PORT OF
TILBURY
LONDON

PLANNING ACT 2008

PROPOSED PORT TERMINAL AT FORMER TILBURY POWER STATION

TILBURY2

REGULATION 8(1) SCOPING REPORT

MARCH 2017

TILBURY2

PORT OF TILBURY

PROPOSED PORT TERMINAL AT FORMER TILBURY POWER STATION 'TILBURY2'

Infrastructure Planning (Environmental Impact Assessment) Regulations 2009

Regulation 8(1) Scoping Report

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Formal Issue Schedule

Version	V&G File reference	Final Issue Date
Draft to statutory consultees for comment	NSIPS Scoping Report Draft v3 24_02_17	27 February 2017
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SCHEME DRAWINGS

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APPENDIX 1

Bioscan Drawings derived from 2016 habitat survey work:

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APPENDIX 2

White Young Green drawings:-

(provided to POTLL as part of the land acquisition package for the site, which relate to 2015 survey work on the former power station site commissioned for the purposes of Demolition Consent and which is equally likely to be of assistance in the EIA scoping process):-

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1.0 INTRODUCTION

BACKGROUND

1.1 Port of Tilbury London Limited (PoTLL) is proposing a new port terminal on the north bank of the River Thames at Tilbury, a short distance to the east of its existing Port. The proposed port terminal will be constructed on largely previously developed land that formed the western part of the now redundant Tilbury Power Station.

1.2 The project is known as “Tilbury2.” The proposed main uses on the site will be a Roll-on/Roll-off (Ro-Ro) terminal and a Construction Materials and Aggregates terminal (the “CMAT”), and associated infrastructure including rail and road facilities and revisions to the existing marine infrastructure. There will also be an 'access corridor' to provide links to the existing rail and road network. The CMAT will include stockpiling of construction materials and some processing of materials for the production of asphalt and concrete products.

1.3 These proposed uses will likely require works including, but not limited to:

- creation of hard surfaced pavements;
- improvement of and extensions to the existing jetty including creation of a new Ro-Ro berth;
- associated dredging of berth pockets around the proposed and extended jetty and their approaches;
- new and improved conveyors;
- erection of welfare buildings;
- erection of a single 10,000sq.m. warehouse
- a number of storage and production structures associated with the CMAT;
- the construction of a new link road from Ferry Road to Fort Road;
- formation of a rail spur and sidings.

1.4 The proposed volumes of import/export of Ro-Ro units for the terminal exceed the threshold of 250,000 units stated in the Planning Act 2008 for throughput per annum. The Tilbury2 project therefore constitutes a Nationally Significant Infrastructure Project (NSIP).

ENVIRONMENTAL IMPACT ASSESSMENT

1.5 Environmental Impact Assessment (EIA) is a process for identifying the likely environmental effects (positive and negative) of proposed developments, and their significance, before development consent is granted.

1.6 The aim of EIA is to ensure a thorough assessment of likely effects and that a consideration of mitigation and alternatives in light of these potential effects has been undertaken. Through this process, the development should include measures to prevent, reduce or offset any significant, adverse environmental effects of the proposals, and enhance the positive ones.

1.7 The findings of the assessment are presented in an Environmental Statement (ES). The purpose of the ES is to help the decision maker, statutory consultees, other stakeholders and the general public to properly understand the predicted effects and the scope for reducing them, before a decision is made as to whether or not to permit development.

1.8 The DCO application for Tilbury2 will be supported by an ES produced in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2009 and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2012. [1]

1.9 PoTLL is aware that the proposed Infrastructure Planning (Environmental Impact Assessment) Regulations 2017[2] are currently under consultation, and that, depending on the results of this consultation, the ES for Tilbury2 may need to take these regulations into taken into account. This has already been considered within the scoping process: as can be seen below, it is proposed that the ES will be prepared by competent experts, and will include consideration of human health.

1.10 The EIA Regulations impose procedural requirements for carrying out EIA for NSIPs which fall to be considered as 'EIA development'. The ES is the document that reports on the likely impacts on the environment resulting from the proposed development. The ES must as a minimum comply with Schedule 4 Part 2 of the EIA Regulations. Advice published by the Planning Inspectorate states that the ES should clearly explain the processes followed, the forecasting methods used and the measures envisaged to prevent, reduce and where possible offset any significant adverse effects. The process is iterative and should include public participation.[3]

1.11 Additional legislation which is likely to be of relevance to the EIA process is identified in Section 2.0 below.

[1] Hereafter referred to together as the EIA Regulations
[2] Hereafter referred to as the 2017 Regulations
[3] PINS Advice Note Seven: Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping

SCREENING

1.12 The EIA Regulations determine development to be 'EIA development' if[4]:

- the applicant notifies the Secretary of State in writing under regulation 6(1)(b) that they propose to provide an environmental statement (ES) in respect of proposed development; or
- the Secretary of State or an Examining authority adopts a screening opinion to the effect that the development is EIA development; or
- the Secretary of State directs an accepted application to be EIA development.

1.13 PoTLL has served a notice under regulation 6(1)(b) that it proposes to provide an environmental statement in respect of the Tilbury2 development..

SCOPING

1.14 The purpose of this Scoping Report is to inform consultees about the proposed scheme, to identify information required to inform the EIA and to identify key environmental issues. It is submitted to PINS as a request for a Scoping Opinion on the proposals as to the information to be supplied within the Environmental Statement (ES) that will accompany the DCO application.

1.15 The EIA Regulations require that the request for a Scoping Opinion is accompanied by:

- a plan sufficient to identify the site of the options being considered; and,
- a brief description of the nature and purpose of the proposed scheme options and their potential impacts on the environment.

1.16 The objective of this Scoping Report is to identify the content and extent of the environmental information that will be considered in the EIA process. It contains a brief description of the site, the development proposal and the potential environmental effects. The baseline condition is briefly described in respect of each of the specific topics that will be covered, and methodologies that will be used in the assessment of the effects. Where some assessment work has already been undertaken, the Scoping Report explains its findings, albeit these will be subject to further iterations of the scheme.

1.17 A previous EIA Scoping Report was sent to the Local Planning Authority, Thurrock Council, on 25 August 2016 (LPA reference 16/01194/SCO). This was prior to final throughput assumptions being settled and prior to the conclusion being reached that the proposals exceeded the thresholds in the Planning Act 2008. The responses to that scoping report have been taken

[4] Regulation 4 of the EIA Regulations

into account in preparing this document, as have comments made by various statutory consultees in meetings to date.

1.18 This draft Scoping Report also takes account of matters raised by statutory consultees during meetings held on the project prior to its preparation. In particular, meetings have been held with :-

– Thurrock Council – planning and highways

– Environment Agency

- Marine Management Organisation

- Historic England

- Port of London Authority

- Highways England

- Anglian Water

- Network Rail

1.19 In addition the Draft Scoping Report was issued to all statutory bodies and adjoining landowners on 27 February 2017 with an invitation to respond by 17 March. Responses were received from :-

- PINS

- PLA

- Castlepoint Borough Council

- London Borough of Havering

- Essex Fire and Rescue

- Historic England

- Transport for London

- Essex County Council

- Medway Council

- Gravesham Borough Council

- Steve Plumb – Thurrock Council ecology and landscape

- Paula Watts – Thurrock Council PROW

- Trinity House

- Essex SUDS
- Dean Page – Thurrock Council EHO
- Julian Howes – Thurrock Council highways

THE PROJECT TEAM

1.20 PoTLL has assembled an experienced team of specialist consultants and advisers in order to ensure that the proposals are advanced by means of a high quality and robust application. The team is as follows :-

Atkins	Port terminal masterplanning and engineering, hydrogeology and ground conditions, water resources, marine ecology, marine navigation, noise and vibration, air quality, natural resources and waste.
i-Transport	Transportation
Arup	Socio-Economics and Health
David Jarvis Associates	Landscape Character and Visual Amenity
CgMs	Archaeology and Cultural Heritage
Bioscan	Terrestrial Ecology
Pinsent Masons	Solicitors
Vincent and Gorbing	Planning Consultants, EIA Co-ordination, Consultant Team Co-ordinators.

2.0 LEGISLATIVE AND REGULATORY REGIME

The Planning Act 2008

2.1 The planning process for dealing with proposals for NSIPs was established by the Planning Act 2008 (the 2008 Act). This process, as amended by the Localism Act 2011, involves an examination of major proposals relating to energy, transport, water, waste and waste water, and includes significant consultation and engagement before a decision is made by the relevant Secretary of State.

2.2 The 2008 Act sets out the thresholds for NSIPs. For the ports sector, applications for development consent will be referred to PINS if the estimated annual capacity exceeds:

- 0.5 million Twenty Foot Equivalent Units (TEU) for a container terminal;
- 250,000 movements for roll-on roll off (ro-ro);
- 5 million tonnes for other (bulk and general) traffic. Or
- a weighted sum equivalent to these figures taken together.

2.3 The proposed scheme, once fully developed and operational, would provide for a Ro-Ro terminal with an initial expected throughput of 360,000 units per annum. The Construction Materials and Aggregates Terminal is likely to have a throughput of circa 1.9mtpa of bulk product.

2.4 As a result, the throughput of the proposals exceeds the threshold stated within the 2008 Act. The proposed port terminal therefore constitutes an NSIP, requiring consent from the Secretary of State via a Development Consent Order (DCO).

Marine and Costal Access Act 2009

2.5 The Marine and Coastal Access Act 2009 provides the legal mechanism to help ensure clean, healthy, safe, productive and biologically diverse oceans and seas by putting in place a system for improved management and protection of the marine and coastal environment.

2.6 Part 4 of the Act puts in place a Marine Licensing System. The Marine Act supersedes the Food and Environment Protection Act 1985 and the Coast Protection Act 1949. The MMO is responsible for delivering licensing arrangements in English waters under the Marine Act. A marine licence is required for the Tilbury2 project (as works will be undertaken within the River Thames) and this will be determined as a deemed Marine Licence as part of the DCO.

2.7 The Act also provides the framework for a strategic Marine Planning System aimed at more efficient, sustainable use and protection of marine resources. A Marine Policy Statement has been produced that sets out both short and long-term objectives for the sustainable use of the marine environment, and a series of marine plans.

2.8 Powers in the Marine Act enable the designation of Marine Conservation Zones (MCZs) in the territorial waters adjacent to England and Wales and UK offshore waters. The purpose of these new conservation measures is to halt the deterioration of the state of the UK's marine biodiversity and promote recovery where appropriate, support healthy ecosystem functioning and provide the legal mechanism to deliver the UK's current European and international marine conservation commitments, such as those laid out under the Marine Strategy Framework Directive, OSPAR Convention, and the Convention on Biological Diversity.

2.9 The proposed Tilbury2 development is within the Thames Estuary recommended Marine Conservation Zone. The 'recommended' status of this designation means that an MCZ assessment is not currently required. However, as the designation of these sites is an ongoing process, guidance has been sought from the MMO as to whether it would be prudent to carry out an MCZ assessment.

Environmental Permitting Regulations 2010 (as amended)

2.10 Some facilities could harm the environment or human health unless they are controlled. The Environmental Permitting Regulations 2010 requires operators to obtain permits for some facilities and operations, to register others as exempt and provides for ongoing supervision by regulators. The aim of the regulations is to protect the environment, provide a framework for compliance and encourage best practice in the operation of facilities.

2.11 Environmental permits are required for:

- Waste operations;
- Industrial processes;
- Water discharge activities;
- Operations using or storing radioactive substances;
- Flood risk activities

2.12 Since 6th April 2016, any activity with a Flood Defence Consent (FDC) was integrated into the Environmental Permitting regime. It is now necessary to apply for an environmental permit for work:

- on or within 8m of a main river;
- on or within 8m of the landward toe of a fluvial flood defence structure;

- in a floodplain; or
- on or within 16m of a tidal waterbody or the landward toe of a tidal defence.

2.13 The Port of Tilbury will need to apply for these permits where they are required but will seek deemed consent under the DCO process (as a consequence of disapplication of the relevant byelaws) for discharges to surface waters/watercourses and work on, in or adjacent to a 'main river', within the floodplain and near the sea defences.

Land Drainage Act 1991

2.14 The Land Drainage Act 1991 sets out the powers and duties of the drainage authorities and riparian landowners. This prohibits any person without the consent of the relevant body from erecting a structure such as a weir or dam, placing a culvert or modifying an existing culvert in an ordinary watercourse where this would obstruct the flow in the watercourse. If such an obstruction to flow is caused without the consent of the relevant drainage authority then a notice may be served on the person responsible to abate the resultant nuisance. Failure to comply with the notice is an offence. As Thurrock is an area of the country that are not covered by a separate drainage authority, Thurrock Council will perform this function as Lead Local Flood Authority.

2.15 The proposed development is likely to affect some ordinary water courses. It is possible that the DCO will dis-apply the need for consent from Thurrock as Lead Local Flood Authority (with their agreement) subject to the inclusion within the DCO of appropriate protective provisions.

Flood and Water Management Act 2010

2.16 The key areas covered by this Act are:

- Roles and responsibilities for flood and coastal erosion risk management;
- Improving reservoir safety;
- Encouraging sustainable urban drainage systems;
- Designation of third party flood management assets;
- Special administration regime for water companies;
- Powers for water companies to control non-essential uses of water; and
- Various provisions relating to charging.

The Flood and Water Management Act 2010 is relevant to the proposed development as it will impact on flood defences, will cross a water course

that acts as an outfall from the Tilbury Flood Storage Area, and will include new and altered surface water drainage features

Port of London Act 1968 (as amended)

2.17 The Port of London Authority (PLA) is a harbour authority, a licensing authority and a landowner. The PLA has a duty to administer, preserve and improve the port of London. The Port of London Act requires the port to maintain and improve the conservancy of the river and estuary.

2.18 Under Section 66 of the Port of London Act, a River Works Licence is required for any works in the River Thames, riverward of the mean high water mark, including any works under the river or overhanging the river. Under section 73 of the 1968 Act the PLA licenses dredging activities on the Tidal Thames. Dredging works are defined as including any operation to cleanse, scour, cut, deepen, widen, dredge or take up or remove material from the bed and banks of the Thames. The licensing process ensures that all developments in the river are assessed for their potential effect on the safety of navigation and the environment.

2.19 As the works to create Tilbury2 will involve such activities, a River Works Licence and a Dredging Licence for Tilbury2 will either form part of the DCO or the DCO will make alternative provision and consequentially disapply the requirement for a River Works Licence and Dredging Licence. The PLA is also the owner of a section of the seabed of the Tilbury2 development. The Port of Tilbury is in discussion with the PLA over the use of this land.

Port of Tilbury Transfer Scheme 1991 Confirmation Order

2.20 The Port of Tilbury has a duty to provide, maintain, operate and improve port and harbour services and facilities at the Port of Tilbury. The Act will be amended by the DCO to extend the Port of Tilbury's statutory jurisdiction to include the Tilbury2 development.[5]

2.21 EU member states have agreed to work together to stop the decline and increase the size of the future eel population. The Council Regulation (EC) No 1100/2007 sets a target for the recovery of European eel stocks and requires EU member states to develop management plans to improve eel stocks. These regulations are transposed into UK law by the Eels (England and Wales) regulations 2009. These regulations afford powers to the Environment Agency to implement measures for the recovery of European eel stocks including the development of management plans. An Eel management plan has been development for the Thames River Basin District (an area that covers the Tilbury2 site), which will be considered to inform the assessment of impacts from Tilbury2 to eels.

Marine Strategy Framework Directive

2.22 The European Marine Strategy Framework Directive (MSFD) (2008/56/EC) requires that member states prepare national strategies in order to manage

[5] http://www.legislation.gov.uk/uksi/2009/3344/made

their seas in order to achieve or maintain Good Environmental Status (GES) by 2020. The MSFD outlines a transparent, legislative framework for an ecosystem-based approach to the management of human activities which supports the sustainable use of marine goods and services.

2.23 The MSFD has been transposed into UK law through the Marine Strategy Regulations 2010. In order to achieve GES, the UK has produced a set of eleven characteristics of GES with associated targets and indicators. These are known as the MSFD descriptors. The potential impacts of the Tilbury2 development will be assessed against the descriptor targets and management measures. The descriptors of particular relevance are biodiversity, seafloor integrity, concentrations of contaminants, and introduction of energy including underwater noise.

OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic

2.24 The Convention for the Protection of the Marine Environment of the North-East Atlantic (the 'OSPAR Convention') is the mechanism by which 15 Governments and the EU cooperate to protect the marine environment of the North-East Atlantic. Contained within the OSPAR Convention are a series of Annexes which deal with the following specific areas:

- Annex I: Prevention and elimination of pollution from land-based sources;
- Annex II: Prevention and elimination of pollution by dumping or incineration;
- Annex III: Prevention and elimination of pollution from offshore sources;
- Annex IV: Assessment of the quality of the marine environment;
- Annex V: On the protection and conservation of the ecosystems and biological diversity of the maritime area

2.25 Annex II applies to dredging and disposal of material at sea. OSPAR guidance on the management of dredged material will be followed when assessing the suitability of material from Tilbury2 for dredging and disposal.

2.26 The OSPAR Biological Diversity and Ecosystems Strategy sets out that the OSPAR Commission will assess which species and habitats need to be protected. An OSPAR List of Threatened and/or Declining Species and Habitats has been developed to fulfil this commitment. OSPAR listed species found within the Thames Estuary at Tilbury from screen monitoring include the European eel (*Anguilla anguilla*); cod (Gadus morhua); short snouted seahorse (*Hippocampus hippocampus*); salmon (*Salmo salar*) thornback ray (*Raja clavata*); and allis shad (*Alosa alosa*). The Tilbury2 EIA will take account of the protection afforded to these species when assessing the significance of potential impacts.

Conservation of Habitats and Species Regulations (2010)

2.27 The Conservation of Habitats and Species Regulations 2010 (the Habitats Regulations) implements EC Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (the Habitats Directive).

2.28 The 2010 Regulations also set out additional protection (i.e. over and above that imparted by the WCA 1981) for a range of 'European Protected Species'. These include bats, great crested newts and dormice, for which there are previous records from the former power station site.

2.29 In accordance with Section 61 of the Habitats Regulations, Appropriate Assessment is required for any plan or project which is likely to have a significant effect on the site either alone or in-combination with other plans or projects. European sites comprise Special Protection Area's (SPA) or a Special Area of Conservation (SAC) as designated under the Habitats Directive. Appropriate Assessment is also required for potential SPAs, candidate SACs and listed Ramsar sites for the purpose of considering development proposals affecting them (ODPM, 2005).

2.30 The proposals do not lie within the boundary of a European nature conservation site or Ramsar site. The nearest such site is the Thames Estuary & Marshes Special Protection Area (SPA) and Ramsar sites which are located approximately 2km to the east of the main site. The potential exists for the proposals to have an effect on these designated sites. This potential is considered further in this Environmental Scoping Report. It is currently considered that the need for a Habitats Regulations Assessment (HRA) will be scoped out during the pre-application engagement process and a HRA Report with the relevant screening and integrity matrices (produced in accordance with PINS Advice Note 10) will be submitted with the DCO application to fully demonstrate how this conclusion will have been reached.

2.31 Should it be determined that an Appropriate Assessment is required, this would be undertaken by PINS as the 'competent authority', with advice from Natural England, following the submission by PoTLL of a HRA report produced in accordance with PINS Advice Note 10, providing the information to enable this Appropriate Assessment to be carried out.

Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000)

2.32 Under the terms of Section 28E of the Wildlife and Countryside Act 1981, as amended by Schedule 9 to the Countryside And Rights of Way Act 2000, any operations within (or in some circumstances adjacent to) a Site of Special Scientific Interest (SSSI) require consent from Natural England. If such consent was necessary it could be dis-applied through the DCO (with the agreement of Natural England) and dealt with on the basis of a DCO requirement.

2.33 The proposals do not lie within a SSSI. The Mucking Flats and Marshes Site of Special Scientific Interest (SSSI), the South Thames Estuary and

Marshes SSSI are located approximately 2km to the east of the main site. These sites are adjudged as likely to be sufficiently remote from impact sources related to the project to rule out significant effects from sources such as lighting or disturbance originating from the project site. Consideration will be given to the potential for significant effects on these SSSI from any changes to air quality, river traffic and sediment circulation and deposition processes attendant with the project.

2.34 The Schedules to the WCA 1981 contain lists of species subject to elevated levels of protection under the Act. A significant number of species with such elevated protection have the potential to be affected directly or indirectly by the proposals. For example, specially protected bird species resident on the Tilbury2 site include Cetti's warbler, peregrine and black redstart. Specially protected animal species resident in the landward areas of the proposed development site include adder, grass snake, common lizard and slow worm. Badger and water vole are also present. Mitigation and compensation measures up to and including translocation (under licence where necessary) will therefore form part of the project design and its implementation, to ensure legal compliance as regards such species and with a view to securing, in consultation and liaison with Natural England, Letters of No Impediment for all such species as part of the DCO process.

The Natural Environment and Rural Communities Act 2006

2.35 Section 40 of the Natural Environment and Rural Communities Act imposes a '*duty to conserve biodiversity*' on public authorities, including members of the Examining Authority and the relevant Secretary of State in the case of NSIPs. The duty requires, under S40(1), that such parties, in exercising their functions, must "*have regard to the purpose of conserving biodiversity*".

2.36 Section 40(2) of the Act requires that the Secretary of State must in particular have regard to the Convention on Biological Diversity (The Rio Treaty) when performing his or her duty.

2.37 Pursuant to Section 41 of the Act, the Government has published lists of habitats and species which are of 'Principal Importance' for the purposes of conserving biodiversity in England. The Secretary of State must "*take such steps as appear to be reasonably practicable*" to further the conservation of the species and habitats on these lists or promote the taking of others of such steps.

2.38 Previous studies for the former site owner and more recent work undertaken by Bioscan in 2016 has, at the time of writing, identified the following Habitats of Principal Importance on, or adjoining the project area): Open Mosaic Habitats on Previously Developed Land, Coastal and Floodplain Grazing Marsh, Lowland Mixed Deciduous Woodland, Ponds, Reedbeds, Hedgerow, Coastal Saltmarsh, Intertidal Mudflats.

2.39 Previous studies for the former site owner and more recent work undertaken by Bioscan in 2016 has also identified the following Species of Principal Importance resident on or using the project area (this list is not exhaustive): Shrill Carder Bee, Brown Banded Carder Bee, Five Banded Digger Wasp,

Hornet Robberfly, Saltmarsh Short Spur Beetle, *Ribautodelphax initans* (a plant hopper), *Dorycera graminum* (a fly), Wall Brown Butterfly, Small Heath Butterfly, Black-headed Mason Wasp, Sea Aster Bee, Four-banded Digger Wasp, Red-shanked Bumblebee, Adder, Grass Snake, Common Lizard, Slow Worm, Soprano Pipistrelle, Water Vole, Song Thrush, Bullfinch, Dunnock, Reed Bunting, Linnet, Skylark, Starling.

2.40 Mitigation and compensation measures up to and including off-site replacement habitat provision and/or habitat translocation will therefore form part of the project design and its implementation, to ensure due regard is had to the conservation of biodiversity consistent with the NERC Act duties and with the general aim of securing no net loss of biodiversity.

The Water Resources Act 1991

2.41 The WRA aims to prevent and minimise pollution of water. Under the WRA it is an offence to cause or knowingly permit any poisonous, noxious or polluting material, or any solid waste to enter any Controlled Water. Polluting materials include silt and soil from eroded areas. If such material is identified to be causing water pollution, the Environment Agency has the powers to prevent or clear up the pollution and recover the damages from the landowner or responsible person.

2.42 The WRA regulates water resources, water quality and pollution, and flood defence. The WRA provides the general structure for the management of water resources, explains the controlled waters standards and what is considered water pollution. The WRA also covers information pertaining to mitigation through flood defence. The DCO application will need to take this into account in preparing a strategy for surface water drainage that prevents pollution of surface and groundwater in the vicinity of the site.

Water Framework Directive

2.43 The Water Framework Directive (2000/60/EC) (WFD) establishes a legal framework to protect and restore clean water across Europe to ensure long-term, sustainable use. It applies to waters out to one nautical mile from the baseline from which territorial waters are drawn.

2.44 One of the aims of the WFD is to ensure that all European waterbodies are of Good Ecological Status or Potential (for 'heavily modified' and 'artificial' waterbodies) by 2015 by the setting of Environmental Quality Objectives (EQOs), for water chemistry, ecological and hydromorphological quality parameters. The WFD is transposed into English and Welsh law through The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003.

2.45 WFD issues, specifically related to tidal, sub-tidal and terrestrial habitats, will be considered in a WFD compliance assessment as part of the EIA.

Waste directives

2.46 All waste Directives applicable to Tilbury2 have been transposed into national legislation. However, at the time of preparing this chapter, the European Commission (EC) is proposing to revise a number of Directives to ensure they align with the recently released Circular Economy Package, which focuses on "closing the loop of product lifecycles through greater recycling and re-use, and bring benefits for both the environment and the economy". With particular reference to Tilbury2, the Directives and their corresponding UK regulations for which amendments have been proposed include:

- The Revised EU Waste Framework Directive (2008/98/EC);
- The EU Landfill Directive (1993/31/EC) (as amended);
- The EU End-of Life Vehicles Directive (2000/53/EC);
- Council Directive on Hazardous Waste (91/689/EEC);
- The European List of Waste (Commission Decision 2000/532/EC);
- The EU Batteries and Accumulators and Waste Batteries and Accumulators (2006/66/EC); and
- Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU) (as amended).
- Waste (England and Wales) Regulations 2011 (as amended)

2.47 The existing Regulations will be taken into account in the EIA for Tilbury2, with any potential updates to the 'parent' Directives referenced as necessary, if the information is available at the time of writing the ES.

Prevention of Air Pollution from Ships

2.48 The MARPOL Convention's Annex VI (Regulations for the Prevention of Air Pollution from Ships) was made statutory in England with the Merchant Shipping (Prevention of Air Pollution from Ships) Regulations 2008[6] and the Merchant Shipping (Prevention of Air Pollution from Ships) (Amendment) Regulations 2010[7].

2.49 These Regulations apply to:

i. a United Kingdom ship wherever it may be; and

ii. any other ship while it is within United Kingdom waters.

[6] 2.51 The Merchant Shipping (Prevention of Air Pollution from Ships) Regulations 2008 – SI 2008 No. 2924

[7] 2.52 The Merchant Shipping (Prevention of Air Pollution from Ships) (Amendment) Regulations 2010 – SI 2010 No. 895

2.50 Schedule 2A replaces Regulation 22 of the Merchant Shipping (Prevention 3.4.20 of Air Pollution from Ships) Regulations 2008 and outlines the control of sulphur oxide emissions. This enforces a 1.5% sulphur limit (by mass) for fuels used by all ships in SOx Emission Control Areas.

2.51 These Regulations will be taken into account as part of the EIA for Tilbury2.

3.0 NATIONAL, REGIONAL AND LOCAL PLANNING POLICY

3.1 The EIA will include full consideration of planning policy and guidance at national and local levels.

National Policy Statement for Ports

3.2 The Planning Act 2008 required new policy to inform decisions on NSIPs in England and Wales. Policy for new port infrastructure is set out in the National Policy Statement for Ports (Department for Transport, 2012).

3.3 Section 104(1)(a) of the Planning Act 2008 requires that the Secretary of State must have regard to this policy statement in deciding any NSIP application where a national policy statement is in place. This policy statement will therefore have primacy (alongside the Marine Policy Statement explained below) in the determination of the Tilbury2 DCO and in the preparation of the ES in support of that application.

3.4 The policy statement seeks to encourage sustainable port development, with judgements as to the location of such development being made by the Port industry on the basis of commercial factors.

3.5 In order to help meet the requirements of government policies on sustainable development, new port infrastructure should also:

- *Contribute to local employment, regeneration and development.*
- *Ensure competition and security of supply.*
- *Preserve, protect and where possible improve marine and terrestrial biodiversity.*
- *Minimise emissions of greenhouse gases from port related development.*
- *Be well designed, functionally and environmentally.*
- *Be adapted to the impacts of climate change.*
- *Minimise use of greenfield land.*
- *Provide high standards of protection for the natural environment.*
- *Ensure that access to and condition of heritage assets are maintained and improved where necessary.*

- *Enhance access to ports and the jobs, services and social networks they create, including for the most disadvantaged."*[8]

3.6 The policy statement does not direct where new capacity should be created, but encourages competition between ports as this *"drives efficiency and lowers costs for industry and consumers, so contributing to the competitiveness of the UK economy"* [9]

3.7 Section 3 of the policy statement indicates that the decision maker :-

"….should start with a presumption in favour of granting consent to applications for ports development. That presumption applies unless any more specific and relevant policies set out in this or another NPS clearly indicate that consent should be refused. The presumption is also subject to the provisions of the Planning Act 2008."[10]

3.8 Section 4 of the policy statement then sets out key considerations for dealing with proposals for individual port developments. It is based on the principle that where the decision-maker reaches the view that a proposal for port infrastructure is in accordance with the NPS, it will *"have to weigh the suggested benefits, including the contribution that the scheme would make to the national, regional or more local need for the infrastructure, against anticipated adverse impacts, including cumulative impacts."*[11]

3.9 The policy statement goes on in Sections 4 and 5 to consider potential environmental impacts in a range of environmental topic areas, and sets a number of tests that must be met by projects in relation to these areas. These will be covered in the ES for the Tilbury2 project and are referred to below. The guidance highlights issues that are particularly relevant to port facilities and should be assessed, including *inter alia* issues such as the impact of dredging on biodiversity and the water environment, flood risk, impact on transport infrastructure (particularly from HGVs), air pollution, noise and landscape character. All of the matters referred to in the NPS will be reviewed as part of the EIA process.

Marine Planning

3.10 The UK Marine Policy Statement provides the framework for preparing Marine Plans and taking decisions affecting the marine environment. It has been prepared and adopted for the purposes of section 44 of the Marine and Coastal Access Act 2009. The Marine Policy Statement sets out High Level Marine Objectives for ensuring that marine resources are used in a sustainable way.

3.11 Under section 104(2)(aa) of the Planning Act 2008, the Secretary of State must have regard to the Marine Policy Statement in determining a NSIP application. This policy statement will therefore have primacy (alongside the

[8] Para. 3.3.3
[9] Para. 3.4.13
[10] Para. 3.5.2
[11] Para. 4.2.2

National Policy Statement explained above) in the determination of the Tilbury2 DCO and in the preparation of the ES in support of that application.

3.12 The Marine Management Organisation (MMO) is also at the early stages of developing a Marine Plan for the South East area, which is intended to be implemented in the next few years, however it is not considered likely that this will be in effect such that it will be considered in the ES for the Tilbury2 project.

National Planning Policy Framework

3.13 The Government's policies on different aspects of planning are set out in the National Planning Policy Framework ("the Framework").

3.14 This document will play an important role in the development of the Tilbury2 project and the ES as a document that is likely to be considered 'important and relevant' to the Secretary of State's decision under section 104(2)(d) of the Planning Act 2008; however to the extent that its policies conflict with the National Policy Statement or the Marine Policy Statement, those documents will take priority.

3.15 The Framework states that the 'presumption in favour of sustainable development' is at the heart of the planning system. The Framework sets out three components of sustainable development – economic, social and environmental.

3.16 It emphasises that the Government is committed to ensuring that the planning system does everything it can to support sustainable economic growth. *"Planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system."*[12]

3.17 The Framework seeks to encourage sustainable economic growth and advises that investment in business should not be over-burdened by the combined requirements of planning policy expectations. Planning policies should recognise and seek to address potential barriers to investment, including a poor environment or any lack of infrastructure, services or housing.

3.18 The promotion of sustainable transport is dealt with in section 4 of the the Framework. At paragraph 32 it states *inter alia* that planning decisions should take account of whether safe and suitable access to the site can be achieved for all people. Development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.[13]

3.19 The Framework also advises that Local authorities should work with neighbouring authorities and transport providers to develop strategies for the

[12] National Planning Policy Framework, para. 19
[13] Para. 32

provision of viable infrastructure necessary to support sustainable development, including large scale facilities such as rail freight interchanges, roadside facilities for motorists or transport investment necessary to support strategies for the growth of ports, airports or other major generators of travel demand in their areas.[14]

The Development Plan

3.20 The development plan applicable to the site comprises :-

- Thurrock Core Strategy and Policies for Management of Development ("Core Strategy"), 2011 and;
- Borough Local Plan, 1997 – remaining saved policies.

3.21 Also relevant are the policies of Gravesham Borough Council, the municipal area of which lies immediately south of the River Thames opposite the Tilbury2 site.

3.22 The Thurrock Core Strategy and Development Management Policies DPD was originally adopted on 21 December 2011 and subsequently updated on 28 January 2015, following an independent examination of the Core Strategy Focused Review document which concentrated on consistency with the National Planning Policy Framework.

3.23 As with the NPPF, these documents will play an important role in the development of the Tilbury2 project and the ES as documents that are likely to be considered 'important and relevant' to the Secretary of State's decision under section 104(2)(d) of the Planning Act 2008; however to the extent that its policies conflict with the National Policy Statement or the Marine Policy Statement, those documents will take priority.

3.24 The Core Strategy highlights the town of Tilbury as a Key Strategic Economic Hub in Strategic Objective SO3 and policy CSSP2 - Sustainable Economic Growth. Core sectors in the growth hub are identified as the Port; logistics and transport; and construction, with growth sectors being Business services; environmental technologies; recycling; and energy.

3.25 The town of Tilbury is identified as a key growth location for employment in the Borough that will provide between 1,600 and 3,800 additional jobs in logistics, port and riverside industries. Port-related employment land was allocated to the north of Tilbury in the Core Strategy, an allocation which has now been developed for port-centric warehousing known as London Distribution Park.

3.26 Of particular relevance to the Tilbury2 project is Policy CSTP28: River Thames. This states that:-

"The Council and Partners will ensure that the economic and commercial function of the river will continue to be promoted through:

[14] Para. 31

i. Priority being given to allocating riverside development sites to uses that require access to the river frontage, especially those which promote use of the river for passenger transportation purposes.

ii. Safeguarding port-related operational land.

iii. Safeguarding additional adjacent land required for further port development, including expansion. For port development onto additional land to be acceptable however, it will be necessary to substantiate the need for it over and above land that is already available for operational port uses.

iv. To safeguard existing and promote new jetties and wharves facilities where appropriate for transport of goods and materials."

3.27 The Core Strategy allocated land at North Tilbury for port-related development and this land has now been developed as London Distribution Park. The Core Strategy does not safeguard any additional undeveloped land on the water front for the expansion of the Port of Tilbury.

3.28 The policy seeks to provide new or enhanced sustainable, safe and equitable access to and along the river foreshore; to maintain or enhance views, particularly of key features including heritage and landscapes, and improve recreational interaction with the river and its setting. This is of relevance to Tilbury2 as a public right of way along the Thames passes along the southern boundary of the site.

3.29 The policy indicates that exceptions to these objectives may apply, including the following which will be relevant during construction of the scheme:-

"Where industrial/commercial development requires use of the river and its foreshore and needs to restrict public access for operational or safety reasons."

3.30 Core Strategy Policy CSTP17 - Strategic Freight Movement and Access to Ports - supports economic growth by ensuring sustainable, high quality and reliable freight access to the ports and other key employment locations, whilst minimising the adverse impacts such activity might have on people, the environment and the transport system including improving access to Ports.

3.31 The Core Strategy identifies the land between Tilbury and the riverside to be enhanced and opportunities for appropriate re-use and refurbishment of Listed Buildings and that the green linkage between the urban area and the river be pursued. It highlights that *"The landscape setting of Tilbury Fort and approaches to it will be enhanced. There will be further development of cultural facilities and industry based upon the riverside development and cultural heritage of the riverside."* [15] and that *"public access and informal*

[15] Thurrock Core Strategy and Policies for Management of Development (as amended), para. 3.36

recreation along the riverside will be improved. There will be improvements to transport links." [16]

3.32 Other policies that may be of relevance to the Tilbury2 project include, but are not limited to, the following

- CSSP3: Sustainable Infrastructure
- CSSP4: Sustainable Green Belt
- CSSP5: Sustainable Greengrid
- CSTP6: Strategic Employment Provision
- CSTP14: Transport in the Thurrock Urban Area: Purfleet to Tilbury
- CSTP15: Transport in Greater Thurrock
- CSTP16: National and Regional Transport Networks
- CSTP18: Green Infrastructure
- CSTP19: Biodiversity
- CSTP20: Open Space
- CSTP24: Heritage Assets and the Historic Environment
- CSTP25: Addressing Climate Change
- CSTP27: Management and Reduction of Flood Risk
- PMD1: Minimising Pollution and Impacts on Amenity
- PMD4: Historic Environment
- PMD6: Development in the Green Belt
- PMD7: Biodiversity, Geological Conservation and Development 203
- PMD9: Road Network Hierarchy
- PMD10: Transport Assessments and Travel Plans
- PMD11: Freight Movement
- PMD15: Flood Risk Assessment
- PMD16: Developer Contributions

[16] Para. 3.37

3.33 The ES for the Tilbury2 project will make reference to these policies where relevant.

Policies Map

3.34 The area within the indicative Order Limits is subject to a range of notations on the Core Strategy Policies Map as shown on Figure 1.1 below

3.35 Parts of the main site are 'white land,' absent any site specific designation. Land to the north of the site is partly identified as secondary employment land whilst other areas are defined as being of nature conservation importance either as Local Wildlife Sites (LoWS)[17] or green corridors. A small area in the north east corner of the site is located within the Green Belt.

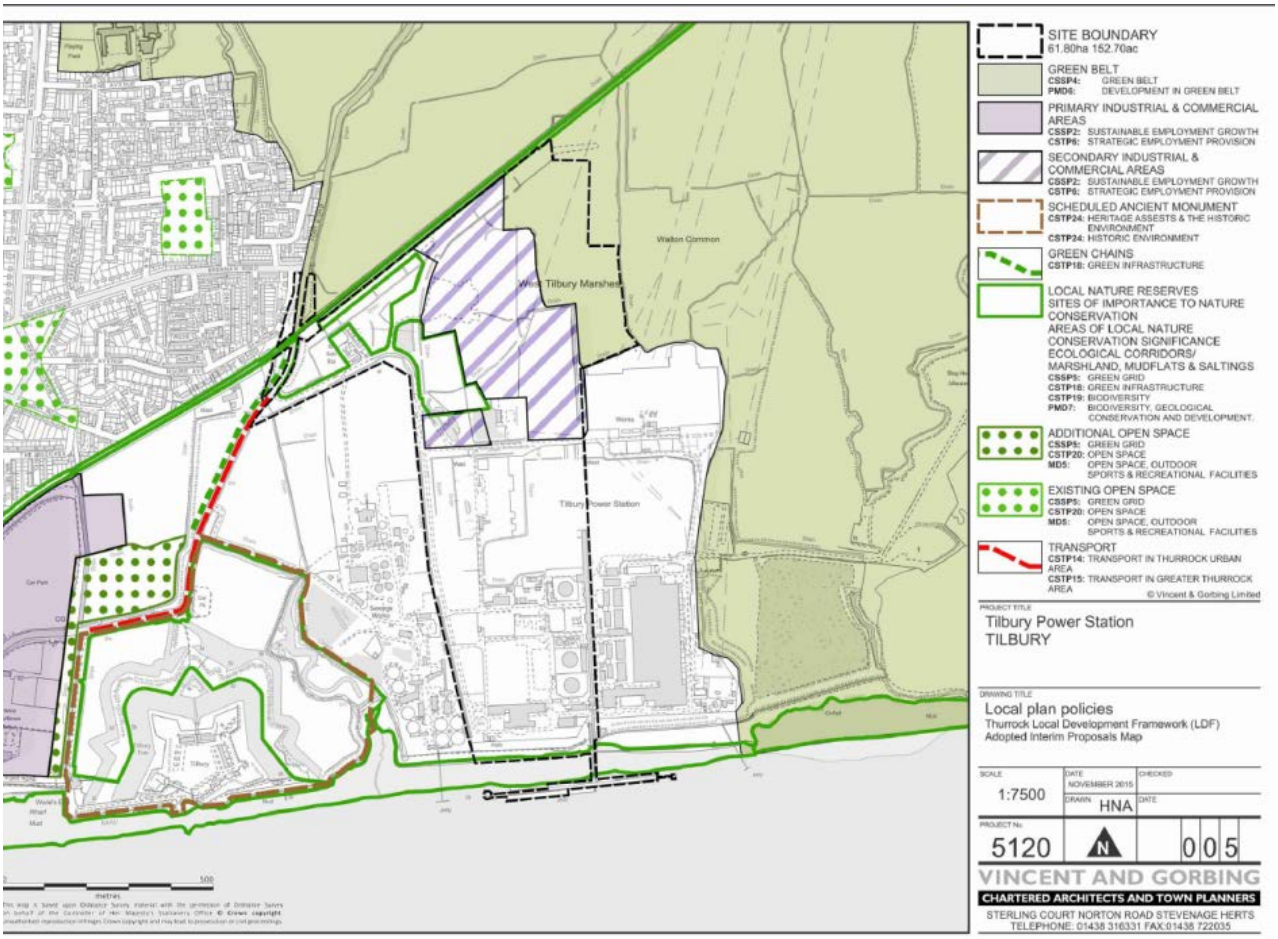


Figure 3.1 Thurrock Local Plan Policies

[17] Note that the Policies Map does not indicate the currently recognised location of the relevant Local Wildlife Sites (LoWS) and the nature conservation designations on the plan do not coincide with these LoWS.

