5 ASSESSMENT OF THE RESIDUAL EFFECTS OF THE PROPOSED FLOOD RELIEF SCHEME ON EUROPEAN SITES FOLLOWING IMPLEMENTATION OF MITIGATION

The sections provided below detail the site-specific residual impact assessment in relation to the relevant QIs and SCIs of the above EU sites in light of their site-specific targets and attributes.

5.1 RIVER MOY SAC (002298)

5.1.1 Alluvial forests with Alnus glutinosa and Fraxinus excelsior (91E0)*

The conservation objective for Alluvial forests with Alnus glutinosa and Fraxinus excelsior (91E0)*is:

'To maintain the favourable conservation condition of Alluvial forests with *Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)* in River Moy SAC'

The attributes and targets Alluvial forests with Alnus glutinosa and Fraxinus excelsior (91E0)*as per the Site Specific Conservation Objectives (SSCOs) for River Moy SAC (NPWS Version 1 2016) and an assessment of the proposed development against the nominated attributes and targets for the species is provided in Table 5.1 below

Attribute	Target	Assessment
Habitat area	Area stable or increasing, subject to natural processes	The proposed flood relief scheme will not result in any direct effects on this habitat type within the SAC. There is no potential for it to result in any adverse effects on this Qualifying Interest in terms of habitat area, distribution or size.
Habitat distribution	No decline	
Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25ha in size and "small" woods at least 3ha in size	
Woodland Structure: Cover and height	Diverse structure with a relatively closed canopy containing mature trees; sub canopy layer with semi mature trees and shrubs and well-developed herb layer	The proposed flood relief scheme will not have any direct effect on this habitat type. Any indirect effects that could potentially have resulted in an effect on woodland structure, community diversity and natural regeneration through pollution of the woodland floor, have been avoided through the design of the scheme and the implementation of mitigation measures to avoid pollution. These measures are fully described in Appendix III. There is no potential for the proposed development to result in any adverse effects on this Qualifying Interest.
Woodland Structure: community diversity and extent	Maintain diversity and extent of community types	
Woodland Structure:	Seedlings, saplings and pole age-classes occur in	

Attribute	Target	Assessment
natural regeneration	adequate proportions to ensure survival of woodland canopy	
Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation	Extensive modelling has been carried out to demonstrate that the proposed flood relief scheme will not result in any significant effect on the hydrological regime within the River Deel and will not affect the hydrological regime necessary for the maintenance of alluvial vegetation. All areas of alluvial that currently flood more than once every approximately 5 years will continue to flood.
Woodland Structure: dead wood	At least 30m^3/ha of fallen timber greater than 10cm diameter; 30 snags/ha (standing dead wood); both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder)	The proposed flood relief scheme will not result in any direct effects on this habitat type within the SAC. There is no potential for it to result in any adverse effects on this Qualifying Interest in terms of proportion of dead wood. or veteran trees
Woodland Structure: veteran trees	No decline	
Vegetation structure: Indicators of local distinctiveness	No decline. Native tree cover not less than 95%	The proposed flood relief scheme will not have any direct effect on this habitat type. Any indirect effects that could potentially have resulted in an effect on vegetative composition and/or structure have been avoided through the design of the scheme and the implementation of mitigation measures to avoid pollution. These measures are fully described in Appendix III. There is no potential for the proposed development to result in any adverse effects on this Qualifying Interest.
Vegetative composition: Typical species	A variety of typical native species present, depending on woodland type, including alder (*Alnus glutinosa*), willows (*Salix* spp) and, locally, oak (*Quercus robur*) and ash (*Fraxinus excelsior*)	
Vegetative Composition: negative indicator species	Negative indicator species, particularly non native invasive species, absent or under control.	

