



**PORT OF SHEERNESS
V164 WIND TURBINE MANUFACTURING
PLANT**

**ENVIRONMENTAL IMPACT ASSESSMENT
SCOPING REPORT**

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1 INTRODUCTION

a) Summary of proposed development

- 1.1 Port of Sheerness Limited ('the Applicant') intends to submit a planning application and associated applications for regulatory approval for the development of a Wind Turbine Manufacturing ('WTM') facility at the Port of Sheerness ('the Port'), located on the Isle of Sheppey within the borough of Swale, Kent. This follows the completion of an Option Agreement between the Applicant and Vestas Wind Systems AS ('Vestas'), one of the World's leading companies involved in the manufacture of wind turbines. If the project proceeds, Vestas will build and operate the WTM facility for a period of at least 30 years, on land leased from the Applicant.
- 1.2 The WTM development is to be constructed on a portion of the existing Port which is entirely within the ownership of the Port Authority, Peel Ports (Medway). The land required for this development includes quaysides, berths and other facilities within the main Port area, together with an extensive area of previously reclaimed land to the south, known as Lappel Bank. The Lappel Bank is currently used for the storage of imported cars and other vehicles. Figure 1.1 shows the approximate boundary and location of the WTM site.

Figure 1.1 - Map of the Port of Sheerness, Identifying Approximate WTM site



- 1.3 The WTM facility at Sheerness will manufacture a new 7 megawatt (MW) wind turbine product - the 'V164', currently in development by Vestas. This turbine would be supplied to the UK 'Round 3' designated zones for offshore wind power, together with other future European markets. The

WTM plant will be one of the largest manufacturing plants of its type in Europe, either planned or existing.

- 1.4 The plant will manufacture the V164 turbine blades in their entirety and will also assemble the generator motor, drive shaft, hub and casing (comprising the 'nacelles'), together with the supporting steel towers, from component parts brought in by both ship and road. The three completed turbine parts (i.e. blades, nacelles and towers) will then be loaded on to specially designed vessels for onward shipment and final assembly at offshore wind farm sites.
- 1.5 The WTM facility at Sheerness is expected to have a minimum operational life of 30 years, but this could be extended to in excess of 50 years depending on future market demand. It is estimated that, at peak production output, the WTM facility at Sheerness will provide in the order of 2,000 direct and indirect jobs.

b) Requirement for EIA

- 1.6 In view of the nature and scale of the proposed WTM development and the sensitive surrounding marine environment, it is acknowledged that the planning application to be submitted to the local planning authority - Swale Borough Council ('the Council'), and the associated marine licence applications to the Marine Management Organisation (MMO), must be supported by an Environmental Impact Assessment (EIA) resulting in the preparation of a comprehensive Environmental Statement (ES) to be submitted with these applications.
- 1.7 The EIA process, together with various supporting surveys, investigations and technical studies, are already well advanced. This initial phase of assessment work has been informed by early discussions with officers of the Council, the MMO, Natural England, English Heritage and other statutory consultation bodies. However, as the detailed elements of the proposed WTM development have only more recently been determined, the Applicant now wishes to obtain formal EIA Scoping Opinions from both the Council and the MMO, as joint decision making authorities. The purpose of this request is to confirm that the scope of the EIA (as set out in this document) is acceptable to both organisations. Accordingly, it is anticipated that, through issue of the Scoping Opinions, consensus can be reached with regard to the potential 'significant environmental effects' of the WTM proposals and the commensurate level of assessment necessary in order to determine the nature and magnitude of such effects.
- 1.8 This Scoping Report has been prepared in conformity with the guidance and requirements set out in the relevant EIA regulations; namely:
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2011; and
 - The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2011).
- 1.9 Chapter 2 of this Scoping Report provides a fuller description of the proposed WTM development.
- 1.10 The WTM development is subject to an iterative design process which is being led by a coordinated team of project managers, engineers, architects, environmental specialists, planners and other professional advisors to Peel and its development partner Vestas.

c) Port Location and Function

- 1.11 The Port of Sheerness is a deep water port with no lock restrictions, offering easy access for shipping. Located at the confluence of the River Medway and the Thames, Sheerness forms part of one of the UK's most important trading arteries, handling a diverse range of cargoes. With its close proximity to the M2, M20 and London's M25 orbital motorway, the Port is well connected to facilitate onward distribution to major markets in the South East of England and beyond.
- 1.12 Medway Ports, of which Sheerness forms part, is the statutory harbour, pilotage and conservancy authority for 27.3 nautical miles of the River Medway, from the Medway Buoy to Allington Lock at Maidstone, and the Swale.
- 1.13 Eight maritime berths (not chronologically numbered) provide sea-borne access to the Port of Sheerness, five of which (Berths 2, 3, 5, 6 and 7) will be altered, strengthened or replaced to facilitate the construction and operation of the WTM facility. These works are described in more detail in the following section of this report.

d) History and Existing Status of the Port

- 1.14 The dockyard was developed from an initial fort and barracks in the mid 16th century. During the 17th century it developed into a Royal Navy repair yard and was rebuilt and refortified in the 1660s following an attack by the Dutch. The fortifications and docks were further modified in the 18th century with the addition of the Sheerness Lines by the 1790s. The dockyard was completely reorganised and largely rebuilt between 1815 and 1830. Further modifications to the defences and gun emplacements occurred through the 19th century and up to World War II with the addition of the Centre Bastion, Garrison Tower, Artillery Fortifications on the Isle of Grain and the Queenborough Lines. The fortifications continued in use until the end of World War II.
- 1.15 In 1975 planning consent was given to fill the existing mud bank beyond the existing sea wall, known as the Lappel Bank. In 1980, work commenced to fill the area in phases, as the need arose, commencing at the Port (North) end. The first phase was filled with dredge material; the second phase with pulverised fuel ash (PFA); the next phase with dredge material; and, finally, the last phase at the south end of the Lappel Bank was bunded with dredge material and infilled with local inert material (brick rubble, etc.). The area is currently used for storage of imported cars and other vehicles and is leased by two main operators – Volkswagen Audi Group (VAG) and GEFECO, who import Citroen, Peugeot and other makes.
- 1.16 In 1998, the existing berths were extended to create Berths 6 & 7. The area behind Berth 6 was infilled back to the bank to support a new cold store warehouse which was opened in 2000. However, over the past decade there has been a significant reduction in demand for cold storage facilities at the Port, due primarily to the shift towards chilled road transport. Therefore, the existing cold store buildings and associated facilities are becoming increasingly redundant and consequently are not expected to be fully re-provided once the WTM facility is built out. Most other businesses and operations will be relocated and/or reconfigured within the remainder of the Port (subject to need and negotiation with the existing tenant companies). Therefore, Port of Sheerness will retain both its Port Authority functions and its key existing customers. These existing tenants include companies involved in steel import/export, timber supply, cement and aggregates, corrugated packaging suppliers and vehicle importers. Most of these businesses will be contained within the northern end of the Port.

1.17 As part of the WTM development proposals, the existing car terminal and floating jetty will be relocated south of its current position in order to facilitate the ongoing importation and export of vehicles from the Port. However, insufficient space will remain on the Lappel Bank in order to accommodate the same quantum of car storage space that exists at present. As such, some of this car storage may be relocated to alternative sites, including the 'Whiteways' site which is located beyond the sea wall and Port boundary at the southernmost point of the Lappel Bank. Relocation to this and other alternative sites is subject to agreement with the car import operators (VAG and GEFCO) and will be determined on the basis of operational, financial, planning and other considerations.

1.18 In all cases, translocation of existing Port businesses will be timed to fit with the phased development of the WTM facility, thereby assuring minimal business disruption to these existing Port customers.

e) General Site Setting

1.19 The WTM site is bounded by the main port car park, the Royal Bridge and Berth 1 to the north; the A249 (Brielle Way) and the Sheerness Line railway to the east; the imported vehicle storage parking to the south; and the River Medway to the west.

1.20 Land access to the WTM site is at its northern end via Great Basin Road, which connects the whole of the Port to Garrison Road and the A249/ A250 roundabout. Vehicular access to the WTM site will be via the existing controlled Port entrance and along a new 8m wide internal access road that will run southward from the internal Port road along the eastern side of the Port boundary.

1.21 The land uses surrounding the WTM site are largely industrial, with much of the local land-use activities being associated with the Port itself and associated businesses. The Thames Steel works, immediately east of the A249, is a prominent industrial landmark that contributes to the industrial character of the local area and townscape.

1.22 Residential areas are located approximately 200m east and southeast of the WTM site, most notably the communities at Blue Town, Sheerness and those along New Road and Queen's Way.

1.23 The Port of Sheerness is located on the Isle of Sheppey, being connected to mainland Kent by road and rail services which bridge over the River Swale north of Sittingbourne. These connections represent the only land-based accesses to and from Sheerness. The Port itself is accessed by UK, European and international shipping and freight vessels.

1.24 The Port is in close proximity to a number of National and European designated wildlife sites, including the Medway Estuary and Marshes Special Protection Area (SPA) and Thames Estuary and Marshes SPA. These and other ecological designations within a 20km radius of the site are described in detail in Section 10 and Appendix B of this Scoping Report.

2 THE PROPOSED DEVELOPMENT

a) Development Description

- 2.1 The proposed WTM facility would occupy a large proportion of the operational Port of Sheerness, comprising approximately 70 hectares of previously developed and reclaimed land. The indicative layout of the WTM plant and associated operational areas is illustrated by Figure 2.1. This Figure is reproduced in A3 size at Appendix A (including a key to the development areas illustrated on the plan), together with a separate indicative phasing plan for the WTM site.
- 2.2 Illustrative 3D images of the proposed WTM plant are provided in Figure 2.2. However, it should be noted that these illustrations have been generated using maximum parameters for the development, which are subject to change as the design evolves.
- 2.3 As described in Section 5 of this Scoping Report, the planning application for the WTM facility will comprise a 'hybrid' application, with some aspects of the project (e.g. marine engineering works) defined in detail and other elements (e.g. building dimensions) provided in outline. The outline elements of the proposals will, however, be defined within the context of a range of maximum and minimum development parameters as defined by a set of Parameter Plans submitted for approval.
- 2.4 The main elements of the WTM facility are summarised below, whilst the detail of the engineering works involved in the development are described in the following sections:
1. Demolition of a number of existing buildings and other structures within the area required for the construction and operation of the WTM facility. These will include the removal of the Grade II* Mast House (Building 26), subject to listed building consent being granted.
 2. Strengthening and infilling of existing quays to create a continuous offshore transit area and quay wall of approximately 450m length.
 3. Creation of a new inset berth (or 'notch') behind the existing Berth 3, including a new finger quay and travelling crane jetty for the importation of wind turbine components (mainly steel sections of the towers) and for the loading of completed nacelles, towers and blades onto ships.
 4. Construction of the blade production building and associated loading and parking areas. The blade production building will be of a modular construction, with internally segregated halls, production lines, finishing, painting, testing and other processes involved in the manufacture of turbine blades. The entire blades building will comprise up to 100,000m² of Gross External Area (GEA). An external 'resin farm' and waste yard associated with this building will also be constructed.
 5. Construction of nacelles assembly and 'offshore' buildings, together with loading and parking areas. These buildings will comprise up to 10,500m² GEA of new buildings and approximately 22,000m² of refurbished building space, including the retention and use of the existing conjoined Cool Store No 2 and 'Ambient' building.
 6. Construction of other ancillary buildings, including one or more Corporate Services Centres (CSC) providing catering, offices and other uses.
 7. Construction of a tower erection area with associated cranes / rigs.
 8. The establishment (and strengthening) of designated areas for the storage and internal transport of completed towers, blades and nacelles prior to shipment.
 9. Construction of two main external electricity sub-stations (32kv to 33kv; and 33kv to 11kv).
 10. Relocation of the existing car terminal and berth further down the Lappel Bank, requiring localised dredging to permit the passage of car ferries to embark, load and offload at this new location.
 11. Alteration and upgrade of incoming services.



12. Provision of a new service road and alterations to the Port entrance.

Figure 2.1 – WTM Indicative Layout Plan

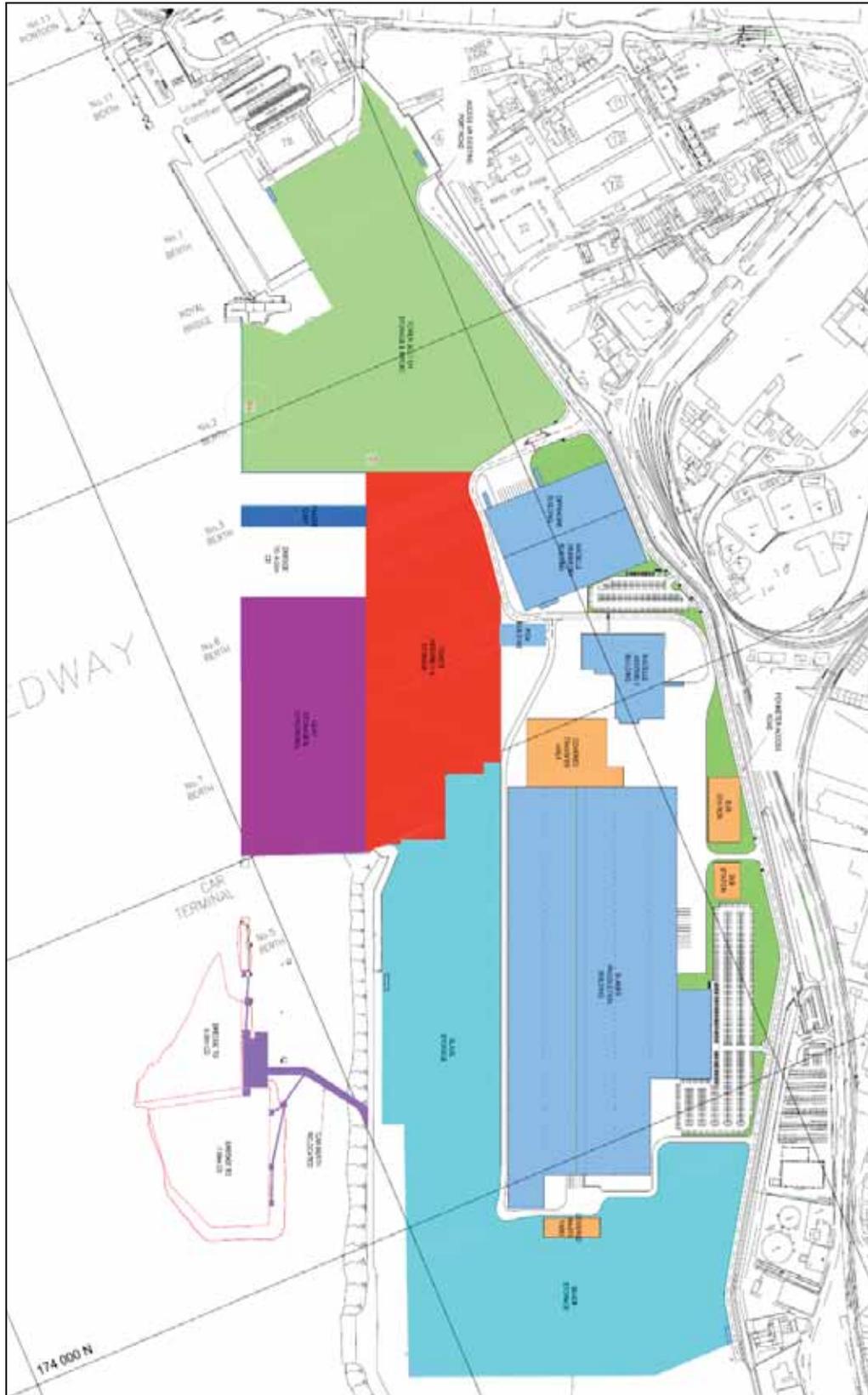


Figure 2.2 – WTM Indicative 3D images of the WTM



b) Engineering Works

2.5 For the purposes of this engineering description of the WTM facility at Sheerness, the proposed works have been categorised under the following headings:

- Site Clearance and Demolitions.
- Quay Structures.
- Relocated Car berth.
- Dredging and Bed Improvements.
- Storage and Working Areas on Existing Lands.
- Roads and Access.
- Site Drainage.
- Buildings.
- Phasing of Engineering Works.

2.6 It should be noted that this description is based on preliminary assessments, made in advance of receiving all data from the site investigations undertaken at the Sheerness site and, as such, may be subject to review and change when more information becomes available.

Site Clearance and demolitions

2.7 The existing buildings and areas within the WTM area affected by the proposed works can be summarised as follows:

Table 2.1 - Buildings/ Areas proposed to be demolished or retained

Building / Area	Proposed Treatment
Shed No 1	Demolished
Shed No 67 / 68	Demolished
Shed No 2 (North, South and East)	Demolished
Cool Store 2A	Demolished
Shed No 27	Demolished
Shed No 26	Demolished – subject to listed building consent
Shed No 25	Demolished
Pump House	Demolished
Shed No 3	Demolished
Cool Store No 1	Demolished
Ambient Area W4	Retained for reuse
Cool Store No 2	Retained for reuse
Cool Store W6	Demolished
Pack House	Demolished
Cemex Silos	Relocated or removed
Jamaica Park	Built over
Car Import Compounds	One of the car importation businesses will be relocated temporarily onto Phases F & G plus Cullet Drive. When Phases F & G are required, the operation will be transferred off port. The other car importation business will be relocated onto the southern end of the Port area, outside the works boundary, and to the adjoining 'Whiteways' site. These relocations are subject to agreement with the operators and relevant planning permissions in due course.
FPR	Built over – relocated to adjacent Berth 5
Porsche Park	Built over
Misc. Park 4	Built over
Berth 2	Retained and altered / strengthened
Berth 3	Demolished – the existing Berth 3 structure including piling will be demolished to accommodate the notch berth construction.
Berth 6	Minor Demolition – a small section of the north end of the existing Berth 6 structure including piling will be demolished to accommodate the notch berth construction.

Building / Area	Proposed Treatment
Berth 5	Demolished/removed – parts of the existing car berth will be removed for re-use in a new location. Some fixed elements such as dolphins and access viaduct will be partially or fully demolished.

2.8 The above demolition works will be carried out to suit the phasing of the area concerned. Existing operations within the area will be transferred according to the Phasing Plan either on to surrounding areas or outside site boundary.

2.9 Demolition of existing berth structures will involve the following operations:

- Break out and recover concrete deck - the deposition of demolition waste on the seabed shall be avoided.
- Complete removal of steel piles by vibration or other such methods. Should complete recovery prove impractical then piles will be cut off at an appropriate depth below the proposed design dredge depth to ensure they do not constitute a hazard to shipping or jack-up operations.

2.10 It can also be anticipated that in some areas of the site, currently at or near ground level, there will be a requirement for some excavation prior to construction of new surfacing. Depending on existing and proposed new levels, prior to excavation there will also be a requirement to remove/demolish existing surfacing which might comprise concrete slabs, traditional road construction materials, block paving and possibly building foundations.

2.11 Where possible, demolition waste will be retained for use within the works. For example it is anticipated that concrete from demolished quay structures will be crushed on site and re-used as fill material.

Quay Structures

2.12 Works on Quay structures can be described under the two main headings:

- Retention and strengthening of Existing Quay Structures.
- New Marine Structures.

Retention and Strengthening of Existing Quay Structures

2.13 As far as possible, existing quay structures are to be retained for use in the WTM facility, although in some cases strengthening works will be required.

Berth 2

2.14 Berth 2 has been assessed as having insufficient strength to be incorporated in the works. Therefore, this structure will be completely replaced and the existing structure will be retained and used as a working platform and permanent formwork for the new construction.

2.15 The works will comprise locally breaking holes in the existing deck slab at each new pile location, installation (driving) of tubular steel piles through the openings and provision of a new concrete slab on top of the existing deck slab.

2.16 Steel piles will vary, with diameters likely to be between approximately 0.8m and 1.2m. The total number of piles will be in the order of 900. Piles will be installed by driving.

- 2.17 The new concrete deck slab will be approx 1m in depth and will be placed directly on top of the existing quay deck. The total area of new deck slab will be approx 16,300 m².

Berth 6 & 7

- 2.18 It is anticipated that the berth 6 & 7 structures can be retained for re-use in the proposed works, although some strengthening works will be required. Further assessment and design will be needed before a final decision can be made, however, two scenarios are thought to be most likely: If the existing piles are proven to be adequate for the proposed loads, it is likely that engineering works will be confined to the deepening of the structural deck by the introduction of a new slab on top of the existing deck. This slab will be structurally connected to the existing deck in order to act compositely, thus increasing the deck's overall capacity. If existing piles are proven to be inadequate for the proposed loads, two possible solutions exist:

- Increase the capacity of the piles by further engineering works – this would be the subject of detailed design; or,
- Completely replace the quay structure – this would be a similar situation to that already described for Berth 2, and would likely comprise 0.8 –1.2m diameter piles on a 5 – 6m grid with an approximately 1m deep concrete slab above the existing deck surface.

New Marine Structures

- 2.19 New marine structures are required for several purposes:

- to create a new notch berth basin with quays for the import of materials and components and for the export of completed turbines;
- to provide a new finger jetty to accommodate a large capacity travelling crane; and
- to provide storage and assembly areas immediately behind the quays.

Notch Berths

- 2.20 The notch berth basin will be constructed between existing Berths 2 and 6, in the space provided by the demolition of existing Berth 3.

- 2.21 The three internal sides of the berth will be formed by the construction of solid quay walls. Given ground conditions, it is anticipated these will comprise steel combi-walls which are formed by the installation of large diameter steel tubular piles with infill sheet piling between. Subject to more detailed design when further site investigation results are available, it is expected that tubular steel piles will be in the order of 1.2 – 1.5m in diameter. The combi-wall will be provided with a reinforced concrete capping beam on top and concrete facing panels, which may also be provided to low water level depending on the berthing and fendering requirements of vessels.

- 2.22 Alongside Berths 2 and 6, the concrete capping beam on top of the combi-wall will be tied into the adjacent deck structures to provide lateral stability. At the rear of the notch where there are no existing structures, stability will be provided by the installation of a sheet piled anchor wall in the existing port lands, approximately 25m behind the main wall. The main wall will be connected to the anchor wall by steel tie rods.

- 2.23 Both tubular steel piles and sheet piles will be installed by driving, although there may also be a need for drilling to assist in installation of the piles.

- 2.24 Works in this area will also involve dredging which is described in a following section.

Finger Jetty

- 2.25 The finger jetty will be constructed as a free standing piled structure. The jetty will be approximately 25m in width.
- 2.26 Piling will be similar to that described previously, comprising driven tubular steel piles (both vertical and raking) with diameters likely to be in the range of 1.0 and 1.2m diameter.
- 2.27 The deck will be of concrete construction and will most likely comprise a composite form of construction. This normally involves the placement of precast pile-caps, beams and slabs on top of the piles with a final in-situ concrete slab being cast on top.
- 2.28 The crane will be accommodated on rails on this structure, which will be installed on top of the in-situ deck slab.

Quayside Storage and Assembly Areas

- 2.29 Some areas proposed for storage and assembly operations are in areas which currently comprise open water. The two main areas thus affected are;
- a small triangular area bounded by the rear edge of Berth 2, the access structure to this berth and the old dock wall adjacent Rats Bay. Total area is approximately 2710 m²; and
 - a larger area between the rear edge of Berth 7 and the Lappel Bank, bounded on the north side by the Berth 6 structure and on the south side by the access viaduct to Berth 7. Total area is approximately 17425 m².
- 2.30 In these cases, new suspended structures will be of a similar form of construction to the Finger Jetty, comprising a composite form of construction with precast pile-caps, beams and slabs on top of the piles, with a final in-situ concrete slab being cast on top. Piles will likely be in the order of 0.8 – 1.2m in diameter and will be installed on an approx 5 – 6m grid. Deck levels will be such as to match the levels of existing or proposed adjacent structures. The level of the new structure behind Berth 2 will also be set to ensure the construction of the new structure does not impact on the existing old dock walls.
- 2.31 Lateral stability will be provided by tying the concrete deck into adjacent structures such as Berth 6 and by installing some piles on existing lands, such as alongside the Lappel Bank. Thus, it is anticipated that generally, only vertical piles will be installed on these structures.

Relocated Car berth

- 2.32 The existing berth 5 (car import berth) is required to be relocated to accommodate the WTM operations. The berth currently abuts the end of Berth 7 but will be moved further southwards to facilitate proposed operations on Berth 7.
- 2.33 The berth comprises a floating pontoon with fixed mooring and berthing dolphins for both the pontoon itself and for vessels. The works will comprise the following:
- removal of pontoon, inspection, repair as necessary and modification to accommodate re-installation at new location;
 - removal of existing link bridge, inspection, repair as necessary and modification to accommodate re-installation at new location;
 - construction of new berthing and mooring dolphins for relocated pontoons and vessels;
 - modification (extension) of several existing dolphins for re-use in the new arrangements; and
 - construction of new access viaduct to the Lappel Bank.

2.34 New construction works will be confined to the dolphins and access viaduct. Dolphins will comprise an in-situ concrete deck on driven tubular steel piles (both vertical and raking), whilst the access viaduct will comprise a composite (precast and in-situ) deck on vertical tubular steel piles.

2.35 Works in this area will also involve dredging which is described in a following section.

Dredging and Bed Improvements

2.36 Dredging works are required at two locations within the works:

- Notch Berths.
- Relocated Car Berth.

Notch Berths

2.37 Within the notch berth, dredging is required for two purposes;

i) To provide a general depth of water for navigation operations

2.38 The depth of dredging will be -9.0m CD (below Chart Datum). The dredge area will be defined by the notch berth quay walls which will prevent excessive side slopes in the existing bed under adjacent berths. On the seaward side, the existing bed level is generally not higher than -9.0m CD and, as such, dredging for the purposes of navigation will not extend beyond the confines of the notch berths.

2.39 The total volume of dredging to provide a navigable depth of -9.0m CD across the entire area of the notch berths is approximately 250,000m³.

2.40 It is anticipated that dredged material will generally comprise soft silty sandy alluvium, although some small volumes of London Clay may be encountered towards the eastern (inner) end of the berth.

ii) Bed Improvement for Jacking Operations

2.41 There will be a requirement for some installation vessels to jack up at the berth along the southern edge of the notch berth. Loads on jacking legs can be very high and the soft alluvium present on site does not provide an adequate bearing stratum for jacking operations. Hence, there will be a requirement to remove the soft alluvium at this berth to a depth greater than -9.0m CD and for the subsequent localised excavation to be filled with imported granular material.

2.42 At the outer end of the berth the depth of additional dredging could extend to -18m or -19m CD with side slopes graded to meet the existing bed levels. The total volume of additional dredging is currently estimated to be in the order of 70,000 – 80,000m³. This estimate represents a worst case scenario as it is anticipated that this may be reduced by more detailed design once further laboratory testing data is available.

