

# Appendix 17-A: Schedule of Environmental Commitments

Environmental Statement Volume II  
Access to Witney

Oxfordshire County Council

March 2022

# Appendix 17-A Schedule of Environmental Commitments

Each technical chapter of the ES (*ES Volume 1, Chapters 5-15*) has identified mitigation measures. Where possible, mitigation has been incorporated into the Proposed Development as part of the iterative design process (i.e. embedded mitigation). Where major or moderate adverse effects are predicted after this mitigation has been taken into account, additional mitigation measures are identified to avoid, further mitigate or remedy those effects. As defined by *DMRB LA 104 Environmental assessment and monitoring* (Ref 1-1), these measures are classed as additional 'essential' mitigation which is critical to the delivery of a project and may be acquired by statutory powers (e.g. as part of a planning condition). Full details of the mitigation measures for the Proposed Development have been provided within the relevant technical chapters. However, a summary of these mitigation measures and potential securing mechanisms is identified within Table 1-1.

**Table 1-1: Schedule of Environmental Commitments**

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
<i>General</i>					
ES Volume 1, <i>Chapter 4: The Proposed Development,</i> section 4.4	Drainage	The drainage design proposes that run-off will be diverted to existing verges or ditches adjacent to the A40 and that there will be one attenuation pond located to the east of the new on-slip road and south of the B4022, and one balancing pond located to the east of the proposed off-slip.	Detailed design and construction	Embedded mitigation	Required to manage surface water runoff in accordance with current highway design standards and will reduce the likelihood and severity of potential pollution incidents and flooding affecting watercourses and the local ditch network to reduce or eliminate adverse effects for aquatic and riparian species and habitats. Drainage will be treated by attenuation ponds which will be landscaped to

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
					provide optimal water treatment.
ES Volume I <i>Chapter 4: The Proposed Development</i> , section 4.12	Standard measures for construction	An ISO 14001 (or equivalent) compliant Construction Environmental Management Plan (CEMP) is to be prepared by the Principal Contractor prior to the start of construction works. The aim of the CEMP is to provide an overarching and strategic framework for the management of environmental effects and the implementation of measures prior to, and during, the demolition and construction phase of the Proposed Development. The CEMP will be a 'live' document and will be continually reviewed and updated by the Principal Contractor.	Prior to and during construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

***ES Volume I Chapter 5: Air Quality***

Section 5.7 Environmental Design and Management	Standard measures for construction	The Proposed Development would be subject to measures and procedures as defined within the CEMP. These would include a range of Best Practicable Means (BPM) associated with mitigating potential environmental impacts. The measures detailed within the CEMP is developed by the selected Principal Contractor which would be implemented for the duration of the construction phase.	Prior to and during construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 5.9 Mitigation and monitoring	Mitigation measures for additional dust management.	The CEMP would include a range of industry standard good practice construction phase dust mitigation measures required during all works undertaken based on the level of construction dust risk at sensitive receptors. This includes measures focused on preparing and maintaining the site such as screens, vegetating stockpiles, specifying the type of machinery used, surfacing of haul routes, wheel washing, as well as specific or additional measures within a Dust Management Plan, potentially including dust monitoring.	Prior to and during construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		Adoption of these mitigation measures have the potential to reduce the magnitude of impacts, so they are not significant.			
Section 5.9 Mitigation and monitoring	Mitigation measures for additional dust management.	Monitoring of particulates or dust may be required close to dusty activities during construction as part of the CEMP (to be defined in the Dust Management Plan).	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

### *ES Volume I Chapter 6: Biodiversity*

Section 6.6 Environmental Design and Management	Standard measures for construction	The Principal Contractor's CEMP will detail and formalise the measures that will be implemented during construction of the Proposed Development to comply with environmental legislation and mitigate construction-related effects on biodiversity associated with the transfer of invasive non-native species, dust deposition, air pollution, pollution incidents, water quality, light, noise and vibration.	Prior to and during construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 6.6 Environmental Design and Management	Impacts from construction on biodiversity and ecological receptors	Vegetation clearance - it is assumed that vegetation clearance will be undertaken outside of the key bird breeding period (i.e. between October and February inclusive), or where this is impractical (or conflicts with other constraints) ensuring a check for the presence of active nests is undertaken by an ecologist prior to the commencement of clearance. If any active nests are found, the work will cease, the area with the nests will be left in situ and an appropriate buffer zone will be established. This area will be left intact until it has been confirmed by the ecologist that the young have fledged and the nest is no longer in use.	Prior to and during construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 6.6 Environmental Design and Management	Lighting impacts	Lighting - minimising construction lighting, directing lights downwards and away from sensitive receptors and minimising light spill into adjacent areas; ensuring that lighting is turned off when not required.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 6.6 Environmental Design and Management	Pollution control	Pollution controls - the CEMP will include mitigation measures to minimise the risk of release of hydrocarbons and oils, and sediment loading in run off. It is assumed that all works in this regard will be undertaken with adherence to current best practice guidance;	Prior to and during construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 6.6 Environmental Design and Management	Noise	Noise - e.g. placing noisy plant and equipment will be placed as far as practical from potential receptors. Machinery will be throttled down or turned off when not in use and modern quiet and well-maintained equipment will be used and fitted with appropriate silencers.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 6.6 Environmental Design and Management	Dust	Dust suppression (where relevant) - prevention of dust deposition on retained habitats and those within the surrounding area through use of best practice methods to prevent dust generation and spread (e.g. wetting of construction access routes during dry weather).	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 6.6 Environmental Design and Management	Standard measures for construction	An ecological briefing will be incorporated into the site induction for all construction staff. This briefing will outline the key ecological receptors in proximity to the site (e.g. location of designated sites), and the procedure to follow in the event that protected species are encountered during works.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

Source	Issue	Mitigation Measure	Timing	Embedded/ Essential Mitigation	Justification
Section 6.6 Environmental Design and Management	Standard measures for construction	<p>The design of the construction compound has sought to avoid the removal of hedgerows or potential impacts on existing mature trees and is situated within arable land. The site compound will utilise the existing gateway/ access point to avoid the requirement for loss of hedgerow habitat or mature trees.</p> <p>The compound will be reinstated to existing land use (arable) following completion of construction (approximately 41 weeks duration).</p>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 6.6 Environmental Design and Management	Landscape Design	<p>The landscape scheme for the Proposed Development will incorporate the following approximate areas of habitat creation:</p> <ul style="list-style-type: none"> <li>• 671m of native hedgerow planting, comprising a species mix such as hazel, hawthorn, elder, blackthorn, dog rose (<i>Rosa canina</i>) and field maple;</li> <li>• 2.55ha of native woodland habitat and woodland edge plantings. Native woodland habitat includes a species mix such as beech (<i>Fagus sylvatica</i>), small leaved lime (<i>Tilia cordata</i>), field maple, silver birch, hazel, hawthorn, holly, sessile oak (<i>Quercus petraea</i>), English oak, crab apple (<i>Malus sylvestris</i>), bird cherry (<i>Prunus avium</i>) and wild service tree (<i>Sorbus torminalis</i>) and a woodland seed mix with garlic mustard (<i>Alliaria petiolata</i>), ramsons (<i>Allium ursinum</i>), cow parsley (<i>Anthriscus sylvestris</i>), lesser burdock (<i>Arctium minus</i>), rough chervil (<i>Chaerophyllum temulum</i>), foxglove (<i>Digitalis purpurea</i>), meadowsweet (<i>Filipendula ulmaria</i>), hedge bedstraw (<i>Galium album</i>), bluebell (<i>Hyacinthoides non-scripta</i>), selfheal (<i>Prunella vulgaris</i>), red campion (<i>Silene dioica</i>), wood sage (<i>Teucrium scorodonia</i>), upright hedge parsley (<i>Torilis japonica</i>), common bent (<i>Agrostis capillaris</i>), sweet vernal grass (<i>Anthoxanthum odoratum</i>), false brome (<i>Brachypodium sylvaticum</i>), crested dog's-tail, tufted hair grass (<i>Deschampsia cespitosa</i>), red fescue (<i>Festuca rubra</i>) and wood meadow grass (<i>Poa nemoralis</i>). Native woodland edge planting comprises a species mix such as hazel, hawthorn, dogwood (<i>Cornus sanguinea</i>), guelder rose (<i>Viburnum opulus</i>), beech, field maple, silver birch, spindle (<i>Euonymus europeaus</i>), holly (<i>Ilex</i></li> </ul>	During construction	Embedded mitigation	Required to ensure that the Proposed Development amounts to comply with environmental legislation and provide visual screening, landscape amenity and habitat replacement for biodiversity.