*Table 5.1 Targets and attributes associated with nominated site-specific conservation objectives for Alluvial forests with Alnus glutinosa and Fraxinus excelsior (91E0)**

5.1.2 Whiteclawed Crayfish *(Austropotamobius pallipes)* [1092]

The conservation objective for White clawed Crayfish (Austropotamobius pallipes) is:

'To maintain the favourable conservation condition of White-clawed Crayfish in River Moy SAC'

The attributes and targets Whiteclawed Crayfish (Austropotamobius pallipes) as per the Site Specific Conservation Objectives (SSCOs) for River Moy SAC (NPWS Version 1 2016) and an assessment of the proposed development against the nominated attributes and targets for the species is provided in Table 5.2 below.

Attribute	Target	Assessment
Distribution	No reduction from baseline.	The proposed development has been specifically designed to avoid any habitat loss or barriers to distribution of this species. The specific methods by which the scheme will be constructed to avoid habitat loss and barriers to distribution are provided in Appendix III
Population structure: recruitment	Juveniles and/or females with eggs in all occupied tributaries	Measures are in place to avoid any direct adverse effects on this species with instream works limited to the construction of the flow control structure and a protocol in place for removing and relocating any crayfish that may be present, under licence prior to any such works being undertaken.
Negative indicator species	No alien crayfish species	Strict biosecurity protocols are in place to ensure that there is no potential for the proposed works to result in the introduction or spread of either alien crayfish species or disease. These protocols are provided in Appendix III
Disease	No instances of disease	
Water quality	At least Q3-4 at all sites sampled by EPA	The proposed scheme has been designed to avoid any effects on water quality. The specific measures that are in place to ensure that there is no impact on water quality are fully described in Appendix III
Habitat quality: heterogeneity	No decline in heterogeneity or habitat quality	The proposed development has been specifically designed to avoid any loss of deterioration of habitat for this species. The habitats at the flow control structure will be replaced following completion of construction.

Table 5.2 Targets and attributes associated with nominated site-specific conservation objectives for Whiteclawed Crayfish (Austropotamobius pallipes) [1092]

5.1.3 Sea Lamprey (*Petromyzon marinus*) [1095]

The conservation objective for Sea Lamprey (Petromyzon marinus) is:

'*To maintain the favourable conservation condition of Sea Lamprey in River Moy SAC*'

The attributes and targets for Sea Lamprey (Petromyzon marinus) is: as per the Site Specific Conservation Objectives (SSCOs) for River Moy SAC (NPWS Version 1 2016) and an assessment of the proposed development against the nominated attributes and targets for the species is provided in Table 5.3 below.

Attribute	Target	Assessment
Distribution: extent of anadromy	Greater than 75% of main stem length of rivers accessible from estuary	The proposed development has been specifically designed so as not to result in any barrier to migration of any aquatic species during construction or operation
Population structure of juveniles	At least three age/size groups present	The proposed development has been specifically designed to avoid any loss of habitat for this species. In addition, the proposed scheme has been designed to avoid any effects on water quality. The specific measures that are in place to ensure that there is no impact on water quality are fully described in Appendix III and will ensure that there is no deterioration in juvenile or adult lamprey habitat as a result. Any instream works will be undertaken in the period from July to September inclusive to avoid the sensitive spawning period for this species. Similarly, following extensive modelling, it has been concluded that there will be no appreciable effect on the hydrological regime in the River Deel, that could result in deterioration of lamprey habitat.
Juvenile density in fine sediment	Mean catchment juvenile density at least 1/m²	
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	
Availability of juvenile habitat	More than 50% of sample sites positive	

Table 5.3 Targets and attributes associated with nominated site-specific conservation objectives for Sea Lamprey (Petromyzon marinus) [1095]

5.1.4 Brook Lamprey (*Lampetra planeri*) [1096]

The conservation objective for Brook Lamprey (Lampetra planeri) is:

'*To maintain the favourable conservation condition of Brook Lamprey in River Moy SAC*'

The attributes and targets for large shallow inlets and bays as per the Site Specific Conservation Objectives (SSCOs) for River Moy SAC (NPWS Version 1 2016) and an assessment of the proposed development against the nominated attributes and targets for the species is provided in Table 5.4 below.