Relocated Car berth

2.43 The relocated car berth has proposed dredge depths of -9m CD, stepping up to -7m CD at the southern end of the site. The material is again predominantly soft alluvium with the potential for a

small fraction of stiff London Clay. The total volume of dredging will be in the order of approximately 65,000m³.

Method of Dredging

2.44 The method of dredging will be influenced by the particular contractor's chosen methods of working (together with any conditions attached to the marine licence for these works), but is likely to be by either:

- Backhoe Dredger; or
- Trailer Suction Hopper Dredger (TSHD).

Disposal of Dredged Materials

2.45 Analysis and testing of the seabed materials is ongoing and a final disposal strategy will not be determined until all information is available and appropriate consultations have been undertaken with MMO and CEFAS.

2.46 However, from information available, it is expected that the dredge material will not be suitable for beneficial re-use and, as such, it is likely to that the material will be proposed to be disposed of at sea. The Port of Sheerness has used several approved sea disposal sites in the past and it is expected that these sites will be suitable for disposal of the material arising from dredging operations.

Storage and Working Areas on Existing Lands

2.47 The existing port lands are to be used for a number of operations associated with the WTM facility, including the storage, assembly and transport of turbine components. These lands can be grouped into two separate areas, as follows:

- those areas of the site located on the lands of the original dockyard (pre 1990's) and which are currently used for a variety of port-related activities; and
- those areas of the site located on the Lappel Bank which was reclaimed in the 1990's and which are largely used for car storage.

2.48 These areas will be mainly be finished at or near existing ground with no planned structures other than buildings. Therefore, construction activities will be restricted largely to ground works and surfacing, the nature of which will depend on the particular proposed use.

2.49 Within the site generally, there will be a requirement for 'cut and fill' and the importation of some fill material in order to achieve the required site levels. A full assessment of the requirements for excavation and filling is yet to be completed pending the finalising of structure and surfacing proposals. However, it can be anticipated that general civil engineering ground works activities such as excavation, grading and preparation of surfaces and the placement and compaction of fill will be carried out to varying degrees across the whole of the site.

Proposed Works to the Lappel Bank

2.50 The ground on the Lappel Bank on which the WTM will be sited is characterised by a layer of imported silty sand used for reclamation (5-6m in depth), overlying a layer of softer original alluvium.

Blade Storage Area

- 2.51 The blade storage area will be located towards the south end of the site. This will be a large ground level storage area.
- 2.52 Final surfacing solutions are yet to be determined, however it is anticipated at this stage that the surfacing will comprise a reinforced concrete ground bearing slab. Ground conditions are relatively poor and variable at this location and it is therefore anticipated that the area will be treated by ground improvement techniques prior to the placement of fill and subsequent surfacing.

Tower Assembly Area

- 2.53 The tower assembly area is located between the quay structures and buildings at the northern end of the Lappel Bank. This area will be subject to heavy loads and will also have a requirement for very stringent gradient tolerances. Hence, at this location a piled structural slab solution is proposed.
- 2.54 Works will comprise:
- driving of precast concrete piles;
 - filling and grading to the underside of the concrete slab; and
 - construction of concrete slab (approximately 650 mm deep) using traditional concrete working practices.
- 2.55 There will also be a requirement for some localised more extensive and deeper piled foundations for tower erection cranes. However, these will generally use the same construction techniques as described above.

Notch Hinterland Area

- 2.56 The area immediately behind the notch berths will be used for the handling and transportation of components. It is anticipated this area will be provided with a reinforced concrete slab on precast concrete piles in order to provide a high capacity quayside working area.

Proposed works to the Original Port Lands

- 2.57 The ground on the original port lands is characterised by a layer of fill comprising differing materials. As on the Lappel Bank, this fill overlies a layer of soft alluvium. A feature of this area are the many existing buildings and also the buried remains of old port buildings since demolished, many of which have heritage status.
- 2.58 This area is largely proposed for the storage and transport of tower sections prior to assembly.

Tower Section Storage Area

- 2.59 The surfacing solution in the tower section storage area will most likely be similar to that in the blade storage area, comprising a reinforced concrete ground bearing slab. It is anticipated there may be a requirement for localised piling in this area to protect buried and historic features by allowing the reinforced concrete slab to span over such features. Precast concrete piles will most likely be used on these occasions. At the moment, it is not possible to estimate the precise location or number of such piles but it can be expected that pile driving will be undertaken to

some extent in this area. There may also be requirements for localised excavation to expose obstructions to piling or rotary drilling/coring to allow piling to be installed through existing structural elements.

Reclamation in Rats Bay

- 2.60 The tower storage area includes a small area of the existing Rats Bay which is currently open (tidal) water. This narrow strip of water is bounded on one side by existing reclaimed lands with stone armoured revetment and, on the other side, by the old original masonry dock wall structure. It is proposed that this area will be filled once the quay structures along the landward side of the notch have been constructed.
- 2.61 Filling will be with either imported granular material or by the use of suitable crushed demolition waste from the site.

Roads and Access

- 2.62 The site will be accessed via the existing port entrance and internal road network, accessing the WTM site entrance through the flood gates adjacent Archway House.
- 2.63 There will be several elements to the main site roads:
- the main site access road along the northern boundary of the site, extending through to the lands at the south end of the Lappel bank, which will continue to be used by the car importers;
 - internal WTM site roads and service yards; and
 - new staff and visitor car parking.
- 2.64 It is anticipated that roads will generally be of traditional construction except where they cross areas where specific surfacing designs are being implemented, as described previously.
- 2.65 Construction activities will be those normally associated with roads construction, namely:
- groundworks, excavations and filling;
 - placement and compaction of sub-base;
 - placement and rolling of bituminous surfacing; and
 - ancillary lighting, drainage and other services.

Site Drainage

- 2.66 The drainage strategy is currently under development and will be described in detail in the ES and other planning application materials. It is anticipated that the drainage design to the WTM site will adopt the principles of Sustainable Urban Drainage Systems (SUDS) where feasible.

Buildings

- 2.67 The proposed WTM buildings will be subject to an outline planning application and design, with their height, width and other dimensions set within maximum and minimum ranges, as defined by a set of Parameter Plans submitted for approval (see Section 5). Therefore, the final form, structure and appearance of these buildings will be established at the detailed design stage. Thereafter, it is anticipated that the approval of such details by the Council will be through 'reserved matters' planning applications and/or the discharge of planning conditions. However,

for the purposes of this Scoping Report, a brief description of the key WTM buildings and their likely construction has been provided below.

New Buildings

- 2.68 New buildings proposed for the site include;
- Blades Production Building with associated Corporate Services centre (CSC).
 - Nacelle Assembly Building.
 - PCM Assembly Building.
- 2.69 Generally, it is anticipated that buildings will be of steel framed construction with piled foundations, and concrete floor slabs.

Buildings retained for Re-use

- 2.70 Two existing buildings are proposed to be retained for re-use:
- Ambient Area W4; and
 - Cool Store No 2.
- 2.71 Precise details of works required to be carried out on these existing buildings will be provided when available, however it is expected that the northernmost structural bay of each building will need to be removed to accommodate construction of the main perimeter building.

Phasing of Engineering Works

- 2.72 The site will be released to Vestas in a number of phases and construction works will therefore be under taken in a similar phased manner. The indicative phasing of the WTM scheme is illustrated in a plan included in Appendix A of this Scoping Report.
- 2.73 In summary, the following areas comprise the first phase and it is proposed that construction of these facilities will commence in late 2012 / early 2013, ready for occupation in early 2015:
- Area A1 – Strengthening Berth 6 and new Notch to Berth 3.
 - Area A2 – Strengthening Berth 2.
 - Area B – Blade production building (Phase 1), nacelles assembly, offshore buildings and associated loading and parking areas.
 - Area C – Tower storage and erection.
 - Area D – Nacelles storage.
- 2.74 The remaining areas comprise subsequent phases and it is anticipated that these facilities will be constructed, ready for occupation in 2016.
- Area B – Blades production building (Phase 2).
 - Area F – Tower storage area.
 - Phase G – Blades storage on Lappel Bank.
 - Phase E1 & E2 – Strengthening Berth 7 and infilling behind.

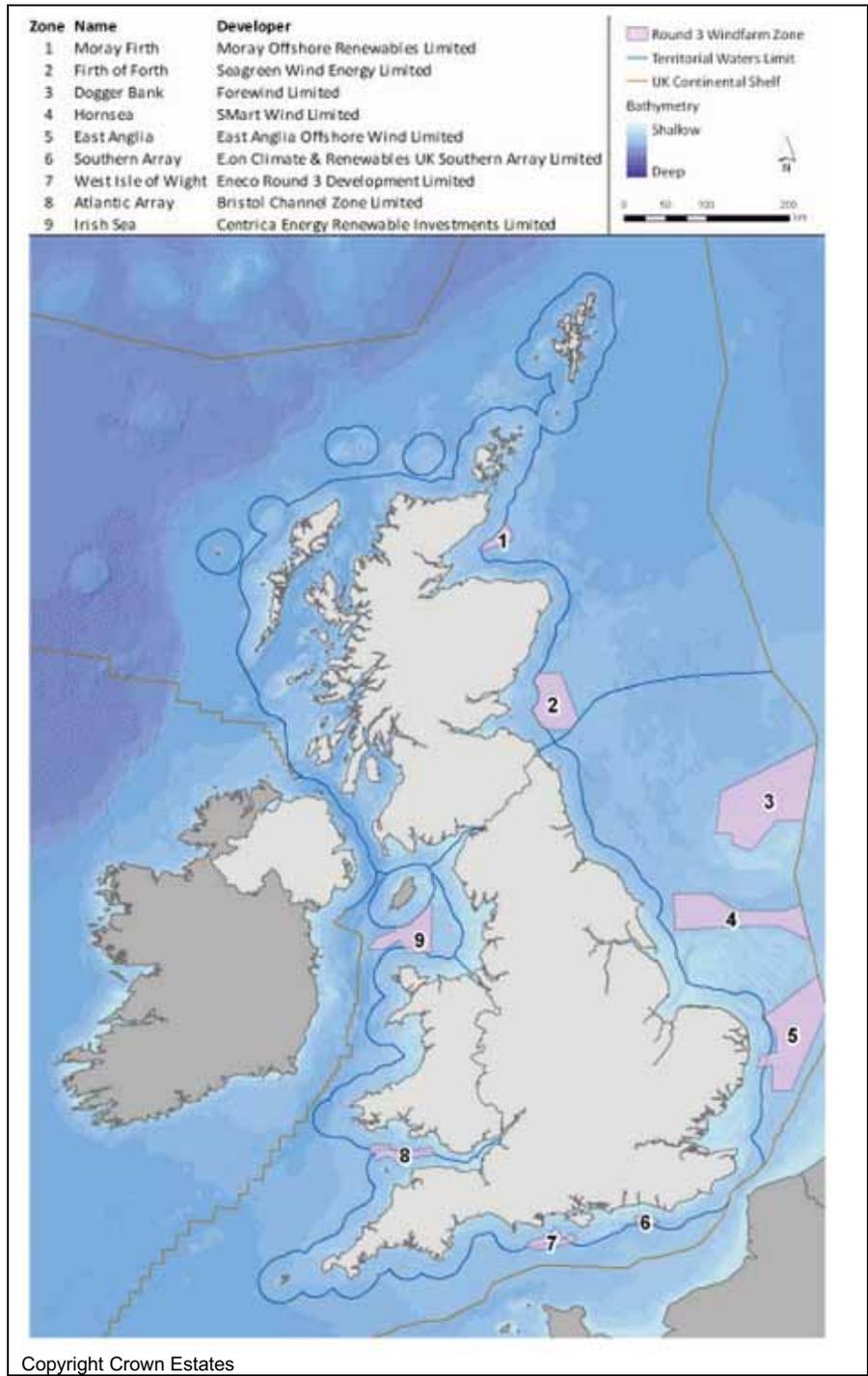
c) Need for the Proposed Development

- 2.75 Wind farm development in the UK has been assisted by Government initiatives in the form of the Non-Fossil Fuel Obligation (1990-2002) and the Renewables Obligation (2002 to present). These obligations have provided the main mechanism by which the Government has promoted renewable energy development in the UK.

- 2.76 In 1998, formal procedures for allocating The Crown Estate (TCE) owned seabed for the purposes of offshore wind farm development began under the Non-Fossil Fuel Obligation. Between 1998 and 2004 two rounds of sea-bed allocation occurred, followed by extensions to these areas in May 2010, under the current Renewables Obligation.
- 2.77 The current “Round 3” series of allocations occurred in the period 2007 to 2009. This identified nine offshore wind development zones, as illustrated in Figure 2.3 below. Subsequent to the identification of these zones, individual investment entities have entered into partnership agreements with The Crown Estate in order to develop individual offshore ‘wind farm’ electricity generation sites.
- 2.78 A potential 32GW of wind generation capacity has been proposed under the Round 3 allocations, all of which is expected to be installed over the period 2013 to 2020.
- 2.79 The following statement from The Crown Estates highlights the general requirement within the UK to invest in the provision of wind farm supply chain goods and services:

“The Crown Estate recognises that supply chain constraints are one of the most significant issues facing investors in offshore wind farms. The strategic approach to Round 3 is expected to provide turbine manufacturers and other links in the supply chain with greater visibility and certainty of future demand, which should allow them to make the necessary investments to meet that demand and reduce constraints.”¹

Figure 2.3 – Round 3 Wind Farm Zones



2.80 It was in response this demand for UK offshore wind turbine technology that, in early 2010, Vestas began a process of site evaluation in order to identify a suitable UK host site at which to develop a major WTM facility to supply turbines to the Round 3 market from 2014 and beyond. By late 2010 it had completed this site evaluation exercise, resulting in the selection of the Port of

Sheerness. The selection of Sheerness was primarily made on the basis of the Port's existing infrastructure, available development space, good accessibility and financial considerations. An Option Agreement to develop the WTM facility at the Port of Sheerness was signed in March 2011.

d) **The V164 Turbine**

Figure 2.4 – The V164 Turbine Enclosed within Nacelle



- 2.81 Vestas propose to manufacture a 'new generation' of offshore wind turbines at Sheerness which will each generate approximately 7MW of electricity supply to the National Grid. This turbine design has been designated the acronym 'V164' on account of the fact that, once installed at sea, this turbine will be fed by a rotor blade circumference of approximately 164m.
- 2.82 Technical and design specifications for the V164 Turbine, nacelles, blades and towers are summarised in Figure 2.5.

Figure 2.5 – V164 Turbine Technical Specifications

POWER REGULATION pitch regulated with variable speed		ELECTRICAL	
<hr/>		Frequency	50 Hz
OPERATING DATA		Converter type	Full scale converter
Rated power	7.0 MW	Generator type	Permanent magnet
Cut-in wind speed	4 m/s	Nominal voltage	33 - 35 and 66 kV
Operational rotor speed	4.8 - 12.1 rpm	<hr/>	
Nominal rotor speed	10.5 rpm	TOWER	
Operational temperature range	-10 - +25°C	Type	Tubular steel tower
Extreme temperature range	-15 - +35°C	Hub heights	Site specific
<hr/>		<hr/>	
DESIGN PARAMETERS		BLADE DIMENSIONS	
WIND CLASS - IEC	IEC S	Length	80 m
Annual avg. Wind speed	11 m/s	Max. chord	5.4 m
Weibull shape parameter	k 2.2	<hr/>	
Weibull scale parameter	12.4 m/s	NACELLE DIMENSIONS (INCL. HUB AND COOLERS)	
Turbulence intensity	IEC B	Height	7.5 m
1 year mean wind speed V1 (10 min avg.)	40 m/s	Length	24 m
50 year mean wind speed V50 (10 min avg.)	50 m/s	Width	12 m
Max inflow angle (vertical)	0°	<hr/>	
Structural design lifetime	25 years	WEIGHTS	
<hr/>		Nacelle, including hub	390 ± 10% tonnes
ROTOR		Blade	35 tonnes
Rotor diameter	164 m	Tower	Site dependent
Swept area	21,124 m ²	<hr/>	
<hr/>		<hr/>	

3 LEGISLATIVE AND REGULATORY REQUIREMENTS

a) Requirement for Environmental Impact Assessment

- 3.1 The licensing regime under Part 4 of the Marine and Coastal Access Act 2009 (MCAA) has replaced various previous regulatory regimes, including those under:
- Part 2 of the Coast Protection Act (CPA) 1949.
 - Part 2 of the Food and Environment Protection Act (FEPA) 1985.
 - The Environmental Impact Assessment and Natural Habitats (Extraction of Minerals by Marine Dredging) (England and Northern Ireland) Regulations 2007.
- 3.2 The Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended in 2011) now apply to marine 'regulated activities' under the MCAA.
- 3.3 Guidance on the scope of development to be included within an MWR Environmental Impact Assessment is provided by the Marine Management Organisation (MMO). This identifies that a particular marine licensing proposals should not be considered in isolation if, in reality, it is properly to be regarded as an integral part of a more substantial plan or project. In such cases, the need for EIA must be considered in respect of all of the proposed works or activities.
- 3.4 In accordance with this guidance, both the marine works and the land-based works associated with the proposed WTM Facility are to be included within the EIA and, as such, the resulting Environmental Statement (ES) will be a composite document submitted with both the planning application and marine licence applications. The proposed development is therefore considered within the provisions of the following:
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2011.
 - The Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2011.
- 3.5 Under both sets of regulations, the EIA process requires the identification of 'likely significant environmental effects' arising from a proposed development or activity, both adverse and beneficial.
- 3.6 The systematic approach to EIA enables development designs to respond in an iterative manner to its receiving environment. All practical measures should be taken to avoid, reduce, and where possible, offset any potentially significant adverse environmental effects. Furthermore, the EIA process aims to ensure that the potentially beneficial effects of the development proposals are optimised.

Relationship to the IPC

- 3.7 The 2008 Planning Act introduced new planning procedures for nationally significant infrastructure projects. The 2008 Act provides for certain harbour (port) developments to be designated as "nationally significant" and therefore subject to Development Consent Orders (DCO) to be determined by the Infrastructure Planning Commission (IPC) rather than the local planning authority or other regulatory body. Such projects include major alterations to harbour facilities that would increase the quantity of materials or passengers that a port can handle on an annual basis. The relevant thresholds given in the Planning Act are:

- In the case of facilities for container ships, 500,000 TEU.
- In the case of facilities for RO-RO ships, 250,000 units.
- In the case of facilities for cargo ships of any other description, 5 million tonnes; and,
- In the case of facilities for more than one of the above an 'equivalent quantity' of material (facilities are capable of handling an equivalent quantity of material if the sum of the relevant fractions is 1 or more).

3.8 The proposed WTM development does not fall into any of the above categories and has therefore been deemed not to constitute an application that is referable to the IPC. Rather, the planning application will be determined by Swale Borough Council as the relevant competent authority, whilst associated marine regulatory approvals will be issued by the MMO.

b) Government and Planning Policy Context

Ports and Harbours

3.9 The Department for Transport's paper entitled "*Modern Ports: A UK Policy*" states the following with respect to the development and ongoing operation of Ports in the UK:

"Ports serve the national interest, supporting the competitiveness of national and regional economies. It is in the national interest that our ports remain able to handle current UK trade and its potential development efficiently and sustainably. They must succeed not only to meet the immediate demands of their customers, but also to invest in new facilities, in safety, and to safeguard communities and the environment"².

3.10 The development of trade through existing ports such as Sheerness, as well as investment in new port facilities is clearly supported by this Government policy document.

3.11 The Draft National Policy Statement for Ports, which is currently undergoing consultation review, identifies the essential role of ports in the UK economy. This Draft NPS notes that:

"Port handling needs for energy can be expected to change as the mix of our energy supplies changes and particularly as renewables play an increasingly important part as an energy source."

Renewables related development

3.12 The Draft National Policy Statement for Renewable Energy Infrastructure (EN-3), which "may also be a material consideration in decision making on applications that fall under the Town and Country Planning Act 1990, as (amended)" applies to offshore wind energy development proposals which generate more than 100MW. While the WTM itself is not a generation proposal, it is considered part of the enabling industry that is required for offshore wind developments to be implemented.

Economic Growth

3.13 The March 2011 "Planning for Growth" statement by the Minister of State for Decentralisation, includes the following:

"In determining planning applications, local planning authorities are obliged to have regard to all relevant considerations. They should ensure that they give appropriate weight to the need to

support economic recovery, that applications that secure sustainable growth are treated favourably (consistent with policy in PPS4), and that they can give clear reasons”³.

- 3.14 In October 2010, the Department of Energy and Climate Change (DECC) and The Crown Estate signed a Letter of Intent to support development of ports infrastructure for offshore wind⁴. The proposed WTM at Sheerness is a direct result of this Government support.

Marine Policy Statement 2011

- 3.15 The UK Marine Policy Statement of March 2011 (MPS 2011) sets out the framework for preparing Marine Plans and taking decisions affecting the marine environment. The MPS 2011 identifies potential impacts on the marine environment resulting from coastal/ marine development projects including Port Development (MPS2011 s3.49, 3.410) and Marine Dredging and Disposal (MPS 2011 s3.63-3.66), both of which are relevant to the scoping of impacts from the proposed WTM.

National Planning Policy

- 3.16 The following National Planning Policy is relevant to the EIA scope and methodology.
- PPS1: Delivering Sustainable Development. The development of sustainable industry and economic growth is supported by PPS1.
 - PPS1: Planning Policy Statement: Planning and Climate Change (Supplement). This document states that Planning has an important role with respect to “*creating an attractive environment for innovation and for the private sector to bring forward investment, including in renewable and low-carbon technologies and supporting infrastructure*”.
 - PPS4: Planning for Sustainable Economic Growth. PPS4 applies to “economic development” which includes development within the B Use Classes. This policy explicitly provides for the recognition of “*existing business sectors...*” (such as industry located at the Port of Sheerness), “*...taking account of whether they are expanding or contracting and, where possible, identifies and plans for new or emerging sectors likely to locate in their area, such as those producing low carbon goods or services*”.
 - PPS22: Renewable Energy. This confirms that the development of renewable energy will contribute to the achievement of the aims of the 2003 National Energy Policy White Paper (now replaced by the 2007 White Paper of the same name). PPS22 sets out planning related policies with respect to renewable energy development proposals. Whilst the WTM development is not, in itself, a renewable energy development proposal, the facility will form an important part of the necessary supply chain required in order to service renewable energy development proposals, in this case, offshore wind farms.

Regional and Local Policy

- 3.17 The Regional Spatial Strategy (the South East Plan) identifies a number of ‘Gateway Ports’ under Policy T10 ‘Ports and Short Sea Shipping’. These include the Port of Sheerness. Policy T10 states that policies at a regional and local level should seek to maintain and enhance the role of ports with encouragement to be given to investment in infrastructure that supports shipping connections into the wider European network. This document might however be abolished at the end of 2011 should the Localism Bill be passed into law.
- 3.18 Local policy in the form of the Swale Local Plan (2008) makes reference to the Port of Sheerness. Although the Local Plan does not contain any specific policies that relate directly to the Port, paragraph 4.39 does recognise that it is an important employer in the Borough, both directly and indirectly and is one of the nation’s major deep water ports.

3.19 The Local Plan notes that pressures for growth and expansion at the Port remain strong. It goes on to state that the LPA considers that these can be dealt with by making more intensive use of land within the confines of the existing Port area, for example through the use of the Lappel Bank area for 'value added processes' and by making use of sites identified on the Proposals Map of the Plan for employment development. The Local Plan goes on to state that any expansion will, though, be dependant upon completion of the A249 improvements (now completed) and making more use of rail for the movement of freight.

3.20 The Local Plan identifies the WTM site as being within the Coastal Zone, and therefore subject to Policy E13, which controls development impacts on "*the landscape, environmental quality, biodiversity and recreational opportunities of the coast, whilst respecting those natural processes such as flooding, erosion and sea level rise that influence the Zone*".

3.21 The Local Development Framework (LDF) which will eventually replace the Local Plan is at an early stage and can only be afforded limited weight at this time.

c) EIA Scoping

3.22 This Scoping Report outlines the proposed scope and methodology of the EIA, to be reported within the ES, and submitted as part of the planning application for the proposed development.

3.23 This Scoping Report has been submitted to request formal Scoping Opinions from both Swale BC and the MMO in accordance with Regulation 13 of the newly adopted Town and Country Planning EIA Regulations 2011 and the equivalent requirements set out in Regulation 13 and Schedule 4 of the Marine Works EIA Regulations 2007 (amended 2011).

3.24 This EIA Scoping Report sets out the following information in order to assist Swale BC and the MMO in forming their Scoping Opinion(s):

- site location plan and description, including the indicative extent of dredging and other regulated activities within the river bed (below the MHWS level) and on land;
- brief description of the nature and purpose of the development, and its possible effects on the environment;
- the environmental features (receptors) likely to be affected by different stages or activities associated with the development;
- the proposed approach to and methodology of the EIA, including the technical studies, surveys and other assessments feeding into the EIA;
- consultations to be undertaken as part of the EIA; and
- the intended structure of the ES.

3.25 Whilst no formal scoping opinions have been sought to date, it should be noted that various meetings and other forms of consultation have been held over the past 6 months or so between the Applicant's consultant team and Swale BC, the MMO, Natural England, English Heritage and other statutory organisations. This consultation has helped inform in the scope and extent of the various baseline surveys, some of which are now complete.

d) Other Consents and Licences

3.26 The requirement for planning permission generally stops at Mean Low Water Mark (MLWM) unless the LPA's jurisdiction extends beyond this point. In this case, the administrative boundary of the Swale BC extends out into the Medway Estuary itself. Swale is therefore assumed to be competent authority for determining 'development consent' for all aspects of the project, with the

exception of marine licences which will be granted by the MMO. As such, the river side 'enabling works' for the WTM project, including structural strengthening and modifications to the quays and piers and relocation of the car import terminal, will be covered by any planning consent granted by the Council.

