

PLANNING ACT 2008
INFRASTRUCTURE PLANNING
(APPLICATIONS: PRESCRIBED FORMS AND PROCEDURE) REGULATIONS 2009
REGULATION 5 (2) (a)

PROPOSED PORT TERMINAL AT FORMER TILBURY POWER STATION

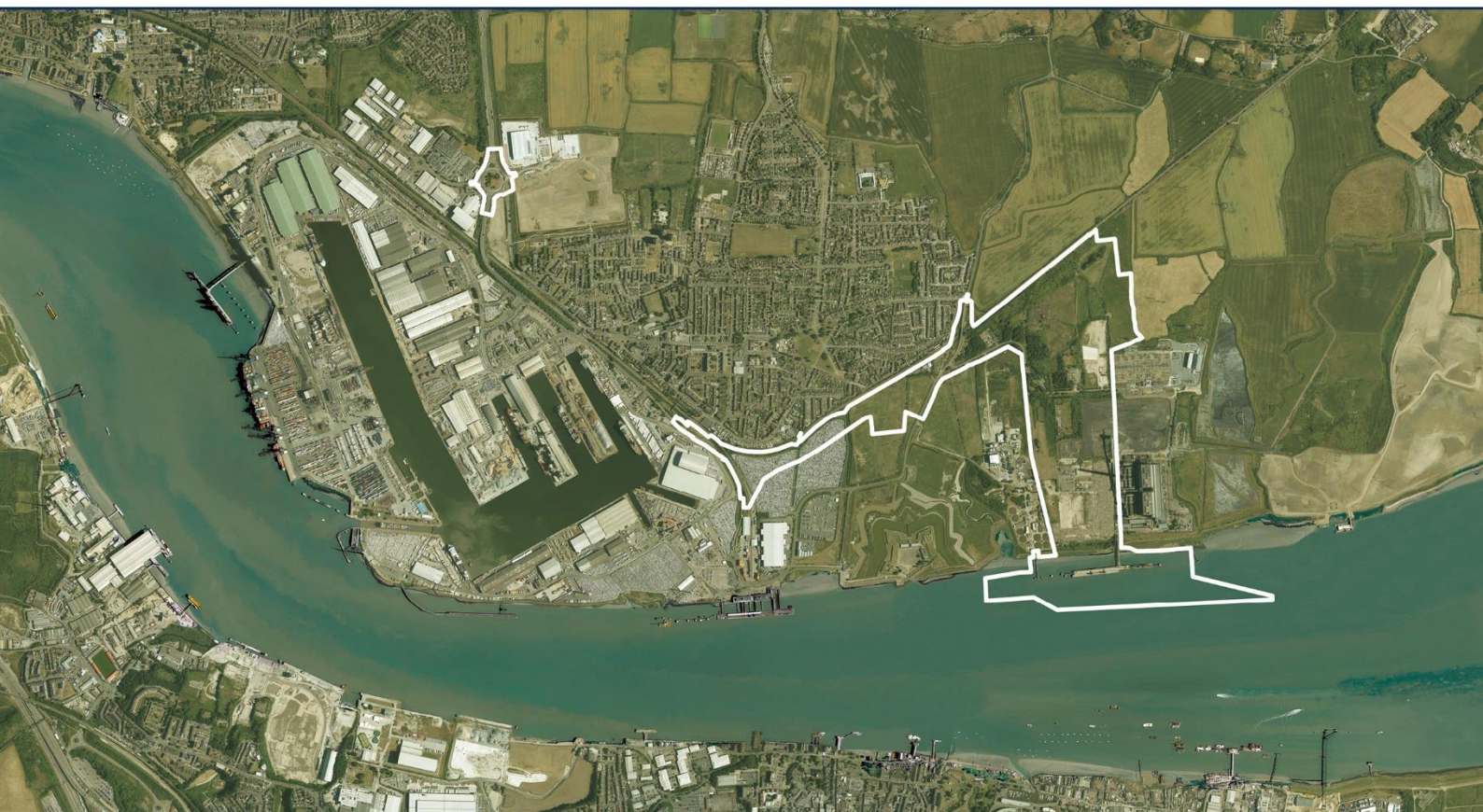
TILBURY2

TR030003

VOLUME 6 PART B

ES APPENDIX 11.A: MCZ ASSESSMENT

DOCUMENT REF: 6.2 11.A



1.0 MARINE CONSERVATION ZONE ASSESSMENT

OVERVIEW OF THE PROJECT

- 1.1 Port of Tilbury London Limited (“PoTLL”) is proposing a new port terminal on the north bank of the River Thames at Tilbury, a short distance to the east of its existing Port. The proposed port terminal will be constructed on land that formed the western part of the now redundant Tilbury Power Station.
- 1.2 The project is known as “Tilbury2” (and hereafter referred to as “the proposed development”). The location of the project is shown in **Figure 1** below.



Figure 1– Location of Tilbury2 Development.

- 1.3 The proposed uses of the site will predominantly be as a Roll-on/Roll-off (Ro-Ro) terminal and a Construction Materials and Aggregates terminal (the “CMAT”). The project includes the construction of an extension to an existing jetty, as well as associated infrastructure including rail and road facilities. An 'infrastructure corridor' is proposed that will accommodate road and rail links to the existing transport network. The CMAT will include stockpiling of construction materials and some processing of aggregates to produce asphalt and concrete products.

- 1.5 The project is described in further detail in Chapter 5 of the Environmental Statement (ES) of which this MCZ Assessment forms an Appendix. The works required include, but are not limited to:
- Creation of hard surfaced pavements;
 - Improvement of and extensions to the existing river jetty including creation of a new Ro-Ro berth;
 - Associated dredging of berth pockets around the proposed and existing jetty and dredging of the approaches to these berth pockets;
 - New and improved conveyors;
 - Erection of welfare buildings;
 - Erection of a warehouse;
 - A number of storage and production structures associated with the CMAT;
 - The construction of a new link road from Ferry Road to Fort Road; and
 - formation of a rail spur and sidings.
- 1.6 The proposed volumes of import/export of Ro-Ro units for the terminal exceed the threshold of 250,000 units stated in the Planning Act 2008 for throughput per annum. The Tilbury2 project therefore constitutes a Nationally Significant Infrastructure Project (NSIP).

