highways england

Lower Thames Crossing

Environmental Impacts Update

Design refinement consultation July 2020

Highways England

Highways England is a government-owned company that works with the Department for Transport.

We operate, maintain and improve England's motorways and major A-roads, also known as the strategic road network.

Our aim is to ensure that road users have safer and more reliable journeys, and that businesses have the high-quality, effective road links they need to prosper.

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1. Introduction

As part of our statutory consultation in 2018, we produced a Preliminary Environmental Information Report (PEIR). This provided the public, statutory consultees and other stakeholders with preliminary information about the project's likely significant environmental effects, and the measures being considered to avoid or minimise them. A copy of the PEIR can be found online at **https://highwaysengland.citizenspace.com/ltc/consultation/**

Following on from our statutory consultation, we held a non-statutory supplementary consultation earlier this year, which sought feedback on a number of proposed changes to the project. We published an Environmental Impacts Update as part of this, which set out our understanding of how the proposed changes affected the preliminary environmental information presented in the PEIR. A copy of the Environmental Impacts Update published at supplementary consultation can be found at **https://highwaysengland.citizenspace.com/ltc/consultation-2020/**

We have continued to develop our design proposals, working closely with stakeholders and statutory consultees, and listening to the comments received at our previous consultations in the process. This has informed a number of design refinements, which we are now consulting on. Further information regarding these refinements can be found in the guide to design refinement consultation.

In this document, we have set out our current understanding of how these proposed refinements affect the preliminary environmental information that was presented in our 2018 PEIR and, where relevant, the Environmental Impacts Update published for our 2020 supplementary consultation earlier this year.

Further assessments and the development of detailed measures to reduce environmental effects are ongoing as part of our Environmental Impact Assessment (EIA). These will be reported in the Environmental Statement (ES), which will also be informed by the project's consideration of consultation responses, and further survey and design work. The ES will be submitted as part of the Development Consent Order (DCO) application, which we will submit to the Planning Inspectorate later this year.

We are continuing to work with stakeholders and statutory consultees to develop our design, so we can minimise environmental impacts wherever possible.

Update on the environmental effects associated with the proposed refinements

The following content provides an update on the environmental effects associated with the proposed refinements, compared with those considered in the PEIR. The PEIR, undertaken in 2018, contains an assessment of the project as a whole at that time. As this document identifies how the previous assessment is affected as a result of the proposed refinements, they are more location specific, as compared to the PEIR.

The assessment here follows the methodology used in the PEIR and the Environmental Impacts Update document published as part of our supplementary consultation.

The guide to design refinement consultation sets out our proposals in relation to special category land. In each case, we do not anticipate that these proposals would result in a change to the nature of effects and mitigation measures reported in the PEIR. This includes the assessment of effects on people and communities.

If you wish to find out more about our preliminary environmental assessment of the effects of the Lower Thames Crossing, you should read the PEIR in conjunction with this document.

Note: In this document we refer to receptors. A receptor is a component of the environment that would potentially be directly impacted by the proposed project. Examples include water bodies, sensitive sites, schools and soils.

Note: Throughout the tables we refer to the Code of Construction Practice (CoCP) and the Construction Environmental Management Plan (CEMP).

Have your say

To comment on the environmental impacts of the refinements and how we plan to reduce them, answer question three in the response form.

2. Design refinements

M2/A2 area

Ancient woodland compensation and planting
There have been a number of refinements to multiple areas of ancient woodland compensation and other planting within this area. None of these would result in any material difference to the environmental effects or mitigation as reported in the PEIR. Subtle differences in environmental conclusions exist between these design changes regarding landscape and visual, biodiversity and people and communities; these are reported separately for each design change.

1. Ancient woodland compensation between Claylane Wood and Shorne Woods

To the west of the A2 between Claylane Wood and Shorne Woods, the proposed ancient woodland compensation has been refined. Due to utility diversions required within Claylane Wood, the ancient woodland compensation in this area would be reduced.

Expected effects	What we are doing and why
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The design change is a result of an update to the landscape mitigation in the area. It comprises a change to planting areas to reflect utility constraints and vegetation loss as a result of construction works. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

2. Ancient woodland planting near the edge of Gravesend

As ancient woodland compensation near Claylane Wood has been reduced due to utilities works (see above), we would increase the proposed ancient woodland compensation planting near the edge of Gravesend, as much as is reasonably practical.

Expected effects	What we are doing and why
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The extent of woodland planting to the edge of Gravesend has been updated to maintain an open aspect of Thong. The shape of planting is considerate to the landscape and reflects the former alignment of the RAF Gravesend airstrip. Although there is a slight benefit to the nature of the effects, there would be no significant change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

3. Ancient woodland compensation between Brewers Wood and Great Crabbles Wood

Between Brewers Wood and Great Crabbles Wood, we have included more detail on the ancient woodland compensation, which comprises woodland and grassland areas. The landscaping in this area would be designed to connect both woodlands and proposed replacement open space land.

Expected effects	What we are doing and why
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The design change relates to additional planting between Brewers Wood and Great Crabbles Wood for the purpose of ancient woodland compensation in the area. This adds to the existing landscape character, which includes numerous woodland areas. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** It is not anticipated that the update of ancient woodland mitigation in this area would alter the assessment of the effects presented in the PEIR. **Operation:** The enhanced ecological connectivity between Brewers Wood and Great Crabbles Wood improves the mitigation for habitat fragmentation and species mortality in the area. This change represents a benefit to the designs assessed in the PEIR.	The upgrade of mitigation from that reported in the PEIR would increase the mitigation of habitat fragmentation as a result of the project construction, and species mortality during project operation.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. The design change would result in a slight increase in land take and therefore a slight increase in likely significant effects on agricultural land and business. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and a CEMP.

4. Ancient woodland compensation south of High Speed 1 (HS1)

To the south of HS1, we would reduce the proposed ancient woodland compensation due to the presence of a cultural heritage building and to maintain a sense of open space at this location. It has also been reduced in response to fewer utility works required than presented at supplementary consultation.

Expected effects	What we are doing and why
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The design refinement is in relation to a change in ancient woodland compensation in the area to fit with existing utility and other constraints. The modification is also because of fewer land take requirements from utilities works. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** The design change is in relation to ancient woodland compensation in the area, to fit with existing utility and other constraints. The modification is also a result of reduced land take requirements for utilities works. With these revisions, there is a reduction in the area required as a potential receptor site for translocation of protected species. Overall, we do not expect a material change to the assessment reported in the PEIR.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

5. Ancient woodland compensation to the north of Shorne Woods

To the north of Shorne Woods, we would redesign the original block planting layout of our ancient woodland compensation, so that it follows the existing topography of the land and better reflects the landscape character of the area. The redesigned area would also accommodate the utility works proposed close to this location.

