

**Aberdeen Western Peripheral Route**  
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**Appendix A10.17 – Ecology Mitigation and Residual Impact Summary Tables**

**Section NL1 – Summary of Site-Specific Mitigation and Residual Impacts (for pre-mitigation impacts of at least Moderate significance)**

Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual impact significance
		Description	Significance		
Badger	Agricultural land to the east of Brimmond Hill (N2, N8 and N13)	Direct mortality due to outlier sett NB3 within 50m of the alignment during clearance of construction.	Moderate	A 30m buffer will be marked out around sett NB3 and access must be retained to the sett. Works will not take place within the 30m buffer zone unless under direct supervision of a named ecologist under SEERAD disturbance licence..	Negligible
		Direct mortality due to RTAs during operation of the road.	Moderate	Underpass to be installed at ch315200. Fencing from ch314800 to ch315080 and ch315620-316180. In addition, side roads to be fenced from ch315000 to 300m west of the AWPR, eastern arm fenced for 300m to roundabout. Fencing for otters below will also mitigate against RTA (see Figure 11.5a)	Negligible
		Habitat loss of foraging and setting territory during construction.	Moderate	Scrub woodland planted east of AWPR for landscape and ecology purposes. HA N11 at ch314800-314950 (e) (Figure 11.5a). Scrub woodland planted west of AWPR for landscape and ecology purposes. HA N8 at ch314800-314900 (w) (Figure 11.5a).	Minor
		Disturbance and fragmentation of setting and foraging territory due to construction and operation of the road.	Moderate	The above habitat creation will reduce disturbance and the underpass to be fitted at ch315200 will reduce fragmentation	Minor
Bats	Newton Farm N11	Direct mortality due to RTAs.	Major	Direct mortality due to RTAs will be reduced due to the measures stated below that mitigate for fragmentation and disturbance	Minor
	Newhills Woods N16	Habitat loss, disturbance and fragmentation of potential roost habitats and foraging corridors.	Moderate	The creation of scrub woodland in N11 as detailed in the badger mitigation above and sympathetic landscape planting will also partially offset habitat loss (Figure 11.5a-b). Temporary screens will be erected surrounding roost in Newton Farm (HA N11) reducing disturbance during construction. In addition to generic mitigation and the underpass detailed in the badger mitigation, there are overbridges and culverts at the following locations that will be also be designed and managed sympathetically for bat usage: North Kingswells Junction Underbridge (ch314970), Kepplehill Burn Culvert (ch315200), Kepplestone Overbridge (ch315200), Ashtown Overbridge (ch316020), Gough Burn Culvert (ch316390). These measures combined with sympathetic landscape planting will reduce construction and operational disturbance and fragmentation. Two blocks of mixed woodland planted east and west of the road 0.15ha in total at Ashtown Overbridge for landscape and ecology purposes. HA N15 at ch315950-316020 to guide bats over the road. (Figure 11.5b).	Minor

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Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual impact significance
		Description	Significance		
Bats [cont'd]	Kepplestone Farm N12, N13 and N14	Habitat loss, disturbance and fragmentation of roost habitats and foraging corridors and potential pollution of aquifers.	Moderate	The habitat creation detailed above will partially offset habitat loss Use of culverting, underpasses and overbridges detailed above combined with sympathetic landscape planting will reduce disturbance, fragmentation and RTAs.	Minor - Negligible
		Potential pollution of aquifers especially Kepplehill Burn.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
Wintering Birds	Agricultural fields surrounding Kepplestone Farm, Gough Burn, Newhills Wood, Agricultural fields and Cemetery at Newhills N11-N17	Habitat loss	Moderate	Habitat loss will be offset by the creation of areas of scrub woodland near Kingswells (N11) as detailed in the badger mitigation above. Secondary mitigation is provided by landscaping in the form of feathered trees and scrub woodland in compliance with the safety requirements for birds.	Minor
		Direct mortality due to RTA, disturbance and habitat fragmentation.	Moderate	Generic mitigation including timing of works should reduce disturbance during construction, while ecological and landscape planting will reduce operational disturbance, fragmentation and RTA impacts.	Minor
		Potential pollution of aquifers.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events..	Negligible
Otter	Kepplehill Burn N11-N13	Direct mortality due to RTAs and or drowning due to operation.	Moderate	Otter-proof fencing to be fitted at ch315080-315620 will prevent RTAs. Fencing for badgers above will also mitigate against RTA (see Figure 11.5a-b). Installation of depressed invert box culvert with integral mammal ledge at crossing of Kepplehill Burn at ch315200 will prevent drowning and reduce fragmentation.	Negligible
		Fragmentation of habitat during operation	Moderate	Underpasses provided for badgers will also serve as mitigation for otters, this and the above culverting will reduce fragmentation and severance of territories.	Minor
		Potential pollution during construction and operation	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible

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**Section NL2 - Summary of Site-Specific Mitigation and Residual Impacts (for pre-mitigation impacts of at least Moderate significance)**

Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual Impact Significance
		Description	Significance		
Terrestrial Habitats	Gough Burn and Craibstone Campus N24 - N26	Habitat loss of valuable pond and stream habitats, disturbance and fragmentation during construction and operation.	Moderate	Habitat loss, fragmentation and severance of woodland habitat areas will be offset by habitat creation in several locations in this section of the route. These include: Three blocks of coniferous woodland to the west of the road of 1.69ha in total in HAs N25 and N28 at ch316450 – 316800 that extend the habitat of Craibstone Wood North (Figure 11.5c). 0.17ha of mixed woodland to the west of the road that extend the habitat of Craibstone Wood North in HA N25 at ch316800-316900 (Figure 11.5c). Coniferous plantation in two blocks (2.05ha) to the west of the road either side of the A96 junction in HA N28 at ch317000 – ch317150 that further extend the habitat of Craibstone Wood North (Figure 11.5c). Block of coniferous plantation of 0.67ha to east of the road and south of A96 that extends the habitat of Craibstone Wood. HA N28 at ch317000-317050 (Figure 11.5c). Narrow linear corridor of mixed plantation to the east of the road and surrounding the detention basins (1.17ha) from ch317100 – 317310 (Figure 11.5c). Secondary mitigation through landscape planting will reduce and offset Disturbance to remaining areas of semi-natural habitat and improve connectivity of remaining fragments of habitat.	Minor
		Potential pollution due to runoff and particulates into aquifers and adjacent land during construction and operation.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Minor
Badger	Craibstone N26-N28	Potential direct mortality due clearance of outlier sett NC6 during construction.	Moderate	The outlier NC6 will need to have any resident badgers removed under licence through an exclusion procedure.	Negligible
		Direct mortality due to RTAs.	Moderate	Fencing to be fitted on chainage sections: ch316180 to ch317500. In addition, A96 Junction Underbridge fenced at ch317060 including 300m of western arm and 600m of eastern arm. Fence Dyce Drive 250m north of A96 roundabout, 350m east of roundabout, 600m west of roundabout. Fencing for otters below will also mitigate against RTA. (see Figure 11.5b-c).	Negligible
		Habitat loss at Craibstone Wood due to construction.	Moderate	The habitat creation detailed in the terrestrial habitat mitigation (above) will offset the impact of habitat loss (Figure 11.5c).	Minor Negligible in long-term

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Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual Impact Significance
		Description	Significance		
Badger [cont'd]		Fragmentation of social group NC's habitat during construction and operation.	Moderate	Outlier sett NC4 lies within 30m of the alignment. A 30m buffer must be marked out around the set and access to the sett must be retained. Depending upon the proximity of works to this sett and the types of works required, either a disturbance licence or an exclusion procedure will be required.  Culverts with associated mammal underpasses to be fitted at Gough Burn ch316390, Craibstone Burn ch316990, Green Burn ch317330 and A96 culvert and culvert north of A96 roundabout to reduce fragmentation of territory.	Moderate
Bats	Gough Burn N18 and N24 Craibstone golf course N19 Woodland north of Parkhead N23 Craibstone Campus N25 Craibstone Burn and Pond N26 Green Burn N27 Craibstone Campus N28	No known roosts to be destroyed but there is potential direct mortality during clearance for construction including of trees and buildings, particularly Sunnybank cottages.	Moderate	Direct mortality will be prevented due to generic mitigation and best practice during construction including timing of works and preconstruction surveys.	Negligible
		Direct mortality due to RTAs during operation.	Moderate	Use of culverting, underpasses and overbridges detailed below combined with sympathetic landscape planting will reduce RTAs.	Minor
		Habitat loss, disturbance and fragmentation of roost habitats and foraging corridors.	Moderate	Habitat creation via blocks of coniferous and mixed woodland to be planted as detailed in the terrestrial habitat mitigation above. In addition, there will be sympathetic landscape planting particularly surrounding suitable second stage detention basins that will enhance the habitat for bats.  Bats will make use of the following overbridges, underpass and culverts, that again will be sympathetically designed and managed for bat use: dry mammal underpass at ch319250, South Kirkhill Junction Underbridge at ch318900, Gough Burn culvert (ch316390), Craibstone Burn culvert (ch316990) Green Burn culvert (ch317330 and A96 culverts and culvert north of A96 roundabout). These in addition to generic mitigation including reduced lighting and the above planting, will reduce and offset disturbance and fragmentation.	Negligible
		Potential pollution of aquifers due to runoff particularly Gough, Craibstone and Green Burn.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events..	Negligible
Breeding Birds	Parkhead Burn N25 Craibstone Burn and Pond N25-N26 Green Burn N27	Risk of direct mortality due to clearance for construction.	Moderate	Generic mitigation including timing of works and pre-construction surveys will prevent direct mortality.	Negligible
		Direct mortality due to RTAs between foraging sites.	Moderate	Generic mitigation and the provision of safety barriers, set back from the road in addition to sensitively design landscaping will reduce direct mortality.	Minor