PRE-APPLICATION ADVICE, SCREENING AND CONSULTATION UNDERTAKEN TO DATE

1.7 A large amount of pre-application consultation has been undertaken by PoTLL to date. For the purposes of this document, the full summary presented in the ES has been préciséd to only that of relevance to MCZs. A summary is as follows:

- Meeting and site visit with the Marine Management Organisation (MMO) on 14th February 2017 to provide the MMO with an overview of the project, enquire about licensing requirements for surveys and discuss the environmental assessments to support the deemed Marine Licence application. As part of this meeting Atkins requested guidance from the MMO on how best to treat the Thames Estuary rMCZ given that its designation is currently on hold. The MMO advised they would revert with guidance;
- Email correspondence with the MMO on 1st March 2017 confirmed that whilst the Thames Estuary rMCZ remains a recommended site (and not a proposed MCZ) there is no formal requirement to undertake a MCZ assessment. However as there is the potential for designation of this site within the timescale of the project an MCZ assessment should be considered;
- An early draft of the Tilbury2 scoping report was distributed to key consultees including the MMO, Natural England (NE), Environment Agency (EA) and Port of London Authority (PLA) to seek initial views on the content of the report ahead of its submission to the Planning Inspectorate (PINS). Initial responses were received from the PLA and EA, and these were considered in the drafting of the final scoping report;
- A scoping report was submitted to the PINS on 25th March 17 to request a scoping opinion. The comments in the scoping opinion that relate to the need for a MCZ Assessment are summarised in the **Table 1** below.

Table 1– Summary of Scoping responses relevant to MCZ Assessment

Consultee	Source of Comment	Comment	Response
Secretary of State	Scoping Response	Marine ecology para 3.65: The Applicant's attention is drawn to the comments of the MMO, the Port of London Authority and Natural England with regards to the need to assess the potential impacts on the Thames Estuary rMCZ.	A MCZ assessment is being undertaken for the project.
MMO	Scoping Response	Para 10.1 Consideration should be given to potential future sites that are not yet formally designated including the Medway Estuary Marine Conservation Zone and the Thames Estuary recommended Marine Conservation Zone.	A MCZ assessment is being undertaken for the project and will include both the as yet undesignated Thames Estuary rMCZ and the designated Medway Estuary MCZ.
Natural England	Scoping response	This proposal must take full consideration of the	A MCZ assessment is being undertaken for the

		potential impacts to the recommended Thames Estuary Marine Conservation zone	project.
Secretary of State	Scoping response	Marine ecology para 3.59: the need for additional benthic ecology surveys should be agreed. The SoS notes the comments of the MMO regarding the need for greater confidence in the notion that the tentacle lagoon worm is not present and Natural England's comments that it may be useful to assume presence of the species if presence cannot be scoped out due to salinity and environmental conditions.	It has been agreed with the MMO, PLA and EA that additional benthic survey work will be undertaken. These consultees have reviewed and agreed the survey specification and its results have informed the EIA and MCZ assessments.
MMO	Statutory Consultation	Para 4.3: greater confidence in the notion that the tentacle lagoon worm is not present within the Tilbury region will be needed.	It has been agreed with the MMO, PLA and EA that additional benthic survey work will be undertaken. These consultees have reviewed and agreed the survey specification. The results of this survey will provide additional information on the presence or absence of the tentacle lagoon worm. This position has moved forward as the result of further consultation, as set out below.
Natural England	Statutory Consultation	It is considered possible that <i>Alkmaria romijni</i> (Tentacled Lagoon Worm) occurs at this location. Salinity and environmental conditions may allow presence to be scoped out. If presence cannot be scoped out, survey work is considered likely to yield a 'false negative' so it may be useful to assume presence, assess the importance of habitat loss and mitigate as appropriate.	It has been agreed with the MMO, PLA and EA that additional benthic survey work will be undertaken. These consultees have reviewed and agreed the survey specification. The results of this survey will provide additional information on the presence or absence of the tentacle lagoon worm. The approach to assessing impacts on the tentacle lagoon worm will be determined following this survey. This position has moved forward as the result of further consultation, as set out below.

- 1.8 Following submission of a Preliminary Environmental Information Report (PEIR) in June 2017 further comments and stakeholder responses were received which have been used to further support the MCZ Assessment presented here. **Table 2** below summarises the responses received to the PEIR relevant to the MCZ Assessment.

Table 2– Summary of PEIR responses relevant to MCZ Assessment

Consultee	Source of Comment	Comment	Response
MMO	Statutory Consultation	<p>The MCZ assessment appears fit for purpose and the MMO agree with the final decisions regarding which MCZ features are likely to be affected by the various potential impacts during construction and operation, however, we defer to Natural England regarding the final list of receptors to be included in the assessment. The majority of these are, however, ultimately dependent upon the outcomes of subsequent field data. These assessments will, therefore, be subsequently finalised within the Environmental Statement (ES).</p> <p>One point to note, however, is that impacts to many of the MCZ (or rMCZ) features are assessed based on the spatial extent of the impact relative to the spatial extent of the feature within the MCZ. While it is possible to appreciate that the spatial scale of impact resulting from the scheme is likely to be small for these features, without the area of each feature present within the MCZ it is not possible to assess the relative area likely to be impacted. When undertaking the assessment the predicted area of each feature likely to be impacted should be given as a percentage of that present within the MCZ?</p> <p>The Thames Estuary rMCZ is an important site for fish nursery and</p>	When assessing the potential impacts upon the MCZ and rMCZs impacts to features have been expressed as a percentage of the available feature within the MCZ (or rMCZ).

		<p>spawning, and seasonal seaward migration of smelt, which is a feature of this site. The MCZ Assessment submitted with the PEIR report acknowledges that there is potential for the construction activities for impact upon smelt when they are transiting past the construction works.</p>	
Natural England	Statutory Consultation	<p>Natural England welcomes the inclusion of the Thames Estuary recommended Marine Conservation Zone (rMCZ) and the separate Marine Conservation Zone (MCZ) assessment provided particularly the information on smelt as a migratory feature of the rMCZ. We note that the applicants have used information as provided in the Thames Estuary rMCZ factsheet available on the Wildlife Trust website. For your information the former Thames Estuary rMCZ has now been split into two separate sites; the first (Upper) stretches from Richmond Bridge to Battersea Bridge and the second (Lower) stretches from The Queen Elizabeth II Bridge to Columbia Wharf/Grays respectively.</p> <p>The Upper Thames Estuary rMCZ is proposed as it is an important area for smelt (<i>Osmerus eperlanus</i>). The boundary of the lower site, Swanscombe rMCZ, has been determined to fit more closely around records of the tentacled lagoon-worm (<i>Alkmaria romijni</i>) for which there is currently considered to be a gap in the ecological network.</p> <p>This information is in draft status only and forms part of our scientific advice on the sites that are under consideration for Tranche 3. Defra will</p>	<p>The updated information regarding the Thames Estuary rMCZ has been taken into account, and in particular the decision to split the former rMCZ in to two separate sites.</p> <p>The updated MCZ assessment will be included as an appendix to the Environmental Statement.</p>

