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);~~
- ~~➤ The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;~~
- ~~➤ This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;~~
- ~~➤ Any free out material will be contained and removed off-site;~~

Residual Impact

The works area will be set back from the Rye Water River wherever possible (limiting the potential source of sediments) and a silt fence will be in place to break the pathway between the works area and the watercourse (receptor). Subject to the implementation of the listed mitigation measures the residual impact will be a negative, indirect, imperceptible and short term.

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Significance of Effects

For the reasons outlined above, no significant effects on the surface water quality are anticipated following implementation of proposed mitigation measures.

53.112 **Potential impacts from Pipework Installation (Horizontal Directional Drilling)**

The installation of a rising main during the construction phase and the release of sediment has the potential to impact on groundwater and surface waters.

Pathway: Groundwater and Surface Water flowpaths.

Receptor: Down-gradient SAC, dependant ecosystems, groundwater quality and surface water quality.

Pre-mitigation Potential Impact: Direct, negative, significant, temporary, likely impact.

Proposed Mitigation Measures

- > Silt fencing measures as described above will be installed.
- > For directional drilling the area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages.
- > Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area;
- > Spills of drilling fluid will be clean up immediately and stored in an adequately sized skip before been taken off-site;
- > The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);
- > The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;
- > This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;
- > Any frac-out material will be contained and removed off-site;

Residual Effects

With the application of the best practice mitigation outlined above, the residual effect will be – Negative, imperceptible, direct, long term, unlikely effect on groundwater and surface water quality.

53.12 **Potential Pollution Event on receiving waterbodies.**

In absence of mitigation or a pollution prevention plan in the event of an unforeseen pollution event during the construction phase, the potential for pollution of the Rye Water River would result in a significant effect on the aquatic species within the watercourse.

Pathways: Drainage and surface water discharge routes.

Receptors: Watercourses (Rye Water River) and dependant ecosystems and aquatic species.

Pre-Mitigation Potential Impact: Direct, negative, moderate, short-term, likely impact.



Proposed Mitigation Measures

The implementation of mitigation measures set out in Section 8.6.3.10 of the ELAR will ensure no adverse impact on receiving waterbodies will occur.

A detailed Pollution Prevention Plan will be prepared prior to construction of the development which will be put in place by the appointed contractor. The Plan shall include the provision of a Schedule of Works Operation Record (SOWOR) which is a means of monitoring works during construction but also determining whether the necessary conditions and mitigation measures are in place prior to the commencement of construction works. Further details on the SOWOR are provided in the revised Kildare Bridge CEMP.

An Emergency Response Plan is included within the CEMP for use in the event of a pollution incident. In the event of an environmental emergency the construction manager will carry out the following in the event of the emergency situations occurring.

- Make the area safe if possible and ensure that there is no identifiable risk exists with regard to dealing with the situation e.g. if a machine has turned over, ensure that it is in a safe position so as not to endanger others before assisting the injured.
- Contact the required emergency services or delegate the task to someone if he is unable to do so. If delegating the task, ensure that they follow procedures for contacting the emergency services.
- Take any further steps that are deemed necessary to make safe or contain the emergency incident.
- Contact any regulatory body or service provider as required.
- Contact the next of kin of any injured personnel where appropriate.

In the event of a fuel spill occurring, the following control measures provide the procedure to be followed to avoid any escalation of such an incident.

- The contractors Emergency Response Procedure will be required to include details of the fuel spillage/clean up team and procedure. This is to be displayed on site and communicated to all personnel during the Environmental Toolbox Talks
- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, such as containment booms, track mats or other material as required.
- The containment boom should be placed within the watercourse to contain and capture the fuel on the surface of the watercourse and to prevent pollutants travelling downstream
- Do not spread or flush away the spill.
- If possible, cover or block any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- Once the spill has been contained, efforts to remove the pollutants can begin.
- If possible, clean up as much as possible using the spill control materials. The spill kit should contain several forms of hydrophobic absorbant materials such as pillows, pads, loose pulp and granular material.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Environmental Clerk of Works immediately giving information on the location, type and extent of the spill so that they can take appropriate action.

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- The ECoW will inspect the site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.
- The Construction Manager will notify the appropriate regulatory body such as Kildare County Council, Meath County Council, Inland Fisheries Ireland, National Parks and Wildlife Service, etc. if deemed necessary.

In the event of sediment run off entering the watercourse, the following control measures provide the procedure to be followed to avoid any escalation of such an incident.

