Lower Thames Crossing

9.192 Responses to the Examining Authority's Third Written Questions (ExQ3)

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1 Responses to the Examining Authority's Written Questions

1.1 Introduction

1.1.1 This document has been prepared by the Applicant to set out its responses to the ExQ3 – Examining Authority's (ExA's) written questions and requests for information (ExQ3) [**PD-046**].

1.1.2 The document is structured as follows:

a. Section 2 – Applicant's response to Issue 2 Climate change and carbon emissions

b. Section 3 – Applicant's response to Issue 3 Consideration of alternatives

c. Section 4 – Applicant's response to Issue 4 Traffic and transportation

d. Section 5 – Applicant's response to Issue 6 Geology and soils

e. Section 6 – Applicant's response to Issue 10 Road drainage, water environment and flooding.

f. Section 7 – Applicant's response to Issue 11 Biodiversity

g. Section 8 – Applicant's response to Issue 12 Physical effects of development and operation

h. Section 9 – Applicant's response to Issue 16 General and overarching questions

i. Section 10 – Applicant's response to Issue 17 Habitats Regulation Assessment

1.1.3 There are no question on the following issues:

a. Issue 5 Air quality

b. Issue 7 Tunnelling considerations

c. Issue 8 Waste and materials

d. Issue 9 Noise and vibration

e. Issue 13 Social, economic and land-use considerations

f. Issue 15 The acquisition and temporary possession of land rights

1.1.4 It is noted that Issue 14 The draft Development Consent Order (dDCO), planning obligations, agreements and the adequacy of security for project delivery and mitigation is covered in the ExA's commentary on the dDCO, published on the 14 November 2023 [**PD-047**]. The Applicant has responded to

this, within the Applicant's response to the ExA Commentary on the dDCO [**Document Reference 9.194**].

2 Climate change and carbon emissions

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ExQ3_Q2.1.1	Applicant Climate Emergency Policy and Planning (Dr Andrew Boswell).	**A47 Judicial Challenges in the Court of Appeal** The ExA understands that the case of *R (Boswell) v Secretary of State for Transport* [2023] EWHC 1710 has been granted permission to be heard by the Court of Appeal. Dr Boswell provided an update at Deadline 6 [**REP6-171**] to which the Applicant has not yet responded. The Applicant's response is sought at Deadline 7. However, at Deadline 7 and at each successive deadline until the closure of the Examination, the Applicant and Dr Boswell are requested to put in a position statement explaining any changes to the circumstances of this litigation. The statements should cover both substantive change (if any judgment or relevant direction or order of the Court is made) and procedural matters (including an update on the anticipated timing of hearings and possible judgment). If there has been no change since the previous deadline, please enter a 'nil return'.
		Response: Dr Boswell has submitted representations into Examination at Deadlines 3 [**REP3-148**] (which includes the appendices to that submission: [**REP3-147**], [**REP3-149**], [**REP3-150**], [**REP3-151**] and [**REP3-152**]), 4 [**REP4-361**], 5 [**REP5-115**], 6 [**REP6-171**], and 7 [**REP7-231**]. The Applicant has carefully considered these representations and notes that the case of R (Boswell) v Secretary of State for Transport [2023] EWHC 1710 was mentioned by Dr Boswell in his Deadline 5 [**REP5-115**] and 6 [**REP6-171**] submissions. The Applicant, at Deadline 6, submitted its Response to Comments Made by the Climate Emergency Policy and Planning (Dr Boswell) at D3 to D5 [**REP6-094**]. This submission cross references the Applicant's response to ExQ1_Q2.3.1 [**REP4-188**] which sets out the Applicant's primary position in relation to the substantive matters of the A47 judicial review. The Applicant specifically sets out in detail in this response the reasons why the carbon emissions of the Project are consistent with the government's ability to meet its binding carbon reduction targets and therefore acceptable, having regard to the extensive mitigation measures secured by the application for the Project together with the wider impact of government policies to reduce road user emissions over time. The Applicant's Deadline 6 submission [**REP6-094**] sets out the procedural update to the A47 judicial review. The Applicant noted that Dr Boswell was given permission to appeal the Boswell judgment on 18 October 2023. It is important to emphasise, and the Examining Authority should be in no doubt, that the granting of this permission does not quash the Boswell decision. The High Court judgement remains extant unless it is overturned by the Court of Appeal.

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		Dr Boswell's submission at Deadline 6 [**REP6-171**] sets out the same procedural update that the Applicant set out in its Deadline 6 submission. The Applicant did not respond directly to this submission as it considered the matters raised had been sufficiently addressed in the Applicant's Deadline 6 submission [**REP6-094**]. The Applicant notes the Examining Authority's request to provide at every deadline a statement that will cover any substantive or procedural changes to the A47 judicial review. The hearing of the substantive appeal is now scheduled for 16 January 2024. There are no further procedural matters to note at this time.

3 Consideration of alternatives

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ExQ3_Q3.1.1	Applicant	**Loss of Ancient Woodland and Local Wildlife Sites** Refer to ExQ3 11.1.7. Responses to that question will be evaluated by the ExA with reference to the consideration of alternatives as well as to biodiversity effects. Please answer that question with this in mind.
		Response: The Applicant acknowledges the basis of this question and refers the Examining Authority to its response to ExQ3_11.1.8 which it believes is the correct reference under biodiversity as opposed to ExQ3_11.1.7 listed above.

4 Traffic and transportation

PINS ID	Question to	Question / Response
ExQ3_Q4.2.1	Applicant	**Connection of haul roads to the SRN: access and timing** A matter arising from the ExA's ASI4 to the Chiltern Tunnel South compound was an observation that construction traffic on the HS2 project had been handled using two main measures: • The early construction of construction traffic access points to the strategic road network (SRN), in that instance by the formation of a slip to the main tunnelling compound directly from the M25. • The early construction of 'on alignment' haul roads, connected to the SRN and interconnecting the main works compounds. The main observed effects of this approach were to reduce the extent to which construction traffic was required to use the local road network (LRN). Please provide a summary statement setting out the degree to which a similar approach is being or can be used for the LTC, with reference to relevant control documents (CDs). Please address questions of timing relating to SRN access construction (with a view to limiting to the minimum practicable the extent to which substantial construction traffic movements on the LRN would be required). How are or will the necessary measures be secured?
		Response: Access routes are presented in the outline Traffic Management Plan for Construction (oTMPfC) [**REP7-148**]. Refer to Section 4. As part of a multimodal strategy, the Applicant has adopted a risk based approach with a focus to minimise the impact on the local road network (LRN) when determining suitable access routes to compounds. Despite constraints imposed by the proximity of the strategic road network (SRN), the Applicant's compound strategy has successfully positioned the majority of compounds (11 out of 18) to be accessed directly via the SRN or well-established A-roads, such as the A226, A1013, and A1089. Instances where the LRN is utilised stem from either the impracticality of using the SRN due to distance or as a temporary measure to establish access before constructing an access route off the SRN when setting up the compound. To minimise reliance on the local road network, the following principles have been adopted as set out in paragraph 4.1.3 of the oTMPfC [**REP7-148**]: • *'Early construction of temporary offline haul routes directly off the SRN where practicable* • *Maximum use of internal haul routes, when available, to gain access to worksites*

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		• *Engagement with local businesses to establish access via private roads'* Haul routes have been proposed within the Order Limits to connect the SRN directly to the work sites as well as provide inter-compound connectivity where reasonably practicable. Refer to the oTMPfC [**REP7-148**] Plates 4.1 to 4.8 which show illustrative construction routes for construction-related heavy goods vehicles (HGVs). Significant parts of the construction of the Project occurs away from the road network. As the Project advances and haul roads are established, a network would be created, significantly reducing reliance on both the strategic and local road network. The establishment of the haul routes would progress with the development of the earthworks and would be utilised when transporting large volumes of excavated material between work sites, as well as providing connections between worksites for the workforce and other deliveries. This rationale is embedded in the assumptions informing the environmental impact assessment and construction traffic modelling and described in Sections 7 and 8 of the outline Materials Handling Plan [**REP7-127**], which the Contractor must adhere to. The Applicant has set out specific commitments to implementing best practices, monitoring and management procedures to control the environmental impact of construction traffic along the haul route in the Register of Environmental Actions and Commitments set out in Section 7 of the Code of Construction Practice [**REP 7-122**]. This includes commitments to control the noise impacts from construction traffic along the haul routes (notably NV010, as well as NV002 and NV004 to NV009) and to control air quality impacts (AQ001 and AQ003 to AQ008). An illustrative example of phasing the works to maximise the use of haul routes is the movement of excavated material from the Ockendon Road compound, east of the M25, for the construction of the Ockendon Link. The Applicant has phased the works whereby the Ockendon Road closure and connecting haul road provide an offline route that avoids interfacing with public traffic for material transportation. Additional examples are detailed in Section 7.4 of the outline Materials Handling Plan [**REP7-127**]. As the detailed construction phasing and associated earthwork strategy is developed, there would be further incentives to use the haul road, which provides efficiency to the Contractor to move material unconstrained by public traffic which inherently limits the use of the road network lessening the concerns of relevant stakeholders. This detail will be incorporated into both the Materials Handling Plan and the Traffic Management Plan, where there are interactions with the road network. It will also be discussed during the Traffic Management Forum (TMF) with relevant stakeholders. The Applicant considers its approach to be appropriate for this stage of the Project, offering a robust framework for developing the respective plans in collaboration with stakeholders as construction phasing details are developed or modified during the construction period within the controls of the Project commitments. Whilst haul routes from the SRN to the compounds are proposed to be constructed early in the Project construction programme, traffic would need to utilise the local road network prior to the operation of newly constructed access routes from the SRN.

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		In instances where the Applicant has proposed the construction of access routes from the SRN to avoid the use of the LRN as the primary access route, the Applicant has committed to a clear timeline for the construction of these access routes. Table 4.1 of the oTMPfC [**REP7-148**] describes the access routes to compounds along with the associated timeline commitments. To summarise, the Applicant has made the following commitments: • Construction of M25 access slips within a timeframe of 6–12 months from the compound's operational period. These access slips, for the M25 and Ockendon Road compound, would remove the use of the B186 North Road and surrounding local roads as the primary access route for HGVs to the respective compounds once completed. • Construction of access from A13–Medebridge Road within a timeframe of 6–12 months from the compound's operational period. These access slips, for Stifford Clays Road East and West, Mardyke, and Medebridge compounds, would remove the use of Stifford Clays Road as the primary access route for HGVs to the respective compounds once completed. The Applicant has engaged in recent technical discussions with London Borough of Havering regarding construction traffic concerns. At Deadline 8, the Applicant has further enhanced the Applicant's commitment to the M25 accesses set out in paragraphs 4.2.10 to 4.2.12 in the oTMPfC [**Document Reference 7.14 (8)**]. This commitment aims to prioritise where reasonably practicable earlier delivery of the M25 accesses, as the detailed design and related construction methodology are finalised. During the development of the Traffic Management Plan (TMP) further refinement would be provided on the committed timelines as the detailed design and associated construction methodology, which would inform the TMP, is developed. As part of the TMP development the Contractor would set out their proposal at the TMF and consult with the relevant local authorities on their proposals. The early construction of these access routes brings notable advantages to the Contractor by establishing an efficient means of accessing and departing from the compounds while minimising reliance on the LRN, which serves as a benefit to the local community. Therefore, there would be a proactive effort in addition to the timeline commitments the Applicant has set out to construct these accesses as early as reasonably practicable. However, the construction of these access routes requires a period for constructing the access routes and, in certain instances, initially undertaking other elements of work such as the re-diversion of utilities to enable the construction of the access routes. This constraint is particularly applicable in the case of the Ockendon Road compound and M25 access. During the implementation of the TMP, further details on the management of access and egress routes from compounds would be discussed at the TMF and would be developed when the TMPs are produced. In particular, in

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		the case where the LRN is utilised due to limitations in constructing an access route from the SRN or until the access from the SRN is completed. A monitoring system will be established with the aim of capturing real-time data and updating the TMF on the impact on the local road network and other relevant factors. This evidence-based approach will facilitate the identification of appropriate operational control measures during construction to minimise the impact on the road network, such as avoiding periods of the day when patterns of congestion on the road network are identified. The TMP, which must substantially accord with this oTMPfC, is legally secured under Requirement 10 in Schedule 2 to the DCO [**REP7-090**].
ExQ3_Q4.2.2	PLA Applicant	**River access and jetties for construction** The respective positions of the Applicant and PLA in relation to the use of the River Thames as a means of construction transport and access has already been discussed and agreement has not been fully reached. There are outstanding concerns by PLA that the Applicant has not given adequate in-principle consideration to the use of the River Thames to serve the element of the construction site south of the River Thames, or is seeking to defer consideration to a later stage than current of the Materials Handling Plan (MHP) [**REP6-160**]. Please keep the ExA updated at Deadline 7 and successive deadlines on any changed positions emerging from discussions on this point. Please ensure that if agreement is not reached, a final position is reflected in a final PADS statement for the PLA.
		Response: Progress has been made on resolving several matters between the Applicant and the Port of London Authority (PLA), but as rightly highlighted by the Examining Authority (ExA) there are outstanding concerns. To explain, the Applicant agrees with the PLA that there are suitable riparian facilities on the south of the river that can serve compounds in the south. This is acknowledged by the Applicant in paragraph 8.2.32 of the outline Materials Handling Plan (oMHP) [**REP7-127**]) which states that '*There are numerous supply sites situated south of the River Thames with river infrastructure facilities who offer services in the supply of bulk aggregates. A non-exhaustive list of identified sites is listed in Annex B.1*.' This Annex assesses suppliers of ready mixed concrete, cement, aggregates and asphalt. It is worth noting that aggregates make up 70% of the material required on the Project, with asphalt and cement making up 13% and 10% respectively. Therefore, this represents 93% of the Project's material requirements. It is based on this assessment and wider considerations provided in the oMHP [**REP7-127**] that the Applicant has not precluded the use of river facilities on the south of the River Thames and their use is in fact encouraged through the commitment in paragraph 8.3.3 of the oMHP [**REP7-127**] which requires Contractors to seek to maximise the use of rail and/or river facilities to transport materials as part of a multimodal approach to transport materials. The Applicant has gone a step further in the latest update of the oMHP [**REP7-**

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		127] and strengthened the wording in paragraph 8.3.3 and has added paragraph 8.3.4 to include the need for Contractors to explain '*how multimodal solutions have been included and implemented or discounted…*'; this would then allow stakeholders to scrutinise the proposed construction phase Materials Handling Plan. The Materials Handling Plan would include an explanation of how multimodal solutions have been included or discounted, and will ultimately be subject to approval by the Secretary of State. The Applicant does not consider it would be feasible to make a river-use only commitment to the south of the River Thames as there is no direct link between the river and the Project Order Limits which excludes reliance on the road network; paragraph 8.2.33 makes this irrefutable point [**REP7-127**]. Consideration has therefore been given to use of the River Thames for the south of the Project in combination with use of the road network and the Applicant is of the view that the multimodal transport commitment, for this stage of the Project, provides an adequate framework within which Contractors can develop the most sustainable solution to transport materials for the entire Project, including the south. One matter which has been agreed with the PLA is the inclusion of the PLA as a standing member of the Traffic Management Forum (TMF) subgroup concerned with river usage and this can be found in Appendix E of the outline Traffic Management Plan for Construction [**REP7-148**]. Paragraph 8.2.20 of the oMHP [**REP7-127**] was amended to clarify the intent of the Applicant's position in the use of wharves: that wharves can be used to supply various compounds throughout the Project both north and south of the river. Similarly, paragraph 8.3.2 of the oMHP [**REP7-127**] did not specifically mention the consideration of wharves in the preceding sections and this has now been amended to reflect what was considered by the Applicant. The definition of 'bulk aggregates' in paragraph 6.2.13 of the oMHP [**REP7-127**] was amended to make it clear that precast concrete elements were included within the commitment. The PLA's concern on the lack of a commitment to moving waste by water was also clarified in the meeting as well as in the oMHP [**REP7-127**]. Paragraph 1.3.6 was amended to read '*no excavated material is expected to go offsite, if contaminated material is discovered then these facilities may also be suitable…*', referring to facilities on the river. A review and feedback mechanism has been added to the derogation process with the addition of paragraphs 6.2.26 and 6.2.27 [oMHP, **REP7-127**] to allow revocation of a previously approved derogation if decided at the TMF sub-group. Finally, as described above, the wording for the multimodal transport commitment was strengthened to highlight the Applicant's desire for the Contractor to employ the most sustainable modes of material transport at paragraph

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		8.3.3 and paragraph 8.3.4 was added to allow transparency in the development of the construction phase MHP [oMHP, **REP7-127**]. Matters raised by the PLA and which were not addressed at this stage and may not be agreed upon include the request by the PLA to import the tunnel boring machine (TBM) or other abnormal indivisible load (AIL) by water. The Applicant has explained that it is anticipated that some parts of, if not all the TBM, will be imported via the river with local connection to the compound via the road network. Due to the size and weight of some TBM components, the Contractor will take a risk-based approach to the delivery of the TBM once procured. The TBM has not been procured; the exact parts to be delivered via the river are therefore not yet known and cannot be committed to. Additionally, committing to using the river at this stage would restrict the Contractor from taking the most advantageous delivery route at the time of planning delivery. In determining the appropriate means of transporting inert or non-hazardous waste offsite, the Applicant has evaluated potential receiver sites, considering the type and quantity of materials expected to be delivered. This evaluation incorporates comprehensive screening criteria set out in Environmental Statement (ES) Appendix 11.1: Excavated Material Assessment [**APP-435**]. The screening criteria encompass various elements, including the operational period, acceptable waste streams, site capacity, permit and planning status, proximity to the local area, and transport capabilities, encompassing river and rail transport. Incorporating waste into the river use commitment was not included because it is part of the multimodal transport requirement (Section 8.3, oMHP [**REP7-127**]) and subject to the wider position on waste. Additionally, there is no spoil anticipated to be exported from the North Portal Construction Area. Although no contaminated waste is anticipated a minimal amount has been allowed for and potential receiver sites for contaminated waste on the river are limited. The PLA requested the Applicant to include cement into the river use commitment with the added caveat that '*if the specification allows, cement should be imported via the river*'; however, this is covered by the multimodal transport commitment and therefore would not need to be included in the river use commitment. Steel was another material that the PLA requested the Applicant to consider including in the river use commitment. The Applicant highlighted again that steel would fall under the multimodal transport commitment and that the steel required would be of various types throughout the construction period and that numerous suppliers, including some on the river, were suitable. However, forming a commitment to supply steel via the river at this stage would narrow the options available to the Contractor and could possibly impede an environmentally better option. Opportunities for reducing embodied carbon in materials such as steel require flexibility at the detailed design development stage and therefore it would not be an environmentally better approach to make such a commitment as it might impede a solution that achieves the greatest reductions in the embodied carbon emissions. Manufacturing techniques for steel vary and the more sustainable options for manufacturing may not lend to river use. The Applicant has secured the multimodal commitment which would form part of the Materials Handling Plan produced by the

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		Contractor to demonstrate they have proposed the best option and in alignment to the carbon approach set out in the carbon energy management plan (Carbon and Energy Management Plan [**REP7-150**]) during construction. The Applicant has made changes to the wording of the multimodal commitment at paragraphs 8.3.3 and 8.3.4 of the oMHP [**REP7-127**] to make clear the intent for the most sustainable material transport solution, without impeding the Contractor's ability to provide a competitive, value for money solution that does not cause disproportionate delay to the programme. The PLA asked the Applicant to provide specific wording, as opposed to these terms which could be interpreted broadly. The Applicant emphasised that at this stage of the Project providing more specific requirements could result in a situation where the most sustainable option is not, or cannot, be pursued and implemented. There is a possibility that as part of the ongoing discussions the two parties can come to common terms on more of these contested issues and the final position may change up to Deadline 9. The ExA will be made aware of any further progress in successive deadlines and the final position will be reflected in the Statement of Common Ground in a Summary statement for the PLA.

5 Geology and soils

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ExQ3_Q6.1.1	Applicant	**Agricultural land reinstatement and soil management** For the purposes of this ExQ and the following ExQ3 6.1.2, the term soil management includes the removal, storage, re-conditioning, placement and aftercare of soils. The Environmental Statement (ES) Appendices, Appendix 2.2 – Code of (CoCP), First Iteration of the Environmental Management Plan (EMP) and Register of Environmental Actions and Commitments (REAC) document [**REP6-038**] suggests: • GS009 Placement/Reinstatement based upon 'DEFRA Construction Code of Practice for the Sustainable Use of Soil on Construction Sites (2009) and the MAFF Good Practice Guide for Handling Soils (2000).' Construction Practice • GS014 5-year after care period. GS009 also states that in relation to soil reconditioning (where required), soil reuse would be set prior to any stripping work commencing. • Who is to determine the reconditioning requirement and when is it to be determined; and where is that secured?
		Response: 'Who is to determine the reconditioning requirement and when is it to be determined; and where is that secured?' GS009 in the Register of Environmental Actions and Commitments (REAC) [**REP7-122**] states that: '*Soils would be handled and stored to allow their sustainable reuse in line with the Defra Construction Code of Practice for the Sustainable Use of Soil on Construction Sites (2009) and the MAFF Good Practice Guide for Soil Handling (2000). Full details of the soil resources present and the procedures for soils management (covering vegetation clearance, setting out haul routes, soil stripping, stockpile creation and management, soil reconditioning (where required) and soil reuse) would be set out prior to any soil stripping works commencing, covering all proposed end uses (for example, agricultural land, woodland or other habitat types).*' GS010 in the REAC [**REP7-122**] notes that characterisation of soils to determine resilience to handling and stripping will be based on information collected as part of the Agricultural Land Classification (ALC) surveys. This information will support decisions regarding whether reconditioning is required, along with in-field soil plasticity testing. Soil reconditioning will be used where soils are handled/stockpiled when in a plastic state. Full details of this testing, to include methodology, responsibility and reporting, will be set out in a Soil Management Plan which will be secured as detailed in the following paragraphs.

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		The above details, set out in a Soil Management Plan, will be secured within EMP2. The Code of Construction Practice (CoCP) – First Iteration Environmental Management Plan (EMP) [**REP7-122**] sets out in paragraph 2.1.1 that no part of the Project is to commence until an EMP2, in accordance with the CoCP has been submitted to, and approved in writing by, the Secretary of State, following consultation with the relevant stakeholders, to the extent that it relates to the matters relevant to their function. Paragraph 2.4.1 also lays out that a soils management plan is required as part of the EMP2 in accordance with Development Consent Order (DCO) Schedule 2, Requirement 4(3). And Paragraph 2.7.2 notes that: '*National Highways and Contractors involved with the construction of the Project will be required to comply with the provisions of this CoCP and EMP2*'. The CoCP also states that Contractors are responsible for the performance of sub-contractors and both will be monitored by the Applicant via the process set out in paragraph 2.7.7, and '*National Highways will appoint a suitably qualified and experienced Environmental Manager who will be responsible for monitoring and assuring compliance of the Project's works with all environmental commitments set out in this CoCP, other Project documentation and relevant environmental legislation*' (paragraph 4.2.3). This manager will be supported by a range of other suitably qualified personnel whose roles and responsibilities are presented in Table 4.1. GS014 in the REAC [**REP7-122**] states that '*The Contractors would prepare and present to National Highways for acceptance a schedule of aftercare monitoring, maintenance and correction. This would include soil testing, appropriate to the target specification (e.g. land grade where restoration is to agricultural use or specific characteristics where restoration is to support habitat creation or re-provision). Implementation of the aftercare monitoring, maintenance and correction will be overseen by an Environmental Clerk of Works*'. Point j in paragraph 10.5.8 of Environmental Statement (ES) Chapter 10: Geology and Soils [**APP-148**] states that '*Reinstatement of soils affected by temporary works would aim to avoid any reduction in soil function. For agricultural land this would be measured by the quality of the land as defined by the ALC system (with a soil profile recreated to 1.2m below ground level where this was the pre-construction soil depth). For areas of landscape planting or habitat creation, this would be measured by the successful restoration of the soil profile (both physical and chemical characteristics) defined for that particular habitat in the soils management procedures suitable to allow the establishment and long-term health of the habitat*'; this is secured in commitment GS012 of the REAC [**REP7-122**]. Accordingly, the Applicant considers that the approach set out above will ensure that decisions regarding soil reconditioning will be taken as appropriate during the construction process, by suitably qualified personnel following appropriate processes to suitable industry standards, which will be secured through provisions in the DCO and subject to monitoring by the Applicant.