		<p>make decisions regarding which sites and which features will go forward to a public consultation. These sites are not currently a material consideration, but the sites and features that are put forward to consultation will become a material consideration at that stage.</p> <p>The applicant must ensure to be compliant with the legislation when carrying out the proposed works. The Marine and Coastal Access Act (2009) concerns the population of the species and therefore the applicants must demonstrate that the conservation objectives for the population of the worm are not hindered by the proposal. We note that this has been provided within the MCZ assessment in Appendix 11A</p>	
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- 1.9 Following receipt of comments on the PEIR, in particular with regards to the assessment of impacts to the Thames Estuary rMCZ (since split in to the Swanscombe rMCZ and the Upper Thames (rMCZ) and one of its constituent features: the Tentacled Lagoon Worm; an informal teleconference was organised with a number of the Statutory consultees to discuss and agree an approach to the assessment of impacts and potential mitigation. The results of this discussion are presented in **Table 3** below.

Table 3 – Summary of meeting discussing tentacled lagoon worm

Consultee	Source of Comment	Comment	Response
MMO, NE and EA	Meeting on 4th September 2017	Meeting to discuss tentacled lagoon worm and appropriate 'reasonable precautions' that can be put forward to prevent committing an offence under the Wildlife and Countryside Act 1981.	It was discussed and agreed that tentacled lagoon worms are only known to be present in the Swanscombe peninsula area of the Thames and they have never been found as far down river as Tilbury2. As such there is a low risk of them colonising the Tilbury2 area.

- 1.10 The outcome of the meeting was that the MMO and NE agreed with the EA that there are currently no records of tentacle lagoon worm being found as far downstream as Gravesend / Tilbury and that there is a low risk of tentacled lagoon worm colonising the areas near to Tilbury2.

- 1.11 It was agreed that the Tilbury2 environmental assessments should be produced on this basis.

BACKGROUND TO MARINE CONSERVATION ZONE (MCZ) ASSESSMENTS

- 1.12 In line with Section 126 of the Marine and Coastal Access Act (MCAA) (2009), the MMO has specific duties relating to Marine Conservation Zones (MCZs) when determining marine licence applications. As such the MMO incorporated a MCZ assessment process into their existing marine licence decision making procedures.
- 1.13 This process applies to all new marine licence applications (including those incorporated within DCOs) and is relevant to all designated MCZs (together with their features and conservation objectives). Those sites identified as possible candidates for designation are not formally subject to the MCZ assessment process, however they are (together with the features for which they are proposed) taken in to account as part of the licence determination (MMO, 2013).

MCZ Assessment Process for Marine Licensing

- 1.14 The process has three sequential stages:
- Screening
 - Stage 1 Assessment
 - Stage 2 Assessment
- 1.15 Although the MCAA does not stipulate that a staged process is required, the approach is designed to ensure that the MMO will have all the necessary information to fulfil its duties in relation to marine licensing in accordance with s.126 of the MCAA. This approach will maintain proportionality for applicants by helping guide them to supply the correct information to accompany their marine licence application.
- 1.16 In making determinations with respect to MCZs at each stage in the process, the MMO will always consider the feature(s) for which the MCZ(s) has been designated, the current status of those features and the conservation objectives against each feature (MMO, 2013).
- 1.17 The MMO produced guidance which broadly sets out the sequential stages of the process.

Screening

- 1.18 All marine licence activities will be screened to determine whether:
- The licensable activity is taking place within or near an area already designated or being put forward as an MCZ; and
 - The activity is capable of affecting (other than insignificantly) either (i) the protected features of an MCZ; or (ii) any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant.

- 1.19 The MMO uses a risk based approach when determining the 'nearness' of an activity with respect to MCZs. This includes applying an appropriate buffer zone to the MCZ features under consideration, as well as a consideration of risks from activities further removed from features.
- 1.20 The MMO generally undertake this stage themselves, without the need of contacting the Statutory Nature Conservation Bodies (SNCBs). Should it be determined that a proposed project has the potential to impact on an MCZ, the application will proceed to a Stage 1 Assessment (MMO, 2013).

Stage 1 Assessment

- 1.21 The Stage 1 assessment will further consider the extent of the potential impact of the proposed project or plan on the MCZ.
- 1.22 At this stage the MCZ conservation objectives for the given MCZ are considered, these are high level criteria describing the desired condition of the MCZ features. There are two objectives for features within a MCZ, namely whether the features are in the desired favourable condition and need to be maintained, or, whether the features are not in the desired favourable condition, and thus need to be recovered.
- 1.23 The MMO use the information provided by the applicant as part of their marine licence application and seek advice from the SNCBs and others to determine whether:
- There is no significant risk of the activity hindering the achievement of the conservation objectives stated for the MCZ; and
 - The MMO can exercise its functions to further the conservation objectives stated for the MCZ.
- 1.24 If neither of the criteria above can be met, the Stage 1 assessment then considers whether:
- there is no other means of proceeding with the act which would create a substantially lower risk of hindering the achievement of the conservation objectives stated for the MCZ. This should include proceeding with it (a) in another manner, or (b) at another location.
- 1.25 If an alternate manner of undertaking the work, methods of reducing the impacts cannot be identified and implemented, and there are no alternate locations, then the application will proceed to a Stage 2 Assessment (MMO, 2013).

Stage 2 Assessment

- 1.26 The Stage 2 Assessment considers the likely benefits that will accrue as a result of the proposed scheme against the potential impacts that may occur, in so doing the MMO consult with the SNCBs and various advisors, in particular for specific advice on socio-economic matters, in order to determine whether:
- the benefit(s) to the public of proceeding with the act clearly outweigh the risk of damage to the environment that will be created by proceeding with it; and, if so, then whether;

- the applicant can satisfy the MMO that they will undertake or make arrangements for the undertaking of measures of equivalent environmental benefit to the damage which the act will or is likely to have in or on the MCZ.
- 1.27 In determining ‘public benefit’ the MMO considers benefits at a national, regional or local level. Applications for activities that are of solely private benefit are not considered to deliver a benefit to the public.
- 1.28 In determining ‘measures of equivalent environmental benefit’ the types of compensatory measures that might be considered under the Habitats Directive would also be appropriate to put forward at this stage, although consideration will not be confined to those.
- 1.29 The above determinations will be addressed in sequence, that is, if the public benefit test is not ‘passed’ then a consideration of measures of equivalent benefit would not be made as the application would be rejected (MMO, 2013).