Expected effects	What we are doing and why
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The design refinement is in relation to a change in ancient woodland compensation in the area. The planting would be changed to reflect existing landscape character, and the edge of the woodland now follows the existing topography of the land. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** The design change is in relation to a change in ancient woodland compensation in the area. Overall, we do not expect a material change to the assessment reported in the PEIR.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

The following environmental observations are shared for each of these design changes:

1. Ancient woodland compensation between Claylane Wood and Shorne Woods.
2. Ancient woodland planting near the edge of Gravesend.
3. Ancient woodland compensation between Brewers Wood and Great Crabbles Wood.
4. Ancient woodland compensation south of HS1.
5. Ancient woodland compensation to the north of Shorne Woods.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual rows above (tables 1-5).
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

6. Reduced land take through Shorne Woods Country Park and additional landscaping

We have revised our utility works and, therefore, require less land take through Shorne Woods Country Park. We have also included additional landscaping in this area.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Thong, there is the potential for temporary significant adverse effects within the vicinity of the works. **Operation:** The design change includes the introduction of an environmental barrier as mitigation to the north of the Lower Thames Crossing. This would act as noise mitigation for the area. We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The design change has resulted in the modification of landscape mitigation in the area, which will help to screen views of the Lower Thames Crossing from the north. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would increase the extent of habitat loss compared with that reported in the PEIR. It would involve vegetation clearance within the Shorne and Ashenbank Woods Site of Special Scientific Interest (SSSI) and an area noted as a potential receptor site for the translocation of protected species. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** The area of works would be replanted as far as practicable; however, it is noted that not all vegetation loss can be replanted in its entirety. Overall, we do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing the measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.
People and communities **Construction:** This design change would result in an increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

7. Electricity substation landscaping

We have developed our landscaping proposals around the electricity substation at the southern tunnel entrance. The proposed earthworks and woodland planting are intended to help integrate the infrastructure into the existing landscape and provide suitable visual screening.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** Although there would be maintenance vehicles accessing the sites during operation, it is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in the area, there is the potential for temporary significant adverse effects within the vicinity of the works. **Operation:** Although there would be maintenance vehicles accessing the sites during operation, we do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** There would be no significant change to the assessment reported in the PEIR due to the development of landscaping proposals, although this design is located within the Kent Downs Area of Outstanding Natural Beauty (AONB).	Mitigation proposals continue to reflect those outlined in the PEIR. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would increase the extent of habitat loss when compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR as appropriate drainage has been designed for the newly proposed access road.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing the measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and a CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

8. Refinements to Brewers Road green bridge

The Brewers Road bridge over the A2 would be moved approximately six metres east. The green space would be amalgamated on the eastern side of Brewers Road bridge over the A2 to provide better connectivity for the landscape, ecology and habitats.

Also in this area, a small section of the proposed National Cycle Route (NCR) 177, south of the Brewers Road green bridge, would be amended to cater for a more gentle incline.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment of archaeological remains reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES.
Landscape and visual **Construction:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. This is a result of the enhanced connectivity of planting in the landscape.	Mitigation proposals continue to reflect those outlined in the PEIR. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** It is not anticipated that the movement and modification of the green bridge at this location would alter the assessment of the effects presented in the PEIR. **Operation:** The improved ecological connectivity between the green bridge and the surrounding area increases the green bridge's value for a range of species and therefore strengthens this mitigation effect for species mortality during operation, when compared to the design assessed in the PEIR.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** There has been a slight change to the proposed provision for walkers, cyclists and horse riders than was shown in the supplementary consultation and PEIR. The new NCR177 cycle route proposed at supplementary consultation has been updated in a small section to cater for a more gentle incline. Overall, we do not expect there to be material differences on the people and communities assessment presented in the PEIR and supplementary consultation as a result of this change.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

9. Retaining wall added alongside HS1 land

A concrete retaining wall approximately 20 metres long and two metres high would be added alongside HS1 land. Although the introduction of the retaining wall adds a new built element, there would be no change in the nature of effects and mitigation measures reported in the PEIR.

10. Refinements to Thong Lane green bridge over the A2

The Thong Lane green bridge over the A2 would move approximately five metres west. Further green space would be amalgamated on the western side of the bridge to improve species habitat, the landscape and ecological connectivity.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported along Thong Lane in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Thong, there is the potential for temporary significant adverse effects locally within the vicinity of the bridge works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment of archaeological remains reported in the PEIR. **Operation:** Increased landscape planting on the western side of the green bridge would likely provide better screening of the Lower Thames Crossing from the southern end of Thong Conservation Area, potentially providing a slight reduction to the nature of the adverse effects reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual row below.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. This is a result of the enhanced woodland connectivity north-south into Shorne and Ashenbank Woods SSSI.	The mitigation proposals have been updated at this location and are available to view in the Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** It is not anticipated that the movement and modification of the green bridge at this location would alter the assessment of the effects presented in the PEIR. **Operation:** The ecological connectivity between the green bridge and Shorne and Ashenbank Woods SSSI increases the green bridge's value for a range of species and therefore strengthens this mitigation effect for species mortality during operation, when compared to the design assessed in the PEIR.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value. The upgrade of this design from that reported in the PEIR would increase the mitigation of habitat fragmentation as a result of the project construction, and species mortality during project operation.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** There has been no change to the proposed provision for walkers, cyclists and horse riders that was shown at supplementary consultation as a result of moving the green bridge or the green space. This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are minimising the impact of the project on recreational users in this area. Mitigation would be as reported in the PEIR. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

11. Refinements to Thong Lane green bridge over the Lower Thames Crossing and a new informal parking area to the east

The Thong Lane green bridge over the Lower Thames Crossing would move approximately 20 metres north and would be raised by less than half a metre. As a result of the bridge moving, the proposed new shared path on Thong Lane over the Lower Thames Crossing would also move. This would allow for more woodland planting on and around the southern part of the bridge, providing a wooded connection between Shorne Woods and Claylane Wood. This means the overhead electricity transmission cable diversion that was shown at supplementary consultation would also require changing (see refinement 17 below for more details).

In addition, a new informal parking area is proposed to the east of Thong Lane green bridge over the Lower Thames Crossing.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported along Thong Lane in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Gravesend, there is the potential for temporary adverse effects locally within the vicinity of the bridge works. However, we do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** A larger construction area due to the introduction of a car park increases the adverse effects reported in the PEIR through a possible change to the setting of Thong Conservation Area. There would be no significant change to the assessment of archaeological remains reported in the PEIR. **Operation:** It is likely that increased landscape planting would provide better screening of the Lower Thames Crossing from the northern end of the Thong Conservation Area, potentially providing a small reduction in the adverse effects reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual row below.