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ExQ3_Q6.1.2	Applicant	**Agricultural land reinstatement and soil management** In continuation from ExQ3 6.1.1 above, given that there are suggested monitoring periods in excess of 5 years, is the 5-year after care period justified and if not, what length of time is appropriate for: • Agricultural land reinstatement? • Other habitat creation? If longer after care periods than 5 years are justified in specific circumstances, can the Applicant confirm that relevant CoCP/ REAC amendments have been made to bring those into effect?
		Response: Regarding the establishment of newly created habitats, as distinct from agricultural land reinstatement, the periods for establishment and related monitoring and management periods are set out within the outline Landscape and Ecology Management Plan (oLEMP) [**REP7-132**], notably in Section 4.2: Habitat establishment monitoring period. In relation to agricultural land, a five-year aftercare period is appropriate to establish sustainable agricultural use and reflects the standard approach across the industry. For example, this is the aftercare period set on High Speed 2. This time period allows sufficient cycles of agricultural activities to be undertaken, such as cultivation, reseeding, drainage, fertiliser applications or cutting and grazing the site. The Soil Management Plan (which would be delivered as part of EMP2) will set out the requirements for an aftercare plan. The aftercare plan for any given location will be based on the agreed post-construction land use and the soil/site characteristics. For example, aftercare may require the establishment and management of a permanent grass cover or annual agricultural cultivation operations suited to the soil type present.
ExQ3_Q6.1.3	Applicant	**Agricultural land use adjacent to site and reinstatement** In the REAC referenced above, RDWE015 and RDWE016 are intended to protect two specific individuals. RDWE006 is to provide protection for the site to allow the proposed project to be constructed. • Where is the provision located that protects other land and property where the proposed project interferes with existing land drainage or irrigation systems? • How is this secured?
		Response: The Applicant has engaged extensively with land and property owners within the Order Limits, having submitted questionnaires and undertaken several site surveys to identify existing land drainage systems and features, as

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		detailed in the Water Features Survey Factual Report [**APP-454**]. Irrigation systems serving two landowners would be affected by the Project and the mitigation described in commitments RDWE015 and RDWE016 in the Register of Environmental Actions and Commitments [**REP7-122**] secure alternative provisions for these landowners. No other irrigation systems with the potential to be impacted have been identified. With regard to field and land drainage systems, any effects during construction would be managed by the Contractor in accordance with the construction phase drainage plan that would be developed, as secured by commitment RDWE002 [**REP7-122**]. This plan will demonstrate how the Contractor would manage surface water runoff across the worksite, including details of how offsite impacts would be managed and mitigated. Provision for land drainage during operation of the Project is secured by commitment RDWE013 [**REP7-122**] which secures culvert design to maintain the current land drainage regime.
ExQ3_Q6.1.4	Applicant Bodies expected to accept future maintenance responsibilities	**Health and safety file** In the REAC, referenced above GS017 suggests contamination locations are available for '… inclusion within the operations Health and Safety file or equivalent ...'. However, in GS018, confined spaces are not afforded the same method of information transmittal. • Why not? • Are there other matters that should be considered as being placed within an Operations Health and Safety File that are not specifically noted in the REAC?
		Response: The Register of Environmental Actions and Commitments (REAC) [**REP7-122**] commitment GS017 states that '*The findings of the verification report (REAC ref. GS016) would be available for inclusion within the operations Health and Safety file or equivalent.*' This is to ensure that residual risk information on any land contamination is handed over to the relevant asset owners. REAC commitment GS018 is related to Gas Management during construction and states that the 'ground gas regime across the Project and especially in close proximity to landfill sites would be investigated to inform design of enclosed and confined spaces'. Pursuant to Part 3, Section 12 of the Construction (Design and Management) Regulations 2015 (CDM Regulations) any risks, including confined spaces as defined in the Confined Spaces Regulations 1997, are required to be included in the Construction Phase Health & Safety Plan and managed by the Principal Contractor followed by residual risks communicated into the Health and Safety File as standard for future maintenance responsibilities. The operations Health and Safety File will provide appropriate information needed during the future maintenance and construction work which includes cleaning, alteration, refurbishment and demolition. The information in the file

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		is essential for those doing the work and alerts them to the risks allowing them to undertake work safely. Items contained within the REAC are actions and commitments that have been identified in the environmental impact assessment and making these commitments in no way alters the Applicant's broader requirement to comply with the CDM Regulations.
ExQ3_Q6.1.5	Applicant	**Groundwater protection during the tunnelling process** In the REAC, referenced above, RDWE059 states that the Highway bored tunnels will utilise closed face tunnelling techniques. How does this tunnelling process protect groundwater from contamination by the water required to operate the tunnel boring machine?
		Response: **Introduction** The fundamental premise of a closed-face tunnelling machine is that the machine exerts a balancing pressure against the ground and groundwater through which it tunnels. Groundwater contamination is prevented by the avoidance of 'over-pressure' and the resultant migration of slurry medium into the ground. **Main text** The tunnelling process with a closed face slurry machine involves the circulation of water within the system, whereby water and chemicals introduced at the tunnel face are incorporated within the material that is then removed from the face of the tunnel bore, pumped to and treated at the slurry facility within the northern tunnel entrance compound. The process that protects groundwater from contamination is a combination of careful pressure management and slurry composition management, to maintain the circulation without leading to excess pressure, which could cause migration of tunnelling slurry into the aquifer, and under pressure, which could lead to settlement or excessive groundwater ingress. Closed-face type tunnelling machines are applicable where there is any combination of soft ground and groundwater pressure to be tunnelled through. In this context chalk is classed as soft ground or a soft rock. The principle is that the cutting chamber and face are sealed from the rest of the machine and tunnel behind allowing balancing pressure to be applied. This minimises relaxation/movement of the ground which would cause settlement, and prevents ingress of groundwater that would otherwise result in localised groundwater drawdown and the production of wet spoil that is difficult to handle and place. Conversely, it is possible to apply excess pressure, and this must be avoided; the causation of ground heave and/or migration of the tunnelling slurry into the ground that would arise as a consequence is equally undesirous. Use of a slurry-type tunnel boring machine (TBM) with its many pressure and flow monitoring stations can accurately control the situation, providing the correct 'confinement pressure' within the excavation chamber to

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		balance this pressure from the ground and groundwater. This is achieved by the transport medium (slurry) pressure in the head being automatically maintained at the relevant level by a volume of compressed air behind the head of the machine called the air 'cushion'. Communicating pipes connect the front part of the excavation chamber (the pressure chamber) with the rear part (the working chamber), where pressures are continuously measured and controlled by a system of regulating valves. In this way the slurry pressure within the cutterhead is accurately controlled and easily adjusted. The pressure parameters will be derived by calculation along the tunnel length and agreed with the Engineering Manager's team prior to commencing. The system pressure can be pre-programmed to match the groundwater pressure (established through calculation, drilled piezometers and measurement). It can be automatically or manually adjusted for the tidal variation which occurs in the area of influence of the Thames. Continuous and calibrated real-time monitoring takes place throughout the slurry system and this is automatically compared against these calculated values. Alarms are triggered whenever negative trends are measured. At all times skilled and trained personnel also monitor these pressures; the TBM Operator (the 'Pilot'), the Tunnel Manager, Shift Engineer and Engineering Manager's delegates amongst others have real-time access to the data both *in situ* and remotely. Monitoring the flow and density of fresh slurry into-, and slurry charged with arisings out of-, the cutter chamber is reconciled continuously to verify no slurry loss (or gain). The action of the cutting tools 'smear' chalk fines into fissures, also preventing slurry migration away from the excavation chamber. Regarding external controls, attention is drawn to the following suggested text from the Environment Agency in their recent question responses and the newly amended Register of Environmental Actions and Commitments (REAC) commitment: • '*Chemicals and materials, such as cement, grout and lubricants used during construction would be stored, transported and used in a suitable manner to safeguard potable water supply, source protection zones and the water environment. Prior to commencement of ground treatment, tunnelling or trenchless installation, the Contractor would be required to agree the use of any chemical additives proposed for the works with the Environment Agency.*' (This has now been updated by the Applicant and forms REAC commitment RDWE019 in the Deadline 7 submission [**REP7-122**].) In addition, it is noted that the Applicant intends to use groundwater for the TBM water supply. This would be raw water from the Northumbrian Water Limited (Essex and Suffolk Water) well at Linford that is currently not connected to mains supply, as discussed in REAC commitment RDWE003. The abstracted groundwater would be from the Chalk aquifer, of which the groundwater would otherwise naturally flow towards the River Thames.

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		Therefore, the water used for the TBM water supply would be of similar quality or more fresh than the *in situ* groundwater encountered during tunnelling. **Summary / conclusion** The Applicant considers that the combination of monitoring and control measures described ensure the correct application of the TBM pressure and slurry make-up such that the risk of over pressure and thus leakage from the slurry circuit is prevented thus protecting the groundwater from contamination.
ExQ3_Q6.1.6	Applicant	**Historically filled land (contamination)** The North Portal is recognised as having potential contaminants from historical land uses, as indicated in the REAC (reference GS021 and others). • How is it proposed to undertake the proposed construction at this site in relation to preventing contamination of adjacent non-contaminated land and on both human health and that of birds, mammals, etc who may come into close proximity to the workings and the transferral process to its final location? • Is the material at this location proposed for re-use and /or where is the envisaged final destination? • Where is this secured?
		Response: **Overview** The overarching assessment of land contamination presented in Environmental Statement (ES) Chapter 10: Geology and Soils [**APP-148**] and supporting Appendices has taken into account a multitude of evidence gathered to identify the potential contaminant linkages using the source-pathway-receptor approach to develop the Conceptual Site Model (CSM) as set out in the Environment Agency land contamination risk management (LCRM) guidance[1]. The LCRM guidance recommends a tiered assessment process in stages, with increased site-specific understanding required at each level. The Project's CSM is presented in ES Appendix 10.6: Preliminary Risk Assessment Report [**APP-427**] and shows the potentially complete pollutant linkages and the potential risk associated with each linkage. Historic land use in the vicinity of the North Portal is characterised by landfilling and land raising activities; predominately Goshems Farm (referenced as HLU0526), the Tilbury Ash Disposal sites (referenced as HLU0527 to HLU0532 and HLU0534) and East Tilbury Landfill (HLU0523 and HLU0533). ES Appendices 10.8 and 10.9 [**APP-429 to APP-432**] present a Generic Quantitative Risk Assessment (GQRA) and compare site-specific investigation results

[1] Environment Agency (2021). Land contamination risk management. https://www.gov.uk/guidance/land-contamination-how-to-manage-the-risks

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		against Generic Assessment Criteria (GAC) for human health and controlled water receptors. Specifically, Annex B [**APP-430**] presents the GQRA of the North Portal area. East Tilbury landfill was the subject of a Qualitative Risk Assessment (QRA) of potential impacts from dewatering for the proposed North Portal construction on the East Tilbury Landfill [**APP-428**]. The North Portal is located at Goshems Farm which was assessed as a medium risk site and as such taken forward to the Remediation Options Appraisal and Outline Remediation Strategy [**REP1-165**]. Site-specific remediation strategies and implementation plans, following the principles set in **REP1-165** will be undertaken by the Contractor prior to works commencement, secured by GS027 of the Code of Construction Practice [**REP7-122**]. To support the development of the site-specific remediation strategy, supplementary investigation will be undertaken, secured by GS001. The Applicant has developed a robust characterisation of the ground conditions at the location of the proposed North Portal and, where guided by the assessments, has identified specific mitigations to minimise the risk of contaminant mobilisation as a result of the Project works. **Proposed construction activities at the North Portal** At the North Portal, the structure transitions from cut and cover to open ramp. The tunnel will be constructed using a tunnel boring machine (TBM). The design of the North Portal has been developed to facilitate the temporary activities associated with launching of the TBMs and servicing of the bored tunnel construction. In order for the road to pass from ground level down to the tunnel level, an approach ramp must also be constructed at gradient between supporting walls. These will be constructed using diaphragm walls. '*How is it proposed to undertake the proposed construction at this site in relation to preventing contamination of adjacent non-contaminated land and on both human health and that of birds, mammals, etc who may come into close proximity to the workings and the transferral process to its final location?*' With regard to controls to prevent contamination on adjacent land and sensitive receptors, Section 2.4 of the Environmental Statement (ES) Appendix 2.2: Code of Construction Practice, First Iteration of Environmental Management Plan (CoCP) [**REP7-122**] sets out a requirement for management plans for contaminated land and pollution prevention controls. These management plans will be produced following engagement with relevant stakeholders, which include Thurrock Council (as the relevant planning authority for the land where the North Portal would be located), the Environment Agency and Natural England, and submitted to the Secretary of State for approval. The Remediation Options Appraisal and Outline Remediation Strategy [**REP1-165**], Section 7.10, sets out requirements for the excavation, transport and stockpiling for required earthworks. Section 6.5 states '*The Contractor shall prepare method statements prior to the implementation of the site-specific remediation strategies which should include a description of methods to be applied for materials movement, asbestos management, unexploded ordnance, environmental management, verification, groundwater / surface water control and*

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		treatment, and well decommissioning.' Site specific remediation strategies and implementation plans will be produced as part of detailed design (secured by Register of Environmental Actions and Commitments (REAC) commitment GS027 [**REP7-122**]), and will be informed by supplementary investigation at the North Portal (secured by REAC commitment GS001 [**REP7-122**]). '*Is the material at this location proposed for re-use and /or where is the envisaged final destination?*' Priority would be given to reuse of suitable excavated materials at this location. The Applicant has undertaken extensive ground investigation works to ensure that the material arising from tunnelling activities would be suitable for placement wholly within the curtilage of the northern tunnel entrance compound area. This would be achieved predominantly through the creation of Tilbury Fields, a new recreational site of over 35 hectares secured through Clause S9.02 of the Design Principles [**REP7-140**]. These Design Principles are commitments that are secured via Requirement 3 and Requirement 5 in Schedule 2 of the draft Development Consent Order (DCO) [**REP7-090**]. An allowance has been made as a precautionary approach for offsite disposal in the event material is unsuitable. This is set out in Table 7.1 of the outline Materials Handling Plan [**REP7-127**]. As explained in the outline Materials Handling Plan, a set of criteria will be established to determine suitable receiver sites and waste facility sites. Where excavated material and soil are to be reused, recycled and/or recovered within the North Portal area this would be subject to the relevant regulatory controls, under the Environmental Permitting (England and Wales) Regulations 2016. All excavated materials and soils proposed for reuse would be required to meet risk-based acceptability criteria applicable to its intended use to be protective of human health and the environment (REAC commitment MW007 [**REP7-122**]). '*Where is this secured?*' The outline Landscape and Ecology Management Plan (oLEMP) [**REP7-132**] explains how arisings, including tunnel arisings, would be used as part of the landscaping of the Project. The oLEMP is secured through Requirement 5 in Schedule 2 of the draft DCO [**REP7-090**]. The understanding of material reusability has been informed by the Project's earthworks approach and related assessments. Ground investigations have also been carried out to inform the Project design. As such, large scale removal of tunnel arisings from site is not expected. A description of how tunnel arisings will be managed within the northern tunnel entrance compound area is provided in paragraphs 7.4.10 to 7.4.15 of ES Appendix 2.2 Annex B: Outline Materials Handling Plan [**REP7-127**]. Requirement 4 in Schedule 2 of the draft DCO [**REP7-090**] states that no part of the authorised development is to commence until an Environmental Management Plan (Second Iteration), substantially in accordance with the CoCP [**REP7-122**], has been submitted to and approved in writing by the Secretary of State, following consultation

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		with the stakeholders identified in Table 2.1 of the CoCP [**REP7-122**]. Under Requirement 4(3), the Environmental Management Plan (Second Iteration) must include a plan for the management of materials, which must be in accordance with the outline Materials Handling Plan [**REP7-127**].

6 Road drainage, water environment and flooding

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ExQ3_Q10.1.1	Applicant EA LLFAs IDB	**Flood Risk Assessment: locationally specific provisions** In general terms, standard guidance has been followed in the current Flood Risk Assessment [**APP-460** to **APP-477** and **REP1-171**] that has been submitted for the project as a whole. The following additional assessments have been provided: • [**REP6-102**] Deadline 6 Submission - 9.147 Coalhouse Point Flood Risk Assessment • [**REP4-225**] Deadline 4 Submission - 9.103 Hole Farm Appx F.3 Flood Risk Assessment Are there any other particular locations where non-standard considerations should be included and if so why? If there are such locations, can the Applicant provide copies of such assessments or the indication of when/if they will be undertaken alongside the reasons why they have not been undertaken thus far?
		Response: The Applicant confirms that there are no other locations where non-standard flood risk considerations need to be assessed. All flood risk assessments have now been submitted to the Examining Authority.
ExQ3_Q10.1.2	Applicant	**Construction flood risk** The ES Appendices, Appendix 2.2 – CoCP, First Iteration of the EMP and REAC document [**REP6-038**] RDWE002 suggests that the site drainage systems would be inspected and maintained. Can the Applicant explain why inspection timeframes, say minimum of fortnightly or before/after extreme events etc., have not been proposed in certain risk evaluated locations?
		Response: The detailed requirements for the inspection and maintenance of temporary drainage infrastructure would be informed by the findings of the site-specific flood risk assessment, as secured through Register of Environmental Actions and Commitments (REAC) commitment RDWE001 [**REP7-122**]. Subsequently, the construction phase drainage plan, as secured through REAC commitment RDWE006 [**REP7-122**], would be prepared by the Contractor and shall demonstrate how the Contractor would manage surface water runoff across the worksite, including details of how pollution control systems would be incorporated and how offsite impacts would be managed and mitigated. The drainage plan would include details of how frequently the work site drainage systems would be inspected including minimum timeframes for inspection and would undergo maintenance to

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		ensure they continue to operate to their design standards. This is secured through REAC commitment RDWE002 [**REP7-122**].
ExQ3_Q10.1.3	Applicant	**Integrated design** In the Design Principles (Volume 7) [**REP6-046**], PRO.02 suggests that design is to be undertaken in a coordinated manner as a cohesive process. Given that accommodation is being made to utilities to place diversions outside highway construction limits, why are culverts being constructed for long lengths under the highway and how does the requirement for future maintenance make this acceptable?
		Response: Culverts are being constructed to convey watercourses under the Project road where practicable alternatives are not available. As noted in the response to ExQ3_Q10.1.12, culvert lengths and routes have been balanced against maintaining a smooth transition of flow into and out of the structures by ensuring a suitable channel gradient and geometry of the upstream and downstream channel reaches. Shorter, more perpendicular culverts have been avoided where a favourable balance cannot be achieved (e.g. where the approach channel or channel downstream would need sharp bends). Culverts will be subject to inspection and maintenance in accordance with National Highways' Design Manual for Roads and Bridges standards[2] as secured by commitment RDWE014 within the Register of Environmental Actions and Commitments [**REP7-122**] and where there are any additional specific inspection or maintenance requirements, for example, on some of the longer culverts, these would be documented in the Health and Safety File.
ExQ3_Q10.1.4	Applicant	**Landscape earthworks** In Design Principles (Volume 7) [**REP6-046**], LSP.08 the purpose is clear; however there is no principle suggesting the need to consider the potential for overland or exceedance flow deflection, to reduce the risk of affecting land and property outside the Order Limits or situated adjacent to the highway. Please explain why such a principle is not necessary?

[2] National Highways (2021). Design Manual for Roads and Bridges (DMRB) CS 450 – Inspection of highway structures.
Highways England (2020). DMRB GS 801 – Asset delivery asset inspection requirements.
Highways England (2020). DMRB GM 701 – Asset delivery asset maintenance requirements.

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		Response: The design principle LSP.08 [**REP7-140**] is very specific to avoiding loss of floodplain storage and inappropriate development in the floodplain. The potential for overland and exceedance flow deflection due to earthworks has been assessed and where the potential for adverse effects was identified within the floodplains of the Mardyke and West Tilbury Main, specific mitigation measures have been secured. These are set out in detail in Flood Risk Assessment – Part 4 [**APP-463**] (covering the hydraulic assessment of the Mardyke) and in Flood Risk Assessment – Part 5 [**APP-464**] (covering the hydraulic assessment of the West Tilbury Main). For example, Project commitments RDWE039 and RDWE040 within the Register of Environmental Actions and Commitments [**REP7-122**] detail the measures included in the design to manage the intercepted floodplain flows in the Mardyke catchment. Commitment RDWE046 provides for measures in the West Tilbury Main catchment. The hydraulic assessments [**APP-463**, **APP-464**] conclude that, together with the secured measures, the Project would not result in adverse flood impacts on land and property situated outside of the Order Limits or situated adjacent to the highway. Therefore, a new Design Principle is not considered necessary. With regard to exceedance flows, commitments RDWE034, RDWE035 and RDWE048, also included within the Register of Environmental Actions and Commitments [**REP7-122**] secure that during detailed design, overland flow paths will be established to manage exceedance flows. The Applicant has updated each commitment in response to ExQ3_10.1.7. These would be submitted at Deadline 8 [**Document Reference 6.3 ES Appendix 2.2 (8)**].
ExQ3_Q10.1.5	Applicant	**New, diverted and reinstated watercourses** In Design Principles (Volume 7) [**REP6-046**], LSP.12 the additional diversion of watercourses is considered as a last resort " *… unless they would afford benefits such as a more natural alignment …* ". At what point will a review be undertaken and by whom? Given the statements made by the EA with respect to culverting and the provisions of the Water Framework Directive, is there a case for reviewing the route of the proposed culverting to reduce 'sterile' lengths? If so, how can this be achieved and secured?
		Response: The design proposals for watercourse diversions and culverting submitted in support of the Development Consent Order application were developed taking account of the influence and constraints imposed by factors such as topography and in some areas, the legacy of land contamination. The designs for watercourse crossings will be reviewed by the appointed Contractors and may be subject to some rationalisation during the detailed

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		design stage of the Project; however, it is unlikely that these would result in any significant or material changes in the design proposed. Culverted lengths and routes have been balanced against maintaining a smooth transition of flow into and out of the structures by ensuring a suitable channel gradient and geometry of the upstream and downstream channel reaches. Shorter, more perpendicular culverts have been avoided where a favourable balance cannot be achieved (e.g. where the approach channel or channel downstream would need sharp bends). Instead, the risks of longer culverts acting as barriers to the movement of flow, sediment, and aquatic fauna and flora have been reduced by several commitments to culvert design that are secured within the Register of Environmental Actions and Commitments [**REP7-122**], for example, RDWE009, RDWE013 and RDWE044.
ExQ3_Q10.1.6	Applicant Environment Agency LLFAs IDBs	**Culvert design** In RDWE013 of the REAC document [**REP6-038**], and similar clauses, it is suggested that the SoS approves designs in consultation with the Environment Agency. Are there conditions, such as on non-Main River watercourses, where it would be more appropriate for the Drainage Authority or LLFA to be the consultation body?
		Response: Part 3 of Schedule 14 of the draft Development Consent Order (DCO) [**REP7-090**] provides provisions for the protection of drainage authorities. Under item 20 'Approval of plans' it is specified that: *(1)* '*Before commencing construction of a specified work* [on an ordinary watercourse (i.e. a non-Main River)]*, the undertaker must submit to the drainage authority plans of the specified work and such further particulars available to it as the drainage authority may within 14 days of the submission of the plans reasonably request.* *(2) The undertaker must not commence construction of the specified work until approval, unconditionally or conditionally, has been given…* (3) *A specified work must not be constructed except in accordance with such plans as may be approved in writing by the drainage authority…'* This part of the draft DCO therefore affords consultation/design approval role to the Lead Local Flood Authorities and North Kent Marshes Internal Drainage Board for works to ordinary watercourses.

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ExQ3_Q10.1.7	Applicant	**Operational drainage: infiltration basins** RDWE034 of the REAC document [**REP6-038**] suggests provisions for the basins. Should there be a clause that provides that they are to be constructed and operational before being required to operate to serve the development? Additionally in this clause, and the other clauses dealing with the various ponds and basins, should there be a requirement to make certain any overland flows from a new asset will flow on an existing route and be of no greater volume or rate than may be currently expected to occur?
		Response: The Applicant acknowledges the Examining Authority's request for clarity on the delivery of the drainage infrastructure and management of exceedance flows. Project commitments RDWE034, RDWE035 and RDWE048 have been updated to clarify the two aspects, within the Code of Construction Practice submitted at Deadline 8 [**Document Reference 6.3 ES Appendix 2.2 (8)**].
ExQ3_Q10.1.8	Applicant	**Integration of infiltration basins and retention ponds** How is future maintenance provision determined in the Design Principles (Volume 7) [**REP6-046**] (LSP17)? Additionally in the Design Principles S12.05 it is stated that designs will: "*facilitate access by the Environment Agency to these watercourses to undertake maintenance activities …*". What other arrangements are required for maintenance access and where are these secured? If the Applicant considers that additional provision is required to address this point, then please make the necessary changes and direct us to their location.
		Response: The Applicant has considered the future maintenance provision of infiltration basins and retention ponds in accordance with the Design Manual for Roads and Bridges (DMRB) GD 304: Designing health and safety into maintenance[3]. Off-network access routes, maintenance parking provision, collated assets, maintenance access steps and access routes around balancing ponds have all been considered in the current design and Order Limit Boundary. Access routes have been included in the General Arrangement Plans [**REP7-026** and **REP7-028**] and have been designed to ensure adequate access for appropriate maintenance vehicles. The Design Principle S12.05 [**REP7-140**] sets out specific access requirements for the Mardyke, Orsett Fen Sewer and Golden Bridge Sewer and requires the Applicant to consult with the Environment Agency during the detailed design, with regards to the width of the proposed access.

[3] Highways England (2020). DMRB GD 304 – Designing health and safety into maintenance.

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		Overall, the Applicant believes that suitable provision is in place to provide access to infiltration basins and retention ponds and therefore no additional provision is required.
ExQ3_Q10.1.9	Applicant	**Watercourse protection** The Design Principles Volume 7 [**REP6-046**], S12.07 states: " *…. [w]here reasonably practicable, vegetation shall be retained along the Mardyke, and along tributary watercourses and ditches, to maintain the existing fenland landscape character …*". Have other watercourses outside the Mardyke valley been considered in a similar manner? If so, where are these measures secured? If the Applicant considers that additional provision is required to address this point, then please make the necessary changes and direct us to their location.
		Response: The Applicant has considered all watercourses across the Project's zone of influence, including those within the Mardyke valley, in terms of vegetation retention as far as reasonably practicable. These measures are reported below, together with their securing mechanism. Environmental Statement (ES) Appendix 2.2: Code of Construction Practice, First Iteration of Environmental Management Plan [**REP7-122**], secured through Requirement 4 of the draft Development Consent Order [**REP7-090**], includes at Section 7: Register of Environmental Actions and Commitments, the following relevant commitments: • LV001: '*Detailed design for the Project, including diverted utilities, will aim to reduce the removal of trees and vegetation as far as reasonably practicable, and in accordance with the LEMP and the Environmental Masterplan (Figure 2.4, Application Document 6.2).*' • LV028: '*An Arboricultural Method Statement and Tree Protection Plan would be prepared in accordance with BS 5837:2012, identifying measures for the protection of retained woodland, trees and hedges prior to the commencement of site clearance works. All works to woodland, trees and hedges and vegetation removal would be implemented under the supervision of the Environmental Clerk of Works having regard for the commitment to reduce the removal of trees and vegetation as far as reasonably practicable as set out in LV001.*' • RDWE008: '*Where below-ground utilities diversions are required, watercourses would be crossed using trenchless techniques in order to avoid disturbance to channel form, flow regimes and riparian habitats and species, unless other techniques are agreed with the Environment Agency or Lead Local Flood Authorities, where relevant, unless otherwise agreed with the* [Secretary of State].'

