

PLANNING ACT 2008

INFRASTRUCTURE PLANNING (EXAMINATION PROCEDURE)
RULES 2010

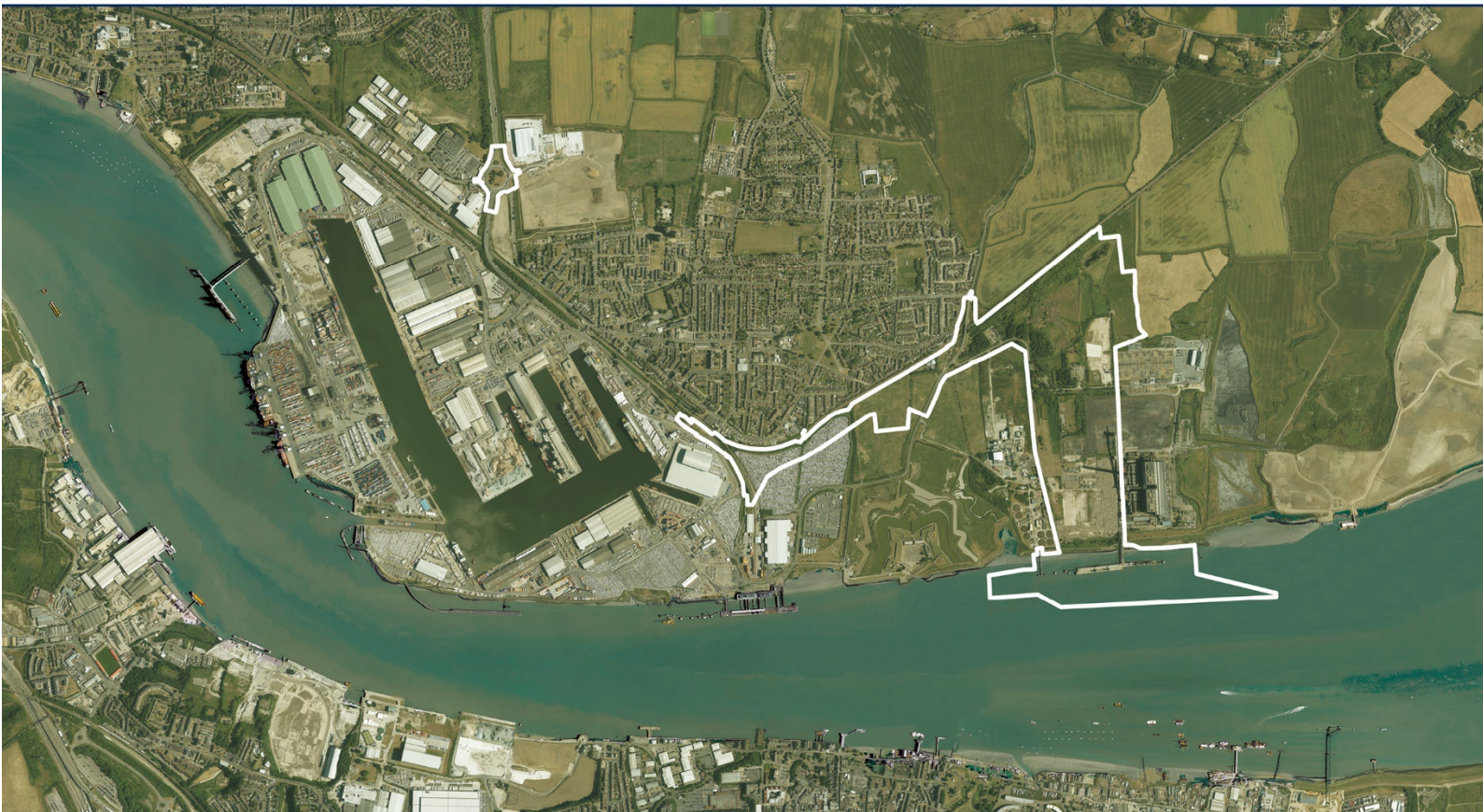
PROPOSED PORT TERMINAL AT
FORMER TILBURY POWER STATION

TILBURY2

PoTLL DEADLINE 3 SUBMISSIONS

QUALITATIVE CUMULATIVE EFFECTS ASSESSMENT OF TILBURY2
WITH TILBURY ENERGY CENTRE AND LOWER THAMES CROSSING

PoTLL/T2/EX/92



PORT OF TILBURY

PLANNING ACT 2008

**PROPOSED PORT TERMINAL AT FORMER TILBURY POWER STATION
'TILBURY2'**

CUMULATIVE EFFECTS ASSESSMENT OF TILBURY2

WITH TILBURY ENERGY CENTRE AND LOWER THAMES CROSSING

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TILBURY ENERGY CENTRE CONSULTATION BOOKLET, FEBRUARY 2018

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1.0 INTRODUCTION

BACKGROUND

- 1.1 The purpose of this document is to undertake a proportionate and qualitative cumulative effects assessment (“CEA”) of Tilbury2 with Tilbury Energy Centre (“TEC”) and Lower Thames Crossing (“LTC”).

Tilbury Energy Centre

- 1.2 The report embraces the CEA undertaken by PoTLL of Tilbury2 with the TEC that was submitted to the Examining Authority (“ExA”) at Deadline 2. This was submitted as Appendix C to PoTLL’s Response to First Written Questions [REP1-016].
- 1.3 With regard to TEC, this report largely replicates that earlier assessment. However, on Tuesday 17th April, RWE published their Scoping Report on the TEC project.¹ In preparing this report, the information contained within the Scoping Report has been considered to ensure the assumptions made remain robust.
- 1.4 The earlier report was specifically prepared to address the following First Written Questions issued on 27 February 2018.

FWQ1.7.2

Please provide an in-combination assessment of the maintenance dredging needed for the operational phase of the Proposed Development with the operation of the Tilbury Energy Centre, in respects of risks to water quality arising from the cooling water effluents from the power station being in close proximity to the port’s proposed maintenance dredging operations, in order to define the level of risk to Water Framework Directive compliance.

FWQ 1.13.18

Historic England raised concern in its statutory response to the PEIR (Table 12.4), that the Tilbury Energy Centre (TEC) proposed redevelopment project did not appear to be included within the cumulative effects assessment. The Applicant has provided justification for this approach in ES Chapter 12 paragraphs 12.246-247 on the basis that no details of the proposal are yet available. No Scoping Report has yet been received from the TEC which puts it in Tier 2. However:

- a) *Would the Applicant comment on whether it intends to undertake a cumulative assessment of the Proposed Development with the Tilbury Energy Centre, proportionate to the information that is available to the*

¹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010089/EN010089-000018-TBEC%20-%20Scoping%20Report.pdf>

Applicant, such that the Applicant can then demonstrate that it has at least considered the matter?

Lower Thames Crossing

- 1.5 With regard to the Lower Thames Crossing, the ExA's FWQ 1.7.1 stated as follows :-

“There are legal requirements within legislation to undertake a cumulative assessment for EIA and an in-combination assessment for HRA. There is also a requirement within the NPS for Ports to consider cumulative impacts. The PINS post-acceptance s51 advice noted that a scoping report for Lower Thames Crossing (LTC) had been produced at that time and so, in accordance with PINS Advice Note 17, a cumulative effects assessment should be provided for the Proposed Development with the LTC. The assessment should be proportionate to the information available to the Applicant and could be at a high level using assumptions about the traffic levels on opening of the LTC and using traffic growth projections used in other projects, if applicable. Please provide an updated Chapter 20 of the ES [APP-031], together with any relevant appendices and plans which screens in the Lower Thames Crossing, using the worst case scenarios. This should consider as a minimum, combined and cumulative impacts from traffic and transport.”

- 1.6 PoTLL's Response to First Written Questions highlighted PoTLL's position on this issue, referring to the detailed analysis in PoTLL's "Response to Relevant Representations" (PoTLL Document Reference PoTLL/Tilbury2/EX/32) at paras. 2.35 – 2.42. It was highlighted therein that PoTLL remains of the view that it is not possible for a CEA to be undertaken of Tilbury2 with LTC at this stage, nor is it considered possible to undertake an in-combination assessment for the purpose of HRA for the same reasons due to the lack of information (particularly the lack of any traffic modelling). This is discussed further below but remains a significant limitation on this exercise.

- 1.7 However, without prejudice to PoTLL's consistent view regarding the problematic nature of CEA on both TEC and LTC (discussed further below), and the absence of any requirement for such an assessment for the purposes of adequate assessment of the environmental effects of the Proposed Development, a high level, qualitative and proportionate consideration of the qualitative cumulative effects of the Tilbury2 proposals with both of these projects has now been undertaken and is set out in this report. This is in particular response to representations made at Deadlines 1 and 2 by Highways England, MMO, Essex County Council and Gravesham Borough Council.

REGULATORY FRAMEWORK

- 1.8 The EIA regime in Europe is governed by Directive 2011/92/EU (as amended) on the assessment of the effects of public and private projects on the environment. The most recent amendment (Directive 2014/52/EU)

indicates (by amendment Annex IV of Directive 2014/52/EU) that the environmental impact statement should include :

“A description of the likely significant effects of the project on the environment resulting from, inter alia...

the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources”²

and

“The description of the likely significant effects on the factors specified in Article 3(1) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project”

1.9 This directive is implemented for the purposes of NSIPs by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 (as amended by the Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012) – referred to here as the “EIA Regulation.”³

1.10 Schedule 3 paragraph 14 of the EIA Regulations, which refers to the selection criteria for screening Schedule 2 development, states that *‘the characteristics of the development must be considered having regard, in particular, to... ..(b) the cumulation with other development’*.

1.11 In relation to the information for inclusion in an ES, Schedule 4 Part 1 of the EIA Regulations lists

‘A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent or temporary, positive and negative effects of the development resulting from: (a) the existence of the development;

(b) the use of natural resources;

(c) the emission of pollutants, the creation of nuisances and the elimination of waste,’ (paragraph 20) and ‘a description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment’ (paragraph 21)”

² Directive 2014/52/EU Of The European Parliament

³ The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 came into force on 16th May 2017. The publication of the Regulations confirmed the position on transitional arrangements. For development requiring EIA, the 2009 EIA Regulations continue to apply if a request for a Scoping Opinion or an Environmental Statement had been submitted before 16th May 2017. The Scoping Report for Tilbury2 was submitted to the Secretary of State on 27 March 2017 and therefore the 2009 Regulations apply.

1.12 PoTLL are of the view that the Environmental Statement submitted with the application [APP-031] complies with this regulatory framework as set out above and is legally adequate. Reasonably foreseeable cumulative developments were identified in consultation with the relevant local authorities and other interested parties. PoTLL remain of the view that even in the absence of this document, the compliance of the application with the regulatory framework would not be in doubt.

POLICY GUIDANCE

1.13 PoTLL has also taken into account policy, guidance and good practice advice.

1.14 The NPS on Ports indicates at para. 4.2.2 that:-

“Where the decision-maker reaches the view that a proposal for port infrastructure is in accordance with this NPS, it will then have to weigh the suggested benefits, including the contribution that the scheme would make to the national, regional or more local need for the infrastructure, against anticipated adverse impacts, including cumulative impacts”

1.15 This policy clearly reflects the regulatory framework identified above.

1.16 PINS Advice Note 17 (“AN17”) has been reviewed and PoTLL’s analysis in this regard was set out in section 2 of Response to Written Representations document (Document Reference PoTLL/T2/EX/32 [AS-049]). This analysis is not repeated here, but PoTLL had regard to PINS advice on CEA in AN17, as well as established NSIP/DCO examination and determination practice, in reaching its conclusion that it was not possible to properly define the schemes in order to assess the cumulative impacts of either with the Tilbury2 proposals.

1.17 In other guidance, RUK 2013⁴ concluded that a meaningful assessment has to be based on :

- Sufficient data of an agreed quality
- Identifying all Reasonable Foreseeable Future Projects (RFFP) for which sufficient data is available

1.18 As highlighted previously, very little data on either scheme is available.

1.19 Natural England has also published a helpful review of cumulative assessment practice⁵ and noted that in defining other plans, projects or activities to be assessed :-

⁴ RUK (Renewables UK) 2013 *Guiding Principles for Wind farms Cumulative Impact Assessments in Offshore Wind Farms*

⁵ Natural England 2014. *Development of a generic framework for informing cumulative impact assessments (CIA) related to Marine Protected Areas through evaluation of best practice.*
NECR147

“In order to undertake a meaningful assessment, it is important that sufficient information is available for other plans, projects and activities. Where the level of available information regarding a particular project is considered to be insufficient to warrant its inclusion within the CIA, the reasoning and justification behind this decision needs to be clearly documented.” (para. 3.5)

- 1.20 It goes on to state that *“the approach to be followed should include ongoing activities and should include future projects where there is meaningful information (either to inform a qualitative or quantitative assessment).”* (para. 3.5).

CURRENT POSITION OF POTLL

- 1.21 PoTLL therefore consider that the approach taken in not undertaking CEA of TEC and TC presents no conflict with the law of environmental impact assessment (and Habitats Regulations Assessment), policy, guidance, advice or best practice.
- 1.22 PoTLL has set out its position in detail in a number of documents, including in the Response to Written Representations document (Document Reference PoTLL/T2/EX/32 [AS-049]. Response to Relevant Representations document (Document Reference PoTLL/T2/EX/32 [REP2-007]) and in the Summary of the Port of Tilbury London Limited’s Submissions to the Preliminary Meeting (Document Reference PoTLL/Tilbury2/EX31 [REP1-001]). This provides clear reasoning and justification and is clearly documented.
- 1.23 PoTLL remain of the view that it should not be for the Environmental Assessment of Tilbury2 to consider the cumulative effect with TEC or LTC. In essence PoTLL remain of the view that there is no *requirement* for this CEA to be undertaken in order to ensure the adequacy of the Environmental Statement that has already been produced for Tilbury2 and the subsequent decision on the proposal.

Position in respect of TEC

- 1.24 In respect of TEC, it must rightly be for RWE, the promotor of Tilbury2 to undertake the assessment of the TEC with Tilbury2 and indeed, that is the approach that PINS confirmed at the TEC Inception Meeting⁶. There is therefore no danger or risk that the cumulative effects will fail to be properly assessed, with this assessment rightly falling to TEC, to be undertaken at a time when sufficient information is available to allow the assessment to be robustly undertaken on a meaningful quantitative and qualitative basis. RWE’s Scoping Report now confirms at para. 325 that Tilbury2 will be considered a cumulative project in the TEC Environmental Impact Assessment process.

⁶ https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010089/EN010089-Advice-00001-1-170526_EN010089_Draft%20Tilbury%20Energy%20Centre%20meeting%20note%20dated%2025%20May%2020...pdf

1.25 Immediately prior to the Preliminary Meeting into the Tilbury2 proposals, RWE announced their intention to conduct a non-statutory consultation exercise between 26th February and 26th March 2018. In undertaking this consultation, RWE published a consultation leaflet and a consultation booklet. At the Tilbury2 Preliminary Meeting and in writing thereafter, PoTLL explained that this did not change the position for the following reasons:

- the consultation is non-statutory only and therefore there is no certainty whatsoever that the early visualisations of a potential scheme found in the consultation booklet⁷ will be representative of the proposals that will eventually be the subject of statutory consultation, EIA and any application submission. Indeed, the visuals provided are entitled “What Tilbury Energy Centre could look like”, and doesn’t include, for example, any representations of mitigation measures;
- at the time there was no Scoping Report published and only a high-level indication of the topics that will be covered in the Environmental Impact Assessment. TEC was at that time a ‘Tier 3’ development when considered against PINS Advice Note 17 and a Level 5 project in relation to the NE/JNCC hierarchy. Nothing that RWE has published changes this position. It is accepted that as a Scoping Report for the TEC has now been published, the proposal would be considered a Tier 2 development in the PINS Advice Note 17 terminology, albeit it would remain a level 5 project in the NE/JNCC hierarchy as no application has yet been submitted;
- the most up to date information in the Scoping Report does indicate that the temporal separation between the TEC and Tilbury2 is now even further apart than originally considered, with a DCO decision expected in Q2 2020. This would mean construction would then start at the earliest in Q3 2020, when, as set out in paragraph 5.127 of the ES (Document Reference AS-006, PoTLL/T2/EX/10), the RoRo is expected to be open and the CMAT would follow soon after; this is discussed further below;
- in any event, as has been set out in PoTLL’s Response to Relevant Representations (Document Reference PoTLL/T2/EX/32), at that time whilst a Scoping Report existed for LTC, this provided insufficient information to undertake CEA. PoTLL pointed out at that time that even if a Scoping Report were to be published for TEC it is likely to remain difficult if not impossible to undertake a CEA with any veracity unless this Scoping Report contained sufficient data and detailed information of an agreed quality to do so;
- moreover, the TEC non-statutory consultation proposals include no indication of any mitigation that might be developed as the final scale and design of the scheme progresses and consultation

⁷ *Tilbury Energy Centre Consultation booklet February 2018*, RWE

takes place (for example location, scale, massing, orientation, landscape treatment, ecology, emissions, materials and finish of the proposals). Therefore any CEA of issues such as the impact on landscape or heritage assets could not be undertaken without making unsubstantiated assumptions on the extent to which impacts arise or could be mitigated.

- 1.26 The Scoping Report that has now been published provides a little more information about the proposals but does not provide any environmental detail or data, nor does it describe proposed mitigation. PoTLL consider that it does not fundamentally alter the limitations of undertaking a CEA with TEC.
- 1.27 However, without prejudice to that position, PoTLL has undertaken this proportionate qualitative CEA of Tilbury2 with the TEC with the limited availability of information highlighted as a significant constraint on any robust conclusions. This element of the CEA was first reported in PoTLL's Response to First Written Questions [REP1-016]. Even with the availability of the Scoping Report, this CEA remains high level, qualitative and proportionate to the information which is now available.

Position in respect of Lower Thames Crossing

- 1.28 In response to the ExA's FWQs, PoTLL did not consider it appropriate to provide CEA of Tilbury2 with LTC. The Scoping Report in respect of LTC was published in October 2017 after the completion of the Environmental Statement for Tilbury2.
- 1.29 The matter has been raised by both the ExA and IPs. In answering FWQ 1.7.1 at Deadline 1, PoTLL reported that :-

“Whilst appreciating the legal and policy context highlighted by the Panel, there is no reasonable basis on which to estimate the impact on the highway network from the implementation of the LTC as no data on this exists. This data is key to understanding the related environmental impacts on topics such as air quality, noise and health. Absent this data, PoTLL would respectfully suggest that any assessment would be so speculative as to be of no value to the decision on Tilbury2 itself.

Moreover, even if such a CEA were undertaken and conclusions were drawn as to the need for additional mitigation as a result of the cumulative impact of Tilbury2 with LTC, that mitigation would clearly fall to the promoters of the LTC and would not be for PoTLL to implement. It would not and could not have practical implications for the Tilbury2 DCO. It is inescapable that the promoters of LTC will have to undertake a CEA of Tilbury2 with LTC and this is confirmed by the identification of Tilbury2 as a cumulative project in the LTC Scoping Report. There is no danger that the cumulative effects will fail to be properly assessed, with this assessment rightly falling to LTC, to be undertaken at a time when sufficient information is available to allow the assessment to robustly undertaken.

- 1.30 PoTLL still subscribe to the above analysis.

- 1.31 However, representations were made on this issue by other IPs at Deadline 1 and Deadline 2. In particular, Highways England commented in response to FWQ 1.7.1 :-

“Highways England supports the request for a Cumulative Effects Assessment to be carried out and considers that there is sufficient evidence within the LTC Scoping Report for this. A cumulative effects assessment should therefore be provided for the Proposed Development with the LTC, in accordance with PINS Advice Note 17, as the LTC scoping proposal was available at the time of acceptance. Highways England has reviewed the “Response to Relevant Representations” (PoTLL Document Reference PoTLL/Tilbury2/EX/32) and while it is noted that there is limited information available regarding the LTC, Highways England supports the production of a proportionate assessment of the potential cumulative effects of the two projects, and the consideration of mitigation measures”. [REP2-001]

- 1.32 However, in responding to the comments by Essex County Council in respect of FWQ 1.18.6, the Highways Agency also further stated that :-

“HE is currently revising the traffic model for the LTC, and is incorporating the latest proposals for the design of LTC. If the Applicant used the current assumptions for LTC in a cumulative assessment of the Proposed Development with LTC, that assessment may be unrealistic. Furthermore providing further detailed information on the traffic model and on the route of LTC prior to a formal consultation would compromise the integrity of the planned consultation. HE accepts responsibility for assessing the cumulative traffic impacts from the Proposed Development and LTC that will be presented in HE’s application for LTC.” [REP2-003]

- 1.33 From these comments, it is clear that traffic data is not available. It follows, as PoTLL has consistently opined, that there are significant limitations to undertaking a CEA of Tilbury2 with LTC at this stage as the environmental effects of LTC will be related to a large degree on the traffic which is modelled to use the revised network following the implementation of the project should the DCO for the LTC project be approved and then implemented. There is clearly insufficient data of an agreed quality.

SUMMARY AND LIMITATIONS

- 1.34 PoTLL has therefore continued to constantly review available information against all relevant guidance, advice and best practice and in order to seek to assist the ExA and IPs has sought to provide a proportionate qualitative CEA given the significant limitations to this process.
- 1.35 It is clearly constrained by the availability of information on the options and extent of the likely scheme and the absence of quantitative data. Given these constraints, the assessment is necessarily high level and qualitative, albeit based upon a consistent set of assumptions where possible and professional judgement.
- 1.36 This document sets out the results of the high level, qualitative, and proportionate assessment. It is a pragmatic response to a situation with two

future projects where there is insufficient evidence and data of an agreed quality such that a meaningful quantitative assessment is largely precluded. It has been undertaken on the basis of professional judgement based on the level of information available.

- 1.37 Based on this limited information, the assessment within this document is high level and includes assumptions and in some instances informed speculation as to the nature and content of the proposals, mitigation and hence the assessed potential cumulative effects. In this regard PoTLL has also tried to use comparable scheme information to inform the TEC but has not been able to take a similar approach to the LTC due to the bespoke form and nature of that proposed scheme and its sensitivity to the specifics of modelling of the defined scheme when it is developed.
- 1.38 Moreover, nothing in this document can be taken as pre-determining or fettering the necessary consultation, optioneering, preparation, environmental assessment and examination processes of any future applications for either project, although these projects will necessarily need to fully take into account the Tilbury2 application as made, and examination documentation, and assess and mitigate any potential cumulative impacts within each of the TEC and LTC schemes.

2.0 DESCRIPTION OF TILBURY ENERGY CENTRE PROPOSAL

DESCRIPTION FROM CONSULTATION BOOKLET

- 2.1 A summary description of what is currently known about the TEC is provided in this section of the report. This forms the basis of the assumptions made about the proposed project to undertake the high level qualitative assessment contained within this report. Information has been based on the material published by RWE as part of their non-statutory consultation, now supplemented by the Scoping Report published by RWE on 17th April.
- 2.2 RWE Generation is proposing to submit plans to develop Tilbury Energy Centre at the former Tilbury B Power Station site. The application will be a NSIP under the Planning Act 2008 (as amended) (PA2008).
- 2.3 A summary description of the proposals is found in the *Tilbury Energy Centre Consultation booklet* dated *February 2018* attached as Appendix 1 to this report as follows :-
- “The Tilbury Energy Centre will provide energy from three sources: a 2,500MW Combined Cycle Gas Turbine plant, a 299MW peaking plant, and a 100MW energy storage facility.”*
- 2.4 The booklet (and now the Scoping Report) explains that all existing structures on the site will be demolished, although existing cooling water infrastructure will remain in place and will be re-used where possible,⁸ albeit the construction of new cooling water infrastructure is not ruled out. The development consent application will also include a 3km gas pipeline which is proposed to run east to connect to the National Grid pipeline at a newly constructed above ground installation (AGI).
- 2.5 The booklet provides an overview of the component parts of the installation, namely the CCGT, ‘peaking plant’ and energy storage facilities.
- 2.6 A block layout is provided on page 7 of the booklet. The proposed development area (15.1ha.) is located partly on the area presently occupied by Tilbury B power station and partly on the area of the former coal stock yard. It is estimated that the southern boundary of this development area is located some 300m north of the existing flood defences.
- 2.7 A visualisation entitled “*What Tilbury Energy Centre could look like*” is provided on page 9 of the booklet which describes that the TEC “*will be designed to minimise its visual impact.*” The scale of the proposals is described as follows :-
- “We are proposing up to three CCGT generating units and up to two open cycle gas turbines or peaking units. The boiler house will be approximately*

⁸ The ‘existing cooling water infrastructure’ includes intake structures located on the PoTLL jetty, which the design of the Tilbury2 proposals retains.

55 metres high excluding stacks which would reach a maximum of 95 metres high. The Above Ground Installation where the 3km from the site pipeline connects to the national grid gas pipeline will be an approximately 40x40 metre area with a collection of valves, pumps and a kiosk.”