Emerging Thurrock Local Plan

3.36 Thurrock Council is at the early stage of preparing a new Borough-wide Local Plan. An Issues and Options consultation was undertaken in October/November 2016. A further (Regulation 18) consultation is planned for late 2017, with a Submission Draft (Regulation 19) consultation following a year later. The current Local Development Scheme assumes adoption by the end of 2020.

Gravesham Planning policies

3.37 The Tilbury2 site lies close to the southern boundary of Thurrock adjoining the municipal area of Gravesham. The policies and proposals contained in the Gravesham Local Plan Core Strategy ("GLPCS") and Policies Map (adopted 30 September 2014) may also be of relevance to the Tilbury2 proposals.

3.38 The GLPCS identifies a number of opportunity areas within the Borough. Of particular relevance to the Tilbury2 proposals is the Gravesend Riverside East and North East Gravesend Opportunity Area which lies immediately to the east of Gravesend town centre. The western parts of this opportunity area lie on the southern shore of the river Thames opposite the Tilbury2 site. This part of the opportunity area includes the 'Canal Basin Regeneration Area' which is proposed within the GLPCS for *"mixed use regeneration that complements the development which has already taken place to the south of the Canal Basin…..This will comprise a mix of residential and business uses that have regard to the constraints imposed by its location in a flood risk area and the proximity of gasholders at Canal Road."*[18] The GLPCS notes that planning permission has been granted for these uses. Policy CS04 highlights that the Canal Basin Regeneration Area Key site will provide *inter alia* around 650 new dwellings.

3.39 There are also a number of other objectives for this opportunity area which include protecting and enhancing river related leisure and commercial activities and heritage assets.

3.40 Gravesend Town Centre is also defined as an Opportunity Area, the objectives for which are set out in Policy CS05. The town centre is identified as *"the principal focus for town centre related economic and social activity in the Borough."* The policy highlights the need to take full advantage of the town's heritage and riverside setting with development seeking to *"reinforce Gravesend's character as a riverside heritage town."* [19]

3.41 Further west along the river (partly opposite the existing Port of Tilbury) is the Northfleet Embankment and Swanscombe Peninsula East Opportunity Area. This is described in Policy CS03 as *"a substantial opportunity for major riverside regeneration in Gravesham. Development will bring significant benefits to existing adjoining residential communities and the Borough as a whole through the delivery of new housing and jobs whilst*

[18] Gravesham Local Plan Core Strategy (2014), para. 4.4.28
[19] Gravesham Local Plan Core Strategy (2014), para. 4.6.41

achieving environmental improvement, especially in air quality, and a high standard of design."[20]

3.42 The EIA process will need to consider likely changes in land use context within the above Opportunity Areas in defining and assessing the impact of the proposals on sensitive receptors. There may also be a need to review these proposals in relation to cumulative impacts.

3.43 Other GLPCS policies of relevance are:-

Policy CS18: Climate Change which covers flood risk, water quality, sustainable drainage and surface water run off, and carbon reduction. The policy indicates that *"as part of its approach to climate change and environmental improvement, the Council will have regard to the delivery of the Water Framework Directive and associated Thames River Basin Management Plan objectives to support water bodies being progressively improved to "good" status over the plan period."*[21]

Policy CS19: Development and Design Principles which seeks to ensure that new development will be visually attractive, fit for purpose and locally distinctive.

Policy CS20 : Heritage and Historic Environment : which sets out the high priority given towards the preservation, protection and enhancement of its heritage and historic environment, including at Gravesend Town Centre.

[20] Gravesham Local Plan Core Strategy (2014), para. 5.14.39
[21] Gravesham Local Plan Core Strategy (2014), para. 5.14.39

4.0 PORT OF TILBURY – EXISTING AND FUTURE

4.1 The town of Tilbury lies within the Borough of Thurrock, within south Essex. It is situated on the north side of the River Thames, to the east of London. The town comprises areas of predominantly residential development with a commercial and retail centre.

4.2 However, the character of the town and its environs is related in large part to the Port of Tilbury itself, which lies to the south and west of the town. The main Port site comprises a total land area of some 445ha. (1,100 acres). Land uses within the Port comprise a mix of waterside facilities, external storage, warehousing, industrial uses, haulier parking and ancillary offices.

4.3 The Port abuts the town of Tilbury to the north-east, divided from it by the Tilbury Loop of the Fenchurch Street to Southend Railway. Beyond the buffer performed by the railway corridor, the Port abuts industrial and warehousing units at Thurrock Parkway, residential and commercial properties within the town, and secondary industrial activities further south.

4.4 The Port is visible from numerous viewpoints, both from the rising land to the north and, obviously, from the river itself. On the southern side of the river is the town of Gravesend, to the west of which is the Swanscombe Peninsula, which is presently the subject of plans for a theme park and entertainment resort.

4.5 The Port is accessed from the A1089, which is trunk road up to the main Port entrance and therefore under the control of Highways England. The A1089 routes north from the Port, via a roundabout adjoining the ASDA supermarket and London Distribution Park, to the A13, and thence to the M25 and the national motorway network.

4.6 Further south from the main Port entrance, Ferry Road provides access to the Riverside Rail Terminal and the London Cruise Terminal. Beyond the Cruise Terminal, the road becomes Fort Road and provides access to the "Fortress Distribution Park" – an area of port related car storage and HGV Haulier Parks. Fort Road then routes to the north of Tilbury Fort itself prior to passing the access to the Tilbury2 site.

4.7 To the north of the main Port area, to the east of the A1089, is London Distribution Park. The development (a joint venture between PoTLL and Roxhill Developments) – part of which is still under construction – provides port-centric warehousing and an area of haulier parking. A warehouse with 195,000sq.m. of floorspace is nearing completion and will be occupied as a distribution and fulfilment centre by Amazon.

CURRENT PORT SERVICES AND FACILITIES

4.8 The main services offered by the Port of Tilbury are summarised below.

4.9 **Containers**: The London Container Terminal is the only UK port with facilities to serve both deep sea and short sea customers. It has the capability to handle over 500,000 containers (over 900,000 TEU) per year. The Terminal offers 24/7 working.

4.10 **Grain and dry bulks**: The Port has dedicated handling and storage facilities to handle grain and dry bulks, and is equipped with high capacity grabbing cranes and loadout elevators. The Port has a wide variety of berths to accommodate bulk handling operations. The Port currently has six bulk handling berths and 7.4 acres of bulk handling operations plus 120,000 tonnes of storage.

4.11 **Paper and forest products**: Tilbury is the UK's leading port for paper products and is the major entry point for print houses and publishers in London and the South East, handling volumes of over three million tonnes per year. The Port opened the London Paper Terminal – a dedicated paper distribution centre – in 2014. The 14.5 hectare (36-acre) terminal includes 65,000sq.m. (700,000sq.ft.) of covered storage and state-of-the-art equipment and technology. The Enterprise Distribution Centre (EDC) is a centre of excellence for paper handling and as a high bay warehouse has significantly improved throughput capabilities. Tilbury is a significant port for forest products with excellent links throughout the supply chain including shipping lines, importers, merchants and distributors. The Port has over 10ha. (25 acres) of dedicated storage, transit, treatment and distribution facilities, and is able to deal with a full range of commodities from sheet materials to specialist timber.

4.12 **Roll-on/roll-off**: the roll-on/roll-off (ro-ro) berths deal with a range of cargos including cars, ferry services and tracked and agricultural plant. The Port also has a dedicated Vehicle Handling Centre which allows for secure car storage. One of the main customers for ro-ro is Hyundai, which handled almost 90,000 cars through the Port of Tilbury in 2015. In addition, P&O operate a twice-daily ferry connection between Tilbury and Zebrugge offering a regular quality service for the ever-growing Thames freight market. This service will be transferred to Tilbury2 as part of these proposals.

4.13 **Recycling**: Tilbury is the UK’s largest recycling and waste export facility, receiving, processing and exporting a wide range of waste products from the UK and overseas. It is estimated that some 15% of Tilbury’s throughput is recycling materials.

4.14 **Cruises**: the London International Cruise Terminal is London's only purpose-built deep water cruise facility, and is located only 22 nautical miles from Central London and within easy access of London airports. The terminal consists of a large, historic Grade II* listed cruise terminal with two elevated ship-to-shore gangways and a 348 metre landing stage. There are some short and long stay car parking facilities located adjacent to the cruise terminal. In 2016, 55 ‘cruise calls’ were made at the Port of Tilbury, representing through flow of around 102,000 passengers. By 2017, this has been forecast to increase to 65 calls with 170,000 passengers with further increases beyond.

4.15 A regular foot passenger ferry service operates from Monday to Saturday between Tilbury and Gravesend on the south bank of the Thames. Approximately 25 services run in each direction each day, with the crossing taking approximately five to ten minutes. The S106 agreement on London Distribution Park includes funding of £350,000 to subsidise the ferry.

4.16 **The London Construction Link (LCL)** is a collaboration between the Port of Tilbury and a construction solutions company. The partnership aims to relieve congestion on the capital's roads through promoting greater use of construction consolidation and river-based freight. The Port acted as the logistics and distribution hub for the construction of the Olympic Park and the operation of the 2012 Olympic and Paralympic Games, and is currently storing and refurbishing the cranes from the Battersea Power Station redevelopment and materials for the Thames Tideway project. .

CURRENT QUANTITATIVE ECONOMIC CONTRIBUTION

4.17 Within the Port, PoTLL itself has around 820 FTE permanent employees. In addition, on site direct employment by Port tenants and operators is estimated to be around 2,360 FTE jobs. Directly related off-site employment by tenants and operators accounts for an estimated additional 1,100 FTE employees.[22]

4.18 In essence, PoTLL employment is sizeable and significant and also serves as a catalyst and enabler for a much larger employment component. Combining PoTLL and tenant/operator employment gives a combined direct employment level of around 4,200 FTE employees. The estimated direct employment also creates and sustains other jobs in the regional economy through multiplier effects. This includes employment derived from spend within the supply chain (indirect effects), and the employment derived from wage expenditure by direct and indirect employees (induced effects). The direct employment is estimated to result in around 2,610 FTE jobs sustained through indirect employment. Induced employment effects are estimated to support a further 1,460 FTE jobs.

4.19 Thus the total employment effect of the Port of Tilbury at a regional level is estimated to support around 8,350 FTE jobs.

4.20 In terms of the economic value added for this employment, a regional Gross Value Added (GVA) per employee measure has been used to convert employment into GVA estimates. The direct Port effects are estimated to result in a regional GVA of around £181.6m. Adding on indirect and induced effects, produces a total estimated regional GVA of £390.6m.

4.21 It is estimated that the total value of cargo handled by the Port of Tilbury each year is around £8.7 billion.

[22] Data provided to PoTLL report by Arup Consulting *"Economic Impact and Future Growth Assessment, Final Report, May 2016."* These figures exclude the Amazon Fulfillment Centre at London Distribution Park which is due to open Q4 2017.

QUALITATIVE CONTRIBUTION

4.22 A number of tangible, albeit qualitative, effects on the locality can be attributed to the Port, including *inter alia:-*

- Education: through trustee status, internships, work experience placements, supporting careers advice and engaging with schools and universities, the Port supports sector-enhanced education opportunities.

- Skills and training: PoTLL is a part of the Logistics Academy East of England, which is a provider of apprenticeships, traineeships and pre-employment training.

- Community support: the Port is active locally through business groups, supporting schools and clubs, sponsoring local sports clubs and in sharing space for use by small companies and local community groups.

- Environmental sustainability: the Port also hosts waste recycling, processing and recovery operations. The Port has collaborated with the Environment Agency to fund enhanced flood defence and alleviation measures. The port has four 3MW wind turbines, and will soon host a 40MW biomass power station capable of meeting the energy needs of around 95,000 homes.

- Tourism: whilst the majority of cruises 'begin' at Tilbury, the location provides the opportunity to extend stays locally, and to access the full range of Central London locations.

GROWTH PROSPECTS

4.23 Studies commissioned by the Port have researched tenants' future requirements as well as considering trend-based growth scenarios, depending on whether growth is 'constrained' or 'unconstrained.'

4.24 The survey of the Port's customers and tenants asked about their plans over the medium (five year) and long (ten year) periods. The large majority of respondents stated that they had plans to expand their businesses within this time period, and 88% of tenants and 65% of customers who answered the question said that their plans would require additional capacity at the Port of Tilbury. In addition, over half of customers and three-quarters of tenants stated that they would consider relocating or using another port if Tilbury is not able to meet expansion needs. This highlights the importance of sufficient land, efficiently used, to continue to support the wider economic impact the Port of Tilbury currently sustains.

4.25 Trend based scenarios have considered potential future growth in throughput over the period to 2035. The analysis adopted a number of different assumptions and indicated that the basic current trend for the Port suggests that the 2014 tonnage volume of 12.9m could grow to 17.6m by 2035, albeit, as of 2016, this has already grown to 16 million tonnes. When

split by type, a different indicative total of 27.9m tonnes was suggested. This was driven by significant forecast growth in the conventional business albeit ignoring in particular the current space constraints of container traffic. A truly unconstrained scenario based on predictions of the next 5 years, predicts volumes to move from to 52.1 million in 2035, and therefore represents an exponential growth.[23]

4.26 PoTLL is of the view that there is significant growth potential at Tilbury, which will facilitate further contributions to the regional GVA. In a realistic scenario, taking into account non-Port related constraints, PoTLL projects that throughput could double from the current 16 million tonnes p.a. to 33 million tonnes p.a. over the next 15-20 years.

4.27 That growth potential is likely to be constrained by land availability as well as berth capacity within PoTLL's current land holdings and operational facilities.

4.28 It is in this context that the new port terminal at Tilbury2 is being proposed. Further details on the economic and business case for the Scheme will form part of the application for the Tilbury2 project.

[23] Estimates from Arup Consulting *"Economic Impact and Future Growth Assessment, Final Report, May 2016"*

5.0 DESCRIPTION OF SITE, SURROUNDINGS AND PROPOSED DEVELOPMENT

INTRODUCTION AND ALTERNATIVES

5.1 This section describes the key features of the construction and operational phases of the proposed development of a new port terminal at Tilbury2. The scope of potential environmental impacts associated with the proposed scheme is described in Section 7.

5.2 Port of Tilbury London Limited have considered a number of alternatives to expansion at the Tilbury2 site. The efficient and intensified use of the existing Port has already been achieved such that the existing land area is effectively at capacity and forecast increases in throughput cannot be achieved without more land. Aside from the Tilbury2 site, there is no land in close proximity to the existing Port that has a deep water frontage to the river Thames, such that increased throughput resulting from increases in berthing capacity can be achieved. Expansion along the river frontage to the west (upstream) is constrained by existing residential development. Expansion immediately to the east of the existing cruise terminal (downstream) is not possible due to the presence of Tilbury Fort, a nationally important heritage asset and scheduled ancient monument.

5.3 Aside from the intervening operational waste water treatment works (which is not available for redevelopment), the Tilbury2 site is the closest land to the existing port operational area that can be utilised to allow for increased berthing capacity and throughput at Tilbury.

5.4 The Tilbury2 site needs to be appropriately accessed from the A1089(T). PoTLL have considered the option of upgrading highway infrastructure along the existing alignment of Fort Road but have deemed such an access solution as unsuitable for engineering and environmental reasons which will be considered as part of the EIA process. The alternative and preferred proposal is a new access corridor alongside the currently railway line to the north of Fort Road.

5.5 A full analysis of the alternatives to the project and the route of the access corridor will form part of the ES for the Tilbury2 project.

THE ORDER LIMITS

5.6 The red line boundary for the DCO (known as the 'Order Limits') will be established to include all works proposed by the Order including those comprising the NSIP itself and Associated Development, as defined by the Planning Act 2008 and the accompanying April 2013 DCLG Guidance. . A draft plan of the potential Order Limits is attached (5153187-ATK-ZZ-ZZ-SK-ZZ-001/P4). The land bound by the Order limits comprises four areas, namely

- the main site of the new port facility on the former Tilbury Power Station land;
- sections of the Tidal Thames required for the construction of expanded berthing capacity and associated dredging;
- a surface access corridor from the main site between Ferry Road and Fort Road; and
- Land around the roundabout to the north of the Port (the "ASDA roundabout") where highway improvements may be required.

5.7 Additional areas may be included that embrace any proposed consequential changes to the highway and public rights of way network in the vicinity of these proposed works or areas required for construction of the works, together with construction compounds and/or corridors and any offsite environmental mitigation areas considered to be necessary as a result of the EIA process.

TILBURY2 SITE

5.8 The Tilbury2 site comprises approximately 61 hectares (152 acres) of the western part of RWE's former landholding at the former Tilbury Power Station. RWE are retaining the 'B' Station land to the east of the site for potential future power generation. PoTLL are the freehold owners of the Tilbury2 site.

5.9 The northern boundary of the site is defined by a railway line which comprises the Tilbury loop of the London-Southend line. The southern boundary is defined by the River Thames. Part of the ownership includes a deep water jetty, previously used for the importation of coal. The site has a frontage of 290m to the river.

5.10 To the east, the site is bounded in part by agricultural land, in part by the Tilbury 400kv substation, and in part by the remainder of the power station complex which is in the process of being demolished. To the west, the site is bounded by the Anglian Water Sewage Works, beyond which is land at and adjoining Tilbury Fort, a scheduled ancient monument and tourist attraction.

5.11 The site itself is divided by an access road which runs east-west, known as 'Substation Road' (as it provides access through the site from Fort Road to the substation referred to above). To the south of this road, the site comprises the land that formerly accommodated the Tilbury 'A' power station and areas previously used for coal storage and ancillary buildings and land including the former Tilbury Energy and Environment Centre (TEEC) which was an educational facility run by RWE and which showcased examples of brownfield habitats and reedbed. Apart from a number of small structures (see below) all buildings and operational structures have now been demolished.

5.12 To the north of Substation Road is land in part used for the open storage of new motor vehicles by Hyundai. PoTLL was granted temporary planning permission for 5 years for this use in September 2016 by Thurrock Council (LPA reference 16/00848/FUL). The remainder of the land north of Sub-Station Road is largely brownfield land with areas of plantation woodland and developing scrub although there are some areas of relic grazing marsh. Parts of the northern area were formerly used to manufacture 'Lytag' blocks as a by-product of fuel ash from the power station. To the north-east of this area is land formerly used for agriculture, but more recently appropriated by RWE for advance habitat creation to provide compensatory habitat for water voles, reptiles and other species in anticipation of the loss of the TEEC site and adjoining areas to a power station development that was subsequently shelved.

5.13 The site is accessed directly from Fort Road, with a former rail connection point to the north, last used in the 1960's.

5.14 Vegetation on the site comprises areas of skeletal grassland on hard-standings or artificial substrates, established grassland in part derived from relict grazing marsh, areas of scrub and plantation woodland and smaller areas of swamp and wetland habitat. A number of drainage channels pass across the site and along its boundaries. The land is predominantly flat.

5.15 That part of the tidal Thames within the Order Limits includes an area of inter-tidal habitat along the site frontage itself and an extent of the river. The riverbed slopes from the frontage of the site to a depth of circa 10m at the southern boundary.

THE ACCESS CORRIDOR

5.16 The access corridor comprises a number of different land use types immediately adjoining the existing railway corridor.

5.17 At its eastern end, the land includes Fort Road itself and the existing bridge where Fort Road crosses the railway at elevation. Immediately to the west of Fort Road is an area of scrub, beyond which is a small industrial/depot site containing a number of small single storey storage buildings and an area of external vehicle and plant storage.

5.18 At its western end, the corridor includes land occupied by an existing rail siding and operational land used by the Port for external storage (presently for import new cars) known as the 'Fortland' site, and a narrow corridor of landscaping between this and the railway itself.

5.19 Between these two developed areas at either end of the corridor is an area of grazing land typically used by for the grazing of horses.

5.20 The effects of the change that the Tilbury2 project will bring to these existing land uses will be considered as part of the ES.

DEMOLITION AND SITE CLEARANCE

5.21 The main site is presently being cleared of most of the structures related to its use as a Power Station by the previous owners, RWE, prior to PoTLL obtaining vacant possession of the entire site on 30 March 2017.

5.22 All structures associated with the Power Station will be removed from the site prior to the submission of the DCO application with the exception of the buildings and structures identified in Table 5.1 below and illustrated on Plan 5148146-ATK-ZZ-ZZ-DR-C-0005/P1 attached. These assumptions, and the results of the condition survey referred to, will be built into the assessments carried out as part of the EIA process.

Building reference	Reference on Plan	Demolished	Comment	Floor Area (m²)
Main Gate House	No.1 Gatehouse	Yes	Material to be crushed and reused on site	51
Club House Building	Old Club House	Yes	Material to be crushed and reused on site	953
Jetty Workshop	Jetty W	No	Retained	192
Junction Towers and Conveyor	Junction Tower 1 no.18	No	Condition surveys to be undertaken by Atkins to determine suitability for re-use	195
Sewage Pump House	Sew Ejector no.2	No	Retained and relocated	22

Table 5.1 : Retained Buildings

DESCRIPTION OF THE AUTHORISED DEVELOPMENT

5.23 The exact description of the works to be included within the DCO is presently being refined alongside iterations of the masterplan and technical assessment process which is presently on-going. The present 'working' description of the authorised development that will be sought to be consented through the DCO is as follows. Once this description is finalised, PoTLL will be able to fully consider which aspects of the development will comprise the 'NSIP', and which will comprise Associated Development.

The Tilbury2 Site

5.24 As per the description above, the redevelopment of the Tilbury2 site itself as a new port terminal will comprise a number of key components with the two principal proposed port uses being a Roll-on/Roll-off (Ro-Ro) terminal, located south of Substation Road, and a Construction Materials and Aggregates Terminal to the north of Substation Road. The current indicative General Arrangement Plan is attached (5153187-ATK-ZZ-XX-DR-ZZ-1).

Jetty/Marine Works

5.25 To facilitate its use for both the Ro-Ro terminal and the aggregates facility, the existing jetty will require modification at both its upstream and downstream arms.

5.26 To create a two berth Ro-Ro terminal the upstream works will comprise:-

- An approach bridge comprising a 3 lane roadway and adjoining footway;
- A linkspan bridge connecting the bridge to the floating pontoon;
- A floating pontoon
- Erection of a control office on the floating pontoon;
- Footway Link bridge, linking the floating pontoon to the existing jetty;
- Seven no. mooring dolphins arranged east west as an extension to the existing jetty connected by a footway link bridge
- Removal of the existing Anglian Water Authority (AWA) jetty. This has been agreed in principle with AWA who no longer use the jetty.

5.27 Downstream works in association with the Construction Materials and Aggregates terminal will comprise -

- Installation of an extension to the existing conveyor system;
- Erection of new feed hopper
- Installation of 6 number mooring dolphins to the front of and downstream of the existing jetty

Berth pockets and approach dredging

5.28 Dredge pockets will be created and maintained for the life of the terminal around the improved terminal jetty. In relation to the downstream (aggregate) jetty, the depth of pocket will cater for the largest likely vessels to visit the site in the future (100,000 tonnes).

5.29 The immediately adjoining approaches to the berth pockets will also need dredging and are included within the indicative DCO limits.

Ro-Ro Terminal – landside facilities

5.30 Following clearance of the site, the land south of Substation Road will be developed to accommodate associated storage areas and access to the Ro-Ro jetty over an area of approximately 20ha. These works will comprise :-

- Formation of concrete pavement for the storage of shipping containers
- Surface water drainage features
- Installation of column mounted and high mast luminaires
- Potential ancillary single storey welfare buildings
- Operation and security gate systems
- Formation of access corridor to the linkspan bridge;
- Peripheral structural landscaping including SUDs features

5.31 This area will also accommodate a single storey warehouse. This will replace the existing "Maritime" terminal warehouse at the existing Port and will be used for multi-modal transhipment of steel.

5.32 No landside cranes are proposed, with containers being moved by reach stackers. In the Ro-Ro terminal area, containers may be stacked.

Construction Materials and Aggregates Terminal – landside facilities

5.33 The Construction Materials and Aggregates Terminal ("CMAT") will comprise a number of permanent uses and structures as follows :-

- Aggregates Distribution Yard
- Block & Precast Manufacturing Facility.
- Cement Facility comprising Importing Sheds / Silos on approximately 0.8ha (2 acres)
- Readymix concrete batching plant.
- Asphalt batching plant

5.34 The facility will include extension to the existing conveyor system from the jetty to the CMAT.

Other uses and structures

5.35 Remaining land within the site may be used for external storage uses, with the principal use likely to be the storage of new imported motor vehicles.

Rail spur

5.36 A rail spur will enter the Main Site in the north west corner, routing around the northern and down the eastern boundary of the site, terminating in new sidings.

Surface access strategy

5.37 In order to fully utilise the new port terminal, a surface access strategy has been devised comprising new and improved road and rail links. Initial proposed alignments are shown on plan 5153187-ATK-ZZ-XX-DR-ZZ-1.

5.38 The details of these proposals are still being considered but in principle, it is proposed to construct a new public highway to link the A1089/Ferry Road from a location to the south of Tilbury Railway station, along an alignment which closely follows the existing railway line, through the northern part of the existing Fortland site.

5.39 Rail provision will be established by a connection from the existing port sidings prior to the spur to the riverside railhead with the existing railhead being closed. The rail siding will route alongside the existing main line railway to the north of the proposed new highway.

5.40 An improved road bridge will be constructed close to the entrance to the Main Site where Fort Road presently crosses the railway. A new manned gatehouse will be constructed within the Tilbury2 site to the east of the junction of the access road with Fort Road

Operational details

5.41 The Ro-Ro terminal will operate 363 days per year, 24 hours per day.

5.42 The capacity of the terminal is considered to be a maximum 500,000 units (trailers or containers) per annum. The objective of the likely operator is a throughput of 360,000 units per annum.

5.43 The Ro-Ro terminal would accommodate two vessel movements per day once the tenant is fully operational at the site.

5.44 The CMAT will operate 312 days per year (six days per week), 7am - 7pm Monday – Friday and 7am – 12pm Saturdays.

5.45 The proposed capacity of the CMAT will be 1,600,000 tonnes per annum. A total of 700,000 tonnes will be transported away from the site by rail, and 750,000 tonnes by road. Of that leaving the site by road, 50% will be exported on 16T vehicles and 50% on 33T vehicles. It is expected that some 1 – 3 trains per day will remove materials from the site.

5.46 A total of circa 150,000 tonnes of material per annum will leave the CMAT by barge.

5.47 Some maintenance dredging of the berthing pockets and the immediately adjoining approach dredge will be required although the extent of this will only become clear once a hydrodynamic assessment is undertaken.

Highways and public rights of way

5.48 The scheme is likely to include diversion of public rights of way and modifications to the local highway network. The full extent of these works will be known following the transport assessment carried out for the Tilbury2 project as part of the EIA process.

5.49 A public footpath (By-way 98 or FP 146) routes along the foreshore of the Thames at the southern boundary of the site. This footpath forms part of the Thames path and may need to be temporarily diverted or temporarily closed during the construction process.

5.50 Footpath FP144 crosses the proposed access corridor to the south of the built up area of Tilbury and will need to locally diverted.

Permitted Development Rights

5.51 The Port is a statutory undertaker and benefits from Permitted Development rights under Part 8 Class B of the Town and Country Planning (Permitted Development) Order 2015. This allows development on operational land by the Port and its lessees in respect of dock, pier, harbour, water transport, required :

"(a) for the purposes of shipping, or

(b) in connection with the embarking, disembarking, loading, discharging or transport of passengers, livestock or goods at a dock, pier or harbour, or with the movement of traffic by canal or inland navigation or by any railway forming part of the undertaking."

5.52 As part of the DCO, PoTLL will seek to ensure that such rights will apply equally to Tilbury2 when that land becomes operational port land. As such, the exact nature of uses on the site may change over time. Thus, as well as the development which is proposed to be authorised through the DCO, EIA will be undertaken of a 'Rochdale Envelope' of port uses and development within the operational land; with the character of that use and development established through development parameters. These will define both the physical attributes of development (for example maximum scale) and the level of activity (for example traffic) which might reasonably be expected in the future. Clearly, any development on the land in the future that was outside of these development parameters or which otherwise caused significant environmental effects or fell within Planning Act 2008 categories, would not be Permitted Development and so would need express planning permission or a further DCO.

6.0 THE ENVIRONMENTAL STATEMENT

INTRODUCTION

6.1 The EIA for the Tilbury2 project will conform to the requirements of the EIA Regulations and, where necessary the 2017 Regulations.

6.2 The contents of the Environmental Statement will address these requirements as follows.

CONTENT OF THE ENVIRONMENTAL STATEMENT

Volumes

6.3 It is envisaged that the ES will be made up of three documents:

Volume 1: Main text of the ES including all drawings and images.

Volume 2: Appendices incorporating information provided by specialist consultants. This will include technical appendices and full reports supplementing the topic chapters in Volume 1.

Volume 3: Non-Technical Summary: Based on chapter summaries from Volume 1 of the ES.

Structure of Volume 1 of the ES

6.4 The main Environmental Statement text will be structured as follows :-

Part 1 : Introduction and Proposals
1. Introduction
2. Need for the development and alternatives considered
3. Description of the development proposals
4. EIA Methodology
5. Policy context

Part 2 : Environmental Topics
1. Individual topic chapters

Part 3 : Inter-relationships
1. Inter-relationship between topics
2. Inter-relationships with other developments (if appropriate)

Structure of each environmental topic chapter

6.5 Each environmental topic will be considered, as far as possible, on a consistent basis, with each chapter being structured as follows :-

(i) Introduction
(ii) Methodology associated with that topic

(iii) Policy Context
(iv) Baseline Assessment
(v) Development proposals and primary mitigation
(vi) Assessment of effects
(vii) Additional Mitigation
(viii) Summary

6.6 In each case, impacts will considered as follows:-

- Direct, indirect and secondary impacts
- Cumulative impacts
- Short, medium and long term impacts
- Permanent and temporary impacts
- Positive and negative impacts

6.7 Impact significance will be considered on the following basis :

- Major (adverse or beneficial)
- Moderate (adverse or beneficial)
- Minor (adverse or beneficial)
- Negligible

6.8 The above approach will ensure that a thorough and robust assessment process is adopted and the ES thoroughly examines the environmental effects of the development.

Baseline

6.9 Defining a consistent baseline is an important part of the EIA process. In the case of Tilbury2, the remainder of the former power station to the east of the Tilbury2 site is likely to be demolished, although will remain standing whilst the environmental assessment is undertaken. RWE's future intentions with regard to redevelopment are not currently known but clearly some form of development is likely to take place on the site in the future. If such proposals emerge they will be considered as part of the assessment of cumulative impacts (see below). However, for the purpose of the Tilbury2 baseline, it is proposed that, where appropriate, two scenarios are considered; namely the baseline both *with* and *without* the continuing existence of the remainder of the power station. This will only be relevant in some cases such as in the landscape and visual assessment and heritage assessment. For other environmental topics, the continued existence of the moth-balled power station or its complete demolition will make no difference to the assessment of environmental effects.

Consultation

6.10 Consultation is an integral part of the EIA process and is particularly important when applying for a DCO.

6.11 A comprehensive approach towards consultation will be adopted to ensure that issues of concern with regard to the potential impacts of the proposed scheme are identified at an early stage in the EIA process and, as such, can be investigated thoroughly and the results presented in the ES. As referred to above, consultation with relevant stakeholders on the content of this Scoping Report has been undertaken prior to its submission.

6.12 A non-statutory consultation is taking place between 6th March and 21st April 2017 and statutory consultation will be undertaken in accordance with the statutory pre-application consultation obligations under Section 42 of the Planning Act 2008 in June/July 2017.

7.0 ENVIRONMENTAL TOPICS

7.1 The following is the initial proposed list of environmental topics to be addressed in the Environmental Statement, and the consultants responsible for each topic.

Socio-economics	Arup
Health	Arup
Landscape character and visual amenity	DJA
Terrestrial Ecology	Bioscan
Marine Ecology	Atkins
Archaeology and Cultural Heritage	CgMs
Land-side Transport	i-transport
Navigation	Atkins
Hydrogeology and ground conditions	Atkins
Water Resources and Flood risk	Atkins
Water Framework Directive Assessment	Atkins
Noise and vibration	Atkins
Air quality	Atkins
Use of natural resources and waste	Atkins

7.2 Each of these topics is considered below.

STUDY AREA

7.3 For a development of this type, it is not possible to define a single 'study area' as the geographical scope of study will differ for each environmental topic. Appropriate study areas will be considered for each environmental topic by the specialist(s) undertaking that assessment.

CUMULATIVE IMPACTS

7.4 Other schemes in the vicinity of the proposed development which have been granted permission (whether in outline or full), or for which an application for consent has been submitted but not determined, will be considered in combination with the Tilbury2 proposal in the assessment of cumulative impacts in the EIA, where relevant information is available. The assessment of cumulative impacts is an integral part of the EIA process and ensures that all aspects of potential impacts from the proposed development have been addressed to ensure minimum impact on communities and the natural environment. Those schemes considered in the EIA may potentially include, but are not limited to the list below. The final list will be developed with regard to the guidance set out in the Planning Inspectorate's Advice Note 9.

- The completion and operation of London Distribution Park and the operation of the Amazon Distribution and Fulfilment Centre
- The completion and operation of Tilbury Green Power Station

- The use of the neighbouring Anglian Water site for storage of wood product for Tilbury Green Power Station
- The demolition of the remainder of Tilbury B Power Station by RWE
- Thames Enterprise Park - redevelopment of the 'Coryton' site
- Construction of a new deep water jetty at Oikos Storage Ltd, Hole Haven Wharf, Haven Road, Canvey Island Essex

7.5 As set out above, the development proposals include berthing pockets on the existing and extended deep water jetty on the River Thames to accommodate the likely largest aggregate vessels (100,000 tonnes, 15m maximum draught) which may visit the site in the future. This effectively 'future proofs' the proposed development.

7.6 PoTLL are aware that the Government are in the process of consulting on proposals for a further crossing of the river Thames (the "Lower Thames Crossing" or "LTC"). The LTC proposals are still at a relatively early stage in the planning process and there is no certainty as to the route and impact on the highway network in the vicinity of the Port. The Tilbury2 proposals do not rely on the delivery of the LTC. Given this context it is not the intention to assess the cumulative impact of Tilbury2 with the LTC; nor is it considered reasonable to prepare an alternative Traffic Impact Assessment that considers the new highway network and traffic distribution that could result if the LTC were implemented. Clearly, the modelling for the LTC itself will need to deal with cumulative impacts, including, as appropriate, from Tilbury2.

SOCIO-ECONOMICS

Overview of baseline conditions and key issues

7.7 Baseline socio-economic conditions will be reviewed, against which the current and future impact of the Port will be judged. Consideration will be given to the impact of the proposed development on employment and the economic well-being of the area. As well as the economic impact, the proposed development has the potential to also impact of the local community in a number of other ways. These include the effect on social and community infrastructure such as demand for housing, education, community facilities and healthcare.

7.8 In addition, the surface access corridor will cross some common land and therefore the effect on the rights of the commoners to use this land will be considered. The effect on the health and wellbeing of individuals will be dealt with separately (see below).

7.9 The Borough of Thurrock as a whole has had a relatively good record in recent years on indicators such as unemployment, economic activity, or business creation rates. However, it displays a number of weaknesses, namely:-

- Local employment is predominantly in relatively low-skilled and low-wage occupations
- Above average levels of deprivation when compared to the country as a whole
- Concentrations of high levels of deprivation within Tilbury in particular;
- Lack of employment growth compared to regional and sub-regional economic policy aspirations.

7.10 The baseline assessment will consider local and regional skill levels and deprivation and the importance and impact of the Port in providing jobs and income to help alleviate this. An Economic Impact Assessment prepared by Arup in May 2016 indicates that within the Port, PoTLL itself has around 820 FTE permanent employees. In addition, on site direct employment by Port tenants and operators is estimated to be around a 2,360 FTE jobs. Directly related off-site employment by tenants and operators account for an estimated additional 1,100 FTE employees. The same study estimated indirect employment at 2,612 within the region, and induced employment at 1,451 within the region.

7.11 In terms of the economic value added for this employment, a regional Gross Value Added (GVA) per employee measure has been used to convert employment into GVA estimates. The direct Port effects are estimated to result in a regional GVA of around £181.6m. Adding on indirect and induced effects, produced a total estimated regional GVA of £390.6m.

7.12 It is estimated that the total value of cargo handled by the Port of Tilbury each year is around £8.7 billion.

7.13 The key issues in relation to socio-economic considerations are:-

- The impact of the proposals on overall levels of local and regional employment, skill levels, deprivation and other economic indicators.
- How the positive impacts of the proposals can be captured and maintained.
- The impact of the 'do-nothing' scenario in relation to the Port's success and contribution to the local economy.
- The impact of the proposals as against the 'do-nothing' scenario on the economic planning and regeneration objectives for the area.
- Potential secondary impacts of development, resulting from job growth, on public services, social infrastructure (such as recreation and housing.

Initial assessment of potential Impacts

7.14 The socio-economic impact of the proposals will need to consider the implications of the development on Port operations, both 'on-site' within the development area, and as a whole in relation to the future growth of trade at the Port.

7.15 These impacts will be assessed in relation to existing and potential future tenants, jobs, services and the overall socio-economic health and wellbeing of the area.

7.16 From work on the current contribution of the existing Port, it is considered likely that Tilbury2 will make a significant and positive economic and employment contribution.

Approach and methodology

7.17 An economic impact assessment of the Port has already been prepared using standards methodologies for such assessments. The following methods and sources were used by the authors (Arup):-

- Review of information already held by PoTLL on its own operations, including: employment levels and staff location; traffic volume trends; capacity; and economic activity and performance.
- Review of PoTLL's five year forecasts of future throughputs and economic performance.
- Collection and analysis of information provided by PoTLL's key tenants, suppliers and customers through an online and telephone questionnaire.

- Analysis of a range of socio-economic data from a range of public sources, including ONS, NOMIS and the Labour Force Survey.

- Overview of relevant policy and strategy documents prepared by a range of national, regional and local bodies.

- Review of other information on activities at the Port of Tilbury from a range of secondary sources.

7.18 This previous assessment will be iterated to (a) take account of the current proposals, (b) update the baseline information to ensure it is up to date and (c) incorporate further information on social infrastructure and housing growth, and the impact of the proposals on these issues assessed by reference to published policies and data.

7.19 The updated assessment will be predominantly desk-based (utilising existing data) with selective stakeholder consultation, and reliance upon prevailing guidance and ready reckoners. Employment effects would be assessed quantitatively, with a mixed quantitative/qualitative appraisal of social elements, tailored to each issue accordingly. The assessment will consider both construction and operational phases of development.

7.20 In order to assess the potential social impacts of the development, consideration will be given to the current availability and affordability of housing in the area by reference to published sources and the extent to which employment growth at the Port could put pressure on the housing market. From analysis of the home locations of existing PoTLL employees (a useful proxy) the initial view is that local housing market conditions are unlikely to be materially affected.

7.21 The use of the land around the site for recreational purposes will be considered, as will the use of the infrastructure corridor by commoners. The use and enjoyment of the river itself – including by sailing clubs located on the southern side of the river – will be considered in relation to such issues as vessel movements. The degree to which such uses will be infringed will be assessed, with cross referencing as appropriate to the landscape and visual impact assessment.

Equalities Impact Assessment

7.22 In addition to the above, the project will be screened in order to establish whether a full Equalities Impact Assessment (EqIA) is required. Such an assessment is required by law for public bodies but is also good practice for responsible promoters of major development. Defined by the 2010 Equalities Act, it is intended to be a living document, updated as necessary as a project proceeds from inception to planning through to delivery and completion.

7.23 EqIA is a systematic process used to identify the potential equalities impacts arising from policies, plans, programmes and projects, to identify the distribution of those effects amongst the population, and to identify mitigation measures to address these effects, thereby minimising adverse effects on

the local population. There are nine Protected Characteristics by law under the Equalities Act 2010: age; disability; gender reassignment; marriage & civil partnership; pregnancy & maternity; race; religion; sex; and sexual orientation. Important issues for this development might include the physical access arrangements for the site, the likely impact of employment opportunities on groups sharing Protected Characteristics, or any inequalities in the impact of negative air quality or noise impacts. It is not unusual to include low income groups in an EqIA assessment because those on low incomes are generally considered to be more vulnerable than average.