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		• RDWE009: '*Bankside vegetation would be reinstated at culvert entries and exits following the completion of construction works as soon as conditions are suitable for planting, with the target to successfully reinstate vegetation at these locations within 12 months.*' • TB021: '*During construction works, it would be necessary to permanently divert a number of watercourses, particularly around the Mardyke and the North Portal area as identified on the Environmental Masterplan (Figure 2.4, Application Document 6.2). Where this occurs, the new watercourses would be planted to ensure they have a greater floral diversity to benefit a wider range of species than the existing watercourses.*' The Design Principles [**REP7-140**], secured through Requirement 3 and Requirement 5 of the draft Development Consent Order [**REP7-090**], includes the following clause: • LSP.01: '*All existing vegetation shall be retained as far as reasonably practicable in order to:* ○ *preserve its intrinsic ecological value* ○ *preserve the existing woodland character and pattern* ○ *preserve its function as a natural screen to the works* ○ *preserve the natural enclosed woodland settings for existing adjacent properties.* *Minimum areas of retained woodland and hedges are shown in the Environmental Masterplan (Application Document 6.2, Figure 2.4). However, even outside these areas, existing vegetation shall be retained as far as reasonably practicable.*'
ExQ3_Q10.1.10	Applicant	**Watercourses in 'The Wilderness'** The Design Principles Volume 7 [**REP6-046**], S12.19 confirms that trees and vegetation loss is to be minimalised but there is no specific design principle in relation to the watercourses that lie in 'The Wilderness' and how these could be affected and protected. Where is their protection secured? If the Applicant considers that additional provision is required to address this point, then please make the necessary changes and direct us to their location.
		Response: During the construction phase, the water environment would be safeguarded through the implementation of temporary drainage measures. Project commitment RDWE006, within the Register of Environmental Actions and Commitments [**REP7-122**], secures the requirement for the development of a construction phase drainage plan to manage surface water runoff across the work site, including details of how offsite impacts would be managed and mitigated. Work site drainage systems would incorporate pollution control systems designed in line with Control of

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		Water Pollution from Construction Sites C532[4] or as agreed with the Secretary of State. Surface watercourses and waterbodies (as identified in Table 14.6 of ES Chapter 14 [**APP-152**]) near work sites would be regularly inspected for signs of siltation or other forms of pollution in line with CIRIA C741 guidance[5] and pumped groundwater, process effluents and construction site runoff would be tested to ensure compliance with discharge consent requirements. Rainfall runoff from areas where there is a risk of contamination would be managed using temporary drainage systems and would be subject to treatment prior to discharge. Rainfall runoff from areas of low contamination risk would be captured and reused where reasonably practicably to reduce consumptive water use (e.g. to supply wheel wash facilities or for dust suppression). In line with commitment RDWE002 [**REP7-122**], the Contractor would be responsible for inspecting and maintaining the temporary drainage infrastructure to ensure they continue to operate to their design standard. The Applicant has set out how it would safeguard the existing hydrological regime for watercourses at and neighbouring The Wilderness in Section 4(a)(iii) and Annex B.4 of Post-event submissions, including written submission of oral comments, for Issue Specific Hearing 9 [REP6-090]. This submission confirmed that the impacts of the Project on the watercourse and the potential for Project activities to cause deterioration of any of the quality elements that support its status have been assessed in Section 4 of the Water Framework Directive Assessment [APP-478], which concludes a negligible risk of waterbody deterioration as a result of diversion.
ExQ3_Q10.1.11	Environment Agency Applicant	**Water Framework Directive: culverting** At ISH9 (transcript [**EV-075**]), it was suggested that the River Basin Management Plan (RBMP) and Water Framework Directive (WFD) requirements were developed in the Mardyke area, alongside the Environment Agency but that the WFD Assessment in ES Appendix 14.7 - Water Framework Directive [**APP-478**] concluded that the proposed culverting had a negligible risk of deterioration at the waterbody scale. There being three waterbodies to be considered within the project's 'Zone of Influence'. The Environment Agency has additionally suggested that the proposed culverting is the 'least bad option', but that they are only concerned with those watercourses defined as "Main River". • The ExA would like to know why non 'Main River' watercourses are not covered by the WFD and RBMP requirements and why it is only those bodies listed in paragraph 4.2.1 of the Environmental Statement Appendices, Appendix 14.7? In the ISH9 Transcript it is confirmed that there was a "Choosing by Advantage Workshop" which has allowed the design of the West Tilbury Main (Main River designated watercourse) culvert to be refined.

[4] Construction Industry Research and Information Association (CIRIA) (2001). Control of Water Pollution from Construction Sites (C532).
[5] CIRIA (2015). Environmental Good Practice on Site Guide (C741).

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		• Which other watercourses have had the benefit of such a process? If West Tilbury Main is unique, then why have other watercourses not been considered worthy of such attention?
		Response: *'The ExA would like to know why non 'Main River' watercourses are not covered by the WFD and RBMP requirements and why it is only those bodies listed in paragraph 4.2.1 of the Environmental Statement Appendices, Appendix 14.7?'* The Water Framework Directive (WFD) assessment has a focus on those waterbodies and protected areas that are named within the Thames River Basin Management Plan (RBMP) and therefore are monitored with regard to their status and have objectives set for them. Within the Project's Zone of Influence (ZoI) there are three such waterbodies: the Mardyke, the Mardyke West Tributary and Mardyke East Tributary. In response to comments received from the Environment Agency at Stage 1 of the assessment, the WFD assessment scope was extended to include all main rivers with the potential to be physically altered or to otherwise deteriorate because of the Project's construction or operational activities. This resulted in the addition of the West Tilbury Main into the scope. The waterbodies (both main and non-main rivers) in Filborough Marshes (part of the Thames Estuary and Marshes Ramsar site) were also scoped in, as were all designated sites within the ZoI that rely on hydrological conditions to support their designated features. Paragraph 4.1.3 of Section 4 of the Stage 4 WFD assessment report [**APP-478**] acknowledges that there are numerous other non-main rivers (ordinary watercourses) within the ZoI, some of which the Project would cross, realign, or discharge operational drainage to. These watercourses have been subject to assessments to identify the potential for effects on several attributes that contribute to WFD status, e.g. water quality [**APP-456**] and hydromorphology [**APP-457**]. The watercourses have also been ecologically surveyed and assessments are presented in Environmental Statement (ES) Appendix 8.4: Freshwater Ecology [**APP-393**], and in ES Chapter 8: Terrestrial Biodiversity [**APP-146**] in Section 8.4 where freshwater ecology is discussed in paragraphs 8.4.13 to 8.4.23 (south) and paragraphs 8.4.102 to 8.4.112 (north). As these watercourses do not have a WFD status or measures and objectives specifically set for them, the Environment Agency advised that measures should be embedded within the Project design to prevent their deterioration. These measures are described in Section 4.3 of the Stage 4 WFD assessment report [**APP-478**] and would be adopted to mitigate the effects of the Project and avoid deterioration of these non-main river watercourses.

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		'There was a "Choosing by Advantage Workshop" which has allowed the design of the West Tilbury Main (Main River designated watercourse) culvert to be refined. - Which other watercourses have had the benefit of such a process?' No other watercourses were subject to Choosing by Advantage Workshops. The Project design is such that the Mardyke (main river/WFD designated waterbody) would be crossed by a viaduct that clear spans the watercourse channel and its riparian corridor. The Mardyke West Tributary would be crossed by a structure that matches the properties of the existing crossing by the M25, in agreement with the Environment Agency. The Project has no physical interaction with the East Mardyke Tributary. *'If West Tilbury Main is unique, then why have other watercourses not been considered worthy of such attention?'* The West Tilbury Main is unique in being the only main river within the Project's ZoI that would be subject to a new culvert crossing. However, reducing the effects of culverting on other watercourses has been considered, in particular, with regard to hydromorphological effects. Table 4.1 of ES Appendix 14.4: Hydromorphology Assessment [**APP-457**] describes the development interactions with these other watercourses and highlights those watercourses that are of low sensitivity to hydromorphological impacts due to a combination of not supporting a permanent flow system, having a channel width of less than 1m, and exhibiting no natural features or processes. Nevertheless, where new crossings (culverts) and/or diversions are proposed on these watercourses, these works would be undertaken in accordance with the measures secured within the Register of Environmental Actions and Commitments [**REP7-122**] (RDWE009, RDWE013, RDWE014 and RDWE044) to mitigate effects.
ExQ3_Q10.1.12	Applicant LLFAs IDB	**Water Framework Directive: culverting** Paragraph 8.1.3 of Post-event submissions for ISH9 [**REP6-090**] states that '… *the Applicant's preference is for a culvert that is as short as it practically can be …'.* Compared with an open channel it is suggested that there is an increased risk of blockage once a culvert is installed, it will create less permeable bed to a watercourse can increase the speed of water flow, possibly: • increasing flood risk downstream, • preventing local recharge of groundwater, • creating or exacerbating downstream or upstream bank and bed erosion, • promoting sediment deposition, and/ or • disrupting the natural transport of sediment.

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		Culverting can have a detrimental impact on the environment, resulting in a complete loss of features within a watercourse, thereby it can break the continuity of the watercourse corridor, adversely affecting the ecological value of the watercourse for migrating species. • The Applicant should provide an example of the methodology that has been gone through to come to the conclusion that the shortest length of culvert possible at the crossing X-EFR-2-04 (as shown in ES - Appendix 14.6 - Flood Risk Assessment - Part 10 [**APP-477**]) is the preferred option? • Who was consulted during the process? • What other options were considered and why were they discarded? • The shortest culvert length would be one that perpendicularly crosses the highway. Why has this not been chosen as a design option at the various locations?
		Response: *'The Applicant should provide an example of the methodology that has been gone through to come to the conclusion that the shortest length of culvert possible at the crossing X-EFR-2-04 (as shown in ES - Appendix 14.6 - Flood Risk Assessment - Part 10 [**APP-477**]) is the preferred option?'* And 'What other options were considered and why were they discarded?' The proposed crossing X-EFR-2-04 is of the Gobions Sewer watercourse via a pre-cast concrete box culvert. In determining the proposed crossing approach for all watercourses, the Applicant has considered the influence and constraints imposed by factors such as the existing topography, the proposed vertical and horizontal carriageway alignment (for example where the proposed road alignment needs to cross other roads), and in some areas, the legacy of land contamination. A clear span crossing of the Gobions Sewer was discounted on the basis of topographical constraints. The Project road is located in a natural valley in this location and the carriageway alignment has been kept as close to existing ground level as possible, with false cuttings provided to screen the road from Linford, which is located approximately 200m to the east. Installation of a clear span bridge crossing was discarded as an option as this form of crossing would require a higher vertical alignment at the crossing location. If the alignment were raised at the crossing location to achieve a clear span crossing, consequently the Project road crossings under Hoford Road to the north and Muckingford Road to the south would not be achievable. Several other forms of culvert crossing were also considered, including pre-cast and *in situ* pipes and a corrugated arch. The pre cast box option is favoured due to the ability to integrate mammal passage, maintain natural bed materials and the speed of installation.

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		In addition to the provision of the crossing, the alignment of this watercourse is such that it is at an oblique angle to the Project road at the crossing point, X-EFR-2-04. A diversion is therefore also proposed on the downstream channel to make the culvert crossing shorter (D-EFR-2-05). A concrete box culvert is included for in the design, 1.7m high and 1.55m wide, which allows for the invert of the culvert to be sunk and the existing channel gradient and watercourse bed materials to be retained, reducing effects on flow and sediment transport regimes. *'Who was consulted during the process?'* The Gobions Sewer is an ordinary watercourse; Thurrock Council and Essex County Council as the Lead Local Flood Authorities (LLFAs) are therefore responsible for consented works to this watercourse. The Project has engaged extensively with the councils in their LLFA role and no comments regarding crossing X-EFR-2-04 have been received. Items 2.1.260-2.1.263 and 3.1.323 of the Draft Statement of Common Ground between (1) National Highways and (2) Thurrock Council [**REP6-030**] sets out the LLFA's current position with respect to the road drainage and the water environment and confirms that the use of culverts as crossings is not an item under discussion. *'The shortest culvert length would be one that perpendicularly crosses the highway. Why has this not been chosen as a design option at the various locations.'* A perpendicular culvert would necessitate a near 90 degree bend in the watercourse alignment on its approach to the culvert inlet. This has been avoided in order to reduce the effects on flow regime and the potential for scouring that such an abrupt change in channel alignment would cause and to help maintain the existing channel gradient. This is also the case at other locations in the design, where culverted length has been balanced against maintaining a smooth transition of flow into and out of the structures by ensuring a suitable channel gradient and geometry of the upstream and downstream channel reaches.
ExQ3_Q10.1.14	Applicant All IPs who are expected to adopt or otherwise be responsible for the future maintenance	**Definition of ditches and other watercourses etc** The Applicant's response to ExQ2 10.1.3 [**REP6-112**] is noted, however, although the response notes that the assets under consideration are 'swales', the sections presented in the Document Deadline 5 Submission - 9.123 Whitecroft Care Home Cross-sections [**REP5-092**] show those assets as 'proposed drainage ditches' which would normally be classed as watercourses. The response also suggests that the Whitecroft Care Home Cross-sections' defined 'proposed drainage ditches' are / or could be linear storage ponds. • The Applicant is requested to provide clarity for all locations on the 'proposed ditch' network and indicate which are: – Watercourses (ie ditches that covey water)

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	of ditches etc	– Swale (ie shallow artificial body) – Linear Storage ponds/basins – Filter drains and formed regular drainage channels. • By defining the assets as 'proposed ditches', the ExA considers that all may be considered as 'watercourses' in the dDCO and dealt with accordingly, albeit there does not appear to be a definition of a 'pond' and be subject to the monitoring etc as suggested by the Flood and Water Management Act 2010? • Are the bodies who are likely to become responsible for the future maintenance of these 'proposed ditches' content that they are aware of the function in each case?
		Response: The location of the drainage features (Ditches, Swales and Ponds) are shown in Drainage Plans Volumes A to C [**REP7-072** **to** **REP7-076**]. The locations of the sections within Whitecroft Care Home Cross-sections [**REP5-092**] are on Sheet 29 of Volume C of these Drainage Plans. Section A of Whitecroft Care Home Cross-sections [**REP5-092**] is taken through the drainage ditches at the bottom of the earthworks; this ditch is labelled in the cross-section. Section B of Whitecroft Care Home Cross-sections [**REP5-092**] is taken through the drainage swale to the north of the A1013 which is labelled as the drainage ditch on the section. This was correctly referred to as a swale in the response to ExQ2_10.1.3 [**REP6-112**]. The drainage ditches that run along the toe of the earthworks are provided to ensure surface water runoff is captured and does not flow from the proposed earthworks into adjacent land. These ditches will be dry, only holding and conveying water in storm events. Proposed ditches such as these, that drain National Highways infrastructure, will be operated and maintained by National Highways, as detailed in and secured by commitment RDWE012 within the Register of Environmental Actions and Commitments [**REP7-122**]. Those that form part of the local highway drainage infrastructure will be operated and maintained by the relevant overseeing authority. Article 10 of the draft Development Consent Order [**REP7-090**] requires any works that are being handed to the overseeing authority to be completed to the reasonable satisfaction of the local highway authority.
ExQ3_Q10.1.15	Applicant	**Landscaping effect on proposed ditches** Where proposed landscaping directs surface flow to a "proposed drainage ditch" such as the embankment at the Whitecroft Care Home, as shown in the Document Deadline 5 Submission - 9.123 Whitecroft Care Home Cross-sections [**REP5-092**]:

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		• has a site-specific risk assessment been undertaken to determine the risk of overtopping and affecting land and property outside the highway boundary, with the appropriate maintenance regime? • if one has not been considered necessary what was the process that came to that conclusion? Are there any locations that may benefit from such considerations and where would the results of the analysis be recorded, and mitigation suggestions/requirements secured?
		Response: *Where drainage ditches are proposed to capture surface flows from areas of landscaping, detailed assessments of overtopping risk have not been undertaken at this stage of the Project's design. The overtopping risk is low. This is because the drainage catchments of these ditches would generally be small and flows would be generated at greenfield rates/volumes. Ditch capacity requirements would therefore be relatively limited, and there is land provision within the Order Limits to accommodate them.* *The ditches would be subject to detailed design to ensure the correct sizing and compliance with Design Manual for Roads and Bridges standards (CG 501 – Design of highway drainage systems[6)], which do not permit flooding beyond the highway boundary during the 1 in 100 year plus climate change storm event. The ditches would also be subject to routine inspection and maintenance in accordance with commitment RDWE012 within the Register of Environmental Actions and Commitments [**REP7-122**].* *Following this approach, there would be no locations with an unacceptable risk of overtopping and consequent effects on land and property outside the highway boundary.*
ExQ3_Q10.1.16	Applicant	**Future maintenance of proposed ditches** Although reference has been made to the appropriate DMRB maintenance standards in the Applicant's response in ExQ2 10.1.3 [**REP6-112**], can the ExA be directed to the location of the evidence: • that sufficient land has been reserved within the Order Limits to allow appropriate and safe access to future operational staff to undertake these tasks; • for the plant that has been assumed to be considered necessary to be used to meet the requirements of the future maintenance laid down in the DMRB; and, • the proposed access routes that meet the proposed plant's requirements?

[6] National Highways (2022). Design Manual for Roads and Bridges CG 501 – Design of highway drainage systems.

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		If the maintenance operation has not been considered at this stage, can the Applicant provide the location of the information showing that there is sufficient space provided within the Order Limits to allow the maintenance work, and access to the relevant areas, to be safely undertaken?
		Response: The Applicant has considered the future maintenance provision of assets in accordance with the Design Manual for Roads and Bridges (DMRB) GD 304: Designing health and safety into maintenance[7]. Off-network access routes, maintenance parking provision, collated assets, maintenance access steps and access routes around balancing ponds have all been considered in the current design and Order Limit Boundary. Access routes have been included in the General Arrangement Plans [**REP7-026** and **REP7-028**] and have been designed to ensure adequate access for appropriate maintenance vehicles. Not all maintenance accesses will be provided in the form of paved surfaces; sufficient width between the boundary line and slopes has been provided in the Order Limits to accommodate appropriate vehicular access to undertake the future maintenance requirements. The Applicant considers that the land included in the draft DCO is sufficient to maintain the Project as outlined in Section 5.3 of the Statement of Reasons [**REP7-096**].

[7] Highways England (2020). DMRB GD 304 – Designing health and safety into maintenance.

7 Biodiversity

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ExQ3_Q11.1.1	Applicant	**Species surveys limitations** The response to ExQ2_Q11.1.1 Deadline 6 Submission - 9.152 Responses to the Examining Authority's ExQ2 Appendix G – 11 Biodiversity [**REP6-113**] is noted. • Is the approach suggested for Water Voles translocation consistent across all species? Confirm that the general approach is to be used at all locations.
		Response: The Applicant can confirm that the overarching principles for translocation will be employed consistently across all relevant species. These principles require suitable habitat to be provided which offers sufficient shelter, foraging and breeding opportunities to support translocated species, and that these habitats link into other suitable connecting habitat and the wider landscape to avoid isolation of populations, maintain viable populations and provide opportunities for species movement at a landscape-scale. As well as water vole, the other key species which will require translocation from the Project's construction area are: • Dormouse • Great crested newts • Reptiles The proposals for translocation are secured in the Code of Construction Practice [**REP7-122**] at the following Register of Environmental Actions and Commitments (REAC) commitments: • TB013: '*Where habitats are known or assumed to support protected or notable species, as identified on ES Figure 8.1 to 8.31 (Application Document 6.2) or referred to in ES Appendices 8.1 to 8.14 (Application Document 6.3), clearance would take place in a phased, directional manner towards areas of contiguous retained habitat. This would encourage mobile species to actively move from the construction site into the wider landscape. These measures would be implemented under the supervision of the Environmental Clerk of Works.*' • TB006: '*Employment of suitably qualified and experienced Environmental Clerk of Works throughout the construction phase of the Project to supervise implementation of environmental mitigation and protection commitments.*'

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		• TB016: '*Where the approach to habitat clearance referred to in REAC ref. TB013 is not considered appropriate by the Environmental Clerk of Works to avoid potential mortality of protected species, a programme of trapping and translocation would occur to move animals away from the construction site and to established receptor sites with sufficient carrying capacity prior to habitat clearance occurring. Species or groups that may be subject to trapping and translocation are GCN (and all other native amphibian species found during this process), water voles and dormice.*' • TB014: '*All required Natural England licences and associated working practices and method statements would be in place prior to any related construction works starting in areas where licensable species occur.*' • TB017: '*Where protected species licences are not required, the approach to habitat clearance and the potential need to trap and translocate non-licensable species (reptiles and/or native amphibians species excluding GCN) to established receptor sites with sufficient carrying capacity would be determined and undertaken by the Environmental Clerk of Works. Where translocation occurs, species will be only be translocated to receptor sites with established habitat.*' • TB018: '*Habitat features of value to protected species that can themselves be moved to mitigation areas/receptor sites (for example dead-wood features for terrestrial invertebrates, and refugia for amphibians and reptiles) would be translocated where appropriate, to be determined by the Environmental Clerk of Works.*' Badgers and barn owls species will require replacement of structures used for shelter but are not proposed for active translocation. Bats will also require replacement structures and are not specifically proposed for translocation unless individuals are found during inspections prior to the removal of roosting features, in which case they would be moved either within the roosting feature or by hand to adjacent trees outside the impacted area. Measures appropriate to these species, in addition to those listed above, are also secured in the Code of Construction Practice [**REP7-122**] at the following REAC commitments: • TB008: '*Badger setts identified within the Order Limits for closure would be closed by permanently excluding badgers and then removing the empty setts. The setts would be closed under licence from Natural England outside of the badger breeding season (breeding season takes place between 1 December and 30 June). For any main setts that will be closed with no suitable naturally occurring alternative sett, an artificial sett will be constructed in a suitable location.*' • TB009: '*Bat roosts that would be lost or heavily disturbed due to construction or operational activities would be removed under licence and alternative roosting structures would be provided in areas indicated on the Environmental Masterplan (Figure 2.4, Application Document 6.2).*'

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		• TB010: '*Barn owl breeding sites that would be lost due to construction would be removed while not in active use. Alternative breeding sites (nest boxes) would be provided >1.5km away from the Project boundary and other major roads, within an appropriate setting and in compliance with Barn Owl Trust advice (2015). A replacement ratio of two boxes for one lost site would be provided. The number of boxes required would be informed by pre-construction surveys. A minimum of 12 artificial nest boxes would be installed.*' Regarding TB014, which secures that all relevant protected species licences would be secured from Natural England prior to impactful construction activity, the Applicant has secured Letters of No Impediment from Natural England with respect to the five licensable protected species known to be affected by the Project: dormouse, great crested newt, badger, bat and water vole. These are reported within the Statement of Common Ground (SoCG) between the Applicant and Natural England at items 2.1.69 – 2.1.76 [**REP7-106**] and in the Consents and Agreements Position Statement to be submitted at Deadline 9 [**Document Reference 3.3 (8)**].
ExQ3_Q11.1.2	Applicant Local Authorities Environmental Authorities / Agencies	**Compensatory Planting** Where it is proposed to affect areas that constitute compensatory habitat for previous projects, should such areas be provided with any special provision in relation to consideration of the earlier project requirements?
		Response: It is the Applicant's view that no special provisions need to be provided for impacts from the Project to areas developed as a result of earlier project requirements. Where mitigation measures have been established following earlier projects, these have been assessed as part of the existing situation/Project baseline. The Applicant believes that this is an appropriate approach given that the mitigation from a previous project has become integral to the landscape and habitat against which the Applicant has undertaken its assessment. Where relevant, appropriate and proportionate measure have been proposed by the Project to mitigate or compensate for any adverse effects on these areas. For example, screen planting and earthwork south of the A2 corridor which formed part of the mitigation design for the High Speed 1 (HS1) development would be lost as a result of the Applicant's Project. To offset this loss, the Applicant has looked to reinstate screening planting in this area. This is reported in the Environmental Masterplan Sections 1 and 2 [**REP4-124** and **REP7-116**]. The Applicant has also sought to identify and secure measures to avoid impacting existing mitigation provided by previous projects. Within the Code of Construction Practice [**REP7-122**], REAC commitment TB023 secures measures to avoid watercourses established by the Port of Tilbury London Ltd as mitigation for water vole impacts that occurred during their Tilbury2 development. The measure secures the avoidance of these ditches: *'The footings of the Tilbury 2 aggregates conveyor will be carefully sited during installation to avoid existing wetland habitat within this area. Footings will be a minimum of 5m from bank tops.*

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		Any temporary crossings of ditches required during the conveyor's installation and decommissioning will be managed using a Bailey bridge (or similar), which will be removed from site once installation is complete. The exact location of the footings and the bridge will be agreed with the Environmental Clerk of Works prior to installation.'
ExQ3_Q11.1.3	Applicant	**Engineered Earthworks** Document 7.5 Design Principles Volume 7 [**REP6-046**], LSP.09 suggests 5m planting beyond the toe of embankment, whereas LSP.14 suggests that hedgerow at the toe of the embankment. Is this a contradiction?
		Response: The intention is that Clauses LSP.09 and LSP.14 of the Design Principles [**REP7-140**] are to be used interchangeably and their implementation shall be informed by the surrounding landscape context. Where the route passes through areas of open farmland, for example, and woodland planting on the false cuttings and earthworks is not appropriate to the context, Clause LSP.14 should apply. Hedgerow planting at the toe of earthworks should be implemented to help soften the appearance of the engineered earthworks and screen the boundary treatment. If woodland planting is appropriate, then Clause LSP.09 should apply. Planting shall extend beyond the toe of the earthworks, to integrate the edge of the earthworks into the existing ground. If appropriate to the landscape, hedgerow planting could also be used to demarcate the highways boundary in this context in addition to woodland planting.
ExQ3_Q11.1.4	Applicant Other IPs	**Wildlife pond provision** Document 7.5 Design Principles Volume 7 [**REP6-046**], LSP.31 states that " *… The design of all ponds shall follow the guidance given in the Great Crested Newt Conservation Handbook …*". Why are other species not considered as being the species on which ponds are designed? Are there other species that should be considered in the design of the proposed Wildlife Ponds?
		Response: The pond design detailed within the Great Crested Newt Conservation Handbook[8], provides for a good practice design that, although specifically relates to great crested newts, would result in the development of habitat which would be beneficial to a range of other species including aquatic and terrestrial invertebrates, other amphibian species, reptiles, bats, birds and mammals. The outline Landscape and Ecology Management Plan

[8] Langton, T.E.S., Beckett, C.L., and Foster, J.P. (2001). Great Crested Newt Conservation Handbook, Froglife, Halesworth.