- 2.8 The visualisation also shows that each boiler house will have a turbine hall to the north. The dimensions of these are not given but are estimated (taking a visual proportionate scaling approach from the illustrative material) to be around 75% of the height of the Boiler House (circa 40m), with a somewhat larger footprint.
- 2.9 The proposals do not show any landscape mitigation. The booklet indicates that a landscape and visual impact assessment will be undertaken to assess the potential impacts of the proposed power station and associated pipeline and this will determine the need for any mitigation measures and landscaping requirements.
- 2.10 It is unclear how or if any provision is to be made for combined heat and power or the nature of carbon capture and storage readiness (as would be expected in accordance with the National Policy Statement for Energy (EN-1). The Consultation Booklet states that *“The project is also reserving land which will allow us to construct and operate carbon capture facilities should the technology become available in the future.”*
- 2.11 There is brief reference in the booklet to air quality impacts, with the scheme producing *“carbon dioxide and water vapour along with small quantities of nitrogen oxides, carbon monoxide and non-methane volatile organic compounds.”* Mitigation of air quality will be achieved through the use of gas fired turbines. The Scoping Report further states *“Emissions of NOx from the station will be very significantly reduced compared to the coal station previously operational at the site. The station will be designed to meet and, where feasible, better emission limits required by its Environmental Permit.”* Residual emissions will be discharged through flues in tall stacks and diluted and dispersed by natural atmospheric processes.
- 2.12 On potential ecological impacts, the booklet indicates that *“the technology and design of the power station will avoid the need to emit chemicals to the aquatic environment and therefore there will be no need to chemically treat outflowing water to the River Thames.”* It indicates that ecological mitigation may be included as *“there is an opportunity to create better and more connected places for wildlife. We will identify areas where it is feasible to support biodiversity, including through the management of habitats.”* The Scoping Report confirms a Stage 1 HRA Screening exercise will be undertaken due to the TEC’s proximity to European Sites and potential for impacts from emissions to air.
- 2.13 Socio-economic impacts are considered, with the suggestion of a community fund to provide *“thousands of pounds of financial support to local initiatives each year.”* It is further estimated that the proposal will create:

“a net economic benefit to the area in terms of employment and supply chain activity. It is estimated that a workforce of up to 1,500 builders

and contractors will be necessary during the site's three-year construction. During operation, the new site will employ up to 100 staff in high-skilled roles, with many local contractors and businesses required to support its day-to-day operations."

- 2.14 Once operational, it is estimated that *"the power station will bring millions of pounds to the local economy"* although no explanation or figure is placed on this.
- 2.15 Transport impacts are recognised during construction (although no estimates of traffic are provided) and no specific comment is made as to transport impacts in operation. The Scoping Report proposes that operational transport impacts are scoped out of EIA.
- 2.16 The consultation booklet notes that temporary noise may occur during construction. During operation the scheme will be *"much quieter than the former coal station."*
- 2.17 The nature or extent of mitigation for environmental impacts is not known as surveys have yet to be produced, but these will *"help determine the mitigation measures we need to implement as part of our proposals. We will seek to coordinate our mitigation proposals with any existing or planned local environment improvement projects."*

SCOPING REPORT DESCRIPTION

- 2.18 As highlighted above, since PoTLL's earlier qualitative Cumulative Effects Assessment of the TEC, RWE have now published their Scoping Report⁹. The description within the Scoping Report is, as one would expect, in accordance with the Consultation Booklet, although further detail is provided as to the general nature of the proposal. The description of the works includes reference to:
- Works for Surface Water Network;
 - Works for Landscaping;
 - Works for Foul Water Sewer;
 - Works for Towns Water connection;
 - Works for site establishment.
- 2.19 The Scoping Report confirms that access to the site is proposed to be via the Tilbury2 site (section 4.6). It also indicates that cooling water infrastructure will be needed, which may comprise of above ground pipework, a concrete caisson, onshore or offshore pumps and new tunnels or a combination of all three. In-river screening at the cooling water intake is

⁹ <https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010089/EN010089-000018-TBEC%20-%20Scoping%20Report.pdf>

also proposed (para. 85). It highlights existing cooling water intake structures and tunnels which if not reused will be left in-situ (para. 85). Construction and maintenance dredging will also be required (para. 86).

- 2.20 It also sets out the requirement, under the Carbon Capture Readiness (Electricity Generating Stations) Regulations 2013, for land to be set aside to be 'carbon capture ready'. Land to the east of the proposed CCGT & OCGT development area and construction laydown areas is therefore shown (blue) in the block layout plan as reserved for future retro-fitting of carbon capture plant and equipment.

PROJECT TIMELINE

- 2.21 The consultation booklet sets out a project timeline. Following the non-statutory consultation, a Scoping Report is expected to be submitted in March 2018 (now submitted on 17 April 2018); statutory consultation in 'late summer 2018' with submission early in 2019, with a decision of the Secretary of State expected in Q2 2020. The submission date is later than RWE previously advised (and as assumed in *PoTLL Response to relevant Representations* (Document Reference PoTLL/T2/EX/32) by at least 3 months.
- 2.22 The consultation booklet does not state when the construction of the scheme would be likely to commence post the Secretary of State's decision, and this therefore remains uncertain and may be affected by bidding timescales in the Contract for Difference. However, RWE previously advised that with a DCO application submitted to the Secretary of State Q4 2018, construction commencement was anticipated as Q1 2021 with a four-year construction and commissioning assumed, and operation commencing in 2025. From the timeline now in the consultation document, it is assumed that construction would commence at the earliest in Q2 or Q3 2021 with consequential knock on effect on the remainder of the indicative timetable. No further information on construction programme is provided in the Scoping Report.
- 2.23 Accordingly, there will be limited, if any, temporal overlap in the anticipated construction programmes of Tilbury2 with TEC. As set out in the Tilbury2 Environmental Statement, the Tilbury2 would become operational with the opening of the RoRo terminal in Q1 2020. Construction on-site for the remainder of the terrestrial works including the CMAT would continue for another 12 months (i.e. Q1 2021). Assuming construction of TEC commences at the earliest Q2 or Q3 2021, all of the main construction activities related to the Tilbury2 proposals (in particular the new lengths of highway and rail line, all maritime infrastructure, and the grading and laying of appropriate pavements across the site) will be complete and the RoRo terminal, and quite possibly the full extent of the CMAT, will be operational.
- 2.24 There is no further certainty provided in the Scoping Report as to project timelines. Paras. 50 and 51 explain that it is proposed that the TEC will, once consented, be subject to prequalification and participation in the capacity market auction as early as of 2020. Appendix 4 is a timeline for the capacity market auction which illustrates how this process operates as a

once a year opportunity¹⁰. The Scoping Report itself further adds that *“There is no certainty, despite achieving a consent to construct the TEC, that it will be successful in a particular auction. Consequently, to ensure that the TEC is given sufficient opportunity to be developed through the capacity auction process RWE Generation is likely to propose a time period for the implementation of the development consent in excess of 5 years.”*

- 2.25 There is therefore, uncertainty as to exactly when and if the TEC will be constructed, but it is a reasonable assumption that there will be limited if any temporal overlap with the construction of Tilbury2.

ADDITIONAL INFORMATION USED IN THIS CEA

- 2.26 This CEA has been supplemented where appropriate by knowledge of a similar installation proposed by a previous NSIP known as Wrexham Energy Centre.¹¹ This comprises a combined cycle gas turbine (CCGT) generating station fuelled by natural gas with a generation capacity of up to 299 megawatts. The combustion, steam raising and electrical generation processes would be the same. The exception would be carbon capture and storage provisions (for which land is reserved) which were not required at Wrexham but which are in generic terms allowed for in the TEC proposals. Moreover, the TEC proposes three types of generation as noted above so the projects are not directly comparable.

¹⁰ Extracted from *“Capacity Market Registration and Prequalification interactive guidance v1.0 July 2017”*, RWE, July 2017.

<https://www.emrdeliverybody.com/SiteAssets/Lists/Latest%20News/NewForm/Capacity%20Market%20Prequalification%20Guidance%20v1.0.pdf>

¹¹ <https://infrastructure.planninginspectorate.gov.uk/projects/wales/wrexham-energy-centre/>

3.0 DESCRIPTION OF LOWER THAMES CROSSING PROPOSAL

3.1 The Lower Thames Crossing (LTC) is a proposed new crossing of the River Thames east of London planned to connect Kent and Essex. It has been the subject of alternative route consultation options and was recently the subject of a consultation on the Scoping Report dated October 2017.¹² The indicative route alignment is shown below. A drawing is attached in Appendix 2, extracted from the LTC Scoping Report. This has been overlaid for the Tilbury2 DCO proposals for illustrative purposes only at Appendix 3.



3.2 The LTC proposes a new junction near Tilbury, including a link road to the Port that is proposed to “*improve traffic flow and provide an alternative route for HGVs.*” (SR, 3.2.3)

3.3 Accordingly, the key aspects of the LTC scheme that have been considered are summarised as follows, however it should be noted that there is no

¹² <https://infrastructure.planninginspectorate.gov.uk/projects/south-east/lower-thames-crossing/?ipcsection=docs>

settled position on the extent and form of the scheme, particularly in relation to the link road, at this stage in the pre-application process:-

- 31km link road connecting the A2 East of Gravesend in Kent with the M25 via Junction 29;
- the road would be in the form of a dual three-lane carriageway between the A2 and A13 reducing to a dual two-lane carriageway north of the A13;
- the route would pass approximately 1.5km to the east of the T2 development at its closest point;
- a new junction would be constructed approximately circa 1.5km north east of the T2 development. A new link road would extend from the new junction in a broadly south west direction to connect with the proposed T2 infrastructure corridor and Port of Tilbury;
- approximately 3.0km of the route would be constructed within a twin-bored tunnel passing beneath the Thames with portals north and south of the river;
- the approach to the southern portal, located broadly east of Chalk village would be in the form of a deep chalk cutting;
- the approach to the northern portal would be located west of East Tilbury;
- excavated materials stored on site, processed as required for re-use or disposal;
- excavated material removed via road/rail network if not accommodated on site and/or possibly by river barge requiring a new project specific jetty and a presently unspecified location;
- construction period approximately 5 years circa 2021-26;
- 3 main construction compounds including one at a tunnel portal as well as other satellite compounds.
- potential installation of tunnel vent stacks (approximately 25m high), service and control buildings at each portal;
- potential modification to the existing HV power infrastructure;
- proposed artificial lighting at junctions and interchanges as well as parts of the local access roads and other elements of the scheme.

3.4 In terms of construction, the project is scoped as taking 5 years to complete, including a 9 month mobilisation period. An estimated opening date of 2026 is assumed, meaning that mobilisation of construction would commence in 2021. This is the 'best case' (earliest) and would slip by one year if private

funding is required (SR, para. 2.1.4). As such, the construction would not commence until after the currently estimated first operation of Tilbury2 following completion of all infrastructure early in 2021 (see below).

- 3.5 Attached at Appendix 3 is an overlay of the plan provided within the LTC Scoping with the General Arrangement drawings for Tilbury2. The proposals provide for a new junction east of Tilbury which routes westwards across land owned by RWE, the Tilbury2 site itself, linking into the Tilbury2 infrastructure corridor and thereby providing an alternative route to the main port. There is no detail as to the design of the road and whether the link between Tilbury2 and the existing St. Andrews Road will be in the form shown in the Tilbury2 DCO or whether the highway design will be any different (for example single or dual carriageway).
- 3.6 As can be seen the LTC route as currently assumed would require landtake within the Tilbury2 site (this land being lost to the CMAT, areas of general storage and part of the ecological mitigation area in the northeast corner of the site) and would require the rail sidings that route along the northern and eastern boundaries of the Tilbury2 site to be crossed (presumably with the LTC link going over the sidings). The access to Tilbury2 would come via a new roundabout on the link road itself.
- 3.7 The potential impacts of the proposals on PoTLL's operations are :-
- Some potential reduction in the operating capacity of Tilbury2 due to land loss;
 - Loss of part of the on-site ecological mitigation and compensation land within Tilbury2 (leading to impacts that would in turn require refinement and minimisation through design or in the absence of avoidance through design, direct mitigation/compensation as part of the LTC proposals);
- 3.8 Clearly, if this was the case, there may need to be modification to the Tilbury2 DCO if the LTC were to overlap with Tilbury2 and the design of the scheme could not avoid altering the proposals within the Tilbury2 DCO assuming it had been consented.
- 3.9 Improved access to the main port and Tilbury2 to the motorway network, with traffic diverting to this route from the A1089/A13 depending on its origin/destination with differential benefits/dis-benefits to residences in Tilbury (in terms of noise, air quality, visual amenity etc) by likely reductions in traffic between the main port entrance and the A13 and increases in traffic along the Tilbury2 proposed infrastructure corridor, all requiring assessment and mitigation within the LTC scheme proposals once the traffic modelling and options are known.

4.0 QUALITATIVE CEA OF TILBURY2 WITH TEC

- 4.1 Each environmental topic has been assessed by competent experts who have considered the cumulative effects of Tilbury2 with the TEC.
- 4.2 The extent to which this is possible given the level of information available and uncertainty varies across environmental topics.
- 4.3 For example, landscape and visual impacts and impacts upon heritage assets will be influenced significantly by detailed design and positioning of the scheme and embedded mitigation. It is on this basis that PoTLL consider that detailed qualitative and quantitative assessment of cumulative effects of the project with Tilbury2 will necessarily be undertaken by the promoter of the TEC. This caveat should therefore be applied to all of the following high level, proportionate and qualitative analysis especially where generic generating type information is taken from the Wrexham Energy DCO scheme.
- 4.4 Where reference is made to the RWE Consultation Booklet, it can be assumed that the subsequently published Scoping Report contains no new information that alters the assessment undertaken. The Scoping Report has been reviewed by all experts in order to ascertain whether additional or different information is now available.

SOCIO-ECONOMICS

- 4.5 This cumulative assessment of Tilbury2 with the TEC assumes a future baseline scenario without Tilbury B but assumes Tilbury2 is consented and in operation. The TEC is expected to generate both construction and operational employment opportunities as set out in the Environmental Impact Assessment (EIA) Scoping Report. In combination with Tilbury2 proposals, these are likely to have a number of positive outcomes on socio-economic indicators across both Thurrock and the wider Essex area.

Predicted combined effects on construction employment

- 4.6 The Tilbury2 assessment assumes a broad range of effect across the London, South East and East of England regions. The TEC assessment will consider the Thames Gateway authorities.
- 4.7 The construction employment associated with the TEC is likely to be greater in scale than that associated with Tilbury2, due to the complex nature of the development. The TEC EIA Scoping Report identifies that the development is located within a sizeable labour pool, of around 72,000 construction workers. It is considered that many of these workers would be capable of meeting project demands.
- 4.8 The TEC consultation booklet outlines that an estimated workforce of up to 1,500 builders and contractors will be necessary during the three year construction period. Although the TEC falls within predominantly the same

labour catchment as Tilbury2, it is anticipated to take place after the Tilbury2 proposals are largely complete. Further multiple developments do not have the effect of 'crowding out' construction labour, that is to say that a project either 'waits in line' or 'extends' its reach to construction labour outside the region from which it might have otherwise been likely to draw upon. This is reflected in the mobile and large-scale nature of the construction sector.

- 4.9 Even considered in combination, both schemes represent only a small proportion of the overall construction sector. As a result, there is unlikely to be any significant cumulative impact during this period. Further, the construction labour force for the TEC will differ markedly both in the type of operational labour force of Tilbury2 in terms of specialisms required, and in terms of the construction timeframe.

Predicted combined effects on operational employment

- 4.10 The ongoing use of Tilbury2 for port and logistics functions differs from the ongoing use of TEC for energy functions. Whilst there will be some low- and medium-skill roles which could be considered generic across these (and other) sites, there are also a number of medium- and high-skill roles which are more specialist and do not overlap. As a result of these specialist labour requirements, the employment generation for the TEC is likely to be of a generally non-competing nature to Tilbury2, and is expected to draw upon a different skills set within the labour market.
- 4.11 The TEC consultation booklet states that the new site will employ up to 100 staff in high-skilled roles. This is repeated in the scoping report, including that up to 60 employees would be on site at a time. The labour requirements for the TEC are likely to draw from a similar catchment to that of Tilbury2, however a small proportion of labour is likely to be highly specialist and might be drawn from a much wider labour pool. The TEC scoping report proposes to assess operational employment for the Thurrock Council area.
- 4.12 Although employment generation is considered to be a benefit to the local and regional area (and thus a positive impact for environmental impact assessment), it is expected that existing local firms will have limited opportunities to contribute to the TEC construction process. There may however be ongoing opportunities to support operation by providing lower skilled services, such as maintenance, security, and cleaning. The anticipated TEC CAPEX (capital expenditure) associated with building a new generating station is expected to be significantly larger than that of Tilbury2, due to both the scale of the undertaking and the associated specialist labour requirements.

Predicted combined effects on employment, skills and training initiatives

- 4.13 Job creation, particularly within technical roles, could play a role in raising the qualification levels in the Tilbury area, which are notably below those across surrounding geographic and administrative areas which are also, in part, included in the ports labour catchment.

- 4.14 There could be new or enhanced opportunities for links with educational establishments, apprenticeships, and STEM (Science, Technology, Engineering and Mathematics) taster days, in conjunction with those already taking place as part of the Tilbury2 proposals. This could include building on existing initiatives, partnership working across a range of sectors and linking up with existing community funds to overcome barriers to employment in Tilbury.
- 4.15 The TEC consultation booklet sets out that the power station is expected to open up opportunities for young people on training schemes, and for creating strong links with local schools, particularly in relation to STEM. In addition, the TEC provides opportunities to support the wider aims of the Thurrock Economic Development Strategy, including potential employment and supply chain opportunities. This is likely to complement the commitments set out in the Tilbury2 Skills and Employment Strategy, such as working with tenants in supporting wider opportunities across South Essex.

HEALTH

- 4.16 Large scale developments have the potential to affect the health, wellbeing, and quality of life of the surrounding population. This can include direct impacts on health arising from increased traffic, air pollution, dust, odour, polluting water, and hazardous waste. Considerations also include the assessment of indirect health impacts, such as the effect on access to key public services, transport or the use of open space for recreation, active travel and physical activity. The Scoping Report on the TEC sets out that it will consider effects (Section 7.2.12) on human health and that it will consider cumulative impacts of the TEC in relation to Tilbury2 and the LTC (Section 7.2.14). The health impact assessment for the TEC covers the same health determinants as the Tilbury2 health assessment.
- 4.17 This section on health takes a high-level view of the potential combined health effects of Tilbury2 and the TEC using data currently available; it has to be borne in mind that health assessment relies on data and modelling from across various other topics, which is not currently available in detail for the TEC.
- 4.18 The TEC is located in proximity to Tilbury town and could in combination with Tilbury2 be associated with cumulative effects on health during the construction and operation of Tilbury2. Tilbury2 will be mostly operational by the time the TEC is under construction. There will be limited if any overlap between the construction of Tilbury2 and construction of the TEC, which could potentially expose the local population to a prolonged period of noise, vibration, air quality, active travel, visual impact, and transport impacts. There may also be cumulative impacts arising from the operation of Tilbury2 and the operation of the TEC which could impact on air quality, noise impacts, active travel, visual impact and transport.
- 4.19 Air quality could influence health via effects on respiratory health and vulnerable populations include those with existing respiratory disease, children, and the elderly. Although no significant health effects from air

quality have been identified for Tilbury2, cumulative effects could arise from changes in air quality as a result of the addition of traffic movements associated with construction although for the reasons set out below these are not considered significant. The Scoping Report indicated that it is anticipated that up to a maximum of 1,500 construction workers will be on-site at the peak of construction resulting, after mitigation measures are applied, in circa 650 one-way vehicle movements per day. However, the cumulative assessment of air quality impacts arising from Tilbury2 and the TEC suggest no cumulative impacts of air quality during construction or operation but if such effects arose they would need to be mitigated by TEC.

- 4.20 Noise could influence health via effects on increased annoyance, loss of sleep and physiological effects and vulnerable populations include residents, as well as those using nearby schools. Again, during construction of TEC the noise associated with TEC construction vehicles cumulatively with Tilbury2 operational traffic may result in health effects due to noise, with mitigation being considered by TEC.
- 4.21 Preliminary information on the TEC (see Land-side Transport Section) in the Scoping Report suggests that the TEC would not change the severance assessment and health effects identified for Tilbury2.
- 4.22 Similarly, the cumulative impact of potentially disrupted access during the construction periods could be harmful, particularly surrounding public transport diversions, and highways improvements. Possible disruptions to the local public transport associated with construction, could have adverse impacts on particularly vulnerable groups including older residents, children, residents with a disability or long-term health condition, low-income households and people without a car. Disruption to the local highways network can also cause a number of issues relating to driver stress, as a result of delays, route uncertainty and congestion, and also impact on active travel.
- 4.23 However, the effects on the local highway network of TEC will be mitigated by the use of the new highway linking Fort Road and Ferry Road, which will be available for use by construction vehicles when construction of TEC commences. This new highway may have positive and negative impacts on the health of the local population via impacts on noise, transport and air quality which could influence respiratory health, annoyance, sleep, and stress. Different vulnerabilities for these health effects may exist in the local population, in particular for children, the elderly, those with existing respiratory disease, those with existing poor-health and those from low-income households. How the cumulative effects of the two proposals would affect different groups within the population will need to be considered through a health impact assessment and an Equalities Impact Assessment for TEC.
- 4.24 Both Tilbury2 and the TEC identify potential health effects associated with the visual impact and lighting of the Schemes. Lighting can influence health by effects on sleep, mood and cognition. Visual impact can influence health by effects on physical and mental health via effects on physiological effects such as obesity and blood pressure, as well as cognition, mood, physical

activity and social cohesion. The cumulative effects of the two Schemes in terms of visual amenity is thought to be greater than the effects identified for Tilbury2 (see Landscape and Visual Amenity section below): based on this it is therefore possible that the health effects of the two schemes may also be greater than the effects identified for Tilbury2.

- 4.25 The TEC will need to prepare both a health impact assessment and an Equalities Impact Assessment to consider these matters further and include a cumulative assessment examining impacts and health effects associated with both the construction of Tilbury2 and the TEC. In particular, the health effect of the prolonged construction periods across the projects in the local population will need to be considered.
- 4.26 However, the mitigation associated with both projects (in particular a CEMP for each), the Operational Management Plan for Tilbury2 and the adherence to industry standards and regulatory controls for the TEC, should ensure that no significant cumulative effects of the TEC with Tilbury2 will result. It is considered a reasonable assumption to make that operational noise minimisation, mitigation and management measures will be required for TEC also, particularly under the dual controls of DCO and regulatory regimes. The TEC will be required to operate in line with the requirements of the European Industrial Emissions Directive (or any equivalent), including limits on emissions of NO_x and CO. The facility will also require an Environmental Permit to operate, issued by the Environment Agency, which will also impose controls on emissions.

LANDSCAPE CHARACTER AND VISUAL AMENITY

- 4.27 This cumulative assessment of Tilbury2 with the TEC assumes a future baseline scenario without Tilbury B but assumes Tilbury2 is consented and in operation. The predicted effects of the TEC are likely to fall within the T2 LVIA core study area. Predicted effects are adverse in nature and would potentially combine with the effects of the Tilbury2 proposals.
- 4.28 The generally open nature of the Tilbury Marshes Local Character Area ('LCA') renders it potentially highly sensitive to development of the scale and type proposed for TEC. That said, the consented landscape context at the time the proposed development would occur would be a post-industrial landscape, defined by the former power station site and comprising cleared ground and retained HV power transmission infrastructure. Assuming the Tilbury2 proposals are consented and in operation, the adjoining former power station land to the west would have become an operational port, itself adjoining the existing Anglian Water Treatment Works.
- 4.29 The immediate industrial/post-industrial context reduces the inherent sensitivity of the LCA which is assessed as medium-low, allowing for the continued presence of buildings and structures identified above. The sensitivity of the adjoining LCA's to development of this type and scale would range between low and negligible.
- 4.30 The TEC would be consistent with the historic and established pattern of industrial activity in the locality. It would potentially introduce a compact

grouping of large industrial structures into the industrial/post-industrial context described above. The proposed buildings, as shown illustratively, would be located approximately 0.45km north of the Thames. The effect on the Tilbury Marshes LCA would likely be negative and of moderate-slight significance whilst the effect on adjoining LCA's would likely fall in the range of slight to slight-imperceptible.

4.31 The main TEC site is unaffected by designations related to the quality of the landscape. A small part of the development area of the TEC would intrude into the Green Belt on the eastern boundary of the site. There would therefore be some direct effect on the designation and also on the valued characteristic of openness that would be very slightly eroded in terms of some limited views across the designated area.

4.32 In terms of local landscape value, and receptor sensitivity :-

- There is no formal designated site of nature conservation interest within the TEC Development Area site or immediately adjoining it.
- Similarly there is no designated interest related to cultural heritage. However, there are many such features in the wider locality including Scheduled Ancient Monuments (SAM's), listed buildings and Gravesend conservation area. The size and scale of proposed development may be sufficient to affect the setting of some of these assets and combine with the effects of Tilbury2 on Tilbury Fort, New Tavern Fort and Coalhouse Fort albeit that setting, as described in the Tilbury2 ES, even in the future baseline without Tilbury2 consented, is already eroded.

