

KERRY COUNTY COUNCIL

N22 Tralee Bypass/ Tralee to Bealagrellagh [KY-99-122]

Schedule of Commitments and Ameliorative Measures

Extracted from the EIS, PDR and Oral Hearing

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1. Introduction

- 1.1 This schedule lists the commitments and ameliorative measures for the N22 Tralee Bypass / Tralee to Bealagrellagh Scheme given by Kerry County Council.
- 1.2 This document also lists the more specialist operations which will be undertaken by Kerry County Council or its agents in advance of the main construction works.
- 1.3 References apply to chapters and paragraphs in the EIS Volume 2, unless otherwise specified. PDR refers to the Preliminary Design Report.

2 EIS Mitigation

	TRAFFIC	Reference
2.1	It is proposed to provide public lighting at all roundabouts on the scheme for reasons of safety.	EIS.Vol 2 para 3.37
2.2	Any existing footpath affected by the proposed scheme will be reinstated.	EIS.Vol 2 para 3.38
2.3	The contractor will provide appropriate traffic management measures where works affect existing roads. These traffic management measures will be agreed in consultation with the Engineer, the Local Authority and the Gardaí.	EIS.Vol 2 para 3.45
2.4	In the tender contract documents the contractor shall be obliged to keep all accesses and rights of way leading to, from or crossing the site free from mud, slurry or other hazardous substances that are deposited through construction operations. Where necessary all carriageways will be swept by a mechanical sweeper.	EIS.Vol 2 para 3.46
2.5	The requirements for cleaning public roads and the restrictions on access routes will be clearly outlined in the contract requirements, and it will be stated that they be strictly adhered to during the construction stage.	EIS.Vol 2 para 3.47
	HUMAN BEINGS	Reference
2.6	Measures to mitigate potential severance along the route will be incorporated into the design process. The inclusion of bridges, roundabouts, junctions and side roads within the scheme design will maintain access to outlying areas, community facilities, businesses and centres of population.	EIS.Vol 2 para 4.48
2.7	To mitigate potential reduction in economic activity within Tralee, revised signage, in accordance with the Traffic Signs Manual, will be erected at the relevant junctions and along the approach roads in advance of the settlement. The risks of economic losses are lessened as long as appropriate signage is erected.	EIS.Vol 2 para 4.49
2.8	Footways, cycleways and public lighting will be provided in proximity to the Institute of Technology Tralee (ITT) along Side Road 4.	EIS.Vol 2 para 4.50

2.9 A pedestrian walkway will be provided beneath the proposed River Lee Bridge and will accommodate the future enhancement of the pedestrian access along the southern side of the River Lee. EIS.Vol 2 para 4.51

2.10 The scheme will incorporate a grade-separated junction (exit only from mainline) leading to Clash Industrial Estate and Ballybeggan Racecourse EIS.Vol 2 para 4.52

FLORA AND FAUNA

Reference

Mitigation by Reduction

Ecological sites

2.11 Where ecological sites cannot be avoided, the working area will be defined at the outset in the land made available by the erection of temporary or permanent fencing to define the limits of site works. Vertical barriers and/or ground protection will be put in place to protect all trees which are to be retained on site prior to any development work or soil excavations being carried out. Such barriers will be installed to protect the Root Protection Area (RPA) which can be calculated with reference to the NRA's '*Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes*' (NRA, 2006). Increases to ground levels in excess of 75mm will be avoided and no storage of materials will occur within the RPA of trees that are to be retained. Trees to be retained shall be protected in accordance with NRA Guidelines EIS.Vol 2 para 5.87

2.12 Many of the habitats of ecological value identified along the preferred route are water-dependent and have very specific hydrological requirements. The most important of these habitats is within the wetland area adjacent to the River Lee between chainages 1000 and 2000 and at the Bealagrellagh wetlands and stream between chainages 14800 and 15200. The provision of drainage blankets or similar within the road construction along these lengths will ensure that the preferred route avoids impacting on the hydrology of any habitats in this area. See drainage mitigation measure outlined in Section 2.39 of this report. EIS.Vol 2 para 5.88

Mitigation by Remedy

Terrestrial habitats

- 2.13 Where other ecological sites, hedgerows, treelines and mature trees cannot be avoided, direct mitigation is not feasible. To compensate for the loss of habitats, new areas of semi-natural habitat will be facilitated using native seed sources, and new hedgerows, treelines and small stands of woodland will be planted (see Table 5.6 in EIS Volume 2 for details) and summarised below in Section 2.17 of this report. The details of the design and planting of the enhanced landscape areas will be finalised at the construction stage of the scheme, following a survey on the ground to assess the existing habitat conditions and determine their suitability for the proposed habitat type. This will be undertaken in conjunction with a suitably qualified ecologist and the landscaping consultants for the scheme.
- EIS.Vol 2
para 5.90
Table 5.6
- EIS Vol 4
Figures 5.1-5.6
- 2.14 Hedgerows and treelines will be planted along new field boundaries at the landward sides of the new road embankment and along link road margins, i.e. outside the immediate roadside verge and outside any safety barriers but within the fence line of the road corridor to reconnect severed hedgerows and treelines, to create new networks of ecological corridors, and to interlink with other areas of semi-natural habitat. The trees and shrubs will be predominantly native species, and the species composition will reflect that of the habitat or habitats being lost in accordance with the '*NRA Guidelines A Guide to Landscape Treatments for National Road Schemes in Ireland*'
- EIS.Vol 2
para 5.91
- EIS Vol 4
Figures 10.2-
10.24
- 2.15 Fencing will be erected to protect newly planted areas. The details of tree planting, species mixes and habitat creation will be established at the detailed design stage and will be undertaken in consultation with the landscape design plan for the scheme. The number of trees that will be planted as part of the general landscaping will be at least equivalent to the number of mature trees that will be lost.
- EIS.Vol 2
para 5.92
- 2.16 The site depot locations will be chosen to avoid the sensitive habitats as per Table 5.2 and 5.4 EIS Volume 2.
- EIS Vol 2
Para 5.93

FLORA AND FAUNA

Reference

Specific mitigation measures

- 2.17 In addition to the general mitigation measures that will apply to work in habitats, some specific mitigation measures, including planting in enhanced landscape design areas, are also proposed for the main ecological areas impacted by the N22 Tralee Bypass / Tralee to Bealagrellagh road scheme. These are summarised below and in Table 5.6 EIS Volume 2. Where these enhanced landscape design areas potentially conflict with proposed runoff attenuation areas (Chapter 6 EIS Volume 2), this is also indicated in the Table 5.6 EIS Volume 2.
- Site 1 (Ch 250)**
- Linear planting of native species along roadside verges as defined in paragraph 5.91 within the EIS.
- Site 2 (510 – 830)**
- Linear planting of native trees and shrubs such as willow and alder along roadside verges (see Table 5.6).
- Site 3 (4800-4450)**
- Linear planting of native trees and shrubs along roadside verges to reconnect severed hedgerows (see Site F in Table 5.6).
- Site 4 (2100-1500)**
- Plant adjoining habitat with native varieties of alder, ash and willows (see Site F in Table 5.6).
 - Provide drainage blankets or similar to maintain hydraulic connectivity. The extent of the drainage blanket shall extend from Chainage 1000 to Chainage 2000.
- Site 5 (450-100)**
- The Enhanced Landscape Area at chainage 1200 –1100 on the northern side of River Lee (site G in Table 5.6) will be planted with alder, ash and willow along the riverside margin, with immature woodland planted elsewhere (see Table 5.6). At the western end of the route the wet grassland will be retained.
- Site 6 (11900)**
- Boundary planting around these ponds with native alder and willows.
- Site 7 (13200-13400)**
- Plant road verges with native species to reconnect severed treelines and hedgerows (see Site K in Table 5.6).
- Site 8 (14700 – 15200)**
- The road construction method proposed for this site will ensure that the hydrology of the remaining section of this wetland complex (i.e. the groundwater regime/flow of water) will not be negatively affected. Provide drainage blankets or similar. The extent of the drainage blanket

EIS Vol 2
para 5.94
Table 5.5 and
5.6

EIS Vol 4
Figures 10.2-
10.24
and Figures
5.1-5.6

shall extend from Chainage 14800 to Chainage 15200.