THE PURPOSE OF THE DOCUMENT

- 1.30 Following receipt of the formal comments to the Scoping Report and the PEIR Document (presented in the tables above), the responses received were clear that the MMO screening had concluded that a MCZ Assessment was required.
- 1.31 As such, this document sets out the required information to support a Stage 1 Marine Conservation Zone Assessment of the proposed development on the nearby Medway Estuary Marine Conservation Zone and the adjacent recommended Swanscombe and Upper Thames Marine Conservation Zones (rMCZs) (formerly the Thames Estuary Marine Conservation Zone (rMCZ)).
- 1.32 The location of these three sites in relation to the proposed works is presented in **Figure 2** below.



Figure 2– Proposed Tilbury2 works in relation to the nearby Medway Estuary MCZ and Swanscombe and Upper Thames rMCZs

- 1.33 The section below presents descriptions of the Medway Estuary MCZ and the recommended Swanscombe and Upper Thames Marine Conservation Zones (rMCZs) (formerly the Thames Estuary Marine Conservation Zone (rMCZ) together with the features for which the sites were designated (or recommended for such).

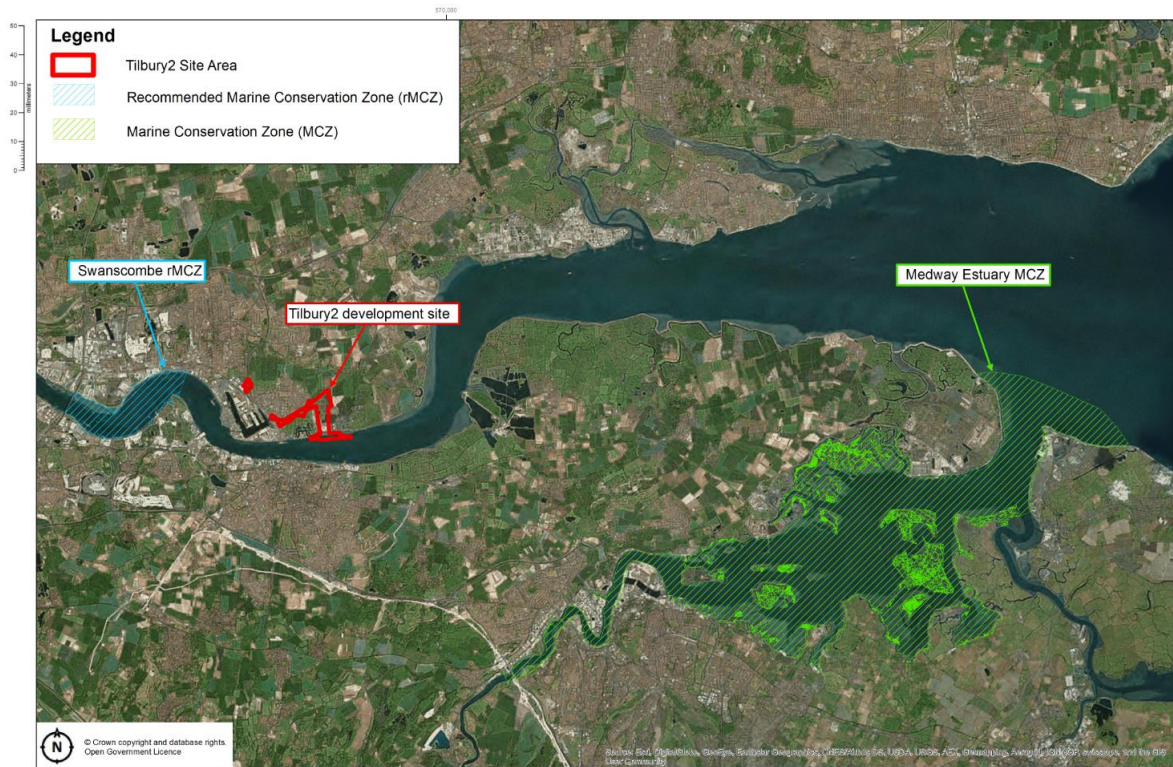


Figure 3 – Proposed Tilbury2 works in relation to the nearby Medway Estuary MCZ and Swanscombe rMCZ



Figure 4 – Proposed Tilbury2 works in relation to the immediately adjacent Swanscombe rMCZ

- 1.34 **Figure 3** and **Figure 4** show the location of the works in relation to the closest sites.
- 1.35 In addition, this document provides a discussion of how the proposals are likely to impact upon the features and their conservation / management objectives.

MEDWAY ESTUARY MARINE CONSERVATION ZONE (MCZ)

- 1.36 The Medway Estuary MCZ is an inshore site, located approximately 30 km downstream (east) of the proposed Tilbury2 site on the Kent coast. It encompasses the Medway Estuary from Rochester down to its mouth, and extends seaward to include an area between Sheerness and the Isle of Grain. A total area of 60 km² is protected by this MCZ (Defra, 2013).
- 1.37 Within the site there is a complex and dynamic ecosystem. The mix of fresh and sea waters combined with tidal movement create changing levels of salinity and nutrients that provide a fertile environment for large populations of animals, particularly invertebrates, fish and birds. Numerous species of commercially important fish including bass, herring, cod, plaice and sole use the area as a nursery ground (Defra, 2013).
- 1.38 The Medway Estuary MCZ is designated for one species and eight different habitats and their associated wildlife. Such a range of habitats creates an environment that is capable of supporting some of the most diverse communities of animals in the South-East region (Defra, 2013).
- 1.39 The nationally scarce tentacled lagoon-worm (*Alkmaria romijni*) is found within the estuary. This is a tiny bristleworm which only grows up to 5 mm long. It creates and lives in tubes within the mud of the estuary. These worms have a number of tentacles around their mouths which they use for gathering food from the surrounding muddy sediments. The tentacled lagoon-worm is particularly vulnerable to threats that cause changes in its habitat (Defra, 2013).
- 1.40 This site is the only designated MCZ where this feature is protected.
- 1.41 Peat and clay exposures are an uncommon habitat type which is effectively irreplaceable as it was formed millions of years ago from ancient lakebeds and forested peatlands. Elongated bivalves called piddocks are typically found on the surface of peat and clay exposures. These species burrow into the habitat creating holes that, once empty, can be inhabited by and provide shelter to animals such as crabs and anemones (Defra, 2013).
- 1.42 The features for which the MCZ was designated and their relevant conservation objectives / management approaches are presented in **Table 4** below.