- 3.27 Works below the Mean High Water Springs (MHWS) level will also require regulatory approval from the MMO under the Marine and Coastal Access Act 2009 (MCAA) and associated guidance and regulations. Subject to agreement of "EIA Consent" (by Swale BC and/or MMO) it is anticipated that the marine licensing process will follow on from the determination of the outline/hybrid planning application by the Council and may be the subject of appropriate planning conditions.
- 3.28 Regulation 10(1)(b)(ii) of the Marine Works EIA Regulations, permits the MMO to defer to another authority's EIA consent decision and this would appear to be a pragmatic solution in this instance. The draft Planning Performance Agreement (PPA) (September 2011) also places an obligation on the Council to liaise with the MMO in order to coordinate the planning and regulatory approval process. However, the final division of responsibilities between the Council and the MMO had not yet been settled at the time of writing of this Scoping Report.
- 3.29 Subject to the outcome of a heritage impact assessment and ongoing consultation with English Heritage and others, Listed Building Consent (LBC) will be sought from the Swale BC for the removal of the Grade II* listed Mast House (Building 26) which sits within the WTM development boundary to the north.
- 3.30 Dependant upon the types and quantities of substances to be stored within WTM facility, Hazardous Substances Consent (HSC) may be required. Swale BC, acting as the Hazardous Substances Authority (HSA) would be responsible for granting any HSC. The Health and Safety Executive (HSE) would be consulted on the application before the HSA make a decision.
- 3.31 Other consents and licences that may be required to implement and operate the WTM project include:
- Leases from the Crown Estate for works on the river bed.
 - Consents under the Water Resources Act 1991 relating to works to flood defences, discharges and waste management – The Environment Agency (EA).
 - Other drainage consents – Lower Medway Internal Drainage Board.
 - Consent from the Rochester Oyster Fishery and Queenborough Oyster Fishery.
 - Wildlife Licences under the Countryside Act 1981 and related acts – Natural England and the EA.
 - Consents under Health and Safety Act 1974 – HSE.
 - Utilities Consents/Licences – Water companies and power providers.
- 3.32 The above list should not be treated as definitive and will be subject to further discussions with the statutory authorities. The EIA will apply an integrated approach to the effects assessment, thus ensuring that the accumulation of different types of effects on certain receptors within the jurisdiction of individual regulatory authorities is not overlooked. Equally, the 'mitigation' introduced by these statutory environmental controls will be taken account of in the ES.
- 3.33 Due to the proximity of the WTM to sites of international wildlife importance (the Medway Estuary and Marshes SPA/SSSI/Ramsar site), the project may in due course be subject to an Habitat Regulation Assessment (HRA) and 'Appropriate Assessment' under the Conservation of Habitats

and Species Regulations 2010 (commonly referred to as the Habitats Regulations). This Appropriate Assessment must be completed by the “competent authority”, who in this case is likely to be Swale BC. However, in discharging this duty, the Council will be advised by both Natural England and the MMO. The ES will be accompanied by an Appropriate Assessment “signposting document” to identify where information is provided in the ES. This document will serve two functions:

- to assist the Competent Authority by making it easier to undertake and consult on an Appropriate Assessment; and
- to act as confirmatory checklist that can be used to ensure that the relevant information needed for an Appropriate Assessment is contained in the ES.

3.34 As indicated above, it is expected that the Applicant will enter into a Section 106 planning agreement with the LPA to secure contributions/obligations to mitigate the impact of the development and to enhance its beneficial effects. It may also be necessary to enter into a Section 278 agreement with the Highway Authority if any off-site highway improvement works are required to accommodate traffic derived from the WTM facility. However, such requirement can only be determined at the conclusion of the EIA and Transport Assessment.

4 GENERAL APPROACH TO THE EIA

a) Background

- 4.1 The ES will be prepared in compliance with the EIA Regulations which implement Council Directive No 85/337/EEC⁵ as amended by the Council Directive No. 97/11/EC⁶. Reference will also be made to current EIA good practice guidance including:
- Preparation of Environmental Statements for Planning Projects that require Environmental Impact Assessment - A Good Practice Guide, Department of the Environment (DoE) (1995)⁷.
 - Department of Environmental, Transport and the Regions (DETR) Circular 02/99 Environmental Impact Assessment⁸.
 - Institute of Environmental Management and Assessment (IEMA) Update to Guidelines for Environmental Impact Assessment (2006)⁹.
 - Marine Licensing Guidance No. 8 – Environmental Impact Assessment (April 2011) issued by the Marine Management Organisation (MMO).
 - The Essex Guide to Environmental Impact Assessment (2007) produced by the Essex Planning Officers Association – recommended by the MMO.
 - Topic specific guidance as referred to in the assessment sections where appropriate.
- 4.2 The EIA will give due consideration to relevant EIA case law and the formal Scoping Opinion(s) received from Swale BC and the MMO.
- 4.3 The EIA will consider the likely significant environmental effects of the development, utilising current knowledge of the site and the surrounding environment. Based on the findings of the studies undertaken as part of the EIA, methods of preventing, reducing, or offsetting significant adverse effects (collectively known as 'mitigation measures'), and methods to enhance any beneficial effects, will be set out in each relevant technical chapter of the ES.
- 4.4 The content of the Environmental Statement (ES) will be informed by the EIA Regulations and relevant best practice guidelines which set out the information required for inclusion within an ES. In accordance with the Town and Country Planning EIA Regulations (Schedule 4, Part I and II) the ES will provide:
- A description of the development for which a planning consent is being sought, including in particular:
 - a description of the physical characteristics of the whole development and land-use requirements during construction and operational phases of the WTM;
 - a description of the main characteristics of the production processes, including the nature and quality of materials used; and
 - an estimate, by type and quantity, of the expected residues and emissions (water, air and soil pollution, noise, vibration, light etc.) resulting from the operation of the WTM.
 - A description of the aspects of the environment likely to be affected by the proposed development including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets and landscape, and the inter-relationship between these factors.
 - A description of the likely significant effects of the development on the environment, including direct, indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects.
 - A description of the forecasting methods used to assess the effects on the environment.
 - A description of the measures envisaged to avoid, reduce and where possible offset any significant environmental effects associated with the development (i.e. mitigation measures);

- An outline of the main site selection and design alternatives considered by the Applicant and the reasons for the selection of the preferred option, taking into account environmental effects;
- A description of any technical difficulties, lack of data or other uncertainties associated with the EIA.
- A Non-Technical Summary (NTS) summarising, in non-technical language, the key findings of the EIA.

4.5 Additionally, in accordance with Schedule 3 of the Marine Works EIA Regulations the following information will be provided:

- The quantity, nature and source of the materials to be used in the course of the project and the regulated activity;
- The quantity, nature and source of any items or materials to be deposited in the sea in the course of the project and the regulated activity; and
- The working methods to be used in the course of the project and regulated activity.

b) Structure of the Technical Chapters

4.6 Each environmental topic and sub-topics 'scoped in' to EIA (described later in this Scoping Report) will be addressed in a separate technical chapter of the ES. Within each of these technical chapters, the assessment will be structured in the following way:

Introduction

4.7 The introduction will provide a brief summary of what is considered in the chapter and will state the author and/or relevant technical contributor. Where appropriate, it will describe the assumptions and limitations related to the assessment of that topic and any constraints to undertaking the assessment.

Summary of Planning Policy and Legislative Context

4.8 This section will summarise the legislation and planning policy (at national, regional and local level) that are relevant to the assessment of environmental effects for to the technical topic.

Description of Assessment Methodology

4.9 The assessment methodology section in each chapter will provides an explanation of methods used in undertaking the technical assessment and the prediction of effects. Reference will be made to any published methodological standards, professional guidelines and best practice that are particular to the topic.

4.10 This section will also describe any topic-specific significance criteria applied in the assessment, particularly where these differ from common or generic criteria applied elsewhere in the ES (e.g. those provided in the IEEM guidance on ecological impact assessment). However, wherever possible, a common scale and language for assessing impacts will be applied.

Description of Baseline Conditions

4.11 This section will describe the environmental conditions that exist in the absence of the development both now (2011) and, where relevant, those that are projected to exist in the future. The results of baseline surveys and desktop research will be summarised in this section.

- 4.12 Relevant receptors to the specific topic-based effects (e.g. noise, air quality, visual effects etc.) will be described, together with an indication of their relative sensitivity of these receptors to such effects.

Assessment of Potential Effects

- 4.13 This section will present the assessment of potential effects/ impacts that are predicted to occur during the construction, operation and (where relevant) decommissioning of the WTM facility. Potential impacts will be considered on the basis of their magnitude, duration and reversibility. The assessment will include:

- the activities and physical elements of the development that are likely to give rise to particular effects, together with a more detailed description of such activities or elements where this would aid the reader's understanding of the assessment;
- any specific mitigation measures that have already been incorporated into the design of the WTM in order to avoid or minimise the environmental effects (i.e. 'design mitigation');
- any proposed additional mitigation measures, to be secured through planning condition or other mechanism, in order to avoid, reduce, off-set or compensate for the identified impacts;
- the likely magnitude, spatial extent and duration of the 'residual impacts' taking account of the proposed mitigation measures; and
- a statement of the significance of each residual impact and, where relevant, a statement of the significance of the total sum of such impacts.

Summary of Mitigation and Residual Effects

- 4.14 This section will summarise the mitigation measures proposed to avoid, reduced or otherwise offset or compensate for any significant adverse environmental effects identified through the EIA process, together with the measures that will be taken by the Applicant to enhance the beneficial effects of the scheme as they apply to the assessment topic. The potential mechanisms by which the proposed mitigation measures will be implemented (e.g. planning conditions/ obligations or conditions attached to the marine licence) will be specified.

- 4.15 A tabulated summary of the impacts at different stages and activities of the WTM development will be provided at the end of each technical chapter.

Cumulative and Combined Effects

- 4.16 The cumulative and combined effects of WTM development itself, and with other planned or committed development in the local area, will be addressed on a topic-by-topic basis and reported in a subsection of each technical chapter.

- 4.17 'Combined effects' (sometimes referred to as Type 1 cumulative effects) occur when two or more different environmental effects from the proposed development (e.g. dust, noise, traffic etc.) act together to produce a different level of effect/ impact experienced by a particular receptor. These combined effects can be additive or synergistic such that the sum of the impacts can be less or more than the individual impacts (i.e. because they may exacerbate or neutralise one another).

- 4.18 'Cumulative' effects (or Type 2 effects) are those that accrue over time and space from a number of different development activities and projects in geographical proximity to one another. The EIA will consider all cumulative effects arising from developments which are (a) of a type, duration and scale that have the potential to cause significant environmental effects in their own right and (b) are reasonably foreseeable in terms of delivery (i.e. committed developments which have

planning consent). The cumulative schemes to be considered through this process will be agreed through consultation with the Council and MMO.

- 4.19 The cumulative effects of other Port-related developments, including the potential relocation of the existing car storage compounds to other locations within and beyond the site boundary, will also be assessed as and when the Applicant decides to proceed with these projects. However, these plans are at an early stage of development and may be subject to separate planning applications and environmental assessments in due course. If any decision is reached on these associated projects prior to the WTM application being submitted, then a separate chapter or standalone cumulative effects assessment will be prepared for submission to the Council. These associated developments are not considered to have any potential effects on the marine environment and thus are unlikely to be of concern to the MMO or to be applicable to the marine consenting process.

5 PRINCIPAL MATTERS TO BE ADDRESSED BY THE EIA

a) Introduction

5.1 With respect to identifying the likely significant environmental effects associated with the development, this EIA Scoping Report gives due consideration to a range of potential effects associated with the proposed WTM development, both beneficial and adverse, which could be deemed to be 'significant' on the basis of:

- the value/ importance of the resources and receptors that could be affected by the construction and operation of the development;
- the predicted magnitude of environmental change and/or impact experienced by these resources and receptors, accounting for their size, duration and spatial extent; and
- options for avoiding, reducing, offsetting or compensating for any potentially significant adverse effects and the likely effectiveness of such mitigation measures.

5.2 Subsequent sections of this EIA Scoping Report set out the range of topics, sub-topics and detailed issues which are proposed to be considered in the EIA, whilst the principal / common considerations of the EIA are described below.

b) Alternatives

5.3 In accordance with Schedule 3(8) of the Marine Works EIA Regulations (and the equivalent requirement under the Town and Country Planning EIA Regulations), the ES will provide:

“A description of the main alternatives studied by the applicant and an indication of the main reasons for the applicant’s choice, taking into account the environmental effects of those alternatives and the project as proposed”.

5.4 The ES will first present a general account of the site selection criteria and process applied by Vestas in reaching its decision to locate the WTM facility at the Port of Sheerness, whilst observing certain commercial confidentialities associated with its negotiations with other UK port operators. The key stages of the design and engineering feasibility process will then be described, including alternative layouts of the WTM facility within the Port, and engineering/enabling works on the quayside and within the river bed.

5.5 The Alternatives chapter of the ES will also include an assessment of the 'do nothing' scenario (i.e. the future existence of the Port in the absence of the WTM).

5.6 In summary, the ES will include a description of:

- alternative locations for the WTM development.
- the 'do nothing' scenario, including the socio-economic consequences of the WTM development not taking place and the site remaining in its current form;
- the 'base case' scenario whereby alternatively planned and consented developments at the Port are implemented. This includes the construction and operation of four wind turbines on the Lappel Bank ("Port of Sheerness Wind Farm") which was approved by Swale BC in March 2009 (planning ref: SW/08/0896). This scheme represents a 'fall back' development option but would be unlikely to be built out if the WTM project proceeds as planned.
- 'alternative designs'. This will summarise the progression of the design work and how environmental considerations have influenced the overall design process. A summary of the

main alternatives considered, such as alternative plan form layouts, building heights and massing will be presented, together with the justification for the selection of the final design.

c) Development Specification

5.7 In accordance with the Town and Country Planning EIA Regulations, the ES will include a description of the proposed development as defined by a set of planning application drawings, engineering designs and other documents submitted for approval. The planning application will also be supported by a Design and Access Statement (DAS) and written 'Development Specification' which, together, will provide further information on the WTM proposals and help inform the EIA.

5.8 As explained earlier in this report, the planning application will comprise a 'hybrid' application, with some aspects of the WTM project defined in detail and other elements (e.g. building dimensions, surface/ elevational treatments, landscaping etc) provided in outline. The outline elements of the proposals will, however, be defined within the context of a range of maximum and minimum development parameters as defined by a set of Parameter Plans submitted for approval. This approach is necessary in order to preserve a degree of flexibility in the final design of the WTM production buildings, storage areas, associated plant and internal transport infrastructure, not least because the new V164 wind turbine model to be built at Sheerness is still under development and not yet in production elsewhere.

5.9 It is expected that final details of the 'land side' elements of the project will be approved through reserved matters planning applications and/or the discharge of planning conditions imposed by the Council. This planning approach is now a tried and tested method for determining major outline/ hybrid applications which are subject to EIA and accords with Circular 01/2006 issued by the Department for Communities and Local Government (DCLG). Specifically, the Parameter Plans will be sufficiently defined in order to determine the main and significant environmental effects of the land side elements of the proposed development, as required by the EIA Regulations and subsequent case law. As a minimum they will show:

- **Principal Land Uses** - detailing the distribution of the major land use components of the development across the application site.
- **Development Zones** - identifying distinct Development Zones within the application site in which buildings and spaces will be constructed and created. Each Development Zone may consist of a series of Building Zones defined by the location of access and circulation routes and associated spaces (e.g. parking and loading areas).
- **Building and Structures Zones** - defining the areas within the Development Zones where buildings and structures will be located.
- **Floorspace Ranges** - defining the maximum and minimum floorspace figures for each Development Zone.
- **Building and Structure Dimensions** - defining the maximum and minimum height, length and width for buildings and structures.
- **Ground Levels** - defining existing ground levels within the site and the finished floor levels of the development.
- **Access, Circulation and Transport Infrastructure** - defining vehicular, pedestrian and cycle routes, new junctions and roads and connections to the existing network.
- **Utility Infrastructure** - identifying locations for energy, waste, water and waste water facilities and plant within the application site and also zones/corridors where major utilities may cross.
- **Indicative Layout** - illustrating how the development could be configured based upon the Parameter Drawings.
- **Indicative Phasing** – identifying how the development may be phased and delivered.

- 5.10 With respect to the 'marine side' elements of the proposed development, it is recognised that a further level of detail is required in order to properly assess the environmental effects of these works and to provide the necessary information in order to comply with the regulatory approval process administered by the MMO (for dredging and other permanent or temporary structures on the river/ sea bed) and, where necessary, to inform an Appropriate Assessment in accordance with the Habitat Regulations. Accordingly, the engineering and enabling works of WTM project will be defined to a sufficient level of detail in order to assess the full environmental effects of these works, including potential changes to hydrodynamic and coastal processes, water quality, marine ecology and other effects of these works. The main engineering works associated with the WTM development have already been described in Section 2(b) of this Scoping Report.
- 5.11 The description of the enabling works development and associated engineering drawings will include a factual account of:
- the dimensions and depths of dredging zones to facilitate navigation, loading and off-loading requirements for vessels involved in the shipment of manufactured components and assembled wind turbines;
 - disposal arrangements for dredged materials (Note: likely to comprise the use of existing sites approved for the disposal of maintenance dredgings by the Harbour Authority);
 - construction of the new finger berth, infilling and structural strengthening of existing quays;
 - construction of the replacement car terminal structure; and
 - other fixed and permanent structures.
- d) Development Programme, Demolition and Construction**
- 5.12 The ES will outline the main activities associated with the proposed demolition and construction programme and phasing, together with the likely duration of each activity. The construction of the WTM Facility and associated works are likely to commence in 2012 and extend over a period of 18 to 24 months, although the blades manufacturing building may be built out in modular form, meaning that this part of the construction programme could be extended.
- 5.13 The ES will also consider potential environmental effects associated with the demolition and construction works. Such effects are likely to include the production of dust, noise, wastes, marine sediment suspension and traffic.
- 5.14 The ES will set out the principles for a site specific Framework Construction Environmental Management Plan (CEMP) to be prepared to regulate construction activities and minimise environmental impacts where possible. This CEMP will incorporate 'good practice; measures and construction guidance, notably:
- Kent County Council, Kent Design Guide: Sustainable Construction Technical Appendix, 2009¹⁰;
 - Supplementary Planning Guidance on Sustainable Design and Construction (2006)¹¹ prepared by the GLA; and
 - London Best Practice Guidance 'The Control of Dust and Emissions from Construction and Demolition' (2006) produced in partnership by the GLA, London Councils and the Association of Local Government¹².
- 5.15 In addition, each technical chapter of the ES will give a detailed account of the potentially significant demolition and construction effects specific to that topic. Each assessment will consider the anticipated demolition and construction timetable, phasing and description of works.

e) Baseline and Assessment Years

- 5.16 For the purposes of the EIA, the Baseline Year will be the period 2010 to 2011, which is the period for which the most up to date environmental baseline information is available for the Port and surrounding environs.
- 5.17 Construction impacts will be assessed for key phases and activities over the period December 2012 to 2016, with some WTM elements becoming operational during this period.
- 5.18 The operational impacts of the WTM will be assessed for the year 2020, which is the year when it is predicted that manufacturing facility will have reached full operational capability, with the potential for maximum production throughput.
- 5.19 It is recognised that the phased nature of construction and operations for the WTM will necessitate, for some of the EIA disciplines, an assessment of intermediate years between 2012 and 2020. In particular, the socio-economic assessment will consider the transition between existing port activities and the anticipated maximum operation of the WTM in 2020, taking into account intermediate changes to employment and economic activities in the interim.

f) Technical Chapters

- 5.20 The following comprise the list of technical disciplines that will be assessed in detail in the Environmental Statement. The proposed scope and methodology for each technical discipline is outlined in the following Sections of this Scoping Report (Sections 8 to 22):

- Socio-economics
- Hydro-dynamics, sediments and coastal processes
- Flood risk and surface water effects
- Marine ecology – general
- Marine ecology – fish and shellfish
- Marine ecology – benthic intertidal and sub-tidal
- Marine ecology – marine mammals
- Terrestrial ecology
- Archaeology and cultural heritage
- Townscape and visual effects
- Traffic and transport
- Air quality
- Noise and vibration
- Ground conditions and contamination
- Waste

6 CONSULTATION

6.1 In the lead up to the planning application and throughout the development design, a programme of consultation has and will continue to be undertaken with statutory and non-statutory consultees and with members of the public. Further consultation will also be undertaken as part of the ongoing EIA process, including with the following organisations:

- Swale Borough Council (SBC)
- The Marine Management Organisation (MMO)
- Environment Agency (EA)
- Natural England (NE)
- Kent County Council (KCC)
- English Heritage (EH)
- Kent Archaeological Society (KAS)
- Kent Wildlife Trust
- Kent and Medway Biological Record Centre
- Port of London Authority (PLA)
- Thames Estuary Partnership
- Medway and Swale Estuary Partnership
- Medway Borough Council
- Balanced Seas
- Kent and Essex Inshore Fisheries and Conservation Authority
- Rochester Oyster and Floating Fishery (ROFF)

6.2 A summary of relevant consultation will be presented in the introductory sections of the ES. This will provide details of any environmental issues raised and provide an audit trail of how the EIA process has responded. Consultation that is specific to a particular EIA discipline will be reported in detail where relevant within the technical chapters of the ES.

6.3 Technical consultation that has already occurred prior to the submission of this Scoping Report includes that shown in Table 6.1. This excludes ongoing meetings and other forms of consultation on the project with both Swale BC and MMO.

Table 6.1 – Technical Consultation Undertaken to Date

Organisation	Content of Consultations	Date	Relevant Feedback
English Heritage Advisory Committee	Heritage Assets	14 September 2011	Feedback to be provided by English Heritage in October 2011
English Heritage	Heritage Assets	03 August 2011	Information gathering meeting, for the benefit of the stakeholders.
Kent County Council	Archaeology (marine)	27 July 2011	Provided feedback on protocol for archaeological recording during marine ecology surveys.
Kent County Council	Traffic and Transport	25 July 2011	Discussed potential impacts on road network. KCC provided information with respect to local traffic issues and road network projects.
Kent Wildlife Trust	Marine Ecology (General)	9 June 2011	Provide data to marine recorder, held by KMBRC (see below)
Kent and Medway Biological Record Centre	Marine Ecology (General)	9 June 2011	Provided BAP habitats and data from marine recorder
Thames	Marine Ecology	9 June 2011	Responded that they were not data holders

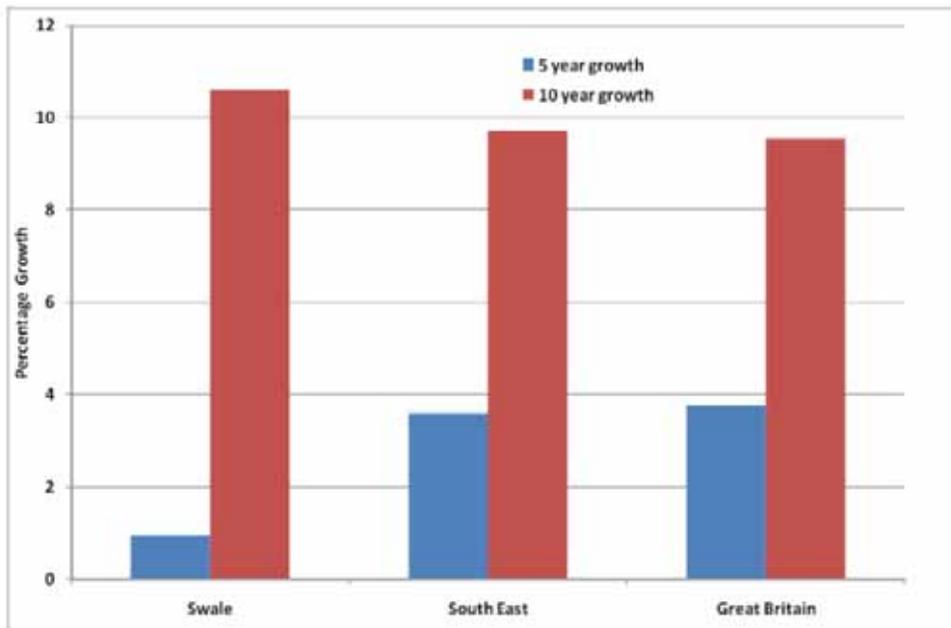
Organisation	Content of Consultations	Date	Relevant Feedback
Estuary Partnership	(General)		
Medway and Swale Estuary Partnership	Marine Ecology (General)	9 June 2011	Responded that they were not data holders
Balanced Seas	Marine Nature Conservation	9 June 2011	Provided draft MCZ recommendations report and GIS data for MCZ boundaries
Environment Agency	Benthic Ecology	6 June 2011	Provided GIS data for benthic sampling locations
Natural England	Benthic Ecology	9 June 2011	Provided information regarding licence process for sampling
Environment Agency	Water Quality	27 June 2011	Provided EA water quality sample locations and data for last 10 years
Environment Agency	Fish and Shellfish Ecology	22 June 2011	Provided GIS data for fish (seine net) sampling locations
Rochester Oyster and Floating Fishery	Fish and Shellfish Ecology	16 June 2011	Provided history of ROFF and current species of commercial importance (in hard copy)
Port of London Authority	Benthic, Fish and Shellfish Ecology	9 June 2011	No response
Natural England	Terrestrial Ecology	11 May 2011	Specific meeting undertaken. Discussed bird surveys and baseline information gathered in the overwintering period; clarified SSSI boundary; reviewed terrestrial ecology survey requirements.

7 SOCIO ECONOMICS

a) Key Issues/ Baseline Overview

- 7.1 Swale borough, and in particular the Isle of Sheppey, face a number of economic and social challenges. Sheerness and much of the rest of the Isle of Sheppey suffers from a high level of deprivation, being amongst the 20% most deprived areas in England.
- 7.2 Between 1998 and 2008 (the latest available data) the growth in employment in Swale, as measured by the number of registered employees, was above the average for both the South East region and Great Britain as a whole. However, in the latter part of this 10 year period, employment in Swale barely grew and growth was much less than for the South East or Great Britain (Figure 7.1).