7.24 Data will be collected to consider the context in which the Tilbury2 development would occur. This will involve collecting information on the current position and recent trends in terms of the protected characteristics in the defined study area(s) for this topic. The baseline data considered will relate to the resident and workforce population relating to the Protected Characteristics above. In general this will rely on national statistical datasets published through ONS including census, Indices of Deprivation and mid-year population estimates, but will also include liaison with Thurrock Borough Council in relation to the data they hold for planning and economic strategy purposes. The evidence base for some groups is sparse. In particular, data on gender reassignment and sexual orientation is limited requiring the assessment to draw on other published data and 'grey literature' to fill information gaps where possible, being clear about the limitations of that data. Where it is not possible to be spatially specific about equalities groups it is appropriate to use the default assumption that people sharing those Protected Characteristics in law are present in the local population in proportion to their presence in the overall population.

7.25 The baseline will also include scoping of any important facilities from an Equalities perspective – for example community centres, health and education facilities or other community assets which may have disproportionate relevance for equalities groups.

7.26 Equalities impacts – both positive and negative – are likely to occur through two principal mechanisms: either the proposed development is likely to impact on people sharing Protected Characteristics differently (for example, noise impacts may disproportionately impact those with mental health problems) or the proposed development causes impacts which are experienced in the same way by all individuals, but there is a spatial concentration of groups with Protected Characteristics in the area where the impact is felt. The assessment will screen each Protected Characteristic in order to provide a brief assessment of whether the project is likely to impact on equalities groups based on the development proposal. It will identify the presence of equalities groups within the defined assessment areas, the range of issues to be considered in relation to those groups and any potential impacts on the groups as a result of the development proposal. If the screening assessment establishes that the proposed project is unlikely to impact particular equalities groups, further equalities assessment for those groups will not be undertaken.

7.27 Where potential adverse impacts are identified a full EqIA will be undertaken to examine the impacts, and develop mitigation and management measures to minimise these impacts on equalities groups. Positive impacts and benefits of the development proposal for equalities groups will be identified and considered in the full EqIA.

HEALTH AND WELLBEING

Overview of baseline conditions and key issues

7.28 Across the Borough of Thurrock as a whole, the average level of deprivation is lower than the English average. However, the two LSOAs[24] within Tilbury town closest to the Port are within the 10% and 20% most deprived nationally. The study area for the assessment will be focussed on these two LSOAs although reference to the wider Thurrock area will also be made.

7.29 The employment and deprivation issues identified in the socio-economic baseline (see above) are relevant to health and wellbeing. Deprivation is directly linked to life expectancy and the length of disability-free life, as well as a wide range of health indicators and health-related behaviours. Other health challenges in Tilbury include:

- A relatively high proportion of children and older people. Children and young people living in areas of high deprivation are more likely to experience adverse health outcomes across a range of indicators. Older people are more likely to experience poor health and to require health services. LSOAs closest to the Dock are in the 10% most deprived areas nationally for income deprivation affecting children and older people.
- Poor housing, including overcrowding, with Tilbury having roughly double the proportion of overcrowded houses compared with the Thurrock and England averages. Poor housing quality is a major contributor to health inequalities.
- Low levels of educational attainment affecting residents in Tilbury closest to the Dock.

7.30 In terms of health deprivation, LSOAs in Tilbury Town are within the 30% most deprived. However the wider Thurrock area generally has lower than average levels of deprivation for this domain.

Initial assessment of potential Impacts

7.31 The health and wellbeing assessment will be based on the identification of 'health determinants' – the social, economic and environmental factors that can influence the health and wellbeing of the population. Based on an initial review of the proposed scheme and the community profile, it is considered that the following health determinants will be included in the assessment:

Environmental health determinants:

- Construction and operational noise and air emissions;

[24] Large Super Output Areas defined in the census general 1,500 – 2,500 people

- Traffic, transport and connectivity – including changes to journey times, connections between public realms and to the Port, traffic calming, road safety and amenity;
- Open space and active travel – impacts and opportunities in relation to the provision of open space and active travel routes;
- Neighbourhood quality, including landscape and townscape quality, local amenity and 'sense of place';

Social and economic health determinants:

- Direct employment and wider economic impacts during construction and operation;
- Education and training opportunities during construction and operation;
- Housing – increased demand for housing from construction and operational workers, changes to the local property market;
- Access to services – increased demand for local services and facilities during construction and operation;
- Social capital – local demographic changes resulting from construction and operational workers, potential impacts on crime and anti-social behaviour, opportunities and impacts in relation to social infrastructure and community facilities.

Lifestyle determinants:

- Physical activity – impacts on opportunities for active travel, sports and leisure activities;
- Diet – impacts on availability and choice of food retail.

Approach and methodology

Guidance

7.32 Available demographic and health data will be reviewed to develop a profile of the communities in the study area. This will focus on population demographics, deprivation and community health indicators, and liaison with relevant stakeholders. Any vulnerable groups prevalent within the local population, who may be particularly susceptible to health effects, will be identified.

7.33 There is no definitive guidance for assessing the health and wellbeing effects of development projects. The assessment will take account of available non-statutory guidance, including:

- ‘Rapid Health Impact Assessment Tool’ and guidance produced by the NHS London Healthy Urban Development Unit (HUDU, 2015)
- IMPACT Urban Health Impact Assessment methodology, Liverpool University (2015)

Health and wellbeing evidence review

7.34 A review of publically available evidence will be undertaken to establish the links between the identified health determinants and potential health outcomes. This will draw on literature reviews undertaken by Arup for recent Health Impact Assessment projects.

Assessment of health and wellbeing effects

7.35 A health and wellbeing assessment will be undertaken to identify potential health and wellbeing effects associated with the construction and operation of Tilbury2. The assessment will comprise qualitative judgements on potential health and wellbeing outcomes, based on qualitative and quantitative data about the impacts on health determinants. The assessment will take account of factors including:

- The nature, duration and intensity of impacts on health determinants;
- The level of exposure of the local and regional population to these impacts;
- The sensitivity of the population to adverse health effects, and the potential for health improvement;
- Specific vulnerable groups within the affected population;
- The strength of evidence for causal links or associations between health determinants and health outcomes.

Mitigation

7.36 The health and wellbeing assessment will describe mitigation measures included in the EIA to address the environmental, social and economic health determinants. Where appropriate, further evidence-based recommendations will be made to improve the health outcomes of the proposed development.

LANDSCAPE CHARACTER AND VISUAL AMENITY

Overview of baseline conditions and key issues

7.37 The proposed development site falls within:

- National Character Area profile 81 – 'The Greater Thames Estuary' (NE473);
- District Character Type –'Marsh Landscape';
- Local Character Areas- 'Tilbury Marshes' and 'Tilbury and Docks Urban Areas'.

7.38 The adjoining Thurrock District character types 'Urban Fringe Landscape' and Urban Landscape' as well as the Kent towns of Northfleet and Gravesend have a contextual relevance to the site and the broader river valley setting.

7.39 The land within the indicative Order Limits contains in the main a mix of buildings, structures and hardstanding associated with the former power station functions. These include areas of disturbed and partly vegetated land, river defences and margins as well as a deep water jetty. The proposed port site adjoins the remaining structures of the power station to the east, a water treatment works to the west, the London to Southend mainline railway to the north and the River Thames to the south. The proposed surface access corridor is defined by a narrow length of land extending broadly west of the proposed site over partly vegetated land immediately south of the railway and the southern margins of Tilbury.

7.40 An assessment will be made on the potential effects of proposed development on the character areas as well as direct effects on the landscape elements within the site.

7.41 Landscape value in the locality is associated with the Scheduled Ancient monuments at Tilbury Fort, New Tavern Fort and Coalhouse Fort, listed buildings and structures, conservation areas, local nature reserves, the public rights of way network and other leisure and tourism facilities.

7.42 The site is visible in part from residential areas in Tilbury, Gravesend and Northfleet, as well as from isolated dwellings. It can also be seen from local footpaths, the National Cycle Network, roads, users of the London to Southend mainline railway and the Thames.

7.43 A tree survey has been undertaken of the Tilbury2 site based on a topographical survey. The survey has been undertaken to establish the value of the tree stock on the site and to inform the potential landscape strategy and assessment of landscape effects. .

Initial assessment of potential Impacts

7.44 Proposed development would take place within previously developed or disturbed land containing long established industrial buildings and structures and substantial river jetty facilities. It would also take place in the immediate

context of a water treatment works and large scale industrial development represented by the former power station, which is currently undergoing a three year demolition programme (completion due circa January 2019). Demolition will be to ground level with all sub-surface features retained.

7.45 In this context the sensitivity of landscape and visual receptors to proposed development will be significantly lower in many instances. Due consideration will be given to predicted effects during the period when the remaining power station structures are in place as well as the currently consented position (post demolition), subject to any alternative development proposals for the power station site being approved.

7.46 Proposed development will affect local landscape value. Potential effects on this aspect, particularly cultural heritage features such as Tilbury Fort and Gravesend Conservation Area (and heritage assets within it), will be considered.

7.47 The following stages of proposed development will be assessed in terms of potential visual impact:

- During construction;
- Construction completion; and
- 25 years following completion.

Approach and methodology

Generally

7.48 The Landscape and Visual assessment will be carried out in accordance with the following guidance:

1. Institute of Environmental Management and Assessment and the Landscape Institute – 'Guidelines for Landscape and Visual Impact Assessment' Third Edition 2013.
2. Countryside Agency and Scottish Natural Heritage – 'Landscape Character Assessment' 2002 and 'Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity' 2004.
3. Department of the Environment, Transport and the Regions – 'Lighting in the Countryside : Towards Good Practice' 1997

7.49 The assessment will involve the following key stages:

- baseline survey;
- identification of potential effects;
- identification of sensitive landscape and visual receptors;

- assessment of landscape capacity;
- evaluation of predicted effects;
- identification of mitigating measures;
- preparation of a landscape strategy; and
- landscape and visual assessment of the development parameters in the context of the two baseline scenarios identified in para. 6.9 above.

Baseline Survey

7.50 Baseline surveys will be carried out to record and analyse the existing landscape characteristics, the value of the landscape and visual resources in the vicinity of the proposed development and to identify sensitive landscape and visual receptors. The local landscape in the vicinity of the proposed development contains a high level of industrial and other development as well as cultural heritage features such as Tilbury Fort. As such it is sufficiently distinct from the remainder of the Tilbury Marshes landscape character area to warrant more detailed assessment of its character. Assessment at this scale provides the basis for carrying out condition, sensitivity and capacity studies in relation to proposed development. The baseline work will include:

- Desk, computer and field based studies to identify the Zone of Theoretical Visibility (ZTV), the predicted Zone of Significant Visibility (ZSV), sensitive receptor viewpoints and local landscape character.
- Research to establish the landscape planning context as well as nature conservation, cultural heritage and amenity value.
- Analysis of landscape characteristics in order to understand how they are made up and experienced as well as ascertaining their relative value.

Identification of potential effects

7.51 Identification of potential effects will form an integral part of the iterative design process.

7.52 The broad design parameters of the project will be established at an early stage. This will provide sufficient information to identify the likely:

- scale and nature of changes to landscape characteristics and landscape value;
- changes affecting visual amenity.

Identification of sensitive landscape and visual receptors

7.53 Identification of the sensitivity of the landscape resource will be based on its ability to accommodate changes in character and value which would be caused by proposed development. Receptors of landscape character and value are separately identified. This is done in order to distinguish between the ability of a landscape to physically accommodate a development in terms of landform, land cover and land use, as opposed to its effects on valued aspects of the landscape which are more subjective in nature.

7.54 Degrees of sensitivity will be identified as appropriate for all categories of landscape and visual receptors to enable a systematic and consistent evaluation. The location and sensitivity of visual receptors will be agreed prior to assessment with the relevant Local Authorities.

7.55 Assessment of visual sensitivity will be based on the following:

- Whether development is likely to draw the eye of the casual observer- this defines the Zone of Significant Visibility;
- The proximity, context, expectations and occupation or activity of the receptor; and
- Potential effects on important views, for example towards listed buildings and their setting;

Assessment of Landscape Capacity

7.56 An assessment will be made of the capacity of the local landscape to accommodate change of the type proposed without significant effects on its character, or overall change of landscape character type.

Description and quantification of the changes to the baseline

7.57 Predicted changes to the baseline will take into account existing trends for change as well as those anticipated as a result of the development.

7.58 Change in landscape characteristics, including elements of landform, land cover and land use as well as significant features will be described and broadly quantified. The effect of these changes on aspects of landscape value will also be described in terms of scenic quality, designated landscape, heritage interests, tranquillity, sense of place, rarity or uniqueness and nature conservation interests.

7.59 Predicted changes to the visual baseline will be described for each sensitive receptor type and location. Consideration is given to change during construction, at completion and 25 years following completion. Computer generated imaging will assist the description.

Evaluation of Predicted Effects

7.60 Predicted landscape and visual effects will be assessed in terms of their scale, duration, magnitude, level and nature on identified sensitive receptors.

7.61 Methods used for evaluation follow published guidance and will include a combination of objective and subjective judgements.

7.62 To aid consistency and allow easier inspection and review of results checklists, tables and matrices will be employed. These include the use of matrices for the determination of significance thresholds, whereby the predicted magnitude of an effect is assessed against the sensitivity of a given receptor. This provides an indication of the level or significance of an effect.

7.63 The nature of an effect, whether adverse or beneficial, is a subjective consideration based on professional judgement and will be identified separately.

7.64 An assessment of potential cumulative effects will be carried out. Consideration will also be given as to the reversibility of predicted effects.

Identification of Mitigating Measures

7.65 Mitigation measures will be considered in relation to:

- primary measures which form part of the iterative design process; and
- secondary measures designed to address any residual adverse effects of the development.

Preparation of a landscape strategy

7.66 The landscape strategy will be informed by published guidance in relation to the contextual landscape character areas, as well as local landscape character assessment carried out by DJA. It will identify those mitigating measures that have been adopted in the development scheme. Any potential additional primary and secondary landscape mitigation measures will be identified separately and assessed accordingly.

MARINE ECOLOGY

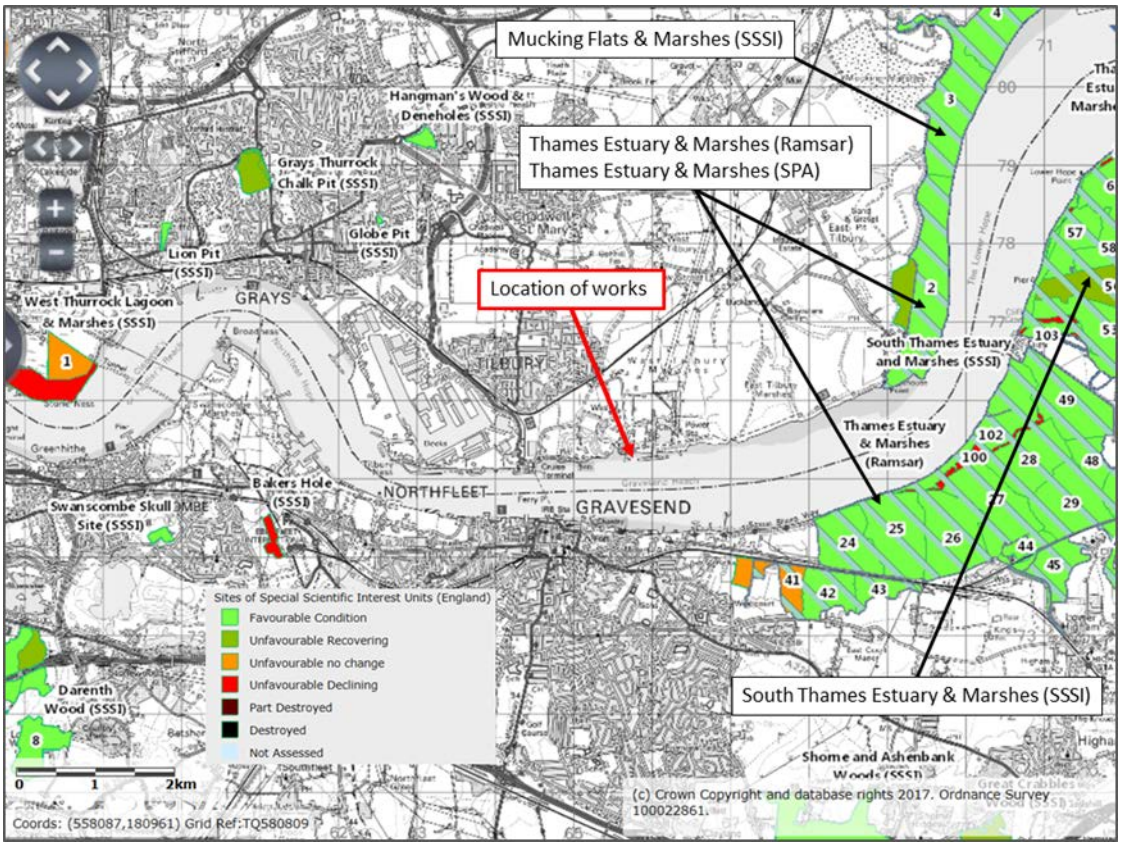
Overview of baseline conditions and key issues

Conservation designations

7.67 Within 3km of the proposed Tilbury2 development there are four designated sites, including two European Designated Sites (Figure 7.1). These are:

- Thames Estuary & Marshes Ramsar Site (1.3 km South East);
- Thames Estuary & Marshes Special Protection Area (1.3 km South East);
- South Thames Estuary and Marshes Site of Special Scientific Interest (1.3 km South East); and
- Mucking Flats and Marshes Site of Special Scientific Interest (1.8 km East).

Figure 7.1 Nature conservation designations



7.68 The **Thames Estuary and Marshes Ramsar site** is formed by tidal flats on both banks of the River Thames and by seasonally flooded agricultural land, used primarily by overwintering birds. It is a complex of brackish, floodplain, grazing marsh ditches, saline lagoons and intertidal saltmarshes and mudflats. These habitats together support internationally important numbers of wintering waterfowl. The saltmarsh and grazing marsh are of international importance for their diverse assemblages of wetland plants and invertebrates, including the nationally important endangered species of the beetle Bagus longitarsus. Additionally, the site contributes to shoreline stabilisation and dissipation of erosive forces, sediment trapping, flood water storage and maintenance of water quality by removing nutrients (JNCC, 2008)[25].

7.69 The **Thames Estuary & Marshes Special Protection Area** partially overlaps with the Ramsar site and is designated to protect bird species of European importance which use this site during their migration route. The site is mainly composed of extensive intertidal mudflats, saltmarshes and a complex channel system. A series of disused quarry pits have become lakes and ponds, which together with the intertidal area provide a variety of habitat types that are important for feeding and roosting of large bird populations. Bird species include dunlin, red knot, ringed plover, grey plover, black-tailed godwit, pied avocet, common redshank and the bird of prey hen harrier. Additionally the site supports an important assemblage of waterfowl. The biggest threats to the habitats and species present at the site are outdoor sports and leisure activities, fire, and changes to biotic and abiotic conditions. (JNCC, 2017)[26].

7.70 A summary of the qualifying features of the European Designated Sites are presented in Table 7.1

Table 7.1 Qualifying features of the Thames Estuary and Marshes European Designates Sites

Nature Conservation Site	Designation	Qualifying Feature
Thames Estuary and Marshes	Ramsar	Bird species of international importance with peak count in spring/autumn: • Ringed plover, Charadrius hiaticula • Black-tailed godwit, *Limosa islandica* Bird species of international importance with peak count in winter: • Grey plover, Pluvialies squatarola • Red knot, Calidris canutus islandica

[25] JNCC (2008). *Information Sheet on Ramsar Wetlands, Thames Estuary and Marshes version 3.* [Online]. Available at: http://jncc.defra.gov.uk/pdf/RIS/UK11069.pdf
[26] JNCC (2008). *Information Sheet on Ramsar Wetlands, Thames Estuary and Marshes version 3.* [Online]. Available at: http://jncc.defra.gov.uk/pdf/RIS/UK11069.pdf

		• Dunlin, Calidris alpina • Common redshank, *Tringa totanus* Birds of national importance with peak count in spring/autumn: • Little grebe, Tachybaptus ruficollis • Little egret, Egretta garzetta • Ruff, Philomachus pugnax • Common greenshank, *Tringa nebularia* Birds of national importance with peak count in winter: • Common shelduck, *Tadorna* • Gadwall, Anas strepera • Northern shoveler, *Anas clypeata* • Water rail, Rallus aquaticus • Pied avocet, Recurvirostra avosetta • Spotted redshank, *Tringa erythropus*
Thames Estuary and Marshes	Special Protection Area (SPA)	Bird species of international importance: • Hen harrier, Circus cyaneus • Dunlin, Calidris alpina • Red knot, Calidris canutus islandica • Ringed plover, Charadrius hiaticula • Grey plover, Pluvialies squatarola • Black-tailed godwit, *Limosa islandica* • Pied avocet, Recurvirostra avosetta • Common redshank, *Tringa totanus*

7.71 **The South Thames Estuary and Marshes Site of Special Scientific Interest** has been designated largely for its importance as an estuarine habitat and is considered to be almost entirely in favourable condition. The site consists of an extensive mosaic of grazing marshes, saltmarshes, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes. Freshwater pools and some areas of woodland provide additional variety and complement the estuarine habitats. The site supports outstanding numbers of waterfowl with total counts regularly exceeding 20,000. Many species are regularly present in nationally important numbers and some species regularly use the site in internationally important numbers. The breeding bird community is also of particular interest. The diverse habitats within the site support a number of nationally rare and

scarce invertebrate species and an assemblage of nationally scarce plants (Natural England, 2017)[27].

7.72 The **Mucking Flats and Marshes Site of Special Scientific Interest** comprises an extensive stretch of Thames mudflats and saltmarshes, together with sea wall grassland. Wintering wildfowl and waders reach both nationally and internationally important numbers on the mudflats, roosting and feeding on adjacent saltmarsh and disused silt lagoons. The mudflats form the largest intertidal feeding area for wintering wildfowl and waders west of Canvey Island on the north bank of the Thames. Ringed plover occur in internationally important numbers, with nationally important populations of shelduck, grey plover, dunlin, black-tailed godwit and redshank. Other species occur in good numbers, with avocet regularly present, sometimes in nationally important numbers.

7.73 The mudflats and saltmarshes are also an important staging post for passaging migrants, with significant numbers of waders such as curlew, sandpiper and an important late summer flock of yellow-legged herring gulls. The saltmarshes provide important high tide roosts, as do the disused silt lagoons at Coalhouse Fort.

7.74 Between the sea wall and mean high water line lie areas of high level saltmarsh of a type uncommon in Essex. The vegetation is dominated by sea couch (*Elymus pycnanthus*) and sea purslane (*Halimione portulacoides*), with sea aster (t*ripolium*), common sea lavender (*Limonium vulgare*) and common saltmarsh-grass (*Puccinellia maritima*). Fragments of lower saltmarsh include glasswort Salicornia spp., common cordgrass (*Spartina anglica*) and lesser sea-spurrey (*Spergularia marina*), together with the nationally scarce golden samphire (*Inula crithmoides*). The saltmarshes are truncated to their landward edge by sea walls, which in places are vegetated with a sward dominated by sea couch (*Elymus pycnanthus*). The saltmarsh has a high invertebrate interest, which includes the rare spider *Baryphyma duffeyi*, as well as many notable and local species (Natural England, 2017).[28]

7.75 The **Thames Estuary recommended Marine Conservation Zone** (rMCZ) is also of relevance. It extends from Richmond to the mouth of the River Thames at Westcliff-on-Sea and crosses most of London. It is an important site for fish nursery and spawning, seasonal seaward migration of smelt (*Osmerus eperlanus*), and for tentacled lagoon worm (*Alkmaria romijni*) mainly found at Greenhithe, approximately 9 km upstream (west) of the proposed development site. The rMCZ is also home to the short-snouted seahorse (an MCZ featured species) and has a high density of European eels (*Anguilla anguilla*), but these are not proposed features of the

[27] Natural England. (2017). *South Thames Estuary and Marshes - Site of Special Scientific Interest.* [Online]. Available at: https://designatedsites.naturalengland.org.uk/

[28] Natural England. (2017). *Mucking Flats and Marshes - Site of Special Scientific Interest.* [Online]. Available at: https://designatedsites.naturalengland.org.uk/

recommended designation. European Eels were one of the initial reasons for recommending the designation of this MCZ. However, MCZ are no longer considered to be an appropriate tool for the protection of eels given their habitat generalists characteristic. The Department for Environment, Food and Rural Affairs (DEFRA) believes that conservation can be better achieved for eels through eel regulations and management plans and as such these regulations will be considered in the assessment of potential impacts to eels, as discussed in section 4 of this report.

7.76 At present the designation of this rMCZ is on hold as DEFRA has indicated a need to better understand the implications of designation of the site on a number of large infrastructure projects at various stages of planning, and potential new developments within the estuary.

Benthic Ecology

7.77 The intertidal seabed at Tilbury is a typical estuarine mud assemblage, dominated by oligochaetes, ragworm and amphipods. Other characteristic species included the Baltic tellin, and the spionid polychaete Streblospio shrubsolii. The subtidal community comprises lower densities of oligochaetes, ragworm and C. volutator. Polychaetes Caulleriella zetlandica and the spionid Polydora cornuta are also common (both being almost absent higher on the shore) (RWE, 2012)29. The difference between the intertidal and the subtidal communities is likely to relate to the tidal-exposure experienced and to the slightly coarser sediments below low water. The species composition is generally dominated by deposit feeding, as opposed to filter feeding. These species are typical of the habitat and the location (RWE, 2012).

7.78 The tentacled lagoon worm (Alkmaria romijni), a feature of the recommended Thames Estuary MCZ, has not been identified in recent samples collected near to Tilbury. The closest location being at Greenhithe approximately 9 km upstream of Tilbury (RWE, 2012).

Sediment Chemistry

7.79 Chemical analysis of sediment samples collected in 2007-2008 for the Tilbury B Biomass Phase 2 Power Station suggests that sediment-bound metal concentrations around Tilbury are elevated above background levels when compared to a ‘clean estuary’, particularly for mercury, lead, copper and zinc. The higher levels of metals were associated with high shore sediments although elevated levels of several metals have previously been reported by other studies of subtidal Thames Estuary sediments (see MEMG, 2004). The levels recorded in the 2007-2008 surveys are reported to be analogous with historical data provided for this part of the Thames Estuary and are comparable with those reported from other industrialised UK estuaries (RWE, 2012).

[29] RWE (2012). Tilbury B Biomass Phase 2 Environmental Statement.

7.80 Hydrocarbon levels measured as part of the same study are reported to be greater than the relevant Threshold Effects Levels (TEL), where adverse effects might occasionally occur, but not exceeding the Probable Effects Levels (PEL), where adverse effects frequently occur. These levels are reported to be comparable to other data for this part of the Thames Estuary and to levels observed in sediments from other heavily populated, industrialised UK estuaries (RWE, 2012).

Fish and shellfish

7.81 Information on the distribution of fish within the Thames is extensive. The Environment Agency (EA) conducts monitoring within the Thames that has been running since 1994. A number of programmes make up this monitoring programme which include the Tideway Monitoring Programme, the National Marine Monitoring Programme (NMMP): renamed the Clean Seas Environmental Monitoring Programme (CSEMP), WFD monitoring work, and joint Cefas-EA bass survey work. The monitoring sites extend from Woolwich in the west to the Medway approaches in the east. In addition, data is also available from monitoring of the cooling water screens of Tilbury Power Station and from monitoring associated with the environmental assessments of Tilbury B Biomass Power Station.

7.82 Approximately 125 fish species have been recorded within the Thames ranging from freshwater species with no estuarine requirement, to marine species with an estuarine requirement (RWE, 2012)[30]. Certain species use the estuary as a nursery area or seasonally as adults. Other species, such as salmon and eel migrate through the estuary to spend different parts of their life-cycle in fresh or salt water.

7.83 The Zoological Society of London (ZSL) conducted screen monitoring surveys at Tilbury Power Station. This work identified 63 species of fish ranging from fully marine to estuarine species including species of conservation and commercial importance (Table 7.1). Herring, gobies and sprat were caught in the highest numbers. The dominant species varied with season with sprat dominating in winter, smelt in spring, gobies and flounder in summer, and bass in autumn.

7.84 The Tilbury B Biomass Power Station baseline fish surveys of the intertidal and subtidal area around Tilbury show that the intertidal areas are utilised by a number of species and life-stages, and areas such as saltmarsh provide valuable habitat for juveniles. The subtidal surveys identified a range of species, principally sand goby, Dover sole, pouting, herring, smelt, whiting and sprat.

7.85 Cefas fish spawning and nursery ground maps do not identify the Tilbury area as a high intensity spawning or nursery area for any species, however

[30] RWE (2012). Tilbury B Biomass Phase 2 Environmental Statement.

further seaward, the lower reaches of the Thames are used as a spawning ground by sole and a nursery ground for sole and herring (MMO, 2017).[31]

Table 7.1 Fish species found at Tilbury through screen monitoring of Tilbury Power Station by ZSL between 2006 and 2010 (RWE, 2012)

Species Caught			
3-beard rockling	Corkwing wrasse	Lesser sandeel	Sea trout
3-spine stickleback	Dab	Lesser weever	Sea snail
5-beard rockling	Dace	Painted goby	Short-snouted seahorse
Anchovy	Deep nosed pipefish	Perch	Snake pipefish
Ballan wrasse	Dover sole	Plaice	Sprat
Bass	European eel	Pogge	Tadpole fish
Black goby	Flounder	Pollack	Thick-lipped grey mullet
Blue whiting	Greater pipefish	Poor cod	Thin-lipped grey mullet
Bream	Greater sandeel	Pouting	Thornback ray
Brill	Greater weever	Red gurnard	Tompot blenny
Butterfish	Grey gurnard	Red mullet	Transparent goby
Cod	Herring	River lamprey	Tub gurnard
Common carp	Horse mackerel	Rock goby	Turbot
Common dragonet	John dory	Salmon	Twaite shad
Common goby	Lemon sole	Sand goby	Whiting
Common smelt	Lesser pipefish	Sand smelt	

7.86 Several species of conservation importance designated under the EC Habitats Directive, Bern convention, UKBAP and Wildlife and Countryside Act have been identified in the vicinity of Tilbury2. These include lamprey, shad, goby, sandeel, mackerel, Dover sole, salmon, sea trout, herring, cod, whiting, plaice smelt, eel and the short-snouted seahorse. Smelt and short-snouted seahorse have also been identified as features of conservation importance for the recommended Thames Estuary MCZ.

7.87 There are no aquaculture production zones in the vicinity of the proposed Tilbury2 development. The nearest commercial shellfish area is located near Southend, approximately 25km downstream in the outer estuary, past Canvey Island. This area is used for the production of oysters (C. gigas, C. edule) and mussels (Mytilus spp.) (MMO, 2017)[32].

[31] MMO (2017) Marine Management Organisation Marine Information System [Online] Available at: http://mis.marinemanagement.org.uk/

[32] MMO (2017) Marine Management Organisation Marine Information System [Online] Available at: http://mis.marinemanagement.org.uk/

Plankton

Phytoplankton

7.88 Phytoplankton are microorganisms (ranging in size from 0.2 µm to >2 mm) which form the photoautotrophic part of the plankton and lie at the base of the aquatic food web. Phytoplankton surveys undertaken for the Tilbury B Power Station project recorded a total of 53 taxa of phytoplankton from the sampling sites. These were comprised mostly of diatoms with small numbers of dinoflagellates, green algae and blue green algae (RWE, 2012)[33].

Zooplankton

7.89 Zooplankton are the animal part of the plankton assemblage. Zooplankton populations typically consist of holoplankton, permanent members of the plankton, such as copepods, amphipods, and bacteria, and meroplankton, temporary members of the plankton, such as juvenile shrimps and the planktonic eggs and larvae of invertebrates.

7.90 Zooplankton surveys undertaken in 2007-2008 for the Tilbury B Power Station project identified a total of 51 taxa. The highest number of zooplankton were recorded in winter 2008 owing to the peaks in Eurytemora affinis and Littorina littorea abundance. The greatest species diversity was observed in the summer. The species recorded were typical estuarine species with no protected zooplankton species identified.

Ichthyoplankton

7.91 Ichthyoplankton are the eggs and larvae of fish usually found in the sunlit zone of the water column. Ichthyoplankton surveys were conducted in 2007-2008 for the Tilbury B Power Station project. The fish caught were from a range of taxa including herrings, flatfish, gobies and eels, typically representative of an estuarine environment. Fish larvae were most abundant during the spring and summer months, corresponding with peak spawning times. Fish eggs were abundant in the water column off Tilbury between December and April.

Saltmarsh

7.92 The Thames Estuary has an extensive area of saltmarsh on both the north and south shores. Large areas of maritime saltmarsh are present along the foreshore of the Thames Estuary in the vicinity of Tilbury, becoming more extensive to the east of the port.

Marine mammals

7.93 The Thames Estuary is an area frequented by seals and transient cetaceans (whales, dolphins and porpoises). Three cetaceans and two seal species are frequently recorded in the estuary, these being:

[33] RWE (2012). Tilbury B Biomass Phase 2 Environmental Statement.

- Harbour porpoise;
- Bottlenose dolphin;
- White-beaked dolphin;
- Common seal; and
- Grey seal.

7.94 Compared to other areas within the UK, presence of marine mammals is low especially upstream of Mucking (RWE, 2012)[34].

7.95 All cetacean species are protected by The Wildlife and Countryside Act 1981 and in addition to this, harbour porpoise and the bottlenose dolphin are listed as an EC Habitats Directive Annex II species. Both the grey and common seal are protected by the Conservation for Seals Act 1970 and they are listed as a protected species under Annex II and Annex V of the EC Habitats Directive. Harbour Porpoise, bottlenose dolphin and white-beaked dolphin are also priority species under section 41 of the NERC Act (2006).

Initial assessment of potential impacts

7.96 The marine elements of the Tilbury2 development broadly comprise:

- Construction of a jetty including piling of berthing dolphins,
- Construction of a linkspan to access the jetty,
- Dredging of the berthing pockets to increase water depth adjacent to the jetty as well as dredging of the approaches to the berthing pockets. The fate of the dredged material is yet to be determined. The port are investigating options to re-use the dredged material within the Tilbury2 development, however if the material is not suitable for this purpose it may require disposal at sea. Ongoing discussions in this regard are being held with the Marine Management Organisation, the Port of London Authority and the Environment Agency.
- Removal of the existing Anglian Water jetty. This has also been discussed with the MMO.
- Maintenance dredging of the berthing pockets and approaches once the development is operational.

7.97 The impact of the proposed Tilbury2 development will be considered for both the construction and operational phases of the scheme. The designated status of the species and habitats present at Tilbury2 under various legislation will inform the assessment of significance of potential impacts The key potential issues that will be considered are:

[34] RWE (2012). Tilbury B Biomass Phase 2 Environmental Statement.

Construction

- Disturbance to fish and marine mammals from geophysical and geotechnical surveys that are required to understand the ground conditions and investigate for the presence of unexploded ordnance (UXO).
- Impacts to fish, marine mammals, benthic ecology and plankton due to changes in water quality (contamination/eutrophication /turbidity) from runoff and discharges from the construction works.
- Impacts to fish, marine mammals and benthic ecology from resuspension of potentially contaminated sediments during dredging. Both direct impacts upon species and indirect impacts on the food chain due to bioaccumulation.
- Impacts to fish, mammals, benthic ecology and plankton due to increased suspended sediments (turbidity) from dredging, piling and removal of the Anglian water jetty, including potential impacts to the Ramsar, SPA and SSSI intertidal saltmarsh and mudflat features.
- Impacts to non-mobile benthic species living within the sediments that are to be dredged from the berthing pocket.
- Disturbance to fish and marine mammals from construction works such as piling of mooring dolphins. Disturbance to birds will be assessed in the terrestrial ecology chapter.
- Disturbance of marine mammals and fish caused by night time working lights.

Operation

- Impacts to benthic ecology due to changes in erosion and accretion patterns caused by creating the berthing pocket and installation of the piled pontoons.
- Disturbance to fish and marine mammals due to increased vessel traffic.
- Impacts to fish, marine mammals, benthic ecology and plankton due to changes in water quality (contamination/eutrophication /turbidity) from discharges from the development.
- Impacts to non-mobile benthic species living within the sediments of the dredge pocket due to ongoing maintenance dredging.
- Impacts to fish, marine mammals and benthic ecology from resuspension of potentially contaminated sediments during maintenance dredging. Both direct impacts upon species and indirect impacts on the food chain due to bioaccumulation.

- Impacts to fish, mammals, benthic ecology and plankton due to increased suspended sediments (turbidity) from maintenance dredging (if required).

Scoped out of the EIA

7.98 Impacts to commercially harvested shellfish have been scoped out due to the 25km distance from the development to the aquaculture production areas at Southend.

Approach and methodology

7.99 The marine environment at the Port of Tilbury is well understood due to large amounts of data that have been collected for the proposed Tilbury B Biomass Power Station development, and from monitoring of the Thames Estuary by various organisations. It is proposed to obtain additional data through consultation with the relevant authorities including the Environment Agency and Natural England. This data will be reviewed to identify any gaps. It is anticipated that existing data will be sufficient to define the baseline environment for fish, plankton and marine mammals and no additional surveys would be required.

7.100 The baseline review will be supplemented by collecting sediment samples from within the dredge pocket. These samples will be analysed for chemical contaminants in line with the OSPAR requirements for the management of dredged material (OSPAR, 2014)[35]. A sample plan for the survey will be requested from the MMO and the results of the analysis will be compared to Cefas Action levels for dredged sediment to determine the likelihood of potential impacts related to sediment contamination. The need for additional data on benthic ecology, to update and validate existing information, is yet to be determined and will be informed by the gap analysis.

7.101 Potential impacts to marine ecology due to degradation in water quality from discharges and runoff will be informed by the projects drainage strategy and Water Framework Directive compliance assessment (discussed below). Risk of degraded water quality impacting coastal habitats adjacent to the site will be considered.

7.102 Potential impacts due to changes in flow conditions, erosion and accretion, turbidity and deposition will be informed by hydrodynamic modelling. The approach and methodology for the modelling is described in the water resources section of this report.

7.103 Site specific bird and saltmarsh surveys are being undertaken. The approach and methodology for these surveys are described in the terrestrial ecology section of this report.

7.104 Potential impacts to marine ecology will be assessed against the baseline condition. The impact significance will be based on assessing the impact

[35] OSPAR, (2014) OSPAR Guidelines for the Management of Dredged Material at Sea (Agreement 2014-06).

magnitude (i.e. the deviation from the baseline condition) and the sensitivity of the receptor. Temporary, permanent, direct and indirect impacts will be considered during both the construction and operational stage, and any mitigation measures necessary will be identified.

7.105 PoTLL has, and will continue to consult the MMO, Environment Agency and Natural England on the assessment methodology, and the development of appropriate mitigation measures in the context of operations across the wider River Thames.

TERRESTRIAL ECOLOGY

Overview of baseline conditions and key issues

Extant Conservation Designations

7.106 As stated above, within 3km of the proposed Tilbury2 development there are four statutory designated sites for nature conservation, including two European Sites (Figure 7.1). These are:

- Thames Estuary & Marshes Ramsar Site (1.3 km South East);
- Thames Estuary & Marshes Special Protection Area (1.3 km South East);
- South Thames Estuary and Marshes Site of Special Scientific Interest (1.3 km South East); and
- Mucking Flats and Marshes Site of Special Scientific Interest (1.8 km East).

7.107 These statutory sites are assessed to be sufficiently remote from the project area to render significant impacts from many sources associated with the project (e.g. dust), impossible or unlikely.

7.108 This leaves the only possible impact vectors being as follows:

- Disturbance to birds using the intertidal mud or saltmarsh adjoining and/or within the zone of influence of the project having implications for the statutory sites through such aggregations being 'functionally linked' to the populations that underpin the designations (citation species). Past studies and ongoing survey work suggest that the numbers of citation bird species using the Thames foreshore are very modest, reducing the scope for significant effects, but such impacts will nevertheless be fully considered within the scope of the terrestrial ecology chapter of the ES.
- Disturbance to birds within the designated sites downstream arising from increases in river traffic associated with the expansion of port capacity and/or related changes to river movements or dredging patterns.
- Water quality changes affecting habitat quality of downstream statutory sites as a consequence of the mobilisation of polluted sediments through construction works or maintenance dredging, and/or affecting (e.g. through bioaccumulation) bird populations within the designated sites or functionally linked bird populations (citation species) on the Thames foreshore adjoining the project site.

7.109 Potential effects on the habitat condition of downstream statutory sites from changes to sediment dispersal patterns (e.g. denudation or smothering of saltmarsh habitats).