Table 4 – Medway Estuary MCZ Features and Management Approaches

MCZ Feature	General Management Approach
Intertidal Mixed Sediments	Maintain in a favourable condition
Intertidal Sand and Muddy Sand	Maintain in a favourable condition
Subtidal Coarse Sediment	Maintain in a favourable condition
Subtidal Mud	Maintain in a favourable condition
Subtidal Sand	Maintain in a favourable condition
Low Energy Intertidal rock	Maintain in a favourable condition
Estuarine Rocky Habitats	Maintain in a favourable condition
Peat and Clay Exposures	Maintain in a favourable condition

Tentacled Lagoon-Worm (<i>Alkmaria romijni</i>)	Maintain in a favourable condition
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SWANSCOMBE AND UPPER THAMES RECOMMENDED MARINE CONSERVATION ZONES (rMCZS) (FORMERLY THE THAMES ESTUARY RECOMMENDED MARINE CONSERVATION ZONE)

- 1.43 The former Thames Estuary rMCZ, which extends from Richmond to the mouth of the River Thames at Westcliff-on-Sea, covers an area of 132 km² and crosses most of London.
- 1.44 It is an important site for fish nursery and spawning, seasonal seaward migration of smelt (*Osmerus eperlanus*), and for tentacled lagoon worm (*Alkmaria romijni*) mainly found at Greenhithe (Swanscombe peninsula), approximately 9 km upstream (west) of the proposed development site (The Wildlife Trust, 2017).
- 1.45 As is the case for the Medway Estuary MCZ, the tentacled lagoon worm is considered a highly vulnerable species, and has been cited as a strong reason for the designation of this site as soon as possible.
- 1.46 The rMCZ is also home to the short-snouted seahorse and has a high density of European eels (*Anguilla anguilla*) (The Wildlife Trust, 2017) but neither of these were proposed features of the rMCZ.
- 1.47 The former Thames Estuary rMCZ has now been split into two separate sites; the first (Upper Thames) stretches from Richmond Bridge to Battersea Bridge and the second (Swanscombe) stretches from The Queen Elizabeth II Bridge to Columbia Wharf/Grays respectively (See **Figure 2** and **Figure 3**).
- 1.48 The boundary of the lower site, Swanscombe rMCZ, has been determined to fit more closely around records of the tentacled lagoon worm (*Alkmaria romijni*) for which there is currently considered to be a gap in the ecological network. Other broadscale habitats that were initially considered when the whole Thames was a rMCZ are included within the recommended Swanscombe site. The area of the Swanscombe rMCZ is approximately 4.75 km² (*pers comms*, Yeomans. A., 2017).
- 1.49 The Upper Thames rMCZ is proposed as it is an important area for smelt (*Osmerus eperlanus*). The area of the Upper Thames rMCZ is approximately 2.9 km².
- 1.50 The features for which the designation of the sites as MCZs were recommended and the suggested conservation objectives / management approaches are provided in **Table 5** and **Table 6**. However, it should be noted that these are based on the recommendations made in 2012 for the Thames Estuary rMCZ and they have yet not been formally adopted.

Table 5 – Swanscombe rMCZ Proposed Features and Management Approaches

Feature Type	Feature Name	General Management Approach
Broad Scale Habitat	Intertidal Mixed Sediments	Maintain in a favourable condition
Broad Scale Habitat	Intertidal Sand and Muddy Sand	Maintain in a favourable condition
Broad Scale Habitat	Subtidal Coarse Sediment	Maintain in a favourable condition
Broad Scale Habitat	Subtidal Mud	Maintain in a favourable condition
Broad Scale Habitat	Subtidal Sand	Maintain in a favourable condition
Habitat Features of	Sheltered Muddy Gravels	Recover to a favourable condition

Conservation Importance		
Species Feature of Conservation Importance	Tentacled Lagoon Worm (<i>Alkmaria romijni</i>)	Recover to a favourable condition

Table 6 – Upper Thames rMCZ Proposed Features and Management Approaches

Feature Type	Feature Name	General Management Approach
Species Feature of Conservation Importance	Smelt (<i>Osmerus eperlanus</i>)	Maintain in a favourable condition

- 1.51 It is understood that the Swanscombe and Upper Thames rMCZs are being considered again in the 3rd tranche of MCZ designations which are being consulted on in 2017, with designations expected sometime in 2018.

PROJECT ACTIVITIES

- 1.52 The marine elements of the Tilbury2 development broadly comprise the following:
- Extension of an existing jetty, including piling of berthing dolphins;
 - Construction of a linkspan to access the jetty;
 - Capital dredging of sediment to increase water depth adjacent to the jetties. The fate of the dredged material is yet to be determined. PoTLL is investigating options to re-use the dredged material within the Tilbury2 development, however if the material is not suitable for this purpose it may require disposal at sea;
 - Removal of the existing Anglian Water jetty;
 - Operation of the new jetty; and
 - The need for ongoing maintenance dredging once the development is operational.
- 1.53 The pathways through which the proposed scheme has the potential to impact upon the features of the Medway Estuary MCZ and the recommended Swanscombe and Upper Thames MCZs are described below:

Construction

- Resuspension of potentially contaminated sediments during dredging and piling works could result in impacts to features of the **Swanscombe rMCZ**;
- Changes in water quality (contamination/eutrophication/turbidity) from runoff and discharges from the construction works could result in impacts to features of the **Swanscombe rMCZ**;
- Noise and vibrations generated as a result of constructions works could result in impacts to smelt feature of the **Upper Thames rMCZs**;
- Lighting associated with night time working could result in impacts to smelt feature of the **Upper Thames rMCZ**;

- Accidental release of fuels / oils / chemicals from vessels during construction or delivery of materials could result in impacts to features of the **Medway Estuary MCZ**, and the **Swanscombe** and **Upper Thames rMCZs**.

Operation

- Changes in water quality (contamination/eutrophication/turbidity) from discharges from the development could result in impacts to features of the **Swanscombe rMCZ**;
- Increased noise and vibrations as a result of increased vessel traffic could result in impacts to smelt feature of the **Upper Thames rMCZs**;
- Accidental release of fuels / oils / chemicals from vessels during construction or delivery of materials could result in impacts to features of the **Medway Estuary MCZ**, and the **Swanscombe** and **Upper Thames rMCZs**.