Source	Issue	Mitigation Measure	Timing	Embedded/ Essential Mitigation	Justification
		<p><i>aquifolium</i>), crab apple, wild privet (<i>Ligustrum vulgare</i>), honeysuckle (<i>Lonicera periclymenum</i>), bird cherry, blackthorn, buckthorn (<i>Rhamnus cathartica</i>), dog rose, elder, wayfaring tree (<i>Viburnum lantana</i>), guelder rose and wild service tree;</p> <ul style="list-style-type: none"> <li>• 0.86ha of species-rich grassland comprising a species mix such as yarrow (<i>Achillea millefolium</i>), common knapweed (<i>Centaurea nigra</i>), crossword (<i>Cruciata laevipes</i>), lady's bedstraw (<i>Galium verum</i>), meadow crane's-bill (<i>Geranium pratense</i>), field scabious (<i>Knautia arvensis</i>), oxeye daisy (<i>Leucanthemum vulgare</i>), ribwort plantain (<i>Plantago lanceolata</i>), salad burnet (<i>Sanguisorba minor</i>), selfheal (<i>Prunella vulgaris</i>), meadow buttercup (<i>Ranunculus acris</i>), yellow rattle (<i>Rhianthus minor</i>), red campion, bladder campion (<i>Silene vulgaris</i>), common bent, crested dog's-tail, red fescue and smooth stalked meadow grass (<i>Poa pratensis</i>);</li> <li>• 0.07ha of attenuation pond/ swale habitat comprising a species rich wetland mix with species such as water plantain (<i>Alisma plantago aquatica</i>), salad burnet, common fleabane (<i>Pulicaria dysenterica</i>), marsh marigold (<i>Caltha palustris</i>), meadow sweet, purple loosestrife (<i>Lythrum salicaria</i>), ragged robin (<i>Lychnis flos cuculi</i>), devil's bit scabious (<i>Succisa pratensis</i>), yellow flag (<i>Iris psuedocorus</i>), autumn hawkbit (<i>Leontodon autumnalis</i>), greater bird's-foot (<i>Lotus uliginosus</i>), greater burnet (<i>Sanguisorba officinalis</i>), water avens (<i>Geum rivale</i>), soft-rush (<i>Juncus effusus</i>), pendulous sedge (<i>Carex pendula</i>), common valerian (<i>Valeriana officinalis</i>), bird's-foot trefoil (<i>Lotus corniculatus</i>), borage (<i>Borago officinalis</i>), crested dog's-tail, smooth stalked meadow grass, tall fescue (<i>Festuca arundinacea</i>), red fescue and tufted hair grass;</li> <li>• 0.25ha of bank and ditch habitat; and</li> <li>• 0.87ha of reinstated arable land;</li> <li>• 0.82ha of modified (reinstated) grassland;</li> <li>• 0.78ha of amenity grassland habitat.</li> </ul>			

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 6.6 Environmental Design and Management	Protected Species (Bats)	The contractor has committed to undertaking no works within a 10m radius of retained trees with confirmed, high or moderate suitability to support roosting bats during the bat active season (i.e. avoiding April to October inclusive) in order to minimise the risk of disturbance of any bats utilising potential roosting features within these trees.	During construction and operation	Essential mitigation	Required to ensure the protection of protected species.
Section 6.6 Environmental Design and Management	Protected Species (Bats)	Operational lighting will balance the need for safety of pedestrians and other road users and also potential impacts on bats. Lighting will be primarily limited to junctions and pedestrian crossings. Lighting of structures will be avoided. All luminaires will lack UV elements when manufactured. Metal halide, fluorescent sources will not be used. LED luminaires will be used where possible. A warm white spectrum of 3000 Kelvin will be adopted to reduce blue light component. Luminaires will feature peak wavelengths higher than 550 nm to avoid the component of light most disturbing to bats (Ref 1-2). Only luminaires with an upward light ratio of 0% and with good optical control will be used. LED technology will be used to create lighting that is directional, limiting light spill onto adjacent areas. Luminaires will be mounted on the horizontal, with no upward tilt. Any external security lighting will be set on motion-sensors and short (1 min) timers.  During operation lighting will be dimmed by 75% between the hours of 00:00 and 06:00.	During construction and operation	Embedded mitigation	Required to ensure the protection of protected species.
Section 6.6 Environmental Design and Management	Protected Species (Dormice)	Desk study data and surveys undertaken in 2021 identified the presence of hazel dormice south-east of the A40, for which a European Protected Species Mitigation Licence (EPSML) will be required for the site clearance works. No evidence of hazel dormouse was recorded within the survey area north-west of the A40 during the survey visits conducted in 2021, although there is a record of hazel	During operation	Embedded mitigation and Essential mitigation	Required to ensure the protection of protected species.



<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>dormouse in this area from 2014. Hazel dormice live at low densities and as a result are difficult to detect. Therefore, given the presence of a hazel dormouse record within the north-west of the site in 2014, vegetation clearance north-west of the A40 will follow a precautionary working method.</p> <p>The Proposed Development will incorporate the following measures to avoid or reduce impacts on hazel dormice:</p> <ul style="list-style-type: none"> <li>• Retaining suitable habitat wherever possible, and increasing the area of suitable foraging habitat for hazel dormouse within the site through habitat planting;</li> <li>• Maintaining linkages through habitat planting;</li> <li>• Prior to removal, vegetation will be checked for signs of hazel dormice by an ecologist who holds a WML-CL10a Natural England hazel dormouse class licence (Class 1 survey licence);</li> <li>• Phased removal of suitable habitat for hazel dormouse for displacement, using hand tools;</li> <li>• The removal of the vegetation should be undertaken at a time of year least likely to impact on hazel dormouse, following a two phased approach with removal of above ground vegetation to 150mm during the hibernation season (November to April) and then removal to ground level (including tree stumps) during the active season (May to October); and</li> <li>• Installation of hazel dormouse boxes within suitable woodland habitat to provide additional nesting habitat within the site.</li> </ul>			