Predicted combined effects on landscape character

4.33 Proposed development of the TEC would introduce additional levels of visual and acoustic intrusion into an area already affected by the presence of road vehicles, trains, large shipping as well as the presence of industry and HV pylons. The highest level of effect would be short-medium term and associated with construction activities. However, there would be limited, if any, overlap between the TEC construction and Tilbury2 (as described above all of the infrastructure corridor and RoRo facility will be complete prior to the construction of the TEC commencing) and therefore limited, if any change, to the effects during the construction of Tilbury2.

4.34 The long-term effect on levels of tranquillity in the locality would most likely relate to visual intrusion and be of slight significance when considered cumulatively with Tilbury2.

4.35 There would be potential cumulative effects of Tilbury2 with TEC in relation to cultural heritage. The combined Tilbury 2 and TEC developments could affect cultural heritage value associated with the SAM's of Tilbury Fort, New Tavern Fort and Coalhouse Fort. The TEC would consolidate the presence of industry established by the water treatment works, Tilbury 2 and retained HV power infrastructure. However, the overall cumulative effect on the cultural heritage value of Tilbury Fort would remain largely unchanged to that reported for Tilbury 2 given the established semi-industrial context.

- 4.36 For similar reasons the essential historic relationship between Tilbury Fort and New Tavern Fort would not be further affected by the cumulative effect of Tilbury2 and TEC in combination. In respect of Coalhouse Fort the TEC would increase the presence of industry in the far distance.
- 4.37 The TEC development would be likely to be set well back from the river frontage and, subject to appropriate design and mitigation, potential effects on the appreciation of the setting of Gravesend conservation area would likely be of slight significance and would not increase by combination with the Tilbury2 proposals.
- 4.38 The TEC would have a significant cumulative effect with Tilbury2 on the amenity of users of public rights of way and users of the River Thames. Tilbury 2 and TEC schemes may be of significant interest in their own right and are likely to be viewed more favourably than the former power station.
- 4.39 In relation to both landscape and visual amenity it is important to see any cumulative assessment in the context that any generating project will need to be designed and brought forward for examination in accordance with the relevant energy National Policy Statements. In relation to TEC this would be the Overarching National Planning Policy Statement for Energy (EN-1), EN-2 on fossil fuel generating stations and EN-3 on renewable energy infrastructure. Criteria for good design are set out in section 4.5 of EN-1.

Predicted combined effects on visual amenity

- 4.40 It is likely that the upper levels of the larger proposed buildings and the stacks within the TEC development would be visible above the proposed Tilbury2 buildings and container facility as viewed from the west. The views would also take in the nearer context of buildings within the water treatment works, effectively reinforcing the industrial context that will form part of the setting of Tilbury Fort.
- 4.41 During the construction period and following completion, the combined effect on these receptors would likely remain at the levels predicted for the Tilbury2 proposals following completion, namely substantial-moderate to slight, according to and dependent on location.
- 4.42 Views of the TEC from locations north-west of the development would likely be partly screened by Tilbury2 itself. From the north-east views would take in the TEC site, particularly the larger structures in combination with the northernmost extent of proposed buildings and stockpiles on Tilbury2 and, to a lesser extent, the southern half of the proposals. From the east the TEC would become one of the most prominent aspects of development in the view. It would consolidate the presence of industry at Tilbury and would likely provide additional visual features in the form of three tall stacks for the CCGT elements and a further lower stack to the east for the OCGT, adding to the effect of the proposed T2 cement silo. The significance of the TEC and Tilbury 2 schemes in combination would, in close views, be of substantial-moderate significance.

- 4.43 Views from the south, including the river, would be affected by the combined Tilbury2 and TEC developments. Tilbury2 and the TEC would be located in very close proximity and would contain buildings of comparable size. The core of built development within the TEC would occupy a relatively small area compared to Tilbury 2. As a result, the developments would likely be viewed as a single industrial grouping, in much the same way as the former power station used to be. The significance of the combined developments in these views would be greater than those predicted in the Tilbury 2 LVIA and more so to views from the south east than the south west. This due to the partial screening of the TEC structures by the Tilbury2 proposals.
- 4.44 Artificial lighting associated with the Tilbury2 and TEC would represent a cumulative effect. To some extent lighting associated with the TEC would likely represent a moderate extension of lighting within Tilbury2 which would extend over a greater area.

TERRESTRIAL ECOLOGY

- 4.45 **Statutory designations.** No Habitats Regulations Assessment (HRA) information for the TEC has been made available at this stage; however, RWE confirm in their Scoping Report that a Stage 1 Screening will be undertaken.
- 4.46 To inform the current high-level qualitative assessment set out below, the existing baseline data¹³ used to inform the Tilbury2 assessment has been reviewed and considered. Potential impacts of the TEC on statutory designations such as the Thames Estuary and Marshes Special Protection Area (SPA) and Ramsar Site may include the following:
- Air Quality. The impacts of the generating station on NO_x concentrations and nitrogen deposition at SACs, SPAs, Ramsar Sites and SSSIs within 10km of the central CCGT stack will be modelled and assessed by RWE as part of the Stage 1 Screening exercise. Increased NO_x emissions, leading to changes in air quality, and resulting in potentially significant increases in nitrogen deposition on European Site habitats (e.g. saltmarsh), could potentially breach the critical load threshold for those habitat types or prevent recovery in the context of otherwise improving trends. For habitats comprising special interest features of the Ramsar Site, there could be a decline in habitat condition/quality, or if the effect were severe then possibly a loss of noteworthy flora and a transition of the vegetation communities to different habitat-types. Knock-on effects for the SPA could arise from a related reduction in quality/suitability of wader-foraging habitat for qualifying species of the SPA;
 - Bird Disturbance. The Scoping Report does not specifically state that disturbance to SPA/Ramsar-cited wading bird species using intertidal habitats and possible high-tide roosts will be considered as part of the Stage 1 Screening exercise. However, it is considered that there is

¹³ In respect of SPA bird species, this includes data provided in the Tilbury2 ES paragraphs 10.269 – 10.285 (document reference 6.1 / APP-031) and the subsequent 'Note of Wintering Birds' (Appendix 7 to the Applicant's Response to Relevant Representations / AS-049).

potential for disturbance impacts to arise during construction of the off-shore cooling water infrastructure (with any associated dredging and piling activity) and during construction of the 3km on-shore pipeline (both within the SPA and outside of it within land that is potentially functionally-connected (i.e. used by SPA/Ramsar Site species for feeding or roosting). Further consideration of potential for in-combination disturbance effects will be provided in the revision to the Tilbury2 HRA Report (to be submitted at Deadline 4). However, initial analysis of the Tilbury2 baseline wintering bird data indicates that for most SPA citation species, the peak counts present within a combined 300m Zone of Influence (from both the Tilbury2 and TEC proposed Order Limits) remain below significance levels (i.e. the peak count of birds present within the combined Zol is equivalent to <1% of recent peak mean counts for citation species within the SPA boundaries);

- Loss of Functionally-linked Habitat. Potential temporary losses of functionally linked land could arise, dependent on the nature and scale of the works within intertidal habitats (related to any cooling water infrastructure), and potentially along the route of the 3km pipeline depending on the extent to which such land is used by SPA/Ramsar Site bird species (the LTC Part One Appropriate Assessment (AA)¹⁴ refers to a high tide roost in this area);
- Other Impacts on Functionally-linked Habitat. Potential construction phase effects will include displacement/removal of benthos; changes to suspended solids levels in the water column during dredging and potential smothering of benthos; release of chemicals in bottom sediments to the water column during dredging; changes to the hydrodynamics resulting from temporary structures leading to potential scour or deposition. During operation discharge of heated cooling water at the outfall and the associated thermal plume could result in positive or negative changes to benthos populations, distributions and availabilities to SPA bird species.

4.47 **Non-statutory designations.** There are no Local Wildlife Sites (LoWS) within the footprint of the CCGT and OCGT areas (i.e. for the TEC itself). However, the 'indicative block layout' arrangement shows that the future 'CCR & CCR construction laydown' locations impinge upon the proposed 'Tilbury Power Station' LoWS (the boundaries for which have been drawn up under the draft LoWS expansion, albeit these are not identified within the Scoping Report). These proposals result in incursions into the following elements of the draft 'Tilbury Power Station' LoWS:

- Walton Common (an area of remnant coastal grazing marsh with value for invertebrates and reptiles);
- RWE's 'A1' PFA mound (former ash disposal mound restored pursuant to planning conditions to maximise value for invertebrates); and

¹⁴ Highways England (January 2016). *Lower Thames Crossing. Pre-Consultation Scheme Assessment Report. Volume 6: Environmental Appraisal.* (Ref: HA540039-HHJ-ZZZ-REP-ZZZ-010)

- The Goshems Farm component of the expanded draft 'Tilbury Power Station' LoWS (albeit noting that the TEC indicative Order Limits do avoid the core surviving section of interest within the original Goshems Farm LoWS¹⁵).
- 4.48 By reference to the 'indicative block layout' showing the land reserved for Carbon Capture Readiness (CCR) and CCR laydown, it is unclear how the temporary and permanent land uses might be distributed, and thus whether the draft LoWS areas would be subject to temporary or permanent losses to accommodate future CCR needs. However, in the event that the draft LoWS areas are required only for temporary uses, then impacts resulting from these direct incursions may be only temporary in nature, providing that appropriate habitat management and restoration is undertaken.
- 4.49 Air Quality. The Scoping Report sets out that air quality impacts on Local Wildlife Sites within 2km will be assessed. Potential increases in nitrogen deposition and/or availability (as compared to the current baseline) could result in deterioration in habitat quality within these LoWS, in particular by accelerating successional processes to the detriment of those species (such as brownfield invertebrates) that need open ground or sparse vegetation cover. Whilst the scope for such effects needs to be viewed in the context of the former coal fired power station (at least in terms of implications for longer established habitats that would have previously been subject to air pollution from that source), and airborne NOx and ammonia emissions generally are anticipated to be lower than the former coal-fired station, there may be spatial differences in dispersal patterns and loadings of nitrogen due to the lower stack heights proposed, such that assumptions that lower 'at source' emissions translate to lower impacts on all downwind receptors may not be wholly robust without further modelling and account of any modern in-stack or emission cleaning or mitigation technology required through DCO or regulatory controls or the change in balance that may come about with the use of ammonia in those processes.
- 4.50 **Habitats**. The footprint of the CCGT and OCGT development areas (i.e. the TEC itself) comprises the former Tilbury power station coal stock yard area. This contains habitats continuous with those within the Tilbury2 site (in the main this being recently disturbed ground, but with S41 Open Mosaic Habitat on Previously Developed Land at its margins). Land-take to accommodate the footprint of the TEC would result in direct and permanent losses of this S41 habitat type. Permanent losses of S41 habitats (primarily Open Mosaic Habitat) are also likely to arise as a result of future CCR uses. Further losses of S41 habitats (including Open Mosaic Habitat on Previously Developed Land, and former Coastal and Floodplain Grazing Marsh) are likely to result from the land-take for CCR construction laydown areas and the pipeline corridor, albeit these losses may be only temporary in nature, providing that appropriate habitat management and restoration is undertaken.

¹⁵ much of the value of the remainder of the Goshems Farm LoWS has already been lost to capping and 'restoration'.

4.51 **Fauna.** Due to the proximity of the TEC development to the Tilbury2 site, potential impacts described below for invertebrates and protected species are likely to relate to metapopulations that span both sites as follows:

- **Invertebrates.** The footprint of the CCGT and OCGT development areas (i.e. the TEC itself) is likely to support a brownfield invertebrate community of elevated value, being continuous in habitat terms with the site component described as the 'The Rest' in the 2017 assessment of the invertebrate interest of Tilbury2 (Appendix 10.L of the Tilbury2 Environmental Statement Appendices (Document Reference 6.2 / APP-057) and encompassing land of known high invertebrate interest in the CCR & CCR construction laydown areas. Analysis of species records from 'The Rest' led to the conclusion that collectively it has an invertebrate interest which complements and arguably exceeds that of the Lytag Brownfield LoWS, and this is supported by historic and more recently available data for the wider TEC site and the A1 former ash disposal area. Further losses of Open Mosaic Habitat on Previously Developed Land for future 'CCR & CCR construction laydown' areas and potentially also the pipeline corridor, would therefore give rise to additional impacts on brownfield invertebrate communities.
- **Protected species.** Construction of the TEC could lead to further loss of habitat for local populations of reptiles and water vole, as well as possibly for scarce breeding birds (such as Cetti's warbler, turtle dove and nightingale). Demolition of the former A-station may have already displaced peregrine and black redstart. Creation of laydown areas could result in further temporary habitat losses for reptiles in particular; and construction of the pipeline route (and possibly also Fort Road junction upgrades) could result in temporary habitat losses for reptiles and water vole, and in disturbance and habitat fragmentation effects for reptiles, water vole and potentially bats.

4.52 Taking the 'worst case' scenario, the potential losses of brownfield invertebrate communities could be considerable, with potential cumulative losses of habitat (from the Tilbury2 site, Goshems Farm and the former power station ashfields) potentially leading to near total elimination of the existing brownfield resource from this part of Thurrock. However, the scope for this to potential effect to be minimised would be dependent on: measures for avoidance (e.g. avoidance by the TEC scheme of permanent landtake within the best areas for invertebrates), proposed measures to restore habitats affected by temporary uses, and the adequacy of and timescales for the compensatory measures proposed.

4.53 For protected species, again, the potential significance of cumulative effects (on water voles, reptiles and scarce breeding birds in particular) will be dependent on the success/extent of mitigation and compensation provision

MARINE ECOLOGY

4.54 There is very limited even generic information available on the marine elements of the TEC. However, the Scoping Report published by RWE anticipates that the scheme will require abstraction of water from the

Thames and the discharge of this abstracted water back into the Thames. It is unknown whether there are any other elements of the construction or operation of the TEC project that could have potential significant effects on marine ecology.

- 4.55 The abstraction of large volumes of water could cause negative effects on fish and plankton due to impingement and entrainment in the abstraction system causing injury or even mortality of fish and plankton species. The scale and significance of these potential effects are unknown, but it is assumed that suitable design, management and mitigation would be put in place at TEC such as the installation of passive screen technology suggested in the TEC Scoping Report. Tilbury2 will not cause any impingement or entrainment of species and therefore there are considered to be no pathway for cumulative effects with this element of the scheme.
- 4.56 Water discharged back into the Thames from the TEC may be warmer than the background conditions in the estuary. The discharge of heated water could potentially reduce or alter water quality and cause effects on benthic ecology, fish and shellfish, plankton and marine mammal receptors within the zone of influence of the outfall. The magnitude and significance of these potential effects from TEC or even if they will occur at all after any appropriate design and mitigation are currently unknown.
- 4.57 Dredging taking place during the construction phase of the TEC (Scoping Report pa.184), could result in adverse effects to marine ecology and water quality through the increase in suspended sediment load within the water column. The magnitude of these effects will depend on the timing, volume and method of dredging among other aspects. However, information on the dredging at the TEC is currently not available and the magnitude of effects on this activity 'alone' can thus not be established.
- 4.58 If dredging during construction of the TEC is undertaken at the same time as maintenance dredging is undertaken at Tilbury2, there is potential for the rise of adverse in-combination effects to marine ecology and water quality. Coordination of dredging activities will therefore constitute an important mitigation measure within the TEC application.
- 4.59 To mitigate potential effects on water quality, Tilbury2 has committed to not undertake water injection dredging in the summer months when dissolved oxygen levels could be reduced due to water temperatures naturally being higher and flows lower. In addition, there will be ongoing chemical analysis of the Tilbury2 dredge sediments to ensure that levels of contamination within the sediment (that could be released into the water column through dredging) are within acceptable limits.
- 4.60 It should be recognised that there has previously been a power station located at Tilbury and dredging of the Tilbury jetty would have been undertaken during the operation of this facility. Any cumulative effects from these two activities were presumably deemed acceptable, and thus it has to be assumed that cumulative effects from the two operations were not significant.

- 4.61 The assessment of impacts for Tilbury2 concludes that all impacts on marine ecology receptors would be minor or negligible, and therefore not significant. As the potential effects for the TEC project 'alone' are currently unknown it is not possible to fully assess whether cumulative effects with Tilbury2 would be significant. However, if the now decommissioned Tilbury power station is used as a likely worst case proxy, it could be assumed that the operation of TEC would not have significant cumulative effects on water quality with dredging of the Tilbury2 jetty as none are known to have been identified when the Tilbury power station was operational. In addition, it is appropriate to assume that if the TEC project were to be given consent, the potential effects on water quality and resultant impacts on the marine ecology of the Thames Estuary from TEC would be appropriately managed and mitigated so that all impacts would not be significant. Given the above mitigation measures, and based on the information that is currently available, it is considered that the cumulative effects of the two projects on marine ecology due to changes in water quality would not be significant.

ARCHAEOLOGY AND CULTURAL HERITAGE

Archaeology

- 4.62 This cumulative assessment of Tilbury2 with TEC assumes that Tilbury2 is consented and in operation. The predicted effects of the construction works at TEC on the archaeological resource is considered to be adverse without mitigation measures, as explained in paragraphs 4.45 and 4.46.
- 4.63 The site lies in an area of known palaeoenvironmental and archaeological interest. No designated heritage assets lie on the site but based on the available information there is a potential for non-designated palaeoenvironmental remains and archaeological assets dating from the prehistoric periods through to the Post Medieval period to be present in the Terrestrial and Marine zones. Consequently the construction works at the TEC could have an adverse effect on the potential buried archaeological and palaeoenvironmental resource. It is anticipated that a suitable strategy would be agreed to avoid, minimise, manage and mitigate against this potential impact.

Predicted Combined Effects on Archaeology

- 4.64 The cumulative effect of the implementation of the recording elements of the mitigation measures set out in the Tilbury2 DCO and the TEC site would result in a greater understanding of the archaeological resource within the Lower Thames Valley area. Consequently the data and records produced from managing and mitigating these effects will be a positive cumulative effect.

Built Heritage

- 4.65 **Visual Effects:** Neither the TEC site nor the Tilbury2 site contain any designated heritage assets. Both proposals are located in close proximity to

Tilbury Fort which has been identified as the principal heritage receptor for potential visual effects resulting from development within the setting of the scheduled monument. The cumulative effects assessment is based on a recently published consultation document from RWE with limited detail on the proposal but showing illustrative form and potential massing on the site.

- 4.66 The key elements of the proposed TEC are the three boiler houses at an estimated 55 metres in height and the associated three chimneys at up to 95 metres in height. Three turbine halls would also be located to the rear of the boiler houses and are estimated to be approximately 40 metres in height. These elements appear to align broadly to the middle of the Tilbury2 site, where the Container Storage Facility is proposed, making the TEC proposals especially prominent in views of the wider area. A further smaller OCGT installation is located on the eastern part of the TEC development area, away from Tilbury2 but closer to Coalhouse Fort.
- 4.67 The TEC proposal would increase the visual effect on Tilbury Fort from that which is proposed in the Tilbury2 DCO. At 55 metres high, the proposed boiler houses would be approximately twice the height of the Rochdale envelope proposed for Tilbury2 and set back slightly farther eastwards from the principal built heritage receptor Tilbury Fort. This would affect the appreciation of the fort in its historically isolated setting. Where the projection of one silo could be peripheral in many views from the fort, the additional chimney stacks, as proposed for TEC and arrayed in series, could provide a more contiguous interruption to the skyline.
- 4.68 The eastward setback of the proposed stacks would somewhat reduce the potential for visual effects from the parade ground of the fort. The boiler house and turbine buildings will likely still be prominent in the immediate setting of the fort, particularly from the grazing marshland towards the north which is considered to contribute to the significance of the fort.
- 4.69 The three proposed chimney stacks, at 95 metres in height, would punctuate the existing horizon line and be prominent in views from the fort bastions. The proposed silo at Tilbury2 is of a similar maximum height (100m) and is located at the river edge on the boundary between the TEC and the proposed port site. In combination, the two proposals would result in a substantial interruption of the horizon line which is appreciable from the bastions of the fort and potentially from other locations within the fort walls.
- 4.70 The TEC proposals comprise of large, fixed building elements which would be substantially taller than the Tilbury2 Rochdale envelope and would potentially be visually dominant in the experience of Tilbury Fort. The height of the proposed boiler houses and turbine halls is sufficient that it could also interrupt the horizon line in views from the fort.
- 4.71 The TEC proposals in combination with the Tilbury 2 proposal would further intensify the industrial character of the immediate area which has built up through the course of the twentieth century.
- 4.72 The following assessment of potential effects is based on the sensitivity of heritage assets as identified in the ES chapter prepared for Tilbury2.

- 4.73 **Tilbury Fort** Given the very high sensitivity of Tilbury Fort and the modification to part of the setting of the Scheduled Monument proposed by both schemes, it is considered that magnitude of effect would be medium adverse to Tilbury Fort. The significance of the effects would therefore be major.
- 4.74 **Coalhouse Fort** Given the substantially lower height of the proposed Rochdale envelope at Tilbury2 and the dynamic nature of operations within the order limits, it is likely that views of Tilbury2 from Coalhouse Fort would be substantially screened by the TEC boiler houses and turbine halls. The cumulative visual effect is less apparent in most views from Coalhouse Fort, however the effect of the TEC proposals on a receptor of very high sensitivity is considered to be low adverse. The significance of such an effect is potentially therefore moderate/major.
- 4.75 **New Tavern Fort and Gravesend Blockhouse** The TEC and Tilbury2 proposals will be visible from the Scheduled Monuments at New Tavern Fort and Gravesend Blockhouse which are considered to be receptors of high sensitivity. The magnitude of effect is considered to be negligible as the changes to the setting are slight due to distance. The significance of effects for these heritage assets would be neutral/moderate.
- 4.76 **Gravesham Conservation Area** is considered to be of high sensitivity and nationally significant and the magnitude of effect to be low adverse. The significance of effect is considered to be minor/moderate.
- 4.77 **Air Quality** The proposed works at TEC during both construction and operational phases are not anticipated to have effects on air quality which could affect the historic fabric of Tilbury Fort and/or the water quality of the moats. It is not considered that there would be further adverse cumulative effect. It is anticipated that the strategy would be to minimise, monitor and mitigate only if necessary and within the design and management of the TEC scheme.

LAND-SIDE TRANSPORT

- 4.78 The construction stage of the TEC is likely to commence at the earliest in 2021 and hence in terms of traffic any cumulative effect during construction will be most likely in combination with the operational traffic of Tilbury2, as the most significant elements of the construction of Tilbury2 will be complete before the TEC construction commences. The infrastructure corridor will have been completed prior to construction commencing on TEC. Vehicle access to TEC is therefore likely to be via the new road link and via the Tilbury2 site.
- 4.79 The Tilbury2 development will generate approximately 3,000 vehicles during a typical day once it is fully operational based on worst case assumptions of traffic. During the first few years of operation it is unlikely traffic flows will reach this level. However, all assessments have assumed that the worst case full level of traffic occurs upon opening.

- 4.80 The EIA Scoping Report for TEC estimates the traffic associated with construction would reach a peak of 650 one way vehicle movements per day. It is assumed that therefore there would be 1,300 two way vehicle movements. No information is provided as to the percentage of the total vehicle movements which would be HGV. It is worth noting that the construction traffic estimates for Tilbury2 are 777 vehicle movements per day of which 177 would be HGV's.
- 4.81 On this basis the cumulative effect of Tilbury2 in operation (based upon the worst case assessment contained within the Tilbury2 Transportation Assessment) with TEC when the latter is under construction is likely to represent in the order of a 40% increase in daily traffic flows above those in the Tilbury2 ES.
- 4.82 With reference to the submitted ES (Chapter 13, Table 13-14) the Tilbury2 development is predicted to result in traffic flow increases of less than 10% for the majority of the road network within the study area in the operational phase. To the north of the existing main Port entrance increases in traffic flow are at a maximum of 12.9%¹⁶ on routes which are not sensitive to traffic flow increases. Accordingly, a 40% uplift on these increases would represent approximately a 18% increase, which is below the 30% threshold where environmental effects are likely to be significant. Thus, the cumulative effect is unlikely to be significant on the road network north of the existing main Port entrance, particularly when considering the temporary and variable nature of construction traffic and any traffic and transport management plans that will be put in place to manage and mitigate the TEC scheme.
- 4.83 Detailed assessments of the increases in traffic flow on Ferry Road (north of Link Road) were included in the submitted ES, as this was the only link where increases in traffic flow were likely to have a significant environmental effect. The cumulative level of traffic would change the magnitude of the increases in traffic with reference to Table 13-5 from low (27.7%) to medium (c39%). Ferry Road (north of Link Road) was assessed in the submitted ES to have negligible sensitivity to all the environmental effects of traffic. Hence, in accordance with Table 13-6 of the submitted ES the significance of the environmental effects on Ferry Road (north of Link Road) would remain negligible. Thus, the cumulative effect would remain as for Tilbury2 alone.
- 4.84 With reference to Table 13-17 of Chapter 13 of the submitted ES a negligible to minor adverse impact on Driver Delay is predicted at ASDA roundabout. With mitigation the residual effect is negligible. With the traffic associated with TEC construction the cumulative effect may remain at negligible to minor adverse levels, although traffic modelling (for the TEC project) would be required to confirm this. However, construction traffic is temporary, can be controlled to avoid peak hours, and is only likely to occur when traffic at Tilbury2 would be at a level below its maximum assessed in the Tilbury2 Environmental Statement. Thus, it is likely the cumulative effect on driver delay would remain as for Tilbury2 alone.