Figure 7.1 – Employment (employees) growth to 2008 in Swale, South East and Great Britain



Source: ONS Annual Business Inquiry

- 7.3 The ratio of unemployed Job Seeker Allowance (JSA) claimants to unfilled vacancies in Swale in May 2011 stood at 9.7, compared to 4.7 for the South East and 6.3 for Great Britain as a whole. These figures also suggest that there is a higher degree of slack in the labour market in Swale and thus, both a greater need for employment growth and potentially a greater capacity to absorb employment growth from major investment projects.
- 7.4 A detailed and more up to date understanding of the baseline demographic and employment conditions within the Borough will be further developed by the Applicant's appointed consultants – Peter Brett Associates (PBA). The following baseline tasks are proposed as part of the socio-economics assessment:

- **Port Activities Baseline:** Collation of information on the number of businesses currently operating at the Port; the number and types of jobs located there; where the workforce comes from; their economic performance to date; and, their catchment area. Information will be sourced from Peel Ports regarding the existing occupiers' supply chains (e.g. to what extent they rely on local, regional, national or international suppliers).
- **Local/ Regional Economics Baseline:** Examination of the local socio-economic position against which the impacts can be measured, and their effects gauged. This study will draw from a range of standard statistical sources and other local research. The study will examine:
 - The sectoral structure and performance of the economy: In particular, PBA will investigate the presence of businesses which may, potentially, be involved in the supply chain of wind turbine manufacture and related activities, as well as existing Port-based businesses;
 - The labour market: unemployment, economic activity, skills availability, training, initiatives, capabilities and commuting patterns;
 - The economic infrastructure: 'hardware and software' (e.g. further and higher education); and
 - Power and utilities provision;
- **Local Social Baseline:** This will cover other "economic" factors which are not necessarily directly affected by the WTM development. The local social baseline will be determined with respect to:
 - Housing supply and demand;
 - Indices of Deprivation;
 - Demographic Structure;
 - The extent of worklessness and benefit receipt; and
 - Community Infrastructure provision (including open space, schools, healthcare and community facilities).
- **Local Policy Context:** Review of local, regional and national policy context relevant to this project in order to highlight the key strategic objectives the project contributes to. These key strategic objectives will fall under three categories:
 - **Economic objectives:** The proposed development at the Port of Sheerness is consistent with saved Policy SP3 on the economy from the 2008 Swale Borough Local Plan as the expected jobs it would produce should provide a "step-change in economic performance" in Swale. The development would also involve both a broadening of Swale's economic base and the development of new innovative industries.
 - **Environmental sustainability objectives:** wind farms and other renewables have a fundamental role to play in decoupling economic prosperity from CO2 emissions. They can have wide-ranging and long-term impacts on all dimensions of human activity, including economic prosperity, climate change and safe energy sourcing.
 - **Social and regeneration objectives:** highlighting the priority objectives of Swale Borough Council.

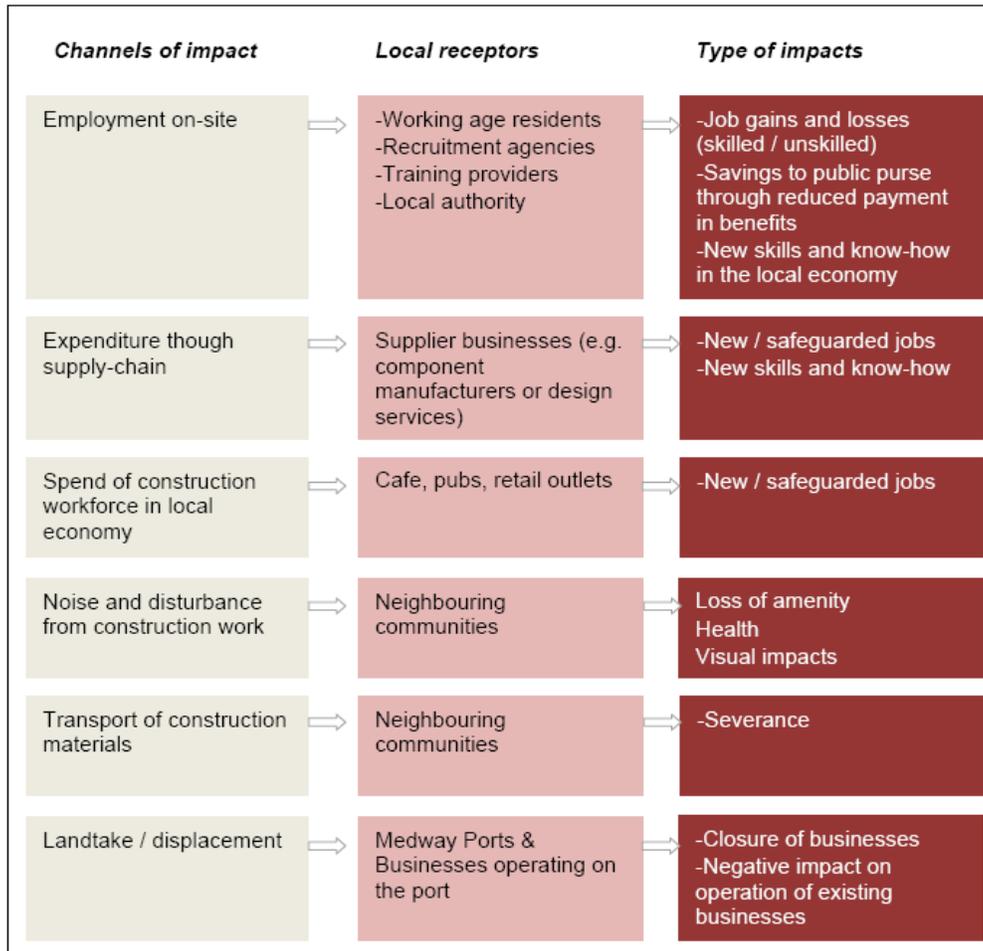
b) Without Development Scenario

7.5 In order to quantify the socio-economic impacts of the development, the EIA will establish what the "without development" (counterfactual) situation would have been in the absence of the WTM. The assessment will rely on any available previous forecasting carried out by the Port, to select the most likely counterfactual scenario. The EIA will draw on the socio-economic baseline and the policy review to establish the expected trajectory of growth under current conditions.

c) Potential Effects

7.6 The following 'roadmap' of impacts (Figure 7.2), sets out the impact pathways by which the project is likely to affect the local and regional community as well as the eventual receptors. The roadmap identifies broad categories of economic and social receptors including businesses, residents as part of the workforce, schools and hospitals.

Figure 7.2 – Roadmap of Socio-Economic Impacts



d) **Approach and Methodology**

7.7 The Socio-economic assessment will be guided by a range of documents including:

- HM Treasury's 'Green Book', which sets out the standard approach to economic impact assessments;
- The Town and Country Planning Environment Impact Assessment Regulations 2011;
- The Marine Works Environmental Impact assessment Regulations 2007; and
- The Essex Guide to Environmental Impact Assessment.

7.8 Table 7.1 details the proposed assessment scope.

Table 7.1 – Content of Socio-Economic Assessment

Assessment	Impacts	Scope of Assessment
Economic Impact Assessment	Impacts during the construction and operational phases	<p>Estimation of the jobs generated according to the following categories:</p> <p>Direct employment: this will be based on quantity and type of employment in the manufacture and assembly of the turbines and in the jobs off site in supplying components and materials for the assembly operation. The jobs at the Port of Sheerness would be calculated from standard floor space density ratios in the absence of more detailed information.</p> <p>Indirect employment: the employment created by the suppliers as a result of the new activity generated by the project.</p> <p>Induced and multiplier impacts: those generated in addition to the impacts identified above. These occur as Vestas' and associated firms' employees create further turnover and employment in the local economy via their spending on local goods and services. In order to calculate these effects, English Partnerships' recommended multipliers will be used, and the size of the induced effects will depend on the salaries that these employees are expected to earn as higher paid employees can be expected to spend more in the local economy.</p> <p>This assessment will also determine which proportion of these gross impacts is going to remain in the district. This is done by applying a leakage factor as not all jobs will go to residents of the district and a displacement factor as a proportion of the jobs/residents will merely relocate from other parts of the area.</p>
	Labour market Effects	<p>Beyond the estimates of job numbers and likely salary ranges being proposed, the EIA will undertake a qualitative analysis of the impact of the development on the local labour market i.e what type of jobs will be created during the construction and the operation phases; the balance between the local labour supply and the potential labour demand in terms of skills and likely expected salary ranges; occupations; likely training needs and local opportunities.</p> <p>This task will also explore the extent to which there is potential for transferring those losing their jobs due to the loss of existing Port activities to the new jobs being created, and the extent to which training provision is required to achieve this.</p>
Social Impact Assessment	Population and housing	<p>This assessment will link the job numbers created by the project with the labour market at the local and regional levels and will assess whether the existing housing provision is sufficient based on this information</p>
	Community infrastructure impacts	<p>Effects of a large new employment site on the community infrastructure and resources, in particular schools, nurseries, local authority services (waste, benefits, police, etc), and GPs and hospitals. This task will draw on the socio-economic baseline analysis, which will show what infrastructure is available at present, what is planned by the local authorities, and whether this is sufficient to accommodate the future needs related to all phases of development.</p>
	Amenity impacts	<p>Such effects as noise, pollution or visual impacts will be dealt with in other chapters of the ES. However, the social impact assessment will review these in order to identify any cumulative impacts on local residents leading to a loss of amenity.</p>

e) Mitigation

7.9 As a result of the assessment, significant impacts from the WTM development will be identified. In order to minimize the negative impact, mitigation measures will be explored and the overall



residual impact will be reassessed taking their likely effect into account. Mitigation measures may include skills and training programmes to enable local residents to access employment opportunities on site.

8 HYDRO-DYNAMICS, SEDIMENTS AND COASTAL PROCESSES

a) Key Issues/Baseline Overview

8.1 The Thames Estuary, Medway and the Swale are covered by European environmental designations. Thus, it will be necessary to show that the proposed dredging and quay construction will not have a significant effect on the coastal processes (tides, waves, sediment transport) within the designated areas.

8.2 Existing data and reports will be collected and reviewed by the project EIA team. The relevant data on bathymetry, current flows, sediment grading etc including the results of the new field studies will be analysed and prepared for use in the model studies.

Water Level Data

8.3 The boundary conditions for the tidal modelling will be provided from output from the RPS North Sea Model. The time series of tidal elevation along the boundaries of the North Sea model are generated using a global tidal model designed by a team at the Danish National Survey and Cadastre Department (KMS). The KMS global tidal model is based on the prediction of tidal elevations using up to 19 semidiurnal and diurnal tidal constants (as opposed to UKHO which uses 4-6 constants). The calibration of the model in terms of tidal level will be checked against a number of tide gauge stations and predicted tidal elevations.

Offshore Wave and Wind Data

8.4 RPS has sourced a database of more than 12 years of 3 hourly wave and offshore wind data for the waters around the UK based on the ECMWF European Water Wave model. This data will be analysed to provide a profile of the wave climate offshore of the site. Specific conditions, such as extreme events, will be transformed to the site to assess the exposure and potential change in exposure due to the proposed development. In addition, more 'typical' conditions will be identified in order to inform the modelling of the longer term sediment transport regime.

Bathymetry and Topographic Data

8.5 The bathymetry and topographic data for the models will be updated using the hydrographic surveys provided. Digital chart data will be used for model bathymetry in sections of the models outside the area of the specific surveys.

b) Potential Effects

8.6 Table 8.1 provides a summary of the potential hydrological effects that will be considered within the assessment.

Table 8.1 – Potential Hydrological Impacts Effects

Impacts/ Effects	Sensitive Receptor/ Receiving Environment
Water Quality / Plume generation: Effects of changes to water quality based on the density, spread and duration of any sediment plumes generated during	Medway Estuary, Swale and Thames Estuary waters

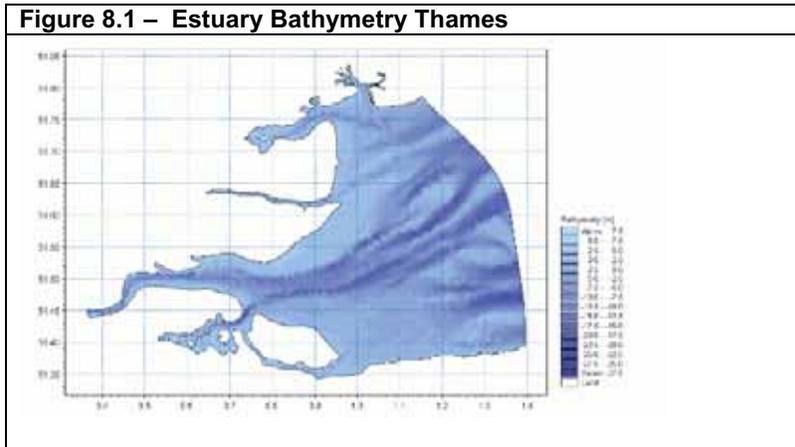
Impacts/ Effects	Sensitive Receptor/ Receiving Environment
construction and dredging works. Likely plume generation will be determined in combination with physical data provided by other project teams	
Effects of changes to coastal and hydrodynamic processes: Prediction of likely modifications in tidal flows, bathymetry, currents etc, identifying any significant effects.	Water Quality/ Sediment; Hydrological processes; Thames, Medway and Swale locally designated areas Any further receptors as identified by the MMO.

c) Approach and Methodology

Modelling of Tidal Flows

Existing Harbour

8.7 The tidal flow regime at Sheerness Port is governed by the flows in and out of the Medway and the western Swale, with ebb velocity being in the order of twice the flood velocity. Thus, the tidal flow models will be set up to cover the area from the outer Thames Estuary to include the whole of the Medway up to the tidal limit at Allington Lock and the Swale, as shown in Figure 8.1. The flow models will be run for in excess of a full neap spring tidal cycle to provide the base data for the water quality and sediment processes of the area.



8.8 The RPS North Sea base model is a flexible mesh model with an extent as shown in Figure 8.2. This model will be used to derive a series of boundary conditions, in the form of tidal levels for the detailed model. The overall model of area will have graded grid spacing with the finest cells in the area of the quay, which will be in the order of 10-15m in resolution. This will ensure that the models will have sufficient detail for the modeling of the sediment transport and dispersion due to the dredging activity.

Modelling of the Wave Climate

Wave Approach Transformation

- 8.11 Waves generated with the Medway and the Thames Estuary can approach the Port of Sheerness and have an influence on the sediment transport regime within the Medway and its approaches. Thus, wave simulations will be included in the study as changes in the wave climate around the Port may affect the movement of sediment around the adjoining areas.
- 8.12 The wave transformation will be undertaken for a range of storm intensities and directions so that the impact of waves on the movement of material can be assessed. As with the tidal modeling, wave modeling will be undertaken with the bathymetry both prior to and following the proposed scheme.

Impact of Dredging Activities

Sediment transport

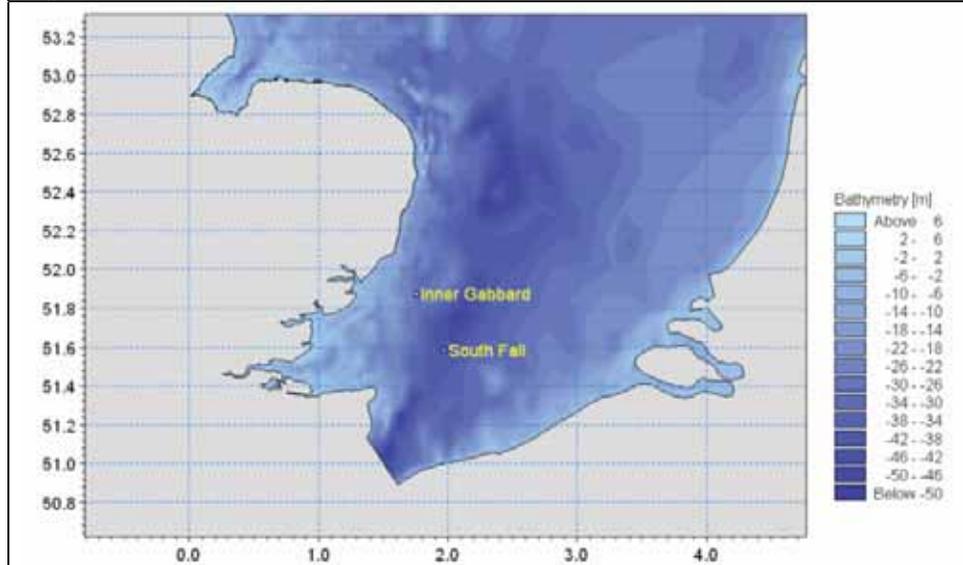
- 8.13 The first of potential effect related to the dredging activity is the influence on the sediment transport regime. The existing regime will be modelled and the calibration of the sediment transport rate will be achieved by means of historical dredging data held by the Port. The proposed design will be included within the model bathymetry and re-run to assess the impact on the sediment transport regime. Where necessary, modification may be made to the detail of the design to mitigate/minimise the impact of the proposed work.

Plume dispersion

- 8.14 As the works are taking place, material will be released into the water column during the dredging process. The impact of the dredging activities on the level of suspended sediment and on deposition of material from the dredging plume will be simulated using particle tracking. The simulations will be run for a full 29 day lunar tidal cycle so that the deposition results can be correctly assessed under the full range of tidal conditions. The simulations will also be related to the intended dredging regime and any imposed restrictions – i.e. the two runs per day as prescribed by the distance to the dumping location. The results of the impact modelling can be used if necessary to specify the types of dredger or dredging programme to be used for the project and to devise monitoring programmes required to ensure compliance with any environmental requirements and to minimise the impact of the dredging works.

Detailed Dispersion Studies for the Disposal Site

- 8.15 A detailed dispersion modeling study will be undertaken using the MIKE321 npa model. The hydrodynamic data will be drawn from the RPS North Sea model, as discussed previously, which encompasses the two existing dumping sites illustrated in Figure 8.4.

Figure 8.4 – Potential Disposal Sites

- 8.16 The initial deposition of the dumped spoil will be simulated by the npa particle tracking model. The model will be run for a full 29 day lunar tidal cycle with the rate and times of dumping linked to the dredging programme. This will allow the initial deposition footprint to be established as well as the suspended sediment levels throughout the water column.

Modeling Results

- 8.17 The results of the modelling studies will be used to prepare a chapter for inclusion in the Environmental Statement. The ES chapter will:
- Describe the existing baseline conditions in terms of tidal flows and wave conditions.
 - Identify the potential impacts on the local tidal flows, wave conditions, sediment transport regime and suspended sediments arising from the proposed development.
 - Make a comparison of the tidal currents, wave conditions and sediment transport regime using the pre-construction bathymetry and the bathymetry post construction.
- 8.18 Further studies will also be undertaken, as described above, to determine the fate of the sediments put into suspension during the dredging process. An assessment will be subsequently made of the magnitude and significance of these impacts, in terms of direct, indirect and cumulative effects.
- 8.19 This assessment will form an integral part of any required Habitats Regulations Assessment (HRA) of the potential impacts to the species and habitats of conservation importance; namely, the Thames Estuary/Outer Thames, Medway Estuary & Marshes, and Swale SPAs, together with the Foulness/mid Essex Coast and Margate & Long Sands SAC. In addition, the impacts will also be addressed in the context of the nearby Ramsar wetland and EU Shellfish Water designations.
- 8.20 Where the impact assessment identifies potential impacts which can be reduced or eliminated through mitigation, such measures will be suggested in consultation with the MMO, Environment Agency and others. These may include the selection of a particular dredger type or dredging

methodology. Where necessary, monitoring programmes may also be incorporated as mitigation, to confirm compliance with any environmental requirements (which may be imposed through conditions attached to the marine licence) and, generally, to minimise the impact of the dredging works in accordance with 'best practice' principles.

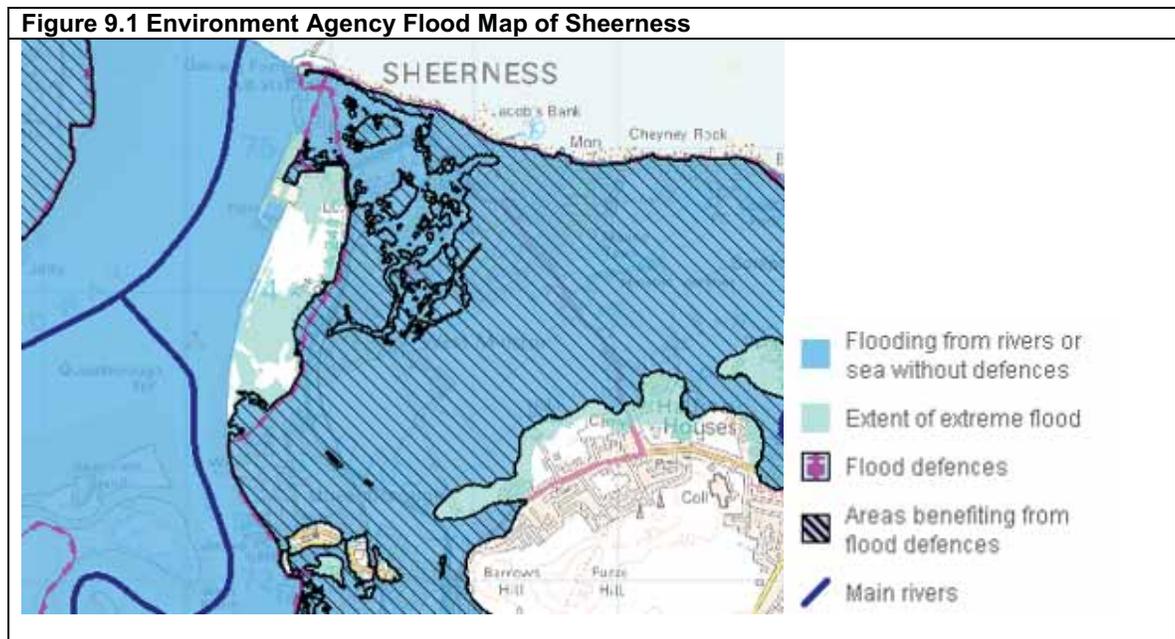
d) **Residual effects**

- 8.21 Following the incorporation of any mitigation measures, the potential impacts will be re-examined and, where necessary, re-modelled and a description of residual impacts will be described. These residual impacts will form part of the final assessment of effects, as may be required in order to complete a Habitats Regulations Assessment or Appropriate Assessment.

9 FLOOD RISK AND SURFACE WATER EFFECTS

a) Key Issues/Baseline Overview

- 9.1 The Port of Sheerness is located at the confluence of the rivers Medway and Thames Estuary. In addition to these main water bodies, a number of smaller streams are located at the western and south-western side of the Isle of Sheppey.
- 9.2 Flood defences and sea-wall structures are built in various locations across the Port site. In particular the eastern edge of the Port is bounded by a sea wall which protects the land to the east from flooding and surges that might inundate the area. Figure 10.1 identifies the location of the existing flood defences around the Port of Sheerness, together with extent of extreme flooding as determined by the Environment Agency (EA).



- 9.3 The Port is not within a Groundwater Source Protection Zone.
- 9.4 A full baseline description of the surface water and surface hydrological regime will be provided within the ES. This description will be informed by desktop analysis of site topography, consultation with the EA and historical flooding records provided by the Port.

b) Potential Effects

- 9.5 This chapter of the ES will examine the potential effects on the land-side hydrological regimes, including surface water quality, drainage and the risk of flooding to the Isle of Sheppey and other nearby land areas.
- 9.6 The proposed WTM has the potential to result in the following effects, all of which will be considered in the EIA:

- Changes to the risk of flooding to the site and surrounding land.
- Changes to the risk of pollution of the River Medway.
- Changes to the local drainage regime and subsequent capacity implications.
- Net changes in surface run-off from the Port.

c) **Approach and Methodology**

- 9.7 The surface hydrological regime at the Port will be investigated in detail by way of the baseline data gathering and initial discussions with the EA and others.
- 9.8 Impacts to surface hydrology (including water quality and drainage) will be identified and assessed in accordance with:
- Relevant provisions of the Water Framework Directive.
 - Relevant objectives of the Medway Estuary and Swale Shoreline Management Plan.
 - The Environmental Objectives (Groundwater) Regulations 2010 (S.I. 9 of 2010).
- 9.9 Given the near 100% hard standing and built cover over the existing Port and Lappel Bank area, it is unlikely that run-off and discharge levels will change significantly with the WTM facility. However, run-off may decrease somewhat with the introduction of Sustainable Urban Drainage (SUDS) features such as porous paving in non-operational areas. Therefore, the reconfiguration of the site drainage will be taken into account, alongside any sustainability measures proposed to attenuate run off.
- 9.10 The assessment will also examine the potential for construction activities to result in sediment and contaminant release to surface waters and comment on the effectiveness of the measures contained in the proposed Construction Environmental Management Plan (CEMP) to avoid or minimise such occurrences.
- 9.11 In accordance with Planning Policy Statement 25 (PPS25), a Flood Risk Assessment (FRA) will be carried out and the results of this will inform the relevant aspects of the EIA and scheme design. The FRA will be appended to the Environmental Statement.
- 9.12 Ongoing consultation with the EA will be carried out in order to establish the appropriate rainfall event level and attenuation targets that should be achieved by the WTM design, including freeboard levels for buildings and infrastructure such as the proposed electricity sub-stations.

10 OVERVIEW OF NATURE CONSERVATION CONSIDERATIONS

a) Introduction

10.1 Recognising that the potential effects of the WTM proposal on marine and terrestrial ecology are some the more complex and important areas of the EIA, the Environmental Statement (ES) will present separate chapters on:

- Fish and Shellfish.
- Benthic Intertidal and Sub-tidal Ecology.
- Marine Mammals.
- Terrestrial Ecology.

10.2 The proposed scope and content of these chapters is described in the following sections of this Scoping Report. However, in order to avoid repetition, this section describes the principal nature conservation designations and potential effects of development which are shared considerations for the different ecological assessments. A fuller account of marine designations, recorded species in proximity to the Port, and survey methodologies is provided in the Marine Ecological Desk Top Study (RPS, July 2011), which is included in Appendix B of this Scoping Report. Terrestrial ecological designations and survey findings are described in Section 14 and Appendix C; this includes a 'Phase 1 Habitat and Ecological Scoping Survey' (RPS, April 2011) and 'Wintering Birds Survey' (April 2011).

European designations

10.3 Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) form part of the Natura 2000 network of protected areas in the European Union. The Natura 2000 network is the EU contribution to the "Emerald Network" of Areas of Special Conservation Interest (ASCIs) set up under the Bern Convention on the conservation of European wildlife and natural habitats. SACs are designated under the Habitats Directive 92/43/EEC (Conservation of natural habitats and of wild fauna and flora), whereas SPAs are designated for their bird interest under the EC Birds Directive 2009/147/EC (the codified version of Council Directive 79/409/EEC).

10.4 The SAC, SPA and Ramsar designations in proximity to the Port of Sheerness (within 20km) will be considered in the EIA, as identified in Table 10.1.

Table 10.1 - International Nature Designations

Site	Area (ha)	Distance from Development (km)	Conservation Interests
Benfleet and Southend Marshes SPA and Ramsar	2,251	7.3	An extensive series of saltmarshes, cockle shell banks, mudflats, and grassland that supports a diverse flora and fauna. The productive mudflats, cockle shell banks and diverse saltmarsh communities provide a wide range of feeding and roosting opportunities for internationally important numbers of wintering wildfowl and waders.