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		[REP7-132] details the outline requirements for ecological ponds (Section 8.27) as integrating into the surrounding landscape to facilitate the movement of animals between ponds and terrestrial habitats, planting with appropriate marginal and emergent vegetation of native species, and managing the ponds to develop into the priority habitat description for ponds[9].
ExQ3_Q11.1.5	Applicant Environmental IPs	**Green Bridges and habitat connectivity** It is acknowledged that, in its Responses to the Examining Authority's ExQ2 Appendix G – 11 Biodiversity (Part 1 of 2) [REP6-114], the Applicant is considering the introduction of mammal culverts at Brewers Road Green Bridge and Thong Lane Green Bridge south. • Can preliminary details be provided to indicate how these are intended to operate and how these are to be secured? Are there other locations where site-specific habitat connectivity is proposed for mammals and other animals, etc in addition to 'Green Bridges' and 'mammal ledges' in culverts? If so, how these are intended to operate and how these are to be secured?
		Response: *'Can preliminary details be provided to indicate how these are intended to operate and how these are to be secured?'* *The Applicant confirms that mammal culverts will be provided within the Project design at the southern extent of Thong Lane south green bridge, and the northern extent of Brewers Road green bridge. At Thong Lane south the new underpass would facilitate safe passage of animals under the Darnley Lodge Lane two-way local connection, fully linking currently fragmented habitats north of the A2 with similar habitats south of the A2 and the Darnley Lodge Lane. At Brewers Road, the new underpass would facilitate safe passage of animals under Brewers Road, linking the vegetation corridor on the east of the green bridge into the woodland habitat in Shorne Wood, west of Brewers Road.* *These are secured in the Design Principles [REP7-140] under the two clauses listed below:* • S1.23. Brewers Road green bridge: habitat connectivity: '*A mammal culvert shall be provided at the north side of the bridge, between the existing and new bridge abutments. The culvert shall be designed to allow mammal passage and adequate space for maintenance and inspection. The culvert structure shall be designed to integrate into the surrounding landscape.*'

[9] Joint Nature Conservation Committee (2008). UK BAP Priority Habitat Descriptions (Standing Open Waters & Canals) (2008) | JNCC Resource Hub.

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		• S2.15. Thong Lane green bridge south: habitat connectivity: '*A mammal culvert shall be provided south-west of the bridge, under the southern connector road. The culvert shall be designed to allow mammal passage and adequate space for maintenance and inspection. The culvert structure shall be designed to integrate into the surrounding landscape.*' *As a broader, Project-wide commitment, the Code of Construction Practice [**REP7-122**] includes the following Register of Environmental Actions and Commitments (REAC) commitment:* • RDWE044: '*Culverts would incorporate ledges or underpasses to ensure continued passage of mammals. The location and design of mammal ledges and underpasses would be as detailed in Part 10 of ES Appendix 14.6, Flood Risk Assessment (Application Document 6.3).*' *Are there other locations where site-specific habitat connectivity is proposed for mammals and other animals, etc in addition to 'Green Bridges' and 'mammal ledges' in culverts? If so, how these are intended to operate and how these are to be secured?* *In addition to the green bridges and mammal ledges in culverts, the following are also provided to ensure connectivity across the Project:* • Viaducts are proposed at the Golden Bridge Sewer and the Mardyke and Orsett Fen. All three of these viaducts will allow animals to cross underneath the Project with no fragmentation effects. The Mardyke and Orsett Fen Viaducts and the Golden Bridge Sewer Viaduct have been designed to reduce shading and cause the least amount of long-term habitat degradation (Clause nos. PRO.04, PLA.05, STR.01, STR.04, STR.06, S12.03, S12.04, S12.05, LSP.05 of the Design Principles [**REP7-140**]). The piers and foundations have been sited so that they would not be located within the watercourses. Where the vegetated banks would be affected, these areas would be restored following construction (see Clause nos. PRO.04, PLA.05, STR.01, STR.04, STR.06, S12.03, S12.04, S12.06, S12.05, LSP.05 of the Design Principles [**REP7-140**]). These design measures will ensure the viaducts will be suitable for a number of animals, with the watercourses flowing under them primarily utilised by aquatic species, including water voles. • Another viaduct is proposed at the Tilbury loop line which has a focus to provide safe passage for commuting bats that follow the existing hedge line parallel to the railway line (see Section E3.4 of Environmental Statement (ES) Appendix 8.16: Draft EPS Mitigation Licence Application – Bats [**APP-408**]). • To ensure connectivity along the Project, a number of habitat creation areas along the Project have been designed to create 'stepping stones' to allow animals to move through and colonise new and existing habitats along the alignment of the Project (see Clause nos. LSP.02 and LSP.22 of the Design Principles [**REP7-140**]). The verges along the Project have been designed to provide species-rich habitats that offer shelter and

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		foraging opportunities for a range of species, in particular invertebrates which will use the verge as a green corridor to colonise new areas further inland from the River Thames area which has a notable invertebrate assemblage (see Clause nos. LSP.02 and LSP.22 of the Design Principles [**REP7-140**]). • To increase connectivity in the wider environment, the mitigation strategy has been designed to connect into existing and retained habitat and to ensure wildlife connectivity on a landscape scale (see Clause LSP.02 of the Design Principles [**REP7-140**]). • To ensure connectivity of commuting bats across the Project, where there is no green bridge or viaduct provision, the Applicant has utilised other crossing locations to allow bats to cross the Project. An example of this is at footpath 79, where the Project has strengthened planting to funnel bats to the footpath crossing, the parapet walls on the footbridge will be 2m high solid parapets to ensure a linear feature continues over the bridge, and the footbridge will be unlit to ensure a dark environment for bats to cross. For full details of the mitigation for each bat crossing, see Section E3.4 of ES Appendix 8.16: Draft EPS Mitigation Licence Application – Bats [**APP-408**].
ExQ3_Q11.1.6	Applicant Environmental IPs	**Green Bridges and habitat connectivity** With reference to the Design Principles [**REP6-046**], where STR.08 suggests that the principle is to *"…. [p]rovide an enhanced user experience for those using the crossing and living in the immediate area …"* and also to the Applicant's response to ExQ2 11.2.5 [**REP6-114**] where the comment *"… no data is available yet on the success or otherwise of the green bridges…"* is made, it is suggested that the provision is of a similar nature to that made for other projects: • What data is to be collected on the success or otherwise of the Green Bridges in this project, and those Bridges listed in the response to ExQ2 11.2.5 across all types of users, including 'non-human' users/ mobile species? • What are the indicators for success that will used in monitoring the success of the 'green bridges' and where are these secured in the Design Principles and OLEMP documents? • What process is proposed to be utilised to determine best practice and how are the lessons that may be being learnt at the other sites being made available to the LTC Design Team? • Referencing S11.03 in the Design Principles [**REP6-046**], is there lighting proposed for the Green Bridges and if so, to what extent might it act as a barrier for use by mobile species that the bridges seek to encourage? Similarly, are the surrounding and connecting highways and junctions intended to be lit, and if so to what extend will lighting act as a barrier for the species that the bridges are looking to encourage?

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		Response: '*What data is to be collected on the success or otherwise of the Green Bridges in this project, and those Bridges listed in the response to ExQ2 11.2.5 across all types of users, including 'non-human' users/ mobile species?* *What are the indicators for success that will used in monitoring the success of the 'green bridges' and where are these secured in the Design Principles and OLEMP documents?*' The outline Landscape and Ecology Management Plan (oLEMP) [**REP7-132**] includes the Project's green bridges as specific management areas. Each of these list management requirements detailing what the structures are designed to deliver, as well as listing the habitat typologies proposed for each bridge. Each habitat typology details outline measures of success which will be monitored during the specified establishment monitoring period for each duration. This information would be discussed with the advisory group and would inform future management strategies to ensure progress towards successful habitat establishment. Specific commitments to monitor green bridge use by protected species are reported in relevant draft protected species mitigation licence applications, detailed below: • The monitoring of dormouse using the green bridges will use data gathered by: '…*monitoring the use of nest boxes / tubes deployed on the green bridges concurrently with the nest boxes in the receptor sites, as described in the work schedule. Monitoring using camera traps at each of the green bridge location will also be employed… Locations planted to link existing habitat including the green bridges will also be monitored for five years after planting. Dormouse nest tubes will be placed within the hedgerows leading to the green bridges, and the hedgerows present on the green bridges themselves.*' (see Section E4.2 of Environmental Statement (ES) Appendix 8.18: Draft EPS Mitigation Licence Application – Dormouse [**APP-414**]). • Monitoring of bats and their use of green bridges will use data that is gathered in the following ways: '*Activity surveys will be undertaken at the green bridges in the first full year post-construction, and at alternate years following this: 2028, 2030, 2032, 2034, and 2036. Monitoring will employ the most effective methodology available at this time. The current approach would be using filming surveys (infra-red or Thermal Imaging) with paired detectors situated on either side of the bridge collecting data simultaneously*.' (see Section E4.2b of ES Appendix 8.16: Draft EPS Mitigation Licence Application – Bats [**APP-408**]). In addition, in line with the Applicant's response to ExQ3_Q11.1.10, the Applicant has amended the oLEMP at Deadline 7 [**REP7-132**] at paragraph 4.2.1 to state '*In addition to the habitat establishment, the in-perpetuity management and monitoring is important to the success of the mitigation planting areas. The outline measures of success will be refined during detailed design with consideration of key species groups, where necessary, to target ecosystems functionality*'. This secures a process whereby the outline measures of success within the

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		oLEMP will be developed and monitored, including key species groups. This would include all appropriate management areas reported in the oLEMP, including green bridges and their effectiveness. *'What process is proposed to be utilised to determine best practice and how are the lessons that may be being learnt at the other sites being made available to the LTC Design Team?'* Throughout the detailed design process, the Applicant will apply the most up-to-date information available to inform the design. This will include evidence of green bridge usage across the strategic road network managed by the Applicant, and reference to published data on other similar structures both within the UK and in any other countries supporting relevant examples. Commitments in the Design Principles [**REP7-140**] ensure detailed design will include such considerations: • Clause PRO.01: '*The Project shall engage with the National Highways Design Review Panel (NHDRP) on the development of the detail design. The design proposals shall be developed with regard to comments raised by the NHDRP.*' • Clause STR.08: *'Planting on green bridges shall tie in with the broader landscape to ensure this connectivity. The design of these green bridges shall be further developed during detail design to also provide an enhanced user experience for those using the crossing and living in the immediate area of the Project (including WCH) and to retain the character of the local roads and routes.'* *'Subject always to the constraints set out in the DCO, the design of green bridges shall be developed to support the successful establishment of the planting typologies as shown on the Environmental Masterplan (Application Document 6.2, Figure 2.4) and as defined in the outline Landscape and Ecology Management Plan (oLEMP) (Application Document 6.7), and shall consider the guidance set out in the Summary of Findings within the Natural England (2015) report, Green Bridges: A Literature Review (NECR181).'* In addition a new Design Principle Clause PRO.06 was included in the Design Principles at Deadline 7 [**REP7-140**], which commits the Applicant to holding multi-disciplinary workshops with relevant stakeholders to inform the detailed design for the green bridges (among other structures).

Plate 1 Extract from Design Principles [REP7-140]

Clause no.	Design principle name	Design principle
PRO.07	Detailed design	Key elements of the detailed design shall be subject to structured stakeholder engagement on their spatial arrangement (within the parameters of the DCO), user experience, appearance ('look and feel'), integration with the surrounding context and, where relevant, signage and interpretation. These elements are: • The consistent design approach as outlined in Design Principle STR.07 • Project Enhanced Structures as outlined in Design Principles STR.02 to STR.06 inclusive and STR.15: – Thong Lane green bridge north (Work No. 3B) – South Portal (Work No. 3C) – North Portal (Work No. 5A) – North Portal operational access bridge (Work No. 5E) – Orsett Fen Viaduct (Work No. 8B) – Mardyke Viaduct (Work No. 8B) – Thames Chase WCH bridge (Work No. 9O) • Chalk Park (Work No. OSC4) • Tilbury Fields (Work No. OSC5) • Green bridges (): – Brewers Road green bridge (Work No. 1D) – Thong Lane green bridge south (Work No. 1H) – Thong Lane green bridge north (Work No. 3B) – Muckingford Road green bridge (Work No. 6B) – Hoford Road green bridge (Work No. 6C) – Green Lane green bridge (Work No. 7M) – North Road green bridge (Work No. 8D) There shall be multi-disciplinary workshops with relevant stakeholders before and after the National Highways Design Review Panel (NHDRP) (Design Principle PRO.01). Comments made on the designs/ design approach by the attendees shall be duly considered and responded to in the detailed design in writing and in accordance with the terms of reference in Appendix D

'*Referencing S11.03 in the Design Principles [REP6-046], is there lighting proposed for the Green Bridges and if so, to what extent might it act as a barrier for use by mobile species that the bridges seek to encourage?*'

No lighting is proposed on Thong Lane north, Muckingford Road, Hoford Road or Green Lane green bridges. Both Brewers Road and Thong Lane south green bridges have lighting due to their proximity to junctions. These existing bridge locations are currently well lit, both on the bridge themselves, but also from the A2/M2 lighting

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		columns which rise above each crossing from below. North Road is also a currently well-lit road, and the green bridge will be lit to ensure safe use of the road. For all of these green bridges, the wildlife crossing area will be separated by a hedgerow which is located behind the lighting columns, to provide a dark corridor for commuting animals (see Clause nos. LST.02 and LST.03 of the Design Principles [**REP7-140**]). For Brewers Road and Thong Lane south the aim is to provide a closed canopy crossing over the green bridge (see paragraph 5.6.6 of the oLEMP [**REP7-132**]), which will facilitate these dark corridors. *'Similarly, are the surrounding and connecting highways and junctions intended to be lit, and if so to what extend will lighting act as a barrier for the species that the bridges are looking to encourage?'* The lighting plans for the surroundings of each of the green bridges are detailed below: • The surroundings and the local roads in the vicinity of Muckingford Road, Hoford Road and Green Lane are not lit. • At North Road green bridge there is lighting on the green bridge itself, and along North Road. The A122 Lower Thames Crossing route alignment will not be lit in the vicinity of the green bridge. North Road is currently a lit road, and the lighting plan will follow the existing lighting plan. • At Thong Lane green bridge north, the only lighting in the vicinity of the bridge is along the route of the proposed A122 Lower Thames Crossing route alignment below the green bridge. • Brewers Road green bridge and Thong Lane south green bridge have lighting due to their proximity to junctions. These existing bridge locations are currently well lit due to the proximity to the A2/M2. The lighting plan for the Project is following the existing lighting along the A2/M2. All lighting plans have been designed to minimise the light spill from the Project, with lux modelling showing that operational lighting will fall to 0.5lux within 30m of the Project (see paragraph 8.6.453 of ES Chapter 8: Terrestrial Biodiversity [**APP-146**]), with the lighting plan minimising light spill in line with good practice guidance. Design Principles Clauses LST.02 and LST.03 [**REP7-140**] minimise lighting both along the main alignment of the Project and along off-line sections. The landscape planting has been designed to lead animals to the green bridges and will provide dark corridors across the Project. A new Design Principle is proposed for Deadline 8 [**Document Reference 7.5 (6)**] as follows: • LST.04 – Lighting on green bridges: *'Where reasonably practicable, and subject to consultation with the Local Highway Authority, lighting on green bridges shall be minimised and where possible column heights shall be reduced. Furthermore, the detailed design shall carefully consider the space allocation on the bridge to*

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		maximise the separation of the Highway and associated lighting from the green space. Where lighting is required, it shall be carefully designed to focus light onto the Highway and to minimise obtrusive light spill.' Where lighting is required, it is focused onto to the highway and will minimise obtrusive light spill. The landscape planting will further help to maintain dark corridors for wildlife.
ExQ3_Q11.1.7	Applicant Natural England Environmental IPs	**Green Bridges** Why should the ExA consider that Thong Lane and Brewers Road bridges are effective 'green bridges' in biodiversity terms, having regard to concerns about the potential lack of effective connectivity for those species that these are intended to deliver? In a similar manner, the ExA would like to receive evidenced representations on each of the bridges identified in the Proposed Development as 'green bridges' on the question of whether they should be considered as such in biodiversity terms? Respondents with broader interests in 'green bridge' design than biodiversity are referred to ExQ3 16.1.4 which seeks a balance of views on 'green bridges' performance against a range of objectives and outcomes.
		Response: *'Why should the ExA consider that Thong Lane and Brewers Road bridges are effective 'green bridges' in biodiversity terms, having regard to concerns about the potential lack of effective connectivity for those species that these are intended to deliver?'* The Applicant considers that the green bridges proposed at Thong Lane green bridge south and Brewers Road green bridge will be effective in terms of providing habitat connectivity for a range of species between existing semi-natural habitats north and south of the A2. Both bridges have been designed in line with the relevant Design Principles [**REP7-140**] set out below: • STR.08: '*Green bridges are required mitigation for the severance and fragmentation of habitat due to the Project. Planting on green bridges shall tie in with the broader landscape to ensure this connectivity. The design of these green bridges shall be further developed during detail design to also provide an enhanced user experience for those using the crossing and living in the immediate area of the Project (including WCH) and to retain the character of the local roads and routes… Subject always to the constraints set out in the DCO, the design of green bridges shall be developed to support the successful establishment of the planting typologies as shown on the Environmental Masterplan (Application Document 6.2, Figure 2.4) and as defined in the outline Landscape and Ecology Management Plan (oLEMP) (Application Document 6.7), and shall consider the guidance set out in the Summary of Findings within the Natural England (2015) report, Green Bridges: A Literature Review (NECR181). Green bridge planting shall be designed to be set back from the*

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		bridge parapet edge to reduce the chance of landscape planting falling onto the operational highway below. Any utility requirements shall be integrated within the structural outline (e.g., not hung and exposed).' • S1.04 (relating to Thong Lane south and Brewers Road green bridges): *'The bridges shall be designed to meet the following criteria:* – *To provide connectivity of habitats for species including dormice, badgers, reptiles, bats and great crested newts between Shorne Woods and Ashenbank Woods, Jeskyns and Cobham Park, and to strengthen the woodland character, new green bridges shall be provided for the replacement of Thong Lane and Brewers Road crossings. Landscape shall be designed to provide continuity of habitat between the bridges along the main highway's corridor as far as reasonably practicable.* – *To act as local landmarks and to signal entry into the Kent Downs AONB for drivers, the vegetation on the bridges shall be visible on the horizon on their approach to the area from the east for Brewers Road green bridge, and from the west for Thong Lane green bridge south.* – *To provide a bridge with soil depth suitable to establish appropriate shrubs and intermittent tree species, reflective of the surrounding character and species makeup of the Kent Downs AONB. Variations in soil depth on the bridge can provide diversity in planting species and heights.* – *To provide a high-quality experience for users crossing the bridge through vegetation and woodland planting. The green bridge shall improve recreation access across the A2/M2/Lower Thames Crossing corridor.* – *To provide planting on the green bridge that links into woodland planting to the edge of Gravesend in the west and the gateway to Shorne Woods Country Park in the east as part of a wider 'wooded circle' connecting Shorne Woods and Claylane Wood.'* With reference to the Applicant's response to ExQ3_11.1.5, the Applicant is now committed to providing culverts at both Thong Lane south and Brewers Road green bridges to facilitate safe passage of animals under the Darnley Lodge Lane two-way local connecter road and Brewers Road respectively. These are reported in the Design Principles at Clauses S1.23 and S2.15 [**REP7-140**]. The two green bridges are designed in line with guidance issued by the Landscape Institute's Technical Note for Green Bridges[10] for mixed use green bridges, whereby there is a wildlife area screened from the road area of the bridge. These green bridges are tied into the habitat on either side of the green bridge (see Environmental

[10] Landscape Institute (2015). Green Bridges Technical Guidance Note. https://www.landscapeinstitute.org/publication/green-bridges/

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		Statement (ES) Figure 2.4: Environmental Masterplan Sections 1 and 1A, Sheet 3 [**REP4-124**] and Section 2, Sheet 1 [**REP7-116**]). Given the existing situation is that the bridges at Thong Lane and Brewers Road, over the A2, are not green bridges, the Applicant's proposal to provide bespoke green bridges and associated culverts as replacement for these existing structures would significantly improve the habitat connectivity for species across the A2 to existing semi-natural habitats north and south of the A2. *'In a similar manner, the ExA would like to receive evidenced representations on each of the bridges identified in the Proposed Development as 'green bridges' on the question of whether they should be considered as such in biodiversity terms?'* As noted above, the Applicant's green bridge design has been designed with reference to the Landscape Institute's Technical Note for Green Bridges in accordance with the mixed-use green bridge design. Green bridges have been located at key crossing points for wildlife where the Project would otherwise result in severance of key commuting/foraging routes or territories for mobile species such as bats, badgers and dormice as well as providing habitat links between new areas of compensatory woodland and retained woodlands or reducing the impacts of historic severance (e.g. across the A2 corridor), as detailed in the response to ExQ2_Q11.2.6 [**REP6-113**]. This is further supported by the Landscape Institute's Technical Note for Green Bridges which states for mixed-use green bridges *'To determine the width, the minimum width of the natural zone should be calculated, based on the project aims in terms of target species.'* The Landscape Institute guidance refers to *'The target species for use may be critical in determining the width, design and vegetation. For examples amphibians may require a "wet zone" across the bridge. For larger animals, the width and location can be more important than the vegetation, but for smaller animals such as bats the vegetation is more important.'* Therefore, the design of the green bridges has been designed appropriately for the target species required in terms of width and vegetation proposed. The full description of the habitat typologies present, and the green features on each bridge, are described in the outline Landscape and Ecology Management Plan [**REP7-132**]. For full details of how these green bridges will be designed for each commuting species see Section E3.4 of ES Appendix 8.16: Draft EPS Mitigation Licence Application – Bats [**APP-408**], Section 5.4 of ES Appendix 8.19: Draft Badger Development Licence Application (CONFIDENTIAL) [**APP-415**] and Section E1 of ES Appendix 8.18: Draft EPS Mitigation Licence

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		Application – Dormouse [**APP-414**]. As described in the response to ExQ2_Q11.2.5 [**REP6-113**], there are examples of green bridges with similar width green verges, particularly the HS1 Thong Lane green bridge, and the A556 Knutsford to Bowden Scheme green bridge. The design of the green bridges is in line with the guidance from the Wildlife Crossing Structure Handbook Design and Evaluation in North America[11], as detailed in the Natural England Commissioned Report NECR181 – Green Bridges – a literature review[12].
ExQ3_Q11.1.8	Applicant	**Loss of Ancient Woodland and Effects on SSSIs and Local Wildlife Sites** In determining the route of the highway works and those utility diversions, there is still ambiguity as to the need to remove component elements of ancient woodland and other protected sites. • The Applicant's response to ISH9 Agenda Item 3b is noted within the transcript for that hearing [**EV-074**], alongside the relevant post event submission [**REP6-090**]; however, although it is acknowledged that utility diversion routes (G1a, G1b, G2 and G3, OH1, and MU7) result in the loss of Ancient Woodland, even noting that land take was reduced in locations and the Design Principles document intention is to reduce it further, why could a route not be determined that allowed the Ancient Woodland to remain untouched? Please respond to this question in general terms but also make specific reference to the latest position on 'The Wilderness'. • In a similar manner the proposed route affects SSSIs, Local Wildlife Sites and Sites of Importance for Nature Conservation (SINCs). For those areas where damage is proposed, such as Low Street Pit and Goshems Farm, whether by the proposed highway alignment or utility works etc, please provide an explanation of why alternative routes, or minor adjustments to the proposed alignment (in effect micro-siting) that leave these areas untouched could not be provided? Please respond to this question in general terms but also make specific reference to the latest position on Shorne Woods SSSI. Refer to ExQ3 3.1.1. The response to this question will be considered by the ExA in relation to the consideration of alternatives as well as in relation to biodiversity effects.
		Response: The Project has been though an iterative route and design evolution in which the effects on the environment, including Ancient Woodland, were considered, including at the preferred route assessment stage where it was sought to minimise environmental impact (as identified in Section 5 of the Planning Statement [**APP-495**]). With regards to all sites of environmental or ecological importance, the Applicant can reaffirm that these impacts

[11] U.S Department of Transportation. Federal Highway Administration (2011). Wildlife Crossing Structure Handbook - Design and Evaluation in North America. Publication No. FHWA-CFL/TD-11-003.
[12] Natural England (2015). Green Bridges – A Literature Review. http://publications.naturalengland.org.uk/publication/6312886965108736

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		have been considered as part of the design evolution as communicated within the Environmental Statement (ES) Chapter 2: Project Description, notably Plate 2.11 [**APP-140**]. Where impacts to designated sites cannot be avoided with certainty, owing to the current stage of the design, and where the ability to wholly mitigate that impact is reliant on other factors such as: • ground investigations • the detailed design • the phasing of the works • design standards and restrictive covenants of those aspects of the Project (other than the highway, such as the utility networks) which will be determined by others suitable Register of Environmental Actions and Commitments (REAC) commitments [**REP7-122**] and Design Principles [**REP7-140**] have been proposed by the Applicant to work towards further reduction/avoidance during detailed design. A description of the highway and utility works is provided in ES Chapter 2: Project Description [**APP-140**]. The alternatives considered and discounted for the highway, and the significant utility works are narrated within ES Chapter 3: Reasonable Alternatives [**APP-141**] and Chapter 5 of the Planning Statement [**APP-495**]. Where the risk of impact to designated sites is low but cannot be conclusively discounted at this stage, the precautionary principle has been applied and the works have been assessed within the Environmental Assessment. This is to ensure that the assessment of a reasonable worst case has been undertaken. However, at detailed design there remains scope to achieve a proposal that reduces the associated impacts. **Ancient Woodland Sites** *Shorne Woods and Claylane Wood* With regards to Shorne Woods (part of Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI)) and the impacts resulting from the Project alignment, the Applicant refers to Post-event submissions, including written submission of oral comments, for Issue Specific Hearing 3 (ISH3) [**REP4-179**] where the design promoted was explained. In summary, a highway alignment or design that could potentially reduce the impact to the ancient woodland and SSSI would be at the expense of the functionality and safety standards of the A2/Lower Thames Crossing junction design, which would mean the Project was not able to deliver the Project's benefits and achieve its transport objectives of providing free-flowing north–south capacity and improving safety, whilst also maintaining local connectivity.