¹⁶ These figures are taken from submitted Tilbury2 ES.

- 4.85 The introduction of the Link Road is predicted to have an adverse effect on severance as noted in the ES (paragraphs 13.95 to 13.99), which PoTLL is seeking to mitigate through the Active Travel Study. This effect is realised upon introduction of the Link Road and relates to the part closure of Footpath 144 and the subsequent diversion. The traffic volumes on the Link Road do not directly influence the significance of this effect, which is more a consequence of the potential increased journey via the proposed alternative routes. Thus, cumulatively with construction of TEC the effect on severance will remain as for Tilbury2.
- 4.86 No details are available for the likely traffic movements associated with the operation of the TEC. However, the TEC EIA Scoping Report notes that there would be up to 100 staff employed, albeit no more than 60 on site at any time. It is worth noting that the Wrexham Energy Centre is predicted to generate some 60 vehicle movements per day with predicted staff numbers of 10 employees per shift. In absence of more definitive information it is reasonable to assume the TEC would generate in the region of 100-150 vehicle movements per day. Such small increases would have no perceptible effect when considered against the volume of traffic increases associated with Tilbury2. Indeed, the TEC EIA Scoping Report notes that the number of vehicle movements during operation would be small and expects that a detailed assessment of the operational phase of development can be scoped out of the ES. Accordingly, it is likely that the cumulative effect of Tilbury2 with the TEC would be as for Tilbury2 alone.

NAVIGATION

- 4.87 Should the river be used for construction materials for the TEC, it is expected that there will be negligible hazards and risks for any increase in ships/vessels in transit in the Thames Estuary as these will be subject to a robust Navigation RA by the PLA. If this method of transport was used it would also result in a lowering of any road transport movements further reducing any potential effects set out above.

HYDROGEOLOGY AND GROUND CONDITIONS

- 4.88 The TEC will be developed on the former Tilbury B Power Station site. Due to the proximity of the TEC to Tilbury2 and the former use of the site as a power station, there may be the potential for cumulative impacts to occur during the construction phase. These impacts include the increased potential for soil erosion, ground stability issues, mobilisation of contaminants, exposure of human and environment receptors and creation of new pathways. However, currently there is no information available on the ground conditions on the TEC site.
- 4.89 In addition, the construction of the infrastructure corridor and RoRo terminal is unlikely to be concurrent with the TEC and only the later construction phases of Tilbury2 may have the potential to overlap with the commencement of TEC construction. The TEC will also be subject to meeting the relevant tests in NPSs EN-1, 2 and 3 and the controls in the NPPF will be important and relevant matters that will need to be taken into account. As such it will be required to ensure that the intended scheme is fit

for purpose and that mitigation and control measures will be adopted during the construction phase to reduce impacts to the environment. Therefore, a low potential for cumulative impacts is predicted during the construction phase.

- 4.90 It is assumed that the development will be operated in accordance with granted consents and the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention.
- 4.91 Therefore, a low potential for cumulative impacts is predicted during construction and operation.

WATER RESOURCES AND FLOOD RISK

- 4.92 As discussed in Section 2.0, based on the available information and the proposed construction programme for the TEC, it is anticipated that there will be limited if any overlap between the construction period of the TEC and that of the infrastructure corridor and RoRo terminal. Only the later construction phases of Tilbury2 may have the potential to coincide with the commencement of TEC construction. Accordingly, it is considered that there will be limited or no cumulative impacts on water resources during the construction phase of the TEC.
- 4.93 Nevertheless, it is anticipated the TEC development will be subject to meeting the relevant tests in NPSs EN-1, 2 and 3, and consequential design, control and mitigation requirements and important and relevant matters in the NPPF, which will ensure that the proposed scheme is fit for purpose and that mitigation, management and control measures will be adopted during the construction phase to reduce impacts to the water environment.
- 4.94 During the operational period of the TEC, there may be a need to abstract cooling water from the River Thames with subsequent discharge of this water into the river. The Tilbury2 scheme may require abstraction of groundwater/surface water for washing aggregates at the CMAT. Based on the anticipated volumes it is considered that these abstractions will require appropriate licensing from the Environment Agency. Abstraction of large volumes of water has the potential to impact on flows and levels in the water environment. Given the anticipated sources of abstraction it is not considered that the required volumes will be a significant proportion of the overall resource. Additionally, assessments and mitigation measures will be required as part of the formal licensing process. Therefore, the cumulative impacts of any abstractions on the surface water and groundwater environments are likely to be low and will be the subject of appropriate regulatory control.
- 4.95 Water discharged back into the Thames from the TEC may be warmer than the background conditions in the estuary. The discharge of heated water could potentially reduce or alter water quality and cause effects on fish receptors within the zone of influence of the outfall (and other receptors not part of the WFD, such as marine mammals). However, currently there is no information available on the volume, dispersion method, frequency, or

temperature of the water being discharged into the river. Hence, the magnitude and significance of these potential effects from TEC are currently unknown, but it has to be assumed that these matters will be dealt with in the design of the TEC and minimised, managed and mitigated to ensure no significant effects for TEC and cumulatively with Tilbury2.

- 4.96 Water discharged at high temperatures could cause changes in the chemistry of contaminants found in the river sediments. This process could be made worse if buried contaminants are exposed during dredging. Contaminants, which would under normal temperatures remain bound to the sediment during dredging, could become soluble, detach from the sediments and enter the water column or react in other way. Likewise, a negligible increase in water temperature from the TEC effluent, made possible through the implementation of available cooling technology, could mean that there is no increased risk to WFD compliance. Chemical compounds tend to react differently at different temperatures under different conditions, and it is currently not possible to define the level of risk of jeopardising WFD compliance, however due to other environmental factors and the need for TEC to reach and maintain WFD compliance and mitigate any potential effects it is unlikely to arise.

NOISE AND VIBRATION

- 4.97 The TEC will have potential noise effects during its construction phase and from its operation. Cumulative construction effects are not considered as there is limited if any overlap in construction periods.
- 4.98 Construction activities would occur whilst Tilbury2 is operational. The construction activities on the TEC site are expected to have a smaller impact than Tilbury2 on the Noise Sensitive Receptors (NSRs) identified for the Tilbury2 assessment as the site is further from the receptors. The EIA Scoping Report for TEC estimates the traffic associated with construction would reach a peak of 650 one way vehicle movements per day. It is assumed that therefore there would be 1,300 two way vehicle movements. No information is provided as to the percentage of the total vehicle movements which would be HGV.
- 4.99 The increase could result in up to 2 dB increase in noise levels that would be perceptible.
- 4.100 The magnitude of these temporary cumulative noise effects would depend on the locations of the works, as well as expected traffic levels, and duration/timing of works, the details of which are not presently available.
- 4.101 Operationally, noise from the TEC gas turbines and energy storage facility is likely to give rise to a noise impact on the noise sensitive receptors identified for the Tilbury2 assessment, in Tilbury, Gravesham and at Tilbury Fort. Noise levels at receptors are likely to increase due to simultaneous operations of Tilbury2 and TEC although the significance of this cannot be known without further information on the TEC. The operation of TEC is not expected to give rise to significant changes in road traffic, and is not expected to give rise to any changes in rail traffic or river traffic.

- 4.102 The plant and equipment at TEC is likely to be designed to give rise to negligible noise impacts.
- 4.103 Overall, it is considered that the operation of TEC is unlikely to alter the significance of the Tilbury2 noise assessment.

AIR QUALITY

- 4.104 As described previously, there will be limited if any temporal overlap of TEC construction activities with the later phases of construction at Tilbury2, and any such works associated with the CMAT will be of low intensity (relative to the primary infrastructure works).
- 4.105 Based on the outline information available for TEC at this stage, there are not anticipated to be any highly sensitive receptors within 350m of the main construction works of both projects. The TEC Scoping report refers to the application of best practice measures for the control of dust and adherence to a CEMP. Application of appropriate management and mitigation measures at both the Tilbury2 and TEC sites will ensure no significant cumulative effects of construction dust at sensitive receptors in the event of the temporal overlap of works.
- 4.106 Construction vehicles associated with TEC may use the same road network as vehicles accessing Tilbury2 once operational, along the infrastructure corridor. There is limited information available from the TEC Scoping Report and no indication of HGV movements. For the cumulative impact assessment for the Wrexham Energy Centre (WEC) the increase due to all cumulative development traffic (including the WEC) was estimated to be less than 1 µg/m³ as NO₂ at a hypothetical roadside receptor. The peak traffic flow may be higher for TEC as it is a larger facility although the flow would not increase in direct proportion to power output as it would be built in phases. In a similar approach, the Highways England DMRB screening tool has been used to give a high level indication of the NO₂ increment associated with estimated TEC construction traffic (for air quality assessment purposes, an AADT flow of 1,500, 25% HGVs, 64 kph was used). At 20 m from the road centreline (a conservative estimate for a hypothetical receptor on the infrastructure corridor) the increment is 1 µg/m³ as NO₂. The ES estimate future concentrations with Tilbury2 at properties on London Road/Sandhurst Road (R13 to R17), will not exceed 30 µg/m³ as annual mean NO₂ (Table 18.44 of Appendix 18.E). The maximum NO₂ concentration at a receptor in 2020 (with Tilbury2) is 36.6 µg/m³ (R10, off Dock Road). The DMRB was used to estimate an increment of 0.6 µg/m³ as annual mean NO₂ due to TEC construction traffic at this receptor. In light of the further reduction in air pollutant concentrations expected in the TEC construction year, the increase in vehicle flows on the same routes used by the Tilbury2 operational traffic is unlikely to have a significant cumulative effect on air quality.
- 4.107 The TEC Scoping Report proposes scoping out operational traffic movements and indicates that the scheme will employ up to 100 staff, approximately half of which will work on shifts with no more than 60 expected to be on site at any one time.

- 4.108
- 4.109 Construction vehicles associated with TEC may use the same road network as vehicles accessing Tilbury2 once operational, along the infrastructure corridor. There is limited information available from the TEC Scoping Report and no indication of HGV movements. However, the expected low numbers of vehicles that would be required for the construction of TEC relative to Tilbury2 operational traffic, mean that the temporary effects of cumulative vehicle emissions are likely not to be significant. For example, the cumulative impact assessment for the Wrexham Energy Centre (WEC) identified that the increase due to all cumulative development traffic (including the WEC) would be less than $1 \mu\text{g}/\text{m}^3$ as NO_2 at a hypothetical roadside receptor. The peak traffic flow may be higher for TEC as it is a larger facility although the flow would not increase in direct proportion to power output as it would be built in phases. The Scoping Report proposes scoping out operational traffic movements and indicates that the scheme will employ up to 100 staff, approximately half of which will work on shifts with no more than 60 expected to be on site at any one time.
- 4.110 On this basis, given the maximum NO_2 concentration at a receptor in 2020 (without Tilbury2) is $34.7 \mu\text{g}/\text{m}^3$ (Table 18.44 of Appendix 18.E) and given the expected further reductions in vehicle emissions by the time the TEC construction works would be carried out, there is no risk of non-compliance with the air quality criteria.
- 4.111 There will be additional emissions to the atmosphere associated with the TEC once operational. Emissions of NO_x from natural gas fired CCGTs are the lowest for any thermal generating plant¹⁷. The choice of CCGT technology is thus considered to be embedded mitigation within the design proposals for TEC. The TEC will be required to operate in line with the requirements of the European Industrial Emissions Directive (or equivalent), including limits on emissions of NO_x and CO. The facility will require an Environmental Permit to operate, issued by the Environment Agency. In obtaining a permit, the operator will need to demonstrate the application of best available techniques in design and operation, and that there is no significant impact on the environment (including human health). The emissions from the combustion of natural gas will be discharged from height (a maximum of 95m as set out in the non-statutory Consultation Booklet). The maximum impact of TEC on annual average NO_2 concentrations will be dependent on issues such as cleaning/exhaust system and technology to be used and exhaust flow rate, but is expected to be between several hundred metres and 2km from the TEC, to the north east i.e. downwind of the prevailing wind. The impact of Tilbury2 traffic emissions in the anticipated area of maximum ground-level concentrations to the north east, is negligible, as most traffic will travel towards the M25. Small, auxiliary combustion activities that may, for instance, be required to support CMAT processing facilities at Tilbury2 would also require a permit to operate. The footprint of the emissions associated with such activities would be much closer to the site boundary commensurate with the stack height and smaller volume flow

¹⁷ Environment Agency Technical Guidance for Combustion Activities (EPR1.01) available at: <https://www.gov.uk/government/publications/combustion-activities-additional-guidance>

of air discharged, and so would not combine with the maximum ground-level concentrations from the much larger TEC.

- 4.112 Operational vehicle emissions associated with the TEC are anticipated to be very low relative to those associated with the operation of Tilbury2¹⁸. No exceedances of air quality criteria were identified at receptors for the operational phase of Tilbury2. The maximum NO₂ concentration at a receptor (R9) during operation of Tilbury2 in 2020 is 36.6 µg/m³ (Table 18.44 of Appendix 18.E). There are expected to be improvements in future baseline air quality between 2020 (Tilbury2 opening year) and 2026 (TEC opening year). On this basis, it is not anticipated that there would be significant cumulative effects from vehicle emissions from the operational transport associated with both projects and there is assessed to be no risk of non-compliance with the air quality criteria in NPS or regulation.
- 4.113 On a similar basis, it is not anticipated that there would be any significant cumulative air quality effects due to combined operational emissions from Tilbury2 and TEC on statutory or locally designated ecological sites.
- 4.114 The Tilbury2 proposals include an Operational Management Plan (Document PoTLL/T2/EX/40, REP1-008) which is secured in the draft DCO. The OMP describes dust mitigation and management for the CMAT that is appropriate to control potential impacts on sensitive receptors such as the ecological mitigation area and public footpaths adjacent to the site while processing facilities requiring an Environmental Permit will be required to comply with that permit, including any emission limits set by the regulator. The operational dust assessment for the ecological mitigation area, which falls within the TEC boundary, found only a slight adverse residual effect on this medium sensitivity receptor adjacent to the north east of the Tilbury2 site (ES Table 18.19).
- 4.115 A site layout plan is not yet available for the TEC and the Scoping Report notes that the EIA will present a detailed appraisal of alternative development layouts, which will consider engineering and environmental requirements. The size range of dust particles arising from the proposed activities within the CMAT at Tilbury2 are expected to be within that of ambient particulate matter as typically encountered in the atmosphere of a semi-rural/industrial setting. Such ambient particulate matter includes both natural and anthropogenic sources (vehicle exhaust, solid fuel burning, sea salt aerosol, pollen and Saharan dust). Where an industrial facility is sensitive to particulates, whether released from another nearby facility in an existing industrial setting or an ambient source such as soil or sea salt, it is expected that the design of such a facility would incorporate an air filtration system appropriate to its setting. This would ensure removal of any such particulate matter and avoid contamination of or damage to sensitive

¹⁸ Wrexham Energy Centre Air Quality Chapter 8 ES “It has been assumed in the transport and traffic assessment (chapter 7) that a maximum of 30 staff will work at the Scheme once operational, operating on a two shift basis resulting in a maximum of 30 arrivals and 30 departures throughout the day i.e. a two way AADT of 60 LDVs. A robust assumption of one HGV accessing the site per day has been made to allow for routine maintenance and repairs.”

equipment. No significant cumulative effects are therefore anticipated from the operation of Tilbury2 in tandem with the TEC.

WASTE AND MATERIALS

- 4.116 The waste arisings from the TEC are not known. The TEC project will need to adhere to the principles of the waste hierarchy and, given the timelines involved, consider waste capacity at the time those arisings occur. There will be some cumulative impact on waste capacity (since the waste arisings from TEC will follow those from Tilbury2) but the significance of this cannot be determined without knowing the arisings from TEC what level of waste hierarchy will be achieved or the capacity and need for that capacity as a result that would exist at that time.

SUMMARY OF CUMULATIVE EFFECTS OF TILBURY2 WITH TEC

- 4.117 The above paragraphs have sought to assess, at a high level and on limited and generic information available, the potential cumulative effects of Tilbury2 with the proposed Tilbury Energy Centre (TEC).
- 4.118 This exercise is undoubtedly limited by the paucity of information related to the TEC and can only be at a very 'high level' on a proportionate, qualitative and professional judgement basis at this stage. As stated in the TEC Scoping Report, alternative development layouts will be considered in the early design stage mainly in response to engineering and environmental requirements and to optimise the design, construction and operation of the site. A detailed appraisal will be presented in the EIA for the TEC.
- 4.119 It has been highlighted that Tilbury2, if consented, will be constructed first and that the major civil engineering works associated with the proposals will be complete prior to the TEC. That said, cumulative impacts could potentially arise by virtue of the more prolonged period of construction with TEC following on from Tilbury2. The effects could be positive (e.g. employment) and adverse (e.g. noise) and therefore the mitigation proposals for each (particularly CEMPs) during the construction phase will need to be robust.
- 4.120 In physical terms, the TEC will be developed alongside the Tilbury2 site and will introduce a level of built development partly on land which is not presently developed with buildings (i.e. the former coal stock yards). The above analysis indicates that cumulative effects could arise in relation to terrestrial ecology, landscape and cultural heritage. The significance of such cumulative effects will depend to a large degree on the final appearance and layout of the TEC and in particular any embedded mitigation, the nature of which is not known at the present time and how the TEC particularly meets the requirements of section 4.5 of NPS EN-1.
- 4.121 In operation the TEC would be subject to industry standard and regulatory controls and the likely cumulative effects on matters such as noise and air quality would be of low significance.

- 4.122 PoTLL has made it clear that the TEC proposals should consider Tilbury2 as either part of the future baseline or as a cumulative project and this approach will rightly be the process by which the full environmental consideration of the two proposals proceeding will be assessed during the evolution and proper assessment and examination of the TEC proposals as and when they come forward and against the relevant energy NPS tests.

5.0 QUALITATIVE CEA OF TILBURY2 WITH LOWER THAMES CROSSING

SOCIO-ECONOMICS

- 5.1 Whilst Tilbury2 is a single-site development on previously developed land, the Lower Thames Crossing (LTC) is a linear development of considerably greater scale crossing a variety of land uses and involving both surface and subterranean works. Whilst the exact extent and alignment of LTC is not known, it is clear that the LTC is likely to have a significantly larger overall construction effect in terms of magnitude, complexity and duration compared with Tilbury2.
- 5.2 Although there will be a substantial workforce for LTC, it will not be likely to give rise to cumulative effects since Tilbury2 construction will have been completed by the time construction of LTC commences. The schemes are unlikely to be competing for labour as the construction period of Tilbury2 will have passed, with construction and commissioning complete, prior to the enabling works on LTC commencing. Whilst this might reduce the overall in situ construction workforce it is likely to result in a prolonged period of construction labour. It is not clear how or where this employment will be based or housed, and this itself could vary during the LTC construction period based on the types of works and the exact locations and phasing of development.
- 5.3 Any influx of construction labour to the area could support the local guesthouse economy, along with other local service businesses (supermarkets, restaurants, public houses, public transport, cinemas and similar). It could also however result in changes to the local demography, and contribute to increased pressure on existing social infrastructure.
- 5.4 There is not likely to be any cumulative employment effect of LTC with Tilbury2 once LTC is operational as it is expected that the LTC will have a negligible impact on operational employment. There may however be ongoing road maintenance (so-called "O&M" activities), which could require some local labour input. Similarly, there could also be increased passing traffic, and a general increase in the overall access to the area. This could also positively impact upon local businesses.
- 5.5 Operationally, the LTC is likely to have a number of policy related outcomes. Improved connectivity, access, and growth opportunities surrounding the LTC could support the critical mass for the Thames Gateway growth area, and generally contribute to raising the profile of the area. The LTC could also improve connectivity to the Port of Tilbury, supporting greater resilience of the highway network and the long term economic contribution of the Port. However, it should be noted that the LTC could remove some operational land from the Tilbury2 site, which could have potentially negative consequences in terms of operational capacity and capability. Similarly, the removal or compromising of surrounding green belt land could impact upon access to open space and wider recreational opportunities.

- 5.6 The LTC could also contribute to improved connectivity across the river, which may help to extend the labour market south of the river. This could create positive impacts for labour market catchments for both employees and employers at Tilbury2. More broadly, improvements to river connectivity could help to open up opportunities in Gravesend, and contribute to the regeneration of existing riverside opportunity areas. Spatially, these are all located along the riverside, with a number of strategic sub areas. The Gravesham Local Plan Core Strategy (2014) sets out the Council's approach to regeneration, both within the boundaries of Gravesham, and as part of the sub-regional vision, including transforming an area predominantly formed of heavy riverside industry, to one that offers a more diverse range of employment and housing opportunities. This improved access could make the area more attractive for people to live and work.

HEALTH

- 5.7 The Scoping Report on the LTC proposes in paragraph 5.5.4 to consider effects on human health in the People and Communities chapter, to be informed by other chapters including the Air Quality and Noise and Vibration chapters. In their response, PINS indicate acceptance of this approach but consider that human health effects may also be relevant to soil handling and waste management and to the Road Drainage and Water Environment chapter topic. There is, however, little detail provided at this stage and many of these assessments will be reliant on the traffic data which as confirmed by Highways England is not yet available.
- 5.8 The LTC will follow the construction of Tilbury2 and cumulatively the two projects could contribute to a prolonged construction period for the wider Thurrock area. The health effect of the prolonged construction periods across the projects in the local population will need to be considered.
- 5.9 The nature of the proposal is likely to cause localised severance during the construction period. Similarly, any removal or compromising of access to surrounding open land (for example by the severance of footpaths) could have ongoing adverse impacts on local communities, and could impact upon access to open space, recreational opportunities, and physical activity as well as on journey times and experience which could lead to health effects by increasing stress responses associated with unpleasant journeys and decreasing opportunities for active travel and recreation. These impacts and effects could fall disproportionately on different groups in the community such as those with social disadvantage. The Land-side Transport section details the lack of data on transport for the LTC: this limits the ability to draw conclusions about cumulative impacts and their effects on health for Tilbury2 and the LTC.
- 5.10 There are likely to be cumulative impacts of dust from the construction of the CMAT of Tilbury2 and the construction of the LTC which could impact on air quality which could influence health via effects on respiratory health. Vulnerable populations include those with existing respiratory disease, children, and the elderly. However, the cumulative assessment of air quality highlights how the appropriate mitigation measures secured within a CEMP or equivalent for the LTC, and the CEMP for Tilbury2 secured by the DCO

will ensure no significant cumulative effects of construction dust at sensitive receptors.

- 5.11 The initial view on air quality once the LTC is operational is set out below (see section Air Quality). Based on existing baseline concentrations, anticipated future trends and modelled increments for Tilbury2 when operational that were reported in the Tilbury2 ES, and given the expected further reductions in vehicle emissions by the time the LTC will open, there is likely to be limited significant cumulative effects in 2026. It should also be noted that the LTC will provide an alternate route for operational traffic accessing Tilbury2 from the strategic road network. This could potentially affect air quality, either positively or negatively by changes in vehicle activity, which could influence respiratory health. These cumulative effects will need to be reported by the LTC, once transport modelling has been undertaken.
- 5.12 There are likely to be cumulative impacts of operational noise from the LTC and Tilbury2 both in terms of traffic noise and noise from operation of the Schemes. Noise could influence health via effects on increased annoyance, loss of sleep and physiological effects and vulnerable populations include children and the elderly. The operational traffic noise impacts from the LTC have the potential to be positive or negative, due to alterations to existing routes, which limits the current cumulative assessment of health effects. The intensity and exposure of potential noise impacts associated with increased traffic are not currently known, and will need to be considered further in line with a TA for LTC that will take traffic from Tilbury2 as part of its baseline, future baseline or committed developments. The LTC will need to prepare both a health impact assessment and an Equalities Impact Assessment to consider these matters further and include a cumulative assessment examining impacts and health effects associated with all aspects of operation of Tilbury2 and the LTC.
- 5.13 Lighting can influence health by effects on sleep, mood and cognition. Visual impact can influence health by effects on physical and mental health via effects on physiological effects such as obesity and blood pressure, as well as cognition, mood, physical activity and social cohesion. Considered cumulatively, the visual impacts of the LTC are assessed as having some impact, due to its location in relation to Tilbury2, on the visual impacts and associated health effects identified for Tilbury2 (see Landscape Character and Visual Amenity section). For this reason, we expect cumulative impacts on visual amenity and lighting for the two schemes, pending further assessment information for the LTC.
- 5.14 The LTC will need to prepare both a health impact assessment and an Equalities Impact Assessment to consider these matters further and include a cumulative assessment examining impacts and health effects associated with Tilbury2 and the LTC.
- 5.15 The operational impact of the tunnel could have adverse health impacts, particularly as tunnels can concentrate emissions at the exit and entry points. However, these locations are distant from Tilbury2 and therefore it is assumed that no cumulative impacts in the immediate vicinity of Tilbury2 will arise. However, this will need to be quantitatively assessed by the LTC.