Site	Area (ha)	Distance from Development (km)	Conservation Interests
Foulness SPA and Ramsar	10,967	7.6	Part of an open coast estuarine system comprising of grazing marsh, saltmarsh, intertidal mudflats, cockle-shell banks and sandflats. It includes one of the three largest continuous sand-silt flats in the UK. The diversity of high quality coastal habitats present support important populations of breeding, migratory and wintering waterbirds.
Medway Estuary and Marshes SPA and Ramsar	4,684	0.5	The Medway Estuary has a complex arrangement of tidal channels, which drain around large islands of saltmarsh and peninsulas of grazing marsh. The mudflats are rich in invertebrates and also support beds of <i>Enteromorpha</i> and some eelgrass <i>Zostera</i> spp. Small shell beaches occur, particularly in the outer part of the estuary. Grazing marshes are present inside the sea walls around the estuary. The complex and diverse mixes of coastal habitats support important numbers of waterbirds throughout the year.
Outer Thames Estuary SPA	379,268	1.9	The Outer Thames Estuary consists of areas of shallow and deeper water, high tidal current streams and a range of mobile sediments. Large areas of mud, silt and gravelly sediments form the deeper water channels, the main ones of which form the approach route to the ports of London and as such are continually disturbed by shipping and maintenance dredging. Sand in the form of sandbanks separated by troughs predominates in the remaining areas and the crests of some of the banks are exposed at mean low water.
Thames Estuary and Marshes SPA and Ramsar	4,839	1.0	The marshes extend for about 15km along the south side of the estuary and also include intertidal areas on the north side of the estuary. To the south of the river, much of the area is brackish grazing marsh, although some of this has been converted to arable use. At Cliffe, there are flooded clay and chalk pits, some of which have been infilled with dredgings. Outside the sea wall, there is a small extent of saltmarsh and broad intertidal mudflats. The estuary and adjacent grazing marsh areas support an important assemblage of wintering waterbirds including grebes, geese, ducks and waders. The site is also important in spring and autumn migration periods.
The Swale SPA and Ramsar	6,515	4.1	A complex of brackish and freshwater, floodplain grazing marsh with ditches, and intertidal saltmarshes and mudflats. The intertidal flats are extensive, especially in the east of the site, and support a dense invertebrate fauna. These invertebrates, together with beds of algae and eelgrass <i>Zostera</i> spp., are important food sources for waterbirds. Locally there are large mussel <i>Mytilus edulis</i> beds formed on harder areas of substrate.

Benthic Habitats

- 10.5 Protected benthic habitats (Annex 1 habitats protected under the EC Habitats Directive) within the vicinity of the Port include mudflats and sandflats (not covered by seawater at low tide), as well as sandbanks (slightly covered by sea water all of the time) and saltmarsh habitats. A number of these habitats are designated for their national and internationally importance, including the Essex Estuaries SAC.

Marine Mammals

- 10.6 Annex II species under the EC Habitats Directive include marine mammals. These mammals are generally rare in the waters area around Sheerness, with low numbers of harbour porpoise (*Phocoena phocoena*) recorded in the Atlas of Cetacean Distribution¹³. Small numbers of

bottlenose dolphins (*Tursiops truncatus*), grey seal (*Halichoerus grypus*) and common seal (*Phoca vitulina*) have also been reported in the area.

Fish

- 10.7 The only Annex II fish species known to occur in the vicinity is Allis shad (*Alosa alosa*) (Kent and Medway Biological Records Centre, 2011), although lamprey and salmonids may also occur.

Local and national designations

- 10.8 Under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000), the UK designates any land which is of special interest for any of its flora, fauna, geological or physiographic features as Sites of Special Scientific Interest (SSSIs). In addition, the National Parks and Countryside Act 1949 requires Natural England to designate National Nature Reserves (NNRs) for the best examples of a particular habitat, and Local Authorities to designate Local Nature Reserves (LNRs) for areas of local wildlife interest and importance.

- 10.9 Sites of national importance, within 20km of the Port include:

- Benfleet and Southend Marshes SSSI and NNR*;
- Elmley NNR;
- Foulness SSSI*;
- Holehaven Creek SSSI;
- Leigh NNR;
- Medway Estuary and Marshes SSSI*;
- Mucking Flats and Marshes SSSI;
- Oare Marshes LNR;
- Sheppey Cliffs and Foreshore SSSI;
- Southend Foreshore LNR;
- South Thames Estuary and Marshes SSSI*;
- The Swale SSSI, NNR and LNR*.

- 10.10 Of the above, those denoted with an asterisk (*) are located within the tidal excursion and, as such, within the zone of influence from the proposed development works.

Marine Protection Areas

- 10.11 The Marine and Coastal Access Act (2009) introduced a framework to create a new type of Marine Protected Areas (MPAs) called Marine Conservation Zones (MCZs).

- 10.12 MCZs (which are presently being developed) will provide additional protected status to marine wildlife, habitats, geology and geomorphology within each designated zone. The Inner and Mid Thames Estuary (located 5.2km from the proposed development) and Medway Estuary itself, in which the Port is located, are currently being proposed as potential MCZs.

Biodiversity Action Plan (BAP) habitats

- 10.13 BAP habitats and species have been identified in the vicinity of the proposed development. These are listed and described in Section 3 of Appendix B.

b) Potential Impacts/ Effects

- 10.14 Potential environmental effects of the WTM development on the different marine and terrestrial ecology receptors are described in the following topic-specific sections. However, some common

effects of Port related developments are summarised below, with reference to the draft National Policy Statement for Ports (DFT, 2009), EC Guidelines on the Implementation of the Birds and Habitats Directive in Relation to Port Developments (European Commission, 2011), EIA guidance, and the experience of the project team.

10.15 Potential impacts from the construction and operational phases could include:

- Dredging can have implications for sediment transport, which can in turn affect marine wildlife, and on potential remobilisation of toxic substances and nutrients, increased suspended solids, reduced visibility and reduction in dissolved oxygen;
- Cargo handling and storage, which may cause run-off, spills, or leakages to the marine environment. Water pollution and bottom contamination resulting from these effluents may lead to deterioration of aquatic biota and fishery resources;
- Discharge of ships' ballast water resulting in the possible introduction of non-native species;
- Noise and vibration, which can have impacts on bird, fish and aquatic mammalian behaviour patterns;
- Increased levels of artificial light, which can disturb birds and other wildlife and alter or hinder the migration of fish through estuaries;
- Direct loss of habitats from within the footprint of the proposed dredging works and placement of additional structures;
- Temporary increases in suspended sediment (SS) concentrations from dredging and construction works (plume effects), which may have direct effects (e.g. physical disturbance, smothering), or indirect effects (e.g. water quality impacts due to remobilisation of toxic substances and nutrients and reduction in dissolved oxygen) on intertidal and sub-tidal habitats and species;
- Changes to the hydrodynamic regime and sediment transport leading to impacts on habitats such as abrasion and scour effects;
- Colonisation of structures leading to a change in the intertidal and sub-tidal ecology and/or an increase in biodiversity; and
- Introduction of chlorination/biocidal products used to prevent fouling of ship hulls;

10.16 It should be noted that many of the above effects would only manifest if entirely new or substantial changes to the marine based operations of the Port were to occur. However, the Port of Sheerness is already a busy operational Port and the operation of the WTM facility is unlikely to result greater impacts than those currently occurring. In particular, once completed, it is predicted that the WTM development would not lead to a significant (if any) increase in: the volume of shipping movements; noise levels; lighting intensity; discharges; pollution risks; or other effects, by comparison the existing Port businesses and activities it will replace. Furthermore, the extent and potential effects of the proposed capital dredging needs to be assessed in the context of regular maintenance dredging activities undertaken by Peel as the designated Harbour Authority. These assumptions will be confirmed through the EIA process.

c) Mitigation

10.17 Whilst the impacts of the WTM proposals on habitats and species of conservation importance will only be fully determined at the conclusion of the EIA, the following generic mitigation measures may be appropriate (source: Ports NPS, DFT 2009):

- during construction, the developer will ensure that activities will be confined to the minimum areas required for the works;
- during construction and operation, best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;
- habitats will, where practicable, be restored after construction works have finished; and

- opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the Port.

10.18 Where appropriate, monitoring strategies will be developed for the construction and post-completion stages of the project in order to provide data to validate the predicted impacts and mitigation set out in the ES. This will principally occur where uncertainty in the magnitude or significance of the impact has been highlighted as a potential issue.

10.19 The Ports draft NPS (DfT, 2009) states that:

“Ecological monitoring is likely to be appropriate during the construction and operational phases to identify the actual impact so that, where appropriate, adverse effects can then be mitigated and to enable further useful information to be published [which might be] relevant to future projects”.

11 MARINE ECOLOGY – FISH AND SHELLFISH

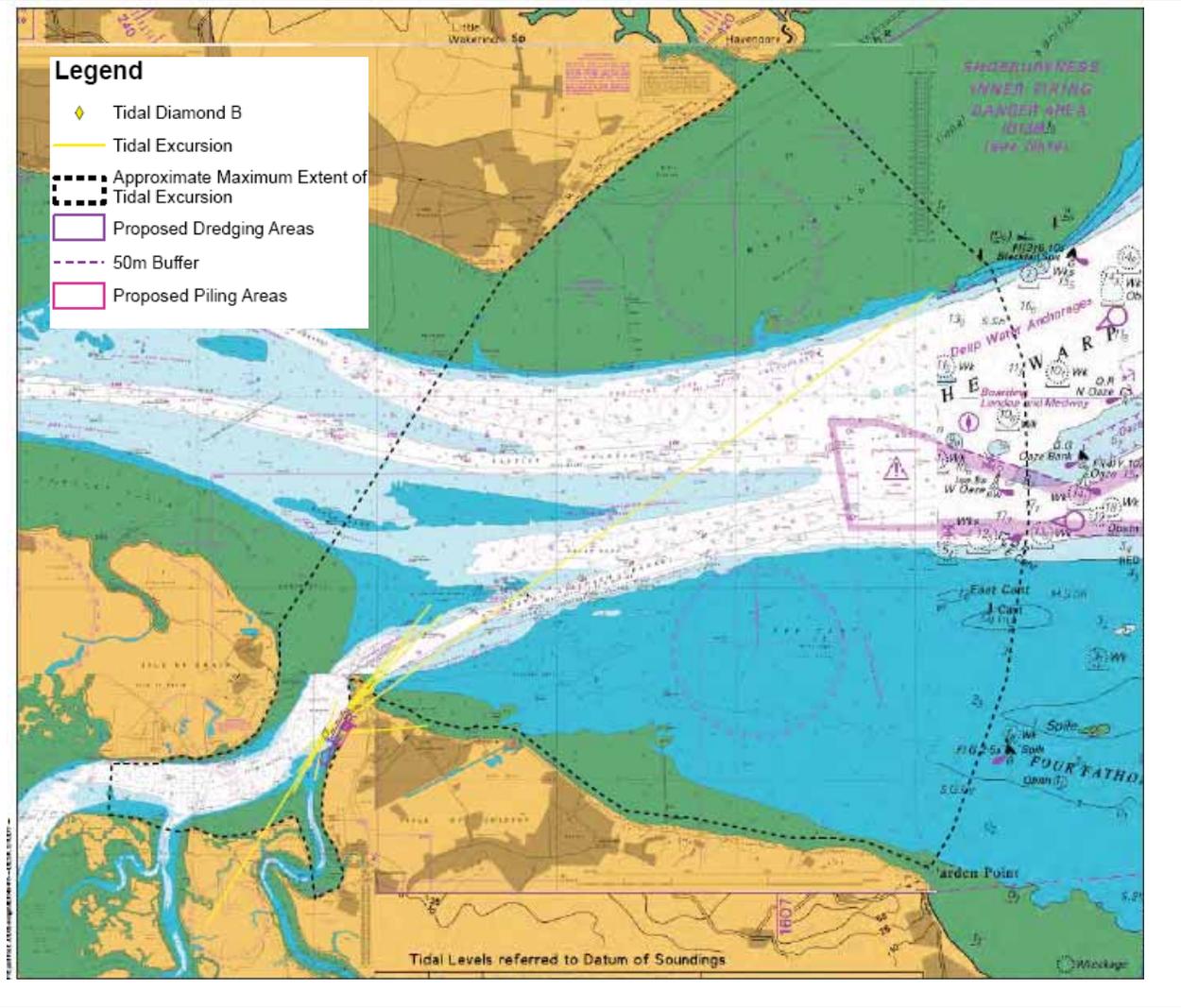
a) Key Issues/Baseline Overview

- 11.1 Results of a recent desktop study on fish and shellfish are presented in Section 5 of Appendix B. This provides information on the local fish and shellfish ecology based on a preliminary desktop study with respect to:
- Fish Assemblage;
 - Spawning and Nursery Grounds;
 - Migratory Species;
 - Sharks, Skates and Rays;
 - Species of Commercial Interest; and
 - Shellfish Assemblage.
- 11.2 The fish and shellfish assemblage of the study area is typical of east coast estuaries, comprising a relatively uniform composition and abundance of fish species across the estuaries with seasonal variation throughout the year. The study area supports an important breeding and/or nursery ground for a number of commercially important species including herring (*Clupea herangus*), plaice (*Platessa pleuronectes*), Dover sole (*Solea solea*), whiting (*Merlangius merlangus*) and thornback ray (*Raja calvata*). In addition, it is possible that migratory fish species such as shad, lamprey and salmonids use the Medway and Swale Estuaries.
- 11.3 It is noted however that there is a lack of up-to-date information on the seasonality of fish in the immediate vicinity of the Port of Sheerness. The data presented in other environmental statements completed for a range of developments in the Outer Thames Estuary and Medway (including Port of London, London Gateway, London Array, Kentish Flats and Isle of Grain Power Station) are somewhat dated and/or too far from the Port of Sheerness to provide a robust characterisation of current baseline conditions within the immediate vicinity of the development site or the potential secondary impact zone. Up-to-date site-specific surveys are therefore required in support of the EIA. In order to further inform the baseline characterisation of the survey area, the following fisheries surveys are scheduled to take place or have already been completed by RPS:
- Otter Trawls - Sampling (eight trawls in total) to collect information, primarily on the distribution, abundance, size, structure and biomass of the demersal fish populations in the study area;
 - Seine Netting - Sampling (six in total) to collect information on demersal fish (primarily small and juvenile fish) including the distribution, abundance, size, structure and biomass of the fish populations in the study area; and
 - A detailed desktop review of existing data on fish and shellfish for the area surrounding the site to provide context for the site-specific surveys. This will include consultation with the Environment Agency for data relating to historical fish survey data.
- 11.4 Further details on the proposed locations of these site-specific sampling sites are provided in Section 5 of Appendix B. Initial consultation with the MMO and their advisory body Cefas, and with Natural England, has been undertaken to inform the proposed site-specific fish ecology surveys, and an additional two trawl sites have been proposed as a result of this consultation.

b) Potential Impacts/ Effects

- 11.5 A list of potential environmental impacts that could have an effect on the fish and shellfish ecology are summarised below. For the reasons given in Section 10, not all of these effects would be necessarily occur, but these are included for the sake of completeness.
- 11.6 During the construction phase of the development possible issues and impacts include:
- Potential effect on migratory and non-migratory fish from construction activities including noise and vibration caused by dredging, piling, shipping movement disturbance and lights which may alter fish movement and behaviour;
 - Disturbance to sediments resulting in the increased mobilisation of contaminants associated with bottom sediments which may produce avoidance reactions in migratory fish and cause a loss of habitat for juvenile fish which use the region in the vicinity of Port of Sheerness as a nursery;
 - Introduction of non-native species from discharges such as ballast waters;
 - Short-term changes in dissolved oxygen linked to disturbance of bottom sediments; and
 - Disturbance to commercial and recreational fisheries by increased shipping movements, dredging, piling and noise pollution.
- 11.7 Potential fishery issues associated with the operation phase include:
- Change in benthic prey species as a result of a change in hydrodynamic regime as well as the colonisation of hard structures;
 - Potential change in species abundance and composition due to change in light levels from port development works; and
 - Introduction of chlorination/ biocidal products used to prevent fouling of ship hulls. Biocides are toxic and may cause avoidance reactions in migratory fish and salmon in particular.
- 11.8 In terms of geographic scope, the assessment will consider the area potentially affected by the dredging works; this being the extent of the tidal excursion as shown on Figure 11.1. This delimits the area over which potentially water-transported impacts could manifest. Particular attention will be given to fish and shellfish species within, and in the immediate vicinity of, the development footprint where direct habitat losses and a range of other effects (e.g. changes in hydrodynamic regime, disturbance etc) will be assessed.

Figure 11.1 - Tidal Excursion Extent



c) Significance Criteria

11.9 The significance criteria used in the assessment of impacts on fish and shellfish Valued Ecological Receptors (VERs) are the same as those which will be applied to the assessment benthic, intertidal and sub-tidal ecology, as described in the following section of this report (see Section 12).

d) Mitigation

11.10 While it is not possible to determine the full extent and significance of the impact upon fish and shellfish VERs until the full impact assessment has been undertaken, the following specific mitigation measures may be included where appropriate:

- use of 'soft start' where piling is required and may be considered to be a significant noise impact. This process ensures that noise emissions start at relatively low levels and are gradually increased over a 15-20 minute period;

- mitigation measures for fish identified in the NPS for Ports (DfT, 2009) also recommends the use of 24 hour construction practices so that the overall construction programme and the potential for impacts to fish communities is reduced in overall time; and
- other mitigation measures will be adopted as good practice, such as techniques to reduce sedimentation during trenching and other earthworks.

11.11 As set out in Section 10, appropriate monitoring strategies will be developed depending upon the findings of the impact assessment process. This monitoring may be necessary in order to provide data to complement predicted impacts made during the EIA, principally where uncertainty in the magnitude or significance of the impact has been highlighted as a potential issue. Where required, any monitoring (for example pre- and post- construction surveys) will be undertaken in line with Cefas advice on marine licence conditions. The design of surveys will be discussed with Cefas and also via consultation with local commercial fishermen to ensure gears and methods adopted are appropriate for the target species.

12 MARINE ECOLOGY – BENTHIC INTERTIDAL AND SUB-TIDAL

a) Key Issues/Baseline Overview

- 12.1 The marine ecological desk top study (Appendix B) has identified the benthic ecology of the area to be typical of that found in Southeast England and of estuarine habitats in general. The main intertidal and sub-tidal habitats within the Medway and Swale Estuaries were mapped as part of the Marine Nature Conservation Review (MNCR) (Hill et al., 1996). The MNCR classified habitats to biotope level in accordance with the Marine Habitat Classification for Britain and Ireland Version 6.95 (Connor et al., 1995). Although, the MNCR provides a useful resource to describe the broad scale marine biotopes present within the vicinity of the proposed development, they are considered to be out of date as the surveys to inform the assessment were undertaken in 1990 and 1993 (21 and 18 years ago respectively). Consequently, this data cannot wholly be relied upon to provide a detailed and accurate assessment of the biotopes present.
- 12.2 In order to provide a complete baseline understanding for the purposes of the EIA, the following benthic (intertidal and sub-tidal) surveys have recently been completed. It should be noted that the full results of these surveys have not yet been returned, but these will be reported in full in the ES.
- 12.3 Benthic Sub-tidal Surveys:
- Benthic sub-tidal grabs - grab sampling was undertaken at 62 sites; 60 sites for benthic faunal and sediment granulometry analysis. Thirteen of these sites were analysed for sediment chemistry and a further two sites were analysed for sediment chemistry and sediment granulometry but not for faunal analysis; and
 - A detailed desktop review of existing sub-tidal benthic ecological data for the area surrounding the site, drawing upon the initial desktop study (Appendix B), to provide context for the site-specific surveys.
- 12.4 Benthic Intertidal Surveys:
- Intertidal Phase 1 Survey - A Phase 1 survey has been undertaken to determine shore type, wave exposure and sediments/substrates present. The report of this survey will provide general descriptions of species/biotopes present across the wider area together with the spatial relationships between these;
 - Intertidal Phase 2 Survey - Split level cores (10 sites in total) have been undertaken for sediment granulometry and biological analysis (benthic infauna) in order to quantify the species present at selected sites within proximity to the development site; and
 - A detailed desk top review of existing intertidal benthic ecological data for the area surrounding the site, drawing upon this initial desk top, to provide context for the site-specific surveys.
- 12.5 Further details on the location of these site-specific sampling sites is provided in Appendix B of this Scoping Report.

b) Potential Impacts/ Effects

- 12.6 Potential effects that could be realised at sensitive benthic and sub-tidal habitats and species include:

- 12.7 During the construction phase of the development:
- Direct loss of habitats from within the footprint of the proposed dredging works and placement of additional structures;
 - Temporary increases in suspended sediment (SS) concentrations from dredging and construction (plume effects), which may have direct or indirect effects on intertidal and sub-tidal habitats and species;
 - Temporary increases in sediment deposition from SS plumes, which may lead to smothering of susceptible habitats and species;
 - Introduction of non-native species from discharges such as ballast waters and on hard surfaces such as new piled platforms and quays;
 - Release of contaminants bound in sediments during construction and dredging works; and
 - Visual, noise and light disturbance to intertidal and sub-tidal species during construction.
- 12.8 During the operation phase of the development, possible issues and impacts include:
- Introduction of chlorination/biocidal products used to prevent fouling of ship hulls;
 - Change in hydrodynamic regime and sediment transport leading to changes in habitats such as scour effects; and
 - Colonisation of structures leading to a change in the intertidal and sub-tidal ecology and/or an increase in biodiversity.
- 12.9 As noted previously, many of the impacts described above, particularly those during the operational phase, are unlikely to lead to greater impacts than those currently occurring given the existing nature of the Port and the low likelihood of a substantial increase in ship movements.
- 12.10 Particular consideration will be given to intertidal and sub-tidal resources within and in the immediate vicinity of the potential development footprint area and those within the tidal excursion, as shown in Figure 11.1.
- c) Significance Criteria**
- 12.11 Ecological Impact Assessment (EclA) is “the process of identifying, quantifying and evaluating the potential impact of defined actions on ecosystems or their components”....”If properly implemented, it provides a scientifically defensible approach to ecosystem management” (IEEM, 2010).
- 12.12 The assessment method used for the EclA which will be reported in the ES, will be based on the following guidance:
- Guidelines for Baseline Ecological Assessment, Institute of Environmental Assessment (1995);
 - Transport Analysis Guidance (TAG): The Biodiversity Sub-Objective, TAG Unit 3.3.10 Department for Transport (2004);
 - Guidelines for Ecological Impact Assessment in the United Kingdom, Institute of Ecology and Environmental Management (2006); and
 - The Marine and Coastal EclA Guidelines (IEEM, 2010).
- 12.13 The EclA methodology to be employed involves five key stages, as outlined below:
- Characterisation of baseline conditions within the study area:**
- 12.14 As reported in the initial desk top study (Appendix B), baseline information about ecological features including sites of importance for nature conservation, species populations, species assemblages and habitats has been already been obtained from a number of key sources. These

include published records and databases, information from local recorders, consultations, and analysis of site-specific surveys for the area.

- 12.15 The assessment will consider both existing and future predicted baseline conditions. Consequently, the description and evaluation of ecological features will take account of any likely changes, including for example, trends in the population size or distribution of species, likely changes to the extent of habitats and the effects of other proposed developments.

Definition and listing of biological features which can be regarded as having ‘importance’ within the study area:

- 12.16 Biological features of importance are termed Valued Ecological Receptors (VER) and, following the IEEM guidelines, are those which satisfy any of the following criteria:
- Designated sites, including international, national and local sites of conservation importance;
 - Legally protected species, such as the flora and fauna listed in Schedule 2 of the Conservation (Natural Habitats &c Regulations, as consolidated 2010), Annex 1 of EC Directive 2009/147/EC on the conservation of wild birds (codified version), and Schedules 1, 5 and 8 of the Wildlife and Countryside Act 1981 (as amended);
 - Features that are important in terms of biodiversity, which, in some cases, can be measured against UK and local Biodiversity Action Plans (BAPs), but which also include a range of other criteria;
 - Features which currently have little value, but which if restored to favourable condition have the potential to meet the criteria for a nationally designated conservation site;
 - Features which are themselves of no conservation value, but which nevertheless perform an important ecological function;
 - Features that have a social or community value (e.g. an area used for recreational purposes); and
 - Features that have an economic value (e.g. fisheries).

Identification and characterisation of potential impacts arising from the development:

- 12.17 Potential impacts arising from the proposed development, both positive and negative, occurring through the construction, operational and, where appropriate, the decommissioning phases will be identified and characterised in terms of scale, spatial extent, duration, timing, frequency of occurrence, and reversibility. The assessment of impacts will take into account any mitigation integral to the design of the development and to which there is commitment from the Applicant. An indication of the confidence with which predictions of potential effects are made will also be given.

Characterisation of the sensitivity of the Valued Ecological Receptors (VER) to the potential impacts identified:

- 12.18 A fundamental consideration in characterising impacts on species and habitats is their sensitivity to changes in their immediate environment. The assessment of the sensitivity of species and habitats to change will be based on evidence available in the scientific literature, although in many cases this is limited by the paucity of data available on effects to marine environment. In such cases, a precautionary approach is taken, insofar as the sensitivity of a given species/habitat is predicted using the best data available and a precautionary impact assessment of the proposed project effects on these made.

Assessment of significance of effect

- 12.19 This is a two stage process involving:

Prediction of the magnitude of effect

12.20 This stage is based on a consideration of the sensitivity of the receptor to an impact, and the size of the impact (in terms of spatial extent, duration, reversibility and timing; seasonality and/or frequency of occurrence). Expert judgment is employed to consider and evaluate the likely effect of the impact on the species, population or habitat identified as a VER. The magnitude of effect is then identified from a five point scale according to the potential consequences of the effect on the VER, as given in Table 12.1

Table 12.1 - Criteria for classifying the Magnitude of Effects

Potential consequence of effect on VER	Magnitude of effect
The proposal would affect the conservation status of the site or feature.	Major
The site or feature's conservation status would not be affected, but the effect is likely to be significant in terms of ecological objectives or populations. If, in the light of full information, it cannot be clearly demonstrated that the effect will not adversely affect the conservation objectives, then the effect should be assessed as major negative.	Intermediate
Neither of the above applies, but some minor effect is likely.	Minor
No observable effect predicted.	Negligible

12.21 In each case (other than negligible) the effect may be adverse or beneficial.

Definition of the significance of effect

12.22 The overall significance of an effect of a given magnitude depends on the status (i.e. the level of designation/importance) of the affected site in question. The status reflects the nature conservation value of the site. The significance descriptors relating magnitude of effect to status/conservation value are shown in Table 12.2.