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Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual Impact Significance
		Description	Significance		
Breeding Birds [cont'd]		Habitat loss, disturbance and fragmentation of habitat and foraging corridors.	Moderate	The areas of habitat creation listed in the terrestrial habitat mitigation include areas of mixed (HA, N28) and coniferous woodland to extend Craibstone North (HA, N25 and N28) and will offset habitat loss. Generic mitigation and best practice including sympathetic landscape planting will reduce disturbance and fragmentation.	Minor
		Potential pollution of aquifers due to runoff.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
Wintering Birds	Agricultural fields and woodland surrounding Craibstone SAC, Craibstone SAC and Craibstone Burn / Pond N18-N20, N23-N26 & N28	Habitat loss and disturbance due to fragmentation of habitat and foraging corridors. Potential pollution of aquifers due to construction and operational runoff.	Moderate	Habitat loss is offset by the creation of habitat as detailed in the terrestrial habitat mitigation above. This habitat creation and landscaping will reduce and offset habitat disturbance and fragmentation. Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for pollution events.	Negligible for pollution Minor for other impacts
		Direct mortality due to RTAs between foraging sites.	Moderate	Generic mitigation and the provision of safety barriers, set back from the road in addition to sensitively design landscaping will reduce direct mortality.	Minor
Otter	Gough Burn N14, N15, N17, N18, N24 Craibstone Burn N21, N24-N26 Green Burn N23, N28, N30 Craibstone Pond N26	Direct mortality due to RTAs and/or drowning where culverted between foraging sites due to construction and operation.	Major  (Moderate at Craibstone Pond)	Best practice guidelines and demarcation of watercourses within 30m of active lying up sites will ensure no mortality during construction. Otter-proof fencing to be fitted at ch316180-317500 as per Badgers above, and A96 Junction fenced at ch317060 including 225m of western arm and 350m of eastern arm. Fence Dyce Drive 80m north of A96 roundabout, 300m east of roundabout, 350m west of roundabout. Fencing inside A96 junction and roundabout. Fencing for badgers above will also mitigate against RTA. (Figure 11.5c). Installation of depressed invert box culverts with integral mammal ledges at Gough Burn ch316390, Craibstone Burn ch316990, Green Burn ch317330 and A96 culvert and culvert north of A96 roundabout will aim to prevent drowning.	Negligible
		Habitat loss due to construction.	Moderate	The mitigation proposed for terrestrial habitats above will mitigate for loss of habitat. Secondary mitigation is provided through landscaping by standard trees along Craibstone and Green Burn and riparian woodland along both banks of Green Burn at HA N30 (Figure 11.5c).	Minor

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Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual Impact Significance
		Description	Significance		
Otter [cont'd]		Disturbance and fragmentation due to culverting (and re-alignment of Green Burn) during construction and operation.	Moderate for Craibstone Pond  Major for other waterbodies	Exclusion of work compounds from Craibstone, Parkhead and Chapel Croft Woods between ch316725-317350 and prevention of night time working will reduce disturbance. Underpasses detailed in badger mitigation can also be used by otters, and will reduce fragmentation. Culverts at locations on watercourses as detailed above will aim to reduce Fragmentation. However, culvert dimensions for Craibstone and Green Burn are likely to result in residual fragmentation. Restriction of lighting and the habitat created will further reduce disturbance.	Moderate for Craibstone and Green Burns Minor for other areas
		Potential pollution of aquifers due to particulates due to construction and operations.	Moderate for Craibstone Pond  Major for other areas	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
Red Squirrel	Craibstone Wood South N24 (woodland 2) Craibstone Woods North N25 (woodland 3)	Risk of direct mortality due to clearance for construction.	Major	Generic mitigation including pre-construction surveys and an exclusion zone around any dreys will prevent direct mortality during construction.	Negligible
		Direct mortality due to RTAs during operation.	Major	There is no specific mitigation practical for red squirrel during operation of the scheme. Squirrels are unlikely to use underpasses designed for other mammals and this impact therefore cannot be mitigated for.	Major
		Habitat loss of the west of Craibstone Wood South and through the middle of Craibstone Wood North.	Moderate	Creation of coniferous woodland as detailed in terrestrial habitat mitigation to the west of AWPR to increase the area of Craibstone North (HA N25 and N28 and Figure 11.5c). This will be planted with tree species of optimal value for squirrel, the mixed woodland that is planted will be planted with species that are not favoured by grey squirrel.	Minor
		Fragmentation of habitat may result in isolation of these populations and ultimately extinction in these areas.	Major	There is no specific provision to provide mitigation for squirrel in this area, as they are unlikely to use mammal underpasses and therefore are not mitigated for.	Major
		Disturbance due to construction and the noise of the road in operation.	Moderate	Generic mitigation including pre-construction surveys and an exclusion zone around any dreys will reduce disturbance during construction. Landscape planting will reduce noise disturbance during operation.	Minor

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Ecological Receptor	Habitat Area	Potential Impact		Site-specific Mitigation	Residual Impact Significance
		Description	Significance		
Fish	Gough Burn N14, N15, N17, N18, N24 Craibstone Burn N25, N26, N28 Green Burn N23, N28, N30	Risk of direct mortality due to pollution during construction.	Moderate	Generic mitigation including best practice on construction site will reduce risk of mortality.	Minor at Green Burn only due to realignment Negligible for Craibstone and Gough Burn
		Risk of fish fragmentation and Isolation due to stranding during culvert construction.	Moderate	Fish to be removed via electric fishing prior to dewatering and translocated to appropriate receptor sites.	Negligible
		Potential pollution due to input of sediment or pollutants from road runoff during operation will affect the currently excellent water quality.	Moderate	Road drainage to be routed via detention basins preventing polluted material directly entering the waterbodies.	Negligible
Freshwater	Gough Burn N14, N15, N17, N18, N24 Craibstone Burn N21, N25-N26, N28 Green Burn N22-N23, N28, N30	Potential pollution due to release of sediment during culvert construction and pollution due to road runoff carrying sediment load and heavy metals may cause long-term decreased habitat complexity for leading to localised changes in invertebrate distributions. Bankside and riparian habitat complexity will be lost in culverted sections	Moderate	Risk of sediment release will be reduced through generic mitigation including best practice. The use of depressed invert box culverts (as detailed above) will reduce the loss of in-stream habitat complexity, although the use of culverts will result in a residual loss of bankside and riparian and localised changes to the distribution of <i>B. putata</i> . No specific mitigation but generic mitigation including best practice will limit the damage during culverting. Residual impacts related to the loss of bankside and riparian habitat, the loss of habitat complexity of in-stream habitat, and impacts on associated invertebrates will remain.	Minor

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**Section NL3 – Summary of Site-Specific Mitigation and Residual Impacts (for pre-mitigation impacts of at least Moderate significance)**

Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Terrestrial Habitats	Agricultural land surrounding Howemoss N32 and N33 Standingstones Wood and Kirkhill Forest North N35, N37-N38 Bogenjoss Burn downstream of Kirkhill Forest N42	Habitat loss of farmland and 13-14 dry stone walls, Disturbance fragmentation and potential pollution of woodlands. Hydrological impacts to marshy grassland.	Moderate	Appropriate dry stone walls are proposed along the boundary of the road corridor for landscape mitigation (See Chapter 9) and will offset the loss of linear habitat features. Habitat loss will be offset by habitat creation in several locations in this section of the route: Habitat creation of a block of mixed woodland 0.33ha in HA N33, starting at ch318900 will increase the habitat area of Kirkhill Forest (South and Standingstones Wood, Figure 11.5e). Mixed woodland strip of 0.85ha to the west of the road in HA N54 at ch319150 to ch319430 will reduce disturbance to the habitat of Standingstones Wood (Figure 11.5f). Coniferous woodland of 4.0ha to the west of the road in HA N54 at ch319430 to ch319730 will extend the habitat of Standingstones Wood (Figure 11.5f). Block of mixed woodland 0.21ha on the west of the road in HA N41 and at ch320400 will extend the habitat of East Woodlands (Figure 11.5g). Coniferous woodland of 0.89ha to the north of the road in HA N46 and N47 at ch321400 to ch321500 will extend the habitat of the eastern leg of East Woodlands (Figure 11.5h). Three blocks of mixed woodland 3.92 ha on the north of the road in HA N47 & N50 and at ch321630-ch322130 will replace the habitat lost from Monument Wood (Figure 11.5h). Habitat creation as detailed above will reduce the impacts associated with habitat fragmentation and reduce disturbance to remaining habitats. Best practice methods will reduce disturbance to vegetation, underpasses and culverts as detailed in the badger and otter mitigation will reduce fragmentation. Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Minor



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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Terrestrial Habitats [cont'd]	Bogenjoss Burn N38, N42	Habitat loss	Moderate	Where Bogenjoss Burn is to be re-aligned between ch319950 and ch320500, the new channel will be restored to maximise its ecological value to otters as well as other species such as fish and aquatic invertebrates. This will include the incorporation of natural bank sides, meanders (where possible) and the planting of emergent vegetation as well as a 10m wide 500m long riparian strip on the west of the re-aligned burn (0.44ha) in HA N37 and N41 between ch320000 and ch320500 and a 10m wide 500m long strip of scrub woodland to the east of the burn in HA N37 at ch319970-320400. This will also include 0.77ha of localised scrub patches to be planted in HAs N41 and N42 between ch320450-320950 (Figure 11.5g). Severance impacts to be reduced by provision of wildlife overbridge at ch319960 and Green bridge at ch320190 to include vegetated cover to enhance use by animal species. This will also reduce severance and fragmentation.	Minor
		Fragmentation and potential pollution of riparian habitat. Hydrological impacts upon wetland habitat surrounding the area.	Moderate	The Kirkhill wildlife overbridge proposed at ch319960 will reduce fragmentation and retain connectivity of habitats across the proposed route. Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for Pollution events.	Minor
Badger	Howemoss, Kirkhill Forest, Standingstones Wood, East Woodlands, Monument Wood and Bogenjoss Burn N33-N35, N37, N39, N41-N44 and N46-N47	Direct mortality during clearance for construction, loss of four setts for social group NE (one main sett), one sett for social group NG and four setts for social group NH (one main sett).	Major	The main sett NE1 and annexes NE2 and NE3, will need to have any resident badgers removed under licence through an exclusion procedure (in agreement with Scottish Natural Heritage). The main sett NH1, annexe NH2, outlier NH3 and outlier NH4 will need to have any resident badgers removed under licence through an exclusion procedure (in agreement with Scottish Natural Heritage). Outlier O6 and outlier O7 will require safe-working distances to be measured, depending on works and techniques adopted.	Negligible
		Direct mortality due to RTAs	Major	Badger proof fencing to be fitted on chainage sections: ch317500- ch317670, ch318000-318420, ch319160-319800 and ch321280-322020. Fencing for otters below will also mitigate against RTA. (See Figure 11.5e-i)	Negligible

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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Badger [cont'd]		Habitat loss of setting and of foraging habitat during construction.	Major	The main sett NE1 and annexe setts NE2 and NE3 represent key setts therefore replacement of these is essential, within potential relocation area No.1 (Confidential Badger Figures). NG1 represents a key sett and may need to be replaced within potential relocation area No.2 (Confidential Badger Figures) The main NH1 and annexe NH2 represent key setts therefore their replacement is essential, within potential relocation areas No. 3 (Confidential Badger Figures). Habitat creation of woodland as detailed in the terrestrial habitat mitigation will reduce the impact of habitat loss (Figure 11.5e-f).	Minor
		Disturbance and severe fragmentation of territory (social groups ND,NE,NF,NG and NH and of Bogenjoss burn as a wildlife corridor due to construction and operation.	Major	Annexe sett NE3, subsidiary sett NG1 and subsidiary sett NH5 all lie within 30m of the alignment. A 30m buffer must be marked out around the setts and access to the sett must be retained. Depending upon the proximity of works to this sett and the types of works required, either a disturbance licence or an exclusion procedure will be required. Outlier sett NH6 lies within 50m of the alignment. A 30m buffer must be marked out around the sett. Works will not take place within the 30m buffer zone and access to the sett must be retained. The following will be installed before the scheme is open to traffic; - Passes to be fitted at chainages: ch317850, ch318450, (Howemoss off-line), ch319250, ch320870 (this underpass is over 100m in length and may be only occasionally used) and ch321320. - Kirkhill Overbridge at ch320180 - Kirkhill Wildlife Overbridge at ch319960 This will reduce fragmentation further and provide a safe crossing point for each of the social groups, thus reducing territorial conflict between them.	Minor
Bat	Standingstones Wood N33 Kirkhill Forest, East Wood, Monument Wood and Bogenjoss Burn N35-N47	No known roosts to be felled, but there is potential direct mortality during clearance for construction.	Moderate	Direct mortality will be prevented due to generic mitigation including best practice and preconstruction surveys.	Negligible
		Direct mortality due to RTAs.	Moderate	Use of culverting, underpasses and overbridges detailed above combined with sympathetic landscape planting will reduce RTAs.	Minor
		Habitat loss, disturbance (not N33) and fragmentation of potential roosts and foraging	Moderate	The habitat and roost creation as detailed below and in the terrestrial habitat mitigation above will offset habitat loss. Disturbance and fragmentation will be reduced by the above culverting and bridging (see badger mitigation) and sensitive landscape planting.	Minor – Negligible

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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Bats [cont'd]		corridors and potential pollution of Bogenjoss Burn due to particles and runoff.		Roosting habitat will be replaced by the provision of bat boxes in Standingstones Wood (HA N35), Farburn Wood (N36), East Woodlands (N43) and Monument Wood (N47). Creation of coniferous, mixed, riparian and scrub woodland as detailed in the terrestrial habitats mitigation, detention basins at the A96 and adjacent to Bogenjoss Burn and sympathetic landscape planting will also offset habitat loss. In addition to generic mitigation and the underpasses detailed in the badger mitigation, there are overbridges and culverts at the following locations that will be also be designed and managed sympathetically for bat usage: Kirkhill Wildlife Overbridge (ch319960), Kirkhill Overbridge (ch320180), and Bogenjoss Burn culverts (ch320100, ch320215, ch320260, ch302475 and ch320500). These measures including the above habitat creation will reduce construction and operational disturbance and fragmentation. Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	
	Farburn Wood N36	Fragmentation of foraging corridors.	Moderate	The above mitigation will partially mitigate for fragmentation impacts. Crossings to be provided at wildlife overbridge as per N37 and South Kirkhill Junction Underbridge may be used for crossing by bats.	Minor
Breeding Birds	Agricultural land surrounding Howemoss N32-N33 Bogenjoss Burn, Kirkhill Forest, Standingstones wood, Monument Woods and East Woodlands N37, N41-N43	Risk of direct mortality during clearance for construction.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
		Risk of direct mortality during operation due to RTAs habitat loss, fragmentation and disturbance.	Moderate	Habitat creation as detailed in the terrestrial habitat mitigation above will offset habitat loss and reduce fragmentation, and disturbance. Generic mitigation and the provision of safety barriers, set back from the road in addition to sensitively design landscaping will reduce direct mortality from RTAs.	Minor
		Potential pollution of aquifers especially Howemoss Burn and Bogenjoss Burn	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
Wintering Birds	Woodland and agricultural surrounding Howemoss N30, N31, N32, N33 & N39	Risk of direct mortality due to RTAs. Habitat loss, fragmentation, disturbance and potential pollution of aquifers.	Moderate	The generic measures stated in the breeding bird mitigation will reduce and help prevent direct mortality, disturbance, and pollution. The habitat created in the surrounding areas and general landscaping will reduce and offset habitat loss and fragmentation.	Negligible for pollution  Minor for all other impacts.