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 6.6 Environmental Design and Management	Protected Species (Invasive Non- Native Species)	The non-native but naturalised New Zealand mud snail and the freshwater shrimp <i>Crangonyx</i> sp. ( <i>floridanus/pseudogracilis</i> ) was found in WB5 in Spring and Autumn. There are no statutory constraints due to the presence of these species; however, best practice biosecurity measures such as those detailed within CIRIA Manual C679 (Ref 1-3) will be implemented throughout construction of the Proposed Development.	During construction	Essential mitigation	Required to avoid the spread of invasive non-native species.
Section 6.6 Environmental Design and Management	Protected Species (Badgers)	Potential killing, injury or disturbance impacts on badgers would be illegal without a Natural England Licence. It is assumed that this licence will be applied for, based on best practice measures and mitigation habitat creation (if required) included. This would not include sett creation but may include fencing as required.	During construction	Essential mitigation	Required to ensure the protection of protected species.
Section 6.6 Environmental Design and Management	Protected Species (Birds)	Without appropriate controls, site clearance works could result in killing and injury of nesting birds and destruction of nests. This killing and injury would be an offence under legislation that protects birds. For this reason, whenever possible, habitat of potential value to nesting birds will be removed during the period October to February when bird species are less likely to be using active nests. If this is not possible, site clearance between March and September will not take place until a suitably qualified ecologist has confirmed absence of nesting birds immediately prior to clearance works commencing.	During construction	Essential mitigation	Required to ensure the protection of protected species.
Section 6.6 Environmental Design and Management	Protected Species (Barn Owl)	Removal of habitat could result in increased collisions of barn owl with road traffic. However, hedgerow and woodland habitat will be retained where possible and where lost temporarily for construction will be replanted, which will discourage barn owl from crossing the A40 resulting in risk of collision with traffic.	During operation	Embedded mitigation	Required to ensure the protection of protected species.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 6.8 Mitigation and Monitoring	Protected Species (Roosting Bats)	<p>Tree 5 has been confirmed to support a non-breeding small summer roost of brown long-eared bats. Tree 5 will be retained within the Proposed Development. Mitigation will be required to avoid any disturbance impacts to the bat roost within Tree 5. Specifically, this will entail avoidance of works within 10m of the tree during the active bat season (i.e. avoid working within 10m of the tree between April and October inclusive) and avoidance of directional lighting of the tree during construction and operation.</p> <p>There are a further up to two trees with moderate suitability to support roosting bats that will be felled to facilitate the Proposed Development. A single tree with low suitability to support roosting bats will also be felled.</p> <p>Where trees assessed to have moderate or low suitability to support roosting bats are to be removed, a precautionary method of felling under the supervision of a suitably qualified ecologist is recommended to avoid potential impacts on roosting bats.</p> <p>The precautionary felling method recommended is as follows:</p> <ul style="list-style-type: none"> <li>• The felling contractors will be notified that the trees were assessed for bats by way of a toolbox talk, and that although no signs of roosts were identified, potential for bat occupancy was identified;</li> <li>• Trees will be subject to an aerial inspection of features by an ecologist who holds a Natural England WML-CL18 (Bat Survey Level 2) licence where possible;</li> <li>• Where aerial inspection is not possible, trees will be soft felled (sections of the tree will be carefully lowered to the ground for inspection by an ecologist) under an ecological watching brief;</li> <li>• Trees will be felled using hand tools; and</li> </ul>	During construction and operation	Embedded and Essential mitigation	Required to ensure the protection of protected species.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<ul style="list-style-type: none"> <li>The removal of the trees should be undertaken at a time of year least likely to impact on bats (early spring (March to April) or late autumn (September to October)).</li> </ul> <p>Should bats be discovered, clearance should stop immediately and a Natural England licence should be obtained before works continue.</p>			
Section 6.8 Mitigation and Monitoring	Protected Species (Dormouse)	<p>Due to the potential for vegetation clearance and construction works to adversely affect hazel dormouse and their habitats through risk of killing and injury and loss of habitat these works would need to be undertaken under an EPSML from Natural England for habitats south-east of the A40. Timing of works to minimise impacts on hazel dormouse and measures to avoid killing and injury, such as phased vegetation clearance, would be detailed within the EPSML and agreed with Natural England. For habitats to the north-west of the A40 a precautionary working method will need to be followed which will include the following:</p> <ul style="list-style-type: none"> <li>Prior to removal vegetation will be checked for signs of hazel dormice by an ecologist who holds a WML-CL10a Natural England hazel dormouse class licence (Class 1 survey licence);</li> <li>Vegetation will be cleared using hand tools; and</li> <li>The removal of the vegetation should be undertaken at a time of year least likely to impact on hazel dormouse, following a two phased approach with removal of above ground vegetation to 150mm during the hibernation season (November to April) and then removal to ground level (including tree stumps) during the active season (May to October).</li> </ul>	During construction	Essential mitigation	Required to ensure the protection of protected species.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		Should hazel dormouse or signs of hazel dormouse be discovered, clearance should stop immediately, and a Natural England licence should be obtained before works continue.			
Section 6.8 mitigation and Monitoring	Habitat Creation	Together with the offsite options, the reinstated and newly created habitats within the site will result in a biodiversity net gain. Impacts relating to habitat loss and fragmentation, where they cannot be avoided, will be mitigated for within the design of the Proposed Development which will incorporate retained and newly created habitats. Habitat connectivity for bats, badgers and dormouse will be maintained by carefully designed planting.	During operation	Essential mitigation	Required to ensure the establishment of habitat and no overall loss of protected species.
Section 6.8 mitigation and Monitoring	Habitat Monitoring	An ecologist will undertake a walkover survey of the site during years 1, 3, 5 and 10 post construction to survey the establishing habitats and provide feedback on the success of the habitat creation undertaken. Where necessary, recommendations will be made for remedial works to ensure that the aims of the habitat creation are met.	During operation	Essential mitigation	Required to ensure the establishment of habitat.
Section 6.8 mitigation and Monitoring	Protected Species (Bats & Dormice)	In order to avoid potential adverse impacts on habitat corridors adjoining the site, the operational lighting strategy for the Proposed Development will aim to reduce light spill at the margins of the site so that boundary hedgerows and surrounding habitats do not become illuminated. Lighting design will be undertaken with reference to best practice guidelines of the Institute of Lighting Engineers and the Bat Conservation Trust (Ref 1-4 ) to reduce adverse effects on the bat species and hazel dormice by avoiding directional lighting and light spill onto existing habitat corridors adjoining the site, and those areas	During operation	Essential mitigation	Required to ensure the protection of protected species.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		of habitat creation included in the Proposed Development around the margins of the site.			

### *ES Volume I Chapter 7: Climate Change*

Section 7.6: Environmental Design and Management	Energy Reduction and Carbon Emissions	The Proposed Development would be subject to measures and procedures as defined within the CEMP. These would include a range of Best Practicable Means (BPM) associated with mitigating potential environmental impacts. The measures detailed within the CEMP are developed by the selected Principal Contractor which would be implemented for the duration of the construction phase. The construction contractor would develop and implement a plan to reduce energy consumption and associated carbon emissions. This could include the consideration of renewable and/or low or zero carbon energy sources and record percentage of savings implemented. Energy consumption and materials use would be recorded and reported on an ongoing basis during the construction phase.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 7.6: Environmental Design and Management	Climate change vulnerability mitigation measures	The Principal Contractor would develop and implement a plan to prevent or reduce the likelihood of climatic hazards affecting construction staff and assets.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 7.6: Environmental	Climate change vulnerability	A climate change allowance of 40% has been added to the 1% annual exceedance probability (AEP) storm used to assess fluvial	Once complete and operational	Embedded mitigation	Required to ensure the Proposed Development

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Design and Management	mitigation measures	flood risks and the design of the Proposed Development drainage systems. Applicable climate allowances have been made during the design of the drainage for the Proposed Development.			design is resilient to future climate change.

### *ES Volume I Chapter 8: Cultural Heritage*

Section 8.6 Environmental Design and Management	Reduce impacts to heritage assets within the area.	During the construction phase, a programme of archaeological mitigation will be undertaken to reduce the impacts and effects that construction of the Proposed Development is likely to have on cultural heritage. In relation to buried archaeological remains, the scope of mitigation required to record and evaluate known archaeological assets during construction has been informed by the results of the trial trenching. All archaeological work will be in line with an Archaeological Management Plan to be produced by the Contractor. Further detail will be contained within the CEMP prepared for the Proposed Development.	During construction	Essential mitigation	Archaeological mitigation required to reduce impacts from construction.
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### *ES Volume I Chapter 9: Geology and Soils*

Section 9.6 Environmental Design and Management	Standard measures for construction	Construction of the Proposed Development would be subject to measures and procedures as defined within a CEMP. The CEMP will include a range of measures to enable compliance with relevant standards and legislation as associated with geology and soils. The CEMP would be implemented by the selected Principal Contractor. Such measures accord with legal compliance and best practice guidance when working with or around contaminated materials.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
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<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>The potential impacts on human health receptors including off-site receptors would be addressed through the adoption of the following measures, which would be included in the CEMP:</p> <ul style="list-style-type: none"> <li>• damping of ground with water to minimise dust;</li> <li>• sheeting of lorries transporting spoil off site and the use of dust suppression equipment on plant;</li> <li>• groundwater level controls (as required);</li> <li>• adequate fuel / chemical storage facilities e.g. bunded tanks, hard standing and associated emergency response spillage control procedures;</li> <li>• well maintained plant and associated emergency response/spillage control procedures; and</li> <li>• any temporary onsite storage of contaminated material would be stored on sheeting and covered to minimise the potential for leachate and run off from the stockpile being generated.</li> </ul>			
Section 9.6 Environmental Design and Management	Standard measures for construction for the management of earthworks	<p>Before construction, an earthworks strategy will be required, which will also include a remediation strategy detailing the procedure should unexpected contamination be identified during construction. The strategy will set out how the earthworks / excavation stage of the Proposed Development will be undertaken. Where necessary, the strategy will consider what materials, if any, can be reused and what materials are surplus and require either disposal or onward management to ensure appropriate re-use. The strategy will also define whether any treatment may be required, prior to reuse or disposal as well as establishing risk-based compliance criteria for soils to be screened against. The strategy will cover site clearance and the works required to prepare it for development.</p>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.