- Areas of severed habitat will be replanted with native willow, alder and ash to recreate ecological verges along the new road (see Site M in Table 5.5). Areas of existing poor fen and flush, wet grassland, and wet willow-alder-ash woodland in severed areas will be retained and protected at the outset with fencing (see Site N in Table 5.6).

Site 9 (8140 – 8430)

- Linear planting of native trees and shrubs along roadside verges to reconnect severed hedgerows and treelines.

Site 10 (7400 – 7800)

- Linear planting of native trees and shrubs along roadside corridor to reconnect severed hedgerows and treelines and provide corridors for wildlife.

Fauna

Bats

2.18 Bats and their roosting sites (summer, maternity and winter hibernation sites) are afforded protection under Annex IV of the EU Habitats Directive. No buildings affected by the proposed road have been shown to be bat roosts. The Forge, (chainage 050, at the junction of the N69 with Side Road 4) which will be demolished, has the potential to yield bats although none were recorded during the mammal survey. The Forge will be checked by a qualified bat specialist in advance of demolition for the presence of bats. Mature trees with potential suitability as roost sites for bats will be examined for the presence or absence of bats immediately prior to felling. Trees found either to contain or likely to contain a roost will be felled, in accordance with the 'NRA Guidelines for the Treatment of Bats During the Construction of National Road Schemes' (National Roads Authority, 2005). The mammal survey (winter and spring survey 2008 in Appendix C7 in EIS Volume 3) describes detailed operations during construction and mitigation for bats. The location of bat mitigation measures are summarised in Table 5.7 EIS Volume 2. These are also summarised below in Table 2.1.

EIS Vol 2
 para 5.107
 Table 5.7

Table 2.1 Location of Bat Mitigation Proposals

Location of bat mitigation proposals	Requirements
Chainage 13120	No lighting and the provision of dense vegetation leading up to Ballyseedy Road Bridge.
Chainage 1000	Lighting at the N22 roundabout at Camp is to be designed to ensure that there is no spread of light to the adjoining river habitats. This can be achieved through cowling.
Chainage 12960	A culvert of no less than 1.8m diam. in the stream.
Chainage 14990	Channelling of the stream through a culvert of not less than 1.5m diam.
Chainage 1200	Channelling of the stream at Ballybeggan through a culvert of 5m x 2.5m culvert (preferably 3m diameter also for badgers) also incorporating a shelf of no less than 500mm diameter for continued access for badgers.
Chainage 485 Side road Clash Industrial Estate	Access to lands along racecourse edge and an emerging stream (see site 13 Ballybeggan Tributary (Big River Flood Relief Channel) chapter 6 of EIS) by a culvert of 5x2.5m culvert 12.
Chainage 4160 to railway crossing	Dense planting along roadside.

Chainages 11130, 11640, 13120, 14500 and 14990	Bat boxes at specified chainages. Forty bat boxes; ten timber wedge shaped boxes, ten standard boxes, fifteen Schwegler 2FN and five Schwegler 1FF, must be erected on remaining trees dispersed between chainages 11130 and 14990.
Chainage 8450	Structure no. 6 over the Big River to be a minimum of 3m high to facilitate bat passage
Chainages 6000, 6900, 7200, 7400, 8100, 8450 8800	10 Schwegler woodcrete bat boxes to be appropriately located between ch. 6000 - 9200

Badgers

2.19 The mammal survey (Appendix C5 EIS Volume 3) also describes detailed operations during construction and mitigation for badgers. Mitigation measures for badgers will be in accordance with the 'NRA Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes' (National Roads Authority, 2005). These are summarised in below.

EIS Vol 2
para 5.108
Table 5.8

EIS Vol 4
Figure 5.7 to
5.12

Table 2.2 Location of Badger Underpasses and Badger Proof Fencing

Location of badger under passes	Fencing requirements ¹
Chainage 5100	Badger proof fencing extending north as far as roundabout at ch 5400 on western side of route and to tie in point with local access road to the east and an appropriate distance to the south (ch 4700) with an opening at ch5200 for an underpass here if this is required.
Chainage 1475	Badger proof fencing extending to ch 1180 (River Lee or farm underpass) to the west and to ch 1800 to the east.
Chainage 1800	Badger proof fencing extending to beyond ch 2350 at roundabout tie in with N21 to the east and west.
Chainage 11180	Badger proof fencing extending to ch 11620 to the east and an appropriate distance to the southwest (ch 10600). From Ch. 11620 to Ch. 10600. Approx. 1020m
Chainage 11620	Badger proof fencing extending to ch 11180 to the west and an appropriate distance to the east to the tie in with the local road from Lissardboola (ch 12050 including the realigned local road to each side). Fencing must continue to ch 12120 to the northern and southern side of the roadside of the road. From Ch. 11180 to Ch. 12050. Approx. 1040m
Chainage 14110	Badger proof fencing extending to ch 14510 to the east and an appropriate distance to the west (ch 13610). From Ch. 14510 to 13610. Approx. 900m
Chainage 14510	Badger proof fencing extending to ch 14110 to the west and to ch 14780 to the east. Approx. 670m.
Chainage 14780	Badger proof fencing extending to ch 14510 to the west and to ch 15280 to the east to the tie in with the N22. Approx. 500m.
Chainage 8780	Badger proof fencing extending south to ch8430 and north to the N69 at Leath Cross (ch 9300).

¹ These measures are in accordance with the NRA's *Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes* (National Roads Authority, 2005).

Chainages 8430	Badger proof fencing extending south to ch 8140.
Chainage 8140	Badger proof fencing extending south to the stream at ch 7650.

- 2.20 Exclusion of badgers from active setts located within the fence line will take place under licence from the NPWS during the months of July to November only in accordance with the '*NRA Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes*' (National Roads Authority, 2005). A survey of setts within 50m of the scheme will be required 10 -12 months prior to construction to confirm that active badger setts as recorded in the EIS are still active and to identify any new setts within 50m of the alignment. This allows time to comply with licensing requirements. Where 36 months has elapsed since the baseline survey, an appropriate level of resurvey will be required. EIS Vol 2
para 5.109
- 2.21 Consideration will be given to the timing of any sett exclusions to minimise restrictions on the contractor's programme. Where road clearance is being carried out during the period December to June inclusive, active setts within the lands made available will require protective fencing to exclude all human activity. The precise extent of exclusion zones is identified in the mammal survey (Appendix C5 in EIS Volume 3). Timber post and rail fencing will be used to allow badgers to move in and out freely. This process and subsequent exclusion can only be conducted under licence from the NPWS, i.e. any permanent exclusion from impacted setts. EIS Vol 2
para 5.110
- 2.22 Where setts occur outside of, but within close proximity to the CPO lands, all affected setts will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage. The extent of fencing is described in the mammal survey (Appendix C5 in EIS Volume 3). There will be continued access provided for badgers until underpasses are operational. This requires the retention of gaps in the fence line at each underpass location. EIS Vol 2
para 5.111
- 2.23 Badger underpasses will be constructed in accordance with the '*NRA Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes*' (National Roads Authority, 2005). The number and location of underpasses is as described in the mammal survey (Appendix C5 in EIS Volume 3) and in Table 5.8 in EIS Volume 2 and summarised in Table 2.2 of this report. EIS Vol 2
para 5.112
Table 5.8