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		In response to impacts regarding Shorne Woods at Thong Lane, the Applicant highlights the Design Principle Clause S2.16 [**REP7-140**] which commits the design of Thong Lane to the north of the A2 to avoid impacting the Shorne and Ashenbank Woods SSSI to the east With regards to Work No G1a and its impacts on the Shorne and Ashenbank SSSI and ancient woodland contained therein, and Work No G1b within Claylane Wood, impacts have been assessed in relation to the potential alignment and the associated construction area required to install the pipeline. The pipeline is an 800mm medium pressure gas pipeline that forms a strategic role in providing gas to south-east London and a safety function with regards to the operations within the Isle of Grain gas facility. As such, the owner of the pipeline (as submitted in Post-event submissions, including written submission of oral comments, for ISH9 [**REP6-090**]) is '*resistant to installation of the gas pipeline under roads forming part of the strategic road network. SGN* [Southern Gas Networks] *will require access to their asset for maintenance therefore they could not be placed under the highly trafficked strategic roads in this area due to the significant disruption and loss of capacity any maintenance works would cause*.' Work No G1a is promoted north of the A2 from Thong Lane to Brewers Road as the points of connection to the existing pipeline are located north of the A2 at its eastern and western extents (as seen on Sheets 3 and 4 of the Works Plans [**REP7-038**]), and furthermore, at the western extent of Work No G1b (as seen on Sheet 6 of the Works Plans [**REP7-038**]). Existing customers of this pipeline are also located north of the A2 and their supply would need to remain live at all times, so far as reasonably practical. Locating the pipeline to the south of the A2 was considered and discounted as it would not have mitigated the associated impacts to designated woodland within the A2 corridor. Instead it would have introduced them to areas such as Ashenbank Wood (as represented by the Development Boundary contained within the 2020 Supplementary Consultation [**APP-085**] (page 122)) and would potentially give rise to increased impacts to Shorne Woods and Brewers Woods due to the associated construction areas required to pass beneath the A2 to divert the pipeline to the south of the A2. For the avoidance of doubt, the pipeline could not have been situated within any of the new structures crossing the A2 as they themselves interface with the existing gas pipeline and therefore cannot be constructed until the existing pipeline is diverted by Work Nos G1a and G1b. Alternative routes for Work Nos G1a and G1b have been discussed in technical workshops with parties such as the Kent Downs Area of Outstanding Natural Beauty (AONB) Unit (see item 2.1.41 of the Statement of Common Ground (SoCG) between (1) National Highways and (2) Kent Downs AONB Unit [**REP6-018**]). It has been explained how alternative pipeline alignments would have (1) been unacceptable to the utility asset owner on multiple grounds, (2) not mitigated those impacts of concern, and (3) increased the potential of impacts in other locations owing to the need for additional temporary construction areas and Utility Logistics Hubs associated with any alternative diversion options.

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		The impacts associated with utility works within Claylane Wood, specifically Work Nos OH1, OHT1, G2 and G3, are notably due to the location of the existing networks (see Plate 2 below) which require diverting (see Plate 3 below), and the Applicant's intention is to limit the extent of the works to those networks and the potential impacts associated with them. The alignment of other utility works, Work Nos G1b and MU17, are constrained by their relationship with the proposed highways junction design and the relevant design guidance, standards and legislation, which determine their alignment within and through Claylane Wood.

Plate 2 Existing utility networks within Claylane Wood

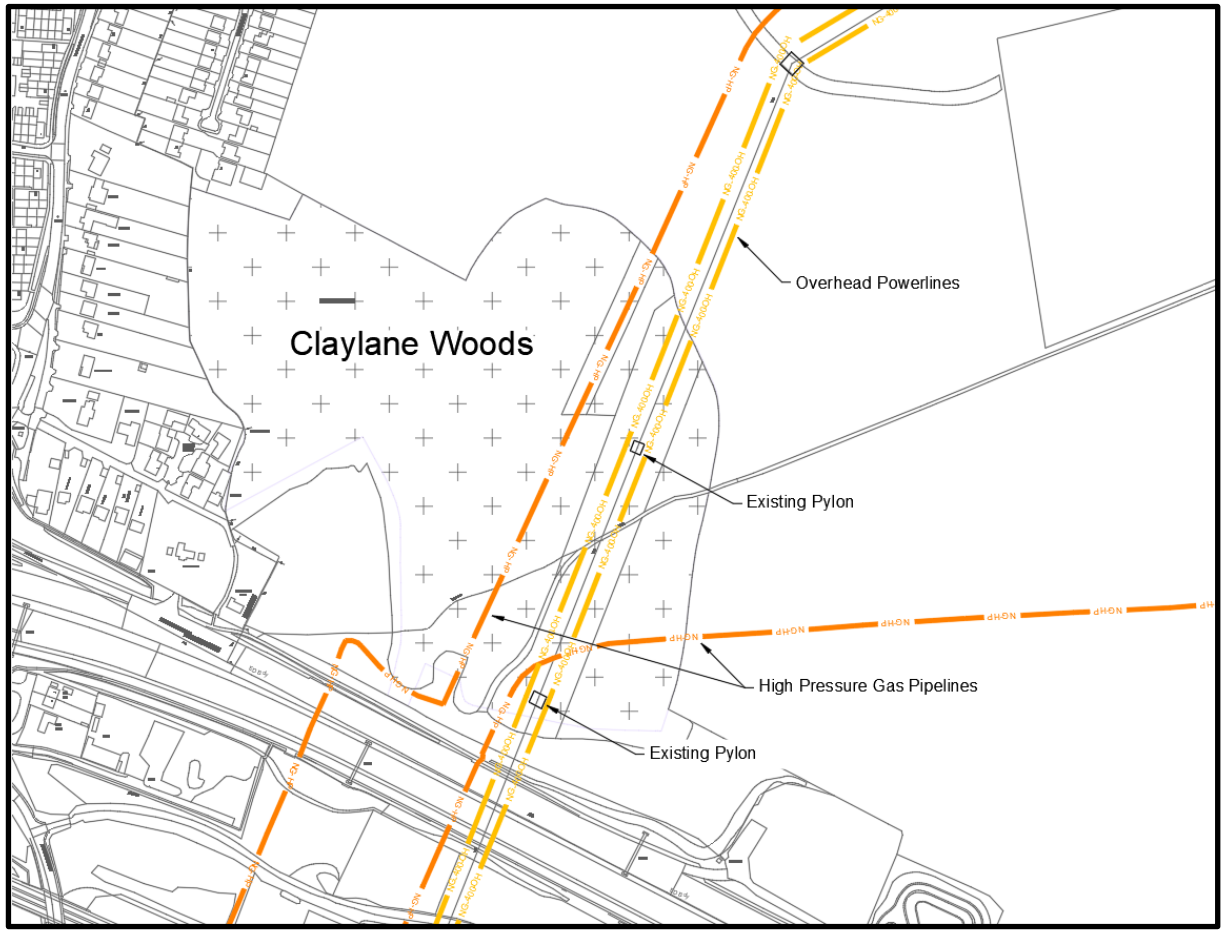
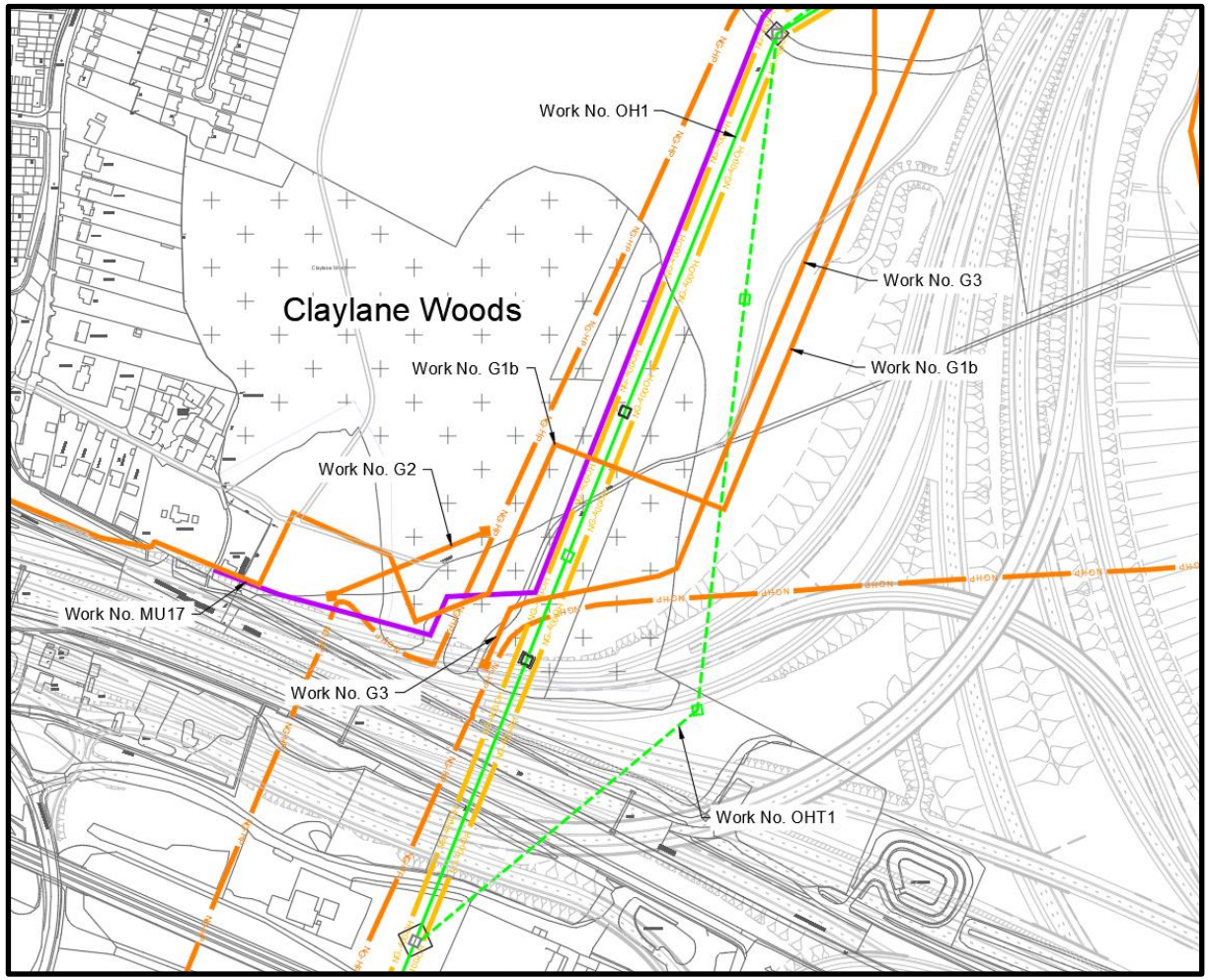


Plate 3 Overview of proposed works alignments, the existing utility networks and Claylane Wood



The Applicant would refer the Examining Authority to item 2.1.2 of the Forestry Commission's SoCG [**REP4-106**] where the Forestry Commission agrees with the Applicant's assessment that it has considered alternative

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		options for the works and has communicated with them at multiple stages of consultation. The Applicant acknowledges that further work is required at the detailed design stage to ensure the commitments made within the Design Principles [**REP7-140**] are applied rigorously to reduce the assessed impact of the utility diversions so far as reasonably practicable. The rigour of that process is assured by the terms of the draft DCO. **Rainbow Shaw Local Wildlife Site** As communicated in ISH9 [**REP6-090**] at Statutory Consultation (2018) the highway alignment resulted in the loss of 0.6 hectares of Rainbow Shaw Local Wildlife Site (LWS), which is designated ancient woodland. However, this highway alignment required substantial and multiple sections of overhead lines to be diverted. To lessen the extent of the overhead powerlines that would need to be diverted, a revised alignment was promoted which realigned the highway north-east further into Rainbow Shaw Wood. Coupled with Work No MU37, which is the diversion of an existing water pipeline located within Hoford Road, the impact to the Rainbow Shaw LWS increased to 1.2 hectares. The Applicant has acknowledged that the only viable way to avoid the impact to the woods would be to move the highway south-west by approximately 150m to ensure the A122, its associated earthworks and the Hoford Road structure and approaches are outside of the woods. Whilst this would avoid the woods, it would reintroduce the diversion of the overhead powerlines (as described at Annex A.9 of Post-event submissions, including written submission of oral comments, for ISH9 [**REP6-090**] and noted above) and promote a highway alignment nearer to the residents of Chadwell St Mary, which the Applicant considers as an inferior proposal to that contained within the Application and that would give rise to materially new or materially different impacts to local receptors than that assessed within the Environmental Statement. **M25 junction 29** As submitted at Post-event submissions, including written submission of oral comments, for ISH9 [**REP6-090**], the works impacting the ancient woodland and Codham Hall Woods LWS results in 0.4ha of impacted woodland. This impact occurs due to the widening works associated with improvements of the existing slip roads and the widening of the M25 through junction 29. No alternative alignment exists that would achieve the required design standards in this location. **Local Wildlife Sites** *Goshems Farm* Impact to the Goshems Farm LWS is associated with the highway alignment, the North Portal and the northern tunnel entrance compound that is required to construct them. Alternatives considered for these works are communicated within ES Chapter 3: Reasonable Alternatives [**APP-141**] and Chapter 5 of the Planning Statement [**APP-495**].

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		The Applicant understands that the current landfill permit by Ingrebourne Valley Limited (IVL) has resulted in the clearance of the majority of the habitats associated with the Goshems Farm LWS and that the area which has been retained as IVL's mitigation area is not impacted by the Project. As part of the Applicant's mitigation proposals for the Project, the area of Goshems Farm LWS that lies within the Project's permanent land-take has been developed to provide a betterment on the mitigation secured by IVL following the conclusion of their land filling activities. The Applicant's approach to mitigating impacts to the Goshems Farm LWS has been agreed with Natural England at item 2.1.52 in their SoCG [**REP7-106**]. **Low Street Pit** Impacts to the Low Street Pit LWS are associated with the highway alignment, namely the Tilbury Viaduct and approach roads. A modification to avoid the LWS, by moving the highway approximately 120m west, would have impacted, potentially extinguishing, the businesses along Station Road, north of the railway line. The moving of the highway west would have brought the highway and associated construction impacts closer to residential receptors at Station Road, Low Street Lane and Church Road in this location. The modified highway alignment would have had to continue further north and south which would then have promoted the A122 in a location that would have impeded on the existing powerlines in the region, extending those works, or located the highway closer to Chadwell St Mary's residents, as opposed to the design in the application that sought to align the highway equidistant from the residents of Chadwell St Mary, Tilbury, East Tilbury and Linford. Work No MU27 (works to the existing overhead line alignment to the east of the A122) is limited in alternative alignments owing to the points of connection along the existing overhead powerline network, one of which is within the Low Street Pit LWS. **Linford Pit** The Linford Pit LWS could not be avoided by the Applicant owing to the need to undertake works to the existing electricity networks in this site (Work No OH5). The existing infrastructure within this site can be seen at [**AS-103**]. The Applicant is, however, seeking temporary powers of access through the Tarmac business site to mitigate impacts during the construction of the Project, as submitted at Compulsory Acquisition Hearing 3 (CAH3) [**REP6-087**]. **Mucking Heath** Mucking Heath LWS is impacted along its western edge (along the eastern verge of Brentwood Road) for Work Nos G5, MU39 and MU40. The works (Work Nos G5 and MU40) cannot be realigned to mitigate this impact owing to the location of the existing pipeline (eastern verge of Brentwood Road), the existing gas infrastructure located along High House Lane and the need to provide adequate separation between the live pipelines and the workforce during the construction of Work Nos G5 and MU40 on the grounds of safety.

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		Brentwood Road was promoted at Statutory Consultation on the alignment of the existing Brentwood Road; however, this was amended to the promoted alignment within the Application owing to the potential for significant impacts on the users of Brentwood Road during construction. Work No MU39 is the diversion of existing utility networks currently located within Brentwood Road and its proposed alignment is determined by that of the realigned Brentwood Road. **Blackshots Nature Area** Blackshots Nature Area is impacted by the A13/A1089/A122 Lower Thames Crossing junction. The need for the junction connectivity and design standards for the highway alignment have determined the impact to the site. Alternative alignments for the highway and alternative junction layouts were considered within ES Chapter 3: Reasonable Alternatives [**APP-141**] and Chapter 5 of the Planning Statement [**APP-495**]. The Applicant would refer to Post-event submissions, including written submission of oral comments, for ISH3 [**REP4-179**] where the need for the design promoted was submitted. Works to the overhead powerlines, Work Nos OH6, OH7 and OHT6, are required owing to the junction design. Alternatives considered for the overhead powerlines are presented in ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**] and Chapter 5 of the Planning Statement [**APP-495**]. Work Nos MU56 and MU57 are sited through the nature area due to the junction design. Reasonable alternatives are not available owing to the promoted junction design and how those assets interface with it during the construction and operation of it, the points of connection required along the affected utility networks to ensure customer continuity, and the lack of certainty with regards to the phasing of construction to ensure that connectivity via an alternative alignment could be delivered to the satisfaction of the utility network owners and operators. Work No MUT20 is the temporary diversion of telecommunication networks that exist within the western boundary of the A1089. These will be relocated back into Work No MU54, the A1089 western verge as part of the Project. Work No MUT20 cannot be realigned owing to the defined points of connection at each end of the works, and the location of the proposed A13/A1089/A122 Lower Thames Crossing junction. **Site of Importance for Nature Conservation (SINC)** *North Ockendon Pit* The works within the SINC are limited to Work Nos 8D and 8N, which is the construction of a new walking, cycling and horse riding (WCH) route connecting Church Lane and the B186 North Road. The Applicant would refer the Examining Authority to its response to 'Paragraph 6.9.21 to 6.9.24 Page 45' of London Borough of Havering's Local Impact Report [**REP2-060**] (pages 37 and 38) regarding its assessed impacts to the site and justification of these proposals. The Applicant proposes to upgrade the existing right of way alignment to a

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		bridleway so there is very limited additional land-take associated with surfacing the existing alignment of the right of way. The Applicant has proposed sufficient land within the neighbouring field (outside of the SINC) in which the temporary access from B186 to the M25 compound and the utility provisions to the compound, Work No MUT29, can be constructed. **Ockendon Railsides SINC** Ockendon Railsides SINC interfaces with Work Nos MU72 and MU73. These works, where they pass through this area, will be installed beneath the railway via trenchless installation methods. The removal of vegetation within this area is proposed on a precautionary basis, to avoid the risk of any existing vegetation falling onto the railway line. Alternative alignments of these works would not have avoided this risk owing to the defined connection points of Work Nos MU72 and MU73 to the existing utility networks, and the extensive length of the SINC along the railway north and south of these locations. **Thames Chase Forest Centre SINC** The Thames Chase Forest Centre SINC is impacted by the highway alignment and supporting infrastructure associated with the M25 and A122 junction. The junction is required to deliver the benefits of the Project. Alternative alignments of the highway are presented in ES Chapter 3: Assessment of Reasonable Alternatives [**APP-141**] and Chapter 5 of the Planning Statement [**APP-495**]. Work No OH8, the diversion of the existing 132kV overhead powerline network situated within the SINC is required to facilitate the construction and operation of the A122. Alternative alignments for this diversion would be comparatively excessive to achieve the Project's needs. An alternative alignment would give rise to potential impacts on other landowners that are currently outside of the Order Limits without avoiding impacts to the SINC due to the need to undertake works to remove the existing assets from within the SINC. Alternative alignments may have introduced new impacts to the Fairplay Farm SINC or Puddle Dock Angling Centre SINC (located east of Clay Tye Road). Work No MU72 could reasonably have passed beneath the M25 further south and then been located along the eastern side of the M25 for a longer alignment; however, this would have introduced additional engineering complexities owing to the depth beneath the A122 that would have had to have been achieved, the crossing point would have been longer and was discounted as being no more advantageous in terms of construction, operation and environmental impact. **Franks Wood and Cranham Brickfields SINC**

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		Franks Wood and Cranham Brickfields SINC is impacted by Work No 9Y. The provisions of this WCH bridge, determined in its alignment by Moor Lane and Folkes Lane requires the diversion of existing utility networks, for which Work No MU91 is a provision. The Applicant believes an alternative location of the bridge would have been less advantageous than that which has been promoted as communicated within Appendix A of Post-event submissions, including written submission of oral comments, for ISH10 [**REP6-091**]. **Folkes Lane Woodland SINC** Folkes Lane Woodland SINC is impacted by the widening works required along the M25. There is no alternative alignment available for these works owing to the alignment of the existing M25. Work Nos G10 and MU92 have no reasonable alternative alignments as they have fixed points of connection to the existing networks and any other alternative would have been comparably longer and given rise to the need for additional land to be considered within the Order Limits without omitting the impact to the SINC. Work No ULH02, the Folkes Lane Utility Logistics Hub, is situated in proximity to Work No G10, which it is to deliver. It has been sited within the SINC at the site of the existing car park, within a clearing, to minimise its impact to the existing vegetation within the SINC, whilst ensuring sufficient heavy goods vehicle access for the delivery and removal of materials and plant required for the works. The Applicant believes any alternative location would not be as advantageous as that promoted. **The Wilderness** The Applicant set out its position regarding the impact on The Wilderness in response to ISH1 matters (Page 64 [**REP1-183**]). The Applicant would refer to Post-event submissions, including written submission of oral comments, for ISH3 [**REP4-179**] where the need for the design promoted was submitted. During the Examination period the Applicant has further refined its proposals within this area, as communicated within Post-event submissions, including written submission of oral comments, for ISH9 [**REP6-090**]. Work No MUT27 cannot be reasonably realigned owing to the points of connection in the B186 North Road (at the western end of the works) to Medebridge compound (Work No CA13) and the constraints associated with the A122 alignment, the presence of The Wilderness and the Ockendon landfill site. However, it is possible to install the required utility provisions without giving rise to a detrimental impact on the trees. As such the Applicant has committed via the REAC [**REP7-122**] at LV034 to ensure: *'No woodland within The Wilderness will be removed in connection with the installation of Work No MUT27.'* The Applicant believes that it has proposed the most advantageous alignment in this location and that any further micro-siting benefits are a matter for detailed design.
ExQ3_Q11.1.9	Applicant	**Shorne Woods SSSI and Car Park**

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	Natural England Kent County Council Gravesham Borough Council Shorne Parish Council	Clarification is requested in relation to the proposed car park retention question at Shorne Woods SSSI. The matter was raised at ISH9 and the decision appears to be, as referenced in the transcript [**EV-074**], and submission [**REP6-090**], that no carpark is to be retained. • Are those bodies listed content that this is the position? The Applicant should also confirm how the land is proposed to be restored after removal of the construction compound and where the restoration proposals are secured.
		Response: In short, the restoration of the land which was previously proposed as a car park following the end of the construction period is secured under article 35, and Requirement 5, of the draft Development Consent Order [**REP7-090**]. In response to concerns expressed by stakeholders in relation to the potential effects on the provision of additional visitor facilities (as expressed at Issue Specific Hearing 9 (ISH9) and through stakeholder engagement) the Applicant has removed the car park proposals (i.e. Work No. 1P) from the Application. This amendment was notified to the Examining Authority on 8 November (Amendment EA08) and reflected in the Applicant's Deadline 7 submission Deadline 7 Hearing Actions [**REP7-185**]. Removing the car park would enable an area of mitigation planting to be relocated further east (to provide screening of substations SS2 and SS3 and the associated Thong Lane access road) resulting in a circa 5,600sqm area of land changed from requiring permanent acquisition powers to temporary possession of land only, as shown on Plate 4 below. The Applicant does not consider this to be a change to the application; it is an amendment contained to land within the Order Limits with no impact on the assessment of the environmental effects of the Project. Revised General Arrangement Plan Volume B Sheet 4 [**REP7-026**] shows the amended layout, retaining the proposed substations and access and restoring the remaining construction compound area in accordance with the outline Landscape and Ecology Management Plan [**REP7-132**] and article 35 of the draft DCO [**REP7-090**].