Expected effects	What we are doing and why
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. This is as a result of the enhanced green space and the woodland planting on and around the southern part of the bridge connecting Shorne Woods and Claylane Wood. The design change would result in the relocation of overhead electricity pylons and a proposed car park being added to the landscape. The car park is located to the east of the green bridge, with Gravesend being on the west. Due to the pylons being in the existing landscape and the chosen location of the car park, it is unlikely that there would be a significant change in associated landscape and visual effects in this area.	The mitigation proposals have been updated at this location and are available to view in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** It is not anticipated that the movement and modification of the green bridge at this location would alter the assessment of the effects presented in the PEIR. **Operation:** The enhanced green space and woodland planting connecting Shorne Woods, part of Shorne and Ashenbank Woods SSSI, and Claylane Wood provides further habitat provision. This increases its value for a range of species and therefore strengthens the mitigation effect for species mortality during operation, when compared to the design assessed in the PEIR. The green bridge would reduce the potential receptor site for translocation of protected species to the north. However, no change to significant effects is likely due to the mitigation effects it provides. The introduction of the car park is likely to remove habitats from the area. However, the additional green space and woodland planting would compensate for any habitat loss.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value. The upgrade of this design from that reported in the PEIR would increase the mitigation of habitat fragmentation as a result of the project construction, and species mortality during project operation.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR as appropriate drainage has been designed for the newly proposed parking area.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** The modification of the green bridge and introduction of a new car park would create a connection between Shorne Woods and Claylane Wood and assist in easing current parking issues along Brewers Road and alleviating problems caused by the lack of capacity at Shorne Woods Country Park Visitors Centre. The design could potentially encourage recreation activities for local communities. The change would result in a beneficial effect and would represent a material improvement to the effects reported in the PEIR.	We would provide better local connections at this location. We are continuing to assess the impact of the project on nearby communities. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

12. LTC alignment raised, south of Thong Lane over the LTC

The position of the LTC, to the south of Thong Lane over the LTC, would be raised by between two and three metres.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** We would not expect this to change the operational air quality effects reported in the PEIR, as vertical alignments are not included in the dispersion model.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors and the scale of the construction works, there remains the potential for temporary significant adverse effects, as set out in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** The increase in the height of the structure would marginally increase the adverse effects reported in the PEIR, as it would be more prominent in the setting of the nearby Thong Conservation Area.	This conclusion would be confirmed through a detailed assessment in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual row of this table.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** There would be a slight worsening to the nature of the visual effects reported in the PEIR, ie a moderate to major negative change in the view for a range of visual receptors. This is as a result of the increased height of the carriageway in proximity to Gravesend to the west and Thong to east. The major negative landscape change would remain the same as per the PEIR.	The mitigation proposals have been updated at this location and are available to view in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** As the change is limited to the vertical alignment, this change would have a negligible effect on the biodiversity assessment described in the PEIR. **Operation:** As the change is limited to the vertical alignment, this change would have a negligible effect on the biodiversity assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** This change would have a negligible effect on the road drainage and the water environment assessment described in the PEIR. **Operation:** This change would have a negligible effect on the road drainage and the water environment assessment presented in the PEIR.	Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents. A hydrogeological risk assessment will be reported in the ES.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

13. Refining the land required for utility diversions

We have been working with our stakeholders to refine our proposals and minimise the land required for works. As a result, we have been able to refine the land required for utility diversions shown at supplementary consultation around the A2 area and, in doing so, reduce the impacts on Shorne and Ashenbank Woods SSSI and in other environmentally sensitive locations. This includes south of the river at Jeskyns Community Woodland and around Claylane Wood, where there is ancient woodland.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors and the scale of the construction works, there remains the potential for temporary significant adverse effects, as set out in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a reduction in the construction working area, which decreases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** There would be a reduction in the construction working area, which decreases the potential for habitat loss in the area. However, we do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a reduction in the construction working area, which decreases the potential for adverse effects on groundwater. Effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. The design change would result in a reduction in land take and therefore a slight benefit in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

14. Upgrade works for the existing overhead electricity distribution cables

Some additional works to those shown at supplementary consultation would be required to upgrade electricity cables on the existing overhead line between the A2/LTC junction and the A226. In conjunction with these works, we may need to install some new electricity cables underground.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Thong, there is the potential for temporary adverse effects within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** As a result of the utility diversion being added to the design, there would be a slight worsening to the nature of the visual effects reported in the PEIR, ie a moderate to major negative change in the view for a range of visual receptors. The major negative landscape change would remain the same as per the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect the change to alter the assessment of effects for project operation reported in the PEIR. **Operation:** We do not expect the change to alter the assessment of effects for project operation reported in the PEIR.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	Construction effects would be managed through the CoCP and CEMP.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

15. Refined gas alignment diversion along Valley Drive

A short extension to the gas diversion along Valley Drive shown at supplementary consultation would be required for approximately 35 metres further north along the road.

Expected effects	What we are doing and why
Air quality **Construction:** The introduction of this diversion brings construction close to a number of properties on Valley Drive. However, section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors on Valley Drive, there is the potential for temporary significant adverse effects locally within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment of archaeological remains reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for vehicles, walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	Construction effects would be managed through the CoCP and CEMP.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

16. New permanent electricity switching station, Thong Lane

A new 33 kilovolt (kV) permanent electricity switching station, contained within an area approximately 50 metres long and 15 metres wide, would be required to distribute electricity to all new and existing smaller substations along the Lower Thames Crossing route.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** Although there would be maintenance vehicles accessing the site during operation, it is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** Due to a limited number of nearby noise-sensitive receptors, we do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** Although there would be maintenance vehicles accessing the site during operation, we do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The addition of the permanent electricity switching station would result in a slight worsening to the nature of visual effects reported in the PEIR, ie a moderate to major negative change in the view for a range of visual receptors. The major negative landscape change would remain the same as per the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. A full assessment will be included in the ES.

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this electricity switching station would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect the change to alter the assessment of effects for the project's operation reported in the PEIR.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR as appropriate drainage has been designed for the electricity switching station.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing the measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.
People and communities **Construction:** Increased land take would be required as a result of the proposed change. Overall, this change would have a negligible effect on the people and communities assessment presented in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

17. Refinement to the overhead electricity transmission cable diversion at Thong Lane

Due to the proposed changes to the Thong Lane green bridge over the Lower Thames Crossing, refinements would be required to the overhead electricity transmission cable diversion that we showed in this area at supplementary consultation. The diversion would be moved approximately 235 metres south of that proposed at supplementary consultation, which is approximately 90 metres south of the existing overhead electricity transmission cable. This means it would move away from Riverview Park and closer to Thong.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Thong, there is the potential for temporary adverse effects within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** As a result of the utility diversion being added to the design, there would be a slight worsening to the nature of the visual effects reported in the PEIR, ie a moderate to major negative change in the view for a range of visual receptors. The major negative landscape change would remain the same as per the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect the change to alter the assessment of effects for project construction reported in the PEIR. **Operation:** We do not expect the change to alter the assessment of effects for project operation reported in the PEIR.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	Construction effects would be managed through the CoCP and CEMP.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

Tilbury area

18. Northern tunnel entrance landscaping proposals

At the northern tunnel entrance we propose creating a new landform with footpaths leading up to elevated viewpoints looking out to the south, east and west, from where Coalhouse and Tilbury forts would be visible. The landform design would be created using excavated material from the tunnel and the surrounding area would be restored for grazing agricultural use, in keeping with the existing land use.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in the area, there is the potential for temporary significant adverse effects within the vicinity of the works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, but this is an area with low potential for archaeological remains due to previous land use. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** The design change would improve earthworks to form a landmark feature that would host informal footpaths for public use. The land would be returned to former pastoral agriculture use. There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** The design change would improve earthworks to form a landmark feature that would host informal footpaths for public use. The land would be returned to former pastoral agriculture use. This change would have a slight benefit to the nature of effects on people and communities as presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and a CEMP.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