LANDSCAPE CHARACTER AND VISUAL AMENITY

- 5.16 Subject to the general comments above regarding the absence of detailed design, or even fully settled options, the cumulative effects of LTC with Tilbury2 are considered as follows.
- 5.17 Those aspects of proposed development that fall outside the T2 LVIA core study area, whilst potentially adverse in nature, are excluded from consideration for cumulative assessment as they would by definition be unlikely to cause cumulative effects. They are the effects of the LTC itself and would need to be mitigated by that scheme.
- 5.18 The proposed route would pass through four National Character Areas and would affect 19 Local Character Areas (LCA's). Those LCA's most likely to be directly affected in closer proximity to the Tilbury2 site include 'Higham Arable Farmland, 'Tilbury Marshes', the Chadwell Escarpment Urban Fringe' and the 'West Tilbury Urban Fringe'. It is assumed that the LCA 'Shorne and Higham Marshes' would not be directly affected as the route would pass underground in this location.
- 5.19 The condition of the LCA's as identified above and described in published assessment ranges from *poor* (Higham Arable Farmlands), to *moderate to poor* (Tilbury Marshes) and *moderate* (Chadwell Escarpment Urban Fringe and the West Tilbury Urban Fringe). The LTC would likely increase landscape fragmentation affecting the Higham Arable Farmlands; add to the relatively high concentration of transport infrastructure within the Chadwell Escarpment and West Tilbury Urban Fringe LCA's, and add to urban influences eroding the sense of exposure and openness within the Tilbury Marshes.
- 5.20 The route would introduce road traffic, associated noise and some artificial lighting into these LCA's. Subject to final design, levels and mitigation it is likely that, along parts of the route, road traffic would become a new detracting feature in the landscape. The effect would likely range between *slight to moderate* significance on these LCA's.
- 5.21 The distribution of road traffic in the vicinity of Tilbury would alter once the Tilbury2 infrastructure corridor is connected to the LTC proposed link road (should this be part of any final designed scheme). There would be an increase in traffic levels currently predicted for the infrastructure corridor and potential corresponding reductions elsewhere. It is assumed for the purposes of this assessment that the proposed acoustic and visual mitigation devised for the infrastructure corridor would remain effective.
- 5.22 The site of the route would fall within and close to the northernmost reaches of the Kent Downs AONB; however, direct effects on the AONB and ancient woodland in the locality would be outside the Tilbury2 LVIA core study area. Potential indirect effects on the setting of the AONB may occur and these would fall within the southern margins of the Tilbury2 LVIA core study area.
- 5.23 The above ground sections of the route would pass within approximately 1.0-1.5km of areas and features designated for their ecological value,

including Sites of Special Scientific Interest (SSSI) and a Local Nature Reserve (LNR). However, these areas are not affected by the Tilbury2 proposals. It would also pass through an area of ecological value associated with the Tilbury 2 site. This is considered further below but it is likely that the ecological interest affected by the route within the Tilbury2 site would be reduced. For the purposes of this high level assessment effects of *slight* significance are assumed.

- 5.24 The LTC would pass close to the East Tilbury and Low Street conservation areas and within approximately 1.0km of the West Tilbury conservation area. It would pass close to a SAM- a Second World War anti-aircraft battery at Bowaters Farm and within approximately 1.5km of three other SAM's including Coalhouse Fort, a local visitor attraction. It would pass close to a number of listed buildings, most of which are located within the conservation areas, but also isolated examples such as the Church of St Mary south of the Thames and 'Buckland' to the north. Subject to the detailed road design and adoption of suitable mitigation, potential effects on the setting of these assets could occur. For the purposes of this assessment effects of *moderate* significance are assumed but these assets are not affected by Tilbury2 and so no cumulative effects with Tilbury2 would result.
- 5.25 With respect to leisure and tourism value the above ground sections of the route would cross the Southern Valley golf course, east of Gravesend. Potentially this would cause a *substantial level* of effect on the amenity value of this facility. The route would also cross a number of rural footpaths and a bridleway, adversely affecting their amenity. The effect on the amenity of the latter would likely be of *moderate* significance overall but again, the cumulative effect with Tilbury2 would be no different.
- 5.26 With respect to visual amenity, the LTC would likely be experienced by occupiers of residential property (both at the margins of Gravesend as well as near villages and isolated properties), users of public rights of way, recreational facilities north and south of the river Thames as well as visitors to Coalhouse Fort. Subject to detail design and mitigation the significance of potential effects on these receptors would be largely dependent on proximity as much as context and range from substantial in relation to near receptors such as residential occupiers in Low Street and public rights of way nearing and crossing the route; to moderate, affecting residents in locations such as West Tilbury and East Tilbury and slight, affecting users of public rights of way on the north and south banks of the Thames.
- 5.27 The Scoping Report indicates that north of the River Thames "*the carriageway emerges on embankment as it crosses the River Thames floodplain, there is potential for views out across the urban fringe landscape of Thurrock, although screening mitigation such as false cuttings, environmental barriers and tree and shrub planting could limit these views.*" Cumulative visual effects could therefore occur in relation to residential property at the eastern margins of Tilbury and West Tilbury. These effects relate to the proposed new LTC link road to the proposed T2 infrastructure corridor and possible the main LTC route as well.

- 5.28 The route of the Tilbury Link as currently depicted passes through the northern margins of the proposed CMAT storage and processing area and across the proposed rail chord. The footprint of the CMAT would be less, reflecting a retreat from the northern boundary, with the result that it would occur at a slightly greater distance from the visual receptors and afford slightly less visual impact. The link road itself may be visible, particularly any elevated sections such as may be required to pass over the T2 rail chord. In the context of the CMAT this is unlikely to represent a higher level of cumulative visual impact. However, the introduction of road traffic in the vicinity (if not sensitively screened) would potentially cause cumulative effects and increase the levels of adverse visual impact recorded for the T2 development from moderate to substantial-moderate. Such effects should be capable of mitigation as demonstrated by those adopted for the T2 infrastructure corridor.
- 5.29 Cumulative effects may occur in relation to residential property at the southern margins of Tilbury and users of roads and footpaths as well as visitors to Tilbury Fort. These would occur only if significant changes were made to the submitted design of the infrastructure corridor. This is as yet unclear from the information currently indicated within the LTC scoping document. Assuming the corridor as currently proposed within the Tilbury2 scheme was retained, these effects would be associated with varying levels of road traffic. As the visual effects of road traffic per se have been identified and appropriate mitigation devised, increased levels of traffic using the infrastructure corridor are unlikely to cause any significant cumulative visual effects as described above.
- 5.30 Further afield cumulative visual effects may occur in relation to receptors to the east and north-east including occupiers of residential property in Low Street, users of roads and footpaths and visitors to Coalhouse Fort. The effects would relate to a combination of distant views over the Tilbury Marshes towards the Tilbury2 site and retained power infrastructure and the intervening presence of road traffic and any elevated structures associated with the LTC. The effect would be likely to increase predicted levels of impact associated with T2 from slight-imperceptible to moderate or slight according to location.

TERRESTRIAL ECOLOGY

- 5.31 As set out above, LTC construction would not commence until after the currently estimated first operation of Tilbury2, and therefore cumulative impacts are considered only in respect of the operational phase of the Tilbury2 project.
- 5.32 **Statutory designations.** Potential impacts of the LTC on the Thames Estuary and Marshes SPA and Ramsar Site were considered under a Part One Appropriate Assessment (AA)¹⁹. Whilst there will be no direct loss of habitat from the SPA/Ramsar Site as a result of the crossing being via a

¹⁹ Highways England (January 2016). *Lower Thames Crossing. Pre-Consultation Scheme Assessment Report. Volume 6: Environmental Appraisal.* (Ref: HA540039-HHJ-ZZZ-REP-ZZZ-010)

bored tunnel, other potential construction/operation impacts identified (in the absence of mitigation) include:

- Disturbance to SPA/Ramsar cited species during construction (particularly waders using intertidal habitats);
- Disturbance impacts during operation (assessed in the Part One AA as likely to be minimal);
- Loss of functional habitat on north side of river (potential high tide roost using functionally linked land near the tunnel portal); and
- Potential for hydrogeological changes to affect ecology.

5.33 Other potential impacts in respect of the SPA/Ramsar Site not specifically identified in the Part One AA (although subsequently raised by Natural England (SR, 6.3.3)) include changes in air quality arising from increased local traffic flows and the potential for nitrogen deposition within 200m of the route alignment, to bring about a change in the vegetation composition of habitats which are interest features of the Ramsar Site/SPA.

5.34 Whilst the Tilbury2 Habitats Regulations Assessment (HRA) document (ES Appendix 10.O / APP-060) concluded no likely significant effect on the SPA/Ramsar Site; there is potential for sub-significance threshold effects identified in respect of Tilbury2 to become significant when considered additively or synergistically with potential effects arising from the LTC project.

5.35 The information available from the LTC project is too high-level at this stage to make a detailed assessment, but on the basis of information available, the impacts with greatest potential to generate a significant cumulative effect, in the absence of appropriate mitigation measures as part of the LTC, are likely to be:

- Air Quality. Air quality impacts arising from additional traffic emissions associated with the LTC resulting in potentially significant increases in nitrogen deposition on European Site habitats (e.g. saltmarsh), potentially breaching the critical load threshold for those habitat types or preventing recovery in the context of otherwise improving trends. For habitats comprising special interest features of the Ramsar Site, there could be a resulting decline in condition/quality, or if the effect were severe then possibly loss of noteworthy flora and a transition of the vegetation communities to different habitat-types. Knock-on effects for the SPA could result from a related reduction in quality/suitability of wader foraging habitat for qualifying species of the SPA.
- Bird Disturbance. LTC construction phase disturbance of wading bird interest features of the SPA/Ramsar Site, especially in respect of functionally linked land to the west of the SPA which could combine with operational-phase effects from Tilbury2.

- 5.36 **Non-statutory designations.** The proposed LTC route could result in total loss of the retained fragment of Lytag Brownfield Local Wildlife Site (LoWS) not otherwise removed by the Tilbury2 project (i.e. up to 0.7ha) albeit much of this would be scrub of relatively limited intrinsic interest.
- 5.37 The LTC Scoping Report (Table 9-8) sets out that there will be no direct habitat loss from the Tilbury Marshes LoWS, a conclusion which is presumably drawn on the basis that the LTC spur road will utilise the Tilbury2 infrastructure corridor without the need to dual the carriageways or augment the linkages/junctions. However, if a dual-carriageway design is put forward at the detailed phase, then further loss of land from that LoWS would result.
- 5.38 Beyond the Tilbury2 Order Limits, there is potential for further Local Wildlife Site losses, with Low Street Pit LoWS (an important site for rare Thames Terrace invertebrates) falling under the proposed route of the LTC and resulting in permanent losses. Potential land-take is also indicated from all remaining components of the proposed 'Tilbury Power Station' LoWS (the boundaries for which have been drawn up under the draft LoWS expansion), and including the only surviving section of the adopted Goshems Farm LoWS. Depending on the detail of the 'temporary land' requirements for the LTC scheme, the losses may be minimal, or they could potentially result in damage to virtually all remaining designated examples of post-industrial habitat within this part of Thurrock.
- 5.39 The LTC Scoping Report (Table 9-9) has also identified changes in air quality arising from vehicle emissions as a potential impact on all retained LoWS cited above. When considered in combination with the Tilbury2 project, potential for cumulative air quality impacts on non-statutory designated sites are anticipated to be greatest in respect of the Tilbury Marshes LoWS and could potentially exceed the critical load for N-deposition (a figure of 20-30 kgN/ha/yr taken from APIS for Coastal and Floodplain Grazing Marsh), dependent on the predicted increases in AADT; albeit the retained Coastal and Floodplain Grazing Marsh habitats adjacent to the Tilbury2 infrastructure corridor are not species-rich examples of their type and show no other signs of acute sensitivity to eutrophication from N-deposition.
- 5.40 **Habitats.** On the basis that the LTC Scoping Report (Table 9-8) does not list habitat loss from the Tilbury Marshes LoWS as a potential impact, by extension, it is anticipated that there will not be any further direct losses of the S41 habitat Coastal and Floodplain Grazing Marsh as a result of the LTC in that location. There could, however, be temporary losses of Coastal and Floodplain Grazing Marsh to the east of the Tilbury2 Order Limits, dependent on the precise requirements for temporary land uses, albeit restoration and compensation are likely to be possible following construction.
- 5.41 Considerable areas of S41 Open Mosaic Habitat on Previously Developed Land are shown within the boundary of the 'Potential land required to construct and operate the Lower Thames Crossing', including the former Tilbury power station ashfields (e.g. RWE's A1 PFA disposal mound) and

the remaining extent of the Goshems Farm LoWS, albeit much of this would be within the temporary land required for the tunnel portal construction and thus there is potential for avoidance of the most sensitive areas and restoration following construction, all fully within the remit and control of the LTC scheme development and design process.

- 5.42 **Fauna.** There is scope for the route of the LTC within the Tilbury2 site to be brought into closer alignment with the London-Southend railway during the detailed phase of design. Potential impacts on protected species would be greater under the currently proposed alignment, than the impacts would be under a revision to the route which resulted in the carriageway/s being moved northward and closer to the railway.
- 5.43 Under the current proposed alignment as drawn, there would be loss of part of the on-site ecological mitigation and compensation land within Tilbury2 (leading to impacts that would in turn require further mitigation/compensation as part of the LTC proposals). It is therefore anticipated that during the detailed design phase, the route of the spur road may indeed be brought into closer alignment to the railway to avoid the need to provide mitigation/compensation for loss of the Tilbury2 on-site ecological mitigation and compensation land.
- 5.44 As such, impacts on various protected and notable species groups are considered below under both scenarios:
- **Water vole.** Under the proposed spur route, there would be a total loss of the existing RWE compensation pond (with attendant population of water vole) and further losses (in the region of 200m) of the new Tilbury2 compensatory water vole ditch-habitat provision. Dependent on timescales this could result in 'double-handling' of water voles. Realigning the spur road to the north could in principle avoid these impacts.
 - **Badger.** The proposed LTC spur route is in sufficient proximity to the Tilbury2 compensatory artificial replacement badger sett that if the artificial sett were occupied there would be scope for disturbance impacts to arise. Realigning the spur road to the north could lead to total loss of the replacement badger sett in this location. In either eventuality, there may be an obligation for the LTC proposals to allow for exclusion of animals from the sett and provision of a further replacement sett (potentially in a less suitable location), compounding disturbance and displacement effects on this social group of badgers.
 - **Reptiles.** The proposed LTC spur route would result in losses of existing reptile habitat within the Tilbury2 site and losses from the proposed on-site reptile receptor area. This would result in the need to 'double-handle' animals in relocating them to a new receptor area, which stands as contrary to best practice. Realigning the spur road to the north could result in similar impacts in terms of the extent of habitat affected, albeit with a smaller impact on the Tilbury2 receptor area itself.

- **Bats.** The proposed LTC spur route, as drawn, could result in loss of the location identified for Tilbury2 compensatory bat boxes west of Station Approach Road, precipitating the need to select alternative and potentially less suitable locations for mitigation provision elsewhere (for which options have largely been exhausted within the Tilbury2 site). Highways lighting is required at junctions/interchanges, but could potentially be of a higher specification than that already required for the infrastructure corridor, leading to impacts on light-sensitive species (i.e. reduction in suitability of habitat for foraging/commuting).
- **Invertebrates.** Low Street Pit LoWS also falls within the proposed route of the LTC and is an important site for rare Thames Terrace invertebrates. Loss of this site could compound problems of local habitat fragmentation and affect the survival prospects of local metapopulation of rare and specialist species.

5.45 Wider potential indirect impacts include habitat loss for the species listed above and metapopulation fragmentation effects, especially for water vole, reptiles, and invertebrates. There may also be impacts on connectivity of habitat for bats dependent on extent of lighting; and potential impacts on breeding birds due to habitat loss and increases in noise leading to potential declines in breeding success for sensitive bird species.

MARINE ECOLOGY

5.46 The LTC proposal is for the construction of road tunnels under the Thames Estuary. These bored tunnels will have no direct connection to the marine environment but their construction and operation on its own could affect the marine environment within the scope of influence of the tunnelling construction operations by, for example, noise or vibration.

5.47 Within the LTC scoping report it states that during construction, excavated material could possibly be transported by river, and to enable this, it is possible that the construction or modification of a jetty may be required. The scoping report also states that *"It is currently uncertain what, if any, impacts to the marine environment within the Thames Estuary may occur as a result of the Project"*. This paragraph goes on to suggest that the marine ecology assessment would be focused on intertidal habitats and their importance for qualifying bird species of the SPA and Ramsar sites.

5.48 The LTC scoping report states that construction impacts will be identified during the pre-construction assessment and provides a high level and generic indication of the potential impacts on marine ecology from the project construction. These are:

- Indirect harm through construction disturbance; vibration, noise, sediment discharge (e.g. from piling or any dredging associated with the construction of a project-specific jetty and the tunnel, if required), increased shipping traffic or hydrological effects.
- Temporary loss of wildlife habitats through land-take (i.e. jetty construction – extent of loss dependent on any jetty proposals,

e.g. if a temporary project-specific jetty was required for import of materials and export of tunnel arisings).

- Direct mortality through construction activities.

5.49 Paragraph 9.8.29 of the LTC scoping opinion states that “the project has no foreseeable negative operational impacts on the marine environment as the Project footprint would be restricted to the tunnel *beneath the estuary*. Any jetty installation provided to facilitate the construction of the Project would no longer be in use and the additional boat traffic associated with construction would cease”.

5.50 As described above, even assuming a best case scenario for LTC, commencement of enabling works would not commence until after the main construction works at Tilbury2 are complete and the RoRo terminal is operational. For the reasons set out above, potential cumulative impacts would therefore only occur during the operational phase of Tilbury2.

5.51 The location of the LTC jetty (if required at all) is currently unknown, as are its scale and construction methods and any dredging requirements. It is therefore not possible to fully assess the potential cumulative effects. However, based on the information that is currently available, it is considered that there is potential for cumulative effects from the two projects to impact fish, marine mammals, benthic ecology and plankton due to suspension of sediment (resulting in reduced water quality and smothering of benthic species); and on fish and marine mammals due to a cumulative increase in vessel traffic (resulting in increased collision risk and disturbance from underwater noise).

5.52 A cumulative increase in suspended sediments could occur if maintenance dredging at Tilbury2 coincided with dredging (if required) for the LTC jetty. Other LTC jetty construction activities are expected to be undertaken in a way that would result in minimal increases in suspended sediment and therefore are considered not to result in significant cumulative effects. As highlighted in the Tilbury2 cumulative assessment for other dredging projects, dredging of Tilbury2 will require prior approval from the PLA under its Protective Provisions, and it is expected that the PLA under their duties would impose appropriate conditions, to ensure that works are coordinated to result in minimal impacts. Similar considerations would apply to the marine licensing of dredging by LTC and Tilbury2 by the MMO. Cumulative impacts on fish, marine mammals, benthic ecology and plankton as a result of increased suspended sediments are therefore considered to be minimal and therefore not significant with this mitigation measure and controls in place.

5.53 The increase in vessel movements (if river transport is used) from the two projects is considered to be relatively small when compared to background traffic levels, and occur over a short to medium term, which is considered likely to result in minor cumulative effects on fish and marine mammals which would not be significant.

ARCHAEOLOGY AND HERITAGE

Archaeology

- 5.54 This cumulative assessment of Tilbury2 with LTC assumes that Tilbury2 is consented and in operation. The predicted effects on the archaeological resource of the construction works at LTC at the spur to Tilbury is considered to be adverse without mitigation measures, as explained in paragraph 5.46.
- 5.55 The site lies in an area of known palaeoenvironmental and archaeological interest and based on the available information there is a potential for non-designated palaeoenvironmental remains and archaeological assets dating from the prehistoric periods through to the Post Medieval period to be present. Consequently the construction works at the LTC could have an adverse effect on the potential buried archaeological and palaeoenvironmental resource. It is anticipated that a suitable strategy would be agreed to avoid, minimise, manage and mitigate against this potential impact.

Predicted Combined Effects on Archaeology

- 5.56 The route of the LTC passes over land which will already have been subject to construction activities associated with Tilbury2. Given the archaeological investigation of that land will already have been completed as a result of the mitigation measures set out in the Tilbury2 DCO, it is not considered that additional disturbance of the same land would result in any greater significance of effect on archaeological value, although when detailed designs are available the need or otherwise for any further mitigation would need to be established. Any such additional mitigation would fall to the LTC project.

Overall, the cumulative effect of the implementation of the recording elements of the mitigation measures set out in the Tilbury2 DCO and the LTC site would result in a greater understanding of the archaeological resource within the Lower Thames Valley area. Consequently the data and records produced from mitigating these effects will be a positive cumulative effect.

Built Heritage

- 5.57 The impact of the LTC on built heritage assets in the vicinity of Tilbury2 will depend on the detailed design of the highway proposals and any proposed mitigation.
- 5.58 The cumulative effect could most readily be experienced in the setting of Tilbury Fort. Such effects would be primarily related to visual, air quality and noise impacts as a result of increased road traffic in the area, all of which could influence the setting and experience of Tilbury Fort which is considered as a heritage asset of very high value in ES terms.
- 5.59 Given that the LTC proposal represents more of the same uses in the area, i.e. road transport, it is considered that the Magnitude of Effect could be assessed, in ES terms, as Low Adverse. There is no elevation data in the

current scoping documents although as noted above the Scoping Report indicates that north of the River Thames where the carriageway may need to be on an embankment then screening mitigation such as false cuttings, environmental barriers and tree and shrub planting are suggested.

- 5.60 The cumulative effects could be limited if the only change to the situation as assessed in the ES for Tibury2 is the change in road traffic on the infrastructure corridor. As the extent of any change is unknown, it is difficult to assess the change in significance of the effect, but it could fall as Moderate/Major Adverse.
- 5.61 The landscape strategy already proposed within the LEMP could be successful in mitigating road traffic impacts on the setting of the Fort, even if the traffic levels were to increase. Increased traffic could increase noise and disturbance in addition to that assessed for Tilbury2. However it is recognised, in heritage terms, that the Fort would have been a place of busy activity and therefore more tolerant of noise than perhaps a residence of place of worship might be.
- 5.62 Further planting to screen the LTC could reduce air, noise and visual impacts to a lesser residual effect, but this may impact further on the historic marshland quality which contributes to the setting of the Fort. Any additional mitigation required would result from the assessment of the LTC proposal.
- 5.63 Clearly if the highways infrastructure between Tilbury2 and Ferry Road were to change (for example if the road were to be dualled), the impact of the proposals on Tilbury Fort could be more significant. The currently proposed landscape mitigation that forms part of the Tilbury2 proposals could be reduced or removed if this highway corridor were to be widened as part of the LTC proposals. Again, effective mitigation would then fall to the LTC project to implement.
- 5.64 The cumulative effect of Tilbury2 with LTC in respect of heritage assets in Gravesham is difficult to determine without further information on the vertical alignment of the highway. However, it seems likely that the views of LTC infrastructure in the vicinity of Tilbury2 as experienced from within the setting of heritage assets within and close to Gravesend are likely to be limited given the proposed alignment and therefore it is considered that there will be no cumulative effect with Tilbury2 on these assets. However, if the LTC (including the Tilbury Link) needed to be elevated there is potential for a greater cumulative effect as the main raised route could be visible in a wider vista from Tilbury Fort looking to the north east. It would also be possible to experience views of the LTC from Coalhouse Fort, with a cumulative impact with Tilbury2 from this asset. However, these would need to be the subject of design review and LTC scheme mitigation within the LTC scheme development and compliance with the National Networks National Policy Statement (NNPS).
- 5.65 The LTC infrastructure on the south side of the river (where the route passes to the east of Gravesend) will have its own potential heritage effects but any such effects are likely to be outside of the heritage effects of Tilbury2 and

whilst potentially additional would be subject to mitigation by the LTC proposals themselves.

LAND-SIDE TRANSPORT

- 5.66 The construction stage of the LTC is likely to commence in 2021 and hence in terms of traffic any cumulative effect will only arise due to the prolonged period of construction if LTC were to follow Tilbury2.
- 5.67 No assessment of the construction traffic is available for LTC. The scale and complexity of the project means it is not possible to estimate a broad guide of construction traffic or use knowledge from any other highway project, as there is no appropriate comparable (that has similar geographic or scheme design and scope parameters). It is therefore not possible to undertake a cumulative assessment.
- 5.68 However, it is worth noting that the LTC Environmental Impact Assessment Scoping Report states that routes for construction traffic would probably be via the A13 (paragraph 2.13.2). Accordingly, with reference to the submitted ES Chapter 13 the cumulative effects would be confined to the A13.
- 5.69 The LTC proposes a new junction and new link road to Tilbury which would connect with the infrastructure corridor proposed as part of Tilbury2. This would provide a new route for all vehicle movements to and from Tilbury particularly to and from the Port of Tilbury and Tilbury2. In addition, as part of the LTC, new interchange arrangements are currently proposed between the A1089 and the A13 along with the new LTC route.
- 5.70 These substantial changes to the road network would have a significant effect on the traffic patterns across the whole of the Tilbury and the wider area. The LTC team are modelling the implications of these changes to enable a proper assessment of their effects. Highways England has confirmed that no traffic data is available and they accept responsibility for assessing the cumulative traffic impacts from the Tilbury2 and LTC that will be presented in HE's application for LTC. Clearly this also limits the ability to which any assessments of related environmental disciplines for which the level of traffic and modelling is fundamental to determining environmental impact.