<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 9.6 Environmental Design and Management	Standard measures for construction for the management of materials	<p>A Materials Management Plan (MMP) will be prepared alongside the earthworks strategy. The MMP will detail the procedures and measures that will be taken to classify, track, store, dispose of and possibly re-use all excavated materials that are expected to be encountered during the development works.</p> <p>The disposal of soil waste, contaminated or otherwise to landfill sites will be best mitigated by minimisation of the overall quantities of waste generated during construction and by ensuring that excavated material consigned to landfill cannot, as an alternative, be put to use either on site or on other sites</p>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 9.6 Environmental Design and Management	Standard measures for construction for the protection of controlled waters	Where piled foundation solutions are required for the Proposed Development, then piling risk assessments would need to be undertaken in accordance with Environment Agency guidance. Construction involving piling or penetrative ground improvement would require a location-specific risk assessment to establish the means of mitigating the risks of causing new pollutant linkages or worsening existing ones with respect to controlled waters at the construction stage. This would be undertaken during the detailed design of the Proposed Development.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 9.6 Environmental Design and Management	Standard measures for construction for the management of soil resources	<p>Potential impacts specific to contamination impacting on soil resources would be mitigated through the following measures:</p> <ul style="list-style-type: none"> <li>• Works would be in compliance with BS 3882:2015 'British Standard Specification for Topsoil and Requirements for Use' (2015) and the Defra Construction Code of Practice for the sustainable use of soils on construction sites.</li> <li>• The source of topsoil and subsoil would be investigated carefully with respect to its suitability for the intended use.</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<ul style="list-style-type: none"> <li>• A Soil Resource Plan would need to be prepared by the Principal Contractor prior to the start of construction. The Soil Resource Plan would detail the areas and type of topsoil/subsoil to be stripped, stripping method, haul routes and the management of the soil stockpiles.</li> <li>• Topsoil would be handled only in the appropriate conditions of weather and soil moisture, and with suitable machinery in line with the Defra Construction Code of Practice.</li> <li>• The stockpiling of soils would be avoided whenever possible. Where stockpiling is unavoidable, heaps would be tipped loosely and the surface firmed and shaped to shed water. Where soils are to be stockpiled for more than six months the surface would be seeded with a grass / clover seed mix.</li> <li>• Where possible, topsoil would be re-used on site as applicable.</li> <li>• The movement of traffic would be confined to designated haul routes to reduce the amount of heavy machinery going over soil materials which could cause compaction of soil materials. Such routes would exclude areas of proposed landscaping.</li> <li>• Following the completion of construction activities, agricultural land taken on a temporary basis would be restored and returned to the landowner for unrestricted agricultural use in the same agricultural condition that currently exists.</li> </ul>			
Section 9.6 Environmental Design and Management	Standard measures for construction for the management of agricultural soils	The primary measures to mitigate the impacts on soil resources would be set out in a Soil Management Strategy, to be prepared at the detailed design stage. The Soil Management Strategy would include a Soil Resource Plan and Soil Handling Strategy which would confirm the different soil types (based on the soil surveys that will be undertaken); the most appropriate re-use for the different types of soils; and the proposed methods for handling, storing and replacing soils on-site.	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>The aim of a Soil Resource Plan will be to re-use as much of the surplus soil resources on-site in the detailed design of the Proposed Development. Any surplus soils will be used in a sustainable manner in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 1-5).</p> <p>The quality of soils retained on-site or exported off-site (if required) will be maintained by following good practice guidance on soil handling and storage, particularly to avoid compaction and biodegradation of soils that are to be retained on site in storage. In this respect, topsoil must be stockpiled separately to subsoil. With the adoption of appropriate mitigation for the handling and restoration of soils, as part of a CEMP, most soils will be able to continue their various ecosystem functions on or off site, principally as a medium for producing food and biomass; for storing and cycling water and carbon; and for supporting habitats, biodiversity and landscape planting.</p>			
Section 9.8 Mitigation and Monitoring	Standard measures for construction for the management of agricultural soils	<p>The Proposed Development would have significant adverse residual effects upon agricultural land, primarily due to the proportion of temporary and permanent land take required to construct the Proposed Development.</p> <p>Where agricultural land taken on a temporary basis is restored and returned to the landowner for continued agricultural use, post-construction monitoring would be required to determine whether pre-existing agricultural soil capability had been reinstated.</p>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

***ES Volume I Chapter 10: Landscape and Visual***

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 10.6 Environmental Design and Management	Management of landscape and visual impacts	<p>The Landscape and Visual Impact Assessment (LVIA) has informed the iterative design process to reduce the potential landscape and visual impacts through the siting and layout of engineered aspects of the Proposed Development, as well as new planting. These measures are included in the drawings for determination and form the embedded or primary mitigation.</p> <p>With reference to the Proposed Development, the primary (embedded) mitigation measures for the development are:</p> <ul style="list-style-type: none"> <li>• The retention of Category A mature oak and pear trees to the north and south of the proposed slip roads, using engineering methods to reduce land take;</li> <li>• New hedgerow and tree planting adjacent to the new road network to provide increased softening and screening of views in comparison to the existing hedgerows;</li> <li>• Retention of vegetation along the elevated embankment to the east of the B4022 underpass; which provide screening to moving traffic visible in views from the southeast;</li> <li>• Enhancement of woodland along the lines of the existing pruned hybrid poplar trees along the south side of the A40, to increase screening from High Cogges;</li> <li>• New woodland screening alongside hedgerow trees, to provide further screening to the view from residential properties including The Paddocks, Meadow View and Ladymead Cottage;</li> <li>• New areas of species rich grassland, including marsh and wet grassland around attenuation ponds and ditches, to enhance</li> </ul>	During operation	Embedded mitigation	Planning Permission: Compliance with Design and Access Statement, planning drawings and landscaping scheme.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>biodiversity and amenity value, particularly where the baseline comprises species-poor arable or pastoral farmland;</p> <ul style="list-style-type: none"> <li>• Creation of a new section of PRow (footpath) 353/31/10, linking the existing crossing of the A40 to the B4022, thus providing increasing amenity value by way of a continuous recreational route that avoids the dangerous crossing of the dual carriageway;</li> <li>• Provision of an enhanced multi-user route along the line of existing PRow 410/41/30 and 410/41/40, thus increasing accessibility and amenity value for residents wishing to access the countryside from the eastern edge of Witney; and</li> <li>• Use of the lowest possible output LED luminaires on road lighting columns, which will also be dimmed to 75% output between the hours of 00:00 and 06:00 to mitigate potential light intrusion.</li> </ul>			