Otters

- 2.24 Mitigation measures to ensure that the passage of otter is unimpeded will be in accordance with the '*NRA Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*' (NRA, 2006). EIS Vol 2 para 5.114
- 2.25 Mammal passes will be provided at the following locations: 1100 to 1200 at the River Lee bridge, and at all of the smaller water courses: 470 (Culvert 12), 5200, 3740, 1000, 7650, 8430, 8800, 11620, 12300, 12960 and chainage 14780. Any culverts for use by mammals such as otter will be designed in accordance with the NRA's '*Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes*' EIS Vol 2 para 5.115 EIS Vol 4 Figure 5.7 to 5.12
- 2.26 Mammal resistant fencing will be provided for 50m to each side of the above locations in accordance with the '*NRA Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes*' (NRA, 2006). EIS Vol 2 para 5.116
- 2.27 Natural riparian vegetation cover will be retained, or other landscaping measures be taken, to ensure that watercourses will continue as contiguous natural habitat for otters and other wildlife. EIS Vol 2 para 5.117

Birds

- 2.28 The Wildlife (Amendment) Act (2000) affords protection to breeding birds by prohibiting the clearance of vegetation during the period 1st March to the 31st of August inclusive. There is an exemption for road construction in agreement with the National Parks and Wildlife Services. As the months of March to June are particularly important for breeding birds, best practice will be to avoid the clearance / removal of hedgerows, trees, treelines or areas of semi-natural habitat during this period, where practicable. EIS Vol 2 para 5.119

WATER QUALITY & DRAINAGE

Reference

- 2.29 Outlined below are the principal requirements for fisheries, taken from recommendations of the South Western Regional Fisheries Board, and NRA Guidelines for the crossing of watercourses during the construction of national road schemes (NRA, 2006): EIS Vol 2 para 6.114
- Pedestrian access to angling stretches along the River Lee will be maintained. Any river works will aim to maintain river habitat quality for fisheries and specific planting will be included along the riverbank to mitigate affects of road development. Watercourse banks shall be left intact if possible and any works undertaken from one bank only. If they have to be disturbed, all practicable measures will be taken to prevent soils from entering the

watercourse;

- Where the road passes over watercourses, bank side habitats will be maintained wherever possible or be re-created. This will include the incorporation of varied bank topography comprising of earth banks and the creation of marginal communities and areas of scrub. Remedial measures shall be undertaken for existing degraded habitats or obstructions along the sections of watercourses to be impacted;
- Construction works, especially ones involving the pouring of concrete, will be conducted in the dry. Pre-cast concrete will be used in preference to uncured concrete, which kills aquatic fauna through alteration of stream pH. When cast-in-place concrete is required, all work will be done in the dry and effectively isolated from any water that enters the stream for a period sufficient to cure the concrete (7 days required to cure concrete);
- The SWRFB have indicated that all of the watercourses in the study area are potential trout spawning streams, although water quality in many of these streams is not currently suitable for salmonid fish. Therefore all watercourses will be treated as fishery potential except drainage ditches. All in-stream works will be undertaken in accordance with the 'NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes';
- Pollution prevention shall be in accordance with good practice, and in compliance with guidelines including CIRIA Construction guidelines, NRA Guidelines and Eastern Regional Fishery Board Guidelines (Murphy, 2004);
- Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from watercourses. Refuelling of machinery, etc. will be carried out in bunded areas. Fuels shall be stored during the construction phase in bunded fuel storage tanks with a 110% holding capacity. Where it is necessary to dispense fuels on site, this will be undertaken in areas covered with an impermeable surface to protect surface water and ground water;
- Stockpile areas for sands and gravel will be kept to a minimum size, well away from watercourses. Runoff from the above shall only be routed to watercourses via suitable designed and sited settlement ponds / filter channels; Construction of the settlement ponds must be undertaken in accordance with the 'NRA Guidelines, A Guide to Landscape Treatments for National Road Schemes in Ireland';
- The following watercourses will be treated as sensitive salmonid waters and construction works within the river channel will only be undertaken during the period stated within 'NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes' and stated by the SWRFB within Appendix A, Volume 3. Salmonid and potential salmonid watercourses are: Caherleheen Stream (Site 1), Lisardboola Stream 1 (Site 2), Lissardboola Stream No. 2 (Site 3), Drainage Ditch (Site 5), Clashedmond Tributary (Site 6), Clashedmond Stream Tributary No.3a (Site 6b), Dromavally Stream (Site 7), Ash Hill Stream (Site 8), Bealagrellagh Stream (Site 8a); Bealagrellagh Stream No. 2 (Site 9), River Lee (Site 10), Tullygarran Stream (Site 11), Ballybeggan River (Sites 12 & 14), Ballybeggan River (Site 14a), Clashedmond Stream Tributary No.1 (Site 15) and Ballygarry Stream (Site 18);
- Preparatory works, such as constructing temporary crossings,

EIS Vol 2
para 6.114

forming cofferdams, creating diversions, will be carried out in accordance with a Method Statement in accordance with 'NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes';

- When cofferdams are being kept dry by pumping, the discharge will be routed to a settlement facility designed in consultation with the SWRFB before return to the river;
- Every care will be taken to ensure against spillage of concrete or leakage of concrete grout within cofferdams; and
- Temporary crossings shall be designed to the criteria laid down for permanent works. Temporary diversions will be used to facilitate working in dry conditions. Liaison with Fisheries Board will take place to ensure that the diversion channel can be designed to accommodate fish migration. The diversion channel shall be formed in the dry, and arrangements will be made for authorised personnel to remove all fish from the natural channel before the flow is diverted. If this work is to be carried out by Fishery Board staff, three week's notice will be given and the Board will recoup the cost from the contractor.

- 2.30 Part of the preferred route runs parallel to the River Lee and also the Ballygarry Stream. The toe of the road will be maintained as far back from the riverbank as possible and construction works will be managed to minimise impacts on the river corridor. The toe of the road will be a minimum of 10-15m from the riverbank and works during construction will not impact on this river corridor. EIS Vol 2 para 6.115
- 2.31 Open drains and a settlement pond will be constructed along this section prior to construction works, to collect silt from construction runoff. This temporary settlement pond is to be maintained for the duration of the construction phase, to trap silt and prevent siltation of the River Lee. EIS Vol 2 para 6.116
EIS Vol 4 Figure 6.9-10
- 2.32 Temporary siltation ponds will be provided during the construction phase to prevent siltation of a small spring fed stream to the north of the River Lee between Ch1100 to Ch1550 and for a tributary of the River Lee which runs in close proximity to the proposed road between Ch1600 and Ch2100 approximately. In addition, machinery will not ingress to the edge of the river, and the river will be fenced off during construction works. Current best practice, whereby suspended solids loadings to watercourses do not exceed 25mg/l will be implemented. The contractor will provide a method statement for this section of road prior to construction works in consultation and compliance with the South Western Regional Fisheries Board. EIS Vol 2 para 6.117
- 2.33 Works will be undertaken as part of the road scheme to enhance the existing River Lee corridor for wildlife by planting of native species and enhancement of river habitats, where river works are required as part of the proposed road. The ecological mitigation (see Figure 5.4 EIS Volume 4) includes Enhanced Landscape Areas along part of the EIS Vol 2 para 6.118
EIS Vol 4 Figure 5.4, 10.16 and