19. Northern tunnel entrance layout

The maintenance access tracks would be moved closer to the Lower Thames Crossing to allow for a shorter culvert length (approximately 60 metres instead of 80 metres). A shorter culvert would minimise the impact on local ecology and allow wildlife, such as water voles, fish and eels, to navigate through the culvert more easily.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, but this is an area with low potential for archaeological remains due to previous land use. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no changes to the visible relationship between the Tilbury Fort and Coalhouse Fort Scheduled Monuments and therefore no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual row of this table.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** Due to the revised design there would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors.	The mitigation proposals have been updated at this location and are available to view in the Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** It is not anticipated that the modification of the northern tunnel entrance would alter the assessment of the effects presented in the PEIR. **Operation:** The modification of local access in the area has allowed for a reduction in culvert length from 80 metres to 60 metres. This reduction would minimise the impact on local ecology and allow wildlife, such as water voles, fish and eels, to navigate through the culvert more easily. There would be a slight benefit to the nature of the effects reported in the PEIR, although it is unlikely to be material.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. The modification of local access in the area has allowed for a reduction in culvert length from 80 metres to 60 metres. A shorter culvert reduces the potential effects on the water quality and physical character of this and linking watercourses. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Potential mitigation measures described in the PEIR, which are relevant to watercourse crossing design and the management of construction and operational drainage, would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We would provide a better recreational facility at this location. We are continuing to assess the impact of the project on nearby communities. Mitigation would be as reported in the PEIR.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

20. Realignment of footpath 61

The proposed realignment of footpath 61 presented at supplementary consultation would be slightly amended to use more of the existing footpath and to follow the existing field boundary.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be a slight reduction in the potential effects on archaeological remains reported in the PEIR due to a reduction in land take. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a moderate negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** There would be a slight benefit to the nature of the effects reported in the PEIR due to a reduction in land take/built footprint and removal of a local watercourse crossing that reduces the potential effects on local wildlife, which navigates through these channels. Although this change is beneficial, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The design change would reduce the adverse effects assessed in the PEIR. The benefits would be linked to a smaller land take/built footprint and removal of a local watercourse crossing that reduces the potential effects on the water quality and physical character of the watercourse. **Operation:** The adverse effects assessed in the PEIR would likely be reduced by this design change, as described for construction above.	Potential mitigation measures described in the PEIR, which are relevant to watercourse crossing design and the management of construction and operational drainage, would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. However, as more of the existing footpath alignment would be used, it is likely that there would be a slight benefit to the nature of the effects reported in the PEIR due to fewer land take requirements. **Operation:** As more of the existing footpath alignment would be used, it is likely that there would be a slight benefit to the nature of the effects reported in the PEIR due to limited change in journey distance and fewer land take requirements.	We would minimise land take required for the project, which would lessen the effects on local communities and businesses, and lessen the requirement for mitigation measures for people and communities, as compared with the PEIR. We are minimising the impact of the project on recreational users in this area. Mitigation would be as reported in the PEIR. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

21. Realignment of footpath 200

Footpath 200 would be diverted around the edge of the field rather than pass through it. This proposal is closer to the original alignment.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight reduction in the potential effects on archaeological remains reported in the PEIR due to a reduction in land take. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** There would be a slight benefit to the nature of the effects reported in the PEIR due to a reduction in land take/built footprint and removal of a local watercourse crossing that reduces the potential effects on local wildlife, which navigates through these channels. Although this change is beneficial, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The design change would reduce the adverse effects assessed in the PEIR. The benefits would be linked to a smaller land take/ built footprint and removal of a local watercourse crossing, which reduces the potential effects on the water quality and physical character of the watercourse. **Operation:** The adverse effects assessed in the PEIR would likely be reduced by this design change, as described for construction above.	Potential mitigation measures described in the PEIR, which are relevant to watercourse crossing design and the management of construction and operational drainage, would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. However, as more of the existing footpath alignment would be used, it is likely that there is a slight benefit to the nature of effects reported in the PEIR due to fewer land take requirements. **Operation:** As more of the existing footpath alignment would be used, it is likely that there is a slight benefit to the nature of effects reported in the PEIR due to a limited change in journey distance and fewer land take requirements.	We would minimise land take required for the project, which would lessen the effects on local communities and businesses, and lessen the requirement for mitigation measures for people and communities, as compared with the PEIR. We are minimising the impact of the project on recreational users in this area. Mitigation would be as reported in the PEIR. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

22. Muckingford Road realigned and widened

Muckingford Road would be realigned and widened to accommodate the new shared path route located along the south side.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** The realignment of Muckingford Road moves it south, further away from residential properties, which may improve temporary effects noted in this area. However, we do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** The realignment of Muckingford Road moves it south, further away from residential properties. However, we do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be a slight increase in the construction working area at Muckingford Road, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of the impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** There would be a slight increase in the construction working area at Muckingford Road, which could add to the nature of the effects reported in the PEIR due to the potential loss of habitat. Although this change is adverse, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR as appropriate drainage has been designed for the realignment.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.
People and communities **Construction:** This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** The introduction of a shared path adjacent to Muckingford Road would result in a benefit to the nature of effects reported in the PEIR, due to improved connectivity for walkers, cyclists and horse riders at Chadwell St. Mary and East Tilbury.	We are minimising the impact of the project on recreational users in this area. Mitigation would be as reported in the PEIR. We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to the climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

23. Tilbury watercourse

The existing watercourse, which has currently dried out at Tilbury, south of the railway and north of Station Road, would be re-established to maintain water flow. There would be no change in the nature of effects or mitigation measures reported in the PEIR. Please refer to Map Book 1: General Arrangements to view this information in more detail.

24. New water supply from the Linford borehole and a local water main

The tunnel boring machine would need a water supply to assist with the excavation process. A water supply would also be required for the construction site in this area.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors near to Linford Well, there is the potential for temporary adverse effects within the vicinity of the works. However, we do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in construction works in the area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for vehicles, walkers, cyclists and horse riders in the vicinity of the project. There would also be the use of traffic management measures ensuring access to residences, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment described in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

25. Potential upgrade of the existing water network

Water may also need to be sourced from a main located at the southern section of the water main near Fort Road. This is to ensure there is enough water for the tunnel boring machine, construction site and other critical activities.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors and the scale of the construction works, there is the potential for temporary adverse effects, as set out in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this diversion would increase the extent of habitat loss used by protected species compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. Slightly increased land take would be required as a result of the proposed change at this location, however, there would be no change in effects on businesses. **Operation:** It is not expected that this would change the PEIR assessment.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment described in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

26. Multi-utilities provision to the construction site and northern tunnel entrance

To supply temporary utilities to the construction site and permanent supply to the northern tunnel entrance, some works would be required that fall approximately 1.5km outside of the development boundary shown at supplementary consultation.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors and the scale of the construction works, there is the potential for temporary adverse effects, as set out in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area that increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major adverse landscape change and a moderate to minor adverse change in the view for a range of visual receptors. **Operation:** We do not expect this to result in a material change to the assessment reported in the PEIR.	The mitigation proposals have been updated at this location and are available to view in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this diversion would increase the extent of habitat loss used by protected species compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** It is not expected that this would change the PEIR assessment.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment described in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

A13/A1089 area

27. A13/A1089 landscaping proposals and watercourse diversion

As part of our woodland planting proposals at the A13/A1089 junction, we have identified two separate woodland areas off Baker Street that we would look to make accessible to the public.