7.110 In addition to the statutory sites listed above, there are two Local Wildlife Site (LoWS) non-statutory designations located within the main site, and a

third along the access corridor, as follows (see also attached WYG Figure 1.3[36]):

- Th39 Lytag Brownfield – This site supports acid grassland and populations of all four species of reptiles native to Essex (adder, grass snake, common lizard and slow-worm) and is considered to be one of the more important reptile sites in the borough.

- Th40 Tilbury Centre - This comprises the grounds surrounding the former Tilbury Energy and Environment Centre (TEEC), and is designated for its complex habitat mosaics and invertebrates.

- Th37 Tilbury Marshes – This designation is engaged by the surface access proposals. It comprises relict grazing marsh, brackish ditches and the outer moats and grasslands of Tilbury Fort. The basis for designation centres on the saltmarsh flora associated with the Fort moats (classed as saline lagoons) and the relict grazing marsh flora, which includes a number of nationally scarce plants. The site is also known to have value for invertebrates.

7.111 The boundaries of the Lytag Brownfield and Tilbury Centre LoWS have recently been reviewed by EECOS[37], on behalf of Thurrock Council, and it is currently proposed that Th39 and Th40 be expanded and (with other land) conjoined into a single larger LoWS (Th39: Tilbury Power Station). The process of review is however ongoing and until the conclusion of that process, the revised LoWS delimitation is provisional, though likely to be treated as if concluded where not otherwise in conflict with adopted planning policy. In any event, the assessment of impact on both existing and proposed areas will be taken into account.

Habitats

7.112 Habitat and botanical surveys of the main site and surface access corridor have been completed to extended Phase 1 level in 2016. The main habitat types are mapped at Bioscan Figures 1a and 1b attached in Appendix 1. For the main site further habitat information is available from earlier work undertaken by RPS Group in July 2007 (subsequently updated by WYG Ecology in 2015) and from various older studies (including detailed botanical monitoring on the TEEC site) which have recently been obtained by Bioscan from RWE. A much smaller volume of existing information for previous development sites encompassing parts of the surface access corridor has also be obtained from archive planning files held by Thurrock Council.

7.113 The central and northern parts of the main site contains a diverse mixture of 'post-industrial habitat types such as open skeletal grasslands on artificial substrates, dense self-sown scrub and a few hedgerows, relict ungrazed expanses of former grazing marsh (complete with an attendant drainage ditch network) and areas of amenity grassland and landscape planting. There are also a number of ponds and associated wetland vegetation, and

[36] All White Young Green Figures are attached as Appendix 2.
[37] Essex Ecology Services Limited, a not-for-profit subsidiary of the Essex Wildlife Trust

areas of former arable land. The southern part of the main site is dominated by areas of sparsely vegetated hard-standing and active demolition areas, although with fringes of mature landscape planting, drainage features and expanding scrub. Between the former power station fence and the flood defences is an area of neglected land, formerly more open and managed as an informal nature reserve for public amenity, but now largely overtaken by scrub. South of the flood defences, and adjoining the Thames Path, are narrow strips of saltmarsh vegetation above the mean high water mark, with exposures of intertidal mud at low tide

7.114 Some of the habitats identified correspond to Habitats of Principal Importance (HPI)[38] and Essex Biodiversity Action Plan (BAP) habitat types. The following habitat types of elevated conservation interest are present on the main site:

- Open mosaic habitats on previously developed land (including unimproved neutral grassland)
- Lowland dry acid grassland (including representations of 'lichen heath')
- Coastal and flood plain grazing marsh
- Reedbeds
- Ponds
- Hedgerows
- Lowland mixed deciduous woodland

7.115 The corridor of land relevant to the surface access proposals has been subject to less comprehensive coverage to date, although extended Phase 1 surveys of this land were completed in the latter part of 2016. The main habitat types here are coastal and floodplain grazing marsh, with associated ditches and other boundary features, scrub, and pockets of amenity grassland and other modified habitats. Representations of the following Habitats of Principal Importance (HPI)[39] and Essex Biodiversity Action Plan (BAP) habitat types are present along the corridor:

- Coastal and flood plain grazing marsh
- Reedbeds
- Ponds
- Hedgerows

[38] further to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
[39] further to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

7.116 The areas encompassed by the current indicative Order Limits south of the main site and extending into the River Thames comprise a mixture of modified saltmarsh and other intertidal habitats, and (below mean low water mark), benthic and aquatic habitats associated with the tidal Thames, the latter being dealt with under Marine Ecology above.

7.117 Representations of the following Habitats of Principal Importance (HPI)[40] and Essex Biodiversity Action Plan (BAP) habitat types are present here

- Coastal saltmarsh
- Intertidal mudflats

Protected species

7.118 On the basis of previous records and field surveys carried out in 2016, the main site is known to support the following European and national protected species:

Badgers

7.119 Comprehensive survey work for badger *Meles meles* was undertaken by WYG in 2008, following a preliminary survey by RPS in 2007. An active main sett was identified at 'Poultry Farm', which is located approximately 1.6km from the current indicative Order Limits. Whilst field sign evidence indicates that badgers make occasional use of the main site, the use of bait marking techniques in 2008 confirmed that badger activity is typically focussed off-site at the locus of this main sett. In 2016, setts have been found within the main site itself and further survey work is proposed to establish their status.

Bats

7.120 Transect surveys have been undertaken over a number of years, to identify the nature and location of bat activity with the site. The most recent surveys were undertaken in 2015, during mid-April (dusk and dawn), mid-July (dusk and dawn) and early-September (dusk only), and comprised two transect routes within the main site. In general, levels of bat activity were low (reflecting the exposed and featureless nature of the southern part of the site), albeit the pond adjacent to the gatehouse was a focus for pipistrelle activity (see attached WYG Figure 4.1). Common and soprano pipistrelle, *Pipistrellus pipistrellus* and *P. pygmaeus* respectively, were by far the most frequently recorded species, but serotine *Eptesicus serontinus* and *Myotis* sp. bats were also very occasionally detected. A single 'pass' by Nathusius' pipistrelle *Pipistrellus nathusii* and by noctule *Nyctalus noctula* were also recorded during the building surveys described below.

7.121 Three existing buildings on the main site were identified as having some potential to support bat roosts, and following initial inspection surveys in May 2015, the buildings were subject to a number of bat emergence/re-entry surveys as follows (see attached WYG Figure 4.2 for building locations):

[40] further to Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

- A-station - High suitability for bats and surveyed on three nights: late-May (dusk and dawn), late-June (dusk and dawn), and late-July (dusk only).

- Owl House (a large open sided maintenance shed)- Medium suitability for bats and surveyed on two nights: late-July (dusk and dawn), and mid-August (dusk only).

- Office complex - Low suitability for bats and surveyed on one night: mid-August (dusk and dawn).

7.122 No bats were observed emerging from or re-entering any of the buildings.

7.123 The buildings were subject to update survey inspections and emergence surveys by Bioscan in April and June 2016. On the former date single *Pipistrellus*-type bat droppings were found stuck to an internal wall of a single-storey brick office building adjoining the Owl House and on an exterior wall of the adjacent Owl House itself. These were assessed as most likely to have come from flying bats foraging within or in close proximity to the buildings respectively. No evidence of roosting was recorded.

Dormouse

7.124 Prior to 2015, no specific surveys of the main site had been undertaken for dormouse *Muscardinus avellanarius*, but in 2009 field signs believed to be indicative of the species were found near the TEEC and a single nest was reported adjacent to the National Grid substation just off-site to the east. In light of these records, a formal survey was conducted by WYG in 2015, for which a total of 160 dormouse nest tubes were installed during April, and checked monthly (May to September). A single nest attributed to this species was identified within scrub in the northern part of the site in September 2015 (see attached WYG Figure 7.1). In addition, a further 3 or 4 survey tubes were suggested to show signs of dormouse nest construction, but were not sufficiently developed to confirm presence. Due to the uncertainty over the status of this species, Bioscan commenced further nest-tube and nest-box surveys in the latter part of 2016 which are ongoing. These are targeted on areas of habitat within the main site of most suitability for the species, and hence they do not cover the entire area. Concurrently, survey work for this species along the surface access corridor has commenced. No dormice have been found on site to date, although nest constructions similar to dormouse, but of wood mouse or yellow-necked mouse origin, have been found. The veracity of the previous nest records is therefore being drawn into increasing question. Investigations have commenced into the detailed nature of those records and these are still underway. One at least appears to be highly dubious. At present, the previous reported presence of this species on the site remains in question.

Water vole

7.125 On the main site, populations of water vole *Arvicola amphibius* were identified during surveys in 2007 and 2008, and in update surveys undertaken for the southern portion of the main site in March/April 2013. A complete re-survey of the main site was undertaken during April 2015, and this identified water vole populations (with relative densities varying from low

to high), primarily using the ditches and waterbodies with a year-round water supply, and concentrated within the central part of the main site (see attached WYG Figure 3.1). In 2016, Bioscan have repeated this survey work to cover the autumn survey window, finding similar results, although the distribution of the species was found to have contracted back to permanent waterbodies with seasonal drying up of the ditch network. It was also determined that due to the failure of exclusion fencing, water voles had colonised the mitigation pond in the north-east of the POTLL landholding, that had been created by RWE to accommodate their anticipated translocation from the TEEC site. Survey work in 2016 was also expanded out to encompass the majority of the surface access corridor, with water voles being found in this part of the project site also.

Great crested newt

7.126 Surveys for great crested newt *Triturus cristatus* undertaken in 2007 identified a small population (peak count of one male, one female and a single egg) within a single ditch on the main site, near to the existing security gatehouse and its adjoining pond (waterbody 12 as shown on attached WYG Figure 4.1). The survey area was expanded by WYG in 2008, yet only a single female great crested newt was recorded. Update surveys conducted by WYG during 2013 and again during 2015 did not record any life stages of great crested newt (adult, eft or egg). They concluded that great crested newts are now entirely absent from the site or present in such low numbers they are undetectable using standard methodology. In April 2016 water samples were taken from the waterbodies where great crested newt had previously been identified (i.e. the gatehouse pond and adjacent ditch) and analysed using eDNA identification techniques. The result for the pond was inconclusive, due to likely sediment contamination from shallow water levels, while the sample from the adjacent ditch was confirmed negative. This provides further evidence in support of the likely continued absence of this species.

7.127 There is no suitable breeding habitat for this species along the surface access corridor, but desk surveys in 2016 unearthed a recent record for this species from a residential garden to the north of the railway line and within dispersal distance for terrestrial phase animals. Further investigations into this record, including conversations with the source, suggest it is derived from identification error, most likely a misidentification of smooth newts.

Reptiles

7.128 During surveys conducted in 2007, 2008, 2009, 2013 and 2015, four species of reptile (adder *Vipera berus,* common lizard *Zootoca vivipara*, grass snake *Natrix natrix* and slow worm *Anguis fragilis*) were confirmed present across the vegetated, but non-wooded, parts of the main site. Population size class estimates for each species in 2015 were low overall, but with areas of exceptional numbers of slow-worm, and good numbers of lizards (see attached WYG Figure 6.1). Surveys of targeted parts of the main site, and incidental observations, in 2016 suggest that this position remains unchanged. Surveys in 2016 of the surface access corridor found sparser populations of common lizard, slow worm and adder.

Birds

7.129 Formal breeding bird surveys of the main site were initially undertaken by RPS (April - June 2007), and updated for some areas by WYG (May-June 2009, and again in May-June 2013). A complete re-survey was completed by WYG over eight visits in 2015 (mid-March – early-June), which was supplemented by observations made during other on-going survey work. The scrubby/wooded habitats support a suite of nesting bird species, including the specially protected (Schedule 1) species Cetti's warbler *Cettia cetti* (see attached WYG Figure 3.1). Black redstart *Phoenicurus ochruros* has (pre-2015) been recorded holding a single territory at the A-station; and peregrine falcon *Falco peregrinus* was seen to be holding territory within the B-station during 2015. The 'Owl House' structures are used by barn owl *Tyto alba*, although not apparently for breeding.

7.130 During survey work in 2016, a number of other bird species of conservation concern were recorded within the main site, including transient marsh harrier and several territories of nightingale *Luscinia megarhynchos*.

7.131 Wintering bird and wader surveys encompassing the foreshore areas of the site, were undertaken by RPS between January 2007 and May 2008, focussing on the intertidal mudflats adjacent to the RWE ownership boundary. The surveys found that no high tide roosts were present across the RWE ownership boundary, with the habitat assessed as being of negligible value to birds.

7.132 In 2016, Bioscan commenced renewed wintering birds surveys of the same area, expanded upstream to encompass the mouth of Bill Meroy Creek, and these are ongoing. In general, only low interest for wintering birds has been found to date, although limited-scale use of the intertidal mud and saltmarsh at the mouth of Bill Meroy Creek has been noted by avocet, dunlin and other species of relevance to the downstream designations. The existing jetty appears, from survey to date, to have no function as a significant high-tide roost, although it is used by very small numbers of species such as oystercatcher.

Terrestrial and Freshwater Invertebrates

7.133 A survey and assessment of the invertebrate interest of the main site was undertaken by Colin Plant Associates during May – October 2007. This recorded a high number of nationally rare (Red Data Book), nationally notable, county rare and threatened species, and species listed under Section 41 of the NERC Act, including the hornet robber fly *Asilus crabroniformis*, five-banded digger wasp *Cerceris quinqefasciata* and shrill carder bee *Bombus sylvarum*. The power station site was assessed at the time as supporting an outstanding assemblage of aquatic and terrestrial invertebrates, with much of this interest focused in the ashfields area (east of the DCO application site) and other 'brownfield' areas such as the area known as the Lytag Site (which lies in the northern part of the DCO application site).

7.134 In 2016, this survey was repeated for the POTLL landholding on the main site, with in the latter part of the year some initial sampling also carried out along the surface access corridor. The overarching conclusions of this study

were that the open mosaic / brownfield areas of the former power-station site appear to retain their significant value for invertebrates. Further work was also recommended for the surface access corridor, which in part encompasses habitats suitable for hornet robberfly and other scarce or rare species. This work is programmed for 2017.

Initial assessment of potential Impacts

7.135 PoTLL has, and will continue to consult Natural England on its survey and assessment methodology.

7.136 However, the ecological surveys conducted to date have confirmed the presence of a number of protected species (four common reptiles, commuting and foraging bats, water voles, badgers and breeding birds) and important habitat for invertebrates; in addition to habitats of elevated conservation importance and intrinsic botanical interest, and the presence of two non-statutory nature conservation designations (Th39 Lytag Brownfield; Th40 Tilbury Centre, Th37 Tilbury Marshes) encompassed wholly or partly within the indicative Order Limits. Potential impacts will relate to the loss of relevant habitats, the extent of which have not yet been clearly defined, and will be guided by the findings of the ecological works to date, and on-going ecological work as set out in the following section.

Approach and methodology

7.137 The large volume of extant data for both the main site, and the adjoining reach of the Thames provides an excellent resource to inform impact assessment predictions and confidence, but elements of it are now approaching ten years old. By contrast, the surface access corridor has been subject to a much lower level of past survey. Further survey work is thus proposed to ensure the baseline understanding of potential ecological receptors and their significance is both up-to-date (at most two years old to accord with best practice) and as comprehensive as possible, in order to be able to assess the impacts of the project on those habitats. The following work is proposed at this stage: :

<u>Desk study</u>

7.138 Ecological data has been obtained from the Essex Wildlife Trust Biological Records Centre (EWTBRC), as well as freely available on-line sources such as the ‘Magic’ database (managed by Natural England) and the National Biodiversity Network (NBN). Repositories of additional specialist data (e.g. Essex Field Club) have also been contacted as appropriate. These third-party data will be kept up to date by supplementary requests as appropriate. A significant volume of additional data held by RWE in connection with past development projects has also been obtained, or is still in the process of being pursued, and information relevant to the surface access corridor has also been obtained from Thurrock’s planning archive. Leads generated in the process of continuing this data trawl will continue to be pursued.

Study Area

The study area is primarily defined by the indicative Order Limits, but extends outside this where it has been considered appropriate to do so and where access has been obtained. In particular, this has been done to record bird use of the intertidal habitats at the mouth of Bill Meroy Creek and to assess any use of the grazing marsh habitats north of Tilbury Fort by non-breeding wildfowl and waders at high tide periods.

Habitats

7.139 The main site, surface access corridor and the above mean low water mark elements of the adjoining section of the Thames (upstream as far as the mouth of Bill Meroy Creek and downstream as far as the RWE landholding boundary) have all been subject to extended Phase I Habitat Survey during the course of 2016. The methodology employed following the standard approach devised by the former Nature Conservancy Council and revised by the Joint Nature Conservation Committee (JNCC) in 2010, as set out in the "*Handbook for Phase 1 Habitat Survey: a technique for environmental audit"*, allowing an inventory to be compiled of the habitats present, and subjecting areas of greater interest to more detailed examination as has been undertaken. Some targeted additional work on brownfield habitat assemblages and priority habitats (e.g. saltmarsh) has been undertaken in the course of this work, in order to permit classification of semi-natural habitats such as saltmarsh to standard community classifications (e.g. the National Vegetation Classification), and also to search for scarce or rare vascular plant species (such as spring ephemerals in skeletal grassland habitats). Further work in 2017 will include further targeted searches for scarce plants and a specialist lichen survey of the lichen-rich habitats of the main site.

Protected and notable species

7.140 The substantial base of extant information on protected and notable species for the main site and its currency in relation to the development proposals has been tested and (where appropriate) re-confirmed by means of surveys carried out by Bioscan during the course of 2016.

7.141 The following further work on individual species/species groups is programmed for 2017 to ensure that this information base remains current as regards any changing patterns of protected species use, and also up-to-date in terms of keeping pace with the NSIP process. Update surveys will also be carried out on the adjoining section of the Thames to build-upon and verify the currency and relevance of the existing dataset, and/or plug any gaps. Completion of surveys along the surface access corridor will also ensure that the information base for each of the various areas encompassed by the proposed development is at a consistently comprehensive level. The approach to survey work will be based upon standard best practice guidance methodologies, as referenced in each of the relevant sections below.

Terrestrial and (freshwater) aquatic invertebrates

7.142 Active and passive sampling of terrestrial invertebrates took place over the summer of 2016, complemented by active sampling of ditch and pond systems within the main site. A more limited amount of active sampling was undertaken along the surface access corridor, with species being targeted here including hornet robber fly. The results of this work permit some degree of comparison with the historical dataset as a means to assess value (which has in the past been graded as 'national' for the Lytag Site), however some limitations were encountered. Coverage of the early part of the 2016 season was to a small degree compromised by loss or vandalism of a static malaise trap and there were periods of the season where weather conditions were suboptimal (e.g. the unseasonably cold May 2016). A repeat season of survey is thus proposed in 2017, and this will permit the coverage of the surface access corridor to be brought into line with that for the main site. The opportunity will also be taken to carry out an update assessment of saltmarsh habitats along the Thames foreshore. Survey approach and methodology will be in-line with Natural England/Defra Standing Advice[41] for invertrebrate surveys and impact assessment, drawing on the industry-standard methodologies recommended by CIEEM (e.g. Drake et al (2007)[42], JNCC (2008).[43]

Dormouse

7.143 The geographic location of the site, its industrial history, the nature of the surrounding landscape and the distribution of past records of dormouse in this part of Essex all point to the presence of this species being at best 'unlikely'. On the other hand, habitat capable of supporting the species is present on the main site, and the railway line that adjoins both the main site and the surface access corridor provides a potential colonisation conduit from areas where there are known established populations, albeit that these are quite distant.

7.144 Notwithstanding the above, a small number of records of this species on the site have been made in the past, including by consultants WYG in 2015 and formerly by other consultants appointed by RWE and/or SEESA. In the main these are nest records, although one older record on which further detail is being sought is reported to be of hair identified to this species from a sample collected from a nest tube adjacent to the National Grid substation. It is not clear whether any hair analysis associated with this record was via DNA or via microscopic characteristics. Error is unlikely with the former, but certainly possible with the latter.

7.145 To try and reduce this uncertainty, Bioscan undertook a part-season survey in 2016, focusing on intensive survey of areas most likely to yield the

[41] https://www.gov.uk/guidance/protected-invertebrates-protection-surveys-and-licences
[42] Drake CM, Lott DA, Alexander KNA and Webb J (2007). *Surveying terrestrial and freshwater invertebrates for conservation evaluation*. Natural England Research Report NERR005. Natural England, Peterborough.
[43] Joint Nature Conservation Committee (2008). *Common Standards Monitoring Guidance for Invertebrates, Version March 2008.* JNCC, Peterborough.

species and using nest tubes and boxes to maximise the chance of a conclusively positive result. No evidence of dormouse was found. A feature of the survey results was the substantial uptake of nest tubes by woodmice and yellow-necked mice and the discovery of nests by these species that bore a fair degree of similarity with dormouse nests. Further surveys are programmed for 2017 in order to bring the information base up to industry standards (e.g. Dormouse Conservation Handbook[44]) but the current position is one where there is an increasing possibility that previous records have been made in error. The further work proposed in 2017, which will include completion and expansion of the targeted survey commenced in the latter part of 2016, is intended to fully clarify the position as regards presence of confidently deemed absence this species on both the former power station site and the surface access corridor.

Breeding birds

7.146 A breeding birds survey of the main site was undertaken in spring 2015. Whilst this survey data is 'in-date' incidental observations made by Bioscan through 2016 noted additional species not reported by WYG including in particular, several territory holding pairs of nightingale. A repeat breeding birds survey will therefore be carried out in 2017, using territory mapping methodology[45] over a minimum of three visits, and supplemented by at least two additional nocturnal visits for nightingale in accordance with the bespoke methodology devised by the BTO for establishing numbers of established breeding territories of the species[46].

Wintering birds

7.147 A wintering birds survey of the Thames foreshore between Bill Meroy Creek and the eastern indicative Order Limits, including the extant jetty, is underway and will be completed in March 2017. The methodology follows the approach used in the Wetland Birds Survey (WeBS) devised and administered by the BTO[47]. This survey also encompasses areas of coastal grazing marsh habitat along the surface access corridor to assess if these are used by any species of significance (e.g. wildfowl). To date, the surveys do not suggest any significant use is made of the adjoining section of the Thames foreshore by any species associated with the internationally important populations of the downstream SPA and Ramsar site, although small aggregations of species such as avocet and dunlin make occasional use of intertidal mud at the mouth of Bill Meroy Creek.

Bats

7.148 Some work on bats was undertaken on the main site by consultants WYG in 2015. This has been supplemented by repeat surveys of built structures and of potential roost trees by Bioscan during the course of 2016. In order to ensure the information base on active bats is kept up to date (in pace with the NSIP process) and compliant with industry methods and minimum

[44] Bright PW, Morris PA and Mitchell-Jones A (2006). *Dormouse Conservation Handbook, 2nd Edition*. English Nature, Peterborough
[45] Bibby CJ, Burgess ND, Hill DA and Mustoe SH (2000). *Bird Census Techniques, 2nd Edition*. Academic Press, London
[46] https://www.bto.org/volunteer-surveys/nightingale-survey/methods
[47] https://www.bto.org/volunteer-surveys/webs/taking-part

standards and guidelines, further work on bats is proposed during 2017. This includes repeat structural inspection surveys of built structures that are not otherwise scheduled for removal under the ongoing demolition process, emergence/re-entry surveys of any buildings or trees assessed to have residual roosting potential, a campaign of static detector deployment to assess the value for commuting/foraging bats of key landscape features – including the railway line/railside scrub (including along the surface access corridor), and transect and static surveys to comply with the referenced guidance for moderate suitability habitat (on the former power station site) and low suitability habitat (for the surface access corridor).

Great crested newt

7.149 In a similar way to dormouse, the position as regards this species on the main site is complicated by the existence of previous records, although in this case the veracity of those records (dating from 2007-08) is not in dispute. A wholly separate recent record from a residential area close to the access road has been investigated further and appears to be an error. The current position is therefore that it appears highly likely that the species is absent from both the main site (as indeed was WYG's conclusion) and also the access corridor. To provide further confirmation of this, Bioscan undertook eDNA surveys of the waterbodies where GCN was previously recorded, in Spring 2016. For one of the waterbodies, the eDNA samples delivered inconclusive results, while the other proved, as expected, negative. An additional attempt will be made in April 2017 to procure an uncompromised eDNA result from the main waterbody from which where the former records originate (a pond adjoining the security gatehouse, on the former power station site). The opportunity will be taken at the same time to take eDNA samples from the two other larger waterbodies on the main site; the 'mitigation pond' in the northeast, from the TEEC pond and from an off-site garden pond north of the access corridor which is the source of the more recent and believed to be erroneous record.

Reptiles

7.150 WYG carried out a reptile survey covering the main site in 2015, and Bioscan refreshed this work to industry standards[48] in relation to a part of this area under consideration for expanded car-parking proposals in 2016, as well as making incidental records of reptile species elsewhere, and surveying the access road corridor. To ensure the currency of these data keeps pace with the NSIP process further work in accordance with the same standard methodologies could be carried out, although it is unlikely to change the population size class assessments for each of the four species present. Consultees' views on the need for further reptile surveys are therefore invited in this context.

Badger

7.151 An active sett has been identified on the main site. Ongoing work includes efforts to establish the status of this sett (i.e. whether or not it is a main sett), with monitoring visits being built into other ongoing survey elements.

[48] Froglife (1999). *Froglife Advice Sheet 10: reptile survey.* Froglife, London

Methodology follows Harris et al (1989)[49] Continuous monitoring of the status of badgers on the site will also be built-in to other survey elements programmed for 2017.

Surveys to inform off-site compensation

7.152 In light of the comprehensive land-use requirements for the Tilbury2 project, it has been recognised that there is limited scope for on-site compensation where this will be required to achieve no net loss of biodiversity and/or to ensure legal compliance as regards protected species (albeit it is likely that water vole habitat can be secured through the proposed surface water drainage strategy, potentially within the surface access corridor). It is therefore assumed at the outset that land will require to be secured for off-site compensation at an early stage in the project, and indeed this process is underway in consultation and liaison with the Essex Wildlife Trust and other parties. To inform assessments of the suitability of such land for the compensation purpose, and to assist in quantifying the degree of uplift required to achieve a no net loss position (with reference to the Essex adopted metrics), surveys will be required. It is assumed that these will comprise, at minimum, an extended Phase 1 survey and any ancillary work required to assess extant populations of key species (e.g. specially protected species) sufficient to inform carrying capacity assessments.

[49] Harris S, Cresswell P and Jefferies D (1989). *Surveying Badgers*. Mammal Society Publication.

ARCHAEOLOGY AND CULTURAL HERITAGE

Overview of baseline conditions and key issues

Built Heritage Assets

7.153 Given the nature of the proposals and the relatively flat topography of the surrounding area, a study area of 2km from the site boundary has been identified for the consideration of the baseline. A large number of designated built heritage assets lie within this 2km radius, including Scheduled Monuments, Listed Buildings and Conservation Areas. A Built Heritage Statement, as part of the ES,will form the baseline study to the ES Chapter and will consider the potential effects of the proposals upon the setting and significance of built heritage assets within the study area.

7.154 Despite the relatively flat topography and inter-visibility across the River Thames, significant effects are not anticipated on the majority of the identified built heritage assets, given their distance from the site and the existing surrounding industrial and built landscape of the river frontage. Nonetheless, the Built Heritage Statement will take these assets into consideration, and seek to identify particular cases where harm may occur, and scope out those that are concealed from the development, or are unlikely to experience any significant impact upon their significance.

7.155 The proposals have the potential to result in significant effects upon the settings of a number of designated heritage assets on both the north and south side of the river

7.156 Most notably, Tilbury Fort is a Scheduled Monument (designated heritage asset), and thus a site that is protected by legislation by national and local planning policy. The Fort also includes the Grade II* listed officer Barracks. The proposed development has the potential to impact on the setting of Tilbury Fort. Assessment of setting will incorporate views/functional links across the Thames to the contemporary New Tavern Fort at Gravesend and to the nearby Coalhouse Fort. The latter lies some 4.25km to the east of Tilbury Fort, with the Tilbury2 site being located between the two. The assessment will consider inter-visibility between these two monuments, how this will be impacted by the development and whether any mitigation is necessary. A recreational link between Tilbury and Coalhouse Fort, comprising a public right of way, passes along the southern boundary of the main Tilbury2 site but will not be affected by the proposals.

7.157 In addition, the Grade II* Riverside Station (including floating landing stage) also lies in close proximity to the site, further west of Tilbury Fort.

7.158 The nearest point of the Tilbury2 site (the deepwater jetty) is approximately 1km north of Gravesend. As well as the aforementioned New Tavern Fort, there are a large number of other designated heritage assets on the south side of the river. Whilst it is anticipated that the majority of these heritage assets will not be significantly affected by the proposed development, there are a number of designated heritage assets that have the potential to be affected by the proposals and have thus been scoped in to the ES. These

built heritage assets include the Gravesend Blockhouse (Scheduled Monument) Town Pier (Grade II* Listed), Royal Terrace Pier (Grade II Listed) and Gazebo in the grounds of HM Customs and Immigration Office (Grade II Listed).

7.159 In addition, Gravesend Riverside Conservation Area includes the Esplanade from where views across the river can be obtained. The impact of the development on the setting of these heritage assets will be considered, allied to the Landscape and Visual Impact Assessment that will consider the impact on northward views more generally. The High Street and Queen Street Conservation Area also includes area surrounding the river, to the west of Gravesend Riverside Conservation Area. Most notably, the High Street and Queen Street Conservation Area include the Church of St George (Grade II* Listed) which is prominent in views from the northern side of the river.

Below- ground Archaeology/Geo-archaeology

7.160 The site lies close to the type-site for Holocene peat and alluvial deposits evidencing the Post-Glacial alluvial and environmental history of the Thames Estuary and is of international interest. Peat deposits (three layers and possibly more) are anticipated.

Marine Archaeology

7.161 The site extends into the River Thames and consequently marine archaeological baseline conditions will need to be established.

Tilbury Power Station

7.162 The demolition of the remaining parts of Tibury Power Station do not form part of the Tilbury2 proposals. Tilbury Power Station itself may be considered to be of some heritage interest although it is not listed and has been considered and rejected for listing by Historic England.

Initial assessment of potential impacts

7.163 The proposed development has the potential to have an effect on the setting of the Scheduled Fort. However the fort's existing setting has already been compromised by its existing surrounding industrial landscape comprising the Sewage Treatment Works and redundant Power Station and also the Port of Tilbury. The structures that lie between Tilbury Fort and Coalhouse Fort largely prevent any inter-visibility and the proposed development is unlikely to impact on this. Views from south of the river will change but the setting of the heritage assets within Gravesend on a working river with a semi-industrial context on the northern shore will largely remain of a similar character.

7.164 The proposed development is unlikely to have a significant impact on the below ground internationally important palaeoenvironmental deposits.

7.165 Subject to details of dredging to create a deep berth for aggregate shipping and the scope of work at jetties, there may be a potential effect on as yet to be discovered maritime archaeological evidence.

Approach and methodology

7.166 Initial baseline investigations will be undertaken and set out in a terrestrial archaeological desk-based assessment, geoarchaeological deposit model, marine archaeological desk-based assessment and Built Heritage Statement which will be summarised in the chapter of the Environmental Statement.

7.167 The Terrestrial Archaeological Desk Based Assessment will consider the following issues:

- Planning Policy Framework;
- Geology and Topography;
- Data from a 1.25km zone from the centre of the Application Site held on the Essex Historic Environment Record and the National Monuments Record;
- Historic map and documentary evidence concentrating on the Application Site including published material in the British Library and the Essex Record Office.

7.168 A review of available borehole, test pit and other site investigation date will be undertaken and from this information a Deposit Model will be prepared. The Deposit Model will identify areas where sensitive deposits might occur. A geo-archaeological watching brief during any proposed geotechnical investigations will be undertaken.

7.169 The Marine Archaeological Desk Based Assessment will include a walkover survey of the foreshore and intertidal zones. The desk-based assessment will include the results of the walkover survey and a review of data held in the Historic England archive at Swindon, the United Kingdom Hydrography Office (UKHO) and the Essex Historic Environment Record.

7.170 The results of the Terrestrial Archaeological Desk Based Assessment and the Geo-archaeological Deposit Model and the Marine Archeaeologoical Desk-Based Assessment will inform the necessity for any mitigation measures either through design in the scheme to avoid an impact or through preservation by record.

7.171 The Built Heritage Statement will be prepared in accordance with the National Planning Policy Framework and the Standards and Guidance prepared by Historic England including *Conservation Principles* (2008), *Historic Environment Good Practice Advice in Planning: Note 3 (GPA3), The Setting of Heritage Assets* (2015) and *Seeing History in the View* (2011) as well as best practise, and in consultation with Historic England and Tilbury Fort itself.

LAND-SIDE TRANSPORTATION

Overview of baseline conditions and key issues

7.172 The site is currently accessed via a simple priority junction with Fort Road. The access historically served the former Power Station and associated operations. At present the access is used by vehicles associated with the demolition of the Power Station and a temporary use for car storage (part of the Port's operation).

7.173 Fort Road is a single carriageway road of varying width; there is no street lighting and limited footways. Traffic flows are modest with a range of vehicle types including regular HGV's. The No.99 Tilbury Town Circular bus routes past the site access connecting the Port, the Ferry, the train station and Tilbury Town. The existing Port has dedicated connections and sidings to and from the railway line which runs through the Tilbury area.

7.174 From the site access Fort Road continues south and west past the Port with a number of dedicated accesses to the Port and associated activities. It becomes the A1089 St Andrews Road continuing west and subsequently becoming a trunk road at the main Port access. The A1089(T) then continues north, providing access to Tilbury and the London Distribution Park at the ASDA roundabout, before joining the A13(T) and subsequently providing strategic connections to the M25 Motorway.

7.175 The site lies immediately adjoining the Tilbury loop of the London to Southend main railway line. As explained above, the proposals include relocating a current railhead that terminates close to the Port's cruise terminal. This will be re-routed to run parallel with the existing railway line and will continue into the main site, creating a new railhead close to its southern boundary. The number of train movements is expected to be between and 1 and 3 per day.

7.176 The key issue will be the effect of the project upon the existing transport network (both road and rail) of increases in movement for both people and freight from both the main site and the new and improved transport infrastructure as part of the surface access strategy.

Initial assessment of potential Impacts

7.177 A Transport Impact Assessment will consider the changes in traffic volumes and highway conditions as a result of the proposed development. The environmental statement will consider in turn the potential environmental effects of these changes.

7.178 These are likely to be greatest once the site is operational albeit the impact during construction will be assessed. The potential impacts will relate to the safe and effective operation of the transport network. In particular, the ability of the existing and improved road network to safely accommodate predicted traffic movements. There are likely to be impacts upon Fort Road which will influence the infrastructure requirements of the surface access strategy.

7.179 Impacts are likely to occur along the main access route (Fort Road) and the A1089 and incorporate key junctions including the ASDA roundabout and existing accesses to the Port. Impacts could potentially extend along the A1089 to the wider strategic network, including the A13 and M25. The potential impacts will include road safety and driver delay.

7.180 The number of rail movements is unlikely to have a significant impact on overall traffic volume on the existing rail infrastructure. Disruption during construction will be minimised as no new signalling or out turn from the existing main line will be required. Movements will be toward London and will therefore not impact on delay at any level crossing to the east of the site. The main environmental effects of the rail proposals are likely to be noise, air quality and severance, as discussed in those topics.

Approach and methodology

7.181 The environmental impact of the traffic associated with the proposals would be assessed in accordance with the Institute of Environmental Assessment's publication "Guidelines for the Environmental Assessment of Road Traffic".

7.182 The environmental impact assessment of traffic would be supported by a Transport Assessment (TA) detailing a full technical assessment of the operational impacts of the development on the adjoining and wider transport network. The scope of the TA would be agreed with the highway authorities; Highways England, Thurrock Council and Essex County Council.

7.183 Assessments would consider the existing traffic situation to establish a base against which the proposals would be assessed. Assessments would consider both the construction and operational phases of the development. The generation of trips by the development would be estimated using accepted techniques and databases along with data from existing activities within the Port. Assessments would consider appropriate time periods for both the operational and environmental impacts.

7.184 The environmental assessment of rail movements will consider the number, type and timing of movements and the likely implications under each environmental topic. This will include establishing whether any mitigation is required.

MARINE NAVIGATION

Overview of baseline conditions and key issues

7.185 The project involves a number of navigation features, including

- New pontoon for RoRo vessels
- New mooring and berthing dolphins for RoRo vessels
- New mooring and berthing dolphins for bulk Aggregate vessel
- New link bridge to pontoon

7.186 All UK Statutory Harbour Authorities (SHAs) have a responsibility to comply with, *inter alia*, the letter and spirit of the Port Marine Safety Code (PMSC). A core requirement of the PMSC is that the Duty Holder of the SHA must:

- Assess, and keep under review, the marine risks within the waters for which the SHA is responsible
- Develop policies and procedures to manage those risks and to employ, resource, and empower suitably competent personnel to manage marine operations and reduce risk
- Undertake the above by means of a structured Safety Management System (SMS), which has clear objectives, clear outcomes, and has the concept of continuous improvement embedded within it

7.187 A Navigational Risk Assessment (NRA) is therefore required to be submitted to the statutory port authority in whose water the candidate shipping will navigate – the Port of London Authority (PLA).

Initial assessment of potential Impacts

7.188 Potential impacts on navigation could occur during the construction period. This will be discussed further with PLA.

7.189 Without prejudice to the outcome of the NRA, the following are the types of hazard which are anticipated will be assessed during this NRA. The list is not intended to be exhaustive, and Hazard Identification meetings may well identify other hazards.

1) RoRo vessel at upper berth in collision with passing shipping
2) RoRo vessel at upper berth losing power or steerage
3) RoRo vessel at upper berth striking berth or linkspan
4) RoRo vessel at upper berth breaking away from its moorings
5) RoRo vessel at upper berth being struck whilst moored
6) to 10) – as above for RoRo vessel on lower berth
11) RoRo vessel on lower berth striking moored aggregate vessel
12) Aggregate vessel striking moored RoRo vessel whilst berthing
13) to 18) as per 1 to 5 above for aggregates vessel
19) Aggregates vessel striking feed hopper on berth

7.190 As part of the assessment,, consideration will be given to the need for mitigation in the form of aids to mitigation whether during construction or operation. This will fully discussed and agreed with the PLA and Trinity House.

7.191 The proposals will not impact on the operation of the Tilbury to Gravesend Ferry as neither the physical infrastructure or vessel movements will infringe on the route of the ferry.

Approach and methodology

7.192 In order to assess the impact of the development on navigation risk the NRA will be based on guidance published by IMO in MSC/Circ.1180-MEPC/Circ.474 and MSCMEPC.2/Circ.5. The approach will follow PLA's preferred methodology for a NRA taken from http://www.pla.co.uk/Safety/Navigational-RiskAssessment-Guidance-to-Operators-and-Owners.

HYDROGEOLOGY AND GROUND CONDITIONS

Overview of baseline conditions and key issues

7.193 The site is located at the former Tilbury A Power Station, adjacent west of the former Tilbury B Power Station. During the operation of Tilbury A, Pulverised Fuel Ash (PFA) was utilised at an aggregate plant in the north of the Tilbury A Power Station site and land to the east of the power station was used for ash disposal. Tilbury A Power Station ceased to operate in the early 1980s.

7.194 A number of ground investigations (GI) have been undertaken on parts of the site. These indicate that there is asbestos within soils at the site and hydrocarbon contamination present within the soil, perched water and deeper groundwater at the site, likely to be attributable to the operation of the former power station. There is a Principal Bedrock Aquifer and Secondary Undifferentiated Superficial Aquifer underlying the site. The Principal Bedrock Aquifer is considered a highly sensitive receptor.

7.195 The ash disposal fields associated with the former power station are located off-site to the east and these have been historically used as an aggregate resource.

7.196 The area of the proposed new carriageway linking Ferry Road with Fort Road and the proposed new rail sidings was historically used as gas works, railway sidings and an engine shed and contamination is considered likely to be present.

7.197 The ES will consider the site's ground conditions and hydrogeology status in more detail through a desktop review of available land quality reports and historical and current operations within and around the development boundary to assess the potential for contaminative activities to have taken place.

Initial assessment of potential impacts

7.198 Potential impacts for hydrogeology and ground conditions are likely to mainly relate to the level of ground contamination on site and its interaction with the proposed development. The physical impacts of the development on ground conditions due to the previous site usage will likely not be significant.

7.199 The environmental impacts are likely to be greatest during construction with reduced impacts likely during operation due to contamination risks being mitigated through the detailed design.

7.200 There is a risk that new piling or excavation during construction could create new pathways between the contaminated soils and the underlying groundwater. Consultation will be undertaken with the Environment Agency and risk assessment undertaken to agree the most appropriate construction method to protect the groundwater. Furthermore, adherence to good site working practices and reference to relevant guidance will be undertaken.