Plate 4 Extract from the General Arrangement Plans Sheet 4 [REP7-026]

As a result of the amendment, Design Principle S2.11 [REP7-140] has been revised to state:

'*The substations shall be appropriately sited and designed (materials and colour) to integrate with the surrounding landscape. Planting shall be provided along Thong Lane between the substations within the constraints of proposed utilities and highway visibility splays to the substation access track entrance. Planting shall be designed to the east of the substations to screen views of the substations from Thong Lane and Shorne Woods. Planting shall be designed to the north of the substations to screen the views from the village of Thong. Boundary planting shall be provided to integrate the substations into the surrounding landscape. The*

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		substations access track shall be coordinated with the landscape design and reutilise the former construction compound access, where technically practicable.' The restoration of land used in connection with the compound is regulated by article 35 of the draft Development Consent Order [**REP7-090**], which provides for reinstatement, and also giving up temporary possession on the completion of the works, in article 35(4) and (5). Moreover, Section 2 of the Environmental Masterplan [**REP7-116**] (secured under Requirement 5) has been amended to show the restoration of this land. The Applicant refers to its response on the restoration of compounds in Post-event submissions, including written submissions of oral comments, for ISH8 [**REP6-089**].
ExQ3_Q11.1.10	Applicant Natural England	**Species monitoring** Within Natural England's Deadline 6 Submission - Annex 4 Response to ExA's Second Written Questions [**REP6-155**] - it is suggested that further discussions are required over the monitoring of various species, particularly those where a protected species licence is not required, such as breeding birds, nationally important invertebrate assemblages, widespread reptiles and amphibians. • Has a strategy for the approach been agreed? Can such a monitoring strategy be utilised to monitor the effectiveness of the Green Bridges for all the target species highlighted within the Design Principles document?
		Response: '*Has a strategy for the approach been agreed?*' In response to the comments from Natural England regarding monitoring of species other than protected species, and through further discussion with Natural England, the Applicant has amended the outline Landscape and Ecology Management Plan (oLEMP) at Deadline 7 [**REP7-132**] at paragraph 4.2.3 to state '*In addition to the habitat establishment, the in-perpetuity management and monitoring is important to the success of the mitigation planting areas. The outline measures of success will be refined during detailed design with consideration of key species groups, where necessary, to target ecosystems functionality*'. This secures a process whereby the outline measures of success within the oLEMP will be developed and monitored, including key species groups. This would include all appropriate management areas reported in the oLEMP including green bridges and their effectiveness. The Applicant anticipates the matter under discussion in the Statement of Common Ground [**REP7-106**] to move to matter agreed following the amendment.

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ExQ3_Q11.1.11	Applicant	**Invasive species** The ES Appendix 2.2 – CoCP, First Iteration of EMP and REAC document [**REP6-038**] TB005 is noted. However, should there be a requirement for identification and remedial action to be undertaken during the construction phase? If so, please prepare such a measure and submit it for consideration.
		Response: The Applicant intended the Register of Environmental Actions and Commitments (REAC) commitment TB005 to cover the identification and subsequent treatment of invasive species during both the pre-construction and construction phases of the Project but recognises this is not explicit in the wording of this commitment. The Applicant will, therefore, update the wording of TB005 to include specific reference to the identification and treatment of invasive species during both the pre-construction and construction phases. This has been submitted in the revised Code of Construction Practice at Deadline 8 [**Document Reference 6.3 ES Appendix 2.2 (8)**].

8 Physical effects of development and operation

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ExQ3_Q12.1.1	Applicant Historic England	**Thatched Cottage, Baker Street – Update Required post EXQ1 Response** At ExQ1 12.1.15 the Applicant was asked to advise whether it had considered relocation, rather than demolition of the heritage asset. The ExA notes the Applicant's response [REP4-200] and further commentary in the Statement of Common Ground with Historic England [REP5-037] stating the Applicant it is involved in discussions with Essex Place Services and Historic England over the potential for a suitable alternative location. The ExA considers that it is possible that there may be other potential alternative custodian bodies and would also flag the value of discussions with others, with a view to securing agreement as to whether relocation is an achievable outcome in principle. The ExA would like an update at Deadline 9 on this situation.
		Response: The Applicant agrees with the Examining Authority that there may be appropriate alternative custodian bodies, and contact with such bodies has been made and discussions are at an initial stage. The Applicant will provide an update at Deadline 9.
ExQ3_Q12.1.3	Applicant	**Missing archaeological fieldwork: update required post EXQ1 responses** The Applicant's responses to EXQ1 12.1.11 and EXQ1 12.1.12 are noted; however, the ExA still requires clarity from the Applicant on what mechanism will be put in place to engage and agree with stakeholders about the design, avoidance of and mitigation of harm to archaeological assets once the result of that archaeological work is available for those sites that have not yet been surveyed, such as nitrogen deposition/ancient woodland compensation sites or landscape mitigation sites?
		Response: All sites where further archaeological work is required to inform the mitigation proposals have been identified as a mitigation site within the Environmental Statement (ES) Appendix 6.9: Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation (dAMS-OWSI) [REP7-128]. All archaeological work on the Project which is carried out before any Development Consent Order (DCO) order is made will be carried out in accordance with a Written Scheme of Investigation (WSI) approved by the Local Planning Authority (LPA) through the Local Authority Archaeological Advisors as the advisors to the various LPAs. This is the same mechanism employed for the earlier phases of geophysical survey and archaeological trial trenching which has been used to inform the Cultural Heritage assessment. As with that work, the results will be used to inform the proposed mitigation as set out in the dAMS-OWSI. This covers, for example, the nitrogen

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		deposition sites where geophysical survey is currently ongoing. All archaeological work carried out before any Development Consent Order (DCO) order is made will be monitored and signed-off by the Local Authority Archaeological Advisors as the advisors to the various LPAs in accordance with the WSI. Archaeological work carried out after any Development Consent Order (DCO) order is made will be carried out in accordance with the dAMS-OWSI [**REP7-128**] and a Site Specific Written Scheme of Investigation will be prepared in consultation with the Local Authority Archaeological Advisors, as the advisors to the various LPAs, and approved by the Secretary of State in accordance with Requirement 9 of the draft DCO [**REP7-090**]. Paragraph 6.1.1 of the dAMS-OWSI [**REP7-128**] states that, regarding archaeological mitigation, priority will be given to the preservation of archaeological remains. As the archaeological works will take place prior to the detailed design of any nitrogen deposition/ancient woodland compensation or landscape mitigation sites the results of the work will be able to inform that design, thereby allowing for the potential preservation of important remains through avoidance of potentially damaging activities (e.g. tree planting). Such preservation in situ would be subject to a method statement that would need to be approved by the LPA through the Local Authority Archaeological Advisors (paragraphs 6.1.1 and 7.1.8 of the dAMS-OWSI [**REP7-128**]). If preservation in situ does not take place, in accordance with National Policy Statement for National Networks[13] paragraph 5.140 and paragraph 6.1.2 of the dAMS-OWSI [**REP7-128**], a record of the archaeological deposits lost, in total or in part, will be made. Creating the record could be achieved through a range of different archaeological techniques that will be agreed with the LPA through the Local Authority Archaeological Advisors. In summary, all archaeological works will be monitored and signed-off by the Local Authority Archaeological Advisors as the advisors to the various LPAs and the results made available to the relevant LPA in accordance with the dAMS-OWSI [**REP7-128**]. This process ensures the involvement of the relevant local authorities throughout the process regardless of whether archaeological works take place before or after any DCO is made.
ExQ3_Q12.2.1	Applicant	**Compensatory woodland planting and wider effects on the Kent Downs AONB landscape** Can the Applicant please direct the ExA to where it can find the assessment of the effect on the landscape character of the proposed woodland planting site between Brewers Road and Great Crabbles Wood to the north of Park Pale? The ExA notes that the area in question retains a former historic parkland character and not a woodland character. It would like to understand where the assessment of the impacts of compensatory woodland planting on the existing landscape character in this location has been reported.

[13] Department for Transport (DfT) (2014). National Policy Statement for National Networks.

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		Several IP's have raised concerns that the landscape scale strategy for compensatory woodland appears to relate to solely to ecological factors and does not consider the effects of compensatory woodland sites on the landscape character, visual amenity or cultural heritage of the AONB. The ExA asks the Applicant to direct the ExA to where it can specifically find the reporting of the wider assessment or to explain why such an assessment has not been undertaken. The Applicant should note that simply referring the ExA to other ES chapter references will not be adequate; the ExA would like specific reference points to the relevant assessments if these have been undertaken.
		Response: **Landscape and visual introduction** The landscape and visual effects of all areas of proposed woodland compensation planting within the Kent Downs Area of Outstanding Natural Beauty (AONB) have been considered within Environmental Statement (ES) Appendix 7.9: Schedule of Landscape Effects [**APP-384**] and ES Appendix 7.10: Schedule of Visual Effects [**APP-385**]. The effects of all relevant Project elements, including compensation planting plots, have been considered together as a whole on Local Landscape Character Areas (LLCAs) and views rather than as separate Project elements. As stated in paragraph 7.3.3 of ES Chapter 7 [**APP-145**], '*the effects on the constituent landscape features and elements, such as trees, woodland, hedgerows and landform, have been considered in combination as part of the effects on landscape character*'. This is in accordance with paragraph 3.17 of Design Manual for Roads and Bridges LA107 Landscape and Visual Effects[14]. Changes in landscape character and views as a result of proposed planting have been considered at opening year (winter) in terms of the permanent change in land use and the presence of protective guards to establish planting, and at design year (summer) to take into account 15 years of plant growth. The Applicant's approach to the assessment of landscape and visual effects in relation to compensation planting within the Kent Downs AONB can be demonstrated for the ancient woodland compensation planting north of Park Pale (land east of Brewers Wood), and areas of nitrogen deposition compensation planting at Blue Bell Hill and south of Shorne village (Fenn Wood site). This is addressed further in the detailed commentary below. **Cultural heritage introduction** ES Appendix 6.1: Cultural Heritage Desk-based Assessment [**APP-351**] includes historic landscape character, which is presented in Section 5.4. Paragraphs 5.4.6 to 5.4.68 summarise the area to the south of the River Thames. Section 5.4 includes plates showing the 1641 map of the Cobham Estate (Plate 5.17), the 1758 map of Cobham Hall and Park (Plate 5.18), the 1768–69 map of Cobham and Shorne (Plate 5.19) and the 1801 Mudge Map (Plate 5.23). Blue Bell Hill did not form part of the original Historic Landscape Characterisation, as it was not

[14] Highways England (2020). Design Manual For Roads and Bridges LA107 – Landscape and visual effects

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		part of the Project at that point. However, the historic landscape of Blue Bell Hill is described in paragraph 6.6.301 of ES Chapter 6: Cultural Heritage [**REP4-116**]. While Historic Landscape Characterisation provides an assessment of the overall historic landscape, the impact of ancient woodland, woodland and nitrogen deposition compensation planting on individual heritage assets, in accordance with the National Policy Statement for National Networks, has also been assessed and is presented in ES Appendix 6.10: Assessment Tables [**AS-052**] and ES Chapter 6: Cultural Heritage [**REP4-116**]. Details of the individual assets with paragraph and page numbers are provided in the detailed commentary below. **Compensation planting within the Kent Downs AONB north of Park Pale (land east of Brewers Wood)** *Design approach* Paragraph 4.5.2 of the Project Design Report Part D: General Design South of the River [**APP-509**] notes that at the proposed ancient woodland compensation site between Shorne Woods/Brewers Wood and Great Crabbles Wood '*The proposed planting includes individual and small areas of mature trees.*' This sentence relates to the existing trees north of Park Pale that contribute to the historic parkland character. The existing trees would be set within an open ride/glade type character, with a mosaic of open grassland and graduated woodland edge around the proposed ancient woodland compensation planting, as shown on Sheets 2 and 4 of the Environmental Masterplan for Sections 1 and 1A [**REP4-124**]. This is in line with the management objectives set out for this area within the outline Landscape and Ecology Management Plan [**REP7-132**], which state (paragraph 5.3.4): '*f. to establish open rides and glades along utility diversion routes and along the proposed footpath routes for public access* *g. to provide a structurally diverse and graduated woodland edge to the rides*' As mentioned in the Applicant's responses to Interested Parties' post-event submissions at Deadline 6 [**REP7-188**], the rationale for the area north of Park Pale to be developed as a linkage between woodland at Great Crabbles and Brewers Woods was identified by Natural England in the Defra Family advice provided to the Project at Statutory Consultation, as presented in Annex C.1 of the Draft Agreed Statement of Common Ground between (1) National Highways and (2) Natural England [**REP7-106**]. **Landscape character** The effects of the proposed ancient woodland compensation planting north of Park Pale on the landscape character of the West Kent Downs (sub area Shorne) LLCA have been considered in Table 3.3 of ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**] (pages 103 to 111). Two of the key characteristics of the West Kent Downs (sub area Shorne) LLCA are the extensive areas of woodland and the strong sense of enclosure created by this woodland. These key characteristics have been summarised in ES Appendix 7.9 (in column 1 on page 103) from the description of the Shorne Local Character

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		Area on page 19 of the Kent Downs AONB Landscape Character Assessment Update 2020[15]. The proposed planting in this area is therefore not considered to be out of character for the West Kent Downs (sub area Shorne) LLCA. The assessment commentary in Table 3.3 of ES Appendix 7.9 (page 104) states that there would be a '*permanent conversion of pasture fields to woodland and grassland habitat*' at opening year (winter) as a result of the ancient woodland compensation planting. Effects of the Project as a whole on the West Kent Downs (sub area Shorne) LLCA have been assessed as large adverse in opening year (winter); however, this is largely attributed to the continued absence of vegetation along the M2/A2 corridor and the resulting increased perception of the road corridor and highway infrastructure (refer to Summary: opening year (winter) on page 107). At the design year (summer), ES Appendix 7.9 (page 110) states that planting in the ancient woodland compensation site would '*help reduce the perception of the M2/A2 corridor and reinforce the wooded landscape character within this part of the LLCA*'. This conclusion was reached following a review of the design intent for the land east of Brewers Wood within Section 5.3 of the outline Landscape and Ecology Management Plan [**REP7-132**], Sheets 2 and 4 of the Environmental Masterplan for Sections 1 and 1A [**REP4-124**], Clauses S1.06, S1.07 and S1.08 of the Design Principles [**REP7-140**] and paragraphs 4.5.2 and 4.5.3 of the Project Design Report Part D: General Design South of the River [**APP-509**]. Overall effects on the West Kent Downs (sub area Shorne) LLCA have been assessed as moderate adverse in design year (summer); however, this is due to the permanent loss of vegetation along the M2/A2 corridor and the associated increased perception of the road corridor and highway infrastructure (refer to Summary: design year (summer) on page 110). Although the area north of Park Pale is largely open in character, it is also influenced by the existing M2/A2 corridor and buildings at Harlex Haulage. It was therefore considered that softening the appearance of the M2/A2 corridor and buildings at Harlex Haulage would be of benefit to local landscape character. The greater enclosure created in the landscape by the ancient woodland compensation planting was also considered to align with the key characteristics of the West Kent Downs (sub area Shorne) LLCA stated in ES Appendix 7.9 (in column 1 on page 103), particularly as the design would include open rides and glades with a graduated woodland edge and would maintain vistas through the planting to features such as Darnley Mausoleum, as stated in Section 5.3 of the outline Landscape and Ecology Management Plan [**REP7-132**]. **Visual amenity** The ancient woodland compensation site north of Park Pale has been considered at Representative Viewpoint S-03 in Table 3.1 of ES Appendix 7.10: Schedule of Visual Effects [**APP-385**] (page 76). As stated on page 15 of the Applicant's comments on Interested Parties' submissions at Deadline 6 [**REP7-187**], a large adverse effect has

[15] Kent Downs AONB Unit (revised and published 2023). Kent Downs Area of Outstanding Natural Beauty Landscape Character Assessment Update 2020.

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		been assessed at opening year (winter), which is an increase in the effect reported in ES Appendix 7.10 (page 76). The large adverse effect is predominantly attributed to the modified A2 corridor being noticeably more visible in the view. A moderate beneficial effect has been assessed at design year (summer) in Table 3.1 of ES Appendix 7.10 (page 76), on account of the beneficial screening provided of existing buildings at Harlex Haulage and infrastructure along the A2 and HS1 corridors. **Cultural heritage north of Park Pale and east of Brewers Wood** The examination of the historic mapping, in particular the 1768–69 map of Cobham and Shorne (Plate 5.19) and the 1801 Mudge Map (Plate 5.23), carried out as part of the historic landscape characterisation reported in ES Appendix 6.1 Cultural Heritage Desk-based Assessment [**APP-351**], shows that the area proposed for ancient woodland compensation planting has changed in nature since the eighteenth century. The 1768–69 map shows the site to be predominantly wooded, but by 1801 the informal parkland of pasture and stands of trees visible today had been established. The ancient woodland compensation planting design responds to the historic landscape character by incorporating existing scattered trees within glades, by retaining areas without planting and by incorporating significant breaks in planting that allow longer views, for example, to the Darnley Mausoleum and views to the wider Kent Downs AONB, as required by Clause S1.08 of the Design Principles [**REP7-140**]. Refer to the photomontage at Representative Viewpoint S-03 submitted at Deadline 6 [**REP6-036**], which illustrates views remaining to a group of existing trees within an open ride and long-range views remaining towards Darnley Mausoleum. The cultural heritage assessment in ES Chapter 6: Cultural Heritage [**REP4-116**] examined the impact on heritage assets and potential archaeological remains. Five heritage assets have been identified within the Kent Downs AONB north of Park Pale in ES Appendix 6.10: Assessment Tables [**AS-052**]. These comprise a former water channel (Asset 1865 on page 157) identified during the Applicant's heritage walkover survey, a Post Medieval well (Asset 4167 on page 371) identified during the Applicant's study of historic mapping and three heritage assets: a Post Medieval copper alloy token (Asset 1991 on page 158), the site of the former Cobham Golf Course club house (Asset 1997 on page 158) and a Medieval silver coin (Asset 4064 on page 172) identified from the Kent Historic Environment Record. Impacts have only been identified for Assets 1865 and 1997, which are reported in paragraph 6.6.90 of ES Chapter 6: Cultural Heritage [**REP4-116**]. The desk-based work does not suggest a great potential for unknown archaeological remains across the area, but there is Mesolithic material known from within Shorne Woods and the presence of two dry valleys suggest there is potential for archaeological remains. Therefore, the Applicant is presenting a programme of further archaeological work in ES Appendix 6.9: Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation [**REP7-128**].

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		Blue Bell Hill nitrogen deposition compensation site within the Kent Downs AONB *Design approach* Section 5.16 of the outline Landscape and Ecology Management Plan [**REP7-132**] sets out the management requirements for the Blue Bell Hill site, including: '*d. Integrate biodiversity objectives with other objectives wherever feasible and not undermining the biodiversity objective* *i. Existing interests such as AONB / Landscape, Conservation areas and Heritage assets…* *iii. Habitat creation shall be designed to conserve and enhance the existing landscape character of the Kent Downs AONB* *e. reflect the historic landscape characteristics of the Blue Bell Hill site where appropriate, such as historic field boundaries, recreation of shaws*' Clauses LSP.25 and LSP.26 of the Design Principles [**REP7-140**] have been included to ensure the detailed design of the nitrogen deposition compensation site maintains a sense of openness along recreational routes, avoids the obstruction of views and seeks to screen existing visual detractors wherever practicable. **Landscape character** The nitrogen deposition compensation site at Blue Bell Hill has been considered within the Mid Kent Downs (sub area Bredhurst) LLCA in Table 3.3 of ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**] (pages 123 to 125). A neutral effect on landscape character has been assessed at opening year (winter) due to the limited change resulting from proposed planting, with ES Appendix 7.9 stating on page 123 '*The establishing habitats would not appear out of character within the existing wooded, arable landscape*'. A moderate beneficial effect on landscape character has been assessed at design year (summer), as the planting would noticeably '*enhance the wooded character of the LLCA*', as stated on page 125 of ES Appendix 7.9. **Visual amenity** The nitrogen deposition compensation site at Blue Bell Hill has been considered at Representative Viewpoints N-Dep-RV-07 to N-Dep-RV-09 in Table 3.1 of ES Appendix 7.10: Schedule of Visual Effects [**APP-385**] (pages 113 to 115). A neutral effect on views has been assessed at opening year (winter) due to the limited change resulting from proposed planting, with ES Appendix 7.10 stating on pages 113 to 115 '*Establishing small trees and shrubs would not appear out of character in the wooded, arable landscape. The potential use of protective guards to establish woodland planting would result in a barely noticeable adverse change in views*.' A moderate or slight beneficial effect on views has been assessed at design year (summer), as the planting would '*effectively extend*

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		the existing woodland within Malling Wood, Westfield Wood and Frith Wood' and soften the appearance of existing communications masts and/or pylons, as explained on pages 113 to 115 of ES Appendix 7.10. **Cultural heritage** There are two high-value scheduled monuments in the vicinity of the Blue Bell Hill nitrogen deposition compensation site. Kit's Coty House Long Barrow (SM27) and The White Horse Stone, Aylesford (SM26) are located c. 635m south-west and c. 830m south of the Order Limits respectively. These assets are part of a larger group known as the 'Medway Megaliths'. This is a group of Neolithic funerary monuments situated around the valley of the River Medway (ES Chapter 6: Cultural Heritage [**REP4-116**] paragraph 6.4.21, page 38). Other heritage assets comprise the findspot of an Iron Age gold coin (Asset 4483) and a group of sarsen stones (Asset 4513) at the northern edge of Westfield Wood (ES Chapter 6: Cultural Heritage [**REP4-116**] paragraph 6.4.105, pages 57–58). The broad route of a Prehistoric trackway (Asset 4553) within the area is paralleled by (and sometimes merges with) the medieval route known as Pilgrim's Way (associated with the veneration of Thomas Beckett) and a Medieval 74olloway (Asset 4555) survives within the woodland on the southern slope of Blue Bell Hill (ES Chapter 6: Cultural Heritage [**REP4-116**] paragraph 6.4.106, page 58). The potential for further unknown archaeological remains exists and the Applicant has carried out a geophysical survey of the nitrogen deposition compensation site, and the results of this work will inform any further archaeological work. The only asset impacted by the planting proposals is the prehistoric trackway (Asset 4553) (ES Appendix 6.10: Assessment Tables, page 315 [**AS-052**]) and it is anticipated that further work will allow this, and any other archaeological remains discovered, to be incorporated into the planting proposals at the detailed design stage, for example, through ensuring no planting were to take place along the route of the trackway. Therefore, the Applicant is presenting a programme of further archaeological work in ES Appendix 6.9: Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation [**REP7-128**]. **Nitrogen deposition compensation site south of Shorne village (Fenn Wood site), partially within the Kent Downs AONB** *Design approach* Section 5.14 of the outline Landscape and Ecology Management Plan [**REP7-132**] sets out the management requirements for the Fenn Wood site south of Shorne village, including: '*h. Integrate biodiversity objectives with other objectives wherever feasible and not undermining the biodiversity objective* *i. Existing interests such as AONB / Landscape, Conservation areas and Heritage assets…*

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		k. Habitat creation shall be designed to: *i. conserve and enhance the existing landscape character of the Kent Downs AONB* *e. reflect the historic landscape characteristics…*' Clauses LSP.25 and LSP.26 of the Design Principles [**REP7-140**] have been included to ensure the detailed design of the nitrogen deposition compensation site maintains a sense of openness along recreational routes, avoids the obstruction of views and seeks to screen existing visual detractors wherever practicable. **Landscape character** The nitrogen deposition compensation site south of Shorne village has been considered within the Shorne Wooded Slopes and West Kent Downs (sub area Shorne) LLCAs. A neutral effect on the landscape character of the Shorne Wooded Slopes LLCA has been assessed at opening year (winter) in Table 3.3 of ES Appendix 7.9: Schedule of Landscape Effects [**APP-384**] (pages 134 to 136) due to the limited change resulting from proposed planting, with ES Appendix 7.9 stating on page 134 '*The establishing planting would not appear out of character within the wooded, arable/pasture landscape*'. A moderate beneficial effect on landscape character has been assessed at design year (summer), as the planting would noticeably '*enhance the wooded character of the LLCA*' as stated on page 136 of ES Appendix 7.9, in combination with other areas of compensation planting within the LLCA. The assessment commentary in ES Appendix 7.9 states for the West Kent Downs (sub area Shorne) LLCA on page 104 that there would be a '*permanent conversion of pasture fields to woodland and grassland habita*t' at opening year (winter) as a result of the nitrogen deposition compensation site. Effects on the West Kent Downs (sub area Shorne) LLCA have been assessed as large adverse in opening year (winter), although this is largely attributed to the continued absence of vegetation along the M2/A2 corridor and the associated increased perception of the road corridor and highway infrastructure (refer to Summary: opening year (winter) on page 107). At design year (summer), the nitrogen deposition compensation site has not been specifically mentioned in the assessment commentary. However, it is considered that the planting would help to reinforce the wooded character of the LLCA, as explained for the Shorne Wooded Slopes LLCA on page 136 of ES Appendix 7.9. **Visual amenity** The nitrogen deposition compensation site south of Shorne village has been considered at Representative Viewpoint N-Dep-RV-02 in Table 3.1 of ES Appendix 7.10: Schedule of Visual Effects [**APP-385**] (page 110). A neutral effect on views has been assessed at opening year (winter) due to the limited change resulting from proposed planting, with ES Appendix 7.10 stating on page 110 '*Establishing small trees and shrubs would not appear out of character in the wooded landscape…The potential use of protective guards to establish woodland planting would result in a barely noticeable adverse change in views*'. A moderate beneficial effect on views has

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		been assessed at design year (summer), as the planting would '*effectively extend the existing woodland within Shorne Woods Country Park at the edge of Shorne Ridgeway village*', with '*open glades and occasional vistas…incorporated…to maintain variety and interest*', as stated on page 110 of ES Appendix 7.10. **Cultural heritage** There is one heritage asset within the nitrogen deposition compensation site south of Shorne village, a ring ditch and barrow, probably dating to the Bronze Age (Asset 1474) (ES Chapter 6: Cultural Heritage [**REP4-116**] paragraph 6.4.27, page 40 and paragraph 6.6.67, page 174).The potential for further unknown archaeological remains exists and the Applicant has programmed a geophysical survey of the nitrogen deposition compensation site, and the results of this work will inform any further archaeological work. It is assumed that the geophysical survey will provide sufficient detail to determine the extent of the ring ditch and barrow (Asset 1474) and allow for its preservation *in situ* within the detailed design. The geophysical survey may also identify additional archaeological remains, which will require further investigation. Therefore, the Applicant is presenting a programme of further archaeological work in ES Appendix 6.9: Draft Archaeological Mitigation Strategy and Outline Written Scheme of Investigation [**REP7-128**].