### *ES Volume I Chapter 11: Material Assets and Waste*

Section 11.6 Environmental Design and Management	Standard measures for construction	<p>A waste minimisation and circular economy workshop was held with the design team on 14th April 2021. The waste minimisation and circular economy opportunities identified during the workshop are recorded in the Waste Minimisation Statement (Ref 1-6) in full.</p> <p>In summary, they comprise the following, which focus on implementing the waste hierarchy through the reuse and recycling of site-won materials on-site where possible to minimise the need to import construction materials to site, and to reduce the quantity of waste to be exported off-site:</p>	During construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
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Source	Issue	Mitigation Measure	Timing	Embedded/ Essential Mitigation	Justification
		<ul style="list-style-type: none"> <li>• Designing the Proposed Development in a manner that facilitates the reuse of acceptable material arisings, for example those associated with earthworks cuttings and other excavations.</li> <li>• Achieving an earthworks balance (cut and fill material) within the design of the Proposed Development, where possible, to minimise the need to import and export material.</li> <li>• The inclusion of land within the Proposed Development boundary for the temporary on-site storage of soils, excavated materials and other materials.</li> <li>• The appropriate sizing of construction compounds to enable the segregation and storage of waste, and to facilitate off-site recovery.</li> <li>• The retention of existing highways infrastructure within the Proposed Development design where feasible, to minimise the need for the demolition of components and infrastructure and the associated generation of waste material.</li> <li>• The reuse of excavated materials and the recycling of demolition and construction materials within the Proposed Development, where practicable.</li> <li>• The optimisation of bridge, soil abutment and wingwall designs through the incorporation of precast concrete elements to reduce on-site waste arisings.</li> <li>• Importing alternative (recycled and secondary) aggregate materials during construction, where practicable.</li> </ul>			
<p>Section 11.6 Environmental Design and Management</p>	<p>Standard measures for construction</p>	<p>Best practice mitigation measures have been identified which would be implemented by the Principal Contractor to reduce the impacts and effects that construction of the Proposed Development is likely to have on material assets and waste.</p> <p>These measures are reported within the Outline Site Waste Management Plan (OSWMP) in <i>ES Volume II, Appendix 11-B</i>, which provides a framework to facilitate good practice in materials and</p>	<p>During construction</p>	<p>Embedded mitigation</p>	<p>Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.</p>

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>waste management. This requires that the Principal Contractor is competent in the storage, handling and management of materials and waste (including hazardous waste), and sets out their responsibilities in relation to ensuring compliance with all legal requirements, both on-site and off-site, including Duty of Care.</p> <p>The OSWMP which sets out measures relating to waste management that would be implemented during construction of the Proposed Development. These include:</p> <ul style="list-style-type: none"> <li>• The implementation of procedures relating to the coding, source segregation and containment of waste on-site to facilitate a high proportion and high-quality recycling.</li> <li>• Materials requiring removal from the site would be transported using licensed carriers, and records would be kept detailing the types and quantities of waste moved and the destinations of this waste, in accordance with the relevant regulations.</li> <li>• Any waste effluent would be tested and, where necessary, disposed of at a correctly licensed facility by a licensed specialist contractor(s).</li> <li>• All hazardous materials including fuels, chemicals, cleaning agents, solvents and solvent containing products to be properly sealed in containers at the end of each day prior to storage in appropriately protected and bunded storage areas.</li> <li>• All demolition and construction workers would be required to use appropriate personal protective equipment whilst performing activities on-site.</li> </ul>			

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
<p>Section 11.6 Environmental Design and Management</p>	<p>Standard measures for construction</p>	<p>The OSWMP sets out measures relating to construction materials and waste reduction and management through the implementation of the following approaches, where practicable, to minimise the quantity of waste arising and requiring disposal:</p> <ul style="list-style-type: none"> <li>• Implementing a ‘just-in-time’ material delivery system to avoid materials being stockpiled.</li> <li>• Reviewing material quantity requirements to avoid over-ordering and the generation of waste materials due to surplus.</li> <li>• The reuse of materials on-site wherever feasible, for example the reuse of excavated soil for landscaping, and the recycling of demolition materials into aggregates.</li> <li>• Undertaking off-site prefabrication, where practical, including the use of prefabricated structural elements.</li> <li>• Implementing agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme.</li> <li>• Where reuse of materials and waste on-site is not practical, implementing off-site reuse, recycling and recovery through the use of off-site waste segregation or treatment facilities or for direct reuse or reprocessing off-site.</li> </ul> <p>The Principal Contractor’s CEMP will also contain a MMP, which sets out the approaches and procedures for the management of site generated materials used within the Proposed Development and thereby not classifying materials suitable for on-site reuse as waste.</p> <p>The OSWMP sets out the following performance targets for material assets and waste, these targets will also be included in the Principal Contractors contract:</p> <ul style="list-style-type: none"> <li>• At least 26% (by weight) of aggregates imported to site for use within the Proposed Development should comprise alternative (reused, recycled or secondary) aggregates, for those</li> </ul>	<p>During construction</p>	<p>Embedded mitigation</p>	<p>Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.</p>



<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>applications where it is technically and economically feasible to substitute these alternatives to primary aggregates. Where primary aggregate materials are mandated within DMRB they would be excluded from the target.</p> <ul style="list-style-type: none"> <li>Recovery of at least 70% (by weight) of non-hazardous construction and demolition waste (excluding naturally occurring materials with European Waste Catalogue Code 17 05 04), with the aim to achieve recovery of 90% (by weight).</li> </ul>			
Section 11.6 Environmental Design and Management	Standard measures for construction	Construction of the Proposed Development would be subject to measures and procedures defined within the Principal Contractor CEMP, which would be produced prior to the commencement of construction by the Principal Contractor and would be based on, and incorporate, the content and requirements of the OSWMP, and other industry standard practice and control measures as necessary.	During construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

### *ES Volume I Chapter 12: Noise and Vibration*

Section 12.6 Environmental Design and Management	Standard measures for construction	<p>The CEMP would include relevant noise criteria, proposed surveys and a range of best practice measures associated with mitigating potential noise and vibration impacts. Such measures may include:</p> <ul style="list-style-type: none"> <li>The selection of quiet and low vibration equipment and methodologies;</li> <li>A review of construction programme and methodology to consider low noise/low vibration methods (including non-vibratory compaction plant where required);</li> <li>The optimal location of equipment on site to minimise noise disturbance;</li> <li>The provision of acoustic enclosures around static plant, where necessary;</li> </ul>	During construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
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<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<ul style="list-style-type: none"> <li>• The use of less intrusive alarms, such as broadband vehicle reversing warnings;</li> <li>• Compliance with working hours, as agreed with the local authority; and</li> <li>• No start-up or shut down of vibratory plant e.g. rollers or compactors, within 50m of receptors.</li> </ul>			
Section 12.6 Environmental Design and Management	Plant Noise	<p>BS 5228 (Ref 1-7) advises that noise barriers can provide a reduction in noise levels of 5dB when the top of the plant is just visible over the noise barrier and 10dB when the plant is completely screened from a receptor. The effectiveness of a noise barrier depends upon its length, effective height, position relative to the noise source and to the receptors, and the material from which it is constructed. Therefore the potential attenuation provided by any such barriers cannot be quantified at this stage.</p>	During construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 12.6 Environmental Design and Management	Report noise and vibrations	<p>The Principal Contractor will undertake and report noise and vibration surveys, if required by West Oxfordshire District Council to validate compliance with all noise and vibration commitments and the requirements of the final CEMP.</p> <p>Regular on-site observation surveys and checks/audits would be undertaken to ensure that best practice Best Practicable Means (BPM) are being employed at all times. The site reviews would be logged, and any remedial actions recorded. Such checks would include:</p> <ul style="list-style-type: none"> <li>• Compliance with working hours;</li> <li>• Presence of mitigation measures e.g. engine doors closed, airlines not leaking and plant switched off if not being used;</li> <li>• Compliance with agreed working methods; and</li> <li>• Compliance with any specific requirements of the CEMP.</li> </ul>	During construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		The survey and compliance assurance process would be set out in the noise and vibration management plan(s) as part of the CEMP.			