Approach and Methodology

7.201 The ES will review the hydrogeology and ground conditions issues at baseline and identify potential impacts that construction and operation of the proposed development could bring about to the existing ground conditions and in turn impact upon identified hydrogeological receptors. However, the government's good practice guide for EIA[50] states that the following potential environmental effects should be considered for ground conditions:

a) physical effects of the development – for example changes in topography, soil compaction, soil erosion, ground stability etc.;

b) effects on geology as a valuable resource – for example mineral resource sterilisation, loss or damage to regionally important geological sites, geological Special Site of Scientific Interest (SSSIs), etc;

c) effects on soils as a valuable resource – e.g. loss or damage to soils with good agricultural quality;

d) effects associated with ground contamination that may already exist on site – for example introducing / changing pathways and receptors;

e) effects associated with the potential for polluting substances used (during construction / operation) to cause new ground contamination issues on site – for example introducing / changing the source of contamination; and

f) effects associated with re-use of soils and waste soils – re-use of site-sourced materials on or off site, disposal of site-sourced materials off-site, importation of materials to the site etc.

7.202 The following environmental aspects of the above list are not relevant to the proposed development and have therefore been scoped out:

a) the physical impacts of the development – the site is brownfield land, changes in topography, soil compaction and soil erosion, and ground stability issues associated with the ground abnormals related to the former use of the site will be addressed through the iterative design in its response to the EIA process – this will be discussed with the Environment Agency;
b) impacts on geology as a valuable resource – there are no recorded statutory geological sites or regionally important geological sites on or adjacent to the site;
c) impacts on soils as a natural resource – due to the former use of the site thisis considered not to be relevant; and

[50] It should be noted that this document has been archived; however, it still constitutes good advice and should be referred to in the absence of alternative guidance documents. Document available at: http://webarchive.nationalarchives.gov.uk/20120919132719/www.communities.gov.uk/documents/planningandbuilding/pdf/151087. Accessed January 2017.

f) implications of soil / material quality for re-use – this is discussed within the Use of natural resources and Waste section.

7.203 The environment aspects of relevance to the proposed development are related to:

d) existing ground contamination; and
e) impacts associated with the potential for polluting substances used during construction and operation of the proposed development.

7.204 The assessment of the potential impacts of the proposed development on hydrogeology and ground conditions will be undertaken over two stages, in consultation with the Environment Agency:

- Stage 1 – a land contamination risk assessment; and
- Stage 2 – a land contamination impact assessment.

Stage 1 – Land Contamination Risk Assessment

7.205 The approach for the hydrogeology and ground conditions risk assessment is based on the guidance document CLR11[51] and the Good Practice Guide to EIA. These documents are considered as key guidance in the United Kingdom, and provide a technical framework for the application of a risk management process through the following steps:

- **Develop a Preliminary Conceptual Site Model (PCSM).** A desk study review of available documentary information to develop the PCSM, which describes the linkages between potential contamination hazards / sources, pathways and receptors relevant to the site. Where all three are present or considered likely to be present, these are described as potential contaminant linkages (PCLs) which can then be subject to the risk assessment process.
- **Gather site specific information.** Previous GI and limited remediation have been undertaken at the site of the proposed development. The available information will be used to assess the potential for existing contamination at the site. Once this data has been reviewed, recommendations for further GI will be made if required and carried out.
- **Risk Assessment.** Generic quantitative risk assessments (GQRA) for human and groundwater receptors to inform a judgement as to whether the concentrations of contaminants in soil, soil leachate and groundwater represent a potential risk to identified receptors. GQRA will be carried out through the comparison of the GI results to appropriate generic assessment criteria (GAC). GAC are concentrations of a contaminant in soil or groundwater, below which the level of risk is considered acceptable. Using the information from the GI and the GQRA, the PCSM will be updated to include an estimation of the level of risk of each PCL identified during the baseline, construction and operational phases. Where risks are identified, consideration is given as to whether these would be appropriately mitigated through design and/or the development

[51] Environment Agency. Contaminated Land Report 11 Model Procedures for the Management of Land Contamination. 2004

of a remediation strategy and its subsequent validation, as necessary. The residual risks will be determined and assessed based on estimation of likelihood and consequence.

7.206 The risk assessment applies the principles given in the National House Building Council (NHBC) and Environment Agency report R&D6652, which provides guidance on the development and application of the consequence and probability matrix (as presented in Table 7.3) for contaminated land risk assessment.

7.207 Liaison will take place with VertaseFLI who are undertaking the remediation works as part of the Environmental Permit surrender for the Power Station.

Table 7.3 Land Quality Estimation of the Level of Risk by Comparison of Consequence and Probability

		Consequence			
		Severe	**Medium**	**Mild**	**Minor**
Probability	**High Likelihood**	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk
	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk
	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk

7.208 The descriptions of the classified risks as given in R&D66[52], are as follows:

- **Very high risk**: There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
- **High risk**: Harm is likely to arise to a designated receptor from an identified hazard at the site without remediation action. Realisation of the risk is likely to present a substantial liability to the site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
- **Moderate risk**: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely, that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.

[52] National House-Building Council & Environment Agency. Guidance on the Safe Development of Housing on Land Affected by Contamination (R&D66). 2008.

- **Low risk**: It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst, that this harm if realised would normally be mild. It is unlikely that the site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
- **Very low risk**: It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.
- **No potential risk**: There is no potential risk if no pollution linkage has been established.

Stage 2 – Impact Assessment

7.209 The approach to the impact assessment will entail undertaking land contamination risk assessments for each of the following:

- Baseline stage: development of a CSM for the site based on its current sources, pathways and receptors and an assessment of the current land contamination risks.
- Construction stage: development of the predicted CSM and risk assessment for the construction phase, addressing the potential for new sources of contamination to be introduced to the site and the change in pathways and receptors.
- Operational stage: the predicted CSM for the developed site, reflecting the final site conditions including the status of contamination sources and the changes in the receptors.

7.210 The impact assessment requires comparison of the baseline risk assessments with the construction phase and the operational phase risk assessments. This approach enables changes in the contaminated land status during the construction and operational phases to be identified, an assessment of the effect of the scheme to be made and appropriate mitigation measures specified. The changes in contamination status are described as either beneficial or adverse and consideration is made of whether they are major, moderate, minor or negligible, on the basis of the area over which the effect may occur, duration (short, medium or long term) and whether the effect is permanent or temporary.

7.211 In addition to these criteria, an assessment will be made as to the value and/or sensitivity of each of the receptors; the criteria of each of these is given in Table 7.4. The value of a receptor is considered when determining consequence of an effect in the risk assessment.

Table 7.4 Criteria for classifying the value and / or sensitivity of environmental resources/receptors

Value / Sensitivity	Criteria	Examples
High	Attribute possesses key characteristics which contribute	Principal Aquifer providing potable water to a large population, within an inner or outer groundwater source

Value / Sensitivity	Criteria	Examples
	significantly to the distinctiveness, rarity and character of the site/receptor. Attribute has a very low capacity to accommodate the proposed change.	protection zone (Source Protection Zone (SPZ) 1 or SPZ 2). WFD high status water body (surface water) providing potable water to a small population. Sensitive human receptors, e.g. young children. Buildings, including services and foundations but of high historic value or other sensitivity e.g. Statutory designations, schools, residential dwellings. Ecological statutory designations with high sensitivity e.g. SSSI, LNR, SPA, RAMSAR etc.
Medium	Attribute possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site/receptor. Attribute has a low capacity to accommodate the proposed change.	Principal Aquifer beyond a SPZ, or secondary aquifer. Secondary aquifer providing abstraction water for agricultural or industrial use. WFD good status water body (surface water). Buildings, including services and foundations.
Low	Attribute only possesses characteristics which are locally significant. Attribute has some tolerance to accommodate the proposed change.	Unproductive strata or Secondary aquifer without abstraction. WFD moderate - poor status (surface water). Infrastructure (roads, bridges, railways). Non-statutory designated sites of regional importance that are not highly sensitive to damage from coastal change.

7.212 The classification of the magnitude of effects is based on the criteria defined in Table7.5.

Table 7.5 Classification of Magnitude of Effect

Classification of Magnitude	Criteria
High	Total loss of major alterations to one of more of the key elements, features or characteristics of the baseline. The post-development situation will be fundamentally different.
Medium	Partial loss or alteration to one of more of the key elements or characteristics of the baseline. The post-development situation will be partially changed.
Low	Minor loss or alteration to one or more of the key elements, features or characteristics of the baseline. Post-development, the change will be discernible but the underlying situation will remain similar to the baseline.
Negligible	Very minor loss or alteration to one of more of the key elements, features or characteristics of the baseline, such that post-development, the change will be barely discernible, approximating to the “no change” situation.

7.213 The classification of significance of effects has been based on the criteria defined in Table 7.6.

Table 7.6 Classification of Significance of Effects

Classification of Significance	Effect
Major adverse	An increase in contamination risk from the existing baseline conditions of 4 or 5 risk levels in the risk matrix, e.g. land that has a very low contamination risk in the baseline becomes a high or very high risk. Land that does not meet the statutory definition of Contaminated Land in the existing baseline becomes capable of being determined under Part 2A of the Environmental Protection Act 1990 (Part 2A).
Moderate adverse	An increase in contamination risk from the existing baseline conditions of 2 or 3 risk levels in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate or high risk. Land that does not meet the statutory definition of Contaminated Land in the existing baseline becomes capable of being determined under Part 2A.
Minor adverse	An increase in contamination risk from the existing baseline conditions of 1 risk level in the risk matrix, e.g. land that has a low contamination risk in the baseline becomes a moderate/low risk.
Negligible	Negligible change in contamination risks.
Minor beneficial	A reduction in contamination risk from the existing baseline conditions of 1 risk level in the risk matrix, e.g. land that has a moderate/low contamination risk in the baseline becomes a low risk.
Moderate beneficial	A reduction in contamination risk from the existing baseline conditions of 2 or 3 risk levels in the risk matrix, e.g. land that has a high contamination risk in the baseline becomes a moderate/low or low risk. Land that meets the statutory definition of Contaminated Land in the existing baseline is no longer capable of being determined under Part 2A.
Major beneficial	A reduction in contamination risk from the existing baseline conditions of 4 or 5 risk levels in the risk matrix, e.g. land that has a very high contamination risk in the baseline becomes a low or very low risk. Land that meets the statutory definition of Contaminated Land in the existing baseline is no longer capable of being determined under Part 2A.

7.214 Following the classification of an effect, as detailed in Tables 7.4, 7.5 and 7.6 a clear statement is made as to whether the effect is 'significant' or 'not significant'. As a general rule, major and moderate effects are considered to be significant and minor and negligible effects are considered to be not significant. However, professional judgement is also applied, where appropriate.

7.215 The following legislation is considered relevant for hydrogeology:

- National Planning Policy Framework (NPPF) [53];
- The Water Resources Act (WRA) 1991 (as amended)[54];
- Water Framework Directive (WFD)[55];
- River Basin Management Plan (RBMP)[56]; and

[53] Department for Communities and Local Government. National Planning Policy Framework. March 2012.
[54] UK Government, 1991 - The Water Resources Act [online] http://www.legislation.gov.uk/ukpga/1991/57/contents.
[55] European Parliament, 2000 – Water Framework Directive (Directive 2000/60/EC).

- Thurrock Borough Council Core Strategy and Policies for Management of Development (CSPMD)[57].

7.216 Further detail on the above can be found in the Water Resources section.

7.217 The hydrogeology and ground conditions assessment will consider the effects of the proposed construction and operational phases on the following hydrogeological resources and receptors:

- The Seaford Chalk Formation and Newhaven Chalk Formation (designated as Principal Bedrock Aquifers); and
- Alluvium deposits (designated as Secondary Undifferentiated Superficial Aquifer).

7.218 Further assessment of hydrology and also surface water features will be undertaken in the Water Resources section.

WATER RESOURCES INCLUDING FLOOD RISK

Overview of baseline conditions and key issues

7.219 The Water Resources and Flood Risk chapter of the Environmental Statement will assess the potential effects of the development on the surrounding water environment and assess the potential implications of these effects on the proposed scheme.

Initial assessment of potential impacts

7.220 The Tilbury2 site is protected from the River Thames by EA flood defences. The defences will be upgraded in future by the EA as part of the TE2100 project of flood defences in this area. Sufficient space will be required for ongoing maintenance and future upgrades. In addition, as a riparian owner PoTLL will be responsible for maintaining the banks within their ownership.

7.221 New gravity outfalls through the existing defences into the River Thames could result in an increased flood risk. The proposed access bridge over the defences could restrict access and maintenance.

7.222 The Main Rivers of Tilbury East Dock Sewer, Chadwell Cross Sewer and Pincocks Trough drain the urban area of Tilbury and the Tilbury Marshes flood storage area. These watercourses pass through the infrastructure corridor and main site and do not have raised defences.

7.223 The infrastructure corridor passes over the three Main Rivers in the area and a number of smaller drains (which are ordinary watercourses) where a constriction of flows could increase flood risk. The alignment of the infrastructure corridor could conflict with Pincocks Trough impacting an existing culverted location.

[56] Department for Environment and Food and Rural Affairs & Environment Agency, 2009 - River Basin Management Plan - Thames River Basin District.
[57] Thurrock Borough Council. Local Development Framework: Core Strategy and Policies for Management of Development. Development Plan Document. December 2011.

7.224 Due to the low lying and flat nature of the site there is a risk of surface water flooding if any surface drainage outfalls are tidally locked. Outfalls are likely to be tidally locked more often in the future due to climate change.

7.225 Climate change will increase river flows in the region, raise sea levels and increase rainfall intensities, therefore increasing flood risk to the development throughout its lifespan.

7.226 The drainage strategy is anticipated to discharge surface water runoff to the River Thames. Development of the site could increase peak runoff rates if the impermeable area is increased. There is a potential for contaminants from surface water runoff to impact the water quality of the River Thames.

7.227 During construction there is a risk of impacting water quality in the River Thames from dredging and in water works such as piling for the new Ro-Ro berth. These activities will increase sedimentation and turbidity and could mobilise contaminants if any are present in the disturbed areas. Risk of degraded water quality impacting coastal habitats adjacent to the site would be considered within the marine ecology section.

7.228 The marine development is of a nature that will interact with the hydrodynamic and sedimentological regime of the area to some degree, and this may in turn have various implications for navigational and environmental issues. The main hydraulic aspects that are likely to be of interest are:

- Flow conditions (speed, direction) at the berths and the effects of the works on hydrodynamics in the authorised channel,
- Infill within the new dredged areas, requiring maintenance dredging,
- Potential changes to erosion or accretion at the intertidal foreshore (including environmentally designated areas), nearby berths and other riparian activities,
- Sediment release from dredging and consequential effects on ecology due to increased turbidity and deposition (to be considered in the ecology chapter).

7.229 The aggregate washing area is understood to be relatively water neutral. On site treatment and re-use of water means this activity is unlikely to result in any significant water quality or water demand issues.

Approach and methodology

7.230 Relevant baseline data will be reviewed, covering the site and extending to 1km from the site boundary. Baseline data will be obtained through an Envirocheck report (or similar) and consultation with the relevant authorities including the Environment Agency and the Lead Local Flood Authority (LLFA) including partner organisations/bodies such as the Tilbury Integrated Urban Drainage Project.

7.231 Relevant baseline data will include any existing surface water features, surface and ground water quality, surface and ground water abstractions, groundwater sensitivity and vulnerability, the existing surface water run-off regime, and a review of any existing flood risk issues.

7.232 A quantitative Level 3 Flood Risk Assessment (FRA) will be completed in consultation with the Environment Agency and in line with the National Planning Policy Framework and CIRIA guidance. The FRA will assess the potential impact of the development on flood risk from all sources of flooding, including fluvial, tidal, surface water, groundwater and artificial influences such as reservoirs and sewers. It will consider the potential for increased flood risk both to the site and adjacent sites.

7.233 In order to assess the risk from the River Thames the FRA will be informed by the results of breach modelling adopted for the recently updated Thurrock Strategic Flood Risk Assessment with an additional breach for the proposed development. The breach modelling will highlight the highest hazard areas of the site should a breach in the defences occur. The results will be used to inform the site layout and formulate suitable emergency response and evacuation plans.

7.234 The FRA will assess the proposed surface water drainage strategy using SuDS guidance, consultation with the LLFA and the results of the Integrated Urban Drainage Study completed by Thurrock Council. The LLFA will be consulted to ensure the proposed run-off rates are in line with their latest guidance.

7.235 Consultation will be undertaken with the Tilbury Mashes reservoir engineers to ensure the proposed changes to the main rivers will not adversely impact the drainage of the system.

7.236 The potential for cumulative impact will also be assessed including the impacts of climate change on all sources of flooding using the Environment Agency's latest climate change guidance (February, 2016).

7.237 The FRA will investigate the order of construction to ensure flood risk is not increased during this phase.

7.238 A Flood Response Plan (FRP) will be provided for the proposed development. The FRP will account for all sources of flooding experienced at the site with the actions specified for the given inundation time. It will be drawn up in close liaison with Thurrock Council's Emergency Planner, the Emergency Services and EA to ensure that it includes appropriate actions related to potential site circumstance and that it is compliant with the wider emergency plans for the District

7.239 A review and summary of relevant international, national and local legislation relating to the water environment will also be undertaken.

7.240 A hydrodynamic and sedimentation study will be undertaken. This will be based on the calibrated Thames Base model, a sophisticated flow and sediment model established for the Environment Agency and Port of London Authority to support their regulatory work on the tidal Thames. The modelling will include both 3D flow modelling and 3D Sediment transport modelling. The outcomes of the hydrodynamic model will be used to determine the footprint and magnitude of any significant impacts of dredging upon the hydrodynamic and sedimentological regimes of the area.

7.241 The project site is one of very high turbidity, with sediment fluxes in the 1000s of kg/s observed[58]. Any dredging activity will, unavoidably, release some fine sediment into the water column, however the rate of release is likely to be in the 10s or possibly in the 100s of kg/s. Therefore the sediment plume is unlikely to provide a significant impact. A desk assessment will be undertaken to estimate the likely sediment release rate from the dredging operation and compare that to the natural sediment flux to demonstrate the negligible effect that is expected.

7.242 Contaminant analysis results obtained from samples of the material to be dredged will be used to inform this ES chapter.

7.243 Potential impacts on the water environment, and in particular the features of the water environment stated above, arising from the proposed development will be assessed against the baseline condition. Impacts will be assessed for both the construction and operational phases of development.

7.244 Potential impacts on the surrounding water environment will be assessed against the baseline condition. The impact significance will be based on assessing the impact magnitude (i.e. the deviation from the baseline condition) and the sensitivity of the likely receptor. Temporary, permanent, direct and indirect impacts will be considered during both the construction and operational stage, and any necessary mitigation measures identified.

WATER FRAMEWORK ASSESSMENT (WFD)

7.245 The ES will include a WFD assessment as a separate chapter, as requested by the Environment Agency in response to the aforementioned Scoping Report submitted to the Local Planning Authority. The purpose of the assessment will be to assess whether the project would cause deterioration in status (or status elements) or water bodies in, or adjacent to, the site. Where a risk is identified the WFD assessment would be used to suggest potential mitigation options.

7.246 The Water Framework Directive Assessment will pull together existing information already available for the site together with results from new studies that will address the various points that you have raised, and consultation with the Environment Agency and MMO. From a WFD perspective there are two main components to consider:

- the impact of the proposal on the site (once constructed) compared to the existing situation; and
- the operational impacts associated with the use of the site.

When considering the impacts on the transitional water body the assessment will follow the recently published Environment Agency guidance on Clearing the Waters for all for Estuarine and transitional water bodies.

[58] Baugh J.V., Littlewood M.A., "Development of a cohesive sediment transport model of the Thames Estuary".Proceedings of the 9th International Conference on Estuarine and Coastal Modelling, 2005

7.247 Despite the possibility of short term temporary degradation to Biological Quality Elements (BQEs) and their supporting substances and conditions, the construction aspects will not be considered as part of the WFD assessment as it is assumed that best practice guidance will be followed to minimise potential impacts of the construction activities.

7.248 The structure of the WFD assessment is proposed below:

1. Introduction (provide context to the process)
    - Legislative background
    - Purpose of report and WFD compliance approach
2. WFD Screening (review information on existing water body(ies))
    - Water body and related scheme background
    - Quality element background
    - Screening assessment of impacts on water body quality elements
    - Consideration of upstream/downstream and cumulative effects
    - Screening assessment results
3. WFD Detailed assessment – this will review the various elements that have been screened in for further study which could potentially impact the compliance with the WFD.
    - Assessment of any direct or indirect impacts on the hydrogeomorphology and water quality of the Thames Water body (which would include an assessment of the impacts of the proposal against the baseline condition and operational element of the new pontoon). This will include an assessment of the findings of the following studies;
    - Qualitative assessment of impacts from silt mobilisation and changes to dispersal patterns on saltmarsh habitats, including in particular the fragments around the mouth of Bill Melroy Creek and how this will impact both sub-tidal habitats, European Eel and Smelt
    - Qualitative assessment of maintenance dredge protocol (if maintenance dredging is required) and its potential impacts on fish species as a whole but specifically European eel and smelt
    - Assessment of impacts on the water network within an indicative general site layout of Tilbury 2 (including Pincocks Trough and the site ditch network). Water quality and Hydro-geological impacts will be cross-referenced with the associated

chapter in the ES. This study will include an assessment of the findings of the following studies:

(i) Ecological assessment of the impacts of the scheme on local aquatic or semi-aquatic invertebrate, flora and fish populations as well as on species such as water vole and birds.

(ii) Ecological assessment of proposed drainage strategy to ensure sufficient mitigation for loss of ditch length across the site

(iii) Invasive species survey and suggested management measures

(iv) Detailed assessment results

4. Recommendations

5. References

7.249 This approach will be agreed with the EA in order to ensure that the EA can also confirm compliance with the requirements of other regulators as part of the marine licence, which will be deemed within the DCO

NOISE AND VIBRATION

Overview of baseline conditions and key issues

7.250 The current noise climate in the vicinity of the site is generally dominated by road traffic, emanating from either local or distant highways. Train services utilising the rail line to the north of the site contribute to the noise climate in the area, in addition to noise associated with activities taking place across the existing port. At locations close to the River Thames, noise from water vessels and birds is prevalent.

7.251 There are a significant number of noise sensitive receptors situated in proximity to the site, most notably the residential area to the north of the site boundary. Tilbury Fort which is a Scheduled Monument is located to the west of the site and the River Thames is immediately to the south. Beyond the River Thames in Gravesend, there are residential properties, scheduled monuments and a SSSI. There are proposals for significant new mixed use development (including residential) on the southern shore of the river at Gravesend and there are areas of recreational uses both on land and within the river itself, which is used by leisure craft.

7.252 The site is relatively flat and therefore the potential for screening of future noise sources via natural topography is limited.

Initial assessment of potential Impacts

7.253 During the construction phase of the development, there is potential for noise and vibration impacts to occur, particularly whilst the proposed transport corridor is under construction. This is a function of the limited separation distance between the works and the nearest noise sensitive receptors.

7.254 Construction induced noise and vibration levels associated with activities across the main site are less likely to give rise to adverse impacts, due to the increased separation between source and receiver positions.

7.255 Construction activities taking place within the River Thames are expected to include piling and dredging works which have the potential to impact upon marine species, such as migratory fish, marine mammals and resident fish populations. This will be considered in the Marine Ecology chapter.

7.256 During the operational phase of the development, there is potential for noise and vibration impacts to occur as a result of:

- Activities taking place across the main site, associated with the Aggregates and Construction Materials Terminal and the Ro-Ro Terminal.
- Road traffic following the introduction of the proposed link road between Fort Road and Ferry Road.
- Increased road traffic on the wider highway network attributable to the proposed development.

- Freight train movements on the new rail line.
- Shipping movements and on-berth vessels.

Approach and methodology

7.257 Liaison with the Environmental Health Department at Thurrock Council has been undertaken to agree the proposed methodology for the assessment. The outcome of the consultation will be reflected in the noise and vibration assessment.

7.258 A baseline noise survey has been undertaken to establish the current noise climate at sensitive receptors in the vicinity of the site. The noise monitoring considered both daytime and night-time periods and comprised a combination of short term attended and longer term unattended measurements. Thurrock Council was consulted on the choice of monitoring locations and all noise measurements were carried out in accordance with the guidance contained within BS 7445-1:2003.

7.259 It is intended that additional baseline noise monitoring will be undertaken to supplement the measurements that have already been obtained.

7.260 An underwater noise survey will be undertaken to derive the existing noise environment which will enable potential impacts from the proposed works to be considered. The proposed monitoring location would be subject to agreement with the MMO, however, it is anticipated that underwater noise levels would be recorded over a period of up to two weeks.

7.261 Construction phase noise and vibration levels will be predicted and assessed in accordance with the methodology and criteria set out within BS5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'. Parts 1 and 2 of the standard consider noise and vibration respectively.

7.262 Underwater noise modelling will be undertaken to estimate the likely level of noise from different construction activities and the extent of propagation under different tidal conditions. The predicted levels will be assessed against the defined criteria for the affected species.

7.263 The assessment of operational phase noise generated by activities and processes taking place across the main site will be undertaken in accordance with the methodology outlined within BS4142:2014 'Method for rating and assessing industrial and commercial sounds'.

7.264 Road traffic noise levels will be predicted in accordance with the methodology set out in 'Calculation of Road Traffic Noise', DfT 1988. The resulting noise levels will be assessed against the short term or long term criteria outlined in Design Manual for Roads and Bridges, Volume 11 Section 3 part 7, 2011.

7.265 The prediction of rail noise levels will be undertaken in accordance with the methodology set out in the technical memorandum 'Calculation of Railway Noise', DfT 1995. The impact of rail noise will be assessed using guideline

values within the World Health Organisation 'Guidelines for Community Noise' and 'Night Noise Guidelines for Europe' as well as 'IEMA Guidelines for Environmental Noise' (2014).

7.266 Vibration from train movements will be assessed against the threshold levels contained within BS 6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings'.

7.267 The noise impacts associated with vessel movements attributable to the proposed development will be determined on the basis of independently published source data information.

7.268 Where significant impacts are identified, mitigation measures will be introduced and the residual impacts presented.

AIR QUALITY

Overview of baseline conditions and key issues

7.269 Air quality impacts from the proposed scheme may arise during both the construction and operational phases. The potential impacts comprise:-

- increased emissions of dust and particulate matter during construction of the proposed scheme, from dust-raising activities within Order Limits and along potential haul routes;
- changes in local air quality during construction, due to emissions from on-site construction plant and/or as a result of additional vehicles travelling to and from site transporting materials, plant and labour;
- changes in local air quality once the scheme is operational, due to changes in traffic flows, speeds and / or fleet composition on the local road network, in particular additional heavy goods vehicle (HGV) movements;
- changes in local air quality due to changes in the distance between emission sources and sensitive receptors as a result of a new length of public highway linking Ferry Road to Fort Road and reconfiguration of existing junctions;
- fugitive emissions of dust and particulate matter from materials processing/storage facilities proposed as part of the scheme;
- increases in rail and shipping emissions associated with the scheme operation, on-site, along the new rail access corridor and at the new jetties respectively; and
- other small, point sources associated with on-site activities such as generators.

7.270 In producing this scoping report, pre-application consultation has been undertaken with Thurrock Council, who gained responses of statutory consultees. The responses from the Thurrock Council Environmental Health Officer, Highways England and Natural England, are among the responses received that refer specifically to air quality. Informal consultation on the scoping report yielded responses from neighbouring authorities. London Borough of Havering highlighted poor air quality 'hot spots' within that municipal area; Gravesham Borough Council also highlighted that an AQMA has been declared in Gravesend town centre.

Air Pollutants

7.271 Emissions from engine exhausts contain a complex mixture of pollutants including oxides of nitrogen (a mixture of nitrogen dioxide (NO2) and nitric oxide (NO) – dominated by the latter), particulate matter (PM10 and PM2.5), carbon monoxide, and hydrocarbons. The quantities of each pollutant emitted depend upon the vehicle type, quantity and type of fuel used, engine size, speed of the vehicle and abatement equipment fitted. In recent years, the local air pollutants of greatest concern have been NO2 and particulate matter, as these are the most likely to be present at concentrations close to or above their statutory limit values in urban areas of the UK. For ports, emissions of sulphur dioxide (SO_2) from the combustion of diesel oils in

large ships or railway locomotives may also be of relevance. In addition, dust may be a perceived issue during construction of the proposed scheme.

Nitrogen dioxide

7.272 Nitrogen dioxide (NO_2) is generally produced by the oxidation of nitric oxide (NO) in ambient air). NO and NO_2 are collectively termed oxides of nitrogen (NO_x). Almost a third of the UK NO_x emissions are from road transport. The majority of NOx emitted from vehicles is in the form of NO, which oxidises rapidly in the presence of ozone to form NO_2. In high concentrations NO_2 can affect the respiratory system, whereas NO does not have any observable effect on human health at the range of concentrations found in ambient air.

7.273 Gaseous NO_x can have a direct toxic effect on sensitive vegetation (e.g. lichen) especially in areas close to roads. NO_x also contributes to nitrogen deposition, which can have an adverse indirect effect on sensitive ecosystems through nutrient enrichment.

Particulate matter

7.274 Particulate matter in engine exhaust gases consists of carbon nuclei onto which a wide range of compounds are absorbed. These particles are generally very small (1 to 10 µm), and include those in the size range referred to as PM_{10}, (denoting particles that smaller than 10 µm in diameter), and $PM_{2.5}$ (denoting particles that smaller than 2.5 µm in diameter). Approximately one fifth of PM10 emissions in the UK are derived from road transport with diesel engines producing the majority of particulate emissions from the vehicle fleet. About a quarter of primary PM_{10} emissions in the UK are derived from road transport.

7.275 Particulate matter appears to be associated with a range of symptoms of ill health including effects on the respiratory and cardiovascular systems, on asthma and on mortality. Reviews by the World Health Organisation (WHO) and Committee on the Medical Effects of Air Pollutants (COMEAP) have suggested that exposure to the finer $PM_{2.5}$fraction of particles, , gives a stronger association with the observed ill health effects.

Sulphur dioxide

7.276 Sulphur dioxide (SO_2) has long been recognised as a pollutant because of its role, along with particulate matter, in forming winter-time smog. Studies indicate that SO_2 causes nerve stimulation in the lining of the nose and throat. This can cause irritation, coughing and a feeling of chest tightness, which may cause the airways to narrow. People suffering from asthma are considered to be particularly sensitive to SO_2 concentrations. Fuel combustion accounted for 95% of UK SO_2 emissions in 2014 with the main source being the combustion of solid fuel, mainly coal, which has a high sulphur content, relative to other fuels.

7.277 Emissions of SO_2 can also have an adverse effect on sensitive ecosystems, through acidification processes.

Dust

7.278 Dust is defined within the Institute of Air Quality Management (IAQM) Construction Dust Guidance (2014) as solid particles that are suspended in air, or have settled out onto a surface after having been suspended in air. It includes particles that give rise to soiling (deposited dust) and to human health and ecological effects (predominantly PM_{10}). There is evidence that major construction sites can lead to an increase in annual mean PM10 concentrations and the number of exceedances of the short term 24-hour objective for PM_{10}. In addition, construction activities have the potential to cause higher than normal levels of dust deposition in the surrounding area.

7.279 Dust emissions from a construction site may be mechanically generated due to land preparation (e.g. demolition, land clearing and earth moving) or as a result of releases from site plant and from the movement of road vehicles on temporary roads, open ground and haul routes.

Air Quality Legislation

7.280 Air quality criteria can be readily divided into two groups; those that are mandatory and those that are designed for guidance. Mandatory criteria that apply to the UK are the objectives from the 2007 Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland, and the Directive 2008/50/EC on ambient air quality and cleaner air for Europe ("Air Quality Directive") limit values, which are incorporated into national legislation, as listed below.

7.281 The following legislation is relevant to air quality regulation within England:

- The Air Quality Standards Regulations 2010 (Statutory Instrument (SI) 2010 No. 1001)which implements mandatory legislative air quality criteria for human health and vegetation, set in EU Directive 2008/50/EC; and
- The Air Quality (England) Regulations 2000 (SI 2000 No. 928, as amended) which enact the air quality objectives applicable to local air quality management (LAQM); and
- Critical levels for the protection of vegetation for oxides of nitrogen based on the work of the United Nations Economic Commission for Europe (UNECE) and World Health Organisation (WHO), as incorporated into the Air Quality Limit Value Regulations (SI 2003 No. 2121) (as amended)

7.282 Statutory responsibility for achieving EU limit values rests with the Secretary of State for Environment, Food and Rural Affairs. The Secretary of State has produced plans for zones and agglomerations that are predicted to

exceed the mandatory EU limit values[59]. The subject of the DEFRA air quality plan is that of cities where exceedences of limit values have been identified and which require Clean Air Zones (CAZs). Thurrock Council lies within the Eastern (UK0029)[60] "non-agglomeration" zone; local road traffic is the dominant source of emissions of NO_x in this zone, particularly HGVs.

7.283 The Secretary of State is currently revising the UK's air quality plan to achieve the mandatory EU limit values (as a result of recent case law)[61]. On 2nd November, environmental law firm ClientEarth won a High Court case against the UK Government over the failure of ministers to put adequate measures in place to address exceedences of the EU limit values in various locations in the UK. The case ruled[62] that the Secretary of State had failed to take measures that would bring the UK into compliance with the law "*as soon as possible*" and that the model for future emissions was "*too optimistic*".

7.284 The 2007 Air Quality Strategy for England, Scotland, Wales and Northern Ireland (UK AQS) sets out the national air quality standards and objectives for a number of local air pollutants[63]. The relevant statutory air quality criteria for the protection of human health are outlined in Table 7.7. Local authorities have no formal responsibility for achieving the national air quality criteria, although they should contribute to this through local action plans designed to reduce air pollution in air quality management areas (AQMAs).

[59] https://www.gov.uk/government/collections/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2015

[60] https://uk-air.defra.gov.uk/assets/documents/no2ten/UK0029.pdf

[61] The Ambient Air Quality Directive 2008/50/EC judgment (R (on the application of ClientEarth) v Secretary of State for the Environment, Food and Rural Affairs [2015] UKSC 28) has asked for the production of a new Air Quality Plan for the achievement of EU air quality limit values for nitrogen dioxide (NO_2) in the UK.

[62] https://www.judiciary.gov.uk/wp-content/uploads/2016/11/clientearth-v-ssenviron-food-rural-affairs-judgment-021116.pdf

[63] The standards define the level of pollution below which health effects are expected to be minimum or low risk, even by the most sensitive members of the population. The objectives are targets for air pollution concentrations, to be achieved by a specified timescale, which take account of the costs and benefits of achieving the standard, either without exception or, for certain short term averaging period standards, with a permitted number of exceedances.

Table 7.7: Statutory Air Quality Criteria

Pollutant	Criteria
NO_2	Hourly average concentration should not exceed 200 µg/m^3 more than 18 times a year Annual mean concentration should not exceed 40 µg/m^3
PM_{10}	24-hour mean concentration should not exceed 50 µg/m^3 more than 35 times a year Annual mean concentration should not exceed 40 µg/m^3
$PM_{2.5}$	UK (except Scotland): annual mean concentration should not exceed 25 µg/m^3 by 2010† Exposure reduction^ (UK urban areas): target of 15% reduction in concentrations at urban background between 2010 and 2020*
SO_2	15-minute mean concentration should not exceed 266 µg/m^3 more than 35 times a year Hourly mean concentration should not exceed 350 µg/m^3 more than 24 times a year 24-hour mean concentration should not exceed 125 µg/m^3 more than 3 times a year
† EU limit value is 25 µg/m^3 to be met by 2015, with a requirement in urban areas to bring exposure down to below 20 µg/m^3 by 2015. ^ New European obligations for a target of 20% reduction * 25 µg/m^3 is a cap to be seen in conjunction with 15% reduction	

7.285 The AQS objectives only apply in locations likely to have 'relevant exposure' i.e. where members of the public are exposed for periods equal to or exceeding the averaging periods set for the standards. For this assessment, locations of relevant exposure include building façades of residential premises, schools, public buildings and medical facilities; places of work (other than certain community facilities) are excluded.

Local Air Quality Management

7.286 Under Part IV of the Environment Act 1995 all local authorities are responsible for Local Air Quality Management (LAQM), the mechanism by which the Government's AQS objectives are to be achieved. Where a local authority anticipates an objective is expected to be breached within their area, they must designate an Air Quality Management Area (AQMA) and develop an action plan to improve pollution levels and work towards achieving the AQS objectives.

7.287 Under the current LAQM regime, a local authority is responsible for regular review and assessment of local air quality, reports on which are published following public consultation and review by Defra. Guidance concerning the modelling and monitoring of local air quality is given in Defra's technical guidance LAQM.TG(16)[64]; the guidance provides relevant methods concerning treatment and interpretation of data that can be applied more widely in development assessments.

[64] London Local Air Quality Management (LLAQM) Technical Guidance 2016 (LLAQM.TG(16))

Ecological criteria

7.288 The EU Directive sets Critical Levels for annual mean concentrations to protect sensitive vegetation. These are included in the Air Quality Standards Regulations 2010. The Critical Level for annual mean NOx for the protection of vegetation is 30 µg/m^3 while that for SO_2 (expressed as an annual mean and winter mean[65]) is 20 µg/m^3.

7.289 Assessment of compliance with the critical level for the protection of vegetation is required at locations more than 20 km from towns with more than 250,000 inhabitants or more than 5 km from other built-up areas, industrial installations or motorways or major roads with traffic counts of more than 50,000 vehicles per day. It is, however, applied as a benchmark in all designated sites for assessment purposes.

7.290 Critical loads for nitrogen and acid deposition have been set by the UNECE. A critical load is a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur, according to present knowledge. Critical loads vary by type of habitat and species. The critical load for deposition (eutrophication) is given as a range and is quoted in units of kg/ha/year. A single critical load is quoted for acidification, in units of keq/ha/year. The critical load for acidification considers both nitrogen and sulphur deposition fluxes.

Dust

7.291 There are no national standards or guidelines for dust deposition currently set for the UK, nor by the European Union or WHO. This is mainly due to the difficulty in setting a standard that would need to relate to dust being a perceptual problem rather than being specifically related to health effects. Typically there is a 'likelihood of complaint' in residential areas where measured dust deposition rates (as an average measured over a month using a passive deposition gauge) are 200 mg/m^2/day or greater.

Planning Policy

7.292 The Government's planning guidance of general relevance to air quality is found within the National Planning Policy Framework (NPPF), which states that: *"Planning policies should sustain compliance with and contribute towards EU limit* values *or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan."*

7.293 Planning Practice Guidance for air quality is intended to support the NPPF and provide further detail to its policies. It indicates at paragraph 006 that information relating to air quality could be important to decision makers, and

[65] Winter period runs from 1st of October to 31st March.

when there are concerns about air quality, the local planning authority may want to know about:

- "the 'baseline' local air quality;
- whether the Proposed Development could significantly change air quality during the construction and operational phases; and/or
- whether there is likely to be a significant increase in the number of people exposed to a problem with air quality, such as when new residential properties are proposed in an area known to experience poor air quality."

7.294 It also advocates, at paragraph 006, early engagement with the local planning and environmental health departments to establish the scope of any assessment. Guidance is also given on the level of detail required in an air quality assessment, and measures which could be employed to mitigate adverse effects.

7.295 The National Policy Statement (NPS) for Ports[66] identifies key emission sources to include:

- large volumes of HGV traffic…, with emissions exacerbated by congestion and stop-start driving conditions;
- emissions (especially sulphur dioxide) from ships entering the port and using coastal routes, estuaries and inland waterways; and
- certain cargoes such as cements and aggregates which can cause local dust pollution.

7.296 The NPS for Ports also provides guidance to mitigate air quality emissions due to port activity – including vehicular and nautical. One example of such mitigation is the function of cold-ironing – the use of fixed shore side electrical power to replace ship's generators when they are at port.

7.297 Section 5.92 of the Thurrock Core Strategy makes reference to the Thurrock Transport Strategy 2008 – 2021[67]. This Strategy sets out how transport improvements will be delivered between 2008 and 2021 and establishes how congestion, road safety, air quality and better access to services will be addressed in Thurrock. It goes on to state that the Transport Strategy will help improve air quality and minimise emissions by reducing the need to travel and encouraging modal shift. Policy CSTP14 of the Core Strategy (Transport in the Thurrock Urban Area: Purfleet to Tilbury) includes the following measures:

- VI. Employ Smarter Choices measures[68] to change travel behaviour to achieve a reduction in forecast traffic and help to deliver better air quality

66 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/3931/national-policy-statement-ports.pdf

67 https://www.thurrock.gov.uk/sites/default/files/assets/documents/ex118_nppf_transport_strategy_2008.pdf [accessed 11.08.16]

68 Smarter Choices are techniques for influencing people's travel behaviour towards more sustainable options such as encouraging school, workplace and individualised travel

and a better environment for job creation. Priority areas for Smarter Choices programmes include Grays and Lakeside.