9 General and overarching questions

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ExQ3_Q16.1.1	Applicant	**BREEAM (environmental performance standards) for the tunnel services building** In the Design Principles (Volume 7) [**REP6-046**], STR.02 suggests that the proposed Tunnel Services Building "*…shall be designed to achieve a **BREEAM** level of 'Excellent' …*". What is the proposal should this not be achievable?
		Response: The Applicant is required to design the authorised development in accordance with the Design Principles document [**REP7-140**] pursuant to Requirement 3 of the draft Development Consent Order [**REP7-090**]. The Applicant does not foresee any technical reason why a BREEAM[16] level of 'Excellent' would not be achievable on the Tunnel Services Building. In the Environmental Statement Appendix 2.2: Code of Construction Practice [**REP7-122**], paragraph 2.2.5 states: *'The Civil Engineering Environmental Quality Assessment & Award Scheme (CEEQUAL) is an evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects. The Contractors will achieve a CEEQUAL 'Very Good' standard by completion of their works and support National Highways in achieving a Project standard of 'Excellent'.*'
ExQ3_Q16.1.2	Applicant	**Environmental performance standards more generally** **BREEAM** includes what was known as 'CEEQUAL', listed as **BREEAM INFRASTRUCTURE** which is applicable to infrastructure and civil engineering projects. • Why is it only the Tunnel Services Building where BREEAM excellent is sought? • Are other elements of the projects amenable to relevant BREEAM assessment? If so which ones and how would that be secured?
		Response: The Applicant has committed to achieving an overall Project assessment of 'Very Good', with an aspiration to achieving an overall assessment of 'Excellent'. This is secured in the Environmental Statement Appendix 2.2: Code of Construction Practice [**REP7-122**] paragraph 2.2.5, which states:

[16] BRE Group (n.d.). Building Research Establishment Environmental Assessment Method (BREEAM). https://bregroup.com/products/breeam/

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		'*The Civil Engineering Environmental Quality Assessment & Award Scheme (CEEQUAL) is an evidence-based sustainability assessment, rating and awards scheme for civil engineering, infrastructure, landscaping and public realm projects. The Contractors will achieve a CEEQUAL 'Very Good' standard by completion of their works and support National Highways in achieving a Project standard of 'Excellent'.*' A significant proportion of the criteria within BREEAM Infrastructure are assessing how the team deal with the social and environmental context of where the project is situated and ensure the project is delivered in a sensitive and responsible manner. In some situations, achievement of absolute best practice (i.e., scores above 75%) may be very challenging across the scale of this Project. Therefore, considering the Tunnel Services Buildings at the north and south portal sites are buildings that contain accommodation and welfare facilities, it was felt that achieving an 'Excellent' rating under BREEAM Building was more appropriate for the Tunnel Services Buildings in Design Principle STR.02 [**REP7-140**] than using the overall Project BREEAM INFRASTRUCTURE as a metric.
ExQ3_Q16.1.3	Applicant Gravesham Borough Council, Thurrock Council, Kent County Council, Essex County Council, Kent Downs AONB Unit, Natural England, Other IPs interested in the design, function and operation of Green Bridges	**Green Bridges: serving multiple objectives** ExQ3 11.1.5 and 11.1.6 refer to the functions of the proposed Green Bridges in relation to biodiversity and habitat connectivity. However, evaluation of the proposed Green Bridges requires consideration of their performance in terms of multiple objectives and outcomes, including but not limited to: • Biodiversity • Habitat connectivity • The provision of non-motorised user (NMU) routes for people • Landscape and landscape mitigation, in general terms and (with reference to the Kent Downs) to AONB landscapes. With reference to these objectives but also to such other functions and outcomes as are considered relevant, please provide your summary assessment of the effectiveness of each Green Bridge proposed within your area of interest. If objectives and outcomes appear to be in competition or to pull in different directions, please indicate the particular objectives considered to be the most important and why.
		Response: The Applicant has previously provided details of the ecological requirements for the green bridges in Post-event submissions, including written submission of oral comments, for ISH9 [**REP6-090**] and ISH6 [**REP4-182**]. In summary, the green bridges have been proposed to maintain commuting routes and/or to reduce the fragmentation of territories and habitats that are used by animals for foraging and movement between places of shelter, specifically for bats, badgers and dormice as identified in Section 8.6 of ES Chapter 8: Terrestrial Biodiversity [**APP-146**], ES Figure 8.29: Badger Survey Results [**APP-290**] and Section E3.4 of ES Appendix 8.16:

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		Draft EPS Mitigation Licence Application – Bats [**APP-408**]. As noted previously, the structures would potentially benefit other terrestrial species (e.g. reptiles, small mammals, amphibians, invertebrates, etc.), but they have not been identified from surveys as the key driver for provision of green bridges at the chosen locations identified below. In addition, the green bridges provide habitat connectivity between areas of new compensation planting and retained woodland and other important landscape features such a sunken lanes and double hedgerows, supporting the integration of the Project into the wider landscape. Further detail is provided below for the other objectives associated with the Project's green bridge provision. **Summary** Whilst each green bridge has been designed holistically, the table below illustrates the primary objective and secondary benefit of each. **Table 1 Green bridge objectives and benefits**

Green bridge	Primary objective	Secondary benefits
Brewers Road	Part of a regional strategy for a wooded loop around the A2 junction. Gateway feature signalling entry/exit into AONB.	Enhanced habitat connectivity across the A2 corridor for habitats. Improves WCH connectivity over A2 corridor for those travelling between Shorne Woods Country Park and Ashenbank Wood.
Thong Lane south	Part of a regional strategy for a wooded loop around the A2 junction. Gateway feature signalling entry/exit into AONB.	Enhanced habitat connectivity across the A2 corridor for habitat. Improves WCH connectivity over A2 corridor for users on the Darnley Trail and those travelling between Shorne Woods Country Park and Jeskyns Community Woodland.
Thong Lane north	Woodland (landscape and habitat) connectivity – connecting Claylane Woods with Shorne Woods. Ancient Woodland compensation and resilience.	Point of intersection for the WCH recreational loops and facilitates PRoW diversions.
Muckingford Road	Habitat connectivity.	Wider WCH benefits connecting residential areas of Linford and East Tilbury and areas of employment. Landscape design responding to context.

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Hoford Road	Habitat connectivity.	Retaining existing historic WCH access with sunken lane character. Landscape design responding to context.
Green Lane	Habitat connectivity.	Retaining existing WCH access to extended bridleway network. Landscape design responding to context.
North Road	Habitat connectivity.	Part of wider WCH strategy improving north/south connectivity for commuters and access to fenland landscape from the west. Landscape design responding to context.

Brewers Road green bridge

The planting strips along Brewers Road green bridge would aid the integration of the structure into the landscape and help reduce the perception of landscape severance north and south of the modified A2 corridor within the Kent Downs Area of Outstanding Natural Beauty (AONB). The planting strips would also help to screen views of traffic on the bridge from within the surrounding landscape, as well as screening views for users of the bridge towards the modified A2 corridor.

Further to this, Clause S1.04 of the Design Principles [**REP7-140**] states:

'*To act as local landmarks and to signal entry into the Kent Downs AONB for drivers, the vegetation on the bridges shall be visible on the horizon on their approach to the area from the east for Brewers Road green bridge, and from the west for Thong Lane green bridge south.*'

It also forms part of the regional landscape strategy as part of the wider 'wooded loop' shown on page 12 of the Project Design Report Part D: General Design South of the River [**APP-509**] and further to Clause S1.04 of the Design Principles [**REP7-140**] which states:

'*To provide planting on the green bridge that links into woodland planting to the edge of Gravesend in the west and the gateway to Shorne Woods Country Park in the east as part of a wider 'wooded circle' connecting Shorne Woods and Claylane Wood.*'

Brewers Road green bridge is an important crossing point of the A2 and links publicly accessible wooded areas of Shorne Woods Country Park in the north and Ashenbank Wood in the south. Improved walking, cycling and horse

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		riding (WCH) connectivity over the A2 has been a longstanding user group request. The experience of crossing between these two recreational areas should be positive, pleasant and in keeping with the environment to north and south. Further to this, Clause S1.04 of the Design Principles [**REP7-140**] states Brewers Road green bridge shall be designed: *'To provide a high-quality experience for users crossing the bridge through vegetation and woodland planting. The green bridge shall improve recreation access across the A2/M2/Lower Thames Crossing corridor.'* **Thong Lane green bridge south** The planting strips along Thong Lane green bridge south would aid the integration of the structure into the landscape and help reduce the perception of landscape severance north and south of the modified A2 corridor within the Kent Downs AONB. The planting strips would also help to screen views of traffic on the bridge from within the surrounding landscape, as well as screening views for users of the bridge towards the modified A2 corridor. Further to this, Clause S1.04 of the Design Principles [**REP7-140**] states: '*To act as local landmarks and to signal entry into the Kent Downs AONB for drivers, the vegetation on the bridges shall be visible on the horizon on their approach to the area from the east for Brewers Road green bridge, and from the west for Thong Lane green bridge south*' It also forms part of the regional landscape strategy as part of the wider 'wooded loop' shown on page 12 of the Project Design Report Part D: General Design South of the River [**APP-509**] and further to Clause S1.04 of the Design Principles [**REP7-140**] which states: '*To provide planting on the green bridge that links into woodland planting to the edge of Gravesend in the west and the gateway to Shorne Woods Country Park in the east as part of a wider 'wooded circle' connecting Shorne Woods and Claylane Wood.*' Thong Lane green bridge south is an important crossing point of the A2 and links publicly accessible wooded areas of Shorne Woods Country Park in the north and Jeskyns Community Woodland in the south. The Darnley Trail links these two areas as well as other woodland spaces; it crosses the existing bridge over the A2/M2 at Thong Lane. Improved WCH connectivity over the A2 has been a longstanding user group request; this is a strategically important location for improved connectivity. The experience of crossing between these two recreational areas should be positive, pleasant and in keeping with the environment to north and south. Enough space should be given for the different user groups.

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		Further to this, Clause S2.12 of the Design Principles [**REP7-140**] states that the design of Thong Lane green bridge south shall include: *'WCH provision, comprising a 3m shared pedestrian/cycle route and a 3.5m horse riding route'* **Thong Lane green bridge north** Planting along Thong Lane green bridge north would aid the integration of the structure into the landscape and help to screen views of traffic on the bridge from within the surrounding landscape, as well as screening views for users of the bridge towards the Project route. Further to this, Clause S2.04 of the Design Principles [**REP7-140**] states: *'The landscape across the bridge shall be designed to extend the character of the well-vegetated Thong Lane and connect woodland to the east and west to provide a habitat corridor for mammals.'* Page 49 of the Project Design Report Part D: General Design South of the River [**APP-509**] describes the landscape design rationale for Thong Lane green bridge north and states: *'Woodland planting along the eastern edge of Gravesend has been designed to form part of a circular wooded habitat corridor linking Claylane Wood and Brummelhill Wood. The green bridge has been designed to form a vital part of this wooded connection. The general arrangement creates a woodland corridor across the bridge that also creates a sense of separation between the Project and local road and WCH routes, whilst still ensuring a limited sense of enclosure around the footway/cycleway created by young woodland...'* *'The design draws inspiration from remnant hedgerows in the local vicinity, giving the landscape a level of maturity, whilst retaining a sense of openness through eye level inter-visibility.'* Page 21 of the Project Design Report Part E [**APP-512**] sets out the rationale for the WCH routes across this bridge; it states: *'Thong Lane green bridge north has been designed to become a focal point of WCH provision in the southern part of the Project. In addition to an environmental and ecological connection, this bridge forms the point of intersection between two proposed looping routes, one around the tunnel portal to the north and one around the junction to the south. As a consequence this bridge become the centre of a figure of eight recreational loop, part of the new north-south link between the A2 and A226 and part of the realigned east-west route between East Gravesend and Shorne Woods Country Park.'* The specific Public Rights of Way (PRoWs) to be diverted over this bridge are listed in Clause S2.02 of the Design Principles [**REP7-140**], which states:

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		'In order to restore PRoWs severed by the Project and to create an enhanced user experience, PRoWs NS167 and NS169 shall be integrated into the new looping WCH route connecting around the M2/A2/A122 Lower Thames Crossing junction. Between Claylane Wood and Shorne Woods Country Park, this shall be via the Thong Lane green bridge north (Work No: 3B). NS167 shall not cross the junction.' The width of this bridge allows for WCH routes crossing this bridge both north and south of Thong Lane. In order to improve the WCH user experience these routes are separated from Thong Lane while not located close enough to the bridge parapet for the road below to become dominant. The quality of user experience is captured in Clause S2.04 of the Design Principles [**REP7-140**] which states: *'Woodland shall be designed to retain a sense of openness and intervisibility at eye level to make people feel safe when crossing the bridge, and not fully enclosed.* *The bridge shall provide a high-quality experience for users crossing the bridge using vegetation and woodland planting.*' **Muckingford Road green bridge** Hedgerows along Muckingford Road green bridge would help to screen views of traffic on the bridge from within the surrounding landscape, as well as screening views for users of the bridge towards the Project route. Muckingford Road green bridge forms part of the wider regional landscape strategy for the area, as described on page 11 of the Project Design Report Part D: General Design North of the River – Tilbury to the A13 Junction [**APP-511**] which states: '*Green bridges within the region provide habitat links for wildlife. In addition to the ecological function, the design of the green bridges reduce people's perception of crossing a bridge by giving the impression of a continuation of the roadside landscape drawing from the character of the roads of which they have become part of.*' *Page 48 of the Project Design Report Part D: General Design North of the River – Tilbury to the A13 Junction [APP-511] describes the multi-functional design rationale for Muckingford Road green bridge, and states:* *'Muckingford Road green bridge has been designed to provide a habitat link for bats, badgers and other wildlife. The design of the bridge draws inspiration from the character of the wider Muckingford Road and incorporates hedgerow planting adjacent to paved areas and a more open grassland character behind the hedge relating to the open character of adjacent fields.* *In order to counter the isolation of Linford, East Tilbury, and even further north to Stanford-le-Hope, east-west inter-urban connectivity for access to employment and services to Tilbury and Grays shall be improved in this location with Muckingford Road green bridge playing an important role. To help achieve this access improvement,*

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		WCH connections will be enhanced across the bridge and also beyond, including a new shared track parallel to Muckingford Road between residential areas and areas of employment.' **Hoford Road green bridge** Hoford Road green bridge would help to maintain the character of Hoford Road Protected Lane across the Project route. Hedgerows along the bridge would help to screen views for users of the bridge towards the Project route. Hoford Road green bridge forms part of the wider regional landscape strategy for the area, as described on page 11 of the Project Design Report Part D: General Design North of the River – Tilbury to the A13 Junction [**APP-511**] which states: '*Green bridges within the region provide habitat links for wildlife. In addition to the ecological function, the design of the green bridges reduce people's perception of crossing a bridge by giving the impression of a continuation of the roadside landscape drawing from the character of the roads of which they have become part of.*' Page 52 of the Project Design Report Part D: General Design North of the River – Tilbury to the A13 Junction [**APP-511**] describes the design rationale for Hoford Road green bridge, and states: *'The character of Hoford Road varies widely along its length. There are places where the existing road appears to have been raised above the surrounding valley floor and other areas where the road's surface lies well below the surface of the adjacent land. The existing enclosure created by the sunken character is further intensified by the dense vegetation lining the route in these locations. To limit the Project's impact on users of Hoford Road, the sunken lane character is adopted along the proposed replacement parts of the route and over the proposed Hoford Road green bridge. The enclosed character created by the route lying below surrounding ground along with roadside hedgerow planting has been designed to limit views toward the Project route. Where the route is diverted to allow the road to remain below surrounding levels, the existing roadside vegetation has been retained where reasonably practicable, and reinforced to further limit views to and the perception of noise from the Project.'* **Green Lane green bridge** Green Lane is both a farm track and a bridleway (BR161). Hedgerows along Green Lane green bridge would help to screen views for users of the bridge towards the Project route and soften the appearance of the bridge structure slightly. Page 28 of the Project Design Report Part D: General Design North of the River – North of the A13 Junction to the M25 [**APP-510**] describes the landscape design rationale for Green Lane green bridge and states: '*The existing vegetation along Green Lane creates a varied experience for users of the route. At times, the existing vegetation encompasses the lane on both sides creating an enclosed and shaded space. Elsewhere, the vegetation is much more open on one side providing views into the surrounding open farmland. At other times, the*

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		lane is open on both sides providing expansive views toward distant higher land. The variance in the level of the enclosure is an asset, providing a varied experience for users who are moving relatively slowly through the landscape. The enclosed areas create a level of contrast that helps to accentuate open views. The landscape design for the green bridge over the proposed Project route draws inspiration from the more enclosed parts of Green Lane to reduce the impact the proposal has on the lane. More open views have been designed to form part of the character of the lane at points more removed from the Project route and associated earthworks, the openness accentuated by the enclosure created by the proposed works.' **North Road green bridge** Hedgerows along North Road green bridge would help to screen views for users of the bridge towards the Project route and soften the appearance of the bridge structure slightly. North Road green bridge forms part of the wider regional landscape strategy for this area, as described on page 10 of the Project Design Report Part D: General Design North of the River – North of the A13 Junction to the M25 [**APP-510**] which states: '*The landscape proposals will ensure that green connections are maintained and enhanced wherever possible. These include the creation of green bridges and the linking of woodland for both visual and habitat connectivity over the Project route and the existing M25.*' Page 32 of the Project Design Report Part D: General Design North of the River – North of the A13 Junction to the M25 [**APP-510**] describes the landscape design rationale for North Road green bridge and states: '*The existing North Road is a key connection route between North Ockendon and South Ockendon. It currently doesn't include any provision for WCH users and is enclosed by dense hedgerow planting creating an undesirable environment for WCH users wishing to use the route. The proposed design includes a designated off-road WCH route on the green bridge and extending north and south of the bridge. The proposed hedgerow planting reflects the existing character of North Road. The bridge forms part of improved connections across the Project route and into an improved PRoW network.*'
ExQ3_Q16.1.4	Applicant	**Design Principles** Clause No. PEO.05 of the Design Principles document [**REP6-047**] states that *"certain points of access into the PRoW network shall be designated as WCH hubs … facilities such as seating and parking for WCH users wishing to access the network."* Can the Applicant please identify the location of such proposed hubs, particularly where new or additional parking areas are proposed?

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The walking, cycling and horse riding (WCH) hubs were proposed at an early stage of the preliminary design to improve accessibility to the Public Right of Way (PRoW) network. It was envisaged that they would be placed at multiple and key locations across the Project. However, these did not all materialise due to some local landowner concerns about anti-social behaviour on these sites and consequent impacts on neighbouring farmland. The one site that developed at Thong Lane car park, is no longer part of the Project following the removal of this car park (amended Design Principle S2.11, [REP7-140]). The reference to WCH hubs in Design Principle PEO.05 is no longer relevant and the Applicant therefore has amended this Design Principles at Deadline 8 [Document Reference 7.5 (6)] to read as follows:
<table>
<tr><td>PEO.05</td><td>WCH facilities</td><td>Facilities that make the PRoWs accessible and visible shall be provided, such as suitable wayfinding, placemaking/design features and where appropriate, facilities such as seating and cycle parking for WCH users wishing to access the network.</td></tr>
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10 Habitats Regulation Assessment

PINS ID	Question to	Question / Response
ExQ3_Q17.1.1	All IPs	**Habitats Regulations Assessment and the Report on the Implications for European Sites** The ExA directs all IPs but specifically NE, MMO, PLA, EA and Local Authorities to the questions posed within the Report on the Implications for European Sites (RIES) as issued by the ExA on 14 November 2023. The questions relate to clarifying matters or seeking information required to inform the Habitats Regulations Assessment (HRA) and the recommendation to the Secretary of State. Comments on the RIES and responses to questions are timetabled for Deadline 8 (5 December 2023). At this time, should disagreements about any aspect of the HRA remain, the Applicant and any relevant IP are requested to submit a statement setting out what is required, in their view, to enable agreement. There will be circumstances where to be of practical use, this will need to be in the form of a 'without prejudice' statement, where one party may acknowledge that they do not agree with an in-principle position taken by another, but they also set out in practical terms the actions that would be necessary to address the issue, without conceding their basic point that such actions are not necessary.
		Response: For the Applicant's detailed response to these matters, please refer to the following documents submitted at Deadline 8: • Applicant's comments on the Report on Implications for European Sites (RIES) [**Document Reference 9.197**] • Applicant's detailed response to comments made by Natural England on HRA matters [**Document Reference 9.198**] • Assessment of the air quality effects on European sites following Natural England advice [**Document Reference 9.199**]

Glossary

Term	Abbreviation	Explanation
A122		The new A122 trunk road to be constructed as part of the Lower Thames Crossing project, including links, as defined in Part 2, Schedule 5 (Classification of Roads) in the draft DCO [**REP7-090**]
A122 Lower Thames Crossing	**Project**	A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
A122 Lower Thames Crossing/M25 junction		New junction with north-facing slip roads on the M25 between M25 junctions 29 and 30, near North Ockendon.
A13/A1089/A122 Lower Thames Crossing junction		Alteration of the existing junction between the A13 and the A1089, and construction of a new junction between the A122 Lower Thames Crossing and the A13 and A1089, comprising the following link roads: • Improved A13 westbound to A122 Lower Thames Crossing southbound • Improved A13 westbound to A122 Lower Thames Crossing northbound • Improved A13 westbound to A1089 southbound • A122 Lower Thames Crossing southbound to improved A13 eastbound and Orsett Cock roundabout • A122 Lower Thames Crossing northbound to improved A13 eastbound and Orsett Cock roundabout • Orsett Cock roundabout to the improved A13 westbound • Improved A13 eastbound to Orsett Cock roundabout • Improved A1089 northbound to A122 Lower Thames Crossing northbound • Improved A1089 northbound to A122 Lower Thames Crossing southbound
A2		A major road in south-east England, connecting London with the English Channel port of Dover in Kent.
Abnormal Indivisible Load(s)	**AIL**	A load that cannot be divided for the purpose of being carried on a road without undue expense or risk of damage.
Affected Road Network	**ARN**	In air quality assessment, the network of roads to be considered within the air quality model (selection of the roads within the model depends on a number of criteria such as changes in Heavy Duty Vehicle flows).
Air Pollution Information System	**APIS**	A website managed by the Centre for Ecology and Hydrology, providing a searchable database and information on pollutants and their impacts on habitats and species.
Air Quality Management Area	**AQMA**	An area, declared by a local authority, where air quality monitoring does not meet Defra's national air quality objectives.
Air Quality Strategy	**AQS**	A strategy defined by the Government for improving air quality in the UK in the medium term.