<p>River Lee, which will facilitate these enhancement works. The landscape design (Figures 10.16 & 10.17 EIS Volume 4) proposes planting along this section of the River Lee to include grass, shrub and tree species suitable for wet ground conditions and in accordance with ecological mitigation requirements. Any construction works for the River Lee Bridge will not impact on the river channel and measures will be taken to ensure that silt and pollutants do not enter the river as a result of these works. If in-stream works will be required these will be undertaken outside of the salmonid spawning period (i.e. in-stream works must only be undertaken between the period specified within the 'NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes' and as recommended by the SWRFB within Appendix A, EIS Volume 3). The SWRFB will also be consulted prior to any such works impacting on the river channel.</p>	<p>10.17</p>
<p>2.34 Non-salmonid watercourses (i.e. sites 6A, 13, 16, 17, 19, 20, 21 and 22 from EIS Volume 2 and summarised in Table 6.1 EIS Volume 2) or those identified by SWRFB as not of fisheries value and therefore works can be undertaken within the salmonid spawning period. However caution will be taken to ensure that sensitive waters downstream are not negatively impacted due to any stream works. Adequate measures will be taken to prevent siltation of watercourses as a result of this work. In addition, no special requirements are required with respect to culverts for these drainage ditches. However, other mitigation measures with respect to drainage, sedimentation and pollutants will be adhered to for all watercourses.</p>	<p>EIS Vol 2 para 6.119</p> <p>EIS Vol 2 Table 6.5</p> <p>EIS Vol 4 Figures 6.5- 6.13</p>
<p>2.35 At the proposed crossings of Sites 7, 8, 10, 12 and 14 and also along the river corridor at Site 18 (there is no crossing point here but the road will run in close proximity to the river), particular care will be taken to protect and retain the existing river corridor particularly the river banks, and measures taken to restore and enhance the river corridor at the proposed crossings allowing passage of wildlife. Further details of ecological crossings are provided in Chapter 5 on Ecology EIS Volume 2.</p>	<p>EIS Vol 2 para 6.120</p>
<p>Operation</p>	
<p>Structures</p>	
<p>2.36 River crossings will be undertaken in accordance with the 'NRA Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes'.</p>	<p>EIS Vol 2 para 6.121</p>
<p>2.37 The OPW 'Guide to information to accompany applications for OPW consent for Bridges and Culverts', recommends a minimum culvert diameter of 900mm to ensure accessibility for future maintenance and reduce the likelihood of blockages. The works will be designed in accordance with the 'NRA Guidelines for the crossing of watercourses</p>	<p>EIS Vol 2 para 6.122- 6.124 EIS Vol 4 Figures 6.5- 6.13</p>

during construction of National Road Schemes'. Those Guidelines state that the diameter of any culvert providing for the passage of fish will not be less than 900mm. It further states that all culverts must be oversized so that they can be set a minimum of 500mm below bed level. This requirement will be assessed on a case-by-case basis where a crossing is on bedrock. The consent of the OPW is required under Section 50 of the Arterial Drainage Act 1945 for construction of crossings over existing watercourses. The OPW consent has been granted for 19 of the 22 proposed culverts on this scheme pursuant to Section 50 of the Arterial Drainage Act, 1945 and all piped culverts, as approved by the OPW, have a diameter of 1500mm or greater. An application has been submitted to the OPW requesting Section 50 consent for 3 additional culverts located on Section A and this is pending at present. In this scheme, all culverts will be minimum diameter of 1500mm. Section 50 consent will also be required for the detailed design prior to construction.

- 2.38 The SWRFB require that fish passage will not be inhibited by structures. The contractor will consult and comply with SWRFB during the pre-construction stage. EIS Vol 2 para 6.125
- 2.39 Crossings will be kept as short as possible with the use of clear span bridges or bottomless culverts to maintain the natural bank and bed features. Bed and bank work shall be executed in natural materials. If piers are required they will be kept slim-line to minimise changes to the channel. All culverts will be installed so that the bottom (invert) is at least 500 mm below the grade line of the natural stream-bed (NRA, 2006). Requirements for culverts are further detailed in the '*NRA Guidelines for the crossing in watercourses*' (NRA, 2006; p5-6). EIS Vol 2 para 6.126

Road Drainage

- 2.40 Existing drains will not be opened or re-formed. New drainage systems will be designed for road and surface runoff from the scheme. The proposed drainage system has been detailed in the Preliminary Design Report (Kerry County Council, 2008) and is shown in Figure 6.5 to 6.13 EIS Volume 4. The proposed drainage system consists of a mixture of sealed drains, combined sealed and filter drains, filter drains and open channels. EIS Vol 2 para 6.127
EIS Vol 4 Figure 6.5-6.13 and PDR Drawings Ref 09/416/401-413
- 2.41 For any watercourses with existing importance or of potential importance for salmonid fish i.e. Caherleheen Stream (Site 1), Lisardboola Stream 1 (Site 2), Lissardboola Stream No. 2 (Site 3), Drainage Ditch (Site 5), Clashedmond Tributary (Site 6), Clashedmond Stream Tributary No.3a (Site 6b), Dromavally Stream (Site 7), Ash Hill Stream (Site 8), Bealagrellagh Stream (Site 8a); Bealagrellagh Stream No. 2 (Site 9), River Lee (Site 10), Tullygarran Stream (Site 11), Ballybeggan River (Sites 12 & 14), Ballybeggan River (Site 14a), Clashedmond Stream Tributary No.1 (Site 15) and EIS Vol 2 para 6.128 and Table 6.5
EIS Vol 4 Figure 6.1-6.13

Ballygarry Stream (Site 18) as shown on Figures 6.1 to 6.4 EIS Volume 4 and Table 6.1 EIS Volume 2, surface water run off from the carriageway will be passed through a bypass retention interceptor (10% of any storm event) prior to discharge to flow attenuation areas. These interceptors will be designed in accordance with UK DoT publication Disposal of Highway Surface Water– Design Considerations, April 1993.

2.42 Silt traps will be constructed at locations where retention ponds are not provided to intercept runoff to streams. Traps will not be constructed immediately adjacent to natural watercourses. A buffer zone will remain between the silt trap and the watercourse with natural vegetation left intact so as to assist silt interception

EIS Vol 2
para 6.129

2.43 Where the watercourse has insufficient capacity to cater for the runoff attenuation measures will be provided. The attenuation area will store the runoff, allow a degree of settlement to occur and attenuate. Proposed location of attenuation areas for the road scheme is indicated on Figures 6.5 to 6.13 EIS Volume 4. The sizing and capacity of these attenuation areas has been determined.

EIS Vol 2
para 6.131

EIS Vol 4
Figure 6.5-
6.13

2.44 The preferred method for the disposal of drained water is via outfalls to existing ditches and watercourses. Discharge will always be in the direction of flow of the river or stream. Protection of the bed and edges of the watercourse at the point of entry will be by means of rock armour, or similar. This will help to prevent erosion by water discharging from the pipe during heavy storms. The use of gabions is not acceptable. The locations of proposed outfalls for the road scheme are indicated on Figures 6.5 to 6.13 EIS Volume 4.

EIS Vol 2
para 6.132
EIS Vol 4
Figure 6.5-
6.13

Flooding

2.45 The River Lee Bridge at site 10 will be constructed with a minimum 13m clear span to ensure hydraulic conveyance of in-stream and out of bank flows during the design flood event. In addition a drainage blanket will be constructed under the proposed embankment from chainage 1200 to 1550 to a height of 300mm above the design flood level to maintain the hydraulic connectivity through the road embankment.

EIS Vol 2
Para 6.133

2.46 There is localised flooding along the L2020 due to the inefficient hydraulic capacity of existing Culverts 1 & 3 (Figure 6.1 EIS Volume 4). Kerry National Road Design Office and the Flood Studies Group Department of Civil and Environmental Engineering UCC have carried out a Flood Study on the impact of the proposed Tralee Bypass on the Ballinorig Area. An overflow channel will be provided between site 12 and site 13 in order to alleviate the existing hydraulic restriction at Existing Culvert 1 and 3 (see Figure 6.2 EIS Volume 4) and associated flooding problems the Ballybeggan River. The OPW have

EIS Vol 2
Para 6.134

EIS Vol 4
Figure 6.1-6.2

provided consent under Section 47 of the 1945 Arterial Drainage Act for the provision of this overflow channel. A notch will be constructed on the stream at site 12 which will restrict the flow in the channel to less than the capacity of the downstream culvert. This shall be in the order of 10-30% of the mean flow as recommended by the report. The intake to the overflow channel will be comprised of a low-level side weir, which will come into operation when the bypass flow is exceeded. The overflow channel will run parallel to side road 6 of the N22 Bypass and discharge to the Big River flood relief channel as shown in Figure 6.2. The Fisheries Consolidation Acts require that all structures placed in rivers provide for the free passage of fish at all times, fish pass arrangements must be approved by the Minister. The design of flow splitting (fish passage) arrangements will be approved by SWRFB prior to commencement of construction.