Table 12.2 - Definitions of the significance of effects

Magnitude of potential effect	International	UK/National	Regional	Local
Major	Major	Major	Major	Slight/Moderate
Intermediate	Major	Major	Moderate	Slight/Moderate
Minor	Slight	Slight	Slight	Slight
Negligible	Negligible	Negligible	Negligible	Negligible

12.23 Each evaluation will state the assessed magnitude of effect arising from main impact of the development and the corresponding significance according to the nature conservation value as given in Table 12.2. In the marine environment, the assessment of status/conservation value within a geographic framework is more difficult, particularly at the more local scale. The best available method identified in the Marine and Coastal EclA document (IEEM, 2010) is that of professional judgement and consensus through peer review.

d) Mitigation

- 12.24 While it is not possible to determine the full extent and significance of the impact upon benthic sub-tidal and intertidal VERs until the full impact assessment has been undertaken, the following specific mitigation measures may be included where appropriate:
- micro-siting of piling foundations to minimise impacts on potentially sensitive habitats; and
 - standard safe working practices for construction vessels to reduce construction/decommissioning related impacts i.e. accidental spillage.
- 12.25 Other mitigation measures will be adopted as good practice, such as techniques to reduce sedimentation during dredging works.
- 12.26 As set out in Section 10, appropriate monitoring strategies will be developed depending upon the findings of the impact assessment process. This monitoring may be necessary in order to provide data to complement predicted impacts made during the EIA, principally where uncertainty in the magnitude or significance of the impact has been highlighted as a potential. The design of any future monitoring surveys will be developed in discussion with statutory consultees (i.e. Cefas, MMO, Natural England and the EA) to ensure methods adopted are appropriate for the target species and habitats (including Annex I habitats).

13 MARINE ECOLOGY – MARINE MAMMALS

a) Key Issues/Baseline Overview

- 13.1 The species of cetacean and pinniped that have been reported within the southern North Sea (Jones *et al.*, 2004), are as follows:
- Minke whale (*Balaenoptera acutorostrata*);
 - Bottlenose dolphin (*Tursiops truncatus*);
 - Killer whale (*Orcinus orcus*);
 - Long-finned pilot whale (*Globicephala melas*);
 - Common dolphin (*Delphinus delphis*);
 - White-beaked dolphin (*Lagenorhynchus acutus*);
 - Atlantic white-sided dolphin (*Lagenorhynchus acutus*);
 - Harbour porpoise (*Phocoena phocoena*);
 - Common seal (*Phoca vitulina*); and
 - Grey seal (*Haliochoerus grypus*).
- 13.2 In general, the populations increase in abundance and diversity progressing northwards in the North Sea, with relatively few commonly occurring species and low abundances of each recorded in southern part of the North Sea (Jones *et al.*, 2004).
- 13.3 Existing published records indicate the following with respect to the Port and its surrounds:
- Harbour porpoise (*Phocoena phocoena*), although common in northern parts of the North Sea, are rare and only occasional visitors to the Outer Thames Estuary (Reid *et al.*, 2003). Sightings from ornithological surveys in support of offshore wind farms in the Outer Thames Estuary showed that harbour porpoise are recorded throughout the year but that sightings are higher during winter and spring.
 - Incidental sightings from local interest groups and Wildlife Trusts confirm that harbour porpoise are present in the Outer Thames Estuary, but in low numbers relative to overall numbers in the North Sea and around the UK.
 - Of the two pinniped species recorded in the Outer Thames Estuary, common (or harbour) seals (*Phoca vitulina*) are present in the greatest numbers, with important haul out sites focused on sandbanks in the centre of the Outer Thames Estuary and Medway estuary, in close proximity to the Port of Sheerness. Tagging studies of common seals in the Thames have also demonstrated that the waters around the Port of Sheerness may lie on the periphery of the main foraging grounds in the Thames for common seals (Sharples *et al.*, 2008).
 - Grey seals (*Haliochoerus grypus*) have historically been recorded in low numbers in the Outer Thames Estuary, and incidental sightings from surveys in support of offshore wind farms in the estuary were also low. Recent aerial surveys in 2010 found that grey seal abundance in the Outer Thames Estuary is lower than that of common seals and that they were concentrated around haul out sites off the east Kent coast and not in the vicinity of the Port of Sheerness (Bramley, 2011).
- 13.4 Further, current baseline data on marine mammals will be gathered during the EIA process by means of a more detailed Marine Mammal Desktop Study.
- 13.5 Specific detail with respect to the content and methodology for this study, and information/data held already is described desk top study presented at Appendix B.

b) Potential Impacts/ Effects

- 13.6 The EIA will assess potential impacts arising from the proposed WTM development, including potential effects on marine mammals during the construction and operational phases of the scheme. A list of potential environmental impacts that could have an effect on marine mammals are summarised below, with reference to the draft NPS for Ports (DFT, 2009) and other guidance documents listed in Section 10 above.
- 13.7 During the construction/decommissioning phase of the development possible issues and impacts include:
- submarine acoustic noise disturbance to marine mammals, in particular during the piling activity;
 - noise and visual disturbance to seals on intertidal haul out sites;
 - physical disturbance to marine mammals due to vessel activity in the area;
 - effect of increased sedimentation on the behaviour of marine mammals during dredging works; and
 - indirect effects of prey availability due to changes in the fish and shellfish resources as a result of the proposed construction works.
- 13.8 During the operational phase of the development possible issues and impacts may include:
- disturbance to marine mammals from potential increase in the numbers of vessels, as well as an increased risk of collision; and
 - change in prey species (i.e. benthic, fish and shellfish species) as a result of change in light levels from the development, change in hydrodynamic regime, colonisation of structures and change in the number of vessels in the area.
- 13.9 In terms of geographic scope, the assessment will consider the area potentially impacted by the dredging at the extent of the tidal excursion, as shown in Figure 11.1.
- 13.10 Noise effects from piling activities will be commented on qualitatively within the ES. It is not considered necessary to construct a waterborne noise model for the proposed construction activities, in view of the very low numbers of marine mammals historically recorded within the study area.

c) Significance Criteria

- 13.11 The same significance criteria, as described in Section 12 (benthic intertidal and sub-tidal effects) will be used to assess and described any impacts on marine mammals.

d) Mitigation

- 13.12 The following example mitigation measures may be included to avoid impacts to marine mammals, depending on the outcome of the impact assessment:
- use of 'soft start' where piling is required and may be considered to be a significant noise impact. This process ensures that noise emissions start at relatively low levels and are gradually increased over a 15-20 minute period; and
 - other mitigation measures will be adopted as good practice, such as techniques to reduce sedimentation during trenching and other earthworks.

- 13.13 If required, appropriate monitoring strategies will be developed, as described in the previous sections of this report. Any such monitoring will be undertaken in line with MMO/Cefas advice on marine licence conditions.

14 TERRESTRIAL ECOLOGY

a) Key Issues/Baseline Overview

Designated sites

- 14.1 A number of designated sites of nature conservation interest are located in the vicinity of the Port and around the Medway Estuary in particular. These include:

The Medway Estuary and Marshes Special Protection Area (SPA)

- 14.2 SPAs are classified as important sites in accordance with Article 4 of the EU Directive on the conservation of wild birds (2009/147/EC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species.

- 14.3 The Medway Estuary and Marshes SPA was classified in 1993 and the citation prepared for that classification, together with the most recent SPA data will be used to inform the assessment. The qualifying bird interest features listed in the original SPA Citation are presented in the wintering birds survey report in Appendix C.

The Medway Estuary and Marshes Ramsar site

- 14.4 This site was designated in 1993. It qualifies for designation under Criterion 3a of the Ramsar Convention by virtue of regularly supporting over 20,000 waterfowl with an average peak count of 53,900 birds recorded in the five-year winter period 1986/1987 to 1990/1991 and under Criterion 3c by regularly supporting internationally or nationally important wintering populations of migratory species of waterfowl. It also qualifies under Criterion 2a of the Ramsar Convention by supporting a number of species of rare plants and animals.

The Essex Estuaries Special Area of Conservation (SAC)

- 14.5 The Essex Estuaries Special Area of Conservation (SAC) is the only SAC located within 20km of the proposed development, being located 7.3km north of the Port of Sheerness. The SAC covers a total area of 46,141ha and is classified for the following Annex I habitats: estuaries, mudflats and sandflats not covered by seawater at low tide, Salicornia and other annuals colonising mud and sands, *Spartina maritima* swards, Atlantic saltmeadows and Mediterranean and thermo-Atlantic halophilous scrub.

The Medway Estuary and Marshes SSSI

- 14.6 This SSSI is notified for the complex of mudflats, saltmarsh and grazing marsh intersected by dykes and fleets. The area holds internationally important populations of wintering and passage birds and is also of importance for its breeding birds. An outstanding assemblage of plant species also occurs on the site. Part of the SSSI has been completely destroyed by the reclaim of the Lappel bank. At present the notification of this destroyed section remains extant.

b) Baseline surveys already undertaken

- 14.7 Since October 2010 field surveys have been carried out at and near to the Port. Two surveys have been completed and reported; these being the survey results for overwintering birds using the intertidal areas, and a Phase 1 habitat and ecological scoping survey. Both reports are contained in Appendix C of this Scoping Report. Other surveys are ongoing and have not yet reported.
- 14.8 Table 14.1 identifies the ecological baseline surveys and reports that have been completed or are underway. The results will inform the EIA.

Table 14.1 – Summary of Baseline Ecological Surveys and Reports 2010 – 2011

Report/ Survey	Date Produced	Content
Overwintering and intertidal Bird Surveys and Report	April 2011	Wintering bird survey data collected for the period October 2010-March 2011. Survey area included left and right banks of the Medway channel from Deadman's Island to Garrison Point, and also included the West Swale
Intertidal Bird Surveys and Report	Ongoing	Intertidal bird survey data collected from April 2011 to September 2011, which with the data from above, will give a full 12 month set of data. Survey area as above.
Phase 1 habitat	September 2011	Survey and classification of habitats within proposed development.
Protected species scoping	Ongoing	Survey to scope potential for protected species within and adjacent to proposed development.

c) Consultation

- 14.9 Some consultation with Natural England has already been carried out with respect to ecological features and potential effects, as described earlier in this report.

d) Approach to and Methodology for Ecological Impact Assessment

- 14.10 The terrestrial ecological impact assessment is being undertaken in four main stages:
- baseline studies;
 - identification of Valued Ecological Receptors (VERs);
 - identification and characterisation of potential effects and mitigation; and
 - assessment of the significance of effects.
- 14.11 The methodology employed in assessing and evaluating the proposed development will have regard to:
- Guidelines for the Ecological Impact Assessment in the United Kingdom, IEEM (2006);
 - PPS9: Biodiversity and Geological Conservation;
 - Circular 06/05: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System; together with any other relevant guidance.
- 14.12 The assessment and evaluation of the baseline condition will cover the following topics:
- ecology policy context;
 - designated sites (statutory and non-statutory);

- habitat / vegetation types); and
- wildlife (i.e. fauna).

14.13 The assessment and evaluation of potential effects of the proposed WTM development, during construction and operation, will cover the following topics:

- effects on designated sites;
- effects on habitats / vegetation; and
- effects on fauna;

14.14 In detail, the four main stages of the assessment involve:

e) **Baseline studies**

14.15 Baseline studies will consist of two parts - a desk study and field surveys, as described above.

Desk Study

14.16 The desk study was based on collating information from within the study area in order to identify key biodiversity features. The area for the desk study extends from the boundaries of the proposed development as follows:

- 2km – non statutory designated sites and species records;
- 5km – additional records of bats and otter; and
- 15km – statutory designated sites.

14.17 Information on sites of importance for nature conservation and records of protected and otherwise notable species has and will continue to be obtained from the Kent and Medway Biological Record Centre. Information on statutory sites of nature conservation importance and Biodiversity Action Plan Priority Habitats has been obtained from the Natural England, Joint Nature Conservation Committee and MAGIC web-sites. If the K&MBRC does not hold certain faunal group information then approaches will be made to specific local bodies such as the relevant badger or bat group.

Field surveys

14.18 The need for specific field surveys, in addition to those already underway, has been determined by the results of the phase 1 habitat and scoping surveys. Surveys will be based on the guidance and optimal survey timing as set out in Table 14.2.

Table 14.2 – Guidance on Optimal Survey timing

Survey	Guidance on survey method	Optimal survey period
Phase 1 Habitat	JNCC 2003	April to September
Protected species scoping	IEMA 1995	April to September
Bat roost, emergence and activity	Bat Conservation Trust 2007	April to September Roost inspection all year
Water Vole	Strachan and Moorhouse 2006	April to July (August to September with additional effort)
Reptiles	Froglife 1999	May to early October
Intertidal birds	RSPB et al 1998	Year round
Terrestrial birds	RSPB et al 1998	Breeding: April to July

f) Identification of Valued Ecological Receptors

- 14.19 Having identified sites of known importance for nature conservation, species populations, species assemblages and habitats present within the site and in the locality, Valued Ecological Receptors (VERs) will be identified. VERs are sites, habitats and species that are valued in some way and which could be affected by the project.
- 14.20 Sites, populations of species, species assemblages and habitats will be evaluated with reference to their importance in terms of 'biodiversity conservation' (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations).
- 14.21 For the purposes of the assessment, sites, species populations, species assemblages and habitats will be valued using the following scale of geographical reference:
- International;
 - National;
 - Regional;
 - County;
 - District (Borough); and
 - Local.
- 14.22 The valuation of sites will make use of established value systems. Thus, Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar Sites are of international importance; Sites of Special Scientific Interest (SSSI) are of national importance; and County Wildlife Sites are of county importance. Professional judgement is required for the valuation of sites of less than county value.
- 14.23 The valuation of populations of species, assemblages of species, and habitats will be based on accepted criteria; examples include:
- Species populations: The importance of populations will be evaluated on the basis of their size and / or recognised status, for example, published lists of species of conservation concern, Biodiversity Action Plan (BAP) status, and legal protection.
 - Species Assemblages: In some instances it is the species assemblage that is of importance. Criteria used to evaluate the importance of assemblages include SSSI selection criteria.
 - Habitats. Criteria for the evaluation of habitats and plant communities include Annex III of the EC Habitats Directive, guidelines for the selection of biological SSSIs and, where available, Local Authority and Wildlife Trust criteria for the selection of Local Sites, for example, Sites of Importance for Nature Conservation (SINCs). Legal and policy protection status is also a consideration for certain habitats, for example ancient woodland.
- 14.24 In assigning values to species populations, it is important to take into account the status of the species in terms of any legal protection to which it is subject. However, it is also important to consider other factors such as its distribution, rarity, population trends, and the size of the population which would be affected. Assigning values to species would have regard to the geographic scale at which the populations which may be affected are important.
- 14.25 Due regard must also be paid to the legal protection afforded to such species in the development of mitigation and compensation measures to be implemented during construction and operation of the scheme. For European protected species there is a requirement that the scheme should not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

g) Identification and Characterisation of potential Effects and Mitigation

- 14.26 An important aspect of scoping is to determine the potential effects that should be assessed and the likely zone of influence of those effects arising from the project. Since it can be difficult at the scoping stage to accurately establish the extent of changes likely to be caused, it is important to take a precautionary approach to ensure that the study area incorporates all areas where significant effects could occur. It is considered that the distances referred to in relation to the desk study above is sufficient to cover potential likely significant adverse effects on terrestrial ecological interests in most circumstances.
- 14.27 No direct land take of any ecologically designated areas is proposed as part of the WTM development. Direct terrestrial habitat loss is therefore likely to be limited to wildlife that has colonised parts of the Port which are to be subject to demolition and new constructions.
- 14.28 The assessment of potential effects would take into account the specific characteristics of the project. In assessing the potential effects, consideration would be given to a number of parameters, including:
- confidence in predictions;
 - magnitude, extent and duration;
 - reversibility; and
 - timing and frequency.
- 14.29 The potential impacts of the construction and operation of the WTM include:
- Direct sub-tidal habitat loss;
 - Habitat fragmentation;
 - Habitat deterioration;
 - Disturbance to species;
 - Introduction of new substrate/habitat; and
 - Pollution of land and watercourses.
- 14.30 Impacts to wildlife beyond the immediate Port boundary (noting that impacts potentially arising from changes to sediment movement and water flows are addressed in the previous marine ecology sections) are likely to include:
- Disturbance associated with lighting and human movements; and
 - Disturbance associated with noise (see below).
- 14.31 In consultation with Natural England, it has been established that the ES should consider, amongst other matters, the impact from noise emissions on birds, both within and when outside the designated sites near to the Port. For noise, the following assessment approach has been discussed with Natural England for the construction and operation phases of the WTM:

h) Construction Noise Effects on Ecology

- 14.32 It is recognised that infrequent, short, sharp ‘percussive’ noises have the potential to cause the greatest disturbance to waders and wildfowl. Such noise events are considered most likely to occur during the construction phase, but are unlikely to be a common event once the WTM facility is operational.
- 14.33 Accordingly, it is considered that noise created during the construction activities closest to the river edge and at the southern extent of the Lappel Bank have the greatest potential to affect

wading birds and waterfowl using the Medway Estuary and Marshes SPA / Ramsar site and might have the potential to carry to the Swale SPA / Ramsar site. Peak levels of sound are most likely to occur from the impact of concrete breaking and pneumatic drilling during site preparation and piling during construction. These activities can have an impact on bird species at a distance of up to 250 metres; based on published research and studies by the Environment Agency for the Humber Estuary Tidal Defences scheme.

- 14.34 Construction noise levels will be predicted by the appointed noise consultants, Temple Group (see Section 15, below) who will work with RPS to map noise propagation and levels at the above ecological receptors. This assessment will then be reported in the Terrestrial Ecology chapter of the ES.

i) Operational Noise Effects on Ecology

- 14.35 People getting in and out of vehicles, including shutting doors, can cause more disturbance than continuous low-intensity disturbances such as low-level continuous noise. It is generally thought that birds may habituate to continual noise so long as there is no large-amplitude 'startling' component. It is expected however, that the existing Port uses nearest to designated ecological areas might have already resulted in "habituation" of birds to the Port's operations.

j) Mitigation

- 14.36 Where potential adverse effects are identified, means to avoid or reduce such effects would be incorporated into the design of the project wherever practical. Any mitigation measures which are integral to the design of the project, and to which there is commitment from the Applicant, would be taken into account in the assessment of the extent and magnitude of effects.
- 14.37 In addition to effective mitigation, there would be an expectation that the project would provide biodiversity enhancements in accordance with PPS9.

k) Assessment of the significance of effects.

- 14.38 The criteria for determining the significance of the predicted effects on VERs will be assessed in accordance with the Institute of Ecology and Environmental Management (IEEM) 2006 guidelines.

15 NOISE AND VIBRATION

a) Key Issues/Baseline Overview

- 15.1 As described previously, the WTM site is bounded to the east and north by industrial, marine transport and other Port related uses and activities. The ambient noise environment is therefore dominated by industrial activities and road traffic noise.
- 15.2 The sensitivity of the immediate surrounding area to noise generated during the construction and operation of the WTM works is considered to be low to moderate, because most neighbouring properties are also commercial or industrial in nature. Properties at Blue Town (~250m north east) are the nearest residential receptors, but these are partly shielded from the WTM site by the sea wall and intervening light industrial and commercial office buildings.
- 15.3 Ecological habitats and species that might be susceptible to noise impacts, particularly along the tidal zone, will be considered in conjunction with the project ecologists (as described above). In particular, construction activities at the south-west of the Lappel Bank might introduce new (albeit temporary) noise disturbances to marine birds and habitats.
- 15.4 A methodology for carrying out baseline noise surveys was agreed with Swale Borough Council through preliminary consultation and a site visit with the Environmental Health Officer. These noise surveys have since been completed. The survey of residential receptor sites comprised continuous long term noise measurements (stored in 15 minute periods) taken at two sites for a minimum period of seven days between 18/08/2011 – 02/09/2011. The long term monitoring locations were as follows:
- rear Garden of residential property 21 West Lane in Blue Town. LAeq (0700-1900 Weekday); and
 - rear Garden of residential property 63 Linden Drive. LAeq (0700-1900 Weekday).
- 15.5 Additionally, a number of attended noise measurements were completed at the following locations:
- Linden Drive.
 - Nelson Close.
 - New Road/Medway Road Junction.
 - West Street / Brielle Way Junction.
 - Hawthorn Avenue.
 - Union Street.
- 15.6 All measurements were completed in terms of A-weighted broad band Leq, Lmax and L10 and L90.
- 15.7 A further set of 1 week of noise monitoring data was obtained from the Lappel Bank at the most southerly point of the existing Port. This location was chosen to provide baseline monitoring data representative of noise levels incident upon Dead Man's Island/ the SPA boundary. A computer model (using the commercially available Datakustik CadnaA software) has been created to predict the level of noise at specified locations on, and around, the SPA boundary. The model will be used to calculate construction noise levels at the site boundary, the low water mark, and

across the Estuary to Dead Man's Island, and thereby allow an assessment of potential noise disturbance to waders and wildfowl birds in conjunction with the project ecologist.

b) Potential Effects

15.8 **Construction Effects:** Potential noise and vibration effects, of different intensity and tonal nature, could arise during different stages of the development depending on the type of activities taking place. The greatest potential for noise and vibration is likely to occur during the demolition, site preparation, piling and quay strengthening works as well as other activities involving heavy plant, percussive activities and peaks in construction HGV traffic movements.

15.9 **Operational Effects:** Operational noise effects could derive from fixed and mobile plant associated with the WTM buildings (e.g. external heating and air conditioning plant, dust extraction, electricity sub-stations etc) together with internal site transport systems, the movement of marine vessels, travelling cranes and other plant involved in the erection of the completed turbine components, and HGV's both within and outside of the site. However, such sources are comparable to existing Port activities and future noise levels with the WTM facility are therefore not expected to be any higher than at present. All building plant will be specified in accordance with current building regulations and Local Authority standards for noise.

15.10 **Effects on Terrestrial Ecology:** As discussed in the previous section, consultation with Natural England has already identified the need to consider the effects of noise emissions from the WTM on nearby sensitive wildlife receptors. These potential effects include:

- Construction Effects: Infrequent, short, sharp 'percussive' noises have the potential to cause the greatest disturbance to wildlife. Such noises are considered most likely to be generated during the construction phase, and be a comparatively uncommon event during the operation of the proposed WTM facility.
- Operational Effects: The effects of plant noise and ongoing port activities on noise sensitive receptors. It is generally thought that birds may habituate to continual noise so long as there is no large-amplitude 'startling' component.

15.11 The assessment of the significance of noise effects on wildlife will be reported in the Terrestrial Ecology Chapter of the ES. The magnitude of noise related impacts from the proposed WTM will be determined by the appointed noise and vibration team.

c) Approach and Methodology

15.12 The noise and vibration assessment includes the following steps:

- Identification of potentially sensitive noise and vibration receptors;
- Undertaking comprehensive baseline noise surveys at appropriate locations, including nearby sensitive wildlife habitat (now complete);
- Preliminary assessment of noise and vibration levels during the construction works with reference to British Standard BS5228 'Noise and Vibration Control on Construction and Open Sites'¹⁴; BS7385 'Evaluation and Measurement for Vibration in Buildings'¹⁵; and, BS6472 'Guide to Evaluation of Human Exposure to Vibration in Buildings'¹⁶;
- Evaluation of noise effects resulting from the operation of new building services plant, with reference to BS4142 'Method for rating industrial noise affecting mixed residential and industrial areas',
- Assessment of noise generated by active ground floor uses;
- Identification and assessment of potential vibration effects;

- Formulation of appropriate noise and vibration mitigation measures with reference to, BS8233 'Sound insulation and Noise Reduction for Buildings - Code of Practice'¹⁷, and the World Health Organisation 'Guidelines for Community Noise'¹⁸; and
- Modelling of noise levels and propagation to sensitive SPA habitat using Datakustik CadnaA software.

15.13 While not solely limited to comparison against published standards, significant effects will, at a minimum, be identified where the likely breach of any British Standard is identified during the assessment. The magnitude (in terms of sound amplitude and the temporal nature) of the impact will be taken into account when considering the level of significance (minor, moderate, substantial) of the identified effects.

16 ARCHAEOLOGY AND CULTURAL HERITAGE

a) Key Issues/Baseline Overview

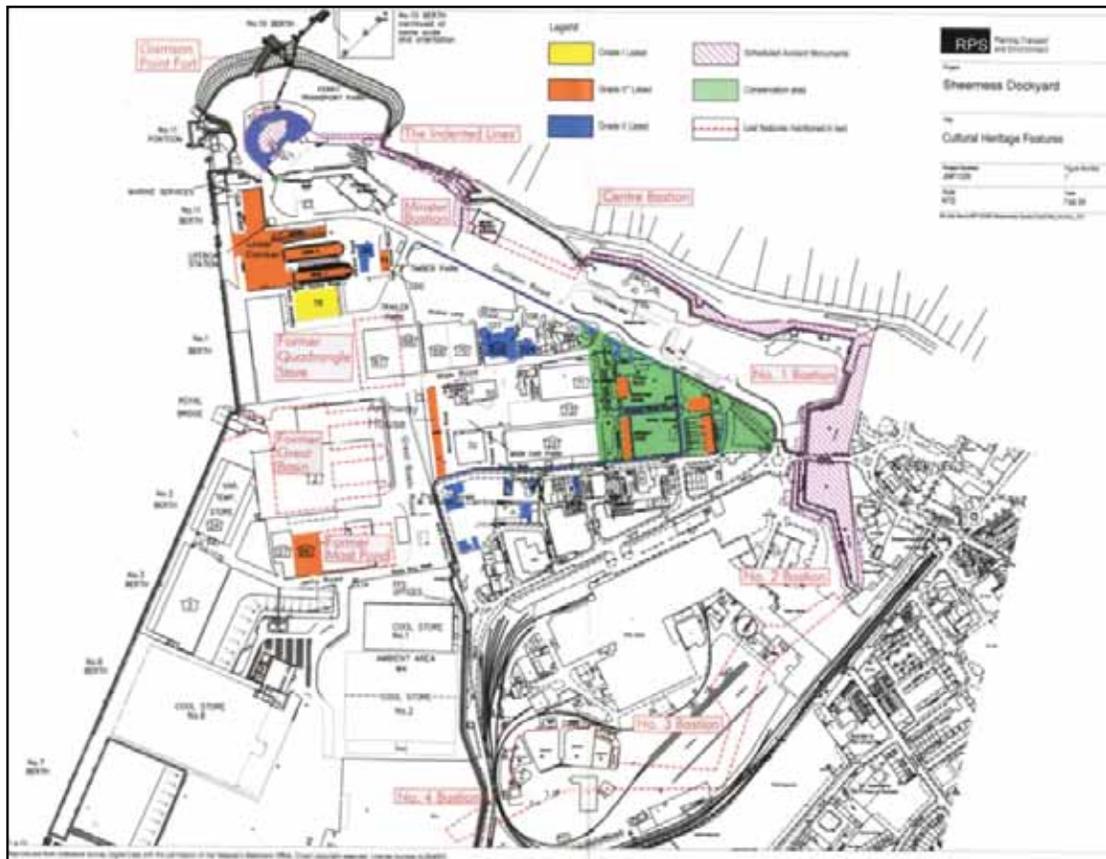
16.1 The Port of Sheerness is recognized for its unique Naval and Maritime history, which has resulted in the location of archaeological and heritage assets at, and near, to the site.