Nearby, we are proposing a minor change to the alignment of the watercourse diversion, before the A13 junction, to align with suggested landscape refinements in this area.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** The inclusion of the watercourse diversion increases the potential for construction effects on the local wildlife that navigates through this channel. Overall, we do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The inclusion of the watercourse diversion increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** The design change has increased the area of space for public use. This change would have a slight benefit to the nature of effects on people and communities as presented in the PEIR.	This does not change the mitigation described in the PEIR.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

28. Removal of a false cutting

A false cutting between the A128 Brentwood Road and Hoford Road would be removed from the proposals. This is because it was proposed to be in the same location as a watercourse, which also required realigning to avoid the proposed Lower Thames Crossing. Planting in the area is proposed to compensate for this change.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** The design change has resulted in the modification of noise screening in the area. This modification results in no material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The design change has resulted in the modification of landscape mitigation in the area and includes additional planting and strengthening of an existing hedgerow to visually screen the new section of road. With these revisions we do not expect a material change to the assessment reported in the PEIR.	The mitigation proposals have been updated at this location and are available to view in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** The inclusion of the watercourse diversion increases the potential for construction effects on the local wildlife that navigates through this channel. There would also be a slight benefit to the nature of the effects reported in the PEIR. This is due to the strengthening of a hedgerow that provides habitat for local wildlife. Overall, we do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The inclusion of the watercourse diversion increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR that are relevant to watercourse crossing design and the management of construction and operational drainage would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

29. Changes to two A13 merge layouts

We propose changes to two A13 merges. The first would be where the A13 westbound/A1089 northbound slip road joins the Lower Thames Crossing northbound. The second would be where the slip road from the Orsett Cock roundabout joins the existing A13 westbound. There would be no change in the nature of effects or mitigation measures reported in the PEIR. Please refer to Map Book 1: General Arrangements to view this information in more detail.

30. Amendments to shared paths in the A13/A1089 area

At supplementary consultation we were exploring the feasibility of a new footpath connection under the A13. Following further investigations, this has not progressed due to its close proximity to the A13 and slip roads connecting to the Lower Thames Crossing northbound. As a result, the open space to the north of the A13 that was proposed at supplementary consultation is also no longer proposed because it would not be accessible by walkers, cyclists or horse riders.

Also in this area, the shared path proposed at supplementary consultation for walkers, cyclists and horse riders between Green Lane and Stifford Clays Road would be amended so it's slightly closer to the Lower Thames Crossing to avoid impacting farmland.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. Changing the alignment of the shared path proposed at supplementary consultation for walkers, cyclists and horse riders between Green Lane and Stifford Clays Road would reduce agricultural land take effects and therefore result in a slight benefit to the nature of effects. **Operation:** As the proposed new shared path under the A13 has been removed from the design, there is a slight worsening to the nature of effects reported in the Environmental Impacts Update document at supplementary consultation. This is because walking, cycling and horse riding are no longer possible.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

31. Traveller site relocation

During supplementary consultation, we presented two potential areas for the relocation of the traveller site at the A13/A1089 junction. Following further design work and feedback from our supplementary consultation, we are now proposing a new site adjacent to its current location, with access off Gammonfields Way. The relocated traveller site would remain approximately 1.5 hectares in area (the same as at present), with an additional 1.5 hectares set aside for appropriate access and landscaping.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The relocation of the traveller site is an addition to the design from that reported in the PEIR; it would move from its current location to a position in closer proximity to the overhead electricity distribution cables. As a result, there would be a slight negative change in the nature of the effects reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.
People and communities **Construction:** This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

32. Multi-utility diversion extension along the B188 High Road

We propose extending the works along the B188 High Road, towards Orsett, so that we can ensure communications supply is maintained for the local area.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Orsett, there is the potential for temporary adverse effects within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area but there is low potential for archaeological remains due to previous development. There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. Slightly increased land take would be required as a result of the proposed change at this location, however, there would be no change in effects on agricultural land and businesses. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

33. Moving overhead electricity distribution cables underground

At the corner of Hornsby Lane and Foxes Green, we would move some of the overhead cables underground to cater for the Lower Thames Crossing route.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Orsett Heath, there is the potential for temporary adverse effects within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area around Heath Place. This would increase the potential for adverse effects on archaeological remains reported in the PEIR, especially given that this location is known for buried archaeology. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a major negative to moderate negative change in the view for a range of visual receptors.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** The diversion would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** Increased land take would be required as a result of the proposed change at this location. However, there would be no change in effects on agricultural land and businesses. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

34. Permanent gas pipeline compound at Stanford Road

A permanent compound east of Orsett Cock roundabout, along Stanford Road, is planned for the operation and maintenance of a proposed gas pipeline in this area. The facility, including equipment, would be located within an area approximately 35 metres by 35 metres.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** Although there would be maintenance vehicles accessing the sites during operation, it is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Orsett, there is the potential for temporary adverse effects within the vicinity of the construction works. However, we do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** Although there would be maintenance vehicles accessing the sites during operation, we do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.
Cultural heritage **Construction:** There would be a slight increase in the construction working area at Stanford Road, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** The addition of the compound would result in a slight worsening to the nature of the visual effects reported in the PEIR, ie a moderate to major negative change in the view for a range of visual receptors. The major negative landscape change would remain the same as per the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this compound would slightly increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect the change to alter the assessment of effects for project operation reported in the PEIR.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.
People and communities **Construction:** This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

35. Additional land for overhead electricity distribution cable diversion works

Some additional land to that shown at supplementary consultation would be required for overhead electricity distribution cable diversion works north of Heath Place.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors at Heath Place, there is the potential for temporary adverse effects within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area around Heath Place. This increases the potential for adverse effects on archaeological remains reported in the PEIR, especially given that this location is known for buried archaeology. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a major negative landscape change and a major negative to moderate negative change in the view for a range of visual receptors.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements.
Biodiversity (terrestrial and marine) **Construction:** The diversion would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP

36. Additional working area for multi-utility construction

Some additional land, from what was shown at supplementary consultation, would be required off Mill Lane. This is for multi-utility works in this area, which includes permanent access that may be required by the utility provider for future maintenance.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in Orsett, there is the potential for temporary significant adverse effects within the vicinity of the works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements.
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and a CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

LTC/M25 area

37. Reduced woodland compensation north of the Thames Chase Forest Centre

North of the Thames Chase Forest Centre, we are proposing a new maintenance access track and a multi-utilities diversion. We have located these within the same area to limit the reduction in woodland compensation that is required to accommodate these changes.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area associated with the maintenance access route, multi-utilities diversion and a route for walkers, cyclists and horse riders. This increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a moderate negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** This is a change in landscape design to reflect minor design refinements in the area. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).