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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Wintering Birds [cont'd]	Woodland at Standingstones Wood, Kirkhill Forest, Bogenjoss Burn and Lower Overton Wood N34, N35, N37, N38, N39 & N40  Agricultural fields and Woodland at Bogenjoss Burn N41-N48	see above		see above	
Otter	Walton Field Ditch N30 Howemoss Field Ditch N33	Risk of direct mortality due to RTAs and/or drowning where culverted between foraging sites	Moderate	Mitigation detailed below will prevent mortality.	Negligible
	Bogenjoss Burn N37, N38, N40, N41, N42, N45	Risk of direct mortality due to RTAs and/or drowning where culverted between foraging sites due to construction and operation.	Major	Best practice guidelines and demarcation of watercourses within 30m of active lying up sites will ensure no mortality during construction. Otter-proof fencing to be fitted at ch317670-ch318000, ch318420-ch319160, ch319800-ch321280 and along a 500m stretch of the U53C Kirkhill road east of South Kirkhill Junction. Fencing for badgers above will also mitigate against RTA. (Figure A11.5e-i). Installation of the Kirkhill wildlife overbridge at ch319960 and depressed invert box culverts with integral mammal ledges at ch320100, ch320215, ch320260, ch320475, ch320500 and ch320870.	Negligible
		Habitat loss of riparian corridors due to realignment of burn, loss of riparian habitat and wildlife corridors.	Moderate	Habitat creation along Bogenjoss Burn as detailed in the terrestrial habitat mitigation above will partially offset habitat loss (Figures 11.5e-f).	Negligible
		Disturbance and fragmentation due to crossing and realignment, of riparian habitat and wildlife corridors.at Bogenjoss Burn	Major	Exclusion of work compounds from Bogenjoss Burn, Pitmedden and Monument Woods between ch319950-321800 and restrictions on night time working will reduce disturbance. No lighting along carriageway and habitat creation will reduce disturbance. Kirkhill wildlife overbridge at ch319960 and culverts at chainages noted above will maintain connectivity of commuting corridors for otters in upstream section of burn. Culvert dimensions at ch320870 are likely to result in residual impacts associated with fragmentation and severance of otter territories.	Minor (disturbance) - Moderate (fragmentation)

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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Otter [cont'd]		Potential pollution of Bogenjoss Burn due to construction and operation.	Moderate	Generic mitigation including best practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
Red Squirrel	Kirkhill Forest N37, N38, N40 (woodland 5) East Woodlands N43 (woodland 6) Standingstones wood N35 (woodland 12)	Risk of direct mortality and disturbance during clearance for construction.	Major	Generic mitigation including pre-construction surveys and an exclusion zone around any dreys will prevent direct mortality and reduce disturbance.	Negligible
		Direct mortality due to RTAs during operation and permanent habitat loss.	Major	The creation of coniferous woodland as detailed in terrestrial habitat mitigation (see above) to the west of AWPR will increase the area of Standingstones wood (HA N39 and Figure 11.5f). This will be planted with tree species of optimal value for squirrel as these areas are contiguous this will provide mitigation for the three woodland areas. Additional riparian, coniferous and mixed woodland will be planted to the east of East Woodlands as detailed in the terrestrial habitat mitigation above. The bridges proposed to offset fragmentation below will also reduce the risk of direct mortality due to RTAs during the operational phase.	Moderate at Kirkhill Forest and Standingstones Wood due to provision of bridges  Major at East Woodlands
	Kirkhill Forest N37, N38, N40 (woodland 5)	Fragmentation of habitats.	Major	The Kirkhill wildlife overbridge at ch319960 will link the fragmented woodlands; it is at least 7.5m wide with scrub planted along the bridge. Habitats on both sides of proposed carriageway will be linked up to the bridge by planting to enhance the connectivity of habitats on either side of the bridge. The Kirkhill overbridge at ch320180 will incorporate a wide vegetated strip to provide further connectivity between woodland on each side of the road. This green bridge will be constructed at least 10m wide with scrub planting 4m wide on the north side of the bridge. Habitats on both sides of proposed carriageway to be linked up to the bridge by planting. This will further reduce fragmentation on this area.	Moderate
	East Woodlands N43 (woodland 6) and Standingstones wood N35 (woodland 12)	Fragmentation of habitats.	Major	Although the above overbridges will somewhat link these two woodlands, squirrels from these areas need to travel some distance to benefit. Therefore there is only a slight reduction of the impacts associated with habitat fragmentation	Major at East Woodlands  Moderate at Standingstones Wood
Monument Wood N47 (woodland 7)		Risk of direct mortality and disturbance during clearance for construction	Major	Generic mitigation including pre-construction surveys and an exclusion zone around any dreys will prevent direct mortality and reduce disturbance.	Negligible

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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Red Squirrel [cont'd]		Direct mortality due to RTAs.	Major	There are no overbridges in the vicinity of Monument Wood and squirrel are unlikely to use underpasses designed for badger therefore this impact is not mitigated for. Direct mortality will be reduced by maintaining a 10m wide verge adjacent to the road to deter squirrels from accessing the carriageway.	Major
		Fragmentation	Major	There has been subsequent felling of this woodland post survey. Habitat creation to the north of the route will partially offset habitat loss and fragmentation. However, residual fragmentation impacts will remain.	Moderate
		Disturbance during construction.	Moderate	Generic mitigation including pre-construction surveys and an exclusion zone around any dreys will reduce disturbance	Negligible
		Disturbance during operation.	Moderate	Squirrel may become habituated to noise in addition to retreating away from the road, therefore in the long term this impact may lessen.	Moderate
Brown Hare	Agricultural land surrounding Howemoss N33	Habitat loss, disturbance and fragmentation.	Moderate	There is no specific mitigation planned for this species, however, secondary mitigation through extensive scrub and mixed woodland planting will provide shelter for brown hare and reduce habitat loss. This planting and the generic mitigation measures to prevent night time working will reduce construction and operational disturbance and the wildlife overbridges and mammal underpasses in this area will reduce fragmentation.	Minor
Fish	Bogenjoss Burn N37, N38, N40-N42, N45	Risk of direct mortality caused by potential pollution due to release of sediment during culvert construction (6) which may damage or kill fish.	Moderate	Generic mitigation including best practice will reduce risk of direct mortality due to pollution.	Minor
		Pollution due to road runoff carrying sediment load and heavy metals.	Moderate	Drainage to be routed via detention basins therefore preventing polluted water from entering the waterbody.	Negligible
		Fragmentation and isolation due to fish stranding during construction of six culverts, prevention of migration upstream resulting in spawning habitat loss.	Moderate	Fish to be removed prior to any de-watering, resulting in reduction of risk of fish being stranded. Culvert dimensions at downstream crossing of Bogenjoss Burn (ch320870) may result in residual impacts associated with the prevention of migration and fish passage.	Moderate at Bogenjoss Burn downstream crossing

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Ecological Receptor	Habitat Area	Impact	Impact significance	Site-specific Mitigation	Residual Impact Significance
Freshwater	Bogenjoss Burn N37, N38, N40, N41, N42, N45	Potential pollution due to release of sediment during re-alignment, culvert construction and short-medium term loss of in-stream habitat complexity. Loss of bankside, habitat loss complexity in culverted and re-aligned and straightened sections	Moderate	Risk of sediment release will be reduced through generic mitigation including best practice although culverting will result in changes to the local distribution of <i>B. putata</i> . In-stream habitat loss will be offset by restoration of stream bed material to culvert. However, the culvert dimensions, will lead to residual impacts associated with bank and riparian habitat loss, and fragmentation of burn habitats. Habitat loss through culverting will be offset by extensive riparian vegetation planting either side of the burn in the realigned section as detailed in the terrestrial habitat mitigation above.	Moderate
		Pollution due to runoff and change in discharge regime carrying sediment load and heavy metals may cause long term reduction in habitat complexity leading to localised changes in invertebrate distributions	Moderate	Burn realignment with riparian zone creation as described in the terrestrial habitat mitigation section above, will partially offset these impacts. Change to discharge regime will be reduced through careful design of realignment and culvert and will be monitored to reduce risk of significant changes in habitat.	Moderate

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**Appendix A10.17 – Ecology Mitigation and Residual Impact Summary Tables**

**Section NL4 – Summary of Site-Specific Mitigation and Residual Impacts (for pre-mitigation impacts of at least Moderate significance)**

Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Terrestrial Habitats	Monument Wood N50 River Don N52 Goval Burn and the Mill Lade N61, N68 and N69 Formartine and Buchan Way (DWS) N62	Habitat loss of riparian and linear habitats	Moderate	<p>Habitat Loss will be offset by habitat creation in several locations in this section of the route: Severance and fragmentation to be reduced by habitat creation of mixed and riparian woodland in HA N61 south of Goval Belt.</p> <p>At Goval, north of the road, east of the A947 in HA N61 creation of 0.54ha of mixed woodland including a 50m long 10m wide strip of riparian woodland (0.04ha) along the Mill Lade at ch324400 (Figure 11.5j).</p> <p>At Goval, south of the road east of the A947 in HA N61 at ch324400 0.66ha of mixed woodland including a strip of riparian woodland 150m long 10m wide north of Goval Burn 0.22ha (Figure 11.5j).</p> <p>South of Goval Burn east of the A947 in HA N61 at ch324400. Small triangle of mixed woodland 0.17ha (Figure 11.5j).</p> <p>Secondary mitigation is provided by landscaping in the form of mosaics of scrub and mixed woodland in flood plain field fragments adjacent to Goval Burn, N61, N68 and N69 (Figure 11.5j) (providing mitigation for otter and badger), will offset habitat lost and offset severance and fragmentation impacts.</p> <p>A replacement pond will be created in Corsehill (N71)</p>	Minor
		Disturbance and fragmentation of wildlife corridors.	Moderate	Best practice methods will reduce disturbance to vegetation, bridges, underpasses and culverts as detailed in the badger and otter mitigation will reduce fragmentation of riparian and terrestrial habitats.	Minor
		Potential pollution of aquifers especially the River Don, Goval Burn and Mill Lade	Moderate	Generic mitigation including best practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for pollution events.	Negligible  Minor for HA N52
Badger	Goval Burn and the Mill Lade N54, N60, N62 and N67	Risk of direct mortality and disturbance during clearance of two setts (social group NK) for construction.	Major	The main sett NK1 and subsidiary sett NK2, will need to have any resident badgers removed under licence through an exclusion procedure.	Negligible



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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Badger [cont'd]		Direct mortality due to RTAs.	Major	<p>Fencing to be fitted on sections: ch321260 – 322820, ch322820 – 323020 and ch323390-325220 including the abutments of the River Dee Crossing. At the B977 overbridge ch323610, the fenced section to extend to approx. 450m north of bridge and to 350m south of bridge.</p> <p>Roundabout at ch324100 fenced 200m west and 400m northeast.</p> <p>Re-aligned A947 at ch324400 fenced for 450m north of AWPR and 450m south. At ch324850 Goval junction fenced, east arm for 300m and west arm for 300m. Fencing for otters below will also mitigate against RTA. (Figure 11.5i-k)</p> <p>Installation of a high span bridge with set-back piers over the River Don at ch323050-323370 (see Figure 11.5i-k).</p> <p>Provision of bridges, underpasses and depressed invert box culverts with integral mammal ledges at locations detailed below and shown on Figure 11.5i-k..</p> <p>The main sett NK1 will need to have any resident badgers removed under licence through an exclusion procedure (Confidential Badger Figures)</p>	Negligible
		Habitat loss and disturbance of setting and of foraging habitat during construction.	Moderate	<p>Subsidiary sett NK2, outlier NK4 and subsidiary sett NJ4 and outlier NJ5 lie within 30m of the alignment. A 30m buffer must be marked out around the sett and access to the sett must be retained. Depending upon the proximity of works to this sett and the types of works required, either a disturbance licence or an exclusion procedure may be required</p> <p>Subsidiary sett NJ3 lies within 50m of the alignment. A 30m buffer must be marked out around the sett and access to the sett must be retained. Works will not take place within the 30m buffer zone.</p> <p>The main sett NK1 and subsidiary sett NK2 represent key setts therefore both will need to be replaced within Potential Relocation area No.5.</p> <p>The habitat created as stated in the terrestrial habitat mitigation will offset the impact of habitat loss.</p>	Minor
		Fragmentation of territory (social groups NH, NI, NJ and NK) and riparian commuting habitat along Goval Burn during construction and operation.	Moderate	<p>Bridges at ch323610 and ch324620 on main line, Parkhill aqueduct at ch323950, dry mammal underpass at ch324000 and bridge at ch324400 on Goval Mill Lade, bridges at ch323610, ch324400 and ch324530 on Goval Burn, culverts at ch325085, and side roads on Corsehill Burn will reduce fragmentation (see Figure 11.5i-k).</p> <p>Bridge with soft banks over River Don at ch323050- 323370 will also reduce fragmentation.</p>	Moderate

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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Bat	Banks of the River Don N52	No known roosts to be felled but potential direct mortality due to clearance for construction.	Major	Direct mortality will be prevented due to generic mitigation and best practice during construction including timing of works and preconstruction surveys.	Negligible
		Direct mortality due to RTAs.	Major	Provision of a wide span bridge (see below) which bats may fly under combined with sympathetic landscape planting will reduce RTAs.	Negligible
		Fragmentation, disturbance, habitat loss and potential pollution of the River Don due to particulates.	Major	Fragmentation will be offset by installation of a high span bridge at River Don, to maintain commuting route along river. The River Don Bridge will be enhanced with bat bricks and bat boxes to provide permanent roost opportunities. Installation of a high span bridge with set-back piers over River Don ch323050-323370. Generic mitigation including best practice PPG guidelines from SEPA and SUDS will prevent / mitigate for pollution events.	Negligible
	Goval Burn and the Mill Lade N61	No known roosts to be felled but potential direct mortality due to clearance for construction.	Major	Direct mortality will be prevented due to generic mitigation and best practice during construction including timing of works and preconstruction surveys.	Negligible
		Direct mortality due to RTAs between foraging sites.	Major	Temporary screens at Parkhill Pumping station to prevent bats emerging from the roost colliding with oncoming traffic. This and the habitat creation including planting, culverting, overbridges and underpasses detailed in otter mitigation above will reduce RTAs in the Goval Burn area	Minor
		Habitat loss, fragmentation and disturbance of existing roost at Parkhill Pumping Station.	Moderate	No other known roosts but should preconstruction surveys discover roosts at Upper Kirkton, Goval Farm and Meadowhead Farm, appropriate mitigation may be required. Second stage detention basins to be provided at the Goval Burn (N55) Corsehill Burn (HA N69) will extend the foraging habitat resource. A replacement pond will be created in Corsehill (N71). Habitat creation as detailed above, with mixed and riparian woodland surrounding Goval Burn (N61) will offset loss of foraging habitat in these areas. Bat boxes to be provided at Upper Kirkton, Goval Burn and Mill Lade to offset loss of potential roosts and reduced suitability of potential roosts due to road disturbance. Where the Goval Burn flows under the B977 and A947 will be enhanced with bat bricks and bat boxes to provide permanent roost opportunities. In addition to generic mitigation detailed in the badger mitigation, there are overbridges and culverts at the following locations that will be also be designed and managed sympathetically for bat usage: bridges at ch323610 and ch324620 on main line, Parkhill aqueduct at ch323950, underpass at ch324000 and bridge at ch324400 on Goval Mill Lade, bridges at ch323610, ch324400 and ch324400 on Goval Burn, culverts at ch325085, and side roads on Corsehill Burn will reduce fragmentation (Figure 11.5i-k).	Minor