- 1.54 In general, the distance between the site of the proposed Tilbury2 development and the Medway Estuary MCZ limits the pathways for potential impacts to occur to the MCZ and its associated features. The only pathway identified, during both construction and operation of the proposed development is via accidental spills and accidents resulting in spillage from vessels transiting past the mouth of the Medway Estuary. It is considered that impacts associated with this fall outside of the area the development could influence, and that best practice and the environmental requirements placed upon registered vessels are sufficient mitigation. As such, no further discussion is given to the potential for impacts to the Medway Estuary MCZ and its associated features.
- 1.55 The distance between the site of the proposed Tilbury2 development and the Upper Thames rMCZ means that direct impacts to the rMCZ itself as a result of either the construction or the operation of Tilbury2 are highly unlikely. However, the primary reason for the recommendation of the Upper Thames as a MCZ is for its importance to smelt (*Osmerus eperlanus*), particularly for breeding and spawning. In order to migrate up the river, smelt will have to pass the Tilbury2 site. As such, some activities, for example those generating noise or increasing turbidity, have the potential to impact their migration. The assessment of impacts to the Upper Thames rMCZ will be limited to those activities that have the potential to impact the migration of smelt.
- 1.56 As can be seen from **Figure 3** and **Figure 4**, the Tilbury2 development is outside of the Swanscombe rMCZ, with the development located approximately 5 km downstream (east) of the rMCZ boundary. As such, it is unlikely that resuspension of sediment, changes in water quality or the release of fuels / oils / chemicals at the Tilbury2 site will impact the Swanscombe rMCZ except in the event of a significant accidental release and on a flood tide. However, since pathways exist, the assessment includes these eventualities.

IDENTIFICATION OF IMPACTS

- 1.57 It should be noted that whilst the designation of the Swanscombe and Upper Thames rMCZs is currently on hold, it is considered best practice to undertake an assessment on the basis that the site is designated. This is in line with the recommendations received from the regulators in the Scoping Opinion.

- 1.58 As such, the features and their associated conservation objectives / management approaches put forward with the sites' recommendation have been used for the assessment of impacts.

Construction

Table 7 – Assessment of Construction Impacts on features of the Swanscombe rMCZ

rMCZ Feature	Potential Impact	Proposed Mitigation
Intertidal Mixed Sediments	<p>There are Intertidal Mixed Sediments within the boundary of the Swanscombe rMCZ. However, these are located approximately 5km upstream of the Tilbury2 site.</p> <p>Numerical modelling undertaken by HR Wallingford (ES Appendix 16D) confirmed that Water Injection Dredging, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>With ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon Intertidal Mixed Sediments or their current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Intertidal Sand and Muddy Sand	<p>There is are Intertidal Sand and Muddy Sand within the boundary of the Swanscombe rMCZ. However, these are located approximately 5km upstream of the Tilbury2 site.</p> <p>Numerical modelling undertaken by HR Wallingford ES Appendix 16D confirmed that Water Injection Dredging, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>With ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon Intertidal Sand and Muddy Sand or its current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Subtidal Coarse Sediment	<p>Based on the information available regarding the Swanscombe rMCZ, it is not known whether there are any Subtidal Coarse Sediments within the boundary of the site. However, the site is located approximately 5km upstream of the Tilbury2 site.</p> <p>Numerical modelling undertaken by HR Wallingford ES Appendix 16D confirmed that Water Injection Dredging, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>With ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon any Subtidal Coarse Sediment present or its current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Subtidal Mud	<p>There is understood to be Subtidal Mud within the boundary of the Swanscombe rMCZ. However,</p>	All water injection dredging to only be

	<p>this is located approximately 5km upstream of the Tilbury2 site.</p> <p>Numerical modelling undertaken by HR Wallingford (ES Appendix 16D) confirmed that Water Injection Dredging, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>With ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon the Subtidal Mud or its current <i>maintain favourable condition</i> conservation objective.</p>	undertaken on an ebb tide.
Subtidal Sand	<p>There is understood to be Subtidal Sand within the boundary of the Swanscombe rMCZ. However, this is located approximately 5km upstream of the Tilbury2 site.</p> <p>Numerical modelling undertaken by HR Wallingford (HR Wallingford. 2017) confirmed that Water Injection Dredging, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>With ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon the Subtidal Sand or its current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Sheltered Muddy Gravels	<p>Based on the information available regarding the Swanscombe rMCZ, it is not known whether there are any Sheltered Muddy Gravels within the boundary of the site. However, the site is located approximately 5km upstream of the Tilbury2 site.</p> <p>Numerical modelling undertaken by HR Wallingford (ES Appendix 16D) confirmed that Water Injection Dredging, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>With ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon any Sheltered Muddy Gravels present or their current <i>recover to favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Tentacled Lagoon-Worm (<i>Alkmaria romijni</i>)	<p>The tentacled lagoon worm (<i>Alkmaria romijni</i>) was not identified in the 2007/2008 Tilbury surveys and was not identified in subsequent (2017) environmental surveys undertaken for the Tilbury2 development or the Gosham's Farm jetty development immediately adjacent. The closest location known to support them is at Greenhithe approximately 9km upstream of Tilbury, for which the Swanscombe rMCZ has been proposed.</p> <p>In a teleconference held on 4th September 2017,</p>	<p>Mitigation during construction is expected to include the following best working practices:</p> <ul style="list-style-type: none"> - Appropriate bunding and spill containment equipment on