Expected effects	What we are doing and why
Biodiversity (terrestrial and marine) **Construction:** There would be a slight increase in the construction working area associated with the maintenance access route, multi-utilities diversion and a route for walkers, cyclists and horse riders. This could add to the nature of the effects reported in the PEIR due to potential loss of habitat or disturbance to species. Although this change is adverse, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area associated with the maintenance access route, multi-utilities diversion and a route for walkers, cyclists and horse riders. This increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. Slightly increased land take would be required as a result of the maintenance access route, multi-utilities diversion and a route for walkers, cyclists and horse riders. This results in a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

38. Reduced woodland planting within The Wilderness

We are diverting a watercourse within an area called The Wilderness. To accommodate this we are proposing a reduction in woodland planting in this area.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual row below.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a moderate negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** This is a change in landscape design to reflect minor design refinements in the area. With these revisions we do not expect a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

39. Modifications at Ockendon landfill (south of the Lower Thames Crossing)

As a result of ongoing design development and to avoid encroachment into the Ockendon landfill site, we would divert a local watercourse, remove earthworks and introduce a retaining wall, which is approximately six metres high by 200 metres long.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight decrease in the construction working area due to the removal of earthworks, therefore reducing the potential for effects on archaeological remains. There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a moderate negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** We do not expect this to result in a material change to the assessment reported in the PEIR.	The mitigation proposals have been updated at this location and are available to view in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** The introduction of a new watercourse diversion introduces new potential effects on the water quality and physical character of this and linking watercourses. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. **Operation:** The effects would be the same as those described in the PEIR as appropriate drainage has been designed following the watercourse diversion.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** The design change removes work from within the boundary of Ockendon landfill and therefore removes associated effects reported in the PEIR. Overall effects would remain as reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

40. Relocation of construction site 13

Construction site 13 would be moved approximately 200 metres west of the location proposed at supplementary consultation to avoid a cemetery in this area.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area for construction site 13 and therefore additional potential for effects on archaeological remains. There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	The mitigation proposals have been updated at this location and are available to view in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** There would be a slight increase in the construction working area at this location, which could add to the nature of the effects reported in the PEIR due to potential loss of habitat. Although this change is adverse, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. We will continue to maximise the re-use of materials generated by the activities on-site and within the design proposals. This would reduce the requirement for off-site haulage and reliance on third-party waste infrastructure. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. There would be a slight benefit to the nature of the effects reported in the PEIR due to the avoidance of a cemetery. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are minimising the impact of the project on visitors to the cemetery in this area. Mitigation would be as reported in the PEIR. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

41. Relocation of footpath 136

Footpath 136 over the Lower Thames Crossing would be moved approximately 40 metres west to avoid a gas pipeline compound located on the north side of the route.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR **Operation:** The altered design would increase the journey distance for walkers, cyclists and horse riders crossing the Lower Thames Crossing at this location. This results in a slight worsening in the nature of effects reported in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

42. Realignment of footpath 252

Footpath 252 would be realigned on the western side near Dennis Road to provide access to a farm.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a moderate negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would slightly increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate. Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and a CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

43. Proposed reconfiguration of land required for multi-utility works

The land required for utility works has changed slightly since supplementary consultation.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a moderate negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

44. B186 North Road multi-utility diversion works

Some above and below-ground multi-utilities within the vicinity of the B186 North Road would need to be diverted. Some of the overhead electricity distribution cables may also need to be placed underground to avoid the proposed Lower Thames Crossing route.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in the locality, there is the potential for temporary adverse effects within the vicinity of the utility works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a moderate negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a moderate negative landscape change and a moderate negative to minor negative change in the view for a range of visual receptors.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements.
Biodiversity (terrestrial and marine) **Construction:** There would be a slight increase in the construction working area around the B186 North Road, which could add to the nature of the effects reported in the PEIR due to potential loss of habitat or disturbance to species. Although this change is adverse, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** The extra land take required for the work could potentially increase effects reported in the PEIR due to the proximity of the works to the landfill site. Overall, effects would remain as reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.

Expected effects	What we are doing and why
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

45. Ockendon Road sewer diversion works

A sewer diversion may be required from Ockendon Road to St. Mary's Lane via the B186.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in the locality, there is the potential for temporary adverse effects locally within the vicinity of the utility works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a major to moderate negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** There would be a slight increase in the construction working area around the B186 North Road, which could add to the nature of the effects reported in the PEIR due to potential loss of habitat or disturbance to species. Although this change is adverse, it is considered unlikely to change the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

46. Works in the Mardyke area for National Grid maintenance access

National Grid would require access from Green Lane for the maintenance of its overhead electricity transmission cables on a permanent basis.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Construction vehicle modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment of archaeological remains reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to minor negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.
People and communities **Construction:** This change would have a negligible effect on the people and communities assessment described in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

M25 junction 29

47. Amendments to walking, cycling and horse-riding routes

We have been exploring solutions to maintain connectivity in this area and now propose a new footbridge over the A127 and a new route and signalised crossings at the northern side of the junction. The existing bridleway adjacent to the A127 and M25 junction would be re-aligned to prevent it clashing with the proposed slip road, and the bridleway south of the M25 junction 29 would be amended to accommodate shared use with maintenance vehicles.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be no significant change to the assessment reported in the PEIR. **Operation:** There would be no significant change to the assessment reported in the PEIR.	This conclusion would be confirmed through a detailed assessment in the ES. Details of any landscape mitigation measures are covered in the Landscape and visual row below.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a minor negative landscape change and a major negative change in the view for a range of visual receptors. **Operation:** Although the new footbridge would be visible from numerous receptors, we do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements. A full assessment will be included in the ES supported by representative photo realistic visualisations (photomontages).
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.
Road drainage and the water environment **Construction:** The effects would be the same as those described in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.

Expected effects	What we are doing and why
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. However, as connectivity in this area has been assured through the new footbridge over the A127 and signalised crossings at the northern side of the M25 junction 29, it is likely that there would be a slight benefit to the nature of effects reported in the PEIR. **Operation:** This change represents a slight benefit to the nature of effects reported in the PEIR as connectivity in this area has been assured through the new footbridge over the A127 and signalised crossings at the northern side of the M25 junction 29.	We would provide better local connections at this location. We are continuing to assess the impact of the project on nearby communities. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

48. Additional land for underground electricity distribution cable works

Further to the proposals shown at supplementary consultation, some additional land would be required to carry out underground electricity distribution cable diversion works near Franks Farm.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors around Franks Farm, there is the potential for temporary adverse effects locally within the vicinity of the construction works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a major negative landscape change and a moderate to major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this diversion would increase the extent of habitat loss used by protected species compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect the change to alter the assessment of effects for project operation reported in the PEIR.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in an increase in land take and, therefore, a worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

49. Overhead electricity distribution cables repositioned underground

Some of the overhead electricity distribution cables near the B186 Warley Street would need repositioning underground to accommodate the proposed Lower Thames Crossing.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be the same as those reported in the PEIR, ie a minor negative landscape change and a major negative change in the view for a range of visual receptors. **Operation:** There would be a slight benefit to the nature of the effects reported in the PEIR, ie a negligible negative landscape change and a moderate negative change in the view for a range of visual receptors.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this diversion would increase the extent of habitat loss used by protected species compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for vehicles, walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in an increase in land take and, therefore, a worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