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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Bat [cont'd]	Agricultural land surrounding railway N49-50	Potential pollution of aquifers, especially Goval Burn.	Moderate	Generic mitigation including best practice PPG guidelines from SEPA and SUDS will prevent / mitigate for pollution events.	Negligible
	Formartine and Buchan Way (DWS) N62	No known roosts to be felled but potential direct mortality during clearance for construction.	Moderate	Generic mitigation including timing of works and preconstruction surveys will prevent direct mortality during construction.	Negligible
	Agricultural fields to the north of Meadow Head N69	Direct mortality due to RTAs between foraging sites at Goval Belt	Moderate	Planting trees with high height when mature at Goval Belt and between the improved A947 and Little Goval Junctions where bat flight lines will be severed by the road.	Minor
	Goval Farm, Goval Wood, Goval Belt and surrounding agricultural fields N54, N58, N60	Habitat loss, disturbance and fragmentation of roosts, foraging and commuting corridors.	Moderate	Habitat creation as detailed above including riparian, mixed woodland and detention basins will offset habitat loss. Habitat creation and the above detailed culverts, underpasses and overbridges will reduce disturbance and fragmentation.	Minor
	Parkhill Estate N63 Skate Wood N65	Disturbance due to construction	Moderate	Habitat creation, the above detailed culverts, underpasses and overbridges and generic mitigation will reduce disturbance and fragmentation.	Negligible
	Den Wood N67	Fragmentation of foraging corridors.	Moderate	Habitat creation and the above detailed culverts, underpasses and overbridges will reduce disturbance and fragmentation.	Minor
Breeding Birds	River Don (DWS) N52	Risk of direct mortality during clearance for construction.	Moderate	Generic mitigation including timing of works and pre-construction surveys will prevent direct mortality	Negligible
	Goval Burn and the Mill Lade 61	Direct mortality due to RTAs, habitat loss, fragmentation, disturbance.	Moderate	Generic mitigation including positioning of safety barriers and sympathetic landscape planting will reduce RTAs Sympathetic landscape planting will also reduce disturbance and fragmentation.	Minor
		Potential pollution of the River Don, Goval Burn and the Mill Lade due to particulates.	Moderate	Generic mitigation including SEPA Best Practice Guidelines (PPGs) and SUDS guidelines will prevent / mitigate for pollution events.	Negligible
Wintering Birds	Farmland surrounding the River Don and River don DWS N49, N50, N51, N52 & N54	Direct mortality during clearance for construction and RTAs during operation. Habitat loss, disturbance and fragmentation. Potential pollution of the River Don.	Moderate	The generic measures stated in the breeding bird mitigation will reduce direct mortality, disturbance, and pollution. The habitat created in the surrounding areas and general landscaping partially offset habitat loss.	Minor

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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Wintering Birds [cont'd]	Agricultural fields and Woodland to the West and South of Goval Burn and Goval Mill Lade N55, N58, N60, N61, N62, N63 & N64	Risk of direct mortality during clearance for construction and thorough RTAs between foraging sites, permanent habitat loss and fragmentation), disturbance and potential pollution of Goval Burn and the Mill Lade from runoff..	Moderate	The above measures will reduce the significance of these impacts.	Minor
	Agricultural fields and Woodland to the East and South East of Goval Burn and Goval Mill Lade N67, N68, N69 & N70	Risk of direct mortality during clearance during construction and due to RTAs between foraging sites during operation, permanent habitat loss and fragmentation (excluding N49), disturbance and potential pollution of Goval Burn and the Mill Lade from runoff.	Moderate	The above measures will reduce the significance of these impacts.	Minor
Otter	River Don N52	Direct mortality due to RTAs and/or drowning during construction and operation of the road.	Major	Mortality will be prevented and/or reduced by: Best practice guidelines and demarcation of watercourses within 30m of active lying up sites will ensure no mortality during construction. Otter-proof fencing to be fitted ch321260–322820, ch322820–323020 and ch323390-325220 including the abutments of the River Don Crossing. At the B977 overbridge ch323610, the fenced section to extend to approx. 450m north of bridge and to 350m south of bridge. Fencing for badgers above will also mitigate against RTA. Roundabout at ch324100 fenced 250m west and 500m northeast. Re-aligned A947 at ch324400 fenced for 600m north of AWPR and 450m south. At ch324820 Goval junction fenced, east arm for 300m and west arm for 300m (Figure 11.5i-k) Installation of a high span bridge with set-back piers over River Don ch323050-323370. Provision of bridges, underpasses and depressed invert box culverts with integral mammal ledges as detailed in badger mitigation above.	Negligible
		Fragmentation and disturbance due to construction and operation.	Major	Night time working will be avoided where practicable. The underpasses stated in the badger mitigation can be used by otter, this and the above bridging and culverting will reduce fragmentation. The above habitat creation and restricted carriageway lighting will reduce disturbance.	Negligible
		Potential pollution during construction and operation.	Major	Adherence to SEPA Best Practice Guidelines (PPGs), and installation of SUDS drainage treatment.	Negligible

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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Otter [cont'd]	Goval Burn N54, N55, N59 - N61	Risk of direct mortality and disturbance during clearance for construction of one holt and lying up sites.	Major	Best practice guidelines and demarcation of watercourses within 30m of active lying up sites will ensure no mortality during construction. Exclusion of the holt under licence from the Scottish Executive Environment and Rural Affairs Department (SEERAD) before destruction will prevent direct mortality.	Negligible
		Direct mortality due to RTAs and /or drowning.	Major	The above otter proof fencing and the installation of overbridges depressed invert box culverts with integral mammal ledges and an underpass and aqueduct at locations detailed in badger mitigation above will prevent RTAs and drowning.	Negligible
		Habitat loss of high value riparian and wildlife corridor habitat due to culverting and re-alignment. Scheme would result in the loss of holt 4 at ch324525.	Moderate (Major for loss of holt)	Two replacement pipe and chamber holts to be positioned within the existing riparian zone of Goval Burn in HA N60 at ch324100 and N61 at ch324620. At Goval, north of the road, east of A947 in HA N61 creation of 0.5ha of mixed woodland including a 50m long 10m wide strip of riparian woodland (0.05ha) along the Mill Lade at ch324400-324530 (Figure 11.5j). At Goval, north of the road, east of A947 in HA N61 at ch324530-324650 creation of 0.5ha of land set aside for otter habitat between Goval Mill Lade and Goval Burn (Figure 11.5j). At Goval, south of the road east of the A947 in HA N61 at ch324400-324530 0.8ha of mixed woodland including a strip of riparian woodland 150m long 10m wide north of Goval Burn (0.15ha) (Figure 11.5j). At Goval, south of road and south of Goval Burn east of A947 in HA N61 at ch324400-324440 small triangle of mixed woodland 0.17 ha total (Figure 11.5j). Secondary mitigation is provided by landscaping in the form of mosaics of scrub and mixed woodland in flood plain field fragments adjacent to Goval Burn, N61, N68, N69.	Negligible (Minor due to loss of holt)
		Fragmentation and disturbance of three holts and lying up sites during construction and operation.	Major	Prevention of night time working where practicable. Underpasses provided for badgers will also serve as mitigation for otters (refer to badger mitigation above), this and the above culverting will reduce Fragmentation. The above habitat creation will reduce disturbance during the construction and operation of the road Monitoring of status of the otter holts will be required during the pre-construction phase. Confirmation of a holt being used for breeding may require cessation of activity within the vicinity of that holt under it has been confirmed that the bitch and young are able to leave the area (usually up to 10 weeks).	Negligible
		Potential pollution due to runoff during construction and operation.	Major	Adherence to SEPA Best Practice Guidelines (PPGs), and installation of SUDS drainage treatment.	Negligible

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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Otter [cont'd]	Mill Lade N55 Corsehill Burn N64, N66, N68, N70	Direct mortality due to RTAs and or drowning during construction and operation.	Major for Mill Lade Moderate for Corsehill Burn	Best practice guidelines and demarcation of watercourses within 30m of active lying up sites will ensure no mortality during construction. Provision of bridges, underpasses and depressed invert box culverts with integral mammal ledges at locations detailed in the badger mitigation above will prevent RTAs and drowning.	Negligible
		Fragmentation and disturbance during construction and operation.	Major for Mill Lade Moderate for Corsehill Burn	Night time working will be avoided where practicable. The underpasses stated in the badger mitigation can be used by otter, this and the above bridging and culverting will reduce fragmentation. Dimensions of Corsehill Burn Culvert are likely to result in residual impacts if otters cannot cross the road safely. Habitat creation and restricted carriageway lighting will reduce disturbance.	Minor for Lade, Moderate for Corsehill Burn
		Potential pollution due to particulates and chemical runoff during construction and operation.	Major for Mill Lade Moderate for Corsehill Burn	Generic mitigation including best practice PPG guidelines from SEPA and SUDS will prevent / mitigate for pollution events	Negligible
Fish	River Don N52	Direct mortality caused by potential pollution due to release of sediment during construction which may damage or kill salmonids.	Major	Timing of works as stated in the generic fish mitigation to avoid sensitive periods Including best practice on construction site. Use sediment traps for road drainage.	Negligible
		Fragmentation and isolation due to physical barriers (such as velocity increases due to bridge footings or concrete apron) may affect migration upstream resulting in reduced spawning..	Major	The bridge is to span the river and floodplain with no in-water piers therefore there will be no barriers and no change in velocity or scouring is predicted.	Negligible
		Disturbance from noise and vibration during bridge construction could damage fish hearing, impede migration or kill young eggs.	Major	No impact piling will be used. A noise threshold will be agreed in advance of works and will avoid sensitive periods, use "soft start" and no night working.	Negligible
		Reduction in water quality due to potential pollutants and sediments caused by runoff and road drainage.	Major	Road drainage to be routed through large detention basins, preventing polluted water entering the waterbody.	Negligible