Attribute	Target	Assessment
Distribution	Access to all watercourses down to first order streams	The proposed development has been specifically designed so as not to result in any barrier to migration of any aquatic species during construction or operation
Population structure of juveniles	At least three age/size groups of brook/river lamprey present	The proposed development has been specifically designed to avoid any loss of habitat for this species. In addition, the proposed scheme has been designed to

Attribute	Target	Assessment
Juvenile density in fine sediment	Mean catchment juvenile density of brook/river lamprey at least 2/m²	avoid any effects on water quality. The specific measures that are in place to ensure that there is no impact on water quality are fully described in Appendix III and will ensure that there is no deterioration in juvenile or adult lamprey habitat as a result. Any instream works will be undertaken in the period from July to September inclusive to avoid the sensitive spawning period for this species. Similarly, following extensive modelling, it has been concluded that there will be no appreciable effect on the hydrological regime in the River Deel, that could result in deterioration of lamprey habitat.
Extent and distribution of spawning habitat	No decline in extent and distribution of spawning beds	
Availability of juvenile habitat	More than 50% of sample sites positive	

Table 5.4 Targets and attributes associated with nominated site-specific conservation objectives for Brook Lamprey [1096]

5.1.5 Atlantic Salmon (*Salmo salar*) [1106]

The conservation objective for Salmon (Salmo salar) [1106] is:

'To maintain the favourable conservation condition of Salmon in River Moy SAC'

The attributes and targets for reefs as per the Site Specific Conservation Objectives (SSCOs) for River Moy SAC (NPWS Version 1 2016) and an assessment of the proposed development against the nominated attributes and targets for the species is provided in Table 5.5 below.

Attribute	Target	Assessment
Distribution	Access to all watercourses down to first order streams	The proposed development has been specifically designed so as not to result in any barrier to migration of any aquatic species during construction or operation .
Distribution: extent of anadromy	100% of river channels down to second order accessible from estuary	
Adult spawning fish	Conservation Limit (CL) for each system consistently exceeded	The proposed development has been specifically designed to avoid any loss or deterioration of habitat for this species. In addition, the proposed scheme has been designed to avoid any effects on water quality. The specific measures that are in place to ensure that there is no impact on water quality are fully described in Appendix III and will ensure that there is no deterioration in juvenile or adult salmon habitat as a result. Any instream works will be undertaken in the period from July to September inclusive to avoid the sensitive spawning
Salmon fry abundance	Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling	
Out-migrating smolt	No significant decline	

Attribute	Target	Assessment
abundance		period for this species.
Number and distribution of redds	No decline in number and distribution of spawning redds due to anthropogenic causes	Similarly, following extensive modelling, it has been concluded that there will be no appreciable effect on the hydrological regime in the River Deel, that could result in deterioration of salmon habitat
Water quality	At least Q4 at all sites sampled by EPA	

Table 5.5 Targets and attributes associated with nominated site-specific conservation objectives for Atlantic Salmon (Salmo salar) [1106]

5.1.6 Otter (*Lutra lutra*) [1355]

The conservation objective for Otter (Lutra lutra) [1355] is:

'*To restore the favourable conservation condition of Otter in River Moy SAC.*'.

The attributes and targets for Otter (Lutra lutra) as per the Site Specific Conservation Objectives (SSCOs) for River Moy SAC (NPWS Version 1 2016) and an assessment of the proposed development against the nominated attributes and targets for the species is provided in Table 5.6 below

Attribute	Target	Assessment
Distribution	Access to all watercourses down to first order streams	The proposed development has been specifically designed so as not to result in any barrier to the movement of any aquatic species throughout the catchment during construction or operation.
Distribution	No significant decline	
Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 262ha above high water mark (HWM); 14ha along river banks/around pond.	The proposed flood relief scheme has been designed to avoid any loss of terrestrial or aquatic habitat for otter with the only elements of it located within the SAC the flow control structure and the intake weir (which is adjacent to the SAC). Following construction the terrestrial and aquatic habitat for otter in these areas will be retained. There will be no effect on lake habitats at any time
Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 4km.	
Extent of freshwater (lake) habitat	No significant decline. Area mapped and calculated as 21ha.	
Couching sites and holts	No significant decline.	No couches or holt sites are located within the works footprint. A holt has been identified within 10 metres of