- 2.47 The estimated Q_{100} flood flow in the Ballybeggan River is $22.12\text{m}^3/\text{s}$, which includes a factor for potential changes in the rainfall pattern due to global climate change. The overflow channel will be designed to $18.12\text{m}^3/\text{s}$ 100-year flood with a top width of 8m, a bottom width of 5.6m and a depth of 1.5m. An additional freeboard of 0.3m is also recommended. The required dimension for the overflow channel Ballybeggan River is also outlined in the Ballinorig Flood Study. The land take required for this diversion is indicated on Figure 6.1 EIS Volume 4, which shows a 15m wide strip on the southern side of the Link Road to Clash Industrial Estate (Side Road 6). The construction of the overflow channel and the flow bypass requirement will be carried out in consultation and agreement with the SWRFB.
- EIS Vol 2
Para 6.135
- EIS Vol 4
Figure 6.1
- Stream Alignments & Diversions**
- EIS Vol 2
Para 6.136
- 2.48 Proposals for temporary watercourse crossings and permanent watercourse diversions shall comply with the '*NRA Guidelines for the crossing of watercourses during the construction of National Road Schemes*' (NRA, 2006).
- 2.49 Fording of watercourses to gain access to the opposite bank must only be considered where no alternative option exists and under the approval of the SWRFB.
- EIS Vol 2
Para 6.137
- 2.50 If there is no alternative to lowering the streambed, the original low flow channel width will be maintained. All diversion or re-routing of the stream away from the proposed road shall be carried out in consultation with the SWRFB and the OPW. This also applies to all minor streams, which appear to be potentially insignificant as a fish and spawning habitat.
- EIS Vol 2
Para 6.138
- 2.51 In general, new or modified channels will be reformed at the original river width with the introduction of an instream low flow channel where necessary to allow the establishment of appropriate marginal planting.
- EIS Vol 2
Para 6.139

Engineering design shall respect the natural flow and substrate characteristics of the existing watercourse allowing natural pools and weirs to form. Natural gravel, shingle or cobble from existing riverbed must be used to mimic natural habitat in the existing channel. Local materials will be employed within a site-specific design. Relocation or formation of bank-side vegetation will use vegetation and sediment dredged from the existing channel. Meanders must be re-instated, where practicable. Optimal timing for relocation works is August or September.

- | | | |
|------|--|-------------------------|
| 2.52 | If there is any requirement to carry out in-stream works these will be undertaken by creating cofferdams / pumping past the works site and working in the dry. | EIS Vol 2
Para 6.140 |
| 2.53 | Any river course or bank side alterations un-associated with the road structure will be avoided. | EIS Vol 2
Para 6.141 |

GEOLOGY AND HYDROGEOLOGY

Reference

- | | | |
|------|---|--|
| 2.54 | Any excavated or imported material which may potentially leach contaminants will be placed within managed stockpiles in such a way as to eliminate the risk of contamination to the underlying strata (e.g. temporary stockpiles piles covered with plastic sheeting in order to minimise leaching of contaminants) The classification of acceptable earthworks materials within the NRA <i>Specification for Roadworks</i> ensures that no such contaminants will be placed in the permanent works. | EIS Vol 2
Para 7.110 |
| 2.55 | The construction techniques will ensure that the construction of cuttings and embankments does not adversely affect groundwater flow and quality. Any drainage of excavations will be designed in order that the groundwater regime beneath the site is not adversely affected, i.e. flow towards surface water features needs to be maintained and the removal of perched water will not be recirculated into the main aquifer as this will compromise quality. The mitigation measures require that the contractor conducts groundwater level and groundwater quality monitoring in areas of cuttings and embankments. This includes monitoring of groundwater levels and quality 6 months prior to, during and 6 months after construction and includes the groundwater sources near cuttings in areas where the aquifers are vulnerable (e.g. well numbers SWW257,138, 134, 135, 136, 137, 050, 079, 080, 083 and 136) in the monitoring network. Locations of wells are shown on Figures 7.7 to 7.12 EIS Volume 2. | EIS Vol 2
Para 7.111

EIS Vol 4
Figures 7.7-
7.12 |
| 2.56 | If perched water tables are encountered during the excavation of cuttings, dewatering is undertaken in such a way as to eliminate recirculation of potentially contaminated waters, i.e. ensure a suitable drainage system is in place to protect the quality of water in the | EIS Vol 2
Para 7.113 |

underlying bedrock. A temporary discharge licence will be obtained from the Local Authority in agreement with the SWRFB to discharge the water into surface watercourses or to infiltrate water after suitable treatment. Prior to discharge water will be treated to an acceptable level by SWRFB.

- 2.57 The following measures will be implemented to reduce any potential adverse impacts on the geology during the construction: EIS Vol 2
Para 7.114
- All demolition waste (resulting from the construction) will be safely handled, transported and disposed off site in an adequately licensed facility/landfill site;
 - Dust reducing measures will be implemented (e.g. water spray);
 - Wheel washing facility will be provided for all vehicles leaving sites;
 - After stripping of the topsoil, the ground will be protected against erosion and adequate temporary drainage will be installed during construction to avoid erosion and transport of solid particles;
 - The design will minimise the requirement for extensive earthworks and will minimise the excavation and transport of fill and/or excavated material within or outside the site. The design will follow the existing topography, where possible, and utilise as much as possible the material excavated on site;
 - The design will optimise the reuse of the excavated material as engineering or landscape fill to minimise the export of excavated material to a landfill site and reduce the import of fill. In turn this will also reduce the construction traffic on the local roads;
 - Unacceptable material per NRA Specification for Roadworks will be processed to be rendered acceptable for reuse as engineering fill where feasible. This can be achieved by a number of means including drying, sieving, crushing, mixing with acceptable material;
 - Where excavated material is found unacceptable for reuse as engineering fill or unsuitable for processing, its acceptability for reuse as landscape fill will be assessed to mitigate the import/export of material as described above;
 - Earthmoving traffic will be kept within the site boundaries; and
 - Good construction and management practice will be followed and adequately experienced and trained personnel will be using plant and equipment and handle hydrocarbons, chemicals, or any other product harmful to the environment.
- 2.58 If during the construction phase any previously unidentified karst features are found the contractor will be required to implement positive drainage to ensure that groundwater is not adversely affected. The contractor will be required to make special arrangements during construction to ensure that groundwater is not adversely affected. Similar arrangements and mitigation put in place for the N21 Ballycarty/Tralee will be used as a reference. EIS Vol 2
Para 7.115
- 2.59 To prevent the contamination of the ground and groundwater, contaminated materials (oils, fuels, chemicals etc.) will be used and stored in an appropriate manner as outlined in the relevant guidance EIS Vol 2
Para 7.116

(CIRIA Construction guidelines, NRA Guidelines and Eastern Regional Fishery Board Guidelines, Murphy, 2004).

- 2.60 Fuels, oils, greases and hydraulic fluids will be stored in bunded compounds well away from watercourses. Refuelling of machinery, etc. will be carried out in bunded areas. Fuels will be stored during the construction phase in bunded fuel storage tanks with a 110% holding capacity. Storage and refuelling areas will be required to be designed to be sufficiently impermeable to prevent the infiltration of any spillage, leakage or run off into the ground. All depots and compounds will be located on lower risk areas, i.e. away from karst features where the overburden is thick with low permeability. Thick shale horizons are favourable. EIS Vol 2
Para 7.117
- 2.61 Adequate design and planning of the earthworks together with good site management will reduce contamination risk. By keeping the construction traffic off the existing local roads, this helps reduce the run off of potentially contaminated water from these roads into the local watercourses EIS Vol 2
Para 7.118
- 2.62 A number of other measures will be adopted to maintain water run-off quality including the use of wheel washing facilities and road sweeping machines to ensure the local roads are kept free of mud, dust and other debris. Water attenuation ponds will be designed in order to ensure water discharged into local watercourses is free of suspended solids. Attenuation ponds will be built at suitable locations to protect the integrity of surface water features, wetlands and groundwater. EIS Vol 2
Para 7.119
EIS Vol 4
Figure 6.5-6.13
- 2.63 Adequate temporary site drainage will be used to control surface water run off. The drainage network will be designed so that groundwater flow distribution is not compromised and the infiltration of such waters avoided, particularly in karstic regions. EIS Vol 2
Para 7.120
- 2.64 Implementation of mitigation measures during the construction phase, along with good site management and construction practices will eliminate any significant and/or permanent impact on the environment. EIS Vol 2
Para 7.121