- VII. Identify priority areas such as Grays town centre and Lakeside Basin, for network efficiency improvement measures to address congestion and air quality issues. Other Air Quality Management Areas as well as growth/regeneration areas will undergo transport network improvements, including where improved access is required.

7.298 Section 5.115 of the Core Strategy introduces the Thurrock Green Infrastructure Plan, which in principle puts natural environment features and processes at the centre of land use management and development of private and public land. Such green infrastructure is recognised for its importance in regulating air quality and climate, among other ecosystem functions.

7.299 Section 6.5 of the Core Strategy document states that the main sources of pollution in Thurrock are emissions from road transport and industrial processes, with Heavy Goods Vehicles (HGVs) being the primary contributors to road traffic related pollution. Section 6.5 of the Core Strategy document goes on to highlight the fact that there are a number of Air Quality Management Areas (AQMAs) in Thurrock, particularly in close proximity to key transport routes such as the M25 and A13.

Baseline Conditions

7.300 An initial review of baseline air quality in the vicinity of the proposed scheme has been carried out. The review has been undertaken with reference to the following sources of information:

- Boundaries of Air Quality Management Areas (AQMAs)[69];
- LAQM review and assessment reports and associated air quality monitoring data in the study area[70]; and
- Background data from Defra's UK Air Information Resource (UK-AIR) website[71].

7.301 The port and related developments are wholly contained within one local authority area – Thurrock Council. The air quality study area considered in this scoping assessment is shown in Figure 7.5 in relation to potential construction impacts and Figure 7.6 in relation to potential operational impacts (changes in traffic emissions). The final air quality study area will be determined at the EIA assessment stage, once the project design has been finalised and potentially revised traffic data are available.

7.302 Thurrock Council has declared 16 AQMAs, which are located throughout Thurrock along the busiest roads; the AQMA are shown in Figure 3. The closest AQMA to the proposed scheme is in Tilbury, along Calcutta Road,

planning. Smarter Choices also seek to improve public transport and the advertising/marketing of travel awareness campaigns such as car share schemes.

[69] Defra Air Quality Management Areas available at: http://uk-air.Defra.gov.uk/aqma/maps.

[70] https://www.thurrock.gov.uk/air-quality/air-quality-monitoring

[71] UK-Air: Air Information Resource, DEFRA, 2015. http://uk-air.Defra.gov.uk/

Dock Road and St Chads Road, encompassing 78 properties[72]. The AQMA was declared due to exceedances of the annual mean objective for NO_2. It lies approximately 30 m to the north east of the indicative Order Limits.

7.303 Gravesham Borough Council has also declared an AQMA within Gravesend Town Centre, also due to air quality objectives in relation to NO_2 being exceeded.

Local Monitoring

7.304 Thurrock Council undertakes monitoring of local air quality in its administrative area, using both Continuous Monitoring Stations (CMS) and passive diffusion tubes (DT).

7.305 Currently there are four CMS sites within the borough which continuously monitor concentrations of NO_2, PM_{10}, $PM_{2.5}$ and SO_2. There are many more NO_2 DTs (DTs are a simpler measurement technique which gives an indication of annual mean concentrations.

7.306 The locations of local air quality monitoring sites within Thurrock are shown in Figure 7.5 below. The data gathered at CMS sites for the years 2011 to 2015 indicate that:

- annual mean NO_2 concentrations exceeded the AQS objective at Purfleet London Road (TK8) roadside site in all years;
- no other CMS sites exceeded the AQS annual mean objective;
- the hourly mean NO_2 AQS objective was met at all CMS sites in all years;
- annual mean PM_{10} concentrations were within the AQS objective at all sites in all years;
- no exceedances of the daily mean PM_{10} AQS objective were recorded at any site in any year;
- annual mean $PM_{2.5}$ concentrations were within the AQS objective at the one site at which it is monitored, in Stanford le Hope Manorway (TK3); and
- the 15 minute average concentration of SO_2 met all short-term objectives in Tilbury in 2014 (where the analyser was recently redeployed).

7.307 Figure 7.2 illustrates monitored trends in annual mean NO_2 concentrations between 2011 and 2015 at CMS sites for which suitable data are available. Annual mean NO_2 concentrations have decreased at a similar rate in recent years at all sites in the local authority area although Thurrock Grays AURN[73] shows less of a marked decrease than the others.

[72] https://www.thurrock.gov.uk/air-quality/air-quality-management-areas
[73] AURN – Automatic Urban and Rural Network; national air quality monitoring network operated by DEFRA (https://uk-air.defra.gov.uk/networks/network-info?view=aurn)

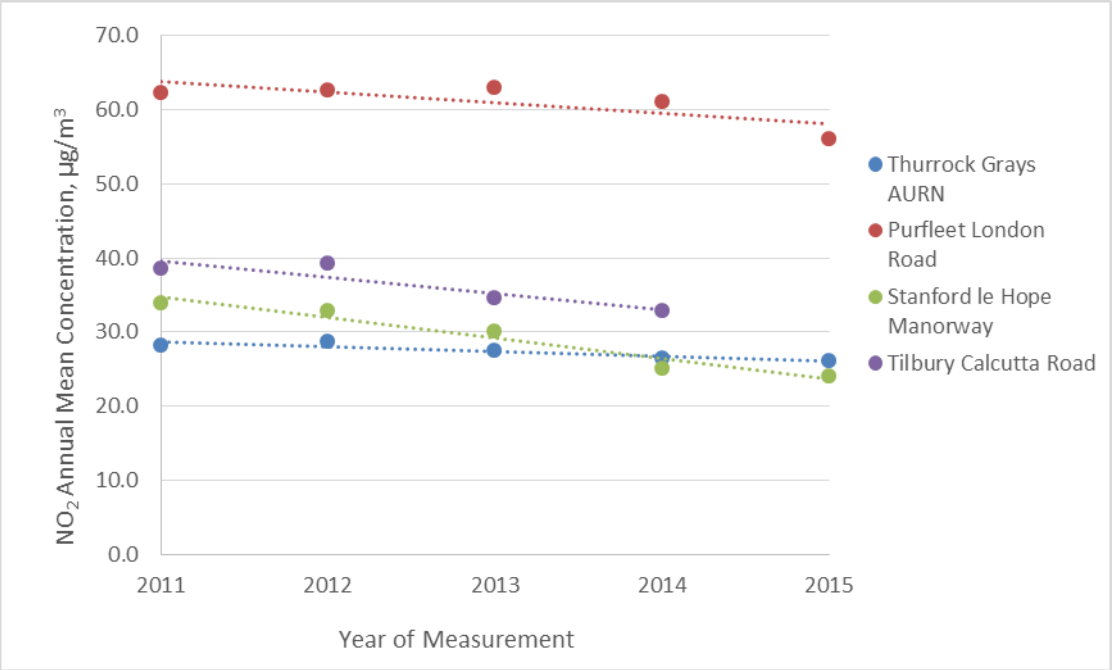


Figure 7.2 Monitored Trends in Annual Mean NO_2 at CMS Sites

7.308 Measurements made between 2011 and 2014 at each of the diffusion tube monitoring sites in Thurrock[74] indicate that there were exceedances of the annual mean AQS objective (40 µg/m^3) at a number of sites during this period, at both roadside and urban background locations, including locations within the Tilbury AQMA and other AQMAs in the wider Thurrock area. The monitoring site of most relevance to the proposed scheme is located on St Andrews Road, Tilbury (A1089). Monitoring results at this site indicate that the annual mean AQS objective was achieved at this site in both 2014 and 2015 (2016 data are not currently available). Exceedances of the annual mean AQS objective were however recorded in 2012 and 2013 at this location.

7.309 On the basis of the available monitoring data, it is concluded that exceedances of the annual mean NO_2 AQS objective have the potential to occur in the air quality study area without the scheme in the opening year, but that AQS objectives for PM_{10}, $PM_{2.5}$ and SO_2 are likely to be achieved.

Background Maps

7.310 Estimates of current and future year background pollutant concentrations in the UK are available on the DEFRA UK-AIR website[75]. Background estimates are available for one kilometre grid squares for years between 2013 and 2030.

7.311 Estimated annual mean background concentrations of NO_2 and PM_{10} for 2015 (the base year) were obtained for 10 grid squares covering the

[74] https://www.thurrock.gov.uk/sites/default/files/assets/documents/air-quality-report-2015.pdf
[75] https://uk-air.defra.gov.uk/

anticipated study area (Table 7.8). In all cases, the mapped background concentrations of NO_2 and PM_{10} are well below (less than 75% of) the annual mean AQS objectives of 40 µg/m^3.

Table 7.8: Modelled Background Concentrations (2015)Grid Reference	**2015**	
	NO_2	**PM_{10}**
557500 ; 179500	26.7	19.7
557500 ; 181500	21.4	18.5
561500 ; 180500	20.6	18.7
563500 ; 180500	21.5	18.9
564500 ; 181500	18.2	17.2
563500 ; 179500	18.2	17.5
563500 ; 177500	16.7	18.0
563500 ; 176500	17.7	16.6
564500 ; 175500	16.6	15.5
565500 ; 176500	15.4	16.0

Meteorology

7.312 The joint frequency distribution of wind speeds and directions is a consideration affecting the dispersion of dust during construction operations. Additional meteorological parameters are required for atmospheric dispersion modelling studies.

7.313 The Meteorological Office station most representative of conditions at Tilbury, with adequate hourly sequential data for dispersion modelling, is London City. The windrose for London City for the period 2008 – 2012 is given in Figure 7.3 below.

7.314 This shows that the prevailing winds are from the south west and adjoining sectors. The closest receptors in the town of Tilbury (to the north west of the main site and north of the link road) are therefore for the most part not downwind of the proposed scheme. There is a notable easterly component to the windrose, which could carry dust towards Tilbury on occasion. Meteorological conditions will be considered in more detail in the EIA including seasonality.

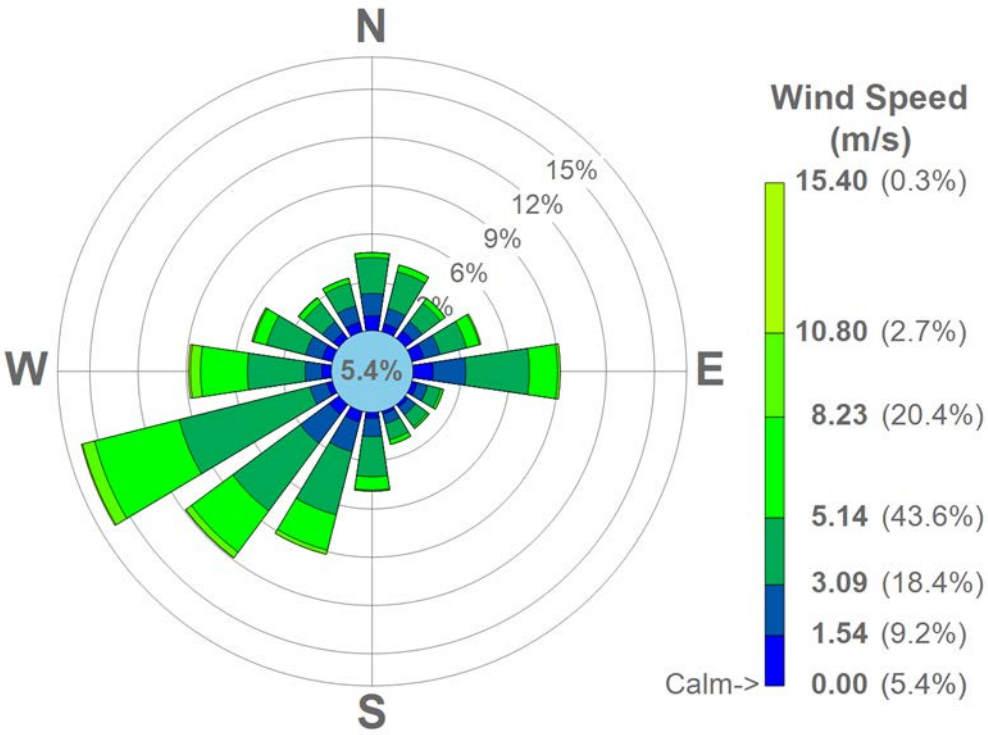


Figure 7.3: London City Windrose, 2008-2012

Sensitive receptors

7.315 From a local air quality perspective, sensitive receptors include residential properties and locations where there are likely to be vulnerable occupants, such as hospitals, nursing homes and schools, as well as designated ecological sites (Ramsar, SAC, SPA, SSSI). Commercial premises may also be sensitive to dust, both during construction and operation

7.316 The residential properties closest to the indicative Order Limits (which includes the main site plus access corridor) are those in the south east quadrant of Tilbury, along Sandhurst Road, London Road, Hume Avenue and Dock Road. Further afield, properties in South Ockendon, Grays, Aveley, Little Thurrock and Chadwell St Mary are close to roads that will be used by vehicles accessing the scheme. Schools within 200m of the affected road network include Lansdowne Primary Academy, St Mary' RC Primary School, Palmers College, Woodside Academy and William Edwards Academy. No nursing homes, hospices or hospitals have been identified at this stage within 200m of the affected road network.

7.317 Short term exposure to air pollutants and dust emissions may also occur along the public right of way network. An existing public rights of way currently passes through the site, namely public footpath no. 146.

7.318 Key commercial receptors that may be sensitive to dust emissions include the Port of Tilbury mainland car delivery centres (comprising large car parks) adjacent to the haul route along Fort Road and the A1089.

7.319 Statutory designed ecological sites (SSSI, SPA, SAC, Ramsar) closest to the proposal are shown in Figure 7.4. None of the sites are within 350 m of the construction area boundary or within 200 m of affected road network or potential haul routes or within 1km of the port.

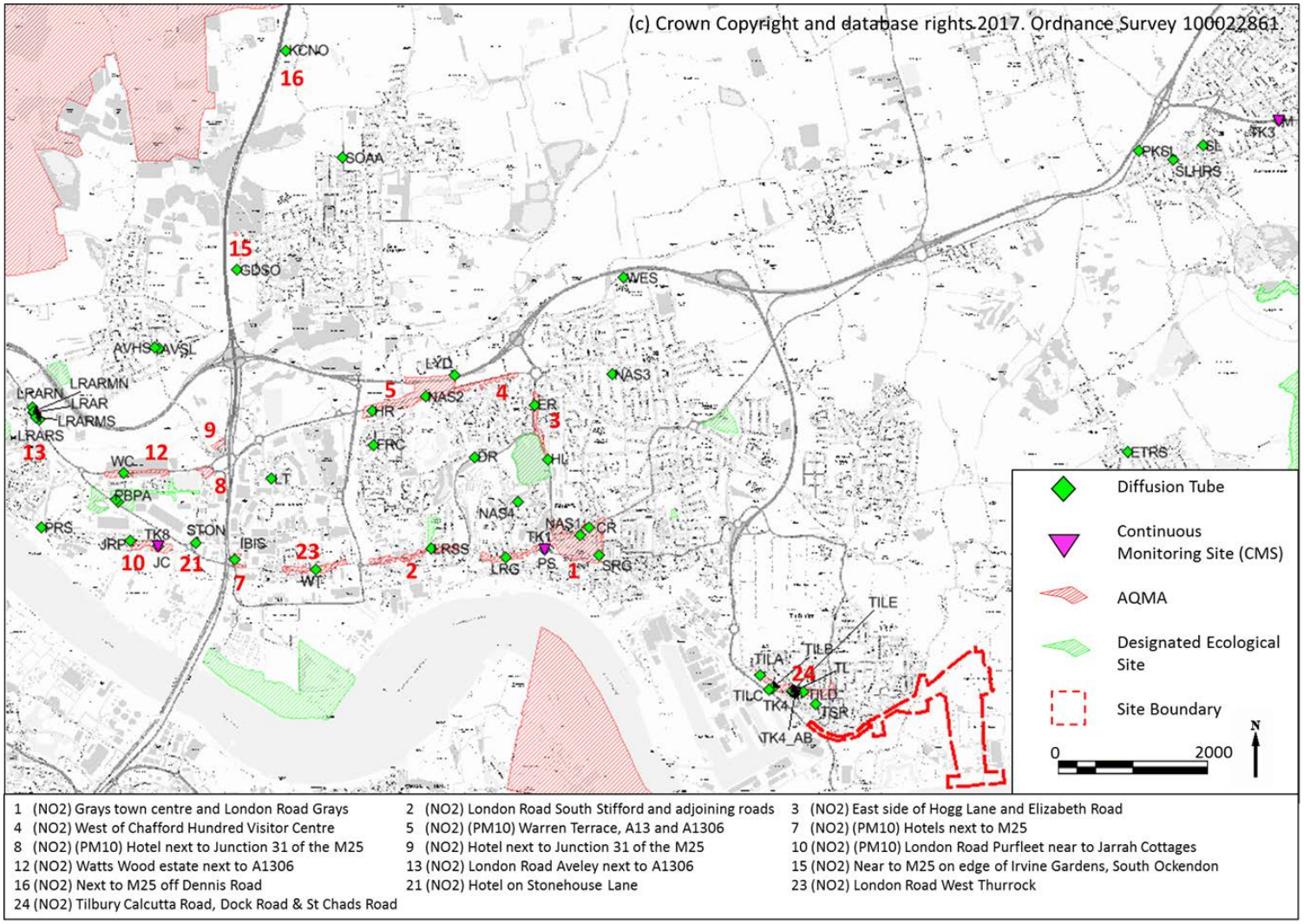


Figure 7.4: AQMAs, Monitoring Sites and Designated Ecological Sites (note: site boundary is indicative)

Initial Assessment of Potential Impacts

Construction Phase - Dust Emissions

7.320 The 2014 IAQM Construction Dust Guidance provides a framework for undertaking risk assessment of construction dust emissions. It considers activities with dust raising potential to comprise demolition, earthworks, construction and trackout (i.e. deposition of mud and dust on to public highways by vehicles leaving construction sites). The site is presently being

cleared of most existing structures related to its use as a Power Station. All structures will be removed from the site prior to the submission of the DCO application with the exception of certain buildings and structures identified in Table 5.1. Material from these buildings will be crushed and re-used on site; such activities have a high potential to give rise to fugitive dust emissions.

7.321 An initial screening assessment to identify potential sensitive receptors has been carried out using Ordnance Survey mapping. Figure 7.6 clearly shows a number of "human" receptors (residential properties, commercial premises, car parks) within 350m of the indicative Order Limits and within 50m of potential haul routes (up to 500m from the site entrance). There are no ecological sites (including local wildlife sites) within 50m of either the indicative Order Limits or potential haul routes.

7.322 These distances represent the maximum distances over which associated construction dust impacts have the potential to occur. It is also a worst case approach as it assumes construction activities may occur at any point within the indicative Order Limits.

7.323 This will be considered further in the ES and necessary mitigation measures identified.

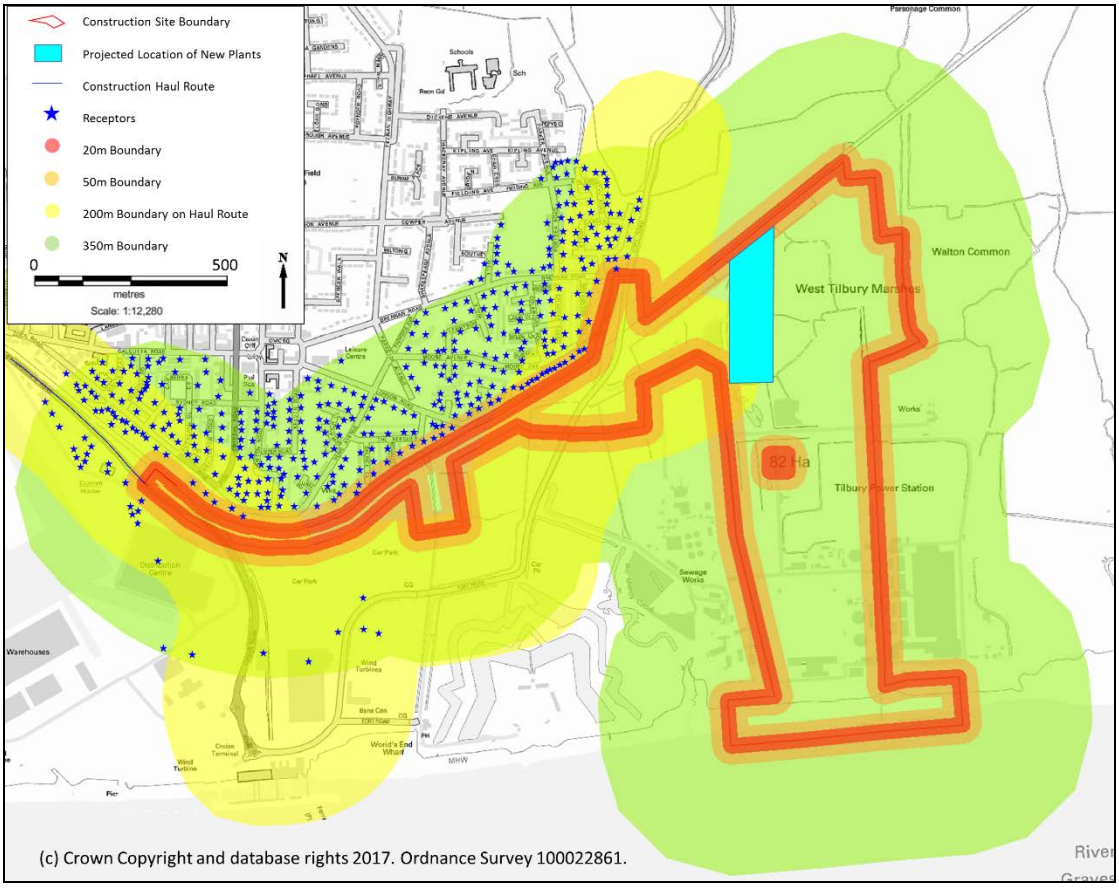


Figure 7.5: Construction Dust and Traffic Emissions Constraints Map (note: construction site boundary is indicative)

Construction Phase – Plant Emissions

7.324 During the construction phase, there may be temporary changes in local air quality due to exhaust emissions from construction plant used on site.

7.325 Plant will be used, for example, for dredging, piling, excavation, creation of hard surfaces, and the construction of a new road and rail link. Limits on plant emissions would be set, which contractors would be required to meet. Exact details of the numbers and type of plant are not available at the time of writing, however due to the short-term operational nature of the equipment it is likely that there would be no measurable effect on air quality. No further assessment is currently proposed at EIA stage.

Construction Phase – Vehicle Emissions

7.326 Exhaust emissions from construction/operative vehicles travelling to and from construction sites along designated routes may affect air quality.

7.327 According to Highways England guidance on air quality, set out in the Design Manual for Roads and Bridges (DMRB), Volume 11.3.1 (HA207/07)[76]), exhaust emissions from vehicles have the potential to affect local air quality at sensitive receptors, and requires an assessment of if they are located within 200m. Figure 7.5 confirms that there are residential properties within 200m of potential haul routes.

7.328 In order to assess the potential for vehicle emissions to affect local air quality during construction, the likely type and number of vehicles travelling to site and the route they are likely to take must be considered. Construction vehicle movements will be estimated by i-Transport and further assessment will be undertaken at EIA stage. This will include the potential for impacts in Thurrock as well as neighbouring boroughs.

Operational Phase – Vehicle Emissions

7.329 An initial screening assessment of operational effects of the scheme in terms of vehicle emissions has been undertaken using provisional traffic data provided by i-Transport.[77]

7.330 Correspondence with Thurrock Council at the pre-application stage suggested that the spreadsheet-based DMRB screening method[78] would be an appropriate means of assessment to determine the impact of vehicle emissions on local air quality.

7.331 It is now widely recognised that the DMRB screening tool does not contain the most up to date version of vehicle emission factors and fleet composition and that future estimates may be optimistic. The DMRB dispersion algorithm was therefore combined with the DEFRA's latest Emissions

[76] http://www.standardsforhighways.co.uk/ha/standards/DMRB/vol11/section3.htm
[77] This data is in the process of being reviewed as the various component uses within the Terminal are refined.
[78] http://laqm.defra.gov.uk/review-and-assessment/tools/modelling.html

Factors Toolkit (EFT, version 7.0, July 2016)[79], in order to estimate road contributions of NOx and PM_{10}. The dispersion algorithm contained within the DMRB tool has thus been combined with the latest vehicle fleet and emission estimates in order to provide a more robust estimate of the contribution from road sources to ambient concentrations. A sensitive test using conservative assumptions for future background concentrations and emissions was also undertaken to account for uncertainty at this stage.

7.332 The first stage in the initial screening assessment was to define the affected road network (ARN). This was undertaken with reference to the stringent criteria contained in the 2017 EPUK / IAQM Land-Use Planning and Development Control Guidance[80]. The EPUK/IAQM criteria (reproduced below in Table 7.9 below) provide an indication as to when an air quality assessment is likely to be required to assess the impacts of a proposed development on the local area. These criteria were preferred over the screening criteria utilised primarily for major road schemes contained in the DMRB (HA207/07) and its associated Interim Advice Notes.

7.333 The EPUK/IAQM guidance indicates that where an air quality assessment is identified as being required due to one or more of these criteria being exceeded, this may take the form of either a Simple Assessment (i.e. one relying on already published information and without quantification of impacts) or a Detailed Assessment (i.e. one completed with the aid of a predictive technique, such as a dispersion model). In other words, meeting a screening criterion in itself does not automatically lead to the requirement for a Detailed Assessment. If none of the criteria in Table 7.9 are met, the guidance indicates that there should be no requirement to carry out an air quality assessment for the impact of the development on the local area, and the impacts can be considered as having an insignificant effect.

Table 7.9: Stage 2 2017 EPUK / IAQM Screening Criteria

The Development Will:	**Indicative Criteria to Proceed to an Air Quality Assessment**
1. Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans <3.5t gross vehicle weight)	A change of LDV flows of: • more than 100 AADT within or adjacent to an AQMA • more than 500 AADT elsewhere
2. Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of • more than 25 AADT within or adjacent to an AQMA • more than 100 AADT elsewhere
3. Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA
4. Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
5. Introduce or change a bus station.	Where bus flows will change by:

[79] http://laqm.defra.gov.uk/review-and-assessment/tools/emissions-factors-toolkit.html
[80] http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf

The Development Will:	Indicative Criteria to Proceed to an Air Quality Assessment
	• more than 25 AADT within or adjacent to an AQMA • more than 100 AADT elsewhere
6. Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor Coupled with the car park having more than 100 movements per day (total in and out)
7. Have one or more substantial combustion processes	Where the combustion unit is: • any centralised plant using bio fuel • any combustion plant with single or combined thermal input >300kW • a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year)
8. Have a combustion process of any size	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way of their size and/or height.
Source: EPUK / IAQM, Land-use Planning & Development Control: Planning for Air Quality (May 2015), Table 6.2.	

7.334 The changes in traffic on key road links are described in Table 7.10 and illustrated in Figure 7.6. The comparison of traffic data against the EPUK/IAQM screening criteria indicated that, with the exception of Fort Road (North of Site Access), changes in Heavy Duty Vehicle (HDV) traffic on all road links exceed the relevant screening criterion. On some roads e.g. the A13 and A1089, the increase is substantial (as a 24 hour two way average flow). The changes on most roads also exceeded the DMRB criterion of 200 movements (as a 24 hour average flow) including on the M25 at Junction 30.

7.335 Changes in LDV traffic are also expected to exceed the EPUK/IAQM criteria at the following locations:

- Fort Road (South of Site Access)
- Site Access
- Ferry Road (North of Link Road)
- Proposed Link Road (also exceeds the DMRB LDV criterion of 1000).

Table 7.10: Modelled Road Links

Link Road ID	Road Link	Description	Within or Adjacent to* AQMA	Change in AADT	
				LDV	HDV
1	A13	East of A1089	No	56	**448**
2	A13	West of A1089	Yes	60	**1342**
3	A13	Westbound (Off-slip)	No	28	**224**
4	A13	Westbound (On-Slip)	No	30	**671**
5	A13	Eastbound (Off-Slip)	No	30	**671**
6	A13	Eastbound (On-Slip)	No	28	**224**
7	A1089	North of A126 Slip Roads	No	116	**1790**
8	A1089	South of A126 Slip Roads	No	164	**1790**
9	A1089	St Andrews Road, N of Gate 1	No	164	**1790**
10	A1089	Ferry Road (N of link road)	Yes	**164**	**1788**
11	A1089	Ferry Road (S of link road)	No	44	**-144**
12	Fort Road	South of Site Access	No	**-564**	**-144**
13	Fort Road	North of Site Access	No	36	0
14	Site Access	Site Access	No	**808**	**1788**
15	Link Road	Proposed Link Road	No	**1336**	**1932**
16	A13	East of M25 Jct 30	No	60	**1342**
17	A13	West of M25 Jct 30	No	26	**334**
18	M25	North of Jct 30	Yes	16	**468**
19	M25	South of Jct 30	Yes	10	**216**

Note: Values in **bold** type denote exceedances of EPUK/IAQM screening criteria.
* Within 200m of
** As specified above, values are based on screening assessment using provisional traffic data

7.336 The traffic screening exercise suggests that the proposed scheme has the potential to result in increases in traffic flows on the existing local road network in excess of relevant screening criteria. Therefore, and as agreed with Thurrock Council through the previous formal EIA scoping process, annual mean concentrations of NO_2 and PM_{10} as a result of the scheme have been estimated at selected sensitive receptor locations using the DMRB Screening Methodology[81].

7.337 Information on traffic flows, vehicle emission rates and road-receptor distances were used to estimate annual mean local air pollutant concentrations at fifteen receptor locations within 200m of the ARN. The modelled road contributions were combined with background

[81] http://laqm.defra.gov.uk/review-and-assessment/tools/modelling.html

concentrations, obtained from the DEFRA maps (see Table 7.8), to give an estimate of the total concentration for comparison with AQS objectives.

7.338 Concentrations of NO_2, and PM_{10} were estimated at fifteen sensitive receptors (thirteen residential properties and two hotels) using the latest versions of the supporting set of LAQM tools from DEFRA (as described in technical guidance LAQM.TG16). A precautionary approach was applied when projecting future year concentrations; background NO_2 and PM_{10} concentrations in 2019 were assumed to be the same as in 2015. This allows for uncertainty in emissions performance of vehicles, in particular those of NOx from diesel engines.

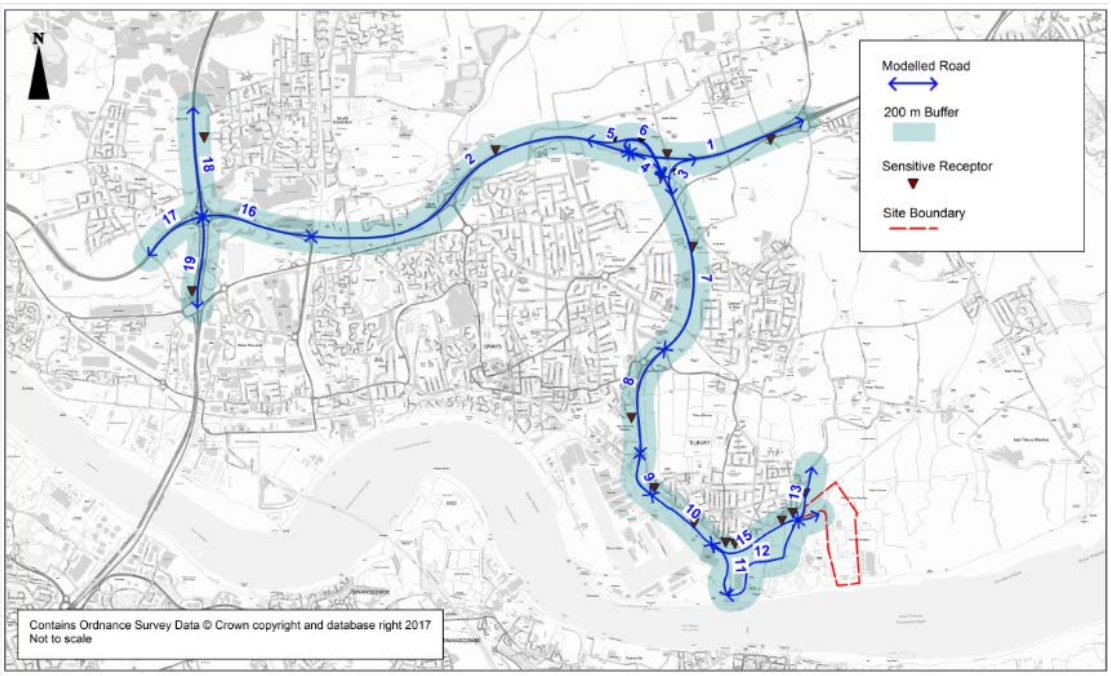


Figure 7.6 : Locations of Representative Human Health Receptors near the ARN (note: site boundary is indicative)

7.339 The results from this initial screening exercise indicate that, with the exception of a receptor on Baker Street (near the A13/A1089 junction) concentrations of NO_2 are expected to be below the annual mean AQS objective at all assessed locations in 2019. Annual mean concentrations of PM_{10} are also expected to be below the AQS objective at all locations in the opening year. The impact of the proposed scheme on annual mean concentrations was estimated to be 'negligible' to 'slight' at all locations and therefore the proposed scheme is not expected to result in significant adverse effects in relation to annual mean NO_2 and PM_{10} concentrations.

7.340 Owing, however, to the potential for exceedances of the annual mean NO_2 objective in the opening year, the increases on local roads of substantial numbers of HGV movements as a result of the scheme, the presence of an AQMA and the current uncertainty regarding air pollution emissions and trends, it is recommended that the EIA comprises further assessment of

road emissions using a detailed dispersion model. When the formal EIA is undertaken the most up-to-date set of DEFRA emission factors will be used in the model, which, depending on the timing of government's response to the Client Earth case, will potentially incorporate revised vehicle emission factors, or in their absence, suitably robust assumptions and sensitivity tests to allow for uncertainty to be adequately accounted for when estimating future conditions. Assessed receptor locations at the EIA stage are likely to include residential properties in Tilbury (near to the proposed road and rail corridor and existing AQMA) and other sensitive locations outside of Tilbury, including those adjacent to the wider ARN for instance the A1089, A13 and potentially the M25[82].

7.341 Where possible the model will be verified using local monitoring data collected by Thurrock Council in Tilbury and at other monitoring locations, where appropriate.

Operational Phase – Point Sources

7.342 In addition to vehicle emissions, the proposed development may incorporate on-site stationary combustion sources associated with the industry that will be operational. These may contribute to local concentrations of NO_2 and PM_{10}, depending on their size and location. This will need to be confirmed once a more detailed design is available as part of the EIA process.

Operational Phase – Fugitive Dust

7.343 The IAQM Minerals Planning Guidance[83] states that emissions of dust to air from minerals sites can occur during the preparation of the land, extraction, processing, handling and transportation of extracted minerals. The proposed scheme will consist of a new aggregates and construction materials terminal, an extension to the existing conveyor system and materials processing facilities including: an asphalt plant, a block plant and a cement batching plant. The latter are located in the northern extent of the main site, as indicated on Figure 7.6. These are considered, like minerals sites, to have a high potential for dust emissions, in the absence of suitable mitigation.

7.344 The main potential impact is that of dust deposited on surfaces. The Minerals section of the national planning policy guidance is not prescriptive on how that impact should be assessed, but does suggest the following approach:

- identify the location of dust-sensitive land uses in relation to the site, as well as proposed or likely sources of dust emission from within the site.
- consider how topography may affect the emission and dispersal of site dust, particularly the influence of areas of woodland, and of valley or hill formations in altering local wind patterns;

[82] The potential impact of operational traffic movements, for instance in the neighbouring London Borough of Havering area, will be considered as appropriate once revised traffic data are available and the ARN determined.
[83] http://www.iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

- consider how climate is likely to influence dispersion by analysing meteorological data.

7.345 It is possible to screen out the need for a detailed assessment based on the distance from a mineral site to potentially sensitive receptors. The IAQM Minerals Guidance suggests that dust impacts will occur mainly within 250m to 400m of the operation, although it is commonly accepted that the greatest impacts will be within 100m of a source (for both large (>30 µm) and small dust particles; see Box 2 of the guidance). Particles with a diameter of less than 10 µm have the potential to persist beyond 400m but with minimal significance due to dispersion. The guidance suggests that if there are relevant human and/or ecological receptors within 400m (from hard rock quarries) then an assessment of potential "disamenity" from dust impacts will almost always be required. This step is deliberately chosen to be conservative (and in practice results in assessments being required for most minerals development schemes).

7.346 A rapid appraisal has been made of the potential for impacts in the area surrounding the proposed scheme. In line with 2016 IAQM Minerals Guidance, this has considered:

- the likely magnitude of dust emissions (after control by measures are incorporated);
- the likely meteorological characteristics at the site;
- the dispersion and dilution afforded by the pathway to the receptors, taking into account distance, orientation, local terrain and features, and other relevant factors;
- the sensitivity of the receptors to disamenity, health and/or ecology effects; and
- any likely cumulative interactions.

7.347 The minerals handling and processing activities at Tilbury2 may need to be regulated under the Environmental Permitting (England and Wales) Regulations 2010 and will thus need to apply for a permit to operate, from the local authority or Environment Agency. Appropriate emission limit values will be set for particulate matter emission points and the operator will be required to undertake regular emissions monitoring, testing and inspections. This will ensure any pollution caused is reduced[84].

7.348 Designed-in mitigation measures together with operational measures will need to be appropriate to mitigate any potential impacts such that there is no significant pollution beyond the site boundary. Process Guidance Note 3/01(12) provides statutory guidance for blending, packing, loading, unloading and use of cement. It describes the transfer of powdered materials through a closed system of heavy duty hoses to storage silos, using compressed air as a carrier medium. Silos are vented to allow air to escape through filters, so controlling dust emission. For the whole process, the guidance requires no visible airborne emission to cross the site boundary such that harm or nuisance may be caused. It is expected that

[84] https://www.gov.uk/government/collections/defra-guidance-on-local-authority-pollution-control-lapc-regime

ship unloading of bulk cement out of bulk carriers for further conveyance, either directly to bulk trucks or to warehouse, will use mechanical equipment with a fully enclosed conveying system with a material intake underneath the materials surface in the ship's hold. To prevent the egress of dust from the warehouse building, negative pressure will be created inside the building. The magnitude of the dust emission source (abated) is thus considered to be small to medium.

7.349 A review of the windrose in Figure 7.3 shows that the prevailing wind direction is from the west south west and adjoining sectors while there is a secondary prevailing wind from the east. Wind speeds above 5 m/s (those associated with increased dust generation potential due to wind scouring of surfaces) are particularly infrequent from the south east (occurring <5% of the time).

7.350 Receptors closest to the aggregates processing facilities fall into the "distant" category (200-400m). According to IAQM Minerals Guidance this provides an "ineffective" pathway and thus presents a negligible risk for small to medium residual sources of emissions (including materials handling). Receptors along the new link road fall within the "close" category, however due to the infrequent nature of winds from the south east, this again provides an "ineffective" pathway and thus presents a negligible risk for the small source that is off-site transportation.

7.351 Background concentrations of PM_{10} in the area are well below the AQS objective of 40 µg/m^3 thus cumulative effects with existing operations nearby are considered to be unlikely.

Table 7.11 - Summary of Operational Dust Emissions Screening Exercise

Receptor location	Location to dust source	Residual Emissions	Pathway	Dust Risk	Receptor Sensitivity	Magnitude of Effect
Sandhurst Road	220 m "downwind" of materials handling	Medium	Ineffective	Low	High	Slight Adverse
London Road	30 m "upwind" of haul road	Small	Ineffective	Low	High	Slight Adverse

7.352 Recent planning decisions, and similar decisions in the devolved administrations, confirm that there is a general acceptance that dust emissions can be controlled and dust impacts can be adequately mitigated. On the basis of the rapid assessment findings, there is not considered to be a significant risk associated with fugitive dust and particulate emissions during operation and additional assessment is not required at EIA stage.

Operational Phase - Rail Emissions

7.353 Diesel or coal fired stationary locomotives can give rise to high short-term SO_2 concentrations near railway stations or depots. Additionally, moving

diesel locomotives can contribute to elevated short-term NO_2 concentrations close to the track along relevant, heavily trafficked lines. However, the contribution from rail transport to UK NO_x emissions compared to that of road transport is small (source: NAEI website and webTAG guidance).

7.354 DEFRA technical guidance LAQM.TG(16) provides screening criteria to determine whether emissions from railways require quantitative assessment. It states that further assessment is likely to be necessary where:

- Diesel or steam locomotives are regularly (at least three times per day) stationary for periods of 15 minutes or more and where there is relevant exposure within 15 m of the locomotives; or
- With respect to moving diesel locomotives, there is relevant exposure within 30 m of relevant railway lines and background NO_2 concentrations are greater than 25 µg/m^3 in areas near to heavily trafficked lines.