Built Heritage Baseline

16.2 Figure 16.1 identifies the location of known heritage assets and historical structures around the Port of Sheerness, although this does not identify the full scope of heritage assets to be considered by the EIA. The EIA will present the results of a wider asset search, based on the search areas identified in Appendix D of this Scoping Report (Draft Historic Environment Desk-based Assessment, RPS, July 2011). These search areas are summarised as follows:

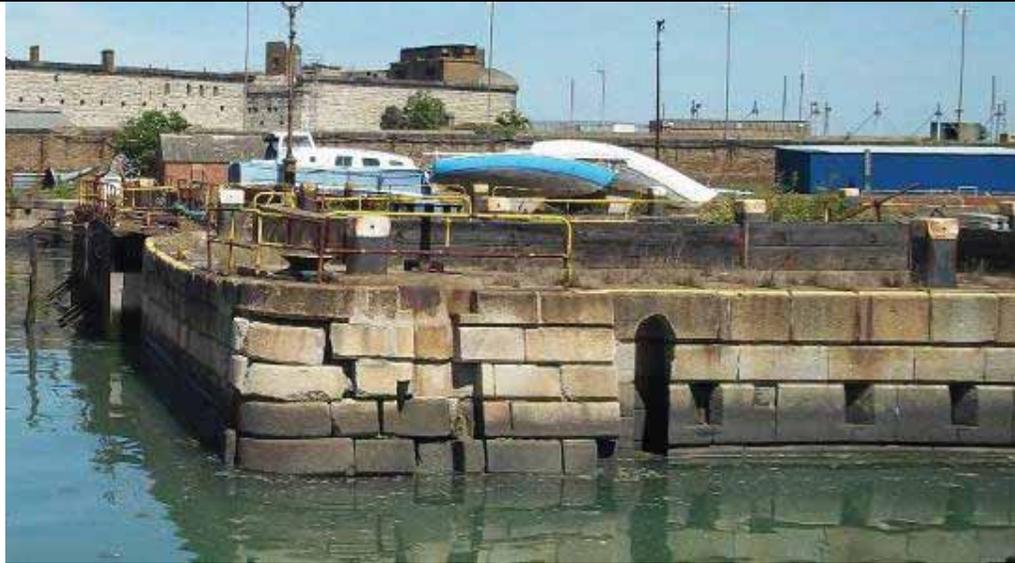
- 5km radius search area for statutory heritage assets; and
- 1km radius search area for archaeological remains and non-statutory heritage assets.

Figure 16.1 – Known Heritage Features at Sheerness Port



- 16.3 During the 16th century there was a simple Tudor 'blockhouse' at the tip of the peninsula. The fort was rebuilt by De Gomme in response to the Dutch threat in the 17th Century.
- 16.4 The south-west corner of De Gomme's moated defences may have extended into the north-east corner of the Proposal Site. At this time the area to the south (including much the northern extent of the Proposal Site) comprised a Royal Navy repair yard and ordnance wharf centred on Powder Monkey Bay, within the riverside inter-tidal mud flats.
- 16.5 In the late 17th and 18th century a number of hulks were used as breakers and additionally as accommodation for the dock-workers and their families. The cluster of accommodation hulks was referred to as a squalid 'floating town' by contemporary observers including John Wesley. The hulks were sunk in the early 19th century following the provision of dry land accommodation at Blue Town.
- 16.6 The dockyard was further modified during the 18th century with the addition of warehouses and other structures. There followed a radical improvement associated with reclamation, rebuild and extension under Sir John Rennie. Much of the original dockyard within the red line is no longer extant. Extant structures associated with John Rennie's dockyard include the Grade II* working Mast House, the former Pump House and the dockyard's sea wall.

Figure 16.2 – Historic Dock Structures



- 16.7 The current Garrison Point Fort to the north was constructed in the 1860's and is now a Scheduled Ancient Monument.
- 16.8 The Sheerness defences beyond the site also included the Indented Lines, Sheerness Lines and the Queenborough Lines (built approximately the same time as Garrison Point). Additional gun emplacements occurred throughout the 19th century through to World War II in concert with similar defences on the opposite side of the Medway at the Isle of Grain.
- 16.9 Some former 19th Century dockyard structures within the Proposal Site including the formerly Grade II* Listed Shed No. 19 (former Quadrangular Store House – demolished in 1980) are no

longer extant, although remains of these may survive archaeologically). The formally Listed Great Basin with associated dry docks and the Small Basin were buried intact in the same period and remain heritage assets.

- 16.10 The Sheerness Defences Scheduled Ancient Monument's including the 19th century Garrison Point Fort and Indented Lines and elements of the Sheerness Lines which provided protection to the fortress and dockyard area, are located to the north and east of the proposed WTM. The SAM's are protected under the Ancient Monuments Act (1979).
- 16.11 Non-statutorily recognised heritage assets (with a 1km search area) will also be assessed, in accordance with the requirements of PPS5. This will include, in particular the conservation area at the Royal Navy Dockyard and Blue Town Conservation Area and Queenborough Conservation Area.

Archaeological Baseline

- 16.12 Prehistoric to medieval exploitation of the coastline and former inter-tidal zone mud flats (alluvium) may have occurred within the area of the Proposal Site, although any evidence will be deeply buried beneath the modern dockyard and reclaimed land to the south (the made ground appears to be 4-6m deep). Therefore, although no settlement, industrial or other activity sites are currently known of within the Proposal Site there is some potential for intertidal zone archaeology to survive beneath the made ground. Inter-tidal zone remains have been known to include preserved wooden fish traps, track-ways, revetments, boats and canoes, oyster pits and salt-working remains such as red mounds or brine settling pits of various dates (prehistoric to post-medieval).
- 16.13 The most notable archaeological features are potential buried elements of various phases of the 16th-19th century dockyards and defences which are referred to here as the Historic Dockyard Zone. The latest significant period of archaeology and most likely to be represented by buried remains relate to early 19th century elements of Sir John Rennie's dockyard (1815-1830). These include the relatively recently in-filled Great Basin, dry docks and slipway now partially located beneath current warehouse No.2 and the former Small Basin and Culvert beneath Warehouses 1 and 67/68. The upper walls of these buried structures are likely to survive just below modern tarmac level. Foundations of various other former storehouses, sheds and basins of the early 19th century dockyard may survive elsewhere (including the former Quadrangular Store House).
- 16.14 The western arm of the southern tidally flooded 'moat' of Sir Bernard De Gomme's 17th century fort defences may have extended into the extreme north-east area of the Proposal Site and could survive as a cut feature. The remains of 17th/18th hulks that were sunk into the estuary mud or broken up as hardcore, may also partially survive later truncation in some areas beneath the northern area of the modern dockyard. The HER reference is for 'old ships sunk with design to make new docks at Sheerness' centred on the current site of Warehouse 1 based on Admiralty maps. This area of the former 'Powder Monkey Bay' was, however, subsequently dug out in the early 19th century to form the Small Basin, (otherwise known as the Middle Basin) such that at least some of these hulks were almost certainly removed. Even though substantial piling also occurred for the dockyard generally and specifically for some of its more robust structures such as the Quadrangle, parts of sunken hulks may survive archaeologically in areas between the deep basins, foundations and piles.

- 16.15 The Proposal Site, to the south of the southern retaining wall of Rennie's dockyard, was mud flats until the land reclamation instigated in the 1970's and only recently completed. This area is known as Lappel Bank on the mapping and is referred to as the 20th Century Reclamation Zone for the purposes of this report. The zone includes several known heritage features recorded on the HER. These include the 17th-early 19th century Mast Pond and the location of Sheerness (Blue Town) pier on its north side, former location of a wreck site of unknown date, and a 19th century sewer outfall. The eastern edge of the Proposal Site is defined by the 19th century sea wall. The western extent of the late 18th century Sheerness Lines moat may have also extended into the eastern extent of the Proposal Site, and could survive as a deeply buried archaeological feature (geotechnical records suggest c.4-6m of made ground was placed upon the former foreshore). Similarly there may archaeological remains associated with the late 18th century and later Queenborough Lines within Whiteways (the 1933 OS shows a bank on the approximate alignment – although this was not shown on earlier maps).

b) Potential Effects

Heritage Effects

- 16.16 To facilitate the WTM, 'Building 26' (working Mast House) would need to be removed, which would require specific permissions. Other non-designated built heritage assets would also be impacted and are likely to require specific permissions. This would constitute a principle heritage consideration for Planning.

Figure 16.3 – Exterior of Building 26

- 16.17 The EIA process will also consider the potential for visual impacts to Listed Buildings, Conservation Areas and Scheduled Ancient Monuments including the Grade I Listed Boat House and the Garrison Point Fort, both close to the northern extent of the Proposal Site and the Conservation Area located to the east of the Proposal Site. The latter extends across the extreme northern tip of the Proposal Site.
- 16.18 The Garrison Point Fort SAM overlooks both the mouth of the Medway and the Thames estuary approach (Thames Gateway) and would be highly visible to and from the WTM site, both during construction and operation. The main consideration will be retention of key military views. There are also a number of World War II defences associated with the shoreline and the Sheerness Lines alignment. The closest of these is an installation at Garrison Point Fort.

Archaeological Effects

- 16.19 Former dry land prehistoric sites are occasionally identified within mudflats due to the effects of sea level rise. However, such remains are deeply buried beneath later made ground at this site and may be too deeply buried to be impacted other than by piling. It is possible that previous phases of dredging to facilitate and maintain deep water berths, depths for which are recorded on Port plans, will have removed any archaeologically significant remains that might have been present in proposed dredging areas.

- 16.20 The foundations and piles of the former Naval Dockyards are likely to have truncated earlier remains and may be encountered by the Proposal Site's ground works, depending on final design.
- 16.21 The design team will consider options for foundations, taking into account potential impacts on the previously in-filled 19th Century structures.

c) Approach and Methodology

- 16.22 No standard, published EIA methodologies exist for Archaeological and Heritage Assessment. However, assessment methodology can be guided by various published documents including the following:
- English Heritage, Conservation Principles, Policy and Guidance (2008),
 - English Heritage, Ports: The impact of Development on the Maritime Historic Environment (2006), and
 - English Heritage, Marine Aggregate Dredging and the Historic Environment (2003).
- 16.23 In order to reach an understanding of the level of any effect that a proposed development may have on a heritage asset, it is necessary to understand the importance of that asset, the proposed impacts and the assets significance.
- 16.24 Using a matrix that measures both asset value and impact magnitude produces an assessment of the level of the effect of the proposed scheme on each asset. The approach to these matrices is set out as follows:

Assessment of Asset Importance – Archaeological Remains

- 16.25 There are no national government guidelines for evaluating the importance of all types of heritage asset. For archaeological remains, DCMS has adopted a series of recommended (i.e. non-statutory) criteria for use in the determination of national importance when scheduling ancient monuments. These are expressed in Scheduled Monuments - Identifying, protecting, conserving and investigating nationally important archaeological sites under the Ancient Monuments and Archaeological Areas Act 1979 (DCMS March 2010). The criteria include period, rarity, documentation, group value, survival/condition, fragility/vulnerability, diversity and potential, and can be used as a basis for the assessment of the importance of historic remains and archaeological sites. However the document also states that these criteria *"should not be regarded as definitive; but as indicators which contribute to a wider judgment based on the individual circumstances of a case"*

Table 16.1: Factors for assessing the importance of archaeological assets

Very High	World Heritage Sites Assets of acknowledged international importance Assets that can contribute significantly to acknowledged international research objectives
High	Scheduled Monuments Undesignated assets of schedulable quality and importance Assets that can contribute significantly to acknowledged national research objectives
Medium	Designated or undesignated assets that contribute to regional research objectives
Low	Undesignated assets of local importance Assets compromised by poor preservation and/or poor survival of contextual associations Assets of limited importance, but with potential to contribute to local research objectives
Negligible	Assets with very little or no surviving archaeological interest
Unknown	The importance of the asset cannot be ascertained

Assessment of Asset Importance - Historic Buildings

16.26 For historic buildings assessment of importance is usually based on the designations used in the Listed Building process. However, where historic buildings are not listed or where the listing grade may be in need of updating, professional judgement will be required.

Table 16.2: Guide for establishing the importance of historic buildings

Very High	Standing buildings inscribed as of universal importance as World Heritage Sites Other buildings of recognised international importance
High	Scheduled Monuments with standing remains Grade I and II* Listed buildings Other listed buildings that can be shown to have exceptional qualities in their fabric or historical association not adequately reflected in the listing grade Conservation Areas containing very important buildings Undesignated structures of clear national importance
Medium	Grade II Listed Buildings Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical association Conservation Areas containing important buildings Historic Townscape or built-up areas with historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Low	'Locally listed' buildings Historic (unlisted) buildings of modest quality in their fabric or historical association Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures)
Negligible	Buildings of no architectural or historic note; buildings of an intrusive character
Unknown	Buildings with some hidden (i.e. inaccessible) potential for historic significance

Assessment of Impact Magnitude - Archaeological Remains

16.27 The magnitude of impact is assessed without regard to the importance of the heritage asset. In terms of the judgement of the magnitude of impact, this is based on the principle (established in PPS5) that preservation of the asset is preferred, and that total physical loss of the asset is the least preferred.

16.28 Impact scales are defined thus:

- **Major:** Change to most or all key archaeological elements, such that the asset is totally altered and much of its archaeological value is lost. Substantial change within the setting leading to considerable loss of the value/importance and or integrity of the asset.
- **Moderate:** Changes to many key archaeological elements, such that the asset is clearly modified and there is some loss of the value/importance and or integrity of the asset. Change within the setting leading to some loss of significance of the asset.
- **Minor:** Changes to key archaeological elements, such that the asset is slightly altered and there is a slight loss of the value and or integrity of the asset. Slight change within the setting leading to a slight loss of value/importance of the asset.
- **Negligible:** Very minor changes to key archaeological elements or within the setting that hardly affect the value/importance of the asset.
- **No change:** No change to key archaeological elements or within the setting.

Assessment of Impact Magnitude - Historic Buildings

16.29 The magnitude of impact is assessed without regard to the importance of the asset, so the total destruction of an insignificant building has the same degree of impact magnitude as the total loss of a highly important building. In terms of the judgement of the magnitude of impact, this is based on the principle that preservation of the asset and its setting is preferred, and that total physical loss of the asset and/or its setting is the least preferred.

16.30 Impacts on the setting of historic buildings may include vibration, noise and lighting issues as well as visual impacts, and may be reversible.

16.31 Impact scales are defined thus:

- **Major:** Change to key historic building elements, such that the asset is totally altered and much of its significance is lost. Change within the setting leading to considerable loss of value of the asset
- **Moderate:** Change to many key historic building elements, such that the asset is clearly modified and there is some loss of significance. Change within the setting of an historic building leading to some loss of value of the asset
- **Minor:** Changes to key historic building elements, such that the asset is slightly altered and there is a slight loss of significance. Change within the setting of an historic building leading to a slight loss of value of the asset
- **Negligible:** Slight changes to historic building elements or its setting that have no obviously discernable affect on the assets value
- **No change:** No change to fabric or within the setting

Significance of Effects

16.32 The significance of effects is a combination of the importance of the heritage asset and the magnitude of impact on that asset. Effects can be adverse or beneficial. Beneficial effects are those that mitigate existing impacts and help to restore or enhance the significance of heritage assets, therefore allowing for greater understanding and appreciation. The following matrix is likely to be used.

Table 16.3: Historic Environment: Level of Effects Matrix

IMPORTANCE					
Very High	Neutral	Minor	Moderate/ Major	Major/ Substantial	Substantial
High	Neutral	Minor	Moderate/ Minor	Moderate/ Major	Major/ Substantial
Medium	Neutral	Neutral/ Minor	Minor	Moderate	Moderate/ Major
Low	Neutral	Neutral/ Minor	Neutral/ Minor	Minor	Minor/ Moderate
Negligible	Neutral	Neutral	Neutral/ Minor	Neutral/ Minor	Minor
	No Change	Negligible	Minor	Moderate	Major
	MAGNITUDE OF IMPACT				

Settings

16.33 Legislation and guidance makes reference to the desirability of preserving or not adversely affecting 'settings'. Until recently, there has been no agreed definition of what this term actually means, with interpretations as simple as a visual envelope and more complex ideas based on historic relationships that may no longer be visible in the landscape. The identification of the 'settings' of heritage assets, and the nature and magnitude of impacts and consequently the significance of effects on such 'settings', have thus been subject to much debate within the historic environment profession.

16.34 PPS5 has brought some clarity in that it provides a clear definition of setting:

Setting: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset,

may affect the ability to appreciate that significance or may be neutral.

- 16.35 Guidance to the PPS is provided in the document *Planning for the Historic Environment Practice Guide*. Paragraphs 113-124 of the Practice Guide address the issue of the settings of heritage assets and include the following points:
- All heritage assets have a setting, irrespective of the form in which they survive and whether they are designated or not;
 - The setting of a heritage asset can enhance its significance whether or not it was designed to do so;
 - The contribution that setting makes to the significance does not depend on there being public rights or an ability to access or experience that setting. This will vary over time and according to circumstance. Nevertheless, proper evaluation of the effect of change within the setting of a heritage asset will usually need to consider the implications, if any, for public appreciation of its significance.
 - For the purposes of spatial planning, any development or change capable of affecting the significance of a heritage asset or people's experience of it can be considered as falling within its setting; and
 - A proper assessment of the impact on setting will take into account, and be proportionate to, the significance of the asset and the ability to appreciate it.
- 16.36 In August 2010 English Heritage published a Consultation Draft of a document entitled *The Settings of Heritage Assets: English Heritage guidance*. The aim of this guidance, as stated in the Consultation Draft, is to 'ensure that judgements made about the contribution of setting to the significance of heritage assets and about the implications of change are as objective and consistent as possible, reducing conflict and delay in decision-making.
- 16.37 Any assessment of the likely effects of a proposed development on the settings of a heritage asset therefore should seek to establish the following:
- Will the proposed development form part of the surroundings of the heritage asset?
 - If so, will it make a positive or negative (or neutral) contribution to the significance of that heritage asset, or the ability to appreciate that significance?
 - In the case of the contribution being positive or negative, what level of impact on the significance of the heritage asset is likely to occur, i.e. high, medium, low or negligible?
- 16.38 The English Heritage guidance identifies a number of factors that could be considered with regard to the assessment of the magnitude of change within the settings of heritage assets:
- The number and the importance of heritage assets affected – the implications for each asset should be considered individually as well as impacts on the shared settings of assets;
 - Proximity – new development affecting an asset's immediate setting is likely to have the greatest impact but change at a greater distance may also have an effect;
 - Prominence – some assets are deliberately placed in prominent locations; and
 - Scale – was the heritage asset designed to stand out?
- 16.39 Other aspects that could be considered with regard to the degree of harm to the significance of the asset include:
- The duration and reversibility of the change;
 - The sensitivity of the heritage asset to changes within its setting;
 - The implications of noise, movement, light and other factors; and
 - Other environmental changes, e.g. hydrology, soil chemistry.

- 16.40 The Consultation Draft raises the issue of cumulative change, both in terms of incremental change within the setting of a single heritage asset as a result of sequential development and also as a result of a combination of different environmental effects arising from a single development or a series of developments.
- 16.41 Appraisal of the sensitivity to change of the setting of a heritage asset incorporates a number of factors that together contribute towards considerations of how certain aspects within the surroundings of a heritage asset contribute towards the significance of that asset, and / or people's ability to appreciate that significance.
- 16.42 The levels of sensitivity (to change) of the setting of a heritage asset are identified thus:
- **Reduced:** the significance of an asset is not likely to be affected by development within its surroundings - there are already several detracting elements within the setting and few contributory elements.
 - **Restricted:** the significance of an asset may be slightly diminished by development within its surroundings - there are some detracting elements within the setting and some contributory elements.
 - **Notable:** the significance of an asset may be substantially diminished by development within its surroundings - there are several contributory elements within the setting and few detracting elements.
 - **Elevated:** the significance of an asset may be wholly diminished by development within its surroundings - there are a number of contributory elements within the setting and almost no detracting elements.
- 16.43 The impact of the proposals on the settings of heritage assets is reached by combining the assessment of the magnitude of change within the setting of the heritage asset with the identified sensitivity (to change) of that setting, as illustrated in Table 16.4.
- 16.44 This is not designed as an absolute predictive tool, but to make the professional judgments as transparent as possible. Where the table gives two possible outcomes, e.g. Minor / Moderate, the allocation of one of these outcomes is made by the assessor on the basis of the individual circumstances of the asset, the nature of the impact and the sensitivity (to change) of the setting, using professional judgment and expertise. For example, a moderate magnitude of change to a setting with a notable sensitivity (to change) would result in a Minor or Moderate impact on the setting of the asset, and the assessor would decide which one of these is the most appropriate. The overall effect would be dependent on the value of the asset.

Table 16.4: Overall Impact on Settings of Heritage Assets

Sensitivity (to change) of setting	Impact magnitude resulting from change within the setting of a heritage asset				
	None	Low	Moderate	High	Very High
Reduced	No change	Negligible	Negligible	Minor	Moderate
Restricted	No change	Negligible / Minor	Negligible / Minor	Minor / Moderate	Moderate / Major
Notable	No change	Negligible / Minor	Minor / Moderate	Moderate	Major
Elevated	No change	Minor	Moderate	Moderate / Major	Major

- 16.45 The impacts described in Table 16.4 can be adverse or beneficial.

17 LANDSCAPE AND VISUAL

a) Key Issues/Baseline Overview

- 17.1 The site is not within any national (e.g. Area of Outstanding Natural Beauty) or local (e.g. Special Landscape Area) designations with respect to landscape and/or the visual environment. The local area is characterised by industrial, commercial and residential land uses, with long distance views across the River Medway and Outer Thames Estuary.
- 17.2 Four components to the baseline data gathering and assessment are proposed as part of the Landscape and Visual Assessment, as described in Table 17.1. This assessment will be completed by Waterman Group.

Table 17.1 – Baseline Desktop Studies and Data Collection

Study name	Description	Data sources
Desktop baseline assessment	Reference to topography, existing vegetation, drainage, roads and built environment	Current OS and satellite mapping. A topographic survey of the site has recently been completed.
Assessment of existing landscape character and sensitivity	To establish the landscape “receptors” and local landscape quality	National and Local Planning policy, and existing published landscape character assessments.
Establish Zone of Theoretical Visibility (ZTV)	Establish areas from which the completed development may be visible, taking account of local topography using suitable computer software. Area of ZTV to be agreed with Swale Borough Council (SBC).	Ordnance Survey mapping
Site survey	Confirm/ record the visual context of the site / extent of views from the study area as determined during the desk top baseline assessment (and agreed with SBC).	Establish the relevant viewpoints from which to assess visual impact. Photo-panoramas will be taken from these locations in order to illustrate the LVIA.

b) Potential Effects

- 17.3 Landscape effects include the direct and indirect effects of the development on individual landscape elements and features, in addition to any effect upon the general landscape character and quality of the surrounding area.
- 17.4 The main contributors to landscape and visual effects are considered to be the WTM buildings (up to ~30m), port cranes (up to 140m), the erection of wind-turbine towers (prior to shipment to offshore wind farms) and the relocated vehicle import business which is to be moved southwards along the Lappel Bank and, subject to planning permission, to port-owned land at Whiteways. However, the development will be set within the wider visual context of the existing Port buildings and structures, as well as local industries including Sheerness Steelworks and Grain Power Station, which are of comparable bulk, mass and height.
- 17.5 Potential impacts to landscape character are expected to be most relevant to the immediate area around the existing Port and Sheerness, although consideration will be given to any impact to

landscape character across the wider study area, including the Isle of Sheppey and Isle of Grain, together with the cumulative effects of other committed developments.

17.6 Potential landscape and visual effects to be addressed by the EIA will include:

- Temporary visual intrusion during demolition and construction works;
- Changes to the character, context and quality of the site and local landscape and townscape; and
- Effects upon local and distant views.

c) Approach and Methodology

Landscape and Visual Impacts/ Effects

17.7 The assessment will review and describe the existing landscape character of the site and surrounding area, and its sensitivity to change, including reference to any existing published landscape assessments and designations. A review of the impact of the proposed development to landscape planning policies will be included.

17.8 The study area and the extent of any Zone of Theoretical Visibility (ZTV) will need to be established and agreed with Swale Borough Council (SBC).

17.9 The visual impact assessment will consider the impact during the construction and operational periods of the proposed development. Approximately 10 photomontages will be produced showing the completed development from a selection of key views. These photomontages will be developed from a 3D model produced by the scheme architects (RPS) and will be used as a reference tool for demonstrating the visual appearance (mass and scale) of the WTM development, including the buildings and storage areas (blades, towers and nacelles) as defined by parameter plans, together with fixed plant such as cranes.

17.10 As agreed with the Council in a meeting with RPS on 5th September, the photomontages will be prepared to a high standard of visual accuracy but will 'unverified' due to outline nature of the building designs. The assessment will instead be based on the maximum and minimum heights, widths and lengths of buildings and other structures as defined by a set of parameter plans (see Section 4 of this Scoping Report).

17.11 Potential visual receptors to the Port and future WTM facility include:

- Users of public highways and public rights of way - PROW (including the Saxon Shore Way) and in and around Queenborough, most notably the PROW that flanks its western edge along the West Swale stretch of the Swale and those that traverse the eastern edge of the Grain Power Station;
- Viewpoints from a wider study area (up to 15km radius, including the Thames Estuary north side, and the Medway left bank);
- Residential properties including those close to Furze Hill (locally prominent point);
- Employment premises and community facilities within a 5km radius of the Development Site; and
- Recreation areas and open space users.

17.12 A qualitative assessment of the impact of changes to artificial lighting conditions will be outlined within the landscape and visual assessment chapter of the ES. However, it is anticipated that site lighting levels will not increase significantly (if at all) compared to the baseline situation (i.e. with

security lighting already being provided to the vehicle storage compound on the Lappel Bank and to existing Port buildings).

- 17.13 The assessment of visual impact will take into consideration the sensitivity of receptors and the nature or magnitude of change. This would determine the significance of the impact which would be defined in terms of criteria contained in a stated methodology following the recommendations of the Guidelines for Landscape and Visual Impact Assessment published by the Landscape Institute and the Institute of Environmental Management and Assessment - IEMA (2nd Edition 2002, Spon Press). Impacts may be adverse or beneficial in nature.

d) Mitigation:

- 17.14 As discussed previously, the WTM buildings will only be designed to outline level at this time and the final appearance of the buildings will be the subject of detailed planning/ reserved matters planning approvals in due course. However, if appropriate, suggested design mitigation measures will be recommended at this stage for consideration at the detailed design stage.
- 17.15 In consideration of the scale of the WTM buildings and associated plant, visual screening is unlikely to be either effective or appropriate, particularly when taking into account its setting within an established operational port, with other large industrial facilities and structures nearby. However, a draft Landscape Strategy/ Plan will be developed for submission with the planning application. This will set out, in broad terms, areas of the site which may benefit from soft-landscaping and planting (e.g. car parking areas) in order to enhance biodiversity and/or screen or enhance local views.