Operational Phase

- 2.65 The drainage system of the proposed carriageway has been designed in order to accommodate accidental spillages during the operational phase in order to arrest any significant impact of hydrocarbons, metals and other chemicals (including oil) on water environments. EIS Vol 2
Para 7.123
EIS Vol 4
Figure 6.5-6.13
- 2.66 Attenuation ponds (as listed in Table 2.3 EIS Volume 2) will be constructed to ensure that suspended solids in the drainage water EIS Vol 2
Para 7.124
Table 2.3 and

- settle out prior to discharge to the local watercourses or groundwater. This will also prevent the sudden overflow of the watercourses or road drainage during storm events. Elsewhere, silt traps, incorporated into Oil/Petrol Interceptors (see Table 6.5 EIS Volume 2), shall be used. 6.5
- 2.67 The drainage system has been designed to mitigate the effect of run off water on any possible karst features identified and prevent infiltration of road run off directly into bedrock aquifers. A full description of drainage design is discussed within Chapter 2 EIS Volume 2. EIS Vol 2
Para 7.126
and para 6.94
- 2.68 To ensure that natural drainage pathways are not impeded in sensitive areas, embankments will be constructed with adequate drainage blankets, toe drainage, pipe culverts etc. This will ensure that run off water does not collect at the toe of the proposed embankment and will help eliminate any potential instability. As a result affected water will be able to flow freely to the down-gradient source maintaining the hydraulic connection. The drainage measures referred to herein will be required in areas such as adjacent to the River Lee and its tributary between Ch 1000 and Ch 2000, in the Ballindooganig area between Ch 13100 and Ch 13600 and at the wetlands at Bealagrellagh between Ch 14600 and Ch 15000. In Sections A and B of the preferred route positive drainage will be required where the road intercepts surface watercourses. These include the stream south of Ballinorig Road originating from Tullygarran (Ch 3700-3750), the stream adjacent to the Kilduff Road (Ch 6050), and the stream south of Ballybrennagh Lower (Ch 7620) and the stream north of Ballybrennagh Lower (Ch 8450). This will ensure that groundwater connection between drift and/or bedrock aquifers and surface watercourses is maintained. EIS Vol 2
Para 7.127-8

AIR QUALITY

Reference

- 2.69 Mitigation measures to control dust during reclamation and construction will be specified within contract documentation. Such measures will include but not necessarily be limited to: EIS Vol 2
Para 8.58
- Regular water-spraying and sweeping of unpaved and paved roads to minimise dust and remove mud and debris;
 - Using wheel washes, shaker bars or rotating bristles for vehicles leaving the site where appropriate to minimise the amount of mud and debris deposited on the roads;
 - Sheeting vehicles carrying dusty materials to prevent materials being blown from the vehicles whilst travelling;
 - Enforcing speed limits for vehicles on unmade surfaces to minimise dust entrainment and dispersion;

- Ensuring any temporary site roads are no wider than necessary to minimise surface area;
- Dampening down of surfaces prior to their being worked; and
- Storing dusty materials away from site boundaries and in appropriate containment (e.g. sheeting, sacks, barrels etc).

NOISE & VIBRATION

Reference

2.70	Noise barriers in accordance with the NRA Guidelines ² , preferably earth bunds, will be erected according to the schedule set out in Table 9.15 EIS Volume 2.	EIS Vol 2 Para 9.72 Table 9.15 EIS Vol 4 Figure 9.1-9.24
2.71	Where earth bunds are not possible thin panel acoustic barriers, which have been tested in accordance with IS EN 1793 Parts 1 to 3 will be used in accordance with NRA Circular 11/2006.	EIS Vol 2 Para 9.67
2.72	The construction noise limits are shown on Table 9.17 EIS Volume 2.	EIS Vol 2 Para 9.81 Table 9.17
2.73	Blasting may be required in rock cut areas and piling may be required in connection with three structures. Rock breaking is likely to be required in Sections B and C where the road is in cutting.	EIS Vol 2 Para 9.83
2.74	The maximum vibration levels (Peak Particle Velocities in mm/sec) that will be permitted near sensitive properties will be in accordance with NRA Guidelines as set out in Table 9.18 EIS Volume 2.	EIS Vol 2 Para 9.84 Table 9.18
2.75	Where there is a possibility that these levels may be approached, a programme of vibration monitoring will be undertaken to the satisfaction of the Local Authority.	EIS Vol 2 Para 9.85

LANDSCAPE AND VISUAL

Reference

2.76	The following measures will be put in place in order to mitigate the long term impacts resulting from the scheme;- <ul style="list-style-type: none"> • Maximise retention of existing vegetation. Where reinstatement of hedgerows is required, species that are consistent with those hedgerows already present will be used in accordance with the 'NRA Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of 	EIS Vol 2 Para 10.37 EIS Vol 4 Figures 10.2-10.24
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² The 'NRA Guidelines for the Treatment of Noise and Vibration in National Road Schemes Revision 1' adopts the EU noise index L_{den} to set a design goal of 60 dB free-field.

National Road Schemes'.

- Planting along the road corridor will be provided to help integrate the development into the existing landscape setting. Choice of species will be consistent with those found in hedgerows in the area generally;
- Plant species mixes will have a higher screening capacity where the development is judged to have a significant negative impact on visually sensitive receivers;
- Reinstatement of working areas to their previous landscape condition will be carried out;
- Road lighting at roundabouts (and where necessary long new footpaths), will be of a specification that minimises visual impact in terms of light pollution i.e. full cut off lanterns with flat glass face pointing downwards (i.e. no bulge below the light housing and installed at zero degrees to horizontal). Full cut off lanterns restrict light going above the horizontal plane ensuring that all light coming from the lanterns is directed down towards the ground i.e. have no direct up light and will have a completely flat glass. These lanterns will be installed at zero degrees. Full Cut off lanterns will be completely shielded on the sides, by using cowlings. The levels of light proposed will be specified by the road design team but will be the minimum requirement necessary to ensure safe negotiation of the road for all users and to avoid night time glare. The levels of light specified for the road lighting will be from BS5489-1:2003 Part 10 which specifies a minimum requirement for lighted lengths of road where traffic is crossing over from one lane to another. To ensure that the minimum levels are achieved with the minimum number of fittings and the lowest energy consumption a fitting with very high performance optics will be provided. These will be fitted with high tightness optics to improve the long-term performance of the installation and reduce the need for cleaning maintenance, thus making the scheme more efficient;
- Earth bunds 2-3m high (as necessary) where feasible will be provided instead of solid walls or fences for noise mitigation (for further details refer to Table 9.15 EIS Volume 2). The advantage of using earth bunds as proposed to walls or fences is that the proposed screen and woodland planting can be placed upon the earth bund thus raising the height of the planting and upon maturity, provide a higher more effective screening barrier. This will reduce the residual visual impact on nearby properties. The use of earth bunds in proximity to sensitive receivers R48 (barrier 17), R65 (barrier 9), R80 (barrier 14) and R96 (barrier 13) will be provided where feasible to significantly reduce visual impact at these locations.

2.77 Landscape mitigation plans have been designed in accordance with 'A Guide to Landscape Treatments for National Road Schemes in

EIS Vol 2
Para 10.38
Table 10.2

Ireland, National Roads Authority; species lists will be compiled at the detailed design stage when consideration must also be given to sight lines and location of utilities. Mitigation types and locations are as shown in Table 10.2 EIS Volume 2. The mitigation measures include ecological planting as recommended in Tables 5.5 and 5.6 EIS Volume 2 and illustrated in Figures 5.1-5.6 in Chapter 5 EIS Volume 4.