7.355 There is relevant exposure within 30m of the Tilbury2 railway access corridor. However, the expected increase in rail movements associated with the scheme is considered to be low and the current track is not classified by DEFRA as "heavily trafficked". On this basis, despite the proximity of the line to residential properties, emissions from rail transport are considered unlikely to be significant.

7.356 This conclusion will be reviewed at EIA stage and, where necessary, the cumulative impact of rail emissions may be taken into consideration in the road traffic emissions modelling described above.

Operational Phase - Shipping

7.357 Large ships may burn sulphur containing oils in their main engines. As a result, shipping operations at some large ports give rise to elevated short-term SO_2 concentrations, which can lead to exceedances of the 15-minute or 1-hour mean air quality objectives. However, the Merchant Shipping Regulations pollution legislation enforces a 1.5% sulphur limit (by mass) for fuels used by all ships in Emission Control Areas.

7.358 Engine emissions of NO_x and PM_{10} may also lead to elevated concentrations at sensitive receptors around ports.

7.359 DEFRA technical guidance LAQM.TG(16) provides screening criteria to determine whether emissions from shipping operations require quantitative assessment. Further assessment is likely to be necessary where:

- There are more than 5,000 large ship movements per year, with relevant exposure within 250m of the shipping berths and main areas of manoeuvring; or
- There are more than 15,000 large ship movements per year, with relevant exposure within 1 km of the port/shipping area.

7.360 There is relevant human exposure within 1 km of the Tilbury2 port/shipping area (within Gravesham Borough) but no statutory ecological sites.

7.361 The expected increases in shipping movements associated with the scheme are marginal (considerably less than 5,000 large ship movements per annum). On this basis, given the expected small number if additional shipping movements and the distance between Tilbury2 and sensitive areas such as Gravesham Town Centre, emissions from shipping, either in transit or at berth, are considered unlikely to be significant and it is likely that it will be scoped out of the EIA process. Accordingly, there is not considered to be any likely impacts on the Air Quality Management Area that has been declared within Gravesham Town Centre.

7.362 The need for further consideration of shipping emissions will be considered at the EIA stage in light of more detailed design and shipping movement data.

Cumulative impacts

7.363 Cumulative impacts and potential combinations of various effects due to other planned developments are not discussed herein; however these will be identified and considered as appropriate in the EIA.

Approach and Methodology

7.364 In accordance with the NPS for ports, the ES air quality chapter will describe existing air quality conditions, assess potentially significant sources of emissions to air, identify any significant deterioration in an area, or generation of a new area, where national air quality criteria are exceeded, recommend suitable mitigation and assess the magnitude of residual effects. Emissions during both the construction and operation of the scheme, including from road traffic generated by the scheme, will be considered.

7.365 The most up to date air quality baseline will be determined by examining monitoring undertaken by local and national authorities and by reviewing the most up to date background pollutant concentration mapping/data available from DEFRA. Air quality reports prepared by the local authority will also be consulted. Any new AQMAs and sensitive receptors since the scoping was undertaken will be identified. If required, additional baseline monitoring using NO_2 diffusion tubes will be undertaken at particular locations along the roads most likely to be affected by the scheme and where monitoring is not currently undertaken (e.g. the A1089) to support the assessment.

7.366 The risk of dust impacts at nearby receptors in relation to construction activities will be subject to further assessment at EIA stage, due to the presence of sensitive human receptors within 350m of the red line boundary. Assessment of impacts at ecological sites was found not to be required. The assessment of human impacts will be carried out in accordance with Stages 2 to 4 the 2014 IAQM Construction Dust Guidance. Key activities that will need to be considered in the dust assessment include: demolition of remaining on-site structures, crushing and screening of materials for reuse, concrete pouring, excavation, dredging and road and rail construction.

7.367 An assessment of dust emissions during scheme operation as a result of materials handling processes and off-site transport is not required, based on the findings of the rapid assessment using 2016 IAQM Minerals Guidance.

7.368 The initial screening of operational traffic emissions has concluded that a more detailed study should be undertaken at EIA stage due to the presence of AQMAs and potential exceedances of AQS objective for annual mean NO_2. This will be undertaken using a detailed dispersion model, ADMS Roads. The assessment will focus on NO_2 and particulate matter (PM_{10} and $PM_{2.5}$), as these are the pollutants of primary concern in the study area (note, SO_2 is primarily associated with shipping and industrial emissions rather than road transport emissions). The assessment will focus on effects on human health as there are no ecological sites within 200m of affected roads.

7.369 The approach to assessment will be discussed with the local authorities and Highways England, a statutory consultee. The affected road network includes sections of strategic trunk roads (including the A1089, A13 (west of the A1089) and the M25 motorway). A sensitivity test for long term trends, which is specifically for road schemes, will be undertaken in accordance with Highways England guidance set out in IAN 170/12 (v3)[85]. This will ensure that any uncertainty due to vehicle emissions now and in the future will be taken into consideration using an accepted methodology. The potential effect of the proposed scheme in terms of significance will be assessed in accordance with Interim Advice Note (IAN) 174/13[86] as well as with reference to 2017 IAQM Planning Guidance. The need for a compliance risk assessment in accordance with IAN 175/13 will be determined through further consultation with Highways England.

7.370 Further consideration of emissions from railways may be required depending on the eventual rail movements and the type of locomotive. Emission rates for diesel locomotives would be taken from a suitable source such as the Strategic Rail Authority (2001) Rail Emissions Model and Transport Analysis Guidance (webTAG[87]).

7.371 Further assessment of emissions from shipping operations is unlikely to be necessary as such sources are considered unlikely to be significant given the expected number of movements and distance from sensitive receptors. This conclusion will be revisited using the most up to date design information available at EIA stage.

[85] Interim Advice Note 170/12 – Updated Air Quality Advice on the Assessment of Future NOx and NO_2 Projections for Users of DMRB Volume 11, Section 3, Part 1 Air Quality Nov 2012
[86] Interim Advice Note 174/13 – Updated Advice for Evaluating Significant Local Air Quality Effects for Users of DMRB Volume 11 Section 3, Part 1 Air Quality (HA207/07) Jun 2013
[87] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/487684/TAG_unit_a3_envir_imp_app_dec_15.pdf

7.372 The need for dispersion modelling of small point sources such as combustion equipment on site will also be confirmed once a more detailed design is available.

7.373 The EIA will consider a robust yet reasonable "worst case" for the potential impacts of the scheme using the "Rochdale Envelope" approach where there is uncertainty regarding characteristics of the final design for the scheme[88]. For instance, the dust assessments may need to consider potential emissions anywhere within the indicative Order Limits; sensitive receptors closest to the affected road network will be selected for the assessment of impacts from vehicle emissions; and a sensitivity scenario will be modelled to examine the effect of uncertainty in vehicle emissions estimates and future trends in air quality.

7.374 Cumulative impacts with other proposed developments will be undertaken. The traffic model data used in the assessment will include, as a minimum, the effects of economic growth and committed developments in the opening year.

7.375 Suitable mitigation will be proposed where significant impacts are identified. Recommendations will be based on industry best practice, for example that contained within the Greater London Authority's Supplementary Planning Guidance for control of construction dust and the National Planning Statement for Ports as well as other relevant documents.

[88] https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2013/05/Advice-note-9.-Rochdale-envelope-web.pdf

WASTE AND MATERIALS

Overview of Baseline Conditions and Key Issues

7.376 Tilbury2 will aim to prioritise waste prevention, followed by preparing for re-use, recycling and recovery and lastly disposal to landfill as per the internationally recognised waste hierarchy. Shown below in Figure 7.7.

Figure 7.7 Waste Hierarchy

7.377 It should be noted that at present no materials are being used and no waste is being generated, as the application site is currently un-occupied. As part of the Environmental Impact Assessment baseline conditions will be established from the sources listed below:

- Consultation with the Thurrock Council, if required;
- Consultation with relevant members of PoTLL, if required;
- British Geological Survey (BGS), Geology of Britain Viewer and Borehole Logs;
- Environment Agency, What's In Your Backyard website;
- Environment Agency, Waste Interrogator Data 2015;
- Multi-Agency Geographic Information for the Countryside (MAGIC) website;
- Regional and local waste policies/ plans:
- Thurrock Local Development Framework: Core Strategy and Policies for Management of Development (2015); and
- Essex and Southend Waste Local Plan (Adopted 2001).

7.378 Key issues with regards to waste and materials, are defined as:

7.379 The waste arisings baseline, the amount of waste that is predicted to be produced within the relevant study area (as set out below) during the construction, demolition and excavation (CD&E) and operational phases of the scheme; and

7.380 The predicted capacity of waste infrastructure within the study area, essentially the capacity of, any site receiving, placing, treating, recycling,

recovering and/ or disposing of waste streams which are anticipated to arise from the scheme during the CD&E and operational phases.

Initial Assessment of Potential Impacts

7.381 Although every effort will be made through the design process to maximise resource efficiency, it is inevitable that waste will be generated during each phase of the scheme and this will have a degree of impact on waste arisings, waste infrastructure and the quantities and volumes of materials used.

7.382 It is anticipated that the majority of the impact from waste generation will be from the CD&E phases of the scheme. Due to the age and historic use of the remaining buildings on site to be demolished onsite there is a possibility that some of the waste could be classified as hazardous (e.g. containing asbestos). There is likely to be contamination present in the soils of the site and as such material that may need to be excavated as part of the construction process could also be classified as hazardous. Excavated material will also include marine sediments from the dredging required for the berths. However, it should be noted that the waste infrastructure for hazardous waste is spread across the UK and there are reported cases of hazardous waste produced in the South East has been transferred to waste infrastructure in the North West[89]. The quantitative assessment of hazardous waste will use hazardous waste infrastructure capacities at a national scale as the baseline.

7.383 The majority of the impact for materials will be from the construction phase. It is expected that potential effects will be addressed through the design and construction of Tilbury2 to ensure, where possible, that wastage of materials is minimised and controlled. The design of Tilbury2 will be reviewed to identify materials needed and the potential waste arisings and assess their magnitude, in order to establish the likely mitigation measures required. Every effort will be made to maximise on-site re-use and off-site recovery and recycling of waste arisings.

7.384 Less impact is envisaged during the operational phase of Tilbury2 as material use and waste arisings will be primarily limited to the operation of the proposed buildings and any planned/ unplanned maintenance. Most of these wastes would likely be non-hazardous municipal type wastes (e.g. paper, food and packaging) and non-hazardous/ inert and hazardous wastes from the operation of the workshop and planned/ unplanned maintenance onsite (e.g. concrete, bituminous materials, waste electrical and electronic equipment (WEEE), oils, etc.).

[89] City of London Corporation (2016). *City of London Waste Arisings and Waste Management Capacity Study Review 2016.*

Approach and Methodology

Definition of Waste and Materials

7.385 For the purposes of the assessment waste is defined in line with the Waste Framework Directive (2008/98/EC) as "any substance or object which the holder discards or intends or is required to discard." Materials are defined as objects/ substances which will be used during both the CD&E and operational phases of Tilbury2.

Study Area

7.386 The study area includes the waste infrastructure and waste arisings regionally, locally, and nationally (for hazardous waste only). The definition of these for the purpose of the Tilbury2 is outlined below:

- Local study area – the waste arisings and waste infrastructure within close proximity, for the purposes of this assessment, this extends to the borough of Thurrock; and
- Regional study area – the waste arisings and waste infrastructure within the county of Essex and outer East London.
- National study area – hazardous waste arisings and waste infrastructure across the United Kingdom.

7.387 The scope of assessment is applicable to both the CD&E (2017 to 2018) and operational phase (late 2018) of Tilbury2 and as such a temporal scope will also be applied.

Proposed Level and Scope of Assessment

7.388 The following tasks are proposed to determine the impact associated with waste and materials:

- Review of relevant legislation, national, regional and local planning policies and guidance to identify applicable material and waste management objectives and targets;
- Identify the waste arisings and waste infrastructure baseline for the local, regional and national (hazardous waste only) study area;
- Review the proposed construction materials and material quantities to be used during the CD&E phase of the scheme in order to estimate the quantities and composition of waste to be generated during the CD&E phase of the scheme.
- Review the operational waste arisings generated at the Port of Tilbury, in order to estimate the quantities and composition of waste to be generated during the operational phase of the scheme;
- Identify and evaluate the impacts of the scheme against the local and regional CD&E and operational (commercial and industrial (C&I)) waste arisings and waste infrastructure;
- Identify and evaluate the impacts of the scheme against the national hazardous waste arisings and waste infrastructure; and

- Identify mitigation measures and development proposals necessary to reduce the environmental effects of both the CD&E and operational phases of Tilbury2.

Proposed Assessment of Significance

7.389 The assessment of the proposed waste arisings from Tilbury2 will be assessed based on both:

- The percentage increase in waste arisings locally, regionally, and nationally (hazardous waste only) during the CD&E and operational phases; and
- The percentage increase in demand, which will be placed on the waste infrastructure locally and regionally during the CD&E and operational phases.

7.390 Table 7.12 shows the significance criteria which will be used to evaluate the environmental effects on the local and regional waste arisings and waste infrastructure baseline. The assessment of significance will determine whether the environmental effects are likely to be major, moderate, minor or negligible. Major and moderate effects will be considered to have the potential to be significant, while minor and negligible effects will be considered not to be significant. The criteria are based on Atkins' prior experience given there is no specific industry assessment standard.

Table 7.12 Criteria for Classifying Significance of Environmental Effects

Level	**Criteria**
Major	• Waste volumes will contribute to greater than 10% of either the local and/ or regional waste arisings or the local and/ or regional infrastructure capacities, which has the potential to result in major alterations to key elements or characteristics of the baseline. • Hazardous waste volumes will contribute to greater than 10% of the national hazardous waste arisings or national infrastructure capacities, which has the potential to result in major alterations to key elements or characteristics of the baseline. • The situation will be fundamentally different to the existing baseline.
Moderate	• Waste volumes will contribute to between 5 and 10% either the local and/ or regional waste arisings or the local and/ or regional infrastructure capacities, which has the potential to result in partial alterations to key elements or characteristics of the baseline. • Hazardous waste volumes will contribute to between 5 and 10% of national hazardous waste arisings or national infrastructure capacities, which has the potential to result in partial alterations to key elements or characteristics of the baseline. • The situation will be partially different to the existing baseline.
Minor	• Waste volumes will contribute to between 1 and 5% of either the local and/ or regional waste arisings or the local and/ or regional infrastructure capacities which has the potential to result in minor alterations to key elements or characteristics of the baseline. • Hazardous waste volumes will contribute to between 1 and 5% of the national hazardous waste arisings or the national infrastructure capacities which have the potential to result in minor alterations to key elements or characteristics of the baseline. • The situation will be discernible and will remain similar to the existing baseline.
Negligible	• Waste volumes will contribute to less than 1% of either the local and/ or regional waste arisings or the local and/ or regional infrastructure capacities, which has the

Level	Criteria
	potential to result in very minor alterations to key elements or characteristics of the baseline. • Hazardous waste volumes will contribute to less than 1% of the national hazardous waste arisings or the national infrastructure capacities, which has the potential to result in very minor alterations to key elements or characteristics of the baseline. • The situation will be barely discernible, approximating to the “no change” situation.

7.391 Throughout the design process and following the assessment of significance, mitigation measures associated with use of natural resources and waste generation will be identified. It is likely that the mitigation measures will include/ evolve around the following themes:

- Reviewing designs to minimise use of natural resources, where applicable;
- Management of waste within the context of the waste hierarchy;
- Management of the waste in accordance with local and national policy and legislation and, where applicable, guidance documents;
- Safe management of the waste generated, as determined by its physical and chemical characteristics (e.g. bulky or hazardous wastes);
- Potential environmental effects or human health risks associated with the waste arisings throughout the lifecycle of the scheme; and
- Use of natural resources and management of waste in accordance with the Proximity Principle, which promotes the procurement of natural resources and management of wastes locally.

7.392 The overall aim of the process of identifying mitigation measures is to minimise use of natural resources and achieve a high reuse, recycling and recovery rate throughout all phases of the scheme. Achieving this will minimise environmental burdens in terms of impacts to the environment and human health, energy and carbon impacts, improve the overall sustainability of the scheme alongside reducing the costs associated with excessive natural resource procurement and waste storage, collection and disposal.

PUBLIC RIGHTS OF WAY

Overview of baseline conditions and key issues

7.393 Two public rights of way (PROWs) will be directly affected by the proposals, namely

- A public footpath (FP146) that routes along the foreshore of the Thames at the southern boundary of the site; and
- Footpath FP144 crosses access corridor to the south of the built up area of Tilbury.

7.394 A number of other PROWs are present within the vicinity of the Order area.

Initial assessment of potential Impacts

7.395 During construction, those PROWs directly affected by the proposals may need to be temporarily diverted. Temporary stopping up will be avoided unless the construction methodology makes it impossible to keep these PROWs open for the duration of the construction due to either health and safety or logistical issues.

7.396 The PROW that routes along the southern boundary of the Main Site will be accommodated within the development proposals. It is a desire of the Council to create a cycle route / bridleway link between Tilbury Fort and Coalhouse Fort and this may form part of the Councils Right of Way Improvement Plans (ROWIP) at present being reviewed for publication in 2017. The extent to which such plans may be incorporated into the development will be given further consideration in liaison with Thurrock Council's PROW officer.

7.397 Public Footpath FP144 will need to be accommodated in the proposals for the new surface access corridor. Measures to improve access from the town of Tilbury to the riverfront will be given further consideration in liaison with Thurrock Council's PROW officer. Other PROWs that could be affected by changes in views will be considered in the landscape and visual impact assessment.

Approach and methodology

7.398 In order to assess the impact of the development on PROWs, the following information will be considered:

- Map existing rights of way
- Review quality and existing problems/opportunities
- Liason with Thurrock PROW officer and other bodies such as Ramblers' Association

8.0 CONCLUSIONS

8.1 Port of Tilbury London Limited is intending to make submit a draft Development Consent Order under the Planning Act 2008 to secure the necessary consents to develop a new port terminal on land at the former Tilbury Power Station and to construct a new surface access corridor to the Tilbury2 site.

8.2 This Scoping Report represents the first stage in the EIA process and sets out the proposed methodology for the assessment of the environmental impacts which have potential to arise due to construction and operation of the proposed development. This Scoping Report sets out the basis for a comprehensive assessment of the environmental effects of both of these elements of the project, the results of which will be presented in an Environmental Statement.

8.3 Many of the surveys and investigations necessary to provide the baseline data for the assessment of potential impacts have already been undertaken or are in progress and have been the subject of consultation with statutory bodies.

8.4 As the masterplan and details of the proposals are development, further refinement of the environmental information will be presented and discussed with all stakeholders prior to the publication of the final Environmental Statement in support of the DCO application.

ATKINS DRAWINGS

5153187-ATK-ZZ-ZZ-SK-ZZ-001/P4	Location Plan
5153187-ATK-ZZ-XX-DR-ZZ-1000/P4	General Arrangement Sheet 1 of 2
5153187-ATK-ZZ-XX-DR-ZZ-1001/P4	General Arrangement Plan Sheet 2 of 2
5148146-ATK-ZZ-ZZ-DR-C-0005/P1	Retained Buildings

Millimetres 0 10 100

ASDA ROUNDABOUT

TILBURY

FORT ROAD RAIL BRIDGE

ST ANDREWS ROAD

FERRY ROAD

FORT ROAD

PORT OF TILBURY

TILBURY FORT

TILBURY POWER STATION

RIVER THAMES

DO NOT SCALE

N

KEY:

PROVISIONAL ORDER LIMITS

PUBLIC FOOTPATH

Rev.	Date	Description	By	Chk'd	App'd
P4	23/03/17	SCOPING REPORT	JS	SR	SR
P3	07/03/17	UPDATES TO ORDER LIMITS BOUNDARY	JS	SR	SR
P2	23/02/17	SCOPING REPORT	JS	SR	SR
P1	16/02/17	DRAFT FOR COMMENT	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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Client: PORT OF TILBURY LONDON

Project Title: TILBURY 2

Drawing Title: SCOPING REPORT LOCATION PLAN

Scale	Designed	Drawn	Checked	Authorised
1:6,000	SR	JS	SR	SR
Original Size	Date	Date	Date	Date
A1	16/02/17	16/02/17	16/02/17	16/02/17

Drawing Number: 5153187-ATK-ZZ-ZZ-SK-ZZ-0001

Revision: P 4

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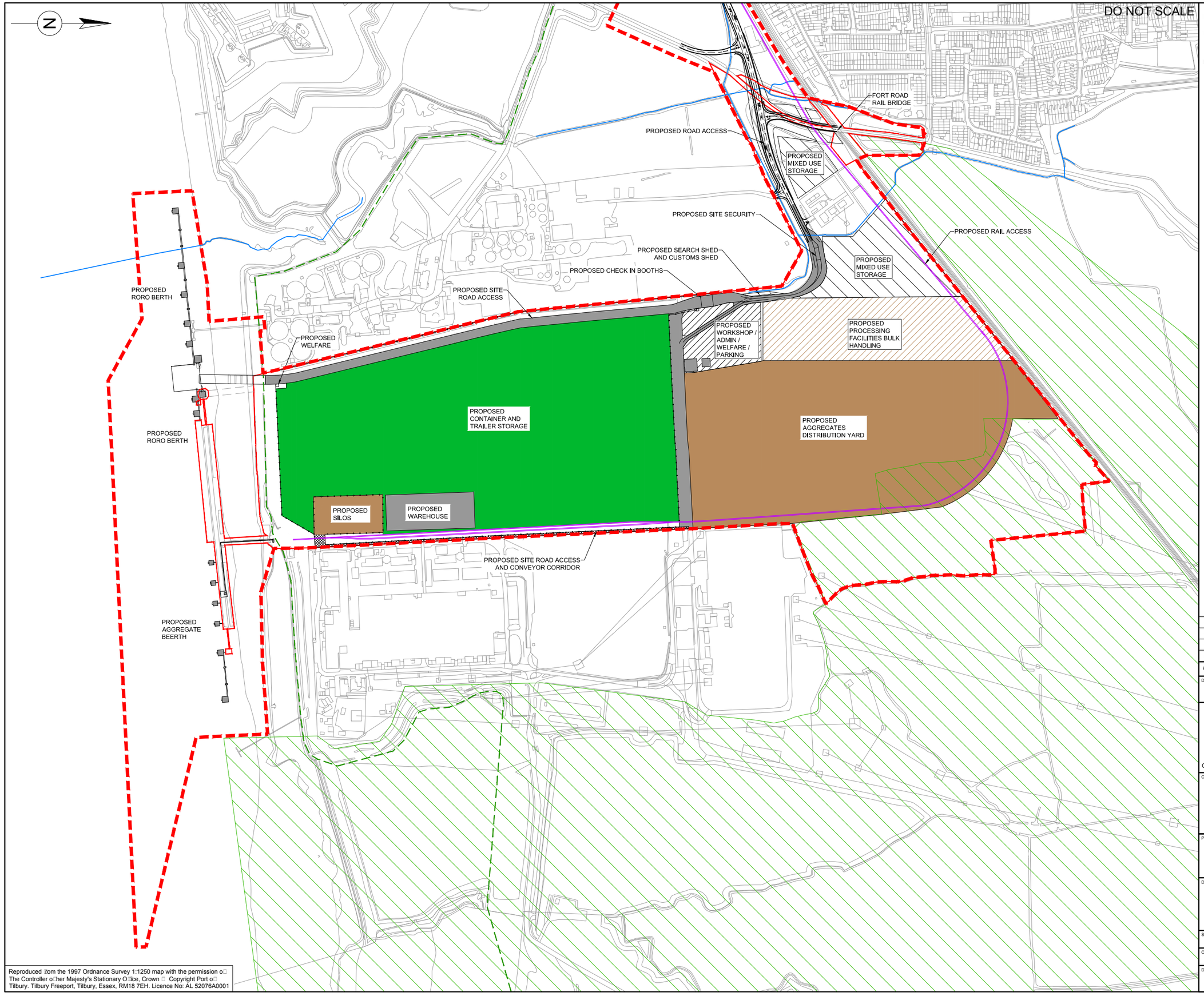

NOTES:

1. LOCATION OF PROPOSED BUILDINGS AND INFRASTRUCTURE SHOWN INDICATIVELY

KEY:

- DETAILED RIVER NETWORK
- PROPOSED SECURITY FENCE
- PoTLL OWNERSHIP BOUNDARY
- PROVISIONAL ORDER LIMITS
- PUBLIC FOOTPATH
- GREEN BELT

Rev.	Date	Description	By	Chk'd	App'd
P4	23/03/17	SCOPING REPORT	JS	SR	SR
P3	07/03/17	ORDER LIMITS BOUNDARY ADDED	JS	SR	SR
P2	23/02/17	SCOPING REPORT	JS	SR	SR
P1	16/02/17	DRAFT FOR COMMENT	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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Client: PORT OF TILBURY LONDON

Project Title: TILBURY 2

Drawing Title: SCOPING REPORT GENERAL ARRANGEMENT SHEET 1 OF 2

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Revision: P 4

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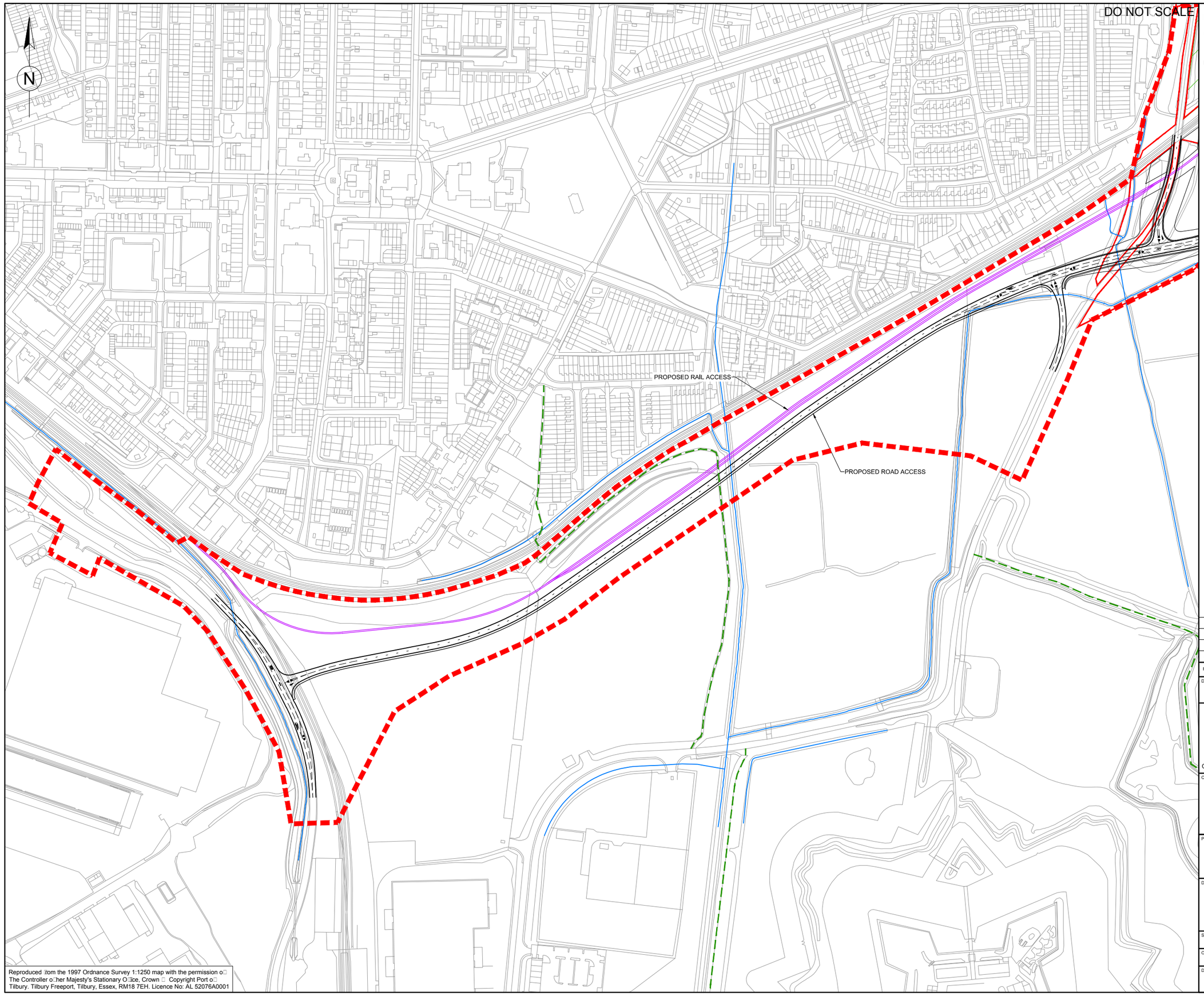

DO NOT SCALE

NOTES:

1. LOCATION OF PROPOSED BUILDINGS AND INFRASTRUCTURE SHOWN INDICATIVELY

KEY:

- DETAILED RIVER NETWORK
- PoTLL OWNERSHIP BOUNDARY
- PROVISIONAL ORDER LIMITS
- PUBLIC FOOTPATH

Rev.	Date	Description	By	Chk'd	App'd
P4	23/03/17	SCOPING REPORT	JS	SR	SR
P3	07/03/17	ORDER LIMITS BOUNDARY ADDED	JS	SR	SR
P2	23/02/17	SCOPING REPORT	JS	SR	SR
P1	16/02/17	DRAFT FOR COMMENT	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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Client: PORT OF TILBURY LONDON

Project Title: TILBURY 2

Drawing Title: SCOPING REPORT
GENERAL ARRANGEMENT
SHEET 2 OF 2

Scale	Designed	Drawn	Checked	Authorised
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Revision: P 4

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DO NOT SCALE

KEY:

BUILDINGS REMOVED

RETAINED BUILDINGS

MAIN GATE HOUSE

CLUB HOUSE BUILDING

SEWAGE PUMP HOUSE

JUNCTION TOWERS AND CONVEYOR

JETTY WORKSHOP

Tilbury Power Station

DRAFT

Rev.	Date	Description	By	Chk'd	App'd
P1	20/10/16	FOR CLIENT REVIEW	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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Project Title: T2 TILBURY

Drawing Title: RETAINED BUILDINGS

Scale	Designed	Drawn	Checked	Authorised
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Original Size	**Date**	**Date**	**Date**	**Date**
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Drawing Number: 5148146-ATK-ZZ-ZZ-DR-C-0005

Revision: P 1

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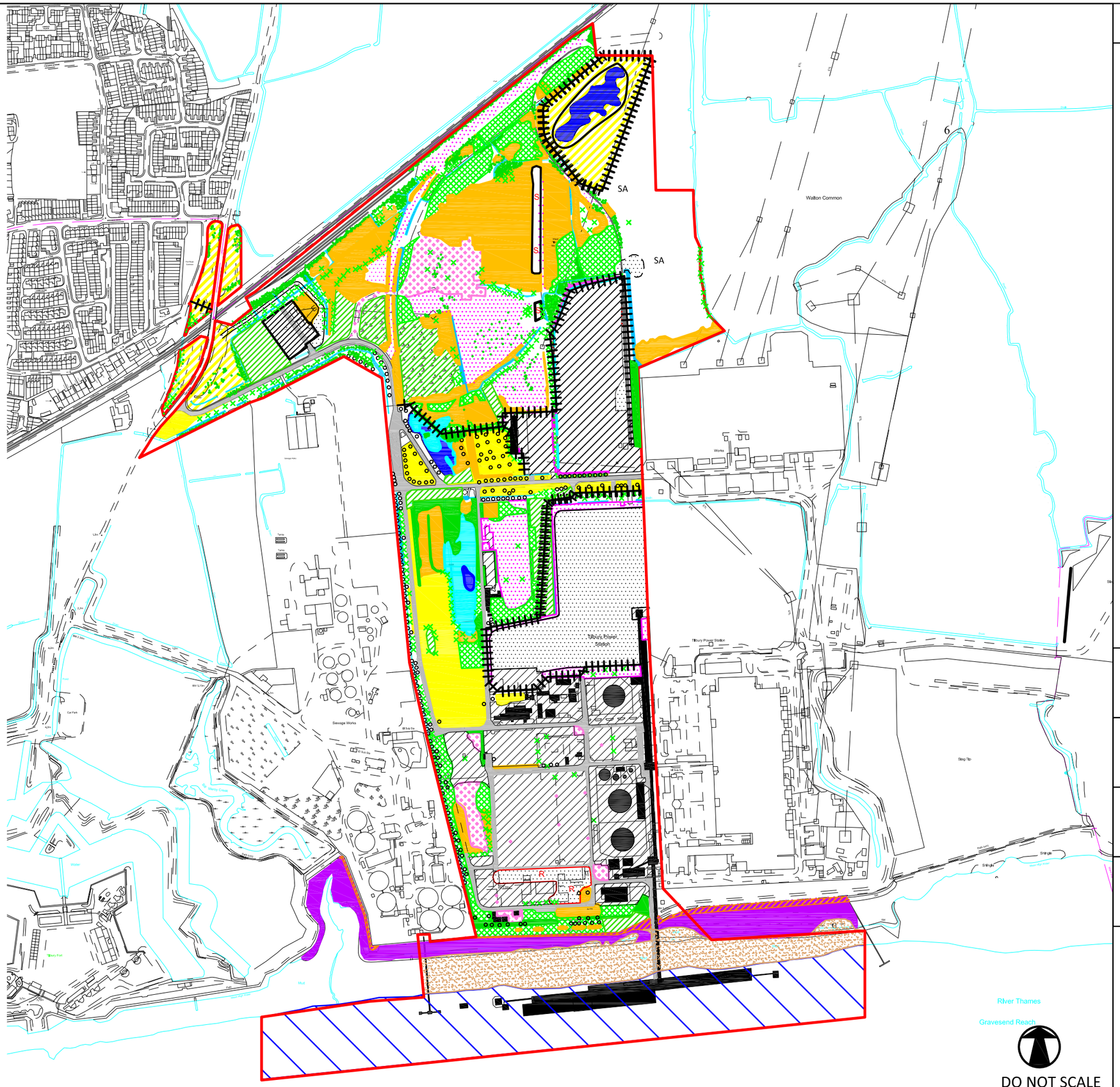
APPENDIX 1

Bioscan Drawings derived from 2016 habitat survey work:

Figure 1a Habitat Map – Main Site and Thames Foreshore
Figure 1b Habitat Map – Surface Access Corridor



DO NOT SCALE

Key

- Survey area (main site)
- Coarse Neutral Grassland
- Drainage Ditch
- Ephemeral/ Short Perennial +Skeletal Grassland
- Palisade fence
- Grazed Grassland
- Hardstanding/Artificial Surfaces
- Immature Scrub/ Dense Bramble
- Mature Scrub and hedgerow
- Mown grassland
- Plantation
- Recently Disturbed Ground
- Semi Mature Plantation Trees
- SA — Set-aside Type Habitats
- Standing Water
- Swamp + Fen
- Target Note + Text Reference
- Tarmac Road
- Vegetated Hard-Standing
- Buildings
- S — Spoil/PFA heap
- R — Demolition rubble mound
- Saltmarsh vegetation
- Intertidal mud
- Tidal river
- Maritime grassland + ruderal

Title

Habitat Map - Main site and Thames foreshore

Project	Client
Tilbury 2	POTLL

Drawing No.	Revision	Project No.
Figure 1a	B	E1862

Drawn	Checked	Date
KP, MF	DW	February 2017

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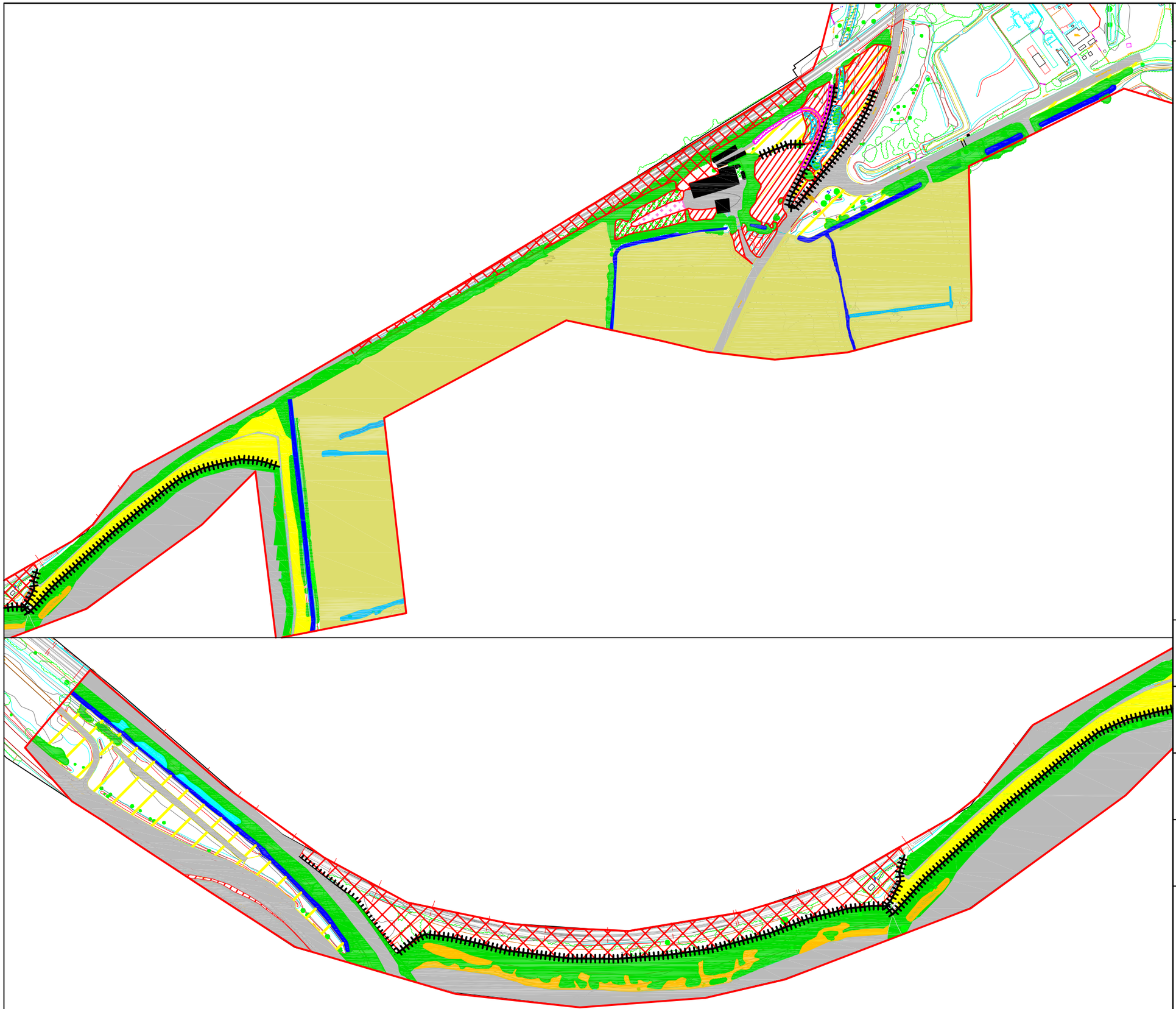

Key

- Survey area
- Coarse Neutral Grassland
- Dry ditch
- Ephemeral/ Short Perennial +Skeletal Grassland
- Fence
- Grazed Grassland
- Immature Scrub/ Dense Bramble
- Tall ruderal vegetation
- Mown grassland
- Mature Scrub
- Coastal and floodplain grazing marsh
- Standing Water (occasional channel flow)
- Swamp + Fen
- Tarmac Road/hardstanding
- Vegetated Hard-Standing
- Area not accessible for survey