18 TRAFFIC AND TRANSPORT

a) Key Issues/Baseline Overview

- 18.1 A separate Transport Assessment (TA) and Travel Plan will be submitted with the WTM planning application, the content of which will be discussed and agreed with the relevant statutory bodies including Kent County Council (KCC) and the Highways Agency (HA). The ES will present a summary of this separate assessment in an appropriate format, as described below. The ES chapter on traffic and transport will focus on the potential environmental effects associated with predicted changes in traffic resulting from the WTM development, during both construction and operation.
- 18.2 The baseline and future predicted traffic flows on local transport links are being established as part of the TA undertaken by RPS (Newbury). Traffic counts have been completed at approximately 15 locations (July 2011) including at all major junctions along the A249 and at the Port entrance. In addition, Peel Ports has provided data on daily and weekly volumes and types of traffic (i.e. cars, MDVs and HGVs) accessing and leaving the Port based on security gate records (March 2011).

b) Potential Effects

- 18.3 Initial consultation with the highways department of Kent County Council (July 2011) has confirmed that the following matters will need to be addressed through the Transport Assessment:
- An assessment of whether or not the traffic generated as a result of the WTM facility would significantly add to the southbound queues on the A249 at Junction 5 of the M2 during the morning peak hour. The 'significance' threshold that is to be applied by the Highways Agency is expected to be 30 additional vehicles per hour. Current congestion problems result in a 3-5 mile southbound queue along the A249 on the approach to Junction 5 during the morning peak hour. This is a moving queue and is largely a result of people out-commuting southbound off Sheppey and from Sittingbourne to the motorway.
 - Any effects on the operation of the Grovehurst roundabout on the A249 that links with the first phase of the Sittingbourne Northern Relief Road. The central section of the Relief Road is due to open in late 2011 and this will provide access around the eastern side of Sittingbourne onto the A2, potentially linking to the M2 at a new junction.
 - Any capacity issues associated with the A249 north of the Grovehurst roundabout (recently improved).
 - Local traffic flows, pedestrian, cycling and public transport provision in proximity to the Port.

c) Approach and Methodology

- 18.4 Current guidance for assessing the environmental effects of road traffic is set out in '*Guidelines for the Environmental Assessment of Road Traffic, Guidance Note No. 1*', published by the Institute of Environmental Management and Assessment (IEMA). The guidelines are based on the forecast increase in traffic on a link resulting from proposed development and sets out thresholds upon which more detailed assessments should be undertaken.
- 18.5 The guidelines suggest that more detailed assessments should be undertaken for links where traffic flows, or the number of HGVs are predicted to increase by more than 30% as a result of

proposed development. The guidelines also recommend that in sensitive locations a 10% threshold for traffic flows should be used as a basis for undertaking assessments in more detail. Such assessments which should account for the following road traffic related effects:

- Noise;
- Vibration;
- Visual Impact;
- Severance;
- Driver Delay;
- Pedestrian Delay;
- Pedestrian Amenity;
- Accidents and Safety;
- Hazardous Loads;
- Air Pollution; and
- Dust and Dirt.

18.6 The environmental effect of road traffic resulting from the proposals will be assessed upon the local and wider highway network in accordance with the above IEMA guidelines, in particular the A249 corridor. Given that the A249 is a Trunk Road, it is considered that this is not a 'sensitive' location and it is therefore appropriate to assess the forecast change in traffic flow resulting from the proposals against the 30% threshold.

18.7 Assessments will be undertaken across a typical working day and each hour will be considered together with 12 hour (0700-1900) and 24 hour (0000-2400) traffic flows.

Construction Assessment

18.8 Given the nature (size and character) of the proposed WTM, it is probable that the construction phase will generate considerable numbers of HGV and other vehicle movements which would require assessment.

18.9 Construction traffic movements resulting from the works will be estimated using the construction programme and the predicted number of construction workers on site at any one time. The estimated number of vehicles throughout the working day will be assigned onto the adjacent highway network and be assessed in accordance with the IEMA guidelines. Where any increase in excess of the 30% threshold is predicted, a more detailed environmental assessment will be undertaken, as set out above. If significant effects are identified then suitable mitigation measures will be identified to reduce or moderate these traffic flows and related effects.

Operational Assessment

18.10 The likely net change in traffic movements to and from the Port, as a result of the operation of the WTM facility and the businesses it will displace, will be estimated in the Transport Assessment (TA).

18.11 As the WTM production and assembly processes will be continuous over a 24-hour period, most of the approximate 1500 workers at the plant will work on a shift basis. It is anticipated that blades manufacturing will operate a 2-shift pattern, whilst the nacelles assembly will operate on a 3-shift basis. Other site staff will work to conventional day-time hours. As such, most vehicle movements are likely to be related to staff travel, with peaks in traffic occurring at shift changeovers as staff leave and arrive at the site at the same time. However, it is expected that these shift turnovers will be timed to avoid peak traffic hours.

- 18.12 HGV traffic movements to and from the WTM site will include the delivery of some large pre-cast turbine components by road, together with other materials and raw products used in the manufacturing process. Other vehicle movements will include visitors to the site, office supplies, catering and general deliveries.
- 18.13 Where this 30% threshold is exceeded on any road link as a result of the above sources of traffic, more detailed environmental assessments will be undertaken in accordance with the IEMA guidelines.
- 18.14 The TA report and associated Travel Plan will form an Appendix to the Environmental Statement and will consider all modes of travel to and from the site.

Assessment of Significance

- 18.15 The approach to the assessment of significance of effects is summarised below, adapted from DMRB HA 205/08. This takes into account the duration, magnitude, direction and location of each effect as well as the sensitivity of the receptor.

Table 18.1 – Assessment of the Magnitude of Change – Traffic and Transport Impacts

Magnitude of Change	Definition
Negligible	Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse). Very minor benefit to or positive addition of one or more characteristics, features or elements (Beneficial).
Minor	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse). Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring (Beneficial).
Moderate	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements (Adverse). Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality (Beneficial).
Major	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse). Large scale or major improvement of resource quality; extensive restoration or enhancement; major improvement of attribute quality (Beneficial).

Mitigation

- 18.16 If the above environmental assessments predict any significant effects then suitable mitigation measures will be determined in consultation with the Highways Agency, Kent County Council and Swale Borough Council.
- 18.17 The promotion of car pooling, shared transport, shuttle buses and other sustainable modes of transport (including cycling and walking initiatives) will be set out in the a Travel Plan for the WTM deveopment. This will take account of Vestas own corporate objectives to encourage sustainable transport, as well as national and local policies.
- 18.18 Secondary impacts associated with traffic flow changes will be assessed in the relevant chapters of the ES (i.e. Noise and Vibration).

19 AIR QUALITY

a) Key Issues/Baseline Overview

- 19.1 Swale Borough Council has designated the following two Air Quality Management Areas (AQMAs) due to high concentrations of nitrogen dioxide (NO₂) attributable to emissions from road traffic:
- An area encompassing those parts of London Road and High Street in Newington; and
 - An area incorporating Ospringe Street, a section of the A2 London Road, trunk road near Faversham.
- 19.2 The Port of Sheerness is not located within a designated AQMA. Furthermore, significant air pollutant concentrations are not expected in and around the Port at present, partly on account of its open, riverside setting with high levels of wind dispersal.
- 19.3 A desk-top assessment of existing baseline air quality conditions will be undertaken to obtain any recent records of local air quality monitoring near to the site and to identify any potentially sensitive receptors to emissions. Emissions from the WTM facility are unlikely to be significant contributors to local air pollution due to the nature of the production processes and the modern standards of pollution control (e.g. dust extraction and scrubbers) that will be incorporated into the production buildings.

b) Potential Effects

- 19.4 As with all significant construction projects, there is the potential for nuisance dust effects to arise during various activities and stages of the works (e.g. demolition, pneumatic breaking and crushing of concrete, and excavations) particularly during periods of dry and windy conditions. However, these sources of dust will be controlled or avoided by the implementation of best practice measures and procedures set out in a Construction Environmental Management Plan (CEMP).
- 19.5 The operation of the wind turbine blades production facility will involve the use of resins, paints, solvents and other substances which could result in emissions of volatile organic compounds (VOCs). Such emissions will be vented to air at high level via flues fitted with filters and scrubbers. Blade finishing/ sanding and other physical processes will also give rise to dust within the manufacturing buildings, which will need to be extracted and filtered by external scrubbing units to avoid open discharge.
- 19.6 During the construction and operational phases, there is also the potential for air quality effects from emissions associated with changes in the traffic flow characteristics on the local road network.

c) Approach and Methodology

- 19.7 For the construction phase, a risk assessment of nuisance dust will be undertaken using a source-pathway-receptor conceptual model. Mitigation measures, informed by the Best Practice Guide on Construction Dust formulated by the Air Pollution Planning and the Local Environment (APPLE) working group, consistent with the level of risk, will be recommended.

- 19.8 Potential dust generating activities will be qualitatively reviewed to establish the likely magnitude of temporary and residual dust emissions, taking into account the duration and frequency of the activity and the likely effectiveness of available dust control measures.
- 19.9 For the operational phase, odour generating activities will be qualitatively reviewed to establish the likely magnitude of fugitive and residual odour emissions taking into account the design of the facility, its proximity to sensitive receptors, and the likely duration and frequency of such emissions. The assessment will review the likely effectiveness of available odour control measures as well as the expected requirements of any environmental permits/ pollution controls with which the facility would need to comply.
- 19.10 Based on the annual amount of coatings to be undertaken by the facility, the typical VOCs concentration expected to be released from the facility will be calculated and compared with the VOCs emission limit of 50 mgCm^{-3} .
- 19.11 The traffic generated by the operational phase activities will be reviewed and compared with the criteria set out in the Environmental Protection UK (EPUK) Development Control: Planning for Air Quality (Update 2010) document. If the criteria are exceeded, a screening level assessment of the vehicle-related emissions will be undertaken.

20 GROUND CONDITIONS AND CONTAMINATION

a) Key Issues/Baseline Overview

- 20.1 This chapter of the EIA would assess the impacts on geology, soils and any ground contamination resulting from construction and operation of the WTM. The assessment will have regard to the former activities at the Port, and its long industrial and maritime history.
- 20.2 Both a Phase 1 (desktop) and Phase 2 (physical site investigation) of the site will be undertaken to assess the likely presence, extent and nature of contaminated ground within the footprint of the WTM development. Initial sampling of ground material has already been undertaken and this has revealed generally low levels of contaminants. Extensive geo-technical ground investigations have also been undertaken across the site in order to inform the WTM design and structural bearing capacity of existing foundations and hardstanding areas.
- 20.3 Soil samples obtained during the investigations have been tested by an accredited laboratory for the following suite of contaminants:
- Phenols - Total (monohydric);
 - Cyanide - Total;
 - pH;
 - PAH - Speciated (EPA 16);
 - Sulphide;
 - Sulphate (as SO₄) - Water Soluble (2:1);
 - Arsenic (aqua regia extractable);
 - Cadmium (aqua regia extractable);
 - Chromium (aqua regia extractable);
 - Lead (aqua regia extractable);
 - Mercury (aqua regia extractable);
 - Selenium (aqua regia extractable);
 - Copper (aqua regia extractable);
 - Nickel (aqua regia extractable);
 - Zinc (aqua regia extractable);
 - TPH CWG;
 - SOM;
 - Hexavalent Chromium; and
 - Asbestos.
- 20.4 Groundwater samples obtained from installed borehole wells have been submitted for the following suite of analysis:
- Phenols - Total (monohydric);
 - Cyanide – Total;
 - RPS Health, Safety & Environment July 2011;
 - pH;
 - PAH - Speciated (EPA 16);
 - Sulphide;
 - Sulphate (as SO₄) - Water Soluble (2:1);
 - Arsenic (aqua regia extractable);
 - Cadmium (aqua regia extractable);
 - Chromium (aqua regia extractable);
 - Lead (aqua regia extractable);
 - Mercury (aqua regia extractable);
 - Selenium (aqua regia extractable);

- Copper (aqua regia extractable);
- Nickel (aqua regia extractable);
- Zinc (aqua regia extractable);
- TPH CWG; and
- Hexavalent Chromium.

b) Potential Effects and Assessment Methodology

20.5 The Ground Conditions and Contamination chapter of the ES will identify whether any environmental effects could derive from the exposure, excavation, mobilisation and disposal or treatment of contamination encountered on site, based on the following:

- Interpretation of site investigation data;
- Derivation of site specific screening criteria;
- Comparison of soil and groundwater data with appropriate screening criteria;
- Construction of a refined conceptual model based on site specific data;
- Generic quantitative risk assessment for the site to establish the risk posed by any identified;and
- contamination to human health and controlled waters.

20.6 The environmental assessment will include an evaluation of ground conditions and the nature of any contamination present. A conceptual model for the site will be constructed and a generic quantitative risk assessment undertaken based on the data in line with the guidance presented in CLR 11. An assessment will be made as to whether the site should be classified as “Contaminated Land” under Part 2A of the Environmental Protection Act. The assessment will also incorporate a review of data obtained from the Geotechnical Investigation.

21 WASTE

a) Key Issues/Baseline Overview

- 21.1 The existing Port includes various import, export, storage and processing businesses which generate various domestic, commercial and industrial wastes.
- 21.2 A waste audit of the existing Port has been undertaken as part of the baseline assessment in order to determine both the quantity and types of waste currently being generated at the Port. The result of this audit will be reported in the ES, which will also describe existing arrangements with respect to the minimisation, recycling and disposal of waste.

b) Potential Effects

- 21.3 The EIA will consider the net changes to waste quantity and type that is likely to result from the WTM facility and the businesses and Port activities it will displace. Consideration will be given to
- Ability for existing waste infrastructure to accommodate any change in construction and operational waste materials leaving the port;
 - Specific waste handling, storage and recycling facilities to be incorporated into the WTM facility;
 - Capacity of existing waste disposal facilities to receive waste from the WTM (according to type and regulatory requirements); and
 - Potential for enhanced environmental performance with respect to recycling and re-use of waste.

c) Approach and Methodology

- 21.4 The EIA will assess the effects of any changes to waste generation as a result of the proposed change in manufacturing and storage activities which will occur at the Port. The assessment will take into account the fact that existing port users generate various types and quantities of waste, and will focus on the overall predicted change to those types (e.g. liquid, solid, hazardous, non-hazardous and inert waste) and quantities (volume and weight), should the WTM be constructed.
- 21.5 The ES will identify and quantify all waste streams arising from the manufacture, assembly, storage and transport of the wind turbine, particularly focussing on the blades manufacturing process as this is likely to be the main source of waste. This assessment will also include any requirement to upgrade or improve the Port's current disposal arrangements (internal and external), and identify appropriate mitigation by way of waste reduction, re-use and recycling where feasible.
- 21.6 The baseline waste audit (September 2011) will provide a basis for predicting changes to waste volumes and sources under the 'without consent' base case and with the proposed scheme, once operational. The implementation of operational management improvements to reduce waste disposal (in accordance with the ISO 14001 EMS standard and Vestas' corporate policies) will be assessed. The assessment will comprise:
- identification and quantification of all waste streams produced at the Port;
 - inspection of existing disposal arrangements (internal and external);
 - review of activities undertaken at the Port specific to waste generation, to identify the potential for waste reduction;

- an outline of the Site waste Management Plan (SWMP) required for the construction phases;
- interviews with relevant Peel Ports and Vestas personnel to establish likely waste management practices to be employed in the WTM facility and in the remainder of the Port in the future; and
- assessment of waste legal compliance (including Duty of Care) requirements for the WTM facility.

21.7 The assessment will consider all major waste-generating activities during the planned construction and operation of the WTM. In addition, reference will be made to the national, regional and local waste policies and hierarchy and an assessment will be made of Vestas' and the Port's compliance with such policies.

21.8 Significant off-site effects (material considerations) will be identified where existing waste disposal facilities are unable to accommodate the waste streams generated by the Port, although at present, this is considered to be unlikely.

22 ISSUES TO BE SCOPED OUT OF THE EIA

a) Introduction

22.1 In consideration of the EIA Regulations which require that the Environmental Statement must identify only the “likely significant environmental effects” of a development, the following topic areas are considered to be ‘non-significant’ issues and therefore are not intended to be assessed in detail through the EIA process. .

b) Microclimate (includes Daylight, Sunlight and Overshadowing and Wind)

22.2 The nearest residential buildings to the WTM are in Blue Town and along Queen’s Way, ~200m and 150m from the proposed WTM respectively at their closest points. It is not considered likely that the erection of new and replacement warehouses on the Port will have an effect on the lighting and wind conditions at any of these residential locations.

c) Telecommunications and Navigation

22.3 Whilst it is acknowledged that large physical structures can impede radio and TV signals, the massing of the proposed development will not be significantly greater than the built form in the local area, which already includes largely industrial buildings, cranes and other tall structures. Wind turbine towers and generator blades will be stored horizontally at the Port before being individually erected at the quayside for loading on to ships. As such, on the basis of professional judgement, it is considered that the development would not adversely affect radio and telecommunication signal transmissions.

22.4 Peel Port (Medway) is the Harbour Authority responsible for navigation on the River Thames and Medway Estuary confluences. The Port will coordinate with the WTM operator (Vestas) to ensure that all associated structures, activities and shipping movements comply with their navigational requirements and operational integrity of their navigational systems.

22.5 The net change in vessel movements once the WTM is operational is not expected to differ substantially from the current quantum of ships embarking and disembarking at the Port

d) Electromagnetic Fields

22.6 Electrical connection to the Local Transmission/ distribution network will be achieved through the installation of a substation and associated cabling at the WTM. The substations will be located on industrial land, and not adjacent to any commercial or residential buildings where the potential for electrical interference might otherwise be realised.

22.7 All new electrical plant will be designed in accordance with current British Standards (e.g. BS EN 62041:2010¹⁹) which set specific limits for electro magnetic fields. Accordingly, this issue will not be considered any further within the EIA.

e) Sustainability and Energy

22.8 The planning application will be supported by a separate Sustainability Statement and an Energy Strategy report. The details of these documents will be summarised in the description of the

development included in the ES. As such, all technical assessments will inherently test all sustainable design features sought as part of the planning application.

- 22.9 This negates the need for a further sustainability and energy assessment within the ES which accords with the Department of Communities and Local Government's (DCLG) consultation paper on EIA Good Practice (2006)⁴¹ which states:

“There is no requirement to include a sustainability appraisal within the Environmental Statement. If such an assessment is required by the LPA, it should be provided as a separate document supporting the planning application.”

23 DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL EFFECTS

23.1 The determination and classification of the significance of environmental effects is intended to aid the relevant Planning Authorities (in this case Swale BC and the MMO) in identifying:

- the likely environmental effects of a development; and
- the relative weight that each identified environmental effect should be given in the decision making process.

23.2 Both are useful informants to the determination of any planning application where EIA has been deemed necessary. For each environmental topic area assessed as part of the EIA, professional judgement will be applied in relation to the relative significance of the environmental effects identified. This will be undertaken with reference to definitive standards and legislation where applicable. Where it is not possible to quantify the magnitude and scale of impacts, then qualitative assessments will be made based on available information and the professional opinion of the consultant team.

23.3 The significance of the likely significant effects will be determined with reference to generic assessment criteria or subject-specific criteria for each environmental topic being considered, as described in the preceding sections of this report. These criteria will apply a common EIA approach of classifying whether the likely significant effects are substantial/ major, moderate or minor, as well as adverse, negligible or beneficial.

23.4 Specific criteria for each issue will be developed, giving due regard to the following:

- Extent and magnitude of impacts;
- Duration of the impacts (short, medium or long term);
- Permanence of the impacts (temporary or permanent);
- Nature of impacts (whether direct or indirect, reversible or irreversible);
- Whether the impact occurs in isolation, is cumulative or interactive;
- Performance against any relevant environmental quality standards;
- Value, importance and sensitivity of the receptor; and
- Compatibility with environmental policies.

23.5 In order to provide a consistent approach in reporting the outcomes of the various studies undertaken as part of the EIA, the terminology in Table 23.1 will be used throughout the ES to describe the relative likely significance of identified effects.

Table 23.1 – Effect Terminology and Explanations

Significant adverse	Negligible	Significant beneficial
Detrimental or negative effect to an environmental resource or receptor that constitutes a material consideration.	The effect can be beneficial or adverse. However, depending on the magnitude/scale of the impact and/ or the sensitivity/ importance of any receptors, the effect may not be deemed significant. The effect is therefore considered be 'negligible' and should not constitute a material consideration in the decision making process.	Advantageous or positive effect to an environmental resource or receptor that should form a material consideration in the decision making process.

23.6 Where significant adverse or beneficial effects are identified it is considered good practice to identify the degree of significance of the effect. It is therefore proposed that where adverse or beneficial effects have been identified, they will be assessed as being of:

- minor significant effect (either beneficial or adverse);
- moderate significant effect (either beneficial or adverse); and
- substantial significant effect (either beneficial or adverse).

23.7 Generally, the determination of significance is a function of the magnitude or scale of the impact(s) and the value or importance of the affected receptor. For example the complete destruction (large magnitude) of an internationally recognised feature (high value) would constitute a substantial (or unacceptable) adverse significant effect. Table 23.2 provides a basic matrix-based approach to the categorisation of environment effects. Those effects identified as “significant” are shown in the highlighted cells.

Table 23.2

		Magnitude/ scale of Impact			
		High/ Large	Medium	Low/ Small	Very small/ Negligible
Value of receptor	High	Substantial (unacceptable)	Substantial	Moderate	Minor
	Medium	Substantial	Moderate	Minor	Negligible
	Low	Moderate	Minor	Negligible	Negligible
	None/ Little	Minor	Negligible	Negligible	Negligible

23.8 Each of the technical chapters constituting the ES will provide the specific criteria, including the sources and justifications for quantifying the different levels of effect.

24 PROPOSED STRUCTURE OF THE ENVIRONMENTAL STATEMENT

a) Introduction

24.1 The proposed structure of the ES is set out as follows, following best practice guidelines:

b) Volume 1: Non-Technical Summary

24.2 The Non Technical Summary (NTS) will provide a summary account of the key information contained within the main Environmental Statement. In accordance with the EIA Regulations, the NTS will be presented in non-technical language and be produced as a stand-alone document in a format suitable for the general public.

c) Volume 2: Environmental Statement

24.3 Volume 2 will contain the main text of the EIA subdivided into the following chapters:

- Introduction;
- EIA Methodology;
- Consultation Summary;
- Existing Land Uses and Activities;
- Alternatives;
- Description of Development;
- Development Programme, Demolition and Construction;
- Socio-economic Effects;
- Hydrodynamic and Sediment Regime Effects;
- Flood Risk and Surface Water Effects;
- Marine Ecology: Effects on Fish and Shellfish;
- Marine Ecology: Effects on Intertidal and Sub-tidal Benthic Communities;
- Marine Ecology: Effects on Marine Mammals;
- Terrestrial Ecology Effects;
- Noise and Vibration Effects;
- Effects on Archaeology and Heritage;
- Townscape, and Visual Effects;
- Traffic and Transport Effects;
- Air Quality Effects;
- Ground Conditions and Contamination Effects;
- Waste;
- Cumulative Effects; and
- Summary of Findings.

d) Volume 3: Technical Appendices

24.4 Volume 3 will provide the full text of a number of technical assessments together with other relevant background information used to inform the EIA. At present, Volume 3 is envisaged to comprise:

- EIA Scoping Report;
- Consultation Records;
- Hydrodynamics Modelling Data and Architecture;
- Flood Risk Assessment;
- Marine Ecology Consents and Licenses (any already obtained);

- Marine Ecological Survey Results;
- Terrestrial Ecological Survey Results;
- Draft Landscaping Plan;
- Archaeological Desk-Based Assessment;
- Archaeological Watching Brief Report;
- Heritage Assessment Reports;
- Noise and Vibration Technical Data;
- Traffic Counts;
- Transport Assessment;
- Air Emissions Data;
- Site Ground Condition Survey Reports; and
- Waste Survey Data.

25 REFERENCES

- ¹ Crown Estates Round 3 Briefing Note, http://www.thecrownestate.co.uk/round3_briefing_note.pdf
- ² Department for Transport, *Modern ports: A UK policy*, para 1.1.2, http://www2.dft.gov.uk/pgr/shippingports/ports/modern/modernportsaukpolicy_pge_2-.html?page=2#a1002
- ³ Marine Management Organisation, *Marine licensing guidance 8: Environmental impact assessment*, April 2011
- ⁴ Department for Energy and Climate Change, *Offshore Manufacturing Sets Sail For UK Ports*, Press Release: 10/111, 25 October 2010
- ⁵ Council Directive No 85/337/EEC (Environmental Impact Assessment)
- ⁶ Council Directive No. 97/11/EC (Environmental Impact Assessment)
- ⁷ Department of the Environment (DoE) (1995). *Preparation of Environmental Statements for Planning Projects that require Environmental Impact Assessment: A Good Practice Guide*. HMSO, London
- ⁸ Department of Environmental, Transport and the Regions (DETR). 1999. *Environmental Impact Assessment*. Circular 02/99. HMSO, London
- ⁹ Institute of Environmental Management and Assessment (IEMA). 2004. *Impact Assessment Guidelines and ES Review Criteria*
- ¹⁰ Kent County Council, *Sustainable Construction Technical Appendix Draft*, Jan 2009
- ¹¹ Mayor of London. 2006. 'Sustainable Design and Construction'. *The London Plan Supplementary Planning Guidance*
- ¹² Greater London Authority, London Boroughs and the Association of London Government London Best Practice Guidance. 2006. 'The Control of Dust and Emissions from Construction and Demolition'
- ¹³ Reid et al., *Marine Ecological Desktop Study 2003*
- ¹⁴ British Standard BS5228 (1997) 'Noise and Vibration Control on Construction and Open Sites'
- ¹⁵ British Standard BS7385 (1990). 'Evaluation and Measurement for Vibration in Buildings'
- ¹⁶ British Standard BS6472 92008) 'Guide to Evaluation of Human Exposure to Vibration in Buildings
- ¹⁷ BS8233 'Sound insulation and Noise Reduction for Buildings - Code of Practice'. 1999
- ¹⁸ World Health Organisation. 1999. 'Guidelines for Community Noise'
- ¹⁹ BS EN 62041:2010: Safety of transformers, reactors, power supply units and combinations thereof