EIS Vol 4
 Figure 10.2-
 10.24
 Enhanced
 landscape
 Areas

MATERIAL ASSETS

Reference

2.78 The NRA's *'Guide to Process and Code of Practice for National Road Project Planning and Acquisition of Property for National Roads'* (2005) will be adhered to with respect to all land potentially impacted by the construction of the scheme. These measures include the following;

EIS Vol 2
 Para 11.54

- The local authority has appointed a Project Liaison Officer who will liaise and engage with affected parties or their representatives on matters relating to the road scheme. The Project Liaison Officer will also act as the first point of contact for individuals encounter difficulties; and
- Where excavations interfere with water supplies, sewers, or septic tanks, these services will be restored as a matter of urgency by the local authority or those acting on its behalf.

2.79 A certain amount of earthwork material may be suitable for re-use, e.g. cut material may be used for landscape screening or noise bunds. Suitable areas are detailed in Section 11.29-11.31 EIS Volume 2 and outlined in Table 11.5 and shown on Figures 11.1 to 11.4; it is the responsibility of the contractor to find a suitable off-site location for disposal of unacceptable material and locations in which to obtain imported fill. Not all of the areas highlighted in Table 11.5 may be suitable for disposal of unacceptable material arising from the site, but nevertheless it may be possible to dispose of all such material *in situ*. Spoil materials will be disposed of in an appropriate and sustainable manner and in accordance with waste management legislation. The construction materials required for the road, such as crushed rock, concrete and asphalt, will be sourced locally where practicable, and quarries and production facilities will be as close as possible to the site to provide these materials without excessive haulage

EIS 11.55
 Table 11.5
 EIS Vol 4
 Figure 11.1 -
 11.4

2.80 The construction materials required for the road, such as crushed rock, concrete and asphalt, will be sourced locally where practicable, and quarries and production facilities will be as close as possible to the site to provide these materials without excessive haulage

EIS Vol 2
 Para 11.56

2.81 The BS3882 guidelines will be used when moving earth. Soil impacts

EIS Vol 2
 Para 11.57

have been discussed in greater detail in Chapter 7 EIS Volume 2.

Construction and Demolition (C&D) Waste Management Plan

EIS Vol 2
Para 11.58

2.82 A C&D waste management plan will be prepared before construction commences in accordance with '*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects*' (Environmental Protection Agency, July 2006), directed by the Department of Environment, Heritage and Local Government.

2.83 The Project C&D Waste Management Plan will be incorporated into the Project's Environmental Operating Plan. The C&D Waste Management Plan will be agreed in writing by the contracting authority in accordance with the NRA Guidelines before construction work commences.

EIS Vol 2
Para 11.60

Utilities

2.84 Accommodation works for the major utilities will be carried out in association with the legal requirements and guidelines from the relevant authorities (ESB, Eircom and Kerry County Council). These guidelines will ensure that all residents affected by relocation of utilities will be given ample notice before construction starts.

EIS Vol 2
Para 11.61

2.85 Relocation of water utilities such as foul or surface drainage will be carried out in consultation with the relevant bodies such as the Office of Public Works and the South Western Regional Fisheries Board and Kerry County Council.

EIS Vol 2
Para 11.62

Fisheries

EIS Vol 2
Para 11.64

2.86 Construction work over the River Lee will be carried out in consultation with the South Western Regional Fisheries Board to ensure that fish stocks are not harmed during construction and operation of the Preferred Route. Spill containment facilities such as petrol interceptors will be used to protect fish stock from pollution and accidental spillage.

Road Infrastructure

2.87 Mitigation measures to reduce impacts from the Preferred Route on traffic are discussed in greater detail in Chapter 3 EIS Volume 2. The Contractor will be required to produce an Environmental Operating Plan.

EIS Vol 2
Para 11.66

AGRICULTURE

Reference

2.88 Mitigation measures detailed in this section relate to engineering

EIS Vol 2
Para 12.49

	accommodation works alone. Measures to compensate farmers due to land acquisition, damage caused to fenced paddock grazing areas, piped water supplies, farm roadways and loss of facilities will be agreed, where possible, by the professional valuers at a later stage. Compensation payments for loss of land, in default of agreement, will be assessed in accordance with the relevant Assessment of Compensation and Arbitration Acts. Mitigation measures required for individual farms are detailed in Table 12.9 EIS Volume 2.	Table 12.9
2.89	The NRA's <i>'Code of Practice Guide to Process and Code of Practice for National Road Project Planning and Acquisition of Property for National Roads'</i> will be adhered to with respect to all land potentially impacted by the construction of the scheme. The terms of the 2001 Agreement between the IFA/NRA/DOE also applies to this scheme	EIS Vol 2 Para 12.50
2.90	All access given will be suitable from the farmer's viewpoint and will not limit the farmer's ability to farm the land. The slopes of field entrances / exits and their location and size will be such as to allow the farmer access to and from the land safely with the type of machinery that the farmer utilizes on an ongoing basis.	EIS Vol 2 Para 12.53
2.91	Stock underpasses will be provided where necessary and feasible for access to severed lands. The provision of these underpasses will be assessed on an individual basis. Factors include, cost of underpass, severed lands, road geometry and drainage. No livestock will be permitted on the new road.	EIS Vol 2 Para 12.54
Reinstating Watercourses / Land Drains		
2.92	Some farmers along the preferred route depend on streams and watercourses as a water supply for animals. The continuity of these streams along their present channels is of relevance to these farmers, and if the continuity of these is affected, these farmers will have to seek alternative water supplies.	EIS Vol 2 Para 12.55
2.93	The proposed drainage system will ensure that carriageway runoff is collected, conveyed and discharged to a suitable outfall, without discharging into adjoining properties. During construction every effort will be made to avoid draining into farmland.	EIS Vol 2 Para 12.56
2.94	Where streams and watercourses are being severed the culverts put in place will be sufficiently large enough to accommodate the water-flow in the periods of highest rainfall and that flooding does not result as a consequence of the development. The level of these culverts will not result in stagnant water, as this can be a disease risk to animals using the water as a drinking water supply. The OPW have granted their consent as per Section 50 of the Arterial Drainage Act 1945 for 19 of 22 culverts on this scheme. All piped culverts as approved by	EIS Vol 2 Para 12.57-8

the OPW have a diameter of 1500mm or greater. An application has been submitted to the OPW requesting Section 50 consent for 3 additional culverts located on Section A and this is pending at present. This consent is sufficient to meet these recommendations.

Reinstating Boundary Fences

EIS Vol 2
Para 12.59

- 2.95 In all cases the road frontage along the proposed new road area with farmlands will be secured and stock-proofed before any construction starts. This will be designed to suit the type of stock that the farmer carries on his land. Farmers will need to move animals across the construction site while they await more permanent measures to be put in place and this will be facilitated by providing gates where needed until such time as the access arrangements are in place for these farmers when these gateways will be replaced by permanent stock-proof fencing. Timber post, rail and wire mesh fence per NRA road construction details (RCD/300/1) will be provided. NRA/KCC will maintain this fence during the operational phase as per IFA Agreement.

Reinstating Water Supply

EIS Vol 2
Para 12.60

- 2.96 Water supplies where severed will be reinstated or alternative supply will be provided or compensation will be provided in lieu.

Construction Phase

- 2.97 The following measures will be introduced to reduce the impact on agricultural activities during the construction phase-;

EIS Vol 2
Para 12.61

- Good communication with farmers in the proximity of construction activities will facilitate organising farm enterprises so that vulnerable livestock are kept as far away as possible from the construction work during critical times;
- In the case where dust proves to be a hazard for milking facilities and storage tanks, mitigation measures will be implemented with each individual farmer to ensure non-contamination of milk;
- Precautions will be taken by the appointed contractor to control noise as per Table 9.17 EIS Volume 2;
- Precautions will be taken by the contractor to control vibration on and off site - particularly in the vicinity of housing and sensitive animals such as horses and dairy cattle as per limits set in Table 9.8 EIS Volume 2;
- As in the case of mitigation measures for noise and dust, good communication between individual farmers and the construction authorities will minimise difficulties caused by the restriction of access to severed land parcels. Such communication will produce a workable arrangement, which will allow all parties to continue their work in return for some compromise to other parties. There also will be proper termination of existing boundaries. Maintenance of open access to all landholdings and properties is required;
- Farmers will need to move animals across the construction site while they await more permanent measures to be put in place and this will be facilitated by providing gates where needed until such time as the access arrangements are in place for these farmers when these gateways will be replaced by permanent stock-proof fencing.
- In cases where impeded drainage during construction will cause

obvious difficulty to a particular landowner, temporary measures will be taken to allow waters to drain to less critical areas and so minimise the impact.