50. Additional land required for gas diversion works

Near Folkes Lane a small amount of additional land to that shown at supplementary consultation would be required for gas diversion works. This would ensure the gas pipeline is a sufficient distance from our main works.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a major negative landscape change and a major negative change in the view for a range of visual receptors. **Operation:** We do not expect this change to result in a material change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this diversion would increase the extent of habitat loss used by protected species compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR. Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be an increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** This design change would result in a small increase in temporary land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

51. Additional land for maintenance of the overhead electricity transmission cables

Some additional land to that shown at supplementary consultation would be required, south-west of the M25 junction 29, so that permanent access can be provided for the future maintenance of overhead electricity transmission cables in this location.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** We do not expect there to be material differences to the potential construction works noise effects as described in the PEIR. **Operation:** Although there would be maintenance vehicles accessing the site during operation, we do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR due to a CoCP being in place to minimise impacts from construction activity. **Operation:** The effects would be the same as those described in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a minor negative landscape change and a major negative change in the view for a range of visual receptors. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR.
Biodiversity (terrestrial and marine) **Construction:** We do not expect this to change the assessment of effects on biodiversity. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	This does not change the mitigation described in the PEIR.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Potential mitigation measures described in the PEIR would remain appropriate.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR. Measures to manage the storage and treatment of excavated materials generated by the activities would be detailed in the ES, CoCP and CEMP.

Expected effects	What we are doing and why
People and communities **Construction:** This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and CEMP.

52. Additional land for multi-utility works

Off the B186 near junction 29 of the M25, some additional land to that shown at supplementary consultation would be required for the multi-utility works proposed in this location.

Expected effects	What we are doing and why
Air quality **Construction:** Section 6.6.3 – 6.6.7 of the PEIR is unaffected by this change. The construction phase of the project has the potential to affect air quality because of dust emissions and the emissions from non-road mobile machinery, and construction vehicle movements by road, river and rail. With mitigation in place, there should be no significant adverse impacts arising from dust emissions or associated with non-road mobile machinery. **Operation:** It is not expected that this would change the adverse operational air quality effects reported in the PEIR.	Modelling has been undertaken to identify any adverse effects associated with construction vehicle movements. Mitigation measures would be incorporated as set out in the PEIR and managed through the CoCP and a CEMP.
Noise and vibration **Construction:** As a result of the proximity to noise-sensitive receptors in North Ockendon, there is the potential for temporary significant adverse effects within the vicinity of the works. **Operation:** We do not expect there to be material differences to the potential road traffic noise effects as described in the PEIR.	Construction effects would be controlled through the CoCP and a CEMP. As set out in the PEIR, best practical means would be followed (detailed in Table 13.15). Potential operational mitigation measures described in the PEIR would remain appropriate and would be incorporated into the design where necessary. With regard to both the construction and operational effects associated with the project, noise and vibration continues to be assessed and considered. These will be reported in full in the ES.

Expected effects	What we are doing and why
Cultural heritage **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on archaeological remains reported in the PEIR. Overall, there would be no significant change to the assessment reported in the PEIR, due to a CoCP being in place to minimise impacts from construction activity. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation of impacts to archaeological remains would be managed through the CoCP, following the approach outlined in the PEIR. A detailed assessment would be included in the ES.
Landscape and visual **Construction:** The nature of the effects would be similar to those reported in the PEIR, ie a minor negative landscape change and a major negative change in the view for a range of visual receptors. **Operation:** There would be no significant change to the assessment reported in the PEIR.	Mitigation proposals continue to reflect those outlined in the PEIR. The latest mitigation proposals are shown in Map Book 1: General Arrangements.
Biodiversity (terrestrial and marine) **Construction:** The inclusion of this design change would increase the extent of habitat loss compared with that reported in the PEIR. Although adverse, it is considered unlikely this would lead to a change in the assessment's significance level in this area. **Operation:** We do not expect this to change the assessment of effects on biodiversity from the project's operation.	Mitigation has been updated and designed appropriately and proportionately with the aim of maximising opportunities to increase the area's biodiversity value.

Expected effects	What we are doing and why
Road drainage and the water environment **Construction:** There would be a slight increase in the construction working area, which increases the potential for adverse effects on groundwater. However, effects would be mitigated through surface and groundwater management measures included in the CoCP and CEMP. Overall, effects would remain as reported in the PEIR. **Operation:** The effects would be the same as those described in the PEIR.	Pollution risks would be managed by implementing measures detailed in the CoCP and CEMP and works would be undertaken in accordance with the conditions of any necessary environmental permits/consents.
Geology and soils **Construction:** There would be no significant changes to the assessment and effects reported in the PEIR, which were assessed as unlikely to be significant. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR, which reported that it was unlikely there would be significant effects.	Construction effects would be controlled through the CoCP and a CEMP. Should ground investigation encounter any contamination, appropriate assessment would be undertaken and, if required, a remediation strategy would be developed and agreed with our stakeholders.
Materials and waste **Construction:** The change would be expected to have a negligible effect on the assessment of materials and waste presented in the PEIR, which reported that the project would be unlikely to have a significant effect on the UK supply of construction materials. The PEIR also reported that the project would be expected to potentially generate large quantities of waste and therefore the change would be unlikely to alter this conclusion. **Operation:** This change would have a negligible effect on the assessment presented in the PEIR.	Mitigation for materials and waste remains as described in the PEIR.

Expected effects	What we are doing and why
People and communities **Construction:** During construction it is likely that there would be some disruption to the existing use of routes for walkers, cyclists and horse riders in the vicinity of the project, resulting in an adverse effect. We do not expect any change in the nature of the effect from that reported in the PEIR. This design change would result in a small increase in land take and, therefore, a slight worsening in the nature of effects on people and communities in the locality of the change, from that reported in the PEIR. **Operation:** This change would have a negligible effect on the people and communities assessment presented in the PEIR.	We are continuing to assess the impact of the project in relation to the proposed change to develop mitigation measures and lessen negative impacts. Construction effects would be managed through the CoCP and a CEMP.
Climate **Construction:** This change would have a negligible effect on the climate assessment described in the PEIR. **Operation:** This change would have a negligible effect on the climate assessment presented in the PEIR.	We will continue to understand the project's overall contribution to climate via greenhouse gas emissions through the outputs of carbon modelling. Measures to manage construction-phase carbon, which the contractors would be required to employ, would be detailed in the CoCP and a CEMP.

Across the route

53. Drainage ponds

Since the production of the PEIR, we have developed our proposals for integrating drainage ponds into the landscape and for making the area of land around these assets easier to manage for landowners and for any maintenance work.

To do this, at a number of locations along the route, we have extended the land required around the drainage ponds to include existing boundaries such as hedgerows. Similarly, we also propose alterations to the shape of some areas of land for planting to make the boundary edges easier to maintain.

For all these modifications, there would be no change in the nature of effects or mitigation measures reported in the PEIR. Please refer to Map Book 1: General Arrangements to view this information in more detail.

54. Flood mitigation zones

Since the production of the PEIR, the design of flood mitigation zones has been updated in the Tilbury and LTC/M25 areas. We have worked closely with the Environment Agency regarding flood risk and the flood risk models have been refined so that they reflect the latest information available. Flood mitigation zones proposed in these areas have been marginally increased or decreased as appropriate to protect the environment and nearby communities.