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Ecological Receptor	Habitat Area	Impact	Impact Significance	Site-specific Mitigation	Residual Impact Significance
Fish [cont'd]	Goval Burn N54, N55, N59, N60, N61	Fragmentation and isolation due to physical barriers (such as velocity increases due to bridge footings or concrete apron) may affect migration upstream resulting in reduced spawning.	Major	The bridge is to span the river and floodplain with no in-water piers therefore there will be no barriers and no change in velocity or scouring is predicted.	Negligible
		Risk of direct mortality caused by potential pollution due to release of sediment during construction which may damage or kill salmonids.	Major	Timing of works as stated in the generic fish mitigation to avoid sensitive periods, including best practice during construction will reduce the risk of direct mortality due to pollution.	Negligible
		Disturbance from noise and vibration during bridge construction could damage fish hearing, impede migration or kill young eggs.	Major	No impact piling will be used. A noise threshold will be agreed in advance of works and will avoid sensitive periods, use "soft start" and no night working.	Negligible
		Reduction in water quality due to potential pollutants and sediments cause by runoff and road drainage during operation.	Moderate	Road drainage to be routed through large detention basins and sediment traps, preventing polluted water entering the waterbody.	Negligible
Freshwater	River Don N52	Potential pollution due to release of sediment during bridging construction and sediment and run-off during operation resulting in loss of in-stream habitat complexity.	Major	Risk of sediment release will be reduced through generic mitigation including SEPA PPG Best Practice.	Negligible
	Goval Burn N54, N55, N59, N60, N61	Potential pollution due to release of sediment during bridging construction and sediment and runoff during operation resulting in loss of in-stream habitat complexity.	Moderate	Risk of sediment release will be reduced through generic mitigation including SEPA PPG Best Practice.	Minor

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**Appendix A10.17 – Ecology Mitigation and Residual Impact Summary Tables**

**Section NL5 – Summary of Site-Specific Mitigation and Residual Impacts (for pre-mitigation impacts of at least Moderate significance)**

Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
Terrestrial Habitats	Littlejohn's Wood N72 Corby and Lily Lochs (SSSI, DWS, SINS complex with Bishops Loch) N85	The AWI listed plantation woodlands of Littlejohn's and Corsehill would be severed. Fragmentation and disturbance of wetland habitats with hydrological disruption and potential pollution of the lochs. Direct habitat loss, severance and fragmentation of woodland habitats to north and south of the proposed route. Potential pollution and disturbance to woodland habitats.	Major	Best practice methods will prevent disturbance to vegetation, underpasses and culverts as detailed in the badger and otter mitigation will reduce fragmentation of habitats. Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for pollution events. Specific drainage solutions will prevent hydrological disruption to the lochs.	Negligible
				Habitat loss, severance and fragmentation to be compensated by creation of woodland south of the route, 0.66ha of mixed woodland is required for landscape and ecological mitigation. Mixed woodland south of the road in HA N72 at ch325700 1.27ha solely for ecological mitigation will be planted in felled areas extending Littlejohn's Wood (Figure 11.5k). This habitat creation will involve planting of localised clumps of Scot's pine, with the rest of the area left unmanaged to allow natural regeneration to occur, as has occurred in northwest corner of existing wood. Creation of scrub woodland on north side of AWPR in HA N87 between ch328040 and 328300 0.81ha of scrub woodland (Figure 11.5m) in isolated field fragments to offset habitat loss and fragmentation. Riparian woodland to be created along Blackdog Burn on either side of the AWPR. South of AWPR and east of Blackdog Burn. 0.37ha in HA N91 at ch330000 (Figure 11.5n). Scrub and riparian mosaic north of road and either side of Blackdog Burn 0.17ha in HA N91 ch329900 to ch329950 (Figure 11.5n). This woodland, primarily to provide otter mitigation, will enhance the local habitat diversity and improve the ecological value of the riparian corridor along the burn.	Minor-Negligible
Badger	Littlejohn's Wood and Harehill N67, N85, N91 and N93-94	Risk of direct mortality during clearance of setts (one outlier sett, social group NO) for construction.	Moderate	The subsidiary sett NO1, will need to have any resident badgers removed under licence through an exclusion procedure, which will prevent direct mortality.	Negligible
		Direct mortality due to RTAs.	Moderate	Fencing to be fitted from ch325220-326800, ch327710-328160, ch328790 - 329750 and ch330350 – 331000.. Fencing 80m stretch east of the A90 North Junction (Figures 11.5k-p) to reduce mortality from RTAs. Fencing for otters below will also mitigate against RTA. Mammal underpasses at the locations provided below will further reduce of mortality from RTAs.	Negligible



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Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
Badger [cont'd]		Habitat loss of setting and of foraging habitat, fragmentation and disturbance of territory (social groups NK,NL,NM,NN)	Moderate	Habitat creation as detailed above including mixed woodland south of the road in HA N72 at ch325700 will be planted in felled areas extending Littlejohn's Wood (Figure 11.5k). Scrub habitat north of the road in HA N72 between ch328040-328300 scrub woodland (Figure 11.5m). Creation of riparian habitat south of AWPR and east of Blackdog Burn in HA N91 at ch330000 (Figure 11.5n). Dry mammal underpass to be fitted at ch326280, culverts to be fitted at ch327500, and 329950, Culvert on Blackdog Burn east of A90 and three culverts on Middlefield Burn at A90 north junction. (Figures 11.5k-p), will reduce fragmentation of territories and allow safe passage of badgers from one side of the road to the other.	Minor
Bat	Cranfield treelines and treelines surrounding Harehill N91	Risk of direct mortality due to destruction of one roost during clearance for construction between Cranfield and Harehill.	Moderate	Direct mortality will be prevented by generic mitigation including roost exclusion.	Negligible
		Direct mortality due to RTAs between foraging sites.	Moderate	The provision of safe foraging corridors in the form of culverts, underpasses and overbridges detailed below will reduce RTAs.	Minor
		Habitat loss, disturbance to potential roosts and fragmentation of foraging corridors.	Moderate	Habitat creation detailed above (refer to terrestrial habitat and badger mitigation) will partially offset habitat loss, culverts, underpasses and overbridges detailed below will reduce disturbance and fragmentation.	Minor
	Cranfield treelines N90	No further known roosts to be felled but potential direct mortality due to clearance for construction roost between Cranfield and Harehill.	Moderate	Direct mortality will be prevented due to generic mitigation and best practice during construction including timing of works and preconstruction surveys.	Negligible
		Direct mortality due to RTAs between foraging sites.	Moderate	The provision of safe foraging corridors in the form of culverts, underpasses and overbridges detailed below will reduce RTAs.	Minor
		Habitat loss, disturbance to potential roosts and fragmentation of foraging corridors.	Moderate	Habitat creation detailed above will partially offset habitat loss, culverts, underpasses and overbridges detailed below will reduce disturbance and fragmentation.	Minor

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Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
Bat [cont'd]	Corsehill Wood N71 Littlejohn's Wood N72	No known roosts to be felled but risk of direct mortality from potential roosts during clearance for construction.	Moderate	Direct mortality will be prevented due to generic mitigation and best practice during construction including timing of works and preconstruction surveys.	Negligible
	Woodland at Red Moss N74 Loch Hills Quarry N80 Fields surrounding Loch Greens Farm N84,-N87 Corby and Lily Lochs N85 Newton of Shielhill woodland N88	Direct mortality due to RTAs between foraging sites.	Moderate	Safe foraging corridors listed below and generic mitigation such as sympathetic landscape planting to prevent RTAs.	Minor
		Habitat loss, disturbance and fragmentation of roosts and foraging corridors.	Moderate	The provision of bat boxes in trees to be retained in Littlejohn's Wood and around Cranfield B977. The provision of habitat including mixed woodland in HA N72 and scrub and riparian woodland in N87 and N91 as detailed in the badger mitigation will partially offset habitat loss.  In addition to generic mitigation and the underpasses detailed in the badger mitigation, there are overbridges and culverts at the following locations that will be also be designed and managed sympathetically for bat usage: B977 East Overbridge (ch325950), Lochgreens Overbridge (ch326730), Red Moss Burn (ch327500), Newtonhill Overbridge (ch.328560), B999 Overbridge (ch329500), and Blackdog Burn Culvert (ch329950 and A90).  The provision of detention basins near Corby Loch and at Blackdog / Harehill Burns will increase the likelihood of bats using these crossing points These measures will reduce disturbance and fragmentation.	Minor
		Disturbance and fragmentation of roosts and foraging corridors	Moderate	The provision of safe foraging corridors listed above and generic mitigation such as sympathetic landscape planting will reduce disturbance and fragmentation.	Minor
		Potential pollution of aquifers, especially Red Moss Burn, Corby Loch and Blackdog Burn.	Moderate	Generic mitigation including adherence to SEPA Best Practice Guidelines (PPGs), and installation of SUDS drainage treatment, and minimising disturbance.	Negligible
Breeding Birds	Corby and Lily Lochs ( SSSI, DWS, SINS) N85	Potential pollution of aquifers.	Moderate	Generic mitigation including adherence to SEPA Best Practice Guidelines (PPGs), and installation of SUDS drainage treatment, and minimising disturbance	Negligible
		Disturbance due to fragmentation of habitat and foraging.	Moderate	Generic mitigation and specific mitigation as detailed above including ecological and landscape planting will reduce disturbance and fragmentation.	Minor
	Area surrounding Lochs N84 and N87 Red Moss N87 Blackdog, N94, N95 and N96	Direct mortality during clearance for construction.	Minor	Generic mitigation including timing of works and pre-construction surveys will prevent direct mortality.	Negligible
		Habitat loss.	Minor	Habitat will be created for landscape mitigation in the form of scrub woodland (HA87) north of the road at Newtonhill and around Blackdog Burn (N91) and surrounding the A90 junction (N 97) as detailed in terrestrial habitat mitigation will partially offset habitat loss.	Negligible