ARCHAEOLOGY AND CULTURAL HERITAGE

Reference

- 2.98 The following mitigation measures in accordance with NRA Guidelines³ will be undertaken;
- Where there is a profound or significant impact on a recorded archaeological site (ARCH 5, 6 10, 16 and 17), archaeological investigation, (i.e. geophysical survey and archaeological testing) will be carried out. Following this, the site (or portion thereof) will be preserved *in situ* or preserved by record, through archaeological excavation, reporting, publishing and archiving. This is determined on a case by case basis by the statutory authorities;
 - Where there is a profound or significant impact on possible archaeological sites (ARCH 8, 12, 22, 23 and 13), further archaeological investigation, (i.e. geophysical survey and archaeological testing) will be carried out. If these sites are deemed to be of archaeological significance, then they will be preserved *in situ* or preserved by record, through archaeological excavation, reporting, publishing and archiving. This is determined on a case by case basis by the statutory authorities;
 - The two recorded archaeological sites (ARCH 7 and 20) in close proximity to the CPO line will be cordoned off from roadworks by permanent fencing and preserved *in situ*. Targeted geophysical survey and archaeological testing will be carried out within the ZAP of these sites;
 - Where there is a slight impact on archaeological sites (ARCH 1, 2, 3, 4, 15 and 21), targeted geophysical survey and archaeological testing will be carried out in the environs within the CPO;
 - A full drawn, written and photographic record will be carried out on the forge (AR 11) and the section of demesne wall (AR 9);
 - The water pump bay (CH 14) will be adequately recorded prior to demolition;
 - An underwater archaeological assessment will be carried out, in consultation with the scheme's Project Archaeologist, and under licence from the National Monuments Service of the DoEHLG, on all rivers to be impacted by the preferred scheme;
 - In order to identify unknown or buried archaeological remains, a programme of extensive archaeological site investigation works will be undertaken. This work will involve geophysical survey and archaeological test trenching and will be carried out in advance of any construction, in order to allow sufficient time to take appropriate action in the event of archaeological remains being identified; and
 - All mitigation measures within this report will be subject to appraisal by the scheme's Project Archaeologist, and approval of the National Monuments Service of the DoEHLG and in consultation with the National Museum of Ireland, as appropriate.

EIS Vol 2
Para 13.55

EIS Vol 4
Para Figure
13.1- 13.6

³ NRA Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, 2005; NRA Guidelines for the Assessment of the Architectural Heritage of National Road Schemes, 2005; and NRA Guidelines for Reporting on Constraint, Route Selection, Environmental Impact Assessment on Archaeological Aspects of NRA Road Schemes; (draft consultation document, February 2003)

2.99 All archaeological mitigation works will be undertaken in compliance with the provisions of the National Monuments (Amendments) Act 1930-2004 and the Code of Practice (2000) agreed between the National Roads Authority and the Minister for Arts, Heritage, Gaeltacht and the Islands

EIS Vol 2
Para 13.56

3 Updates on Mitigation since EIS was published

LANDSCAPE AND VISUAL		Reference
3.1	Screen planting on Tralee Bypass will be extended from Ch. 5340 to Ch. 4900 (Western Boundary only).	EIS Vol 4 Figure 10.8 Rev A
3.2	Screen planting on Tralee Bypass will be extended from Ch. 6500 to Ch.6800 (Western Boundary only).	EIS Vol 4 Figure 10.6 Rev A
3.3	Screen planting on Tralee Bypass will be extended from Ch. Ch13620 and Ch14110 (northern side of road).	EIS Vol 4 Figure 10.23 Rev A
FLORA AND FAUNA		Reference
3.4	Mammal fencing will be amended to tie with CPO line a Ch. 4830 to Ch 5440.	EIS Vol 4 Figure 5.9 Rev A
3.5	Structure No. 6 over the Big River will be amended at Chainage 8450 to be a minimum of 3m high to facilitate bat passage.	Bat Assessment of the Northern Section of the N22 Bypass supplied during Oral Hearing process
3.6	10 Schwegler woodcrete bat boxes will be located appropriately between ch. 6000 – 9200 (Chainages 6000, 6900, 7200, 7400, 8100, 8450 8800).	
WATER QUALITY AND DRAINAGE		Reference
3.7	EIS Vol 2 para 6.126 shall be amended to add subject to OPW requirements as follows: <i>‘Crossings will be kept as short as possible and the use of clear span bridges or bottomless culverts is preferable, subject to OPW Requirements since they maintain the natural bank and bed features. Bed and bank work shall be executed in natural materials where possible. If piers are required they will be kept slim-line to minimise changes to the channel. All culverts will be installed so that the bottom (invert) is at least 500 mm below the grade line of the natural stream-bed (NRA, 2006). Requirements for culverts are further detailed in the ‘NRA Guidelines for the crossing in watercourses’ (NRA, 2006; p5-6)’.</i>	EIS Vol 2 para 6.126
3.8	Figure 6.4 EIS will be amended to include correct alignment of Bealagrellagh Stream 1.	EIS Vol 4 Figure 6.4 Rev A

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| 3.9 | Culvert proposal for Culvert No. 1 will be revised as agreed with SWRFB (Table 6.4 EIS Volume 2) | Drawing BR-Cu1
Rev A11 |
| 3.10 | Culvert proposal for Culvert No. 22 will be revised as agreed with OPW/SWRFB to Structure 6 (Table 6.4 EIS Volume 2). | Drawing BR_St 6
Rev A16 |
| 3.11 | Flood Relief Channel proposal will be revised to take account of SWRFB recommendations (Figure 6.2 EIS Volume 4). | Drawing BR_Mi_1
Rev A11 |

AGRICULTURE

Reference

- | | | |
|------|--|---|
| 3.12 | Provision of access to farms as identified in Table 12.9 of EIS Volume 2 will be as described in Accommodation Works Drawings as submitted to An Bord Pleanala Inspector by Kerry NRDO on 17/12/08 | Drawing No's
09_465_14 to
09_465_17 |
|------|--|---|

4 Mitigation agreed during Oral Hearing

WATER QUALITY AND DRAINAGE

- 4.1 Kerry County Council will continue to consult with SWRFB as outlined in their submission to An Bord Pleanála dated 13/1/09 in order to reach agreement with the SWRFB in relation to the notch for the Ballybeggan River to restrict the flow in the channel to less than the capacity of the downstream culvert as described in EIS Vol 2 para 6.134-5.
- 4.2 Kerry County Council will appoint a suitability qualified engineer with aquatic habitat expertise to inform and advise the contractor on specific aquatic sensitive restoration design and to monitor site works in the vicinity of watercourses, subject to the approval of the NRA. A site ecologist will also be present on site to monitor the works.
- 4.3 Where cavities, fissures or other similar features are identified in the bed or sides of newly constructed channels, diversions or excavation works for culverts, appropriate measures will be incorporated such as lining or similar to prevent loss of river water by infiltration. These measures will be agreed with the SWRFB prior to commencement of the works.
- 4.4 Subject to approval of the scheme by An Bord Pleanála, Kerry County Council will continue to liaise with affected landowners, particularly in relation to drainage.

LANDSCAPE AND VISUAL

- 4.5 The enhanced Landscape areas as described in EIS Vol 2 para 6.118 and EIS Vol 4 Figure 5.4 will be further enhanced to include recommendation from SWRFB.