For all updates, there would be no change in the nature of effects or mitigation measures reported in the PEIR. Please refer to Map Book 1: General Arrangements to view this information in more detail.

55. Noise barriers

Following publication of the PEIR, where the need for noise mitigation was identified, detailed noise assessments have been carried out. These assessments have identified locations along the route where noise barriers could be used to reduce road traffic noise. As a result, we are now proposing to install 17 noise barriers at specific locations along the route. A summary of the environmental assessment on these changes is provided below. For further details on the indicative location and sizes of the noise barriers, please refer to the guide to design refinement consultation.

M2/A2 junction

The design proposes four noise barriers, up to 600 metres long and between one and two metres high. These would help to mitigate potential road traffic noise effects in the local area, including Gravesend, Shorne and Thong. Although they introduce a new built element and may introduce new visual receptors, there would be no change in the nature of effects or mitigation measures reported in the PEIR.

Tilbury area

Four noise barriers, up to 700 metres long and between one and two metres high, are proposed in the Tilbury area between the northern tunnel entrance and Muckingford Road. These would help to mitigate potential road traffic noise effects in the local area, including East Tilbury, West Tilbury and Chadwell St. Mary. Although they introduce a new built element and may introduce new visual receptors, there would be no change in the nature of effects or mitigation measures reported in the PEIR.

A13/A1089 junction

A noise barrier, less than 150 metres long and six metres high, is proposed near Brentwood Road. This would help to mitigate potential road traffic noise effects in the local area, including Chadwell St. Mary. Although it introduces a new built element and may introduce new visual receptors, there would be no change in the nature of effects or mitigation measures reported in the PEIR.

Five noise barriers, up to 550 metres long and between one and two metres high, are proposed in the A13/A1089 area. These help to mitigate potential road traffic noise effects in the local area, including Chadwell St. Mary, Orsett and Orsett Heath. Although they introduce a new built element and may introduce new visual receptors, there would be no change in the nature of effects or mitigation measures reported in the PEIR.

LTC/M25 junction

Three noise barriers are proposed in the LTC/M25 area. Two are up to 1,500 metres long, and both are approximately one metre high. One is less than 200 metres long and approximately two metres high. These barriers help to mitigate potential road traffic noise effects in the local area, including South Ockendon. Although they introduce a new built element and may introduce new visual receptors, there would be no change in the nature of effects or mitigation measures reported in the PEIR.

56. Substations

Following publication of the PEIR, a number of small permanent electricity substations, approximately three metres wide by three metres long and 2.5 metres high, would be installed across the route. These would be located within a total area of approximately five metres by four metres to allow maintenance of the substations. The exact number and locations of these substations, as described in the guide to design refinement consultation, are indicative only at this stage, but they would introduce a new built element across the Lower Thames Crossing.

Due to their likely proximity to noise-sensitive receptors, there is the potential for temporary significant adverse effects within the vicinity of the construction works. In addition, due to the required marginal increase in land take, there is the possibility for a slight increase in the nature of effects, as reported in the PEIR. However, there would be no change in the significance of effects or mitigation measures reported in the PEIR.

57. Maintenance access tracks and maintenance bays

Following publication of the PEIR, there has been an update to the design of maintenance access tracks along the Lower Thames Crossing, some of which feature a parking bay for maintenance vehicles. The tracks would provide access to ponds, fields, culverts, pylons and technology assets. They are not for public use or 'rat-running' and would be secured with an access control system. They would only be used for the purposes of operating and maintaining the Lower Thames Crossing and associated infrastructure. This would include maintenance access to infrastructure owned by the utility companies. In some instances, we have combined the access tracks with routes for walkers, cyclists and horse riders.

These access tracks and parking bays result in a marginal increase in land take and therefore a slight increase in the nature of the effects reported in the PEIR. However, there would be no change in the effects or mitigation measures reported in the PEIR. Please refer to Map Book 1: General Arrangements to view this information in more detail.

3. How to have your say

Please take this opportunity to let us know your views on the design changes we are proposing for the Lower Thames Crossing. All of our consultation information, including the response form, is available at **www.lowerthamescrossing.co.uk/design-consultation**

Home delivery

If you do not have access to the internet, we can send a printed consultation pack (one copy per household) to your home, free of charge. You may request the guide to design refinement consultation, maps, a response form and Freepost return envelope. Please call us on **0300 123 5000** to request a consultation pack.

Telephone surgery

You can book a call back from a member of the project team who will answer your questions on the proposed changes.

The surgery will be held between 14 July and 12 August. You can book an appointment from 14 July by visiting **www.lowerthamescrossing.co.uk/design-consultation** or by calling **0300 123 5000.**

Submitting your response form

Our response form can either be completed online or downloaded and sent by email or to our Freepost address (details are set out below). You can also request a printed copy of the form by emailing us at **info@lowerthamescrossing.co.uk** or calling us on **0300 123 5000**.

The following response methods are available and are all free to use. Please note, we cannot guarantee that responses sent to any other address will be considered.

Online

Fill in the online survey at
www.lowerthamescrossing.co.uk/design-consultation

Freepost

Send your response form or comments to:
FREEPOST LTC CONSULTATION
The Freepost address is the only text needed on the envelope and no stamp is required.

Email

Comments or electronic copies of the response form should be emailed to **LTC.CONSULTATION@TRAVERSE.LTD**

Telephone

Due to the restrictions in place relating to the COVID-19 pandemic, we are offering additional support to help you provide feedback over the phone. Please call us on **0300 123 5000** to book an appointment.

Scan me

Use your phone to scan this QR code to go straight to the consultation.

Data privacy notice

We are committed to protecting your personal information. Whenever you provide such information, we are legally obliged to use it in line with all applicable laws concerning the protection of personal data, including the General Data Protection Regulation (GDPR).

How will Highways England use the information we collect about you?

We will use your personal data collected via this consultation for a number of purposes, including:

- to analyse your feedback to the consultation
- to produce a summary report, based on our analysis of responses (individuals will not be identified in our consultation report)
- to write to you with updates about the results of the consultation and other developments
- to keep up-to-date records of our communications with individuals and organisations

Any personal information you include in this form will be handled and used by (or made available to) the following recipients to record, analyse and report on the feedback we receive:

- Highways England
- Traverse (which has been contracted by us to analyse feedback to the consultation)
- The Planning Inspectorate (which will consider our application for permission to build the Lower Thames Crossing)
- The Secretary of State (who will take the decision on our application)
- our legal advisers
- consultants working on the Lower Thames Crossing project

It is also possible that trusted third-party providers, for example construction companies, may later use the contact details provided in your responses to communicate with you.

Find out more

Under the terms of the GDPR you have certain rights over how your personal data is retained and used by Highways England. For more information, see our full data privacy statement:
www.highwaysengland.co.uk/privacy

Please submit your response by 23:59 on 12 August 2020.

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Lower Thames Crossing Environmental Impacts Update, Design refinement consultation July 2020

This document is also available on our website at **www.highwaysengland.co.uk**

For an accessible version of this publication please call **0300 123 5000** and we will help you.

If you have any enquiries about this publication email **info@highwaysengland.co.uk**
or call **0300 123 5000***. Please quote the Highways England publications code **PR85/20**

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