NAVIGATION

- 5.71 The Scoping Report for LTC notes that the opportunity to transport material by water to reduce the number of construction movements by road will be considered. It adds that if transport by water was found to be practicable then this may require either the construction of a new jetty, or the modification of an existing jetty located on the River Thames.
- 5.72 If this is the case, the cumulative effect of LTC with vessel movements associated with Tilbury2 will need to be assessed. However, it is expected that there will be negligible hazards and risks for any increase in ships in transit (should this mode of transport be used for transporting waste arisings) in the Thames Estuary. Such movements will be subject to a

robust Navigation Risk Assessment by the PLA, as has been undertaken for Tilbury2 itself.

- 5.73 During operation it is not considered that LTC will generate any vessel movements.

HYDROGEOLOGY AND GROUND CONDITIONS

- 5.74 There may be the potential for cumulative impacts to occur during the construction of the LTC. These impacts include the increased potential for soil erosion, ground stability issues, mobilisation of contaminants, exposure of human and environment receptors and creation of new pathways. However, currently there is no information available on the ground conditions on the LTC site.

- 5.75 The LTC proposal will also need to show compliance and conformity with the NNNPS and the controls in the NPPF as far as they are relevant and important to the planning of the LTC. As such it will be required to ensure that the intended scheme is fit for purpose and that mitigation and control measures will be adopted during the construction phase to reduce impacts on hydrogeology and ground conditions. The construction will not commence until after works on Tilbury2 are largely completed. Therefore, a low potential for cumulative impacts is predicted during the construction phase.

- 5.76 It is assumed that the developments will be operated in accordance with granted consents and the relevant regulations and best practice guidance in applying Best Available Techniques and pollution prevention. Therefore, a low potential for cumulative impacts is predicted during operation.

WATER RESOURCES AND FLOOD RISK

- 5.77 As discussed in Section 2.0, based on the available information and the proposed construction programme for the TEC, it is anticipated that there will be limited if any overlap between the construction period of the TEC and that of the infrastructure corridor and RoRo terminal. Only the later construction phases of Tilbury2 may have the potential to coincide with the commencement of TEC construction. Accordingly, it is considered that there will be limited or no cumulative impacts on water resources during the construction phase of the TEC.

- 5.78 Nevertheless, it is anticipated the TEC development will be subject to meeting the relevant tests in NPSs EN-1, 2 and 3, and consequential design, control and mitigation requirements and important and relevant matters in the NPPF, which will ensure that the proposed scheme is fit for purpose and that mitigation, management and control measures will be adopted during the construction phase to reduce impacts to the water environment.

- 5.79 Based on the information in the scoping report and the proposed construction programme for the LTC, it is understood that there is unlikely to be any overlap between significant construction activities at Tilbury2 and the

construction period of the LTC. As a result, it is considered that there will be no construction cumulative impacts on the water environment due to the LTC. Even if there was some overlap, the LTC will be subject to appropriate controls to accord with the NPS and NPPF. Nevertheless, it is anticipated the LTC scheme will be subject to meeting the relevant tests in NPS for National Networks and consequential design, control and mitigation requirements and important and relevant matters in the NPPF, which will ensure that the proposed scheme is fit for purpose and that mitigation, management and control measures will be adopted during the construction phase to reduce impacts to the water environment.

- 5.80 However, the LTC scoping document does highlight the potential adverse effects on the water environment associated with such infrastructure projects. This includes lowering of groundwater levels due to dewatering and impacts by uncontrolled release of pollutants in discharges.
- 5.81 The scoping document indicates that the bored tunnel of the project will avoid any effects on the River Thames but there may be a need to construct a jetty to facilitate transporting construction waste materials.
- 5.82 There is potential for localised impacts of increased sediment loading during piling and dredging activities for any jetty construction, if undertaken. If the piling works coincide with operational dredging at Tilbury2 there could be increased cumulative effects on the water quality of the River Thames due to the higher sediment loading. As part of the LTC construction programme, it is necessary to ensure that the jetty construction activities are undertaken with minimal impact to suspended sediment loading. It is anticipated that a combination of phasing of works to avoid coincident dredging, and industry best practice to minimise disturbance of sediment during the dredging activity will be implemented. This will result in low cumulative effects.
- 5.83 It is expected that the MMO and PLA would impose appropriate conditions on all dredging activities in the vicinity of Tilbury2 operations to ensure that any construction works are coordinated with the operations on Tilbury2 in order to minimise cumulative effects on the water environment.
- 5.84 The scoping document indicates that the LTC development will be subject to a detailed assessment, which will ensure that the proposed scheme is fit for purpose and that mitigation and control measures will be adopted during the construction phase to reduce impacts.

Operational Phase

- 5.85 Cumulative operational effects include potential for increased risk of flooding from both schemes, which are located close to the existing flood defences on the River Thames. Both schemes also have the potential to reduce the floodplain storage capacity. However, mitigation measures considered in the LTC scoping include provision of compensatory storage to offset any loss of floodplain. Tilbury2 also includes appropriate mitigation measures including acceptable stand-off distance for all permanent structures. As such it is not considered that there will be any cumulative effect on risk of flooding from both schemes in combination.

- 5.86 Implementation of the mitigation measures for Tilbury2 provided in the Drainage Strategy, developed in line with the NPS, NPPF and Thurrock Core Strategy will minimise the potential cumulative effects of flood risks. The same approach will be required for the LTC to ensure compliance in a similar manner.
- 5.87 There will be potential cumulative effects from increased surface runoff and flood risk due to the increased area of hard standing across both schemes, particularly given the increased area of hard surfacing associated with the link road that will run through the northern part of the Tilbury2 site, consuming land that under the Tilbury2 proposals in isolation will not be developed. It is envisaged that the LTC site will have an appropriate drainage strategy to ensure impacts off site are minimised. It is anticipated that this will predominantly be similar to the Tilbury2 drainage strategy, which proposes to channel all run-off into the existing drainage network. The exception will be run-off from the RoRo pavement which will be discharged to the River Thames. The LTC scoping document indicates that mitigation measures will include provision of storage to attenuate discharge rates of surface water drainage from the operational area. These measures will minimise the potential cumulative effects.
- 5.88 There is the potential for cumulative effects associated with the potential pollutants from surface water run-off, accidental spills of oil/fuels on both sites impacting on the watercourses and drainage systems on and off both sites. However, it is anticipated that in line with industry best practice, both schemes will have appropriate embedded mitigation measures incorporated in the design to prevent uncontrolled release of potentially contaminated water to minimise the impacts. If the layout of the Tilbury2 infrastructure corridor was altered as a result of the LTC proposals (for example, widened or dualled), the drainage proposals would need to be suitably reviewed and enhanced to ensure that they maintain the level of protection of watercourses and drainage systems in the potential impact area and catchment and this would need to be an integrated part of the LTC scheme.
- 5.89 Proposed mitigation for both schemes includes treatment of construction and operational drainage discharges prior to entry into the water environment. The measures include utilising SuDS features such as swales and ponds as appropriate. As a result, the cumulative effects are considered to be low.
- 5.90 Based on the above assessment, it is considered that the cumulative impacts on the water environment due to the LTC development are likely to be low.

NOISE AND VIBRATION

- 5.91 The traffic assessment for LTC will include operational traffic using Tilbury2 as part of its future baseline assessment, and thus the effect of LTC with Tilbury2 on noise will be assessed through this process.
- 5.92 The route of the proposed LTC spur goes through what is currently the northern extent of the CMAT (see Appendix 2) with an associated potential

reduction in the operating capacity of the CMAT. If the scheme were to proceed on that basis, the cumulative impact of the LTC and TEC would change from that assessed in the Tilbury2 ES. There could be some reduction in noise effects and an increase in distance between Tilbury2 noise sources and the nearest sensitive receptors in Tilbury.

- 5.93 However, the traffic using the LTC would itself have noise implications and would need the mitigation proposed as part of the Tilbury2 proposals to be reassessed and designed to consider effects arising from the LTC scheme. The extent of mitigation will depend upon detailed design of the link road between Tilbury2 and Ferry Road, the quantum of traffic using this link in the post-LTC scenario and the implications of the design of the mitigation already proposed (such as noise barriers). If additional noise impacts are assessed that require additional mitigation, clearly this would form part of the mitigation for the LTC itself, ensuring that cumulative effects are fully taken into account by the LTC assessment, design and mitigation proposals. Away from the Tilbury2 scheme, the LTC may result in adverse or beneficial noise impacts at receptors as a result of the re-distribution of traffic once LTC becomes operational.

AIR QUALITY

- 5.94 The Scoping Report for the LTC indicates the potential for adverse effects during construction of the crossing in terms of both construction dust and vehicle emissions but that these effects will be temporary in nature and minimised through the application of best practice mitigation measures. At this stage, it is not known where or precisely when the LTC construction works will commence, however, it can be assumed the construction of LTC would be phased and rolled out over the linear extent of the project. Phasing and extent of works across the construction phases and period will be part of the design and mitigation of the LTC project as it is developed, assessed and consulted on.
- 5.95 As described above, it has been assumed that the main construction works for Tilbury2 will be complete and the RoRo and CMAT operational before construction works for LTC commence. There is potential for some temporal and spatial overlap of LTC construction activities with low dust risk engineering works at the CMAT of Tilbury2. It is conservatively assumed that there may be some sensitive receptors within 350 m of the construction activities for both projects. Application of appropriate mitigation measures for the LTC, secured within a CEMP or equivalent, and the application of the Tilbury2 CEMP, which will be secured through the DCO, will ensure no significant cumulative effects of construction dust at sensitive receptors.
- 5.96 Road traffic emissions from Tilbury2 construction have been determined as not significant (change of less than 1% of the annual mean NO₂ criterion). The main Tilbury2 construction works will be complete prior to LTC construction works commencing thus any residual construction traffic flows in 2021 will be lower than those that were assessed for the ES. The highest NO₂ concentration at a receptor without the Project in 2020 is 34.7 µg/m³ (Table 18.44 of Appendix 18.E). The maximum NO₂ increment at a receptor during the construction of Tilbury2, (which includes an infrastructure corridor

and thus, in the absence of further information at this stage, is considered comparable to LTC, which is assumed to also be constructed in a phased approach, is just $0.3 \mu\text{g}/\text{m}^3$. The expected further reductions in vehicle emissions by the time the LTC construction works would be carried out in 2021, mean that the potential for adverse cumulative impacts, where the affected traffic networks may overlap both temporally and spatially during construction, is deemed not to be significant. On the basis of this high level assessment of cumulative impacts there is not considered to be a significant risk of the air quality criteria being breached.

- 5.97 On a similar basis, it is not anticipated that there would be any significant cumulative air quality effects due to combined emissions from construction traffic associated with Tilbury2 and LTC on statutory or locally designated ecological sites.
- 5.98 The traffic assessment for LTC will include Tilbury2 operational traffic as part of its future baseline assessment, and thus the effect of LTC on air quality at sensitive receptor locations, including European sites, will be fully evaluated as part of that project.
- 5.99 The LTC will provide an alternate route for operational traffic accessing Tilbury2 from the strategic road network, to that which formed the basis of the traffic assessment for the ES. At this stage, insufficient information is available to allow a meaningful, quantitative appraisal (see above section on Land-Side Transport). The LTC Scoping Report states that air quality could be affected (positively or negatively) by changes in vehicle activity (flows, speeds and composition) as a result of the LTC although it specifically notes it has the potential to improve air quality in the AQMA on the A282 (Dartford Crossing).
- 5.100 It can be assumed that the combined operation of Tilbury2 and LTC has the potential to reduce vehicle flows on routes west of Tilbury2, for example the A1089 and A13) as vehicles elect to use the LTC and associated new routes as an alternative way to the M25 and/or the M2²⁰. As a consequence, there may be an improvement at receptors close to the A1089 and A13. Emissions on the current and future road network to the east of Tilbury2 will increase above those for Tilbury2 alone. Based on the existing baseline concentrations, modelled pollutant increments for Tilbury2 operational land-side transport (reported in the ES, Appendix 18.E Table 18.44 to 18.46), the expected further reductions in vehicle emissions by the time the LTC will open, and the lower background concentrations in the less built up area to the east through which LTC is expected to pass²¹, there is likely to be limited potential for significant cumulative effects in the year 2026. Any such effects would need to be mitigated through the environmental assessment of LTC. A Scheme Air Quality Action Plan would be prepared for the LTC in the event of a risk of non-compliance with any EU limit values.

²⁰ Highways England, Post-consultation scheme assessment report (Volume 5) – Traffic and Economics Appraisal, March 2017

²¹ Review of DEFRA air quality background maps, 2015 base year for the year 2016

- 5.101 The route of the LTC spur goes through what is currently the northern extent of the CMAT (see Appendix 2) with an associated potential reduction in the operating capacity of the CMAT. If the LTC scheme were to proceed on that basis, the cumulative impact of the LTC on Tilbury2 operational dust emissions would be a slight reduction in dust source magnitude and an increase in distance between the dust source and the nearest sensitive receptor. There could also be an indirect reduction in operational land-side transport emissions, due to a reduction in the CMAT area, with less of an increase in NO₂ than that reported in the ES (in addition to any reduction associated with the movement of Tilbury2 traffic eastbound towards the LTC itself).

WASTE AND MATERIALS

- 5.102 The waste arisings from the LTC are not known but will be much greater than that assessed for Tilbury2. The LTC project will need to adhere to the principles of the waste hierarchy and, given the timelines involved, consider waste capacity at the time those arisings occur. There will be some cumulative impact on waste capacity (since the waste arisings from LTC will follow those from Tilbury2) but the significance of this cannot be determined without knowing the arisings from LTC or the capacity that would exist at that time.

6.0 COMBINED CEA OF TEC AND LTC WITH TILBURY2

- 6.1 This section of the statement summarises potential cumulative effects of all three schemes, namely, Tilbury2, TEC and LTC. In considering this it must be taken into account that each project will need to seek to develop and design a scheme that is relevant NPS compliant and meets legislative and regulatory tests and requirements.

COMBINED CONSTRUCTION PERIODS

- 6.2 From the information available to date (as described above) there will be only limited if any potential overlap in the construction period of Tilbury2 with TEC and LTC. The Tilbury2 infrastructure corridor, the laying out of the RoRo Terminal and all marine works will be completed by the end of 2020 when the operation of the RoRo terminal commences, prior to the earliest anticipated construction commencing on either the TEC or LTC. Whilst construction of the CMAT will continue through 2021 and would potentially overlap with LTC and TEC earliest commencement on site, the extent of engineering works at Tilbury2 will be reducing during this period.
- 6.3 As such, it has been assumed that the cumulative effects of adding the Tilbury2 construction works during 2021 to the enabling works at TEC and LTC will not be significant and are therefore not generally assessed in this document aside in respect of specifically sensitive issues such as air quality.

SOCIO-ECONOMICS

- 6.4 Combined, TEC and LTC with the Tilbury2 proposals will create a sustained period of construction. This will have both positive and adverse effects on socio-economic outcomes, in terms of job creation, skills and training opportunities, and potential stresses on existing infrastructure and community networks. The local demographic profile is expected to be affected by the proposal, particularly if additional employees move to the study area.

HEALTH

- 6.5 The anticipated prolonged construction period (even though significant construction at Tilbury2 will be completed prior to commencement at LTC and TEC) could have both physical and psychological health impacts on local communities.
- 6.6 Whilst the Tilbury2 assessment has concluded that construction impacts on health are unlikely for this project on its own, the lure of three projects together has the potential to lead to an influx of new workers. If employment is sourced locally some jobs may go to people who would otherwise currently be out of work, and this would affect the levels of job seekers and benefits claimants as well as potentially improve health. The employment impact could therefore have a small positive cumulative effect on health and wellbeing in the local population.

- 6.7 The cumulative impact of all three projects once operational on health would need to be considered further once more detail on aspects such as air quality and noise are known. However, provided the mitigation proposals for the TEC and LTC are robust, the cumulative effect of all three on human health could potentially be limited.

LANDSCAPE CHARACTER AND VISUAL AMENITY

- 6.8 With Tilbury2, TEC and LTC all operational, the cumulative effect on local landscape character would likely be of moderate significance within the Tilbury Marshes. These schemes having been constructed would likely require a re-assessment of this character area to better reflect what will be increasingly urban fringe characteristics. An effect of moderate-slight significance would likely occur within the Chadwell Escarpment Urban Fringe and one of slight significance within the Shorne and Higham Marshes.
- 6.9 The combined sight and sound of the three projects would have an overall effect of moderate significance on scenic quality and tranquillity. The area where this effect would likely be most marked is broadly defined by the rural extents of the West and East Tilbury Marshes, including the north bank of the Thames as well as the eastern reaches of the Chadwell Escarpment.
- 6.10 Rarity value is associated with Tilbury Fort, which represents a singular example of its type in the wider locality. Predicted effects on this aspect of rarity relate solely to the proposed Tilbury2 infrastructure corridor.
- 6.11 As highlighted above, the combined Tilbury 2 and TEC developments would affect cultural heritage value associated with the SAM's of Tilbury Fort, New Tavern Fort and Coalhouse Fort. In respect of Tilbury Fort the LTC may add to the cumulative effects of the other two although given the overall context the cumulative effect on the cultural heritage value of Tilbury Fort would remain largely unchanged to that reported for Tilbury 2.
- 6.12 In respect of Coalhouse Fort the TEC would slightly increase the presence of industry in the far distance and the LTC may be visible and audible in the middle distance. It is the latter development which carries the greater potential to affect appreciation of that fort and its setting and any mitigation would fall to that scheme to minimise or avoid any adverse effect.
- 6.13 The cumulative impacts of all three schemes on leisure and tourism value – particularly users of the public rights of way directly affected by the LTC – would fall into a range of moderate to slight significance following completion.
- 6.14 In terms of visual amenity, the combined effects of all three projects would be experienced in views from the east and north-east that take in the TEC site (that would be prominent and consolidate the presence of industry at Tilbury2), the LTC link road and main junction north of the LTC tunnel portal, the introduction of high levels of associated road traffic, the northernmost extent of buildings and stockpiles on Tilbury2 and, to a lesser extent, the southern half of the port as well as associated shipping. From the north east

the significance of the effects on these receptors would likely fall into the substantial range in closer proximity (i.e. within 0.5 km) reducing to moderate further afield in locations such as West Tilbury. From the east the effect would be substantial in close views but slight in more distant views such as Coalhouse Fort, where the LTC and associated traffic would be visible in the middle distance. From the south (when viewed from Gravesham), the cumulative effects of all three schemes will be little different from only the Tilbury2 and TEC schemes as described above. The LTC is likely to become a minor element visual to views from the south due to its relatively low profile, subject to the scale and design of the north shore tunnel portal and visibility of road traffic.

- 6.15 The cumulative effect of artificial lighting would increase when Tilbury2, TEC and LTC schemes are all operational. As discussed above, the TEC would likely represent a relatively minor extension of lighting within Tilbury 2 which would extend over a greater area, and lighting associated with the LTC is assumed to be most evident at the link road junction and tunnel portal locations as is the movement of road traffic along the corridor.

TERRESTRIAL ECOLOGY

- 6.16 **Statutory designations.** The cumulative impact considered to have the greatest potential to generate a likely significant effect on European Sites is air quality. However, the assessment of Tilbury2 did not identify any significant effect in this regard and therefore this combined cumulative effect arises from the combination of increases in road traffic (from the LTC) and energy generation emissions (from the TEC) which could lead to a significant overall increase in atmospheric NO_x, and in corresponding N-deposition, which could in turn lead to a change in the quality, condition or extent of habitats comprising special interest features of the Thames Estuary and Marshes Ramsar Site.
- 6.17 These potential changes in the nature of the coastal habitats could also lead to a decline in suitability for foraging waders, and particularly when considered in combination with possible LTC and TEC construction or operational phase disturbance of wading birds, this could potentially lead to significant impacts on qualifying species of the SPA.
- 6.18 However at present too little information is available in terms of emissions modelling to be able to make an assessment of the likelihood of a significant effect being generated or avoided and this assessment would need to be undertaken by the promoters of TEC or LTC when these schemes are in a more advanced position.
- 6.19 **Non-statutory designations.** The Lytag Brownfield LoWS, Tilbury Centre LoWS and a portion of the Tilbury Marshes LoWS will be lost to the construction of Tilbury2. Taken in combination with potential losses of Low Street Pit LoWS and parts of the proposed 'Tilbury Power Station' LoWS (which includes the surviving section of the Goshems Farm LoWS and the A1 ashfield area) to the LTC and TEC this represents a significant diminution of the quantum of non-statutory designated sites from this part of Thurrock. Furthermore, those remaining LoWS will be subject to potential N-

deposition effects that could result in deterioration in habitat quality (i.e. in particular the retained sections of Goshems Farm, proposed 'Tilbury Power Station' LoWS, and to a lesser degree Tilbury Marshes).

- 6.20 Mitigation would need to be addressed by LTC and TEC in the future. TEC has set out within its Scoping Report that, where practical, the mitigation and enhancements prescribed within the terrestrial ecology chapter will seek to join up with existing or future plans for a landscape scale approach; albeit timescales for other development will preclude this approach being relied on for mitigation in the short-medium term.
- 6.21 The losses may to a degree be ameliorated by appropriate restoration and the provision of compensatory habitat, although given the timescales, losses would nonetheless be significant in the short-term.
- 6.22 **Habitats.** Taken cumulatively, the potential losses of S41 Open Mosaic Habitat on Previously Developed Land from the three projects would be considerable. Following recent losses from Goshems Farm to capping and 'restoration'; the future loss of 9ha brownfield habitat to the construction of Tilbury2, taken cumulatively with potential future impacts on the surviving section of Goshems Farm LoWS, the former power station ashfields (including the A1 ash mound) from TEC and effects on Low Pit LoWS from LTC, the result could be near total elimination of the existing brownfield resource from this part of Thurrock, albeit the overall significance of the effect would depend on the success of any proposed restoration and the provision of compensatory habitat.
- 6.23 The extent of potential losses of Coastal and Floodplain Grazing Marsh from the LTC and TEC pipeline construction is difficult to predict but a degree of restoration and compensation are likely to be possible following construction, which may ameliorate the significance of the losses.
- 6.24 **Fauna.** Cumulative impacts can be summarised for these faunal groups as follows:
- **Invertebrates.** Taken cumulatively, the potential losses of brownfield invertebrate communities would be considerable, with potential losses of habitat from the Tilbury2 site, Goshems Farm and the former power station ashfields, (and the Low Street Pit invertebrate site), potentially leading to near total elimination of the existing brownfield resource from this part of Thurrock. The significance of the effect would be dependent on the success of any proposed restoration and the provision of compensatory habitat, and also the timeframes over which habitat loss and recreation may occur (staggered losses being likely to facilitate retention of residual/isolated populations until restored/created habitat becomes available).
 - **Protected species.** Loss of habitat for reptiles and water vole will be generated by all three projects, and dependent on the detailed design of the LTC, there may be impacts on the on-site compensatory habitat provision of the Tilbury2 scheme, resulting in additional disturbance (double-handling) of retained populations of water voles and reptiles.

Cumulative habitat loss and fragmentation may also give rise to significant effects on local populations of scarce breeding birds and bats. Again, the potential significance of cumulative effects on protected species within Thurrock will be dependent on the success/extent of mitigation and compensation provision by the three schemes.

MARINE ECOLOGY

- 6.25 If water injection dredging operations at Tilbury2 and LTC (if required) are coordinated so that they do not occur at the same time, and water injection dredging operations do not occur over the summer months when water temperatures are naturally higher (and therefore dissolved oxygen levels lower), it is anticipated that there would be no significant combined cumulative effects from the LTC, TEC and Tilbury2 projects.

ARCHAEOLOGY

- 6.26 Construction works at the TEC and LTC could have an adverse effect on the potential buried archaeological and palaeoenvironmental resource which would be in addition to that assessed for Tilbury2. It is anticipated that a suitable strategy for each project would be agreed to avoid, minimise, manage and mitigate against this potential impact.
- 6.27 The route of the LTC passes over land which will already have been subject to construction activities associated with Tilbury2. Given the archaeological investigation of that land will already have been completed as a result of the mitigation measures set out in the Tilbury2 DCO, it is not considered that additional disturbance of the same land would result in any greater significance of effect on archaeological value, although when detailed designs are available the need or otherwise for any further mitigation would need to be established. Any such additional mitigation would fall to the LTC project.
- 6.28 Through the successful implementation of the appropriate mitigation measures, it is considered that there will not be any adverse cumulative effects on archaeological resource but instead a beneficial residual effect.
- 6.29 Overall, the cumulative effect of the implementation of the recording elements of the mitigation measures set out in the Tilbury2 DCO, with similar measures for the TEC and the LTC would result in a greater understanding of the archaeological resource within the Lower Thames Valley area. Consequently the data and records produced from mitigating these effects will be a positive cumulative effect.