	<p>the Environment Agency confirmed that tentacled lagoon worms have never been found as far downstream as Tilbury and that there is a low risk of tentacled lagoon worm colonising the areas near to the proposed development.</p> <p>As with any construction works taking place in or close to water, there is a potential for a reduction in water quality to occur as a result of a fuel / oil / chemical spill or simply due to an increase in turbidity. Although the Swanscombe rMCZ is located approximately 5km upstream (west) of the proposed development, in the event of an extreme release and on the occasion of a flood tide, there is potential for water with reduced quality to reach the Swanscombe rMCZ.</p> <p>In the unlikely event that this should occur, it is expected that the concentration of any contaminants would be very diluted by the time it reached the site and thus any impacts would be minimal.</p> <p>Thus, with ebb tide only mitigation in place for water injection dredging, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon Tentacled Lagoon Worm (<i>Alkmaria romijni</i>) or its current recover to favourable condition conservation objective.</p>	<p>site;</p> <ul style="list-style-type: none"> - Use of well-maintained equipment and plant to minimise potential for fuel / oil and chemical spills. - All water injection dredging to only be undertaken on an ebb tide.
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Table 8 – Assessment of Construction Impacts on features of the Upper Thames rMCZ

rMCZ Feature	Potential Impact	Proposed Mitigation
Smelt (<i>Osmerus eperianus</i>)	<p>European Smelt are small fish found mostly in coastal and estuarine waters from southern Norway to north-west Spain (Maitland, 2003 as cited by HR Wallingford, 2016). They migrate into rivers, including the tidal River Thames, in early spring to spawn.</p> <p>Eggs are laid on gravel substrates or macrophytes and are highly adhesive. Maitland (2003) suggests that spawning occurs on the highest spring tides and occurs over days to a few weeks (HR Wallingford, 2016).</p> <p>In estuaries around Britain and the rest of Europe, smelt migrate up estuaries during the spring to spawn. In some estuaries, the spawning grounds have been identified and found to be confined to a localised area. Following various studies, including a numerical modelling campaign undertaken by HR Wallingford (ES Appendix 16D), the spawning grounds in the Thames are believed to be in the Wandsworth area. The Upper Thames rMCZ was proposed to include the Wandsworth spawning grounds.</p> <p>Given the distance between the site of the proposed Tilbury2 scheme and the Upper Thames rMCZ (approx. 50km), potential impacts to smelt via disturbance to spawning grounds during construction of the works has been dismissed from further consideration.</p> <p>There is potential for the construction of the proposed Tilbury2 scheme to impact upon smelt when they are transiting past the construction</p>	<p>Mitigation during construction is expected to include the following best working practices:</p> <ul style="list-style-type: none"> - Soft start and cushioning during impact piling works; - Seek to minimise the duration over which impact piling will occur; - Working hours during construction for piling will be restricted to 08.00 to 18.00 Monday to Friday, and 08.00 to 16.00 on Saturdays and Sundays therefore providing a non-piling window of at least 14 hours per day. - Appropriate bunding and

	<p>works via the following pathways:</p> <ul style="list-style-type: none"> - The generation of underwater noise and vibration during piling and dredging activities as well as the increased vessel activity during construction works has the potential to cause disturbance, alter the behaviour or in extreme cases cause physical damage to smelt as a feature of the rMCZ; - The resuspension of potentially contaminated sediments during dredging and piling works could result in impacts to smelt; - Changes in water quality (contamination/eutrophication/turbidity) from runoff and discharges from the construction works could result in impacts to smelt; - Lighting associated with night time working could result in disturbance and changes to the behaviour of smelt; - The accidental release of fuels / oils / chemicals from vessels during construction or delivery of materials could result in impacts to smelt. <p>Following completion of additional survey and modelling work undertaken as part of the preparation of the ES the following conclusions were drawn from the impact assessment presented in Chapter 11 (Marine Ecology):</p> <ul style="list-style-type: none"> • The impacts associated with the generation of underwater noise during construction to nationally important fish species (including smelt) were assessed as minor / negligible; • The impacts associated with reduced water quality, including the suspension of potentially contaminated sediments during dredging to nationally important fish species (including smelt) were assessed as negligible; • The impacts associated with lighting required for night time working to nationally important fish species (including smelt) were assessed as minor. <p>Thus, the construction of the Tilbury2 scheme could result in some negative impacts to smelt as a feature of the Upper Thames rMCZ transiting past the area of construction. However, the impacts are anticipated to be minimal. Given the scale of the works, the width of the estuary at this point (approx. 1km, thus allowing a large degree of avoidance if necessary) and the best industry working practices, it is considered highly unlikely that the construction of the proposed scheme will have any impact upon the current <i>maintain favourable condition</i> conservation objective.</p>	<p>spill containment equipment on site;</p> <ul style="list-style-type: none"> - Timing of works to avoid likely fish migration periods, in particular no WID from June to August; - Use of well-maintained equipment and plant to minimise potential for fuel / oil and chemical spills.
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Operation

Table 9 – Assessment of Operational Impact on Features of the Swanscombe rMCZ

rMCZ Feature	Potential Impact	Proposed Mitigation
Intertidal Mixed Sediments	<p>During the operation of Tilbury2 there will be a requirement for ongoing maintenance dredging. As per the assessment of impacts during construction, numerical modelling confirmed that WID, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>There is not considered to be any potential for the operation of the proposed scheme to negatively impact this feature of the rMCZ.</p> <p>It is considered highly unlikely that the operation of the proposed scheme will have any impact upon the current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Intertidal Sand and Muddy Sand	<p>During the operation of Tilbury2 there will be a requirement for ongoing maintenance dredging. As per the assessment of impacts during construction, numerical modelling confirmed that WID, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>There is not considered to be any potential for the operation of the proposed scheme to negatively impact this feature of the rMCZ.</p> <p>It is considered highly unlikely that the operation of the proposed scheme will have any impact upon the current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Subtidal Coarse Sediment	<p>During the operation of Tilbury2 there will be a requirement for ongoing maintenance dredging. As per the assessment of impacts during construction, numerical modelling confirmed that WID, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>There is not considered to be any potential for the operation of the proposed scheme to negatively impact this feature of the rMCZ.</p> <p>It is considered highly unlikely that the operation of the proposed scheme will have any impact upon the current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Subtidal Mud	<p>There is understood to be Subtidal Mud within the boundary of the Swanscombe rMCZ. However, this is located approximately 5km upstream of the Tilbury2 site. As per the assessment of impacts during construction, numerical modelling confirmed that WID, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly</p>	All water injection dredging to only be undertaken on an ebb tide.