### *ES Volume I Chapter 13: Population and Human Health*

Section 13.6 Mitigation and Monitoring	Standard measures for construction	<p>Construction of the Proposed Development will be subject to measures and procedure defined within the contractor's CEMP, which will be produced prior to the commencement of Proposed Development construction by the contractor. To minimise disruption to walkers, cyclists, and horse riders, the following essential mitigation steps will be recommended to be taken with regards to the management of local PRoW:</p> <ul style="list-style-type: none"> <li>• Most of the Proposed Development will be constructed offline. Working offline will reduce impacts on traffic congestion and prevent delays.</li> <li>• The Proposed Development has been designed to maintain or increase the distance between properties and traffic where possible, and to redistribute traffic away from local centres and sensitive receptors, therefore mitigating against air quality impacts.</li> </ul>	During construction	Embedded mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
Section 13.6 Mitigation and Monitoring	Standard measures for construction	<ul style="list-style-type: none"> <li>• A detailed Traffic Management Plan (TMP) will be implemented by the Principal Contractor, which will outline how: <ul style="list-style-type: none"> <li>– Access points to site compounds will be designed to minimise local disruption;</li> <li>– Traffic will be managed throughout the construction phase to minimise the need to divert traffic along alternative routes, hence minimising delay and disruption; and</li> </ul> </li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<ul style="list-style-type: none"> <li>The contractor will liaise with landowners, occupiers, and agents, as appropriate, and agree the programme of works and access routes to be used.</li> <li>Where temporary or permanent access to: private property or housing; community land and assets, including open space and nature; community, recreational, and healthcare infrastructure as well as development land; and businesses is severed as a result of the Scheme, appropriate alternative temporary or permanent access will be provided.</li> <li>The Proposed Development has been designed to reduce land take from agricultural land, hence reducing the impact upon agricultural enterprises and activity.</li> <li>The contractor will liaise with agricultural land holding owners, occupiers, and agents, as appropriate, to establish measures to protect livestock, agricultural land, and water supplies, and make arrangements regarding access to land holdings and required maintenance.</li> </ul>			
Section 13.6 Mitigation and Monitoring	Communication with local residents	Plans for the Proposed Development will be shared with local residents through web-based content, newsletters, newspapers, radio announcements, etc. Awareness of Scheme construction activities will help minimise local disruption.	During construction	Essential mitigation	Required to ensure that local residents and business owners are aware of construction activities that may affect them.

### *ES Volume I Chapter 14: Road Drainage and Water Environment*

Section 14.6 Mitigation and Monitoring	Drainage Strategy	<p>The proposed Drainage Strategy (<i>ES Volume II, Appendix 14-A</i>) is to provide a new drainage system to cater for the proposed highway improvements.</p> <ul style="list-style-type: none"> <li>Filter drains will convey runoff from both proposed slip roads to attenuation basins located to the east of the off-slip with an</li> </ul>	Detailed design	Embedded mitigation	Compliance with the Drainage Strategy.
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<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>intermediary carrier drain provided within the B4022 carriageway to convey runoff from the on-slip as well as the impacted section of the existing B4022 carriageway. The attenuation has currently been designed as two wet ponds, but this design can be optimised for water quality treatment and biodiversity benefits during detailed design following a planning decision.</p> <ul style="list-style-type: none"> <li>• An additional wet pond has been proposed to the south-west, adjacent to the A40 northbound carriageway to cater for storm runoff from the lower portion of the proposed off-slip which will drain onto the existing A40 northbound due to a highpoint midway of the proposed slip road. This basin has been designed to also attenuate existing flows from the A40 northbound carriageway helping alleviate observed flooding of the existing A40 to the south of the Proposed Development and providing some treatment where none is currently provided. This wet pond discharges back into the existing A40 drainage system that ultimately discharges to Hardwick Brook to the south of Witney.</li> <li>• It is proposed to provide ditches re-linking and connecting existing minor watercourses which were cut off when the existing A40 was constructed. All existing highway ditches impacted by the Proposed Development are to be re-provided via diversions with redundant ditches retained where possible to minimise impact on the existing ecology. In addition, the proposed wet ponds to the south of the A40 will drain into one of these diverted ditches via another small ditch. This avoids the need for any new engineered outfalls on either the diverted ditch or the Limb Brook.</li> <li>• Attenuation features have been designed to store runoff from a 1 in 100 year (1% occurrence probability) and 40% climate change event. They have also been located outside of areas at risk of fluvial or pluvial flooding. The proposed drainage systems will also discharge at the equivalent existing discharge rate with a 40% reduction for existing brownfield areas and at greenfield rates for all new impermeable area. Flows from the ponds will be restricted by flow control devices. Finally, overland drainage from adjacent fields will also be intercepted by cut off ditches which will discharge into existing watercourses.</li> </ul>			

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 14.6 Mitigation and Monitoring	CEMP	<p>A CEMP referring to a range of standard mitigation measures will be prepared and implemented by the Principal Contractor as necessary to protect the water environment from pollution and physical impacts during construction works.</p> <p>Pollution prevention and derogation mitigation measures that accord with legal compliance and good practice guidance to be implemented when working with or around water bodies or resources will broadly focus on:</p> <ul style="list-style-type: none"> <li>• Controlling and minimising the risk of pollution to surface waters and groundwater by managing construction site runoff and the risk of chemical spillages;</li> <li>• Measures to control the storage, handling and disposal of potentially polluting substances during construction;</li> <li>• The management of activities within the floodplain of Limb Brook with temporary land take required for construction to be located out of the floodplain as far as reasonably practicable or allowances made for floodplain control measures and contingency actions;</li> <li>• Management of water removed from excavations and cuttings. Minimising the need for groundwater dewatering or abstractions by use alternative construction methods;</li> <li>• Managing the risk from groundwater flooding through appropriate working practices (during excavations) and with adequate plans and equipment in place for de-watering to ensure safe dry working environments;</li> <li>• If necessary, provide compensatory discharges to surface water bodies or GWDTEs that are groundwater fed to minimise impacts on the water level and flows to these receptors; and</li> <li>• Appropriate methods and mitigation measures when undertaking works within, over, under and adjacent to water bodies.</li> </ul> <p>Prior to the start of construction, the CEMP will be prepared to detail the measures necessary to avoid, prevent and reduce adverse</p>	Prior to and during construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		effects where possible upon the local surface water and groundwater environment. The CEMP will be supported by a Water Management Plan (WMP) that will be included as a technical appendix. The WMP provides greater detail regarding mitigation to be implemented to protect the water environment from adverse impacts during Proposed Development construction.			
Section 14.6 Mitigation and Monitoring	Permits and licencing	<p>Watercourses identified as Ordinary Watercourses are also statutory in type in England and Wales. An Ordinary Watercourse is generally smaller than a main river and includes every river, stream, ditch, drain, cut, dike/dyke, sluice, sewer (other than a public sewer) and passage through which water flows and which does not form part of a main river. The Local Lead Flood Authority (LLFA) is the leading authority on Ordinary Watercourse Regulations, unless the Ordinary Watercourse falls within the jurisdiction of an Internal Drainage District where Internal Drainage Boards (IDB) will lead instead.</p> <p>Land drainage consent will be required from Oxfordshire County Council as the LLFA for certain works that may affect the flow in Ordinary Watercourses (i.e. all other watercourses that are not Main Rivers) under The Floods and Water Management Act 2010 (Ref 1-8) and The Land Drainage Act 1991 (Ref 1-9).</p> <p>Under the Environmental Permitting (England and Wales) Regulations 2016 (Ref 1-10) an Environmental Permit (known as a Water Activity Permit) may also be required for the discharge to surface waters or groundwater of any unclean construction site runoff, again where exemptions do not apply. However, local highways authorities do not require permission from the Environment Agency to discharge runoff from highways to Controlled Waters (i.e.</p>	Detailed design	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>all watercourses, canals, lakes, groundwater etc.) under the Highways Act 1980 providing water pollution does not occur.</p> <p>If water is required for construction works, then depending on the source of water and volumes required, they may require abstraction licences from the Environment Agency (where more than 20m<sup>3</sup> per day is abstracted or the abstraction lasts longer than 28 days). Any licence issued may contain conditions requiring abstraction to cease at times of lower flows. Further, dewatering works or groundwater control may also require an abstraction licence, although there may be exceptions that apply to the standard 20m<sup>3</sup> per day threshold as defined in the Environment Agency's Position Statement. Only emergency dewatering and small-scale temporary dewatering will be exempt from this requirement.</p>			
Section 14.6 Mitigation and Monitoring	Management of construction site runoff and sediment	<p>As a minimum the Principal Contractor will adhere to the following measures:</p> <ul style="list-style-type: none"> <li>• Site clearance will be kept to a minimum and there will be a 10m buffer around all water bodies (e.g. using temporary exclusion fencing, fabric silt fences, straw bales, maintaining vegetation etc.) other than at crossings or where there are specific tasks that need to be undertaken close to a water body (in which case see the section later entitled 'Working in, over, under and adjacent to water bodies');</li> <li>• Avoidance of wet weather working where practical, especially site clearance, earthworks and works to water bodies;</li> <li>• Appropriate separate storage of topsoil/subsoil and materials, and at least 20m from water bodies on flat ground;</li> <li>• Any earth bund/ stockpile to be present for longer than two weeks will be either seeded, covered using geotextiles, or other pressures provided to ensure it is not a source of excessive fine sediment in runoff to water bodies;</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.