BUILT HERITAGE

- 6.30 The combination of effects on built heritage from Tilbury2, TEC and LTC will be greater than any of the individual projects but will to a large degree depend upon the mitigation allied to TEC and LTC, for which no information is available.

- 6.31 The most sensitive asset – Tilbury Fort – and its setting will be affected by all three proposals. However, whilst the CEA of Tilbury2 with TEC has assessed each key asset as described above, it is very difficult in particular to assess the impact of the LTC as an additional project as the design of the highway within the Tilbury2 order limits will rely on further detail in order to properly assess the cumulative effect. Some additional effect on Tilbury Fort may result, with additional mitigation required that would fall to be proposed by the LTC project, contingent on detailed design.

LAND-SIDE TRANSPORT

- 6.32 As set out above it is Highways England's own submission that:

“HE is currently revising the traffic model for the LTC, and is incorporating the latest proposals for the design of LTC. If the Applicant used the current assumptions for LTC in a cumulative assessment of the Proposed Development with LTC, that assessment may be unrealistic. Furthermore providing further detailed information on the traffic model and on the route of LTC prior to a formal consultation would compromise the integrity of the planned consultation. HE accepts responsibility for assessing the cumulative traffic impacts from the Proposed Development and LTC that will be presented in HE’s application for LTC.” [REP2-003]

- 6.33 From these comments, it is clear that traffic data is not available, a position confirmed at the Issue Specific Hearing on 18 April 2018. As such it is therefore not possible to assess the cumulative effects of LTC as noted above and it is not possible to undertake a combined cumulative assessment of all three projects in a meaningful manner.

NAVIGATION

- 6.34 There may be some cumulative effects on vessel movements and hence navigational risk as a result of construction activities of the LTC using the River Thames for construction materials and waste arisings whilst Tilbury2 is operational. It does not appear that the TEC proposals will make any use of the river during construction or operational phases therefore the CEA of all three projects will not differ from the CEA of Tilbury2 with LTC.

- 6.35 As described above, the movement and positioning of vessels associated with the LTC will be subject to a Navigational Risk Assessment to ensure that the effect of construction works on navigation (including vessel movements from Tilbury2) will be acceptable. Clearly, the methodology and timing of marine works and the use of the river for construction of the LTC will need to be discussed and agreed in advance with the PLA.

HYDROGEOLOGY AND GROUND CONDITIONS

- 6.36 Through the successful implementation of appropriate mitigation measures during the construction and operational phases, it is not anticipated that there will be significant cumulative effects for the LTC, TEC and the Tilbury2 projects in relation to hydrogeology and ground conditions.

WATER RESOURCES AND FLOOD RISK

- 6.37 It is not anticipated that there will be any significant cumulative effects for the LTC, TEC and the Tilbury2 projects. As described above there is likely to be limited overlap between the construction phases of Tilbury2 with the LTC and TEC proposals. However, it is necessary to ensure that any dredging required to facilitate construction of these projects does not coincide with the operational dredging works for Tilbury2 as this could result in potentially significant impacts on the water environment. This would be controlled through the operation of the PLA and MMO licensing regimes (as incorporated within the DCOs for each scheme).
- 6.38 There are a number of potential combined cumulative effects due to both the TEC and LTC projects which could impact on the water environment without appropriate design in the TEC and LTC schemes and appropriate mitigation measures. This includes increased risk of flooding, increased surface run-off, pollution associated with discharge of process water, spills and leakages during operational periods. Although the magnitude and significance of some of the effects is currently unknown due to the limited information available on the schemes, it is considered that with the appropriate approach to design and mitigation measures in place the combined effects are unlikely to be significant.

NOISE

- 6.39 It is not anticipated that there will be any significant cumulative effects for the LTC, TEC and the Tilbury2 projects during construction. As described above there is likely to be limited overlap between the construction phases of Tilbury2 with those of the LTC and TEC proposals. There may be cumulative noise effects with Tilbury2 during the limited construction phases overlap depending on the locations of the works and duration, with key noise effects likely to arise from construction traffic. Construction of LTC is likely to contribute more to the combined cumulative effect than TEC. However, it is necessary to ensure that any noise impacts of the developments both individually and in combination are adequately mitigated through a CEMP, which will be secured by the respective DCOs.

The combined noise effects of the operation of TEC and LTC with Tilbury2 will increase noise levels in Tilbury and Gravesham due to increased road traffic movements on the transport corridor and the operation of plant and equipment from the developments. The operation of TEC is unlikely to be a significant factor in the combined cumulative assessment as plant is likely to be designed to have a negligible noise impact. Combined cumulative impacts at receptors away from the environs of Tilbury2 and Tilbury town may be adverse or beneficial and are likely to be determined principally by traffic re-distribution once LTC becomes operational.

AIR QUALITY

- 6.40 It is not anticipated that there will be any significant cumulative effects for the LTC, TEC and the Tilbury2 projects during construction. As described above there is likely to be limited overlap between the construction phases

of Tilbury2 with those of the LTC and TEC proposals. However, it is necessary to ensure that any dust emissions of the developments both individually and in combination are adequately mitigated through a CEMP, which will be secured by the respective DCOs

- 6.41 Once operational, the maximum ground-level concentrations from TEC stack emissions may overlap with the LTC new road network, which may be used by Tilbury2 land-side transport. If significant effects are identified, then appropriate mitigation would need to be developed such as reconsideration of stack height and/or route alignment. Although the magnitude of the effects is currently unknown due to the limited information available on the schemes, and on the basis of the low existing baseline concentrations in the relevant area, the combined residual effects are unlikely to be significant. There would also be beneficial effects on those routes which would be relieved by the LTC, with or without the TEC in place.

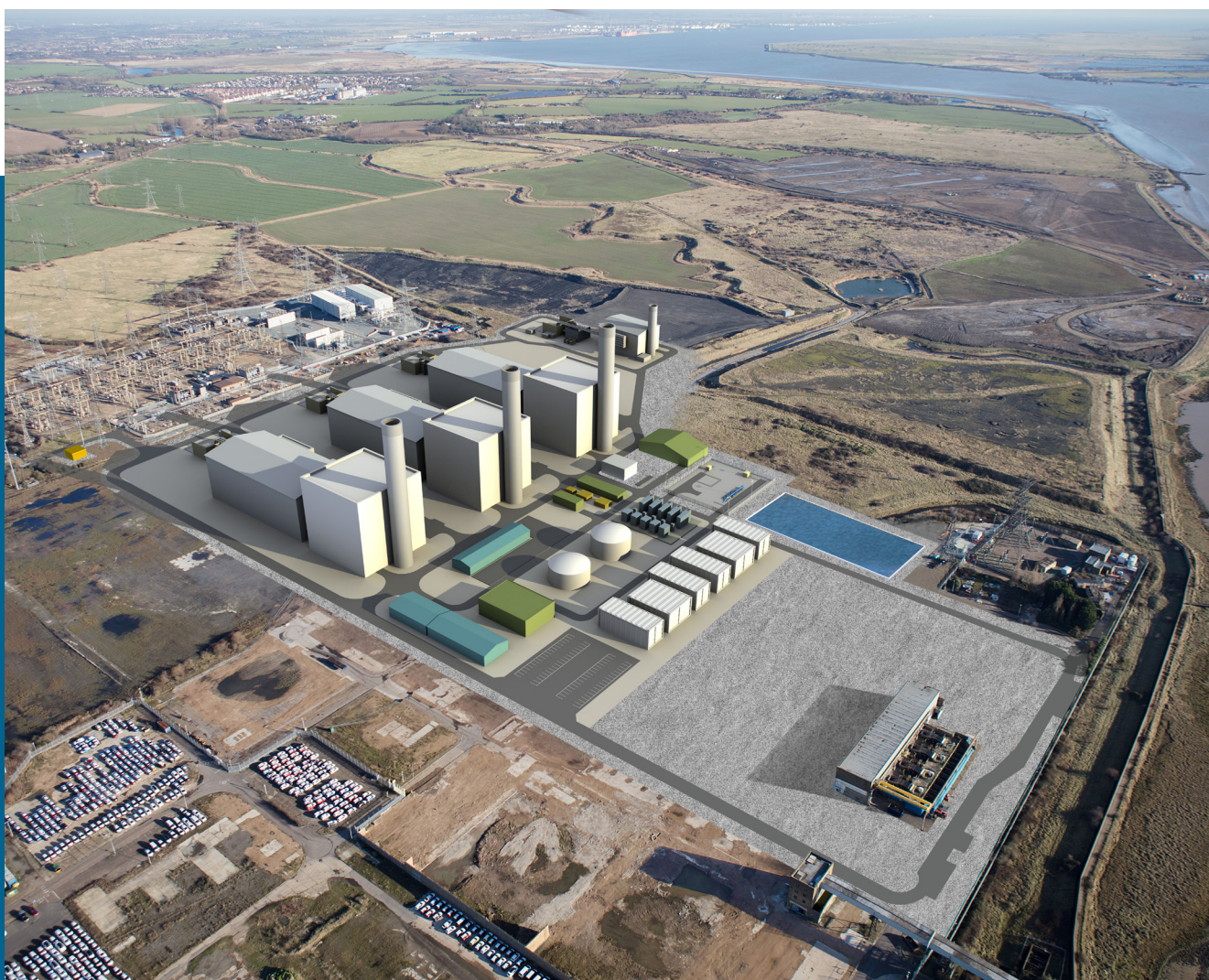
WASTE AND MATERIALS

- 6.42 The waste arisings from all three projects are not known but in combination will be much greater than that assessed for Tilbury2. Each project will need to adhere to the principles of the waste hierarchy and, given the timelines involved, consider waste capacity at the time those arisings occur. There will be some cumulative impact on waste capacity (since the waste arisings from both TEC and LTC will follow those from Tilbury2) but the significance of this cannot be determined without knowing the arisings (particularly from LTC which could be significant) or the capacity that would exist at that time.

Tilbury Energy Centre

Consultation booklet

February 2018



RWE

Powering. Reliable. Future.





Foreword

“Breathing new life
into the Tilbury site”

Tilbury has a proud history of power generation, with the first power plant opening on the current Tilbury Power Station site in the 1950s. Tilbury B started generating in 1969 and until 2011 operated as a coal-fired power station before conversion to biomass and eventual closure in 2013.

We believe that Tilbury is an excellent site for power generation because of its location close to areas of high electricity demand and its proximity to the 400 kilovolts (kV) National Grid substation, the gas transmission network and the River Thames for cooling water.

The UK energy market has dramatically changed since Tilbury B closed its doors five years ago. More renewable generation has been developed, older power plants have closed, and the future of coal is limited. For these reasons, we believe it is very important that RWE provides options for new power generation development at our Tilbury site to ensure that the country is provided with safe and more sustainable electricity for the long-term. The proposed Tilbury Energy Centre will help support a new energy system for the future with lower carbon, efficient, controllable, state of the art technology.

A new modern gas-fired station, battery storage development and quick start up gas plant would provide power to millions of homes and businesses, bringing significant investment and skilled jobs into the area.

As proposals for the Tilbury Energy Centre evolve, the project team and I are committed to keeping the local community informed. We will also ensure that everyone has the opportunity to provide feedback to help inform the development of our proposal. Your understanding, conversations, concerns and views are very important to us and will help us shape a meaningful consultation process.

The document provides a summary of what we propose and we hope this is a helpful guide to the Tilbury Energy Centre project and our approach to future consultation. For more information or to express your views please see the website www.rwe.com/tilburyenergycentre, email rwegenerationuk@rwe.com or telephone 08450 770 150.

We believe our development would provide the UK with a new power plant which will be essential to help the UK's security of energy supply. We can't do this alone, we would like to work hand in hand with you, the community that worked at and supported the former A and B power stations for over 60 years to provide a development that is fit for the future.



Severine Poncelet,
Tilbury Energy Centre
Project Director

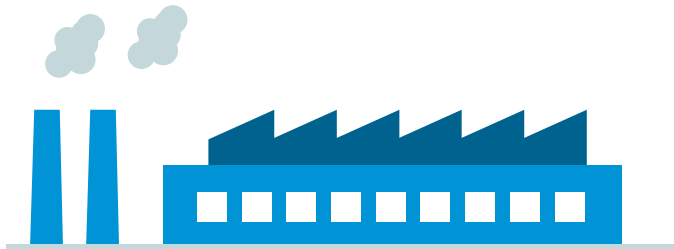
RWE



Who we are

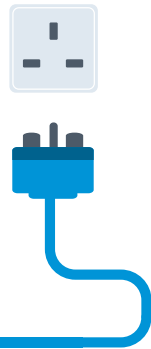
RWE is a leading power generation company, producing 15% of the UK electricity. It owns and operates the UK's largest fleet of gas-powered stations along with a coal and a biomass plant. The gas fleet includes two of the most modern and highly efficient plants in Europe, capable of providing 4 gigawatt (GW) of efficient, flexible power (enough to serve 6 million homes) and respond quickly to changes in demand, giving the national grid greater flexibility. This is crucial to the country's electricity supply, making RWE a key partner in helping the UK to transition to a low-carbon energy future.

RWE has a long history at Tilbury - a site with an even longer history of power generation. The Tilbury A power plant came online in 1956 and was supplemented by the Tilbury B plant in the late 1960s. The initial power station was closed in 1981 and subsequently demolished. The B plant continued generating and soon after the privatisation of the UK electricity industry in the early 1990s, its operation was taken over by RWE npower. In 2011, RWE upgraded the coal-fired power station to a biomass plant which reduced greenhouse gas emissions by over 70%. On August 13 2013, Tilbury B generated its final unit of electricity. After 46 years of operation on a site that had generated electricity for 57 years, the station closed.



RWE Generation has a strong position in the UK energy market with an overall installed capacity of over 8.5GW. Most of the fleet is made up of modern combined cycle gas turbines (CCGTs), along with some coal and a small amount of biomass.

RWE Generation is the UK's second largest generator. In 2016, RWE UK generated 43.3 Terawatt-hour of electricity, around 15% of all the electricity generated in the UK.



RWE is among the **top five** energy companies providing gas-fired generation capacity in Europe.

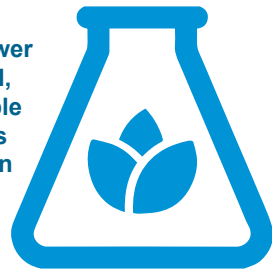


RWE's sites are located across England, Wales and Scotland and the business provides over **1,500** highly-skilled jobs in the UK.



The old Tilbury B coal power station had a generating capacity of **1,467MW**

In 2011, Tilbury B power station was converted from a coal-fired power station to run on 100% biomass fuel, using sustainably-sourced renewable wood pellets for the remainder of its lifetime under the Large Combustion Plant Directive (LCPD). The 100% biomass plant used wood pellets to generate up to 750MW.



Why the Tilbury Energy Centre is needed

The UK has made great steps to reduce and improve its consumption of electricity. However, despite increasing energy efficiency, electricity demand is projected to remain at current levels or rise over the coming years due to growth in the economy and electricity being increasingly used for transport and heating. Meanwhile, the government plans to phase out coal generation by 2025 and power stations across the country will reach the end of their lives. In addition new nuclear plants will not begin supplying electricity to the country in the short term. There is therefore a need to invest in infrastructure that will bridge this energy gap whilst providing highly efficient energy development for the future.

The challenge of changing renewables

The UK is investing record amounts in upgrading to a low-carbon, flexible, and secure energy network. It has allocated millions of pounds into renewable energy generation and as it takes an increasingly important role in the country's energy mix, we will need to develop complimentary sources of supply. This is because a network supported exclusively by renewables could see peaks in demand on a cloudy day or low demand during strong winds, meaning energy provision would be determined by external uncontrollable factors, not by demand.

How Tilbury Energy Centre can help

The 2,500 megawatt (MW) CCGT power station is a low-carbon, highly efficient generation mechanism that will deliver power to 3 million homes. A separate, smaller 299MW peaking plant will give the site flexibility in its responses to surges in demand as it can reach generating capacity in a matter of minutes. This will help ensure we have sufficient capacity to meet energy demand at all times. Finally, the storage facility will be able to capture surplus energy to be dispensed when needed. Altogether, this site will use some of the most efficient and advanced technology available to support the UK's transition to a low-carbon future while maintaining a secure and flexible energy supply.

The Tilbury Energy Centre's mix of technologies will fit in with the Government's national policy framework by providing clean and flexible electricity generation. The Government's National Policy Statements on Nationally Significant Infrastructure Projects, EN-1, EN-2 and EN-4, set out the Government's policy for new major energy developments. These documents emphasise the United Kingdom's ambition to deliver secure energy as it achieves its legally binding target to cut greenhouse gas emissions by at least 80% by 2050, compared to 1990 levels.

You can read these at <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>.



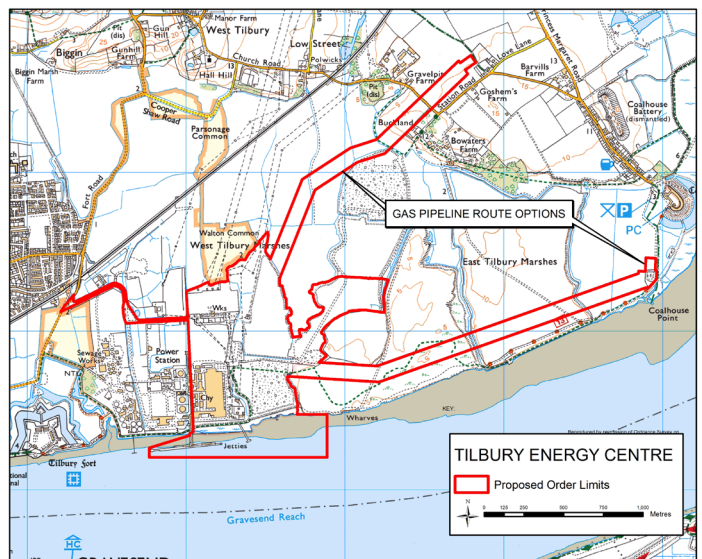
Why Tilbury is a good site

Tilbury has a history of power generation that stretches back over half a century – and for good reason. Situated in Essex and close to London, it is near a densely populated region with high energy demand that needs to be met. Its location on the north bank of the River Thames gives it access to plenty of water to cool a power station; enough to enable the highly efficient direct cooling method proposed by the Tilbury Energy Centre. Thanks to the A13 and the M25, the area has good transport links to the region and the country, facilitating the construction, operation and servicing of a power plant.

Its history of generation is also a major benefit. The proposed Tilbury Energy Centre has direct access to the National Grid electricity and gas transmission systems. Having both of these essential components for a gas-fired power station so close will reduce the amount of construction work required to complete the project.

Over the past two years the former B station has been decommissioned and is in the process of being demolished. Land that was surplus to RWE's requirements has been sold to the Port of Tilbury. RWE has retained land for future power station development because the Tilbury site is an excellent location for new power station development.

The Tilbury Energy Centre will help meet the needs of the region. It is essential to maintain and develop energy generation capacity in the South East to minimise system losses and increase network efficiencies. Furthermore, a new power station at Tilbury is a key scheme in Thurrock Council's adopted Core Strategy Development Plan. Considering its excellent location and history, it is only fitting that we breathe new life into Tilbury power station.



Tilbury Energy Centre order limits



Aerial view of Tilbury B with Tilbury Energy Centre order limits

What we propose

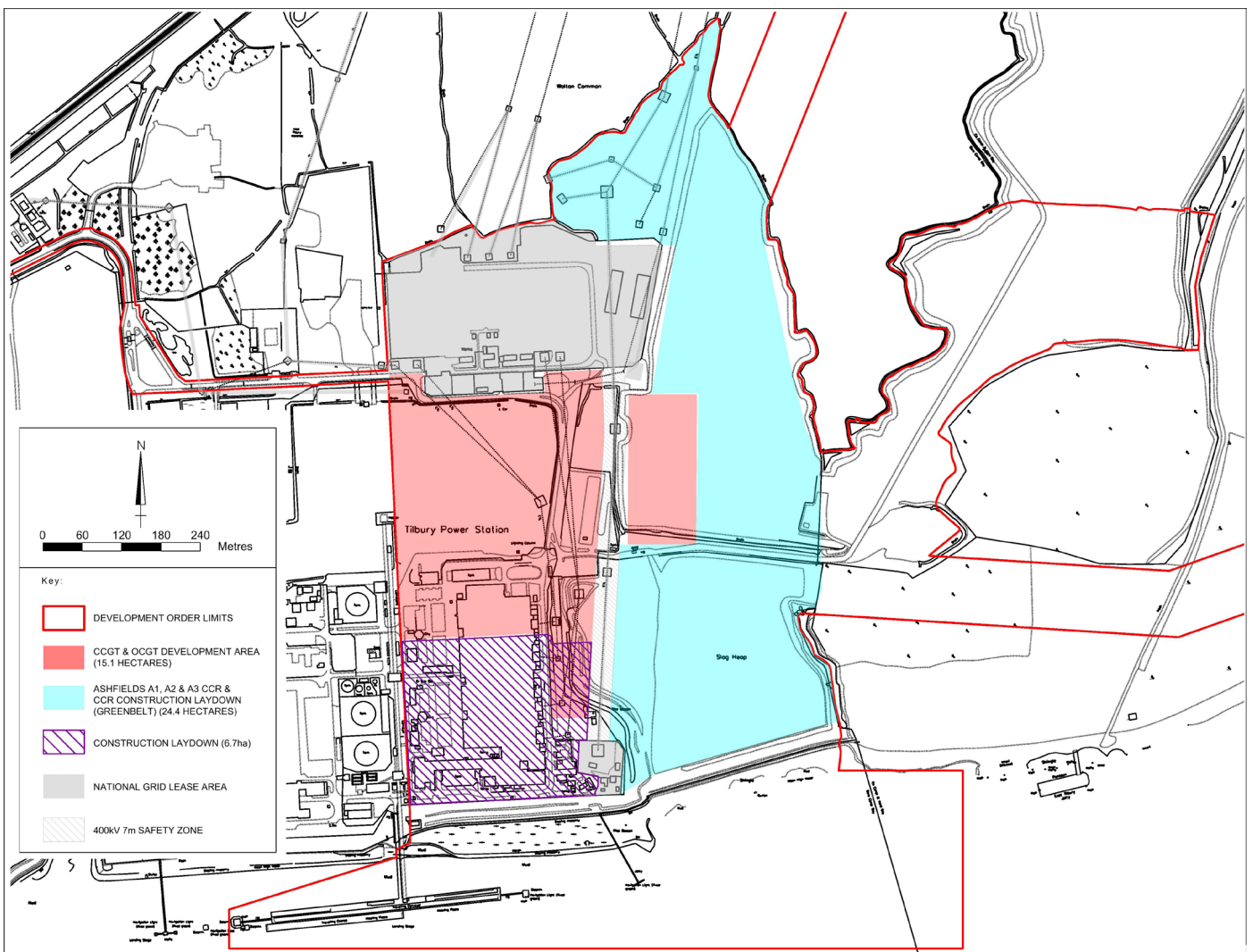
The Tilbury Energy Centre will provide energy from three sources: a 2,500MW Combined Cycle Gas Turbine plant, a 299MW peaking plant, and a 100MW energy storage facility.

Prior to construction of the Tilbury Energy Centre, the vast majority of structures associated with the former Tilbury A and B power stations will be demolished to ground level and the site cleared in preparation for new construction activity. This is because structures associated with the former power stations are generally not suitable to house modern power generating equipment. Existing cooling water infrastructure will remain in place and will be reused where possible.

However, we have not ruled out construction of new cooling water intake infrastructure in the River Thames at this stage.

An underground pipeline will be constructed to supply gas to the development. This will run 3km east to connect to the National Grid pipeline at a newly constructed above ground installation (AGI). This will ensure safe and efficient operation of the pipeline.

The project is also reserving land which will allow us to construct and operate carbon capture facilities should the technology become available in the future.