DO NOT SCALE

Title

Habitat Map - Surface Access Corridor

Project	Client
Tilbury 2	POTLL

Drawing No.	Revision	Project No.
Figure 1b	B	E1862

Drawn	Checked	Date
FM	DW	February 2017

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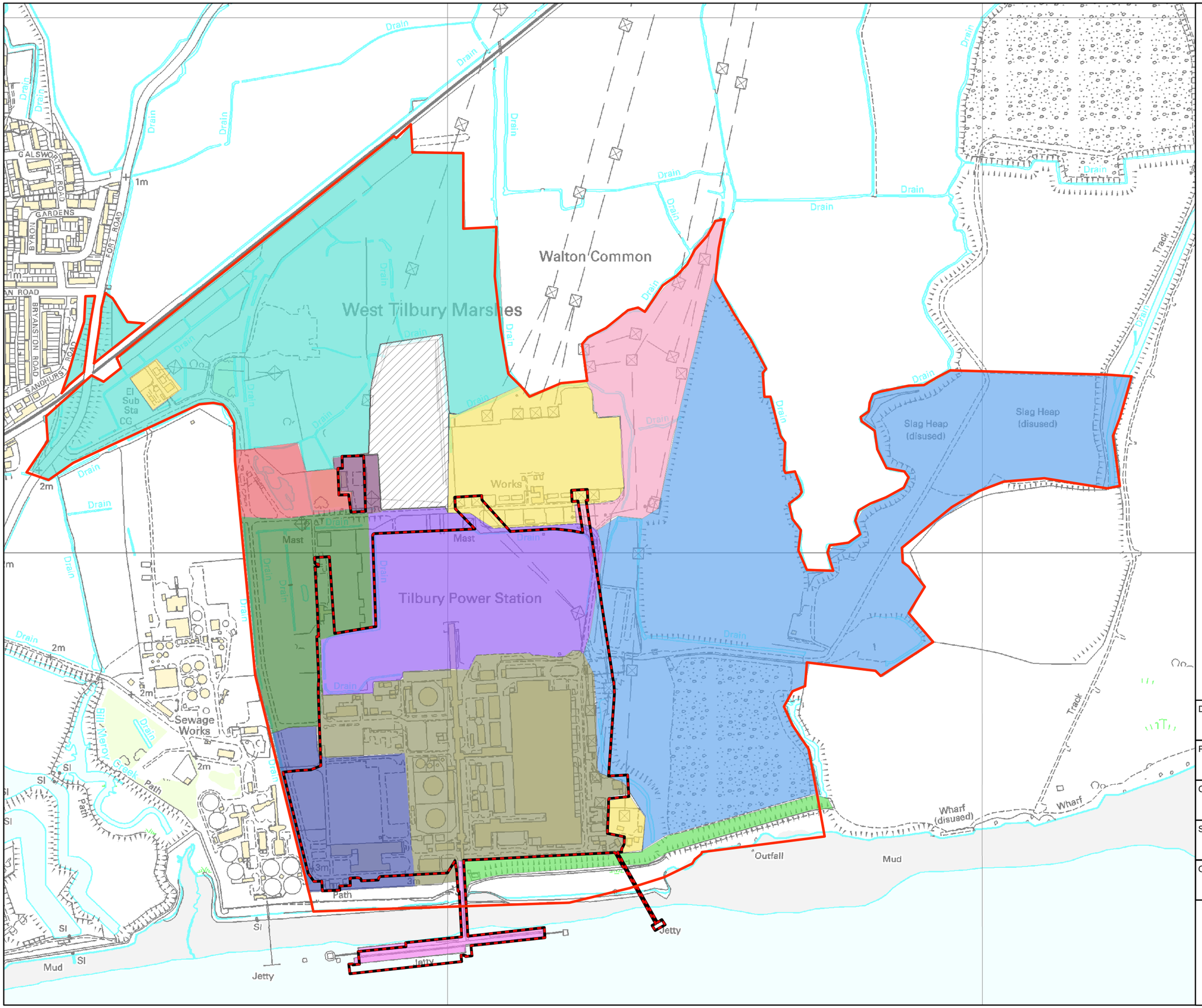
APPENDIX 2

White Young Green drawings:-

(provided to POTLL as part of the land acquisition package for the site, which relate to 2015 survey work on the former power station site commissioned for the purposes of Demolition Consent and which is equally likely to be of assistance in the EIA scoping process):-

Figure 1.2	Tilbury Site Areas
Figure 1.3	Tilbury Wildlife Areas
Figure 3.1	Water Vole Survey Map
Figure 4.1	Bat Transects
Figure 5.1	Waterbodies surveyed for GCNs
Figure 4.2	Surveyor Locations for Bat Emergence
Figure 6.3	Reptile Population Site Class Map
Figure 7.1	Dormouse Tube Locations
Figure 8.1	Breeding Bird Schedule 1 Species
Figure 8.2	Breeding Birds Survey Birds of Conservation Concern Red
Figure 8.3	Breeding Birds Survey Birds of Conservation Concern Amber



N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- A-Station
- Tilbury Energy and Environment Centre (TEEC) Wildlife Site
- Coal Fields
- Tilbury Riverside Project Community Meadow
- Ashfields
- Northern Area
- Owl House
- National Grid compounds
- Sub Station
- Jetty
- B-Station
- Gatehouse
- SEESA Compound

0 50 100 200 300 M

Drawing title:
Tilbuy Site Areas

Project:
A088550 Tilbury Powerstation

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/15	CW 11/11/15

Office:	Drawing number:	Revision:
4594	Figure 1.2	Rev.01

WYG
100 St. John Street
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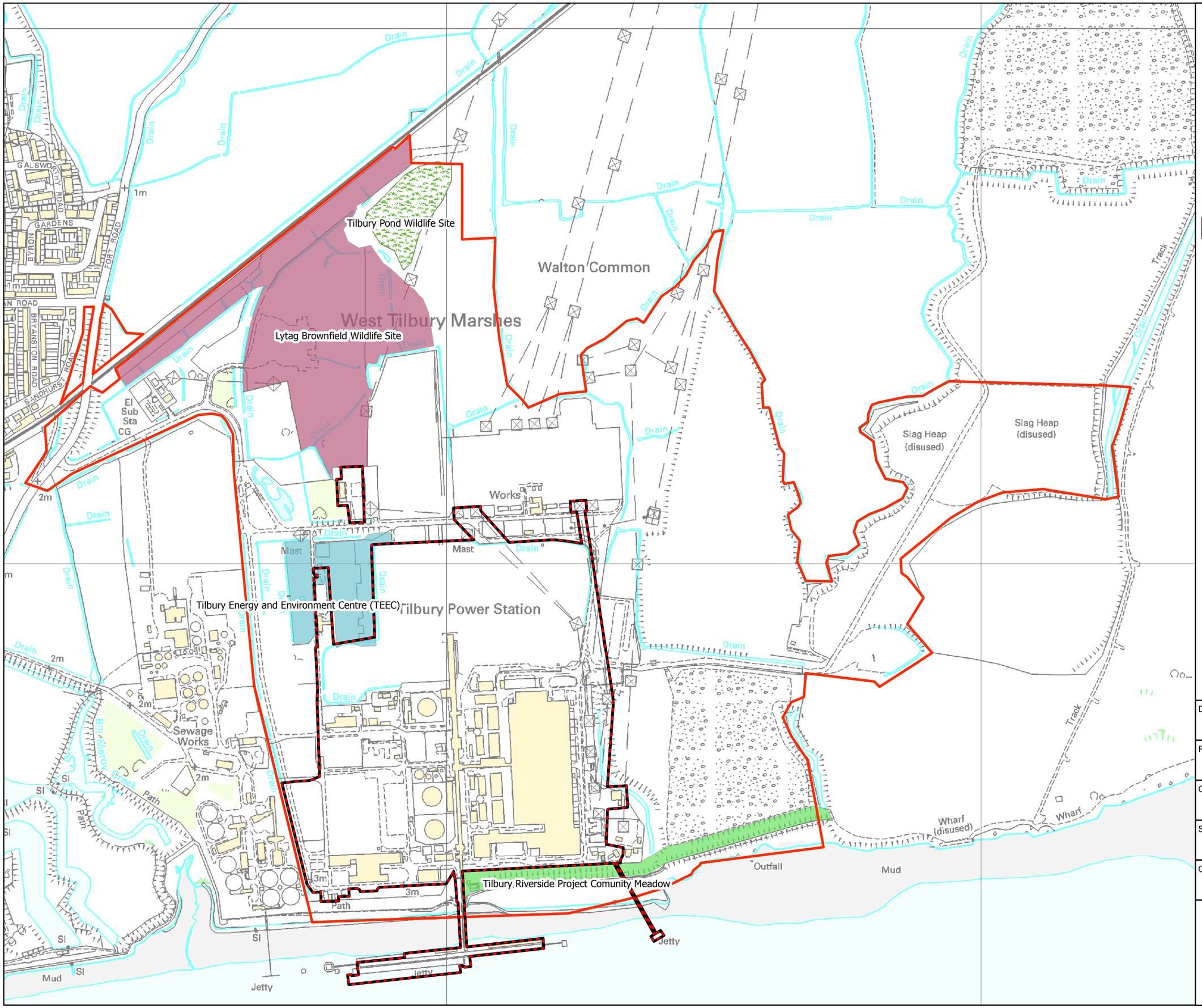
Tel: 0207 250 7500
Fax: 0207 250 7501
Email: ecology@wyg.com



N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Tilbury Pond Wildlife Site
- Lytag Brownfield Wildlife Site
- Tilbury Energy and Environment Centre (TEEC) Wildlife Site
- Tilbury Riverside Project Community Meadow

0 50 100 200 300 M

Drawing title: Tilbury Wildlife Areas

Project: A088550 Tilbury Powerstation

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/15	CW 11/11/15

Office:	Drawing number:	Revision:
4594	Figure 1.3	Rev.01

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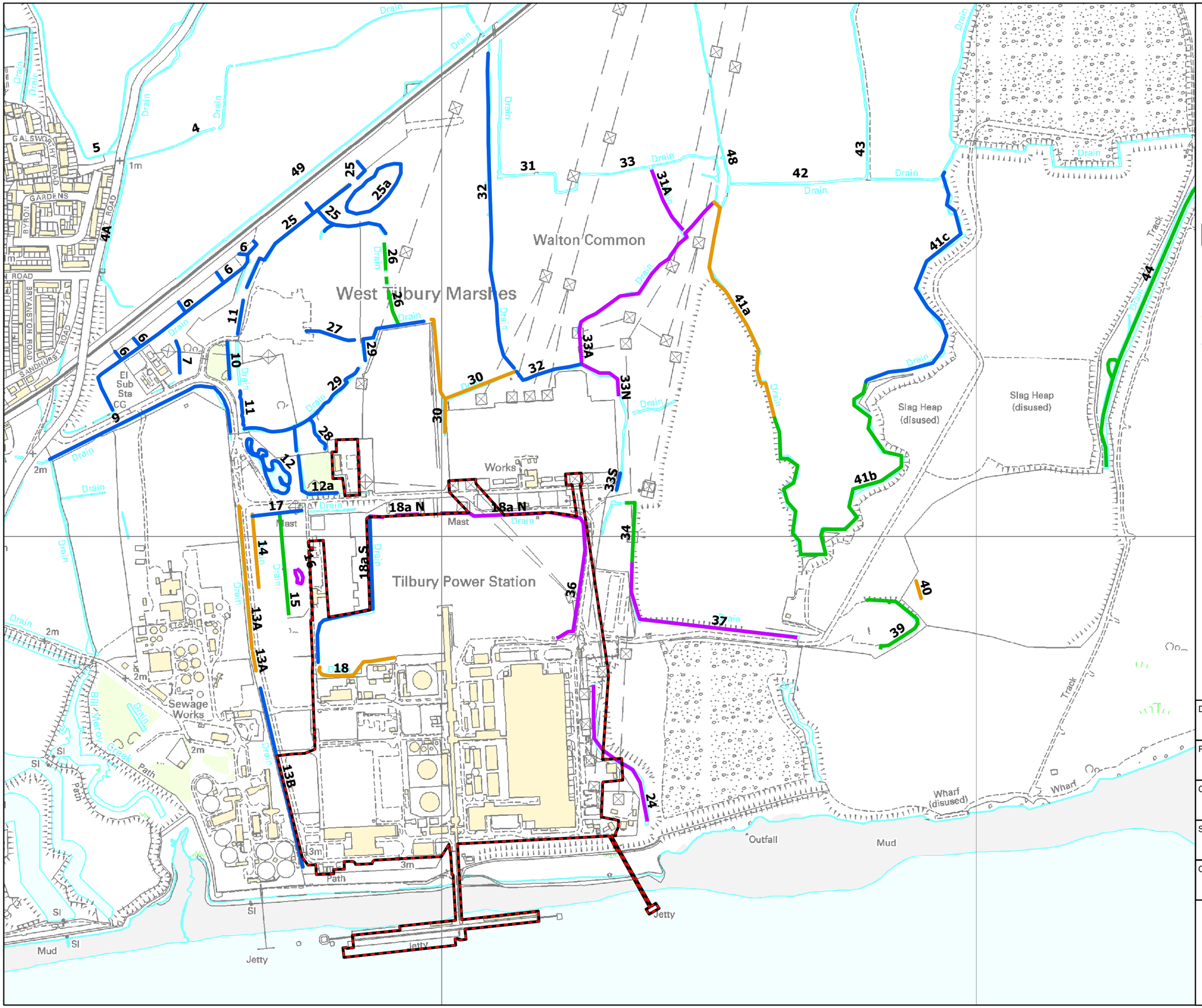

Drawing title:
Water vole survey map

Project:
A088550 Tilbury Powerstation

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 11/11/2015	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 3.1	Rev.01

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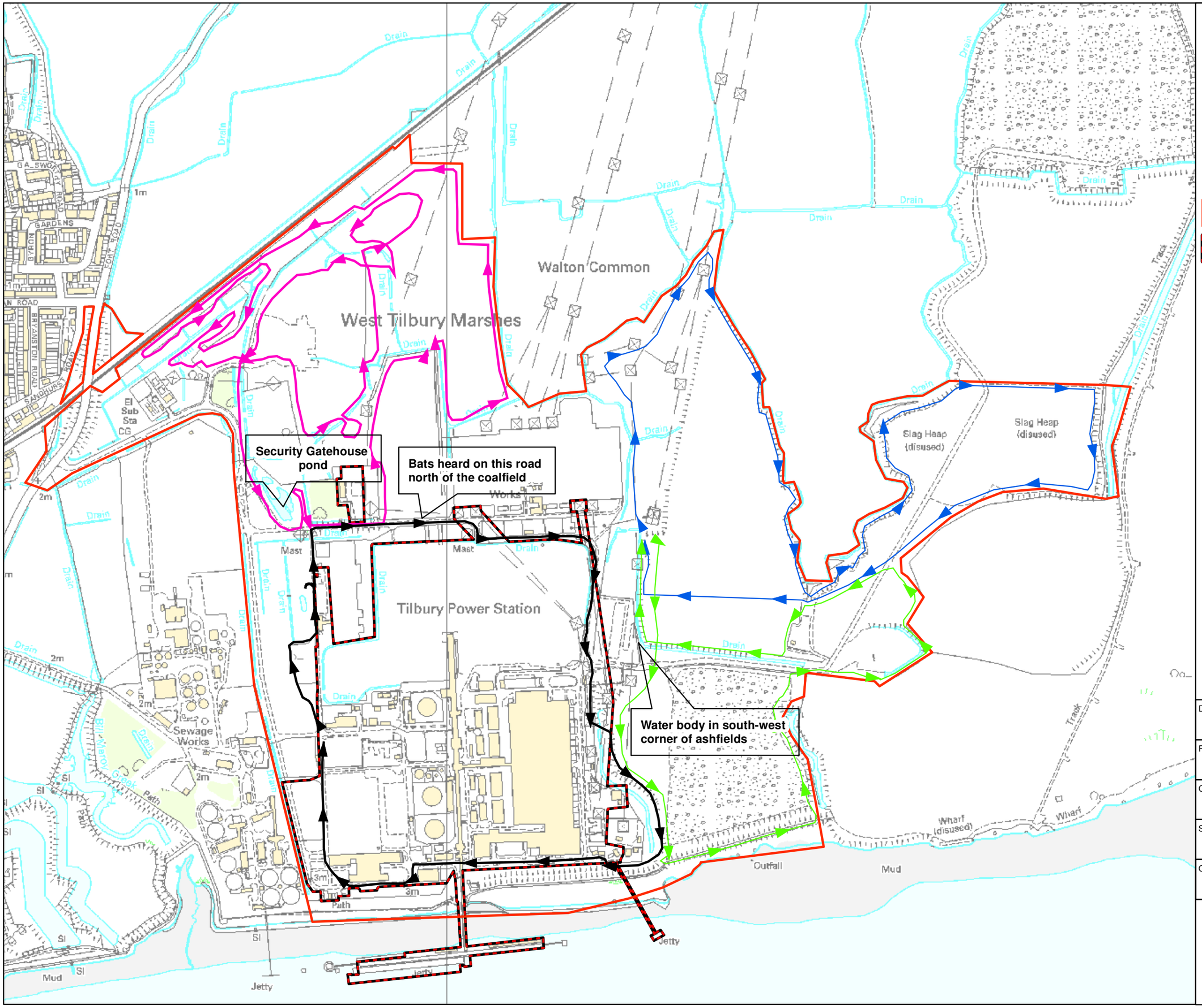

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Transect 1
- Transect 2
- Transect 3
- Transect 4

0 50 100 200 300 m

Drawing title: Bat Transects

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	TB 11/11/15	JS 11/11/15	CW 11/11/15

Office:	Drawing number:	Revision:
4594	Figure 4.1	Rev.01

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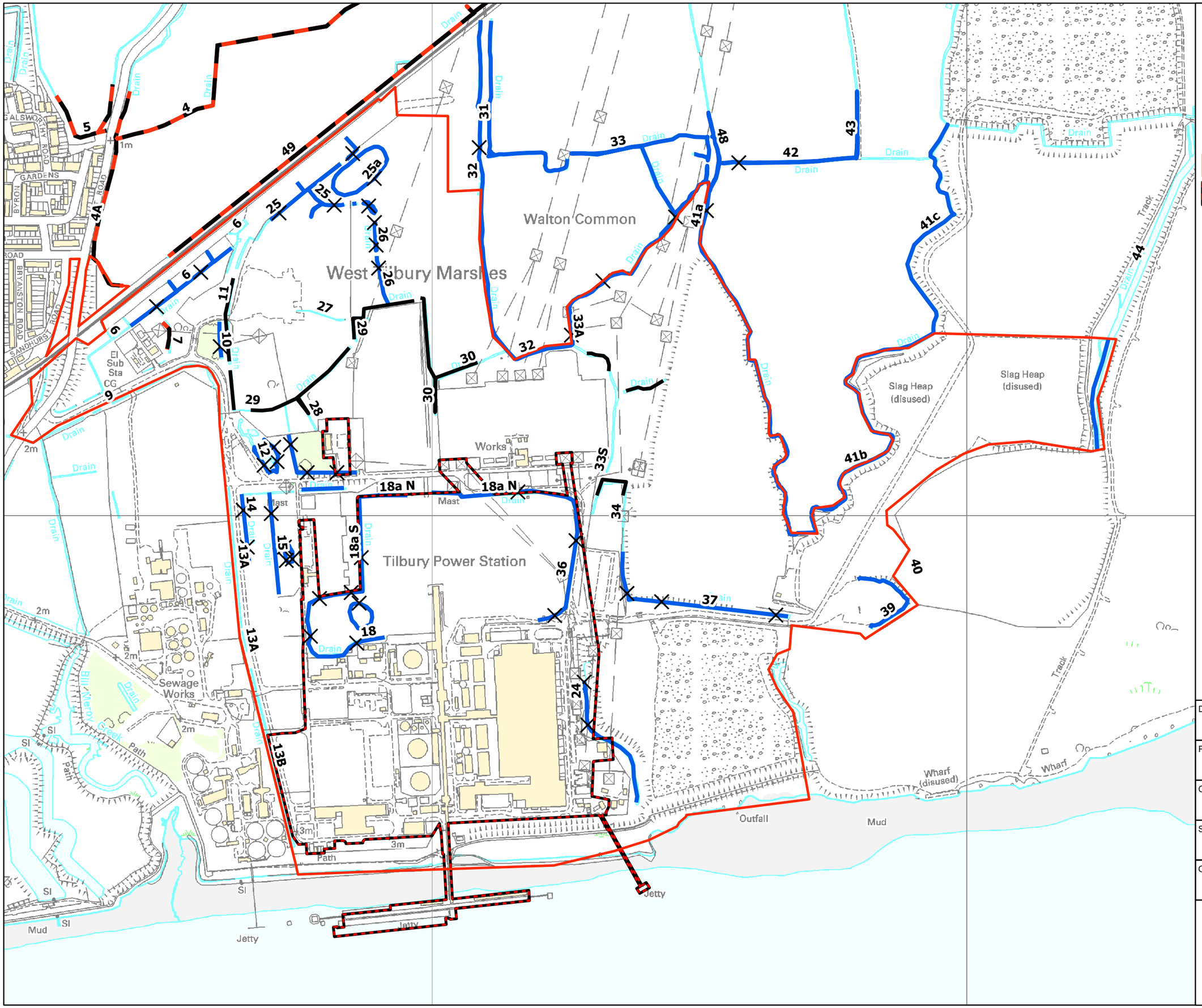

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Bottle Locations
- Dry
- Waterbodies Surveyed
- Polluted

0 50 100 200 300 m

Drawing title:
Waterbodies surveyed for GCN's

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 11/11/15	DS 11/11/15	CW 11/11/15

Office:	Drawing number:	Revision:
4594	Figure 5.1	Rev.01

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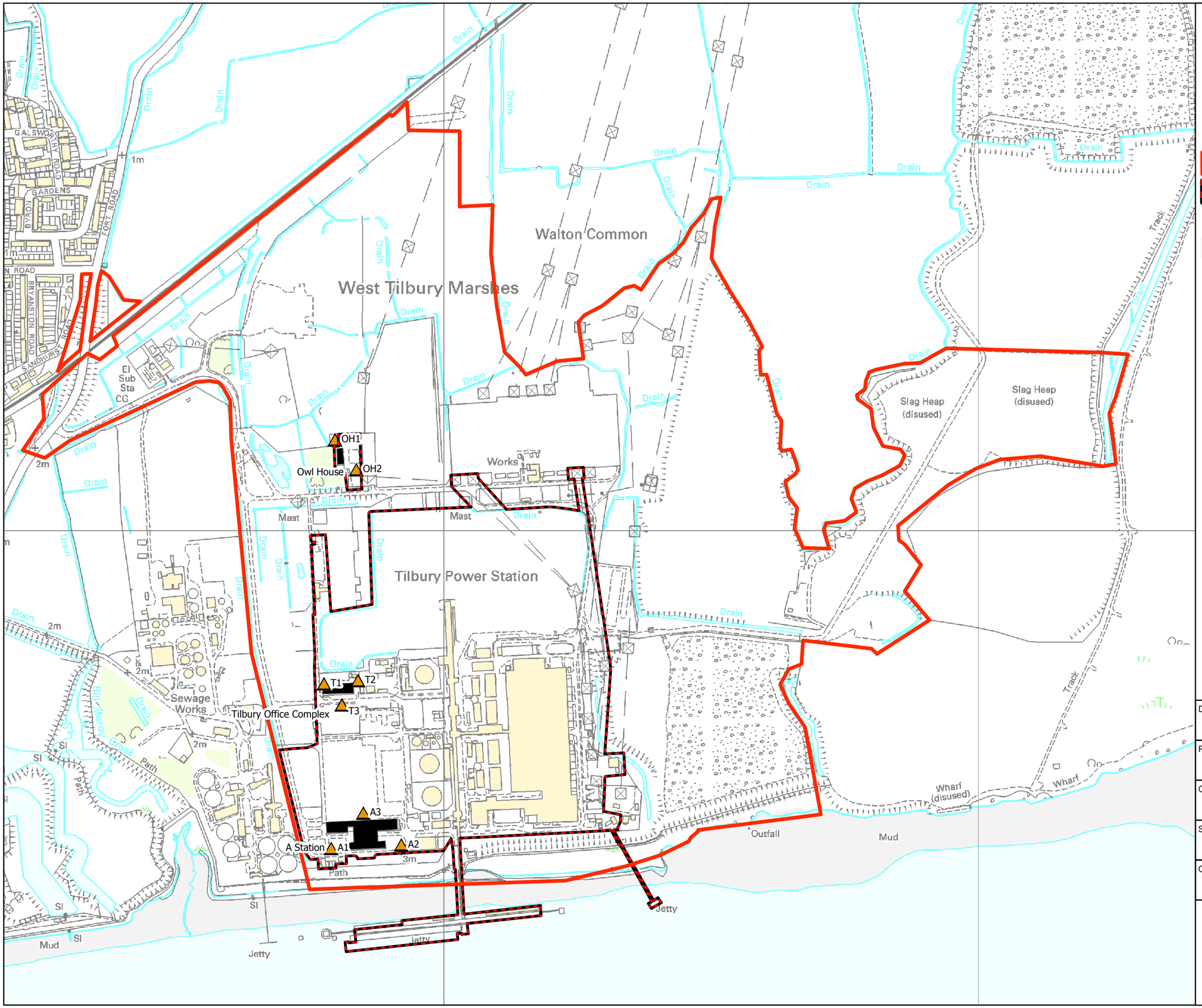

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Surveyor Locations
- Buildings

0 50 100 200 300 m

Drawing title:
Surveyor Locations For Bat Emergence

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 09/11/2015	DS 09/11/2015	CW 09/11/2015

Office:	Drawing number:	Revision:
4594	Figure 4.2	Rev.01

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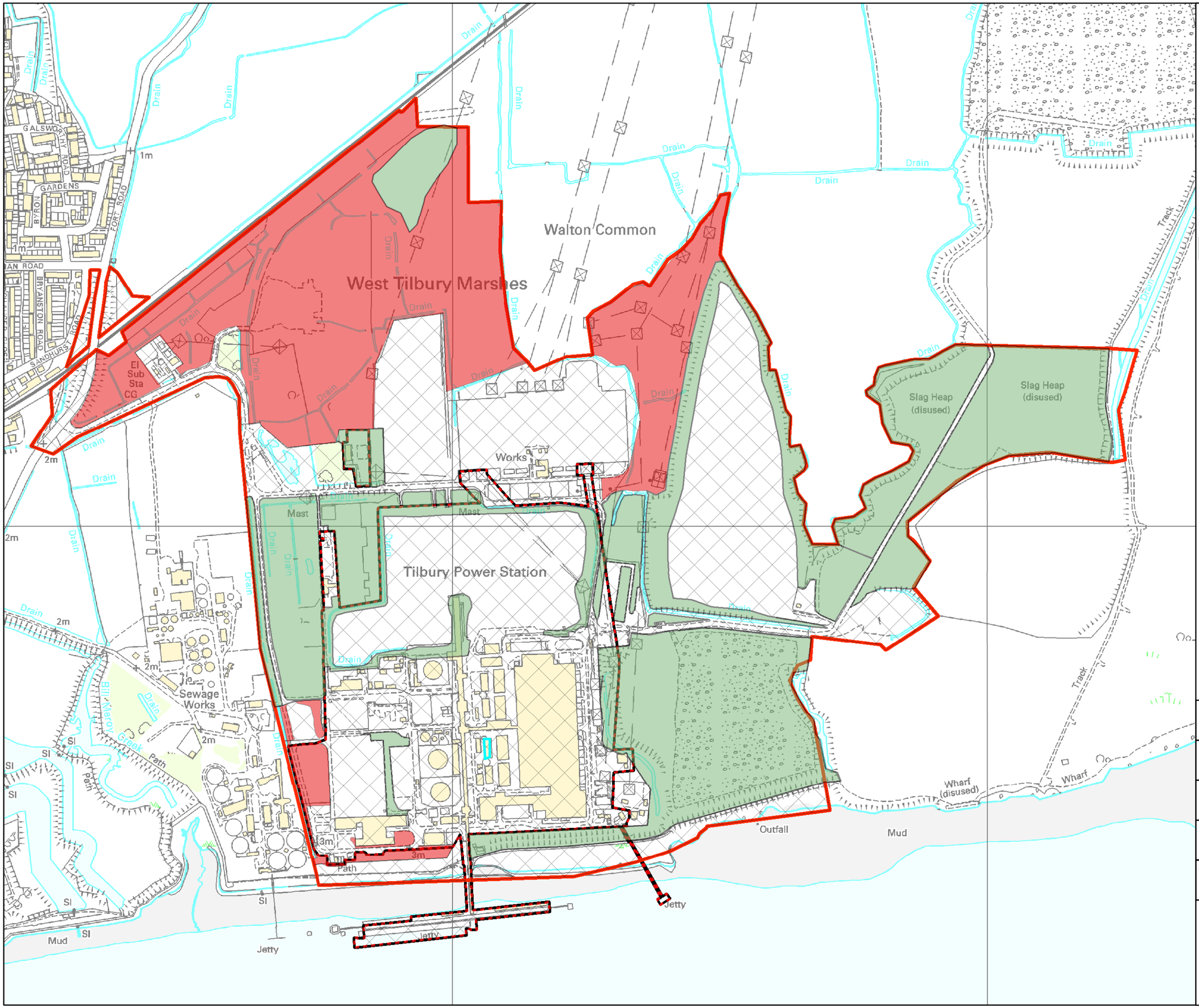

N

Legend

- RWE Ownership Boundary
- Demolition Boundary

Population Sizes

- Exceptional
- Low
- Unsuitable habitat

0 50 100 200 300 M

Drawing title:
Reptile Population Size Class Map

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 10/11/2015	DS 10/11/2015	CW 10/11/2015

Office:	Drawing number:	Revision:
4594	Figure 6.3	Rev.01

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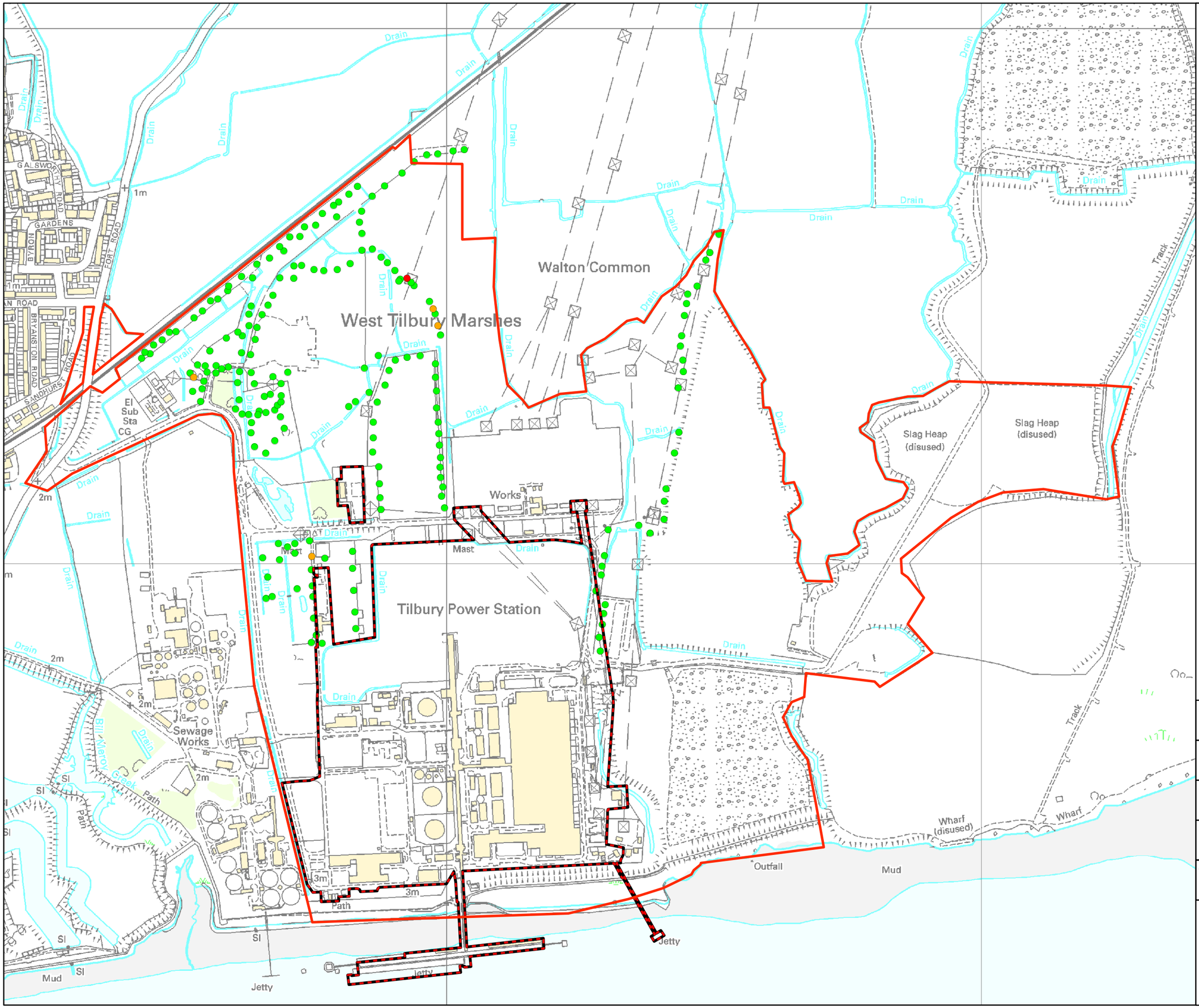

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Dormouse Tube Locations
- Dormouse Signs
- Dormouse Nest

0 50 100 200 300 M

Drawing title:
Dormouse Tube Locations

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/2015	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 7.1	Rev.01

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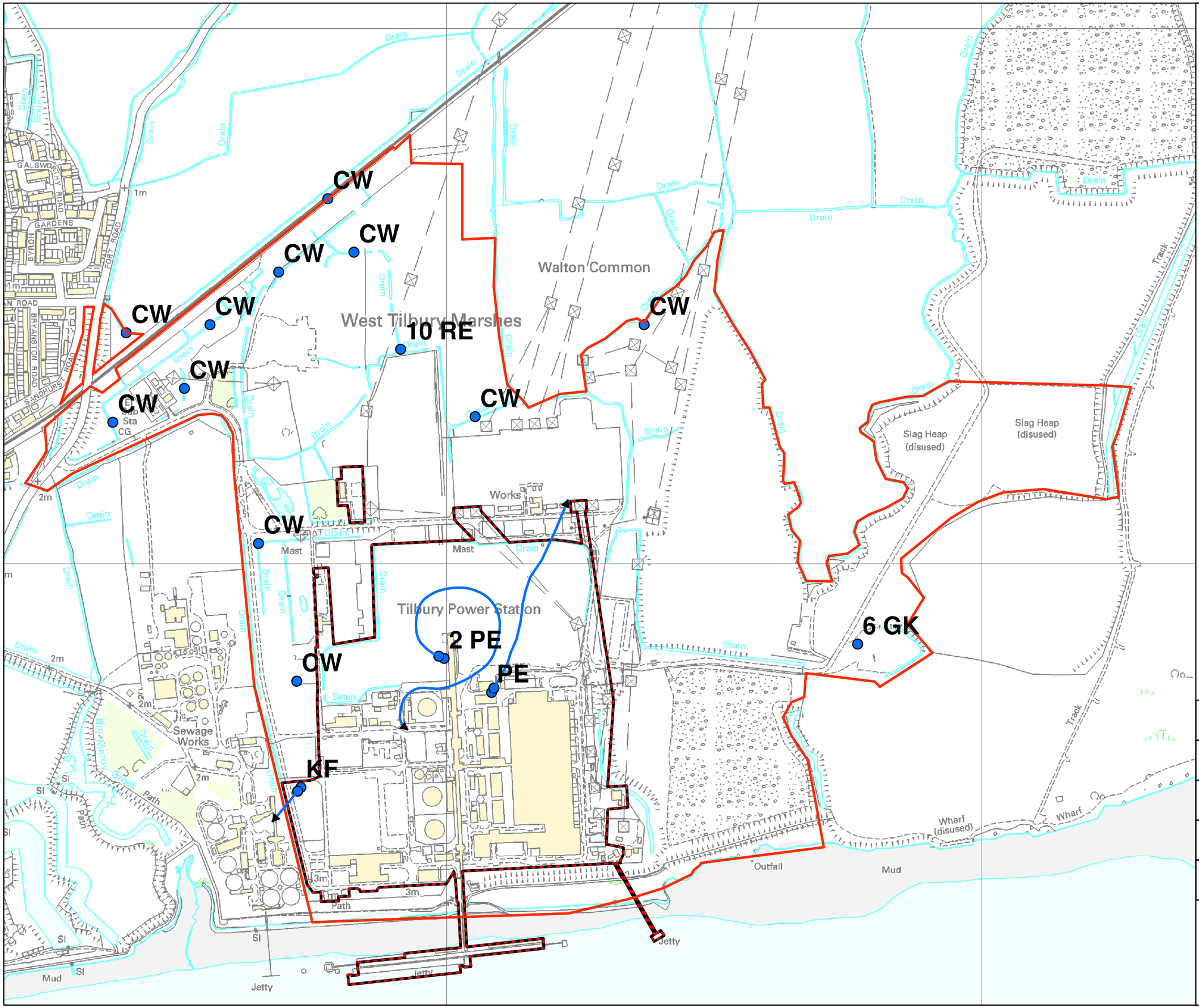

N

Legend

- RWE Ownership Boundary
- Demolition Boundary

Territory locations

- CW Cettis warbler
- GK Greenshank
- KF Kingfisher
- PE Peregrine
- RE Redwing

Flight lines of Schedule 1 Species

0 50 100 200 300 M

Drawing title:
Breeding Bird Schedule 1 Species

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 8.1	Rev.01

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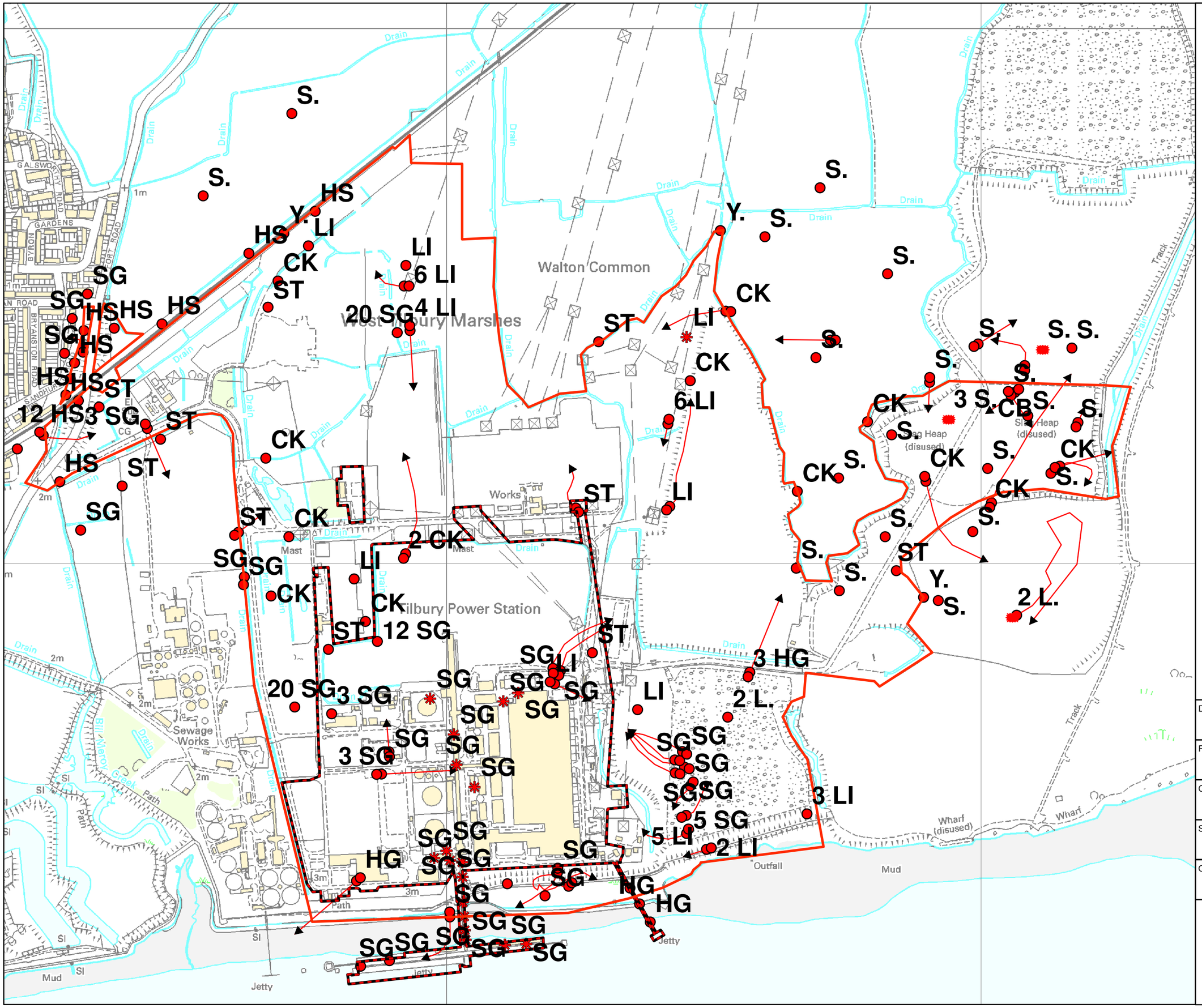

N

Legend

- RWE Ownership Boundary
- Demolition Boundary

Territory locations

- CB Corn bunting
- Y. Yellowhammer
- CK Cuckoo
- HG Herring Gull
- HS House Sparrow
- L. Lapwing
- LI Linnet
- S. Skylark
- SG Starling
- ST