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Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
Breeding Birds [cont'd]	Red Moss N87 Backhill of Cranbog N89	Disturbance, fragmentation and potential pollution of aquifers during construction and due to runoff during operation.	Moderate	Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for disturbance and pollution events. Generic mitigation and specific mitigation as detailed above including ecological and landscape planting will reduce disturbance and fragmentation.	Negligible
Wintering Birds	Woodland at Red Moss, North of B977 N74	Risk of direct mortality due to RTAs between foraging sites, permanent habitat loss and fragmentation and disturbance potential pollution of ground water from runoff.	Moderate	The generic measures stated in the breeding bird mitigation will reduce direct mortality, disturbance, and pollution. The habitat created in the surrounding areas and general landscaping partially offset habitat loss.	Negligible
	Area around Lochgreens Farm N80, N81, N83, N86 & N87	Risk of direct mortality due to RTAs between foraging sites, permanent habitat loss and fragmentation and disturbance potential pollution of aquifers from runoff.	Moderate	The generic measures stated in the breeding bird mitigation will reduce disturbance and pollution. In addition to the habitat created in the surrounding areas as detailed in the terrestrial habitat and breeding bird mitigation. General landscaping will partially offset habitat loss.	Minor
	Corby and Lily Lochs N85	Fragmentation, disturbance and potential pollution of aquifers.	Moderate	Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for pollution events. Generic mitigation and specific mitigation as detailed above including ecological and landscape planting will reduce disturbance and fragmentation.	Negligible
	Backhill of Cranbog N86-N90	Disturbance (N86, N88, N89 only). Risk of direct mortality due to RTAs between foraging sites, permanent habitat loss and fragmentation and disturbance. Potential pollution of ground water from runoff (N90 only).	Moderate	The generic measures stated in the breeding bird mitigation will reduce direct mortality, disturbance, and pollution. The habitat created in the surrounding areas and general landscaping partially offset habitat loss.	Minor
	Fifehill N94, N96 & N97	Risk of direct mortality due to RTAs between foraging sites, permanent habitat loss and fragmentation and disturbance potential pollution of ground water from runoff.	Moderate	The generic measures stated in the breeding bird mitigation will reduce direct mortality, disturbance, and pollution. The habitat created in the surrounding areas and general landscaping partially offset habitat loss.	Negligible

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Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
Otter	Blackdog Burn N91, N93, N94, N95	Direct mortality due to RTAs during commuting and or drowning; potential pollution and disturbance during construction.	Major	Direct mortality due to RTAs will be prevented and/or reduced by otter-proof fencing to be fitted at ch326800-327710, ch328160 – 328790, ch329750-330350, along a 400m stretch of the A90, along the edge of the riparian zone on Middlefield Burn at the A90 North Junction and 250m stretch of Blackdog access road (see Figure 11.5l-p). Fencing for badgers above will also mitigate against RTA. Installation of depressed invert box culverts with mammal ledges at Red Moss Burn, Blackdog Burn and Middlefield Burn to prevent drowning and reduce fragmentation. Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for disturbance and pollution events.	Negligible
	Blackdog Ditch N94	Direct mortality due to RTAs , drowning and potential pollution	Moderate	Installation of a depressed invert box culvert at ch330065 along with the mitigation detailed above will help reduce direct mortality through RTAs and/or potential pollution.	Negligible
	Corby and Lily Lochs N85	Potential pollution of the lochs during construction and operation.	Moderate	Exclusion of work compounds from terrestrial habitat surrounding Lily and Corby Lochs between ch327200-328000. No night time working where practicable will reduce disturbance during construction. Underpasses provided for badgers will also serve as mitigation for otters, this and the above culverting will reduce fragmentation. Generic mitigation including Best Practice PPG guidelines from SEPA and SUDS guidelines will prevent / mitigate for disturbance and pollution events. Generic mitigation and specific mitigation as detailed above including ecological and landscape planting will reduce disturbance and fragmentation.	Negligible

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Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
	Blackdog Burn N91, N93, N94, N95	Fragmentation of habitat and disturbance.	Moderate	<p>The above mitigation will be applied to mitigate these impacts, in addition there are small areas of riparian habitat creation surrounding Blackdog Burn and Middlefield Burn that will reduce disturbance and provide cover for otters using the commuting routes under the road. They are as follows.</p> <p>Block of scrub woodland to the north of the road (LE) (1ha) in HA N87 at ch328030-328300 (Figure 11.5l).</p> <p>Scrub woodland planting of approx. 0.1ha and riparian woodland planting of approx. 0.05ha to north of road along Blackdog Burn in HA N87 at ch328970-329970. Riparian woodland planting of approx 0.5ha south of the road to east of Blackdog Burn in HA N87 at ch329980-330090 (Figure 11.5n).</p> <p>Riparian woodland planting (LE) approx 0.5ha at the A90 North Junction inside roundabout (HA N96). Above Fife Hill (HA N97) east of the road and east of A90 Junction there will be a 170m strip of riparian woodland (approx 0.3ha) surrounding an detention basin, and 100m strip of riparian woodland (approx 0.2ha) east of the A90 junction.</p> <p>East of AWPR west of the A90 junction there is a mosaic of scrub and species rich grassland (approx 1ha of scrub).</p>	Negligible
	Red Moss Burn N82, N83, N84, N85, N86, N87	Direct mortality due to RTAs during commuting and or drowning and potential pollution fragmentation of habitat and disturbance.	Moderate	The above mitigation will be applied to mitigate these impacts.	Negligible
		Habitat loss	Moderate	The above mitigation will partially mitigate these impacts.	Minor
	Middlefield Burn N97	Direct mortality due to RTAs during commuting and/ or drowning and potential pollution; fragmentation of habitat and disturbance.	Moderate	The above mitigation will mitigate these impacts.	Minor for fragmentation Negligible for other impacts

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Ecological Receptor	Area	Impact	Impact significance	Site-specific Mitigation	Residual Impacts Significance
Red Squirrel	Corsehill Wood N71 (woodland 7)	Risk of direct mortality during clearance for construction.	Major	Generic mitigation including pre-construction surveys and an exclusion zone around any dreys will prevent mortality during construction.	Negligible
	Littlejohn's Wood N72 (Woodland 8)	Permanent habitat loss, fragmentation and disturbance.	Major	Habitat creation in the remaining areas of Littlejohn's wood and sympathetic management of the woodland for red squirrels will offset habitat loss and fragmentation. The generic mitigation will reduce disturbance during construction.	Moderate (Minor for habitat loss and fragmentation in the long-term)
Terrestrial Invertebrates	Red Moss N82	Potential hydrological disruption affecting the quality of the surrounding habitat.	Moderate	Pollution control through best practice at site over and above SEPA pollution prevention guidelines to prevent hydrological and/or pollution impacts on drainage channels connecting Red Moss and Lily and Corby Lochs.	Negligible
	Corby Loch N84-85	Potential hydrological disruption affecting the quality of the surrounding habitat.	Moderate	The measures stated in the terrestrial habitat and the otter mitigation will prevent an impact upon habitat quality.	Negligible