Term	Abbreviation	Explanation
Ancient Woodland	**AW**	Designated land that has been continuously wooded since at least 1600AD. Ancient woodland is regarded as irreplaceable habitat and is protected by the National Planning Policy Framework.
Ammonia	**NH_3**	A gas with the formula NH_3 which is released from natural and manmade sources. It contributes to air pollution and can damage the environment through processes such as soil acidification and eutrophication.
Annual Average Weekday Traffic	**AAWT**	The daily number of vehicles passing a point in the road network, averaged over a full year excluding weekends.
Application Document		In the context of the Project, a document submitted to the Planning Inspectorate as part of the application for development consent.
Archaeological Trial Trenching	**ATT**	A method of on-site archaeological investigation where trenches are dug at intervals across a site to identify any archaeological remains.
Area of Outstanding Natural Beauty	**AONB**	Statutory designation intended to conserve and enhance the ecology, natural heritage and landscape value of an area of countryside.
Automated Number Plate Recognition	**ANPR**	Automated Number Plate Recognition is a technology that reads vehicle registration plates to create vehicle location data.
Automatic Traffic Count	**ATC**	Equipment placed on a road that counts traffic.
Automatic Urban and Rural Network	**AURN**	The UK's largest automatic monitoring network and the main network used for compliance reporting against the Ambient Air Quality Directives.
Baseline Noise Level	**BNL**	A measure of source noise.
Best and Most Versatile	**BMV**	Agricultural land which is the most versatile, produces the highest yield or output, produces consistent yields and requires the least input. BMV agricultural land is graded 1, 2 and 3a in the Agricultural Land Classification.
Best Practicable Means	**BPM**	A term used under the Control of Pollution Act 1974 and Environmental Protection Act 1990 to refer to measures which are reasonably practicable, having regard to local conditions and circumstances, to the current state of technical knowledge and to financial implications, concerning the mitigation of noise and other potential nuisance.
Building Research Establishment	**BRE**	n/a
Calculation of Road Traffic Noise	**CRTN**	Provides a methodology originated by the National Physical Laboratory for calculating road traffic noise levels in some situations. It is linked to the procedure issued by the Department for Transport.
Chartered Institute of Ecology And Environmental Management	**CIEEM**	CIEEM provides a variety of services to develop the competency and standards of professional ecologists and environmental managers and also to promote ecology and environmental management as a profession.
Climate Emergency Policy and Planning	**CEPP**	n/a

Term	Abbreviation	Explanation
Code of Construction Practice	**CoCP**	Contains control measures and standards to be implemented by the Project, including those to avoid or reduce environmental effects.
Common Analytical Scenario(s)	**CAS**	A set of seven standardised, off-the-shelf, cross-modal scenarios exploring national level uncertainties which have been developed by DfT for use in forecasting and appraisal.
Community Impacts and Public Health Advisory Group	**CIPHAG**	n/a
Conceptual Site Model	**CSM**	Refers to the source-pathway-receptor (SPR) linkage approach for identifying pollutant linkages. Development and refinement of the CSM is part of the process defined in Environment Agency guidance Land Contamination: Risk Management (Environment Agency, 2020).
Conservation Area	**CA**	An area of special environmental or historic interest or importance, of which the character or appearance is protected by law against undesirable changes (Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990).
Construction		Activity on and/or offsite required to implement the Project. The construction phase is considered to commence with the first activity on site (e.g. creation of site access), and ends with demobilisation.
Construction Site Waste Management Plan	**CSWMP**	A document which sets out how resources will be managed, and waste controlled during the Project. Plans usually involve recording the amount of waste that will be produced and details the proposed methods of waste disposal.
Contaminated Land: Applications in Real Environments	**CL:AIRE**	CL:AIRE is an independent not-for-profit organisation established in 1999 to stimulate the regeneration of contaminated land in the UK by raising awareness of, and confidence in, practical and sustainable remediation technologies.
Control of Pollution Act 1974	**CoPA**	An Act to make further provision with respect to waste disposal, water pollution, noise atmospheric pollution and public health; and for purposes connected with the matters aforesaid.
Department for Environment, Food and Rural Affairs	**Defra**	The government department responsible for environmental protection, food production and standards, agriculture, fisheries and rural communities in the United Kingdom of Great Britain and Northern Ireland. Activity on and/or offsite required to implement the Project.
Department for Transport	**DfT**	The government department responsible for the English transport network and a limited number of transport matters in Scotland, Wales and Northern Ireland that have not been devolved.
Department for Levelling Up, Housing and Communities	**DLUHC**	The UK Government department for housing, communities, local government in England and the levelling up policy. Formerly called the Ministry of Housing, Communities and Local Government.

Term	Abbreviation	Explanation
Design Manual for Roads and Bridges	**DMRB**	A comprehensive manual containing requirements, advice and other published documents relating to works on motorway and all-purpose trunk roads for which one of the Overseeing Organisations (National Highways, Transport Scotland, the Welsh Government or the Department for Regional Development (Northern Ireland)) is highway authority. For the A122 Lower Thames Crossing the Overseeing Organisation is National Highways.
Development Consent Order	**DCO**	Means of obtaining permission for developments categorised as Nationally Significant Infrastructure Projects (NSIP) under the Planning Act 2008.
Development Consent Order application	**DCO application**	The Project Application Documents, collectively known as the 'DCO application'.
Do-Minimum	**DM**	A future year scenario in LTAM which includes changes to the road network and planned development that is forecast to go ahead, but not the Lower Thames Crossing.
Do-Minimum Future Year Scenario	**DMFY**	A future year (2045) scenario in the Project traffic model (LTAM) which includes changes to the road network and planned development that is forecast to go ahead, but not the Lower Thames Crossing.
Do-Minimum Opening Year Scenario	**DMOY**	An opening year (2030) scenario in the Project traffic model (LTAM) which includes changes to the road network and planned development that is forecast to go ahead, but not the Lower Thames Crossing.
Do-Something	**DS**	A future year scenario in LTAM which includes changes to the road network and planned development that is forecast to go ahead, and the Lower Thames Crossing.
Do-Something Future Year Scenario	**DSFY**	A future year (2045) scenario in the Project traffic model (LTAM) which includes changes to the road network and planned development that is forecast to go ahead, and also the Lower Thames Crossing.
Do-Something Opening Year Scenario	**DSOY**	An opening year (2030) scenario in the Project traffic model (LTAM) which includes changes to the road network and planned development that is forecast to go ahead, and also the Lower Thames Crossing.
DP World London Gateway	**DPWLG**	Dubai Ports World, London Gateway Port
Draft Development Consent Order	**dDCO**	The Project's draft Development Consent Order [**REP7-090**].
Draft National Policy Statement National Networks	**dNPSNN**	The revised draft National Policy Statement for National Networks by the Department for Transport, which was consulted on in March 2023.
Electric vehicle	**EV**	n/a
Emissions Factors Toolkit	**EFT**	The Emissions Factors Toolkit (EFT) is published by Defra and the Devolved Administrations to assist local authorities in carrying out review and assessment of local air quality as part of their duties under the Environment Act 1995.
Environmental Clerk of Works	**ECoW**	A key role on sites where ecological receptors may be affected by development. The presence of an ECoW is often a requirement of planning conditions, or a European Protected Species (EPS) licence, whereby the ECoW provides the mechanism to discharge conditions.

Term	Abbreviation	Explanation
Environmental Impact Assessment	**EIA**	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. For certain projects, EIA is a statutory requirement, reported an Environmental Statement.
Environmental Management Plan	**EMP**	For the Project, a plan setting out the conclusions and actions needed to manage environmental effects as defined by the Design Manual for Roads and Bridges standard LA 120. The CoCP is the equivalent of the first iteration of the EMP (EMP1). The contractor's EMP would be EMP2 and the end of construction EMP would be EMP3.
Environmental Statement	**ES**	A document produced to support an application for development consent that is subject to Environmental Impact Assessment (EIA), which sets out the likely impacts on the environment arising from the proposed development.
Essex Place Services	**EPS**	A public sector provider of integrated environmental assessment, planning, design and management services
Examining Authority Environmental Statement	**ExAES**	The Examining Authority is appointed by the Secretary of State to examine an application for a Development Consent Order and make a recommendation. A document produced to support an application for development consent that is subject to Environmental Impact Assessment (EIA), which sets out the likely impacts on the environment arising from the proposed development.
Flood Risk Assessment	**FRA**	An assessment of the risk of flooding from all flooding mechanisms, the identification of flood mitigation measures, and identification of actions to be taken before and during a flood.
Framework Construction Travel Plan	**FCTP**	A framework with regard to the implementation of travel planning for the movement of personnel to and from the construction worksites, compounds and ULHs during the construction phase of the Project.
GEH	**-**	A formula used to compare two traffic volumes, named after its originator, Geoff E. Havers. It is similar to a chi-squared test.
Generic Quantitative Risk Assessment	**GQRA**	Tier 2 of the risk assessment process according to LCRM guidance on the assessment of land contamination. A GQRA uses generic assessment criteria and assumptions to estimate risk.
Greenhouse gas	**GHG**	Gases able to absorb infrared radiation emitted from Earth's surface and reradiate it back to Earth's surface, thus contributing to the greenhouse effect. Carbon dioxide, methane, and water vapour are the most important greenhouse gases.
Guidelines for Landscape and Visual Impact Assessment (Third Iteration)	**GLVIA3**	Assessment guidelines issued by the Landscape Institute (version 3: GLVIA 3)
Highways England		Former name of National Highways.
Heavy Goods Vehicle Highways England	**HGV**	A large, heavy motor vehicle used for transporting cargo. Former name of National Highways.

Term	Abbreviation	Explanation
Habitats Regulations Assessment	**HRA**	A tool developed by the European Commission to help competent authorities (as defined in the Habitats Regulations) to carry out assessment to ensure that a project, plan or policy will not have an adverse effect on the integrity of any Natura 2000 or European sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites), either in isolation or in combination with other plans and projects, and to begin to identify appropriate mitigation strategies where such effects were identified.
Health and Equalities Impact Assessment	**HEqIA**	A systematic process used to identify the potential health and equalities impacts arising from policies, plans, programmes and projects, to identify the distribution of those effects amongst the population and to identify mitigation measures to address these effects, thereby minimising adverse effects on the local population
High Speed 1	**HS1**	A 109km high-speed railway between London and the UK end of the Channel Tunnel. The line carries international passenger traffic between the UK and continental Europe; it also carries domestic passenger traffic to and from stations in Kent and east London, as well as Berne gauge freight traffic.
Institute of Air Quality Management	**IAQM**	A professional body for air quality professionals.
Integrated Care Board	**ICB**	A statutory NHS organisation which is responsible for developing a plan for meeting the health needs of the population, managing the NHS budget and arranging for the provision of health services in a geographical area.
Integrated Care Partnership	**ICP**	A statutory committee jointly formed between the NHS integrated care board and all upper-tier local authorities that fall within an Integrated Care System area. The ICP is responsible for producing an integrated care strategy on how to meet the health and wellbeing needs of the population in the Integrated Care System area.
Interested Party	**IP**	A person or persons with an interest in land affected by the application, or who has registered a relevant representation by the deadline set by the Planning Inspectorate after the application has been accepted.
Land Contamination Risk Management	**LCRM**	Guidance published by the Environment Agency used to identify and assess if there is an unacceptable risk, assess what remediation options are suitable to manage the risk, plan and carry out remediation, and verify that remediation has worked.
Landscape Character Area	**LCA** **LLCA**	The 'discrete geographical areas of particular landscape type' (source of definition: GLVIA3). Note: Local Landscape Character Area is referred to as LLCA.
Landscape and Ecology Management Plan	**LEMP**	A document which provides details on the delivery and management of the landscape and ecology elements identified in the Environmental Masterplan for the Project, including their success criteria.
Landscape and Visual Impact Assessment	**LVIA**	Part of a planning application or environmental assessment that looks at the impact of development on the character of a landscape.

Term	Abbreviation	Explanation
Lead Local Flood Authority	**LLFA**	LLFAs are county councils and unitary authorities. They lead in managing local flood risks (i.e. risks of flooding from surface water, ground water and ordinary (smaller) watercourses). This includes ensuring co-operation between the Risk Management Authorities in their area. The LLFA for the M25 area is Essex County Council who is acting on behalf of Thurrock.
Light detection and ranging process	**LiDAR**	A surveying method that measures distance to a target by illuminating that target with a laser light.
Light Duty Vehicle	**LDV**	A vehicle designed for light duty work, such as a small van.
Light Goods Vehicle	**LGV**	Vehicles meeting the Department for Transport VEH04 criteria.
Likely significant effects	**LSE**	n/a
Limit Value(s)	**LV**	A level for an air quality pollutant fixed on the basis of scientific knowledge, with the aim of avoiding, preventing or reducing harmful effects on human health and/or the environment as a whole, to be attained within a given period and not to be exceeded once attained.
Local Air Quality Management	**LAQM**	A process that requires local authorities across the UK to review, assess and manage the air quality within their geographical areas.
Local Impact Report	**LIR**	As set out in the Planning Inspectorate's Advice Note One, as part of the Planning Act 2008 process, the relevant local authorities are invited to submit a Local Impact Report (LIR) giving details of the likely impact of the proposed development on the authority's area.
Local Nature Reserve(s)	**LNR**	Locally designated nature site protected through the planning system.
Local Road Network	**LRN**	n/a
Local Wildlife Site(s)	**LWS**	Locally designated nature site protected through the planning system. See also the entry for 'LNR'.
London Borough of Havering	**LBH**	n/a
Lower Thames Area Model	**LTAM**	Transport model designed to forecast impacts of providing additional road based capacity across the River Thames at locations at or east of the existing Dartford Crossing.
Lower Thames Crossing	**LTC**	A proposed new crossing of the Thames Estuary linking the county of Kent with the county of Essex, at or east of the existing Dartford Crossing.
Lowest Observed Adverse Effect Level	**LOAEL**	The lowest concentration or amount of a substance found by experiment or observation that causes an adverse alteration of morphology, function, capacity, growth, development or lifespan of a target organism distinguished from normal organisms of the same species under defined conditions of exposure.
M2 junction 1		The M2 will be widened from three lanes to four in both directions through M2 junction 1.
M2/A2/A122 Lower Thames Crossing junction		New junction proposed as part of the Project to the east of Gravesend between the A2 and the new A122 Lower Thames Crossing with connections to the M2.

Term	Abbreviation	Explanation
M25 junction 29		Improvement works to M25 junction 29 and to the M25 north of junction 29. The M25 through junction 29 will be widened from three lanes to four in both directions with hard shoulders.
Micrograms per cubic metre	**µg/m^3**	The principal unit of measurement for the concentration of an air pollutant in ambient air.
Micrometre/micron	**µm**	One millionth of a metre.
Manual Classified Counts	**MCCs**	n/a
National Cycle Network	**NCN**	A series of traffic-free paths and quiet, on-road cycling and walking routes that connect to every major town and city. These routes are promoted for both recreational and active travel purposes.
National Cycle Route	**NCR**	A cycle route part of the National Cycle Network created by Sustrans to encourage cycling throughout Britain.
National Highways		A UK government-owned company with responsibility for managing the motorways and major roads in England. Formerly known as Highways England.
National Highways Design Review Panel	**NHDRP**	n/a
National Planning Policy Framework	**NPPF**	A framework published in March 2012 by the UK's Department of Communities and Local Government, consolidating previously issued documents called Planning Policy Statements (PPS) and Planning Practice Guidance Notes (PPG) for use in England. The NPPF was updated in February 2019 and again in July 2021 by the Ministry of Housing, Communities and Local Government.
National Policy Statement	**NPS**	Set out UK government policy on different types of national infrastructure development, including energy, transport, water and waste. There are 12 NPS, providing the framework within which Examining Authorities make their recommendations to the Secretary of State.
National Policy Statement for National Networks	**NPSNN**	Sets out the need for, and Government's policies to deliver, development of Nationally Significant Infrastructure Projects (NSIPs) on the national road and rail networks in England. It provides planning guidance for promoters of NSIPs on the road and rail networks, and the basis for the examination by the Examining Authority and decisions by the Secretary of State.
National Road Traffic Projections 2022	**NRTP22**	2022 report presenting the Department for Transport's updated strategic view of future road travel demand. Including long term projection data of road traffic, congestion and emissions in England and Wales from 2025 to 2060
Nationally Significant Infrastructure Project	**NSIP**	Major infrastructure developments in England and Wales, such as proposals for power plants, large renewable energy projects, new airports and airport extensions, major road projects etc that require a development consent under the Planning Act 2008.

Term	Abbreviation	Explanation
National Trip End Model	**NTEM**	A model that forecasts the growth in trip origin-destinations (or productions-attractions) up to 2051 for use in transport modelling. The forecasts take into account national projections of population, employment, housing, car ownership and trip rates.
Natural England	**NE**	An executive non-departmental public body, sponsored by the Department for Environment, Food & Rural Affairs, which is the government's adviser for the natural environment in England, helping to protect England's nature and landscapes for people to enjoy and for the services they provide.
Nature Improvement Areas	**NIAs**	Established to create joined up and resilient ecological networks at a landscape scale. These are run by partnerships of local authorities, local communities and landowners, the private sector and conservation organisations with funding provided by Defra and Natural England.
New Nuclear Local Authorities Group	**NNLAG**	n/a
Nitrogen	**N**	A chemical element
Nitrogen dioxide	**NO_2**	A reactive gas introduced into the environment by natural causes, including entry from the stratosphere, bacterial respiration, volcanos, and lightning. It is also introduced by the emissions of internal combustion engines burning fossil fuels.
Nitrogen oxides	**NO_x**	A group of seven gases and compounds composed of nitrogen and oxygen, sometimes collectively known as NO_x gases.
Noise and Vibration Management Plan	**NVMP**	Incorporates measures proposed and procedures for the management of noise and vibration arising during the construction phase.
Non-motorised users	**NMUs**	Users of non-motorised vehicles (eg cyclists, horse riders) and pedestrians
North Portal		The North Portal (northern tunnel entrance) would be located to the west of East Tilbury. Emergency access and vehicle turn-around facilities would be provided at the tunnel portal. The tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.
Operation		Describes the operational phase of a completed development and is considered to commence at the end of the construction phase, after demobilisation.
Order Limits		The outermost extent of the Project, indicated on the Plans by a red line. This is the Limit of Land to be Acquired or Used (LLAU) by the Project. This is the area in which the DCO would apply.
Outline Written Scheme of Investigation	**oWSI**	Sets out the scope, guiding principles and methods for the planning and implementation of essential archaeological mitigation.
Particulate matter (2.5µm)	**$PM_{2.5}$**	Particulate matter with a diameter equal to or less than 2.5 micrometres.
Particulate matter (10µm)	**PM_{10}**	Particulate matter with a diameter between 2.5 and 10 micrometres.

Term	Abbreviation	Explanation
Passenger Car Unit(s)	**PCU**	A metric to allow different vehicle types within traffic flows in a traffic model to be assessed in a consistent manner. PCU factors used within the Project's transport model are: 1 for a car or Light Goods Vehicle; 2 for a bus, 2.5 for a Heavy Goods Vehicle.
Personal Injury(ies) Accident(s)	**PIA**	An accident that involves personal injury occurring on the public highway (including footways) in which at least one road vehicle or a vehicle in collision with a pedestrian in involved and which becomes known to the police within 30 days of its occurrence.
Planning Act 2008		The primary legislation that establishes the legal framework for applying for, examining and determining Development Consent Order applications for Nationally Significant Infrastructure Projects.
Pollution Climate Mapping model	**PCM model**	Defra's Pollution Climate Mapping model
Port of London Authority	**PLA**	A self-funding public trust established by The Port of London Act 1908 to govern the Port of London. Its responsibility extends over the Tideway of the River Thames and its continuation (the Kent/Essex strait). It maintains and supervises navigation, and protects the river's environment.
Port of Tilbury London Limited	**PoTLL**	n/a
Post Opening Project Evaluation	**POPE**	Checks whether investments in Major Projects are delivering the outcomes documented in the Appraisal Summary Table published prior to scheme approval. National Highways produces the reports 'one year after' and 'five years after' road opening.
Preliminary Navigational Risk Assessment	**pNRA**	A document which assesses the risk to water users associated with the works the Project is undertaking within the Tidal Thames.
Private Rented Sector	**PRS**	n/a
Project Air Quality Action Plan	**PAQAP**	The section of the air quality assessment where the proposed viable mitigation measures are set out and assessed.
Project road		The new A122 trunk road, the improved A2 trunk road, and the improved M25 and M2 special roads, as defined in Parts 1 and 2, Schedule 5 (Classification of Roads) in the draft DCO [**REP7-090**].
Project route		The horizontal and vertical alignment taken by the Project road.
Public Right of Way	**PRoW**	A right possessed by the public to pass along routes over land at all times. Although the land may be owned by a private individual, the public may still gain access across that land along a specific route. The mode of transport allowed differs according to the type of Public Right of Way, which can consist of footpaths, bridleways and open and restricted byways.
Queen Elizabeth ll Bridge	**QEII Bridge**	Queen Elizabeth ll Bridge, part of the Dartford-Thurrock crossing.

Term	Abbreviation	Explanation
Register of Environmental Actions and Commitments	**REAC**	The REAC identifies the environmental commitments that would be implemented during the construction and operational phases of the Project if the Development Consent Order is granted, and forms part of the Code of Construction Practice (Application Document 6.3, ES Appendix 2.2).
Relevant Representation	**RR**	A form that is completed before the examination begins, to register as an Interested Party.
Road Investment Strategy	**RIS**	The Government's long-term strategy to improve England's motorways and major A roads. The first RIS (known as RIS 1) was published in 2015 and covers the period 2015-2020. A second RIS (RIS 2) was published in 2020, and covers the post-2020 period.
Roadside Nature Reserve	**RNR**	Highway verges that are protected for their special wildlife interest which help to complete the protection of non-statutory sites of wildlife interest, in parallel with the County Wildlife Site system.
Secretary of State	**SoS**	The Secretary of State has overall responsibility for the policies of the Department for Transport.
Significant Observed Adverse Effect Level	**SOAEL**	The noise level above which significant adverse effects on health and quality of life occur.
Simulation and Assignment of Traffic to Urban Road Networks	**SATURN**	Software used to build transport models.
Site of Importance for Nature Conservation	**SINC**	Locally designated nature site protected through the planning system.
Site(s) of Special Scientific Interest	**SSSI**	A conservation designation denoting an area of particular ecological or geological importance.
Site-Specific Written Scheme of Investigation	**SSWSI**	Site-Specific Written Schemes of Investigation will be prepared by the archaeological contractors, based on the outline Written Scheme of Investigation, to set out the detailed methodology for each area of fieldwork.
Site Waste Management Plan	**SWMP**	A document which sets out how resources will be managed, and waste controlled during the Project. Plans usually involve recording the amount of waste that will be produced and details the proposed methods of waste disposal.
Skills, Education and Employment	**SEE**	n/a
South East Local Enterprise Partnership	**SELEP**	The business-led, public/private body established to drive economic growth across East Sussex, Essex, Kent, Medway, Southend and Thurrock.
South Portal		The South Portal of the Project (southern tunnel entrance) would be located to the south-east of the village of Chalk. Emergency access and vehicle turn-around facilities would be provided at the tunnel portal. The tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations.

Term	Abbreviation	Explanation
Special Area(s) of Conservation	**SAC**	A designation under EU Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, also known as the Habitats Directive.
Special Educational Needs and Disabilities	**SEND**	n/a
Special Protection Area(s)	**SPA**	A designation under EU Directive 2009/147/EC on the Conservation of Wild Birds.
Statement of Common Ground	**SoCG**	A Statement of Common Ground is a written statement containing factual information about the proposal which is the subject of the appeal that the appellant reasonably considers will not be disputed by the local planning authority.
Strategic Road Network	**SRN**	The core road network in England managed by National Highways.
Sulphur Dioxide	**SO_2**	A gas primarily arising from anthropogenic activities and, more specifically, combustion of fuels containing sulphur and sulphur compounds. Sulphur dioxide is emitted in negligible quantities during the combustion of natural gas but generally at higher concentrations for liquid fuels which have a higher sulphur content.
The tunnel		Proposed 4.25km (2.5 miles) road tunnel beneath the River Thames, comprising two bores, one for northbound traffic and one for southbound traffic. Cross-passages connecting each bore would be provided for emergency incident response and tunnel user evacuation. Tunnel portal structures would accommodate service buildings for control operations, mechanical and electrical equipment, drainage and maintenance operations. Emergency access and vehicle turn-around facilities would also be provided at the tunnel portals.
Tonnes of CO_2 equivalent	**tCO_2e**	A metric relating to emissions of carbon dioxide and the resultant climate change impact adopted by the UN.
Traffic Management Forum	**TMF**	The TMF would review planned traffic management arrangements and receive comments as to their appropriateness. The TMF would also monitor, review, and provide updates to the TMPs when required
Traffic Management Plan for Construction	**TMP**	A plan setting out the strategy and measures to be adopted with respect to highway and transportation issues for the Project. The TMP supports the DCO application and would be embedded within the eventual construction contractor documentation and will form an overarching and comprehensive management procedure for the Contractor to adhere to.
Transport Analysis Guidance	**TAG**	National guidance document produced by the Department for Transport.
Transport Decarbonisation Plan	**TDP**	A plan published by the Department for Transport in 2021 which sets out the government's commitments and the actions needed to decarbonise the entire transport system in the UK.
Trip End Model Presentational Program	**TEMPro**	DfT software for viewing data from the DfT's National Trip End Model.

Term	Abbreviation	Explanation
Tunnel Boring Machine	**TBM**	Machine used to excavate tunnels with a circular cross-section.
Unexploded ordnance	**UXO**	Explosive ammunition that did not explode when they were deployed and still pose a risk of detonation. Sometimes referred to as UXBs.
Utility Logistics Hub(s)	**ULH**	Temporary compounds required for specific utility works. They would receive, store and distribute the plant machinery and materials for specific utility works. They may include offices, welfare facilities, refuelling stations, security hubs, vehicle/wheel washing sites and parking areas similar in size to the main works satellite compounds.
Variable Message Sign	**VMS**	A road sign able to display different messages, typically mounted on a portal gantry.
VISSIM	**-**	Micro-simulation traffic modelling software
VISUM	**-**	Strategic car and rail modelling software.
Walking, Cycling and Horse Riding	**WCH**	Walkers, cyclists and horse riders.
Water Framework Directive	**WFD**	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. The Directive establishes a framework for the protection of inland surface waters, estuaries, coastal waters and groundwater. The framework for delivering the WFD is through river basin management planning. The UK has been split into several river basin districts. Each river basin district has been characterised into smaller management units known as water bodies. The surface water bodies may be rivers, lakes, estuary or coastal.
Wider Network Impacts Management and Monitoring Plan	**WNIMMP**	This document sets out National Highways' approach on the forecast wider network impacts of the Project.
Workers Accommodation Report	**WAR**	This document sets out the estimated number of workers at the peak construction phase of the Project who would require temporary accommodation. It considers what type of accommodation these workers are anticipated to seek and where, and a consideration of this demand in the context of supply and the operation of the accommodation market.
Workforce Accommodation Working Group	**WAWG**	n/a
Written Representation	**WR**	

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