<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<ul style="list-style-type: none"> <li>• The implementation of a temporary drainage system and other measures to manage pollution risk during construction (e.g. fabric silt fences, lagoons, bunds, straw bales, sand bags or lamella clarifiers) etc.;</li> <li>• Any dewatering of excavations will include measures where necessary to filter the water prior to discharge to a watercourse or ground (there shall be no discharge of any construction site runoff to existing ponds); and</li> <li>• The control of mud deposits at entry and exits to the site using wheel washing facilities and/ or road sweepers operating during earthworks or other times as considered necessary.</li> </ul>			
Section 14.6 Mitigation and Monitoring	Management of spillage risk	<p>As a minimum the Principal Contractor will adhere to the following measures:</p> <ul style="list-style-type: none"> <li>• Spill kits would be available on the site in watertight containers (e.g. works near watercourses) and carried on all mobile plant. They would be regularly checked and topped up, especially after use. Appropriate training would be given to all construction workers in their use.</li> <li>• Storage of fuel and chemicals would be in accordance with The Control of Pollution (Oil Storage) (England) Regulations 2001 and GPP 8: Safe storage and disposal of used oils.</li> <li>• Surface water drains on local roads or within the Proposed Development compound area would be identified and where there is a risk that fine particulates or spillages could enter them, they would be protected (e.g. covers or sand bags).</li> <li>• Any containers of contaminating substances (e.g. fuel) onsite would be leak-proof and kept in a safe and secure building or compound from which they cannot leak, spill or be open to vandalism. The containers would be protected by temporary impermeable bunds (or drip trays for small containers) with a capacity of 110% of the maximum stored volume. Areas for</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>transfer of contaminating substances (including refuelling areas) would be similarly protected.</p> <ul style="list-style-type: none"> <li>• Any permanent oil storage tanks and temporary storage of 201 litres or more of oil in drums and mobile bowsers, and ancillary pipe work, valve, filters, sight gauges and equipment requiring secondary containment, e.g. bunding or drip trays, as defined in the Control of Pollution (Oil Storage) (England) Regulations 2001. Environment Agency guidance on oil storage regulations for business and preventing groundwater pollution from underground fuel storage tanks would be complied with.</li> <li>• No oil would be stored within 20m of a watercourse (and potentially further if ground is angled towards a waterbody except for fixed/large plant associated with the construction of new bridges/culverts or hand tools.</li> <li>• Where possible re-fuelling will be undertaken in designated areas within main compounds or satellite compounds. It is possible that refuelling of mobile plant may be required by mobile fuel bowser. This will not be undertaken within 20m of a water body, and only on flat land (or otherwise a greater distance and other measures may be required subject to an on-site risk assessment) and with a drip tray/plant nappy. Certain semi-mobile very large plant (e.g. crane) may need to be located close to watercourses and potentially within 20m. Due to the difficulties in moving plant such as this they may need to be refuelled in situ. Again, a site specific risk assessment will need to be undertaken by the Contractor.</li> <li>• Biodegradable hydraulic oils would be used where possible in all plant and only in equipment working in or over watercourses.</li> <li>• Any plant, machinery or vehicles would be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off site if possible or only at designated areas in the site compound.</li> <li>• All fixed plant used on Site to be self-bunded.</li> <li>• Mobile plant to be in good working order, kept clean and fitted with plant 'nappies' at all times.</li> </ul>			

Source	Issue	Mitigation Measure	Timing	Embedded/ Essential Mitigation	Justification
		<ul style="list-style-type: none"> <li>• An Emergency Response Plan or similar titled plan would be prepared and included in the CEMP.</li> <li>• Spill kits and oil absorbent material to be carried by mobile plant and located at high risk locations across the site and regularly topped up.</li> <li>• All construction workers would receive spill response training.</li> <li>• The site is to be secure to prevent any vandalism that could lead to a pollution incident.</li> <li>• Construction waste/ debris are to be prevented from entering any surface water drainage or water body.</li> <li>• Concrete will not be batched on site and would instead be delivered on an 'as and when' basis in ready mixed lorries.</li> <li>• Particular care would be taken with the delivery and use of concrete and cement as it is highly corrosive and alkaline. No washing out of delivery vehicles to take place on site without suitable provision for the washing out water and provision of a suitable location that is lined with a geotextile to prevent infiltration to ground. Such washing would not be allowed to flow into any drain, watercourse or other waterbody, and the CEMP contains a methodology for dealing with any washing out water, or wheel wash. Wash water would be adequately contained, prevented from entering any drain/watercourse, and removed from Site for appropriate disposal at a suitably licenced waste facility or otherwise treated and discharge under any required consent from the Environment Agency.</li> </ul>			
Section 14.6 Mitigation and Monitoring	Management of Flood Risk during construction	<p>As a minimum the Principal Contractor will adhere to the following measures:</p> <ul style="list-style-type: none"> <li>• Works adjacent to watercourses will be kept to a minimum, with any stockpiling of materials or stripped soils to be located away from watercourses as far as reasonably practicable.</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<ul style="list-style-type: none"> <li>• Where construction works do encroach on the channel of watercourses works will be undertaken to ensure water flows are unobstructed and that flood risk does not increase elsewhere.</li> <li>• Suitable de-watering methods will be used to maintain a dry working area or to maintain flows where they are being pumped around the works. This will require spare pumps to be stored on site. After each day, equipment and debris will be removed from the channel and a portion of flow allowed to flow through any temporary dam that has been constructed.</li> <li>• Weather forecasts will be monitored on a daily basis and works planned accordingly.</li> <li>• Contractors will be required to sign up to Environment Agency flood warning alerts and prepare and implement an Emergency Response Plan or similar entitled plan in the event of a possible flood event (based on weather forecasts, flood alerts and observations on site), enforceable from the first day of construction works through to the end of all works on site, 24 hours per day, seven days per week.</li> </ul>			
Section 14.6 Mitigation and Monitoring	Management of risks working in, over, under, or adjacent to waterbodies	<p>As a minimum the Principal Contractor will adhere to the following measures:</p> <ul style="list-style-type: none"> <li>• Works in, over, under or adjacent to water bodies will be avoided, but if this is not possible dry working areas will be created using the least intrusive techniques with downstream measures to prevent any silt and chemical spillages propagating.</li> <li>• It is assumed that where there are diversions or other works to watercourses that they would need to be either flumed, over-pumped, or otherwise diverted around dry working areas in water bodies (e.g. using sand bags for small areas of work or otherwise coffer dams or other similar ways to create a dry working environment).</li> <li>• Where the flow in watercourses is over-pumped, spare pumps must be maintained on site. Temporary barriers to flow must be</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		<p>partially removed at the end of shifts once pumps/equipment and any debris/materials have been removed from the channel.</p> <ul style="list-style-type: none"> <li>• Temporary works to watercourses will be fully reinstated as found. Where riparian vegetation is cleared adequate protection of soils will be provided (e.g. using a biodegradable geotextile staked into the ground using wooden pegs) until vegetation re-establishes.</li> <li>• The above would need to be done in accordance with a Land Drainage (Ordinary Watercourse) Consent under Section 23 of the Land Drainage Act 1991 (as amended) (Ref 1-7)) from the LLFA.</li> </ul> <p>This is of particular relevance to the temporary works crossing of Limb Brook. Given the modest size of the Limb Brook channel where it will be crossed by the temporary works crossing, it is assumed that the following would be applied:</p> <ul style="list-style-type: none"> <li>• A geomorphic survey of the channel supported by photographic evidence will be undertaken as a record of the channel prior to the installation of the temporary works crossings.</li> <li>• A suitably sized plastic pipe(s) will be placed on top of a geotextile and backfilled with clean aggregate between sandbag parapets extending to above the elevation of the access track.</li> <li>• The plastic pipe(s) must protrude a minimum of 0.5 m beyond the sandbag parapet walls so that any aggregate that may spill into the channel can be easily removed.</li> <li>• Parapet walls should be tapered and must be built up to just above the elevation of the access track.</li> <li>• Sandbags will be filled with a coarser gravel as this will be more natural if spilt or easier to remove.</li> <li>• Crossing to be monitored daily to ensure that materials are not falling into the channel and that the parapet walls remain in place.</li> <li>• An oil boom and a silt matt will be installed across the channel of Limb Brook downstream of the temporary works crossing.</li> </ul>			