Attribute	Target	Assessment
		the flow control structure but any works will be preceded by a pre-commencement survey to determine if it is in active use and if it is, works will either not proceed until it is vacated or will proceed under licence for temporary disturbance to the species. There will be no decline in holts or couching sites as a result of these works.
Fish biomass available	No significant decline	The specific measures that are in place to ensure that there is no impact on water quality are fully described in Appendix III and will ensure that there is no decline in fish biomass as a result of the proposed scheme
Barries to connectivity	No significant increase.	The proposed development has been specifically designed so as not to result in any barrier to the movement of any aquatic species throughout the catchment during construction or operation.

Table 5.6 Targets and attributes associated with nominated site-specific conservation objectives for Otter (Lutra lutra) [1355]

5.2 LOUGH CONN & LOUGH CULLIN SPA

There are no site-specific conservation objectives for Lough Conn and Lough Cullin SPA. However targets and attributes for the conservation of the SCI bird species (and wetland habitat) are available from other SPAs. Such targets and attributes are representative of factors considered in the conservation of the SCI species in other areas and were considered in the preparation of this assessment.

5.2.1 SCI Species

The SCI species for the Lough Conn and Lough Cullin SPA are listed below:

- Tufted Duck (*Aythya fuligula*)
- Common Scoter (*Melanitta nigra*)
- Common Gull (*Larus canus*)
- Greenland White Fronted Goose (*Answer albifrons flavirostris*)

Attributes and targets that are common to other SPAs are used in the assessment of these species in Table 5.7 below.

Attribute	Target	Assessment
Population Trend	Long term population trend stable or increasing	The proposed flood relief scheme is located entirely outside of the SPA and over 300m from it and the

Attribute	Target	Assessment
Distribution	There should be no significant decrease in the range, timing and intensity of use of areas by the SCI species other than that occurring from natural patterns of variation	construction and operation of it will not result in disturbance to SCI bird species. Measures are in place to prevent any adverse effects resulting from pollution and there will be no appreciable change to the hydrological regime either in the River Deel or in the washlands. There is no potential for the proposed flood relief scheme to affect the population trend of the SCI species or their distribution within the SPA.

Table 5.7 Targets and attributes associated with SCI species

5.2.2 Wetland and Waterbirds [A999]

Attributes and targets that are common to other SPAs are used in the assessment of Wetlands and Waterbirds [A999] in Table 5.8 below.

Attribute	Target	Assessment
Habitat Area	The permanent area occupied by wetland habitat should be stable other than that occurring from natural variations	The proposed flood relief scheme is located entirely outside of the SPA and over 300m from it and there will be no direct or indirect loss of wetland habitat. Measures are in place to prevent any adverse effects resulting from pollution and there will be no appreciable change to the hydrological regime either in the River Deel or in the washlands. There is no potential for the proposed flood relief scheme to affect the habitat area or quality within the SPA.

Table 5.8 Targets and attributes associated with Wetlands and Waterbirds [A999]

5.3 DETERMINATION ON POTENTIAL FOR ADVERSE EFFECTS FOLLOWING MITIGATION

Following an examination, evaluation and analysis, in light of best scientific knowledge and the conservation objectives of the site, and, on the basis of objective information, having taken into account the relevant mitigation measures, it can be concluded that the proposed development will not have an adverse effect on the integrity of any European Site.

It will not prevent the QIs/SCIs of any European Sites from achieving favourable conservation status in the future as defined in Article 1 of the EU Habitats Directive. A definition of Favourable Conservation Status is provided below:

> '*conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2;*

The conservation status will be taken as 'favourable' when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats,

- And the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.'

Based on the above, it can be concluded in view of best scientific knowledge, on the basis of objective information that the Proposed Development will not adversely affect the Qualifying Interests/Special Conservation Interests associated with any European Sites including in particular, the following:

- River Moy SAC [002298]
- Lough Conn and Lough Cullin SPA [004228]