	<p>reduced.</p> <p>There is not considered to be any potential for the operation of the proposed scheme to negatively impact this feature of the rMCZ.</p> <p>It is considered highly unlikely that the operation of the proposed scheme will have any impact upon the Subtidal Mud or its current <i>maintain favourable condition</i> conservation objective.</p>	
Subtidal Sand	<p>There is understood to be Subtidal Sand within the boundary of the Swanscombe rMCZ. However, this is located approximately 5km upstream of the Tilbury2 site. As per the assessment of impacts during construction, numerical modelling confirmed that WID, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>There is not considered to be any potential for the operation of the proposed scheme to negatively impact this feature of the rMCZ.</p> <p>It is considered highly unlikely that the operation of the proposed scheme will have any impact upon the Subtidal Sand or its current <i>maintain favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Sheltered Muddy Gravels	<p>During the operation of Tilbury2 there will be a requirement for ongoing maintenance dredging. As per the assessment of impacts during construction, numerical modelling confirmed that WID, when undertaken on a floodtide, could result in suspended sediment and deposition of sediment within the Swanscombe rMCZ. However, when undertaken on an ebb tide, the potential for this to occur was significantly reduced.</p> <p>There is not considered to be any potential for the operation of the proposed scheme to negatively impact this feature of the rMCZ.</p> <p>It is considered highly unlikely that the operation of the proposed scheme will have any impact upon the current <i>recover to favourable condition</i> conservation objective.</p>	All water injection dredging to only be undertaken on an ebb tide.
Tentacled Lagoon-Worm (<i>Alkmaria romijni</i>)	<p>As described in Table 7 The tentacled lagoon worm (<i>Alkmaria romijni</i>) was not identified in the 2007/2008 Tilbury surveys and was not identified in subsequent (2017) environmental surveys undertaken for the Tilbury2 development or the Gosham's Farm jetty development immediately adjacent. The closest location known to support them is at Greenhithe approximately 9 km upstream of Tilbury, for which the Swanscombe rMCZ has been proposed.</p> <p>As with the assessment of construction impacts, any works taking place in or close to water, have the potential to result in a reduction in water quality to occur as a result of a fuel / oil / chemical spill or simply due to an increase in turbidity during maintenance dredging, which could adversely affect the tentacle lagoon worm. Although the Swanscombe rMCZ is located approximately 5km upstream (west) of the proposed development, in the event of an extreme accidental release and on</p>	<p>Mitigation during operation is expected to include the following best working practices:</p> <ul style="list-style-type: none"> - All water injection dredging to only be undertaken on an ebb tide. - Appropriate bunding and spill containment equipment on site; - Use of well-maintained equipment and

	<p>the occasion of a flood tide, there is potential for water with reduced quality to reach the Swanscombe rMCZ.</p> <p>In the unlikely event that this should occur, it is expected that the concentration of any contaminants would be very diluted by the time they reached the site and thus any impacts would be minimal.</p> <p>Thus, it is considered highly unlikely that the operation of Tilbury2 will have any impact upon Tentacled Lagoon Worm (<i>Alkmaria romijni</i>) or its current recover to favourable condition conservation objective.</p>	<p>plant to minimise potential for fuel / oil and chemical spills</p> <p>-</p>
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Table 10 – Assessment of Operational Impacts on features of the Upper Thames rMCZ

rMCZ Feature	Potential Impact	Proposed Mitigation
Smelt (<i>Osmerus eperianus</i>)	<p>As per the assessment of impacts during construction, given the distance between the site of the proposed Tilbury2 scheme and the Upper Thames rMCZ (approx. 50km), potential impacts to smelt via disturbance to spawning grounds during operation of the works has been dismissed from further consideration.</p> <p>There is potential for the operation of the proposed Tilbury2 scheme to impact upon Smelt when they are transiting past Tilbury2 via the following pathways:</p> <ul style="list-style-type: none"> - The generation of underwater noise and vibration during maintenance dredging activities as well as the increased vessel activity during operation has the potential to cause disturbance, alter the behaviour or in extreme cases cause physical damage to smelt as a feature of the rMCZ; - Changes in water quality (contamination/eutrophication/turbidity) from runoff and discharges from the operation of Tilbury2 could result in impacts to smelt; - Lighting associated with night time working could result in disturbance and changes to the behaviour of smelt; - The accidental release of fuels / oils / chemicals from vessels during operation could result in impacts to smelt. - Suspended sediments and release of contaminants from maintenance dredging. <p>Following completion of additional survey and modelling work undertaken as part of the preparation of the ES the following conclusions were drawn from the impact assessment presented in Chapter 11 (Marine Ecology):</p> <ul style="list-style-type: none"> • The impacts associated with the generation of underwater noise during operation to nationally important fish species (including smelt) were assessed as negligible; • The impacts associated with reduced water quality, including the suspension of potentially contaminated sediments during dredging to nationally important 	<p>Mitigation during operation is expected to include the following best working practices:</p> <ul style="list-style-type: none"> - All water injection dredging to only be undertaken on an ebb tide; - Timing of works to avoid likely fish migration periods, in particular no WID from June to August; - Use of well-maintained equipment and plant to minimise potential for fuel / oil and chemical spills.

	<p>fish species (including smelt) were assessed as negligible;</p> <ul style="list-style-type: none"> The impacts associated with lighting required for night time operations to nationally important fish species (including smelt) were assessed as minor. <p>Thus, the operation of the Tilbury2 scheme could result in some negative impacts to smelt as a feature of the Upper Thames rMCZ transiting past Tilbury2. However, the impacts are anticipated to be minimal. It is considered highly unlikely that the operation of Tilbury2 will have any impact upon the current <i>maintain favourable condition</i> conservation objective.</p>	
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SUMMARY

- 1.59 In summary, it is considered highly unlikely that either the construction or the operation of the proposed Tilbury2 scheme will result in any negative impacts to the Medway Estuary MCZ or its features. As a result, there is anticipated to be no impact on any of the conservation objectives.
- 1.60 As described previously, impacts to the Swanscombe rMCZ during either construction or operation of Tilbury2 are highly unlikely given the distance between the sites.
- 1.61 As such, with the mitigation secured through the Construction Environmental Management Plan or Deemed Marine Licence incorporated within the DCO as appropriate, it is considered unlikely that either the construction or the operation of the proposed Tilbury2 scheme will result in any impacts to the proposed conservation objectives of the Swanscombe rMCZ.
- 1.62 Although impacts to the Upper Thames rMCZ are unlikely from both the construction and operation of the proposed scheme due to the distance between the sites, there is potential for impacts to the feature for which the site is recommended.
- 1.63 Both construction and operation of Tilbury2 have the potential to impact smelt, either through disturbance, obstruction, alteration to behaviour or in extreme cases physical damage. However, as described above, the nature and scale of the works, result in these impacts being considered minor. With the addition of identified mitigation measures, these impacts are considered to be at an acceptable level.
- 1.64 The results of further survey and modelling work, as reported in the ES support this assessment.
- 1.65 It is considered unlikely that either the construction or the operation of the proposed Tilbury2 scheme will result in any impacts to the proposed conservation objectives of the Upper Thames rMCZ.
- 1.66 Further information regarding the assessment of impacts to the marine ecology associated with the Tilbury2 development can be found in Chapter 11 – Marine Ecology, of the Environmental Statement.

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