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 14.6 Mitigation and Monitoring	Management of Groundwater Activities	<p>To minimise the impact of any groundwater control activities during construction on the water receptors, a Construction Groundwater Control Strategy will need to be prepared by the Contractor at the detailed design stage. Furthermore, best practice mitigation measures will be followed to avoid and or minimise impact on groundwater and will be included in the First and Second iteration CEMPs which are not included this assessment. The mitigation measures will be informed by the findings from the GI which will provide information of site-specific ground conditions, including groundwater quality and quantity data.</p> <p>As a minimum the Principal Contractor will adhere to the following mitigation measures:</p> <ul style="list-style-type: none"> <li>• A scheme of groundwater control would be implemented to ensure water levels in adjacent water bodies are maintained and any discharge is of a suitable quality.</li> <li>• A programme of water monitoring of the dewatering discharges.</li> <li>• If discharging water to a nearby watercourse, the rate of discharge will need to be agreed with the relevant authority to ensure that there is no unacceptable increase in flood risk or risk of scour. Any discharge will need to be undertaken with the agreement of the relevant statutory regulator and will need to comply with the pollution prevention requirements set out in the future CEMP and WMP.</li> <li>• Managing the risk from groundwater flooding through appropriate working practices (during excavations) and with adequate plans and equipment in place for de-watering to ensure safe dry working environments.</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
Section 14.8 Mitigation and Monitoring	Water quality monitoring during construction	<p>To supplement existing site-specific water quality data further pre-construction and during construction water quality monitoring is proposed. The scope of the water quality monitoring, action and reporting procedure will be set out in a Water Quality Monitoring Plan, that could be pursuant to a planning condition or delivered as part of the CEMP. The scope of water quality monitoring will be discussed with the LLFA and Environment Agency by the Principal Contractor.</p> <p>At this stage it is proposed that a minimum of six water quality monitoring visits are undertaken in advance of any construction works. These visits should be spread out over up to six months to ensure a range of conditions and flow states are captured. Monitoring locations will include upstream and downstream of the A40 on the Limb Brook. They should be located close to the location of the works with observations of any local factors that may influence water quality (e.g. nearby outfall).</p> <p>During construction, it is proposed to undertake further water quality monitoring to ensure that the proposed mitigation measures are operating as planned and preventing pollution. Monitoring will be linked to an action plan of measures to be taken in the event that a pollution incident is identified or suspected.</p> <p>At this stage it is anticipated that pre- and during construction water quality monitoring will consist of a combination of:</p> <ul style="list-style-type: none"> <li>• Frequent visual and olfactory observations of water quality including photographs;</li> <li>• Frequent in-situ water quality monitoring using a calibrated hand held water quality probe for indicator physico-chemical parameters such as temperature, dissolved oxygen, turbidity, pH and conductivity;</li> </ul>	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.

Source	Issue	Mitigation Measure	Timing	Embedded/ Essential Mitigation	Justification
		<ul style="list-style-type: none"> <li>• Regularly sampling of water for laboratory analysis will also be undertaken (minimum quarterly with ad hoc sampling as required) from all key water bodies to maintain general background checks on quality; and</li> <li>• Notes on weather conditions and other third party influences on water quality.</li> </ul> <p>Water quality monitoring will continue throughout the construction period for as long as there are activities ongoing that may result in a significant water pollution incident.</p> <p>The water quality monitoring programme will be developed by the Principal Contractor and will need to be informed by, or updated by, any conditions imposed by the Environment Agency or LLFA in respect of any environmental permits, licences or consents that have to be obtained in the future.</p>			
Section 14.8 Mitigation and Monitoring	Water quality monitoring once complete and operational	<p>The highways authority should implement the Drainage Strategy (<i>ES Volume II, Appendix 14-A</i>) and any recommendations for management and maintenance of Sustainable Urban Drainage Systems (SuDS) and drainage assets.</p> <p>It is important that during the Proposed Development operation phase that there is a requirement for regular inspection and maintenance of the drainage systems and culverts. This will be carried out in accordance with good practice guidance. Information regarding the maintenance regime will be provided in Operation and Maintenance manuals. The drainage system is designed in accordance with current guidance to ensure that the potential for siltation and blockages is minimised under normal operation. If there is any evidence of excessive erosion or sedimentation associated with new structures further actions will be considered to remedy that impact in as sustainable a way as possible.</p>	Complete and operational	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.



<i>Source</i>	<i>Issue</i>	<i>Mitigation Measure</i>	<i>Timing</i>	<i>Embedded/ Essential Mitigation</i>	<i>Justification</i>
		The maintenance regime for ponds, ditches and road drainage networks will be identified to reduce the residual risk from failure or improper function of the drainage system due to blockages. This risk of flooding can also be alleviated during design by improving the existing drainage system where impermeable areas are increased.			

***ES Volume I Chapter 15: Traffic and Transport***

Section 15.6 Environmental Design and Management	Construction Traffic Management Plan	A CTMP will be required for each phase of the construction. This will identify the strategy for controlling / minimising traffic related impacts of the construction. For a full list of key principles that will be identified in the CTMP, and the CEMP where relevant, please see <i>ES Volume I, Chapter 15 Traffic and Transport</i> .	During construction	Essential mitigation	Required to ensure that construction works comply with environmental legislation and adhere to environmental best practice.
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## References

- Ref 1-1 DMRB, (2020); LA 104 Environmental assessment and monitoring. Available at: Standard for Highways (<https://standardsforhighways.co.uk/dmrb/search/0f6e0b6a-d08e-4673-8691-cab564d4a60a>).
- Ref 1-2 AECOM, (2022); Access to Witney Lighting Assessment.
- Ref 1-3 Wade, M, Booy, O, White, V (2008) CIRIA Manual C679 'Invasive species management for infrastructure managers and the construction industry
- Ref 1-4 Bat Conservation Trust & Institute of Lighting Engineers, (2018); Bats and artificial lighting in the UK Guidance Note 08/18
- Ref 1-5 DEFRA, (2022); Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
- Ref 1-6 AECOM, (2022); Waste Minimisation Statement.
- Ref 1-7 BSI, (2009); BS 5228 Code of practice for noise and vibration control on construction and open sites.
- Ref 1-8 HMSO, (2010); Flood and Water Management Act 2010. Available at: Flood and Water Management Act 2010 ([legislation.gov.uk](http://legislation.gov.uk)).
- Ref 1-9 HMSO, (1991); Land Drainage Act 1991. Available at: Land Drainage Act 1991 ([legislation.gov.uk](http://legislation.gov.uk)).
- Ref 1-10 HMSO, (2016); Environmental Permitting (England and Wales) Regulations 2016.

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