Tilbury Energy Centre block layout

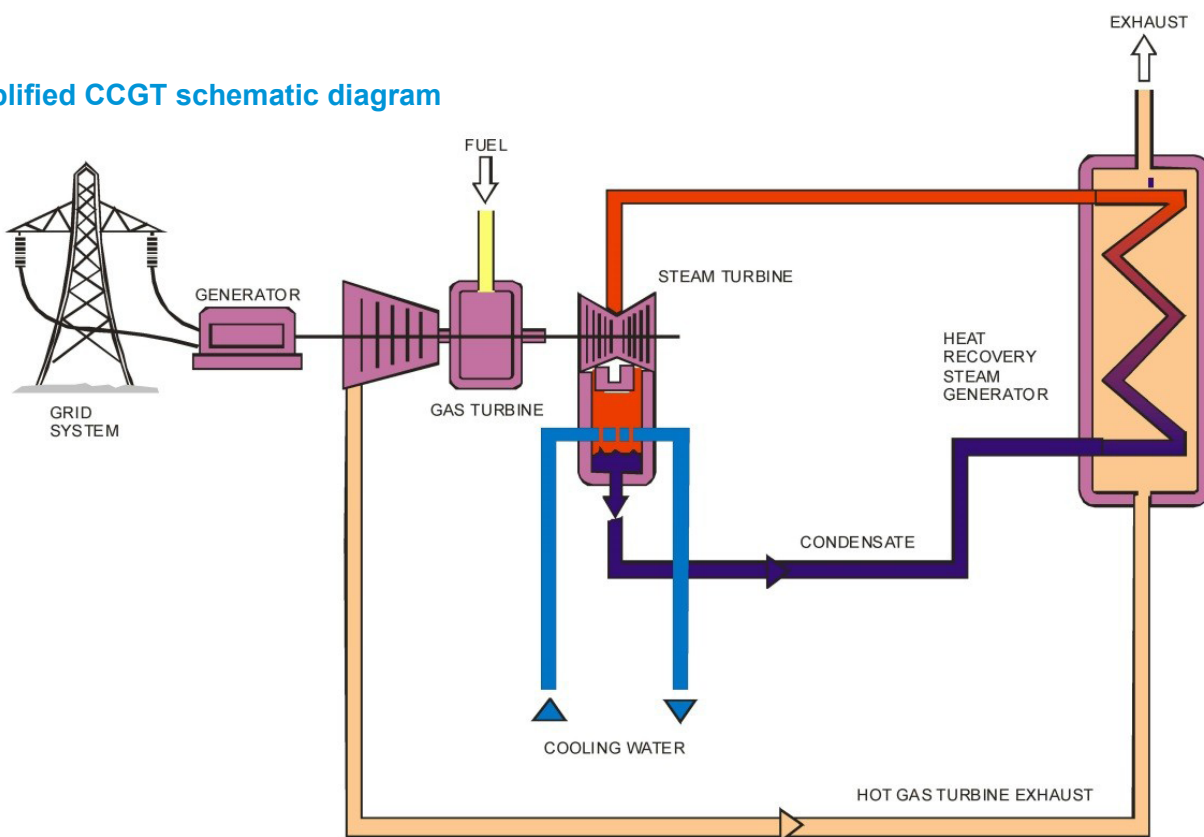
The technology

CCGT

A Combined Cycle Gas Turbine (CCGT) plant uses the heat produced as a by-product of gas combustion to generate further energy. Compressed air and natural gas are ignited to turn a turbine and a generator which produces electricity. The high temperature exhaust from this process is then used to heat water, creating steam which drives a second turbine and generator.

By combining gas and steam cycles to produce energy, the efficiency of the plant is almost doubled in comparison to a single cycle turbine plant. The CCGT plant we propose will have a capacity of up to 2,500 megawatts which is sufficient to power up to 3 million homes.

Simplified CCGT schematic diagram



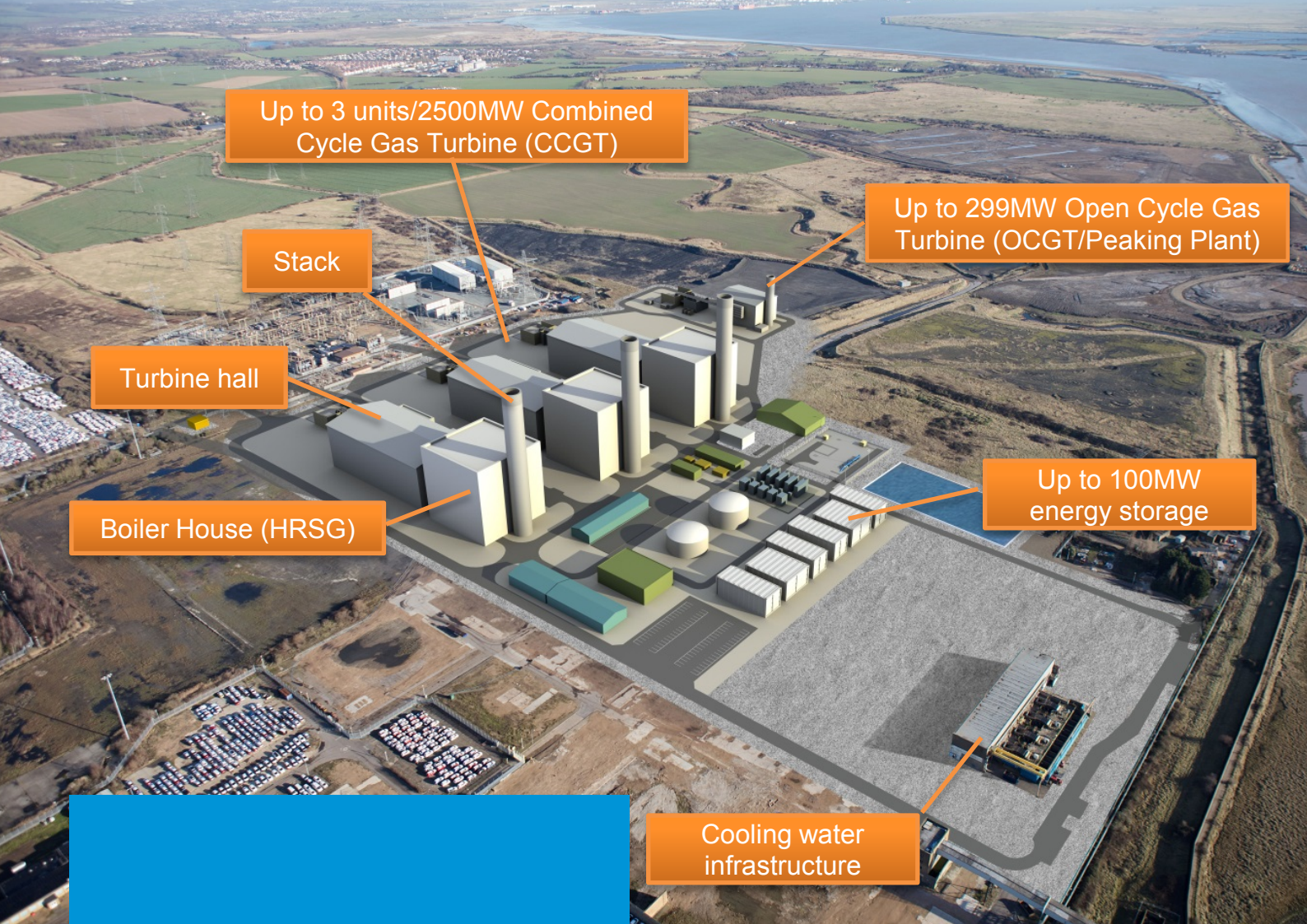
Find out more about the Tilbury Energy Centre and the environment on page 11

Peaking plant

The peaking plant is a crucial piece of infrastructure to ensure we have a flexible energy supply. The open cycle turbine technology (OCGT) is capable of reaching full operation from standby in a matter of minutes. This will give the Tilbury Energy Centre the ability to respond to surges in demand or reductions in supply rapidly, helping prevent interruptions in the provision of electricity.

Energy storage

Energy storage enables the capture and storage of energy which will then be distributed when needed. In an evolving energy solution, storage facilities will be an important complement to smooth the peaks and troughs of renewable generation. Various technologies are available and emerging and we will investigate which best suits the requirements of the project. This is a new and evolving technology that RWE will invest in so that the Tilbury Energy Centre can play an active role in the UK's future security of energy supply.



What Tilbury Energy Centre could look like

A snapshot of the scheme

The Tilbury Energy Centre will be designed to minimise its visual impact. The stacks will be significantly smaller and thinner than the former Tilbury B chimneys. We are proposing up to three CCGT generating units and up to two open cycle gas turbines or peaking units. The boiler house will be approximately 55 metres high excluding stacks which would reach a maximum of 95 metres high. The Above Ground Installation where the 3km from the site pipeline connects to the national grid gas pipeline will be an approximately 40x40 metre area with a collection of valves, pumps and a kiosk.

A landscape and visual impact assessment will be undertaken to assess the potential impacts of the proposed power station and associated pipeline on the surrounding landscape and visual amenity. This assessment will determine the need for any mitigation measures and landscaping requirements will be identified for both the proposed power station and the AGI.

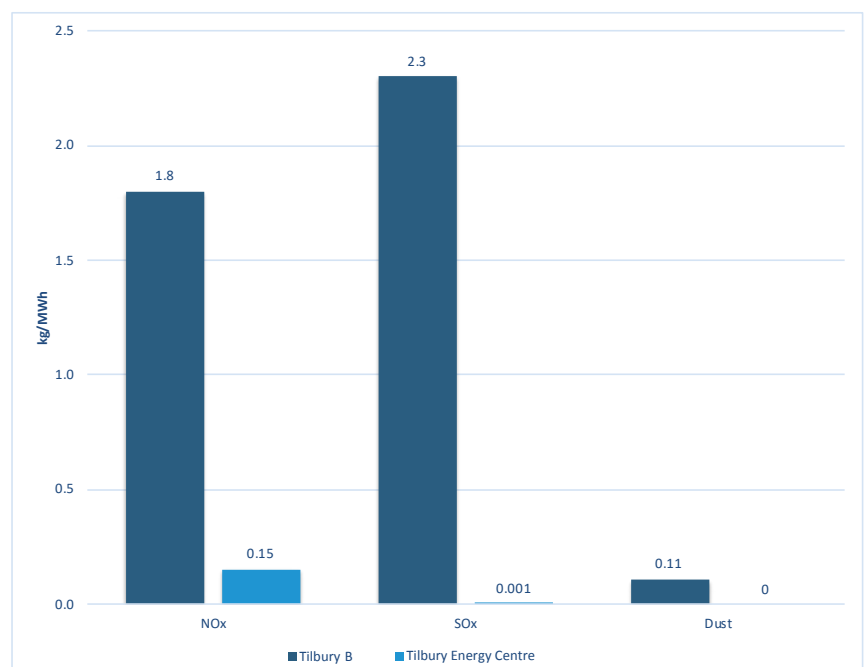
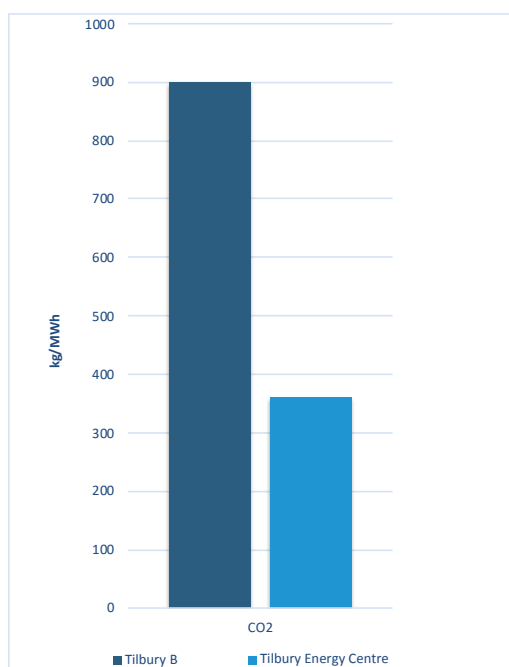
The Energy Centre and the environment

The Tilbury Energy Centre's design and technology are significantly different and highly advanced in comparison to the former coal-fired power station at Tilbury. It will be cleaner, have less of an impact on the landscape, and need to adhere to strict environmental standards.

Air quality

The proposed Energy Centre will use gas to generate electricity. This produces carbon dioxide and water vapour along with small quantities of nitrogen oxides, carbon monoxide and non methane volatile organic compounds. These emissions will better national standards, and are a significant reduction compared to the old coal power station. It is estimated that it will produce 61% lower carbon dioxide, 94% lower nitrogen oxides, 99% lower sulphur oxide and 96% lower particulate emissions than the old Tilbury B plant. These will be released into the atmosphere through flues in tall stacks which will be diluted and dispersed by natural atmospheric processes.

The chart below shows a comparison of the emissions from Tilbury B Power Station and the Tilbury Energy Centre.



Projected Tilbury Energy Centre emissions compared to Tilbury B

Ecology

RWE will use the best available techniques to minimise the Energy Centre's impact on the local environment. For instance, the technology and design of the power station will avoid the need to emit chemicals to the aquatic environment and therefore there will be no need to chemically treat outflowing water to the River Thames.

Although no designated wildlife sites are present on or adjacent to the Tilbury site, there is an opportunity to create better and more connected places for wildlife. We will identify areas where it is feasible to support biodiversity, including through the management of habitats. Appropriate treatment for invasive species will be determined and all hedgerows affected by construction will be appropriately reinstated.

Detailed surveys and assessments of the environment and heritage of the local area will be submitted to the Planning Inspectorate in our Environmental Statement. These will help determine the mitigation measures we need to implement as part of our proposals. We will seek to coordinate our mitigation proposals with any existing or planned local environment improvement projects. Altogether, these measures will ensure that the impact caused by the construction and operation of the Tilbury Energy Centre on the local environment are appropriately alleviated.



What the project means for the local area

The construction and operation of the Tilbury Energy Centre will have an effect on the local area. We will aim to maximise the opportunities created by the project and address any issues as quick as possible.

Socio-economic

RWE strives to be a good local neighbour and works closely with the communities in which it operates. Over the years, we have invested into community projects and the onsite environmental centre. This involvement will continue in several ways following the construction of the new Tilbury Energy Centre. A community fund will provide thousands of pounds of financial support to local initiatives each year. Furthermore, staff will personally engage in the community by volunteering in local charities, projects and schemes, and meeting with a local liaison group that will be created to give residents a voice in Tilbury's power generation.

The Tilbury Energy Centre will create a net economic benefit to the area in terms of employment and supply chain activity. It is estimated that a workforce of up to 1,500 builders and contractors will be necessary during the site's three-year construction. During operation, the new site will employ up to 100 staff in high-skilled roles, with many local contractors and businesses required to support its day-to-day operations. A new power station also opens new opportunities for young people on training schemes and RWE hopes to forge strong links with local schools to support Science, Technology, Engineering and Maths. Once operational, it is estimated that the power station will bring millions of pounds to the local economy.

Transport

The transport impacts caused by the construction of the site will be temporary and short term in nature. To alleviate these, we will develop and implement a traffic management plan which will state the hours and routes construction workers and construction vehicles will use to access the site. It will be agreed with Highways England and relevant local authorities before being submitted to the Planning Inspectorate with our proposal. In doing so, we will ensure that the disruption caused to local residents during the construction phase of our power station is minimised.

Noise

Temporary noise may occur from construction, the laying of the gas pipeline and commissioning activities, whilst once operational the power station will be much quieter than the former coal station.

We will assess all potential noise impacts on the existing environment, both during the construction and operational phases of the development. Our noise assessments will take into account impacts from traffic, vibration, and piling where appropriate. A management scheme will be implemented throughout to ensure noise remains within permitted levels and all noise control measures designed into the main plant will be incorporated into predictions to gather the true impact of operation on the surrounding area.

Get involved and have your say

Visit the website, watch our video and give us your views. www.rwe.com/tilburyenergycentre



Come to a public exhibition:

Wednesday 28th February, 1pm – 7pm

The Tilbury Hub
16 Civic Square, Tilbury, RM18 8AD

Monday 5th March, 2pm – 8pm

West Tilbury Village Hall
Rectory Road, West Tilbury, RM18 8UD

Tuesday 6th March, 2pm – 8pm

Gravesend Old Town Hall
24 High Street, Gravesend, DA11 0AZ

Project timeline

26 February – 26 March 2018

Non-statutory consultation

March 2018

Scoping report submission

March – July 2018

Assessment of non-statutory consultation responses and mitigation

Late summer 2018

Statutory consultation

September – December 2018

Review of consultation responses and changes to application as appropriate

Early 2019

Submission of planning application to planning inspectorate

Q2 2020

Secretary of state decision

What next?

- We will gather all the feedback received during this consultation and analyse the key issues raised.
- Taking your views into account, we will carry out further surveys, studies and analysis.
- You will get another chance to have your say when we open a statutory consultation on our final plans in summer.

Find out more

For further information about our project, please visit:

- RWE Generation's Tilbury project page - <http://www.rwe.com/tilbury-energy-centre>
- The Planning Inspectorate's Tilbury page - <https://infrastructure.planninginspectorate.gov.uk/>

For further information about the consent process and how to participate:

- The Planning Inspectorate's guide to the consent process - <https://infrastructure.planninginspectorate.gov.uk/application-process/participating-in-the-process/>

For further reading about the UK energy market:

- Energy UK - <https://www.energy-uk.org.uk/energy-industry.html>
- Ofgem - <https://www.ofgem.gov.uk/>

Contact us

✉ rwegenerationuk@rwe.com

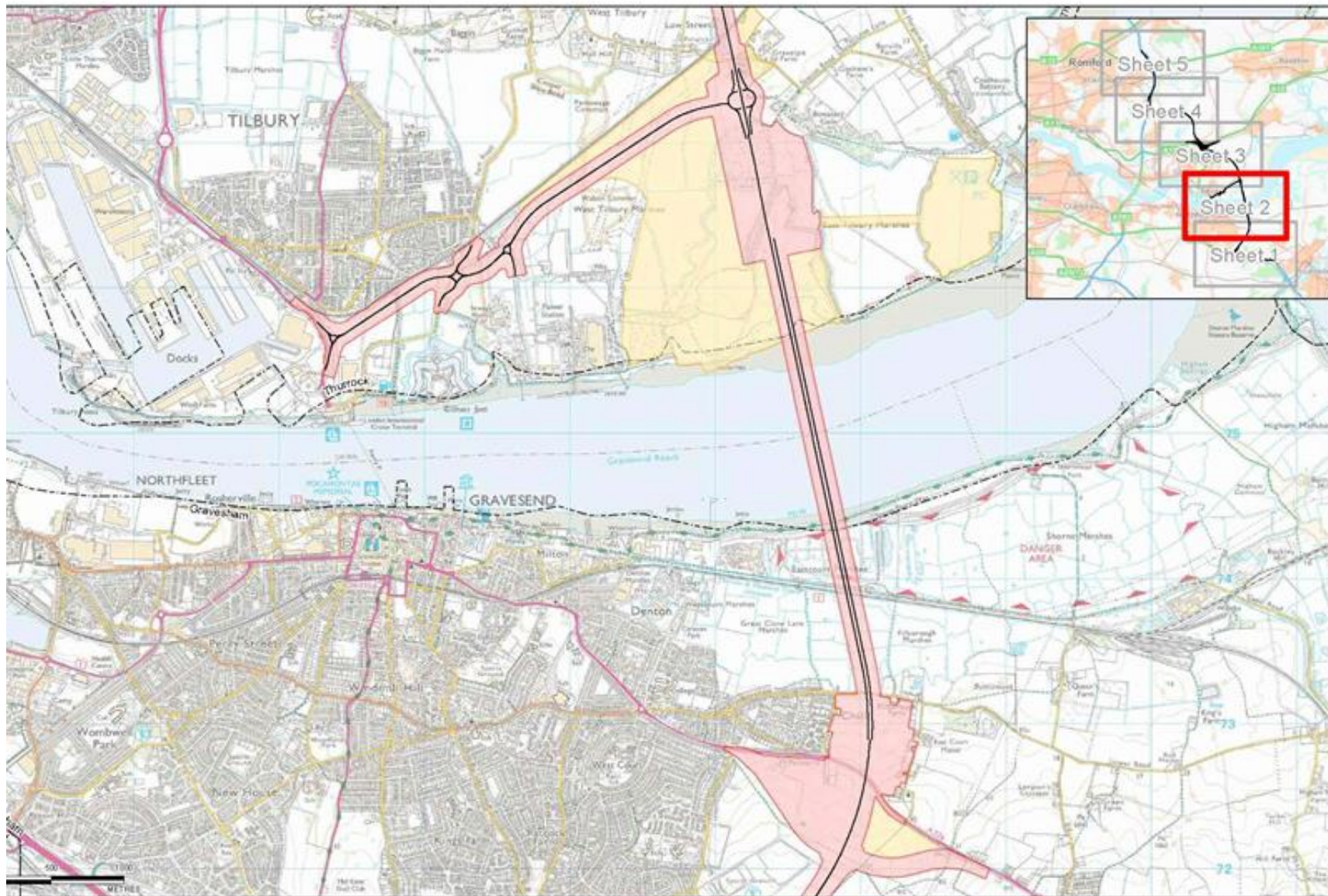
☎ 08450 770 150

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🌐 www.rwe.com/tilburyenergycentre

APPENDIX 2 :

SCOPING REPORT STAGE PLAN OF LTC IN THE VICINITY OF TILBURY2



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- LTC Road Alignment
- Permanent Land Requirement
- Temporary Land Requirement

OSD0 1:50,000 N.M. 50K 044
 OS 1:50,000 N.M. 50K 044
 OS 1:50,000 N.M. 50K 044

highways
 england

Lower Thames Crossing
 10th Floor, Beaufort House
 10 St Botolph Street
 London EC3A 7DT

**LOWER THAMES CROSSING
 DEVELOPMENT PHASE**

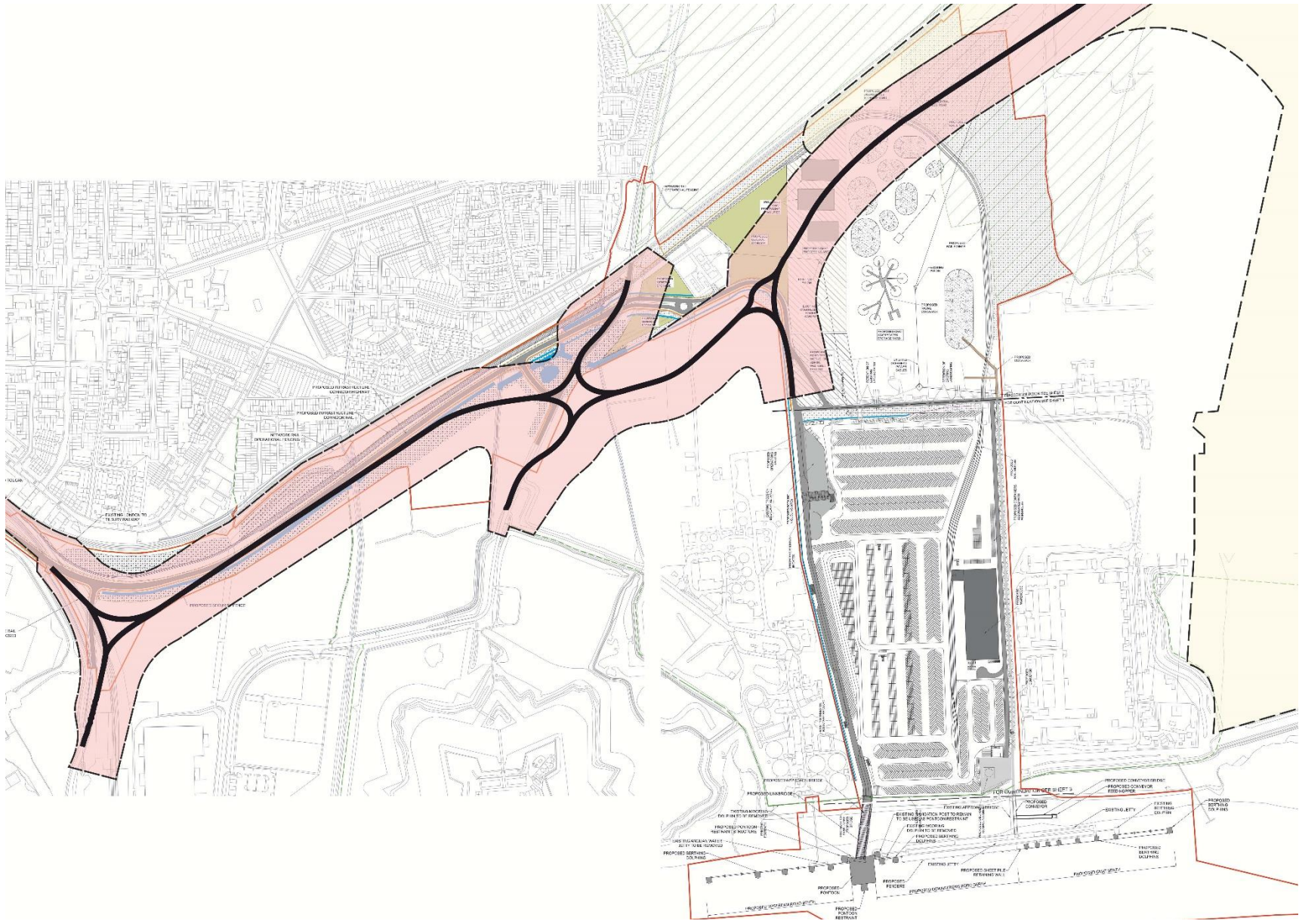
Figure 2.1
 Application Site Location Plan
 Sheet 2 of 5

Sheet No.	52	Project No.	A2
Author	P. J. L. M. A. S.	Date	11/11/11
Checker	J. B. M. L.	Date	11/11/11
Approver	C. S. O. U. R. Y. S. A. T. H.	Date	11/11/11
Drawing Code	HE54059-CV-01EN-52P_E-04EN000000-04		

APPENDIX 3 :

OVERLAY OF PLAN OF LTC FROM LTC SCOPING REPORT WITH TILBURY2 GENERAL ARRANGEMENT DRAWINGS

FOR ILLUSTRATIVE PURPOSES ONLY



Extract Capacity Market Registration and Prequalification interactive guidance v1.0 July 2017, illustrating the time line for the market capacity auction process