- Stop the source of the sediment entering the watercourse and raise the alarm to alert people working in the vicinity of any potential dangers.
- Contain the sediment using the physical barriers such as a boom or silt curtains/fencing, or other material as required.
- If possible, cover or block off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, dam the watercourse and deploy a pump and silt bag in order to remove the silt before allowing the water to re-enter the watercourse downstream.
- A mobile settlement tank should be on hand in the event of an emergency which can be deployed at short notice.
- The provision of emergency settlement ponds should be used where appropriate. Settlement ponds can be excavated and in place where water can be diverted to in the event of sediment run off entering the watercourse.
- If possible, clean up as much loose sediment which is in the vicinity of the watercourse.
- Notify the ECoW immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The ECoW will inspect the site and will assist by providing any advice possible to ensure the necessary measures are in place to contain and clean up the sediment and prevent further run-off from occurring.
- The Construction Manager will notify the appropriate regulatory body such as Kildare County Council, Meath County Council, Inland Fisheries Ireland, National Parks and Wildlife Service, etc. if deemed necessary.

In the event of riverbank instability or failure during the construction phase, which has the potential to cause siltation as a result of the bank collapsing and solid material entering the watercourse, the following control measures provide the procedure to be followed to avoid any escalation of such an incident.

- Bank instability or collapse should be contained with the use of an excavator which will be used to remove the bank material from the watercourse swiftly.
- Contain the sediment with the use of physical barriers downstream of the incident such as silt curtains and fencing.
- If possible, dam the watercourse and deploy a pump and silt bag in order to remove the silt before allowing the water to re-enter the watercourse downstream.
- Bank restoration or containment will be undertaken as advised by the project engineer or geotechnical specialist in consultation with the project ecologist.
- The ECoW will inspect the site and will assist by providing any advice possible to ensure the necessary measures are in place to restore the bank and clean up the sediment to prevent further run-off from occurring.
- The Construction Manager will notify the appropriate regulatory body such as Kildare County Council, Meath County Council, Inland Fisheries Ireland, National Parks and Wildlife Service, etc. if deemed necessary.



Residual Impact

The mitigation outlined above, will in the first instance limit and prevent any pollution entering the watercourse through the use of silt fencing in place, breaking the pathway of pollution between works on the bank and the watercourse (receptor). The pollution prevention plan and emergency response plan are in place in the unforeseen event of any pollution entering the watercourse. The plans outline the procedure to control, contain and clean up the pollution within the watercourse and therefore negating any potential impacts on aquatic species downstream of the works area. Subject to the implementation of the listed mitigation measures the residual impact will be a negative, indirect, imperceptible and short term.

Significance of Effects

For the reasons outlined above, no significant effects on the surface water quality are anticipated following implementation of proposed mitigation measures.

Kildare Bridge (Operational Phase)

Potential Impacts due to Rising Main Failure

The use of rising mains is standard common practice throughout the country for the carrying of wastewater.

A potential failure is the failure of the pump system. Pumping systems have standby capacity in order to ensure the discharge of wastewater can continue to occur. Wastewater will be contained within the rising main and therefore no pollution of watercourses would occur.

Release of wastewater/effluent from the failure of the rising main, associated with a crack in the main, has the potential to impact on groundwater and surface water quality if standards and conditions are not adhered to. Impacts on surface water quality could affect fish stocks and aquatic habitats.

Pathway: Groundwater and surface water quality.

Receptor: Down-gradient SAC, aquatic habitats and species, dependant ecosystems, groundwater quality and surface water quality.

Pre-mitigation Effect: The potential for a failure to occur is unlikely, however in the event of a failure there is the potential for a negative, significant, direct, temporary, likely effect to surface water quality. Negative, slight, direct, temporary, likely effect to local groundwater.

Mitigation by Design

The design and construction of the wastewater infrastructure at Kildare Bridge will be in accordance with Irish Water code of practice and standards as highlighted in Appendix 4-9 of the EIAR, which is likely to mitigate any potential impacts during the operational phase.

The installation of the rising main will result in a continuous, sealed high density polyethylene pipe which will include air valves and scour vales on either side of the river crossing, enabling the potential to flush the system.

The construction methodology proposed is aligned with Irish Waters proposals for Wastewater Bellmouth Ground Capital Maintenance programme, which is described as:



'Provision for Capital Maintenance programmes covering capital maintenance of collection system assets (sewers, rising mains and pumping stations). These programmes target the replacement of failing assets and interventions are prioritised based on outputs of a risk assessment process. The programme will reduce the incidents of equipment failures, blockages, pipe collapses and the resultant flooding and pollution incidents'

Post-Mitigation Residual Effect: Direct, negative, neutral, temporary, unlikely effect. Proven and effective design measures to ensure the quality and integrity of the rising main will be employed. The residual effect will be - Neutral, indirect, temporary, likely effect on down gradient streams/rivers.

Significance of Effects: No significant effects occur during the operational phase of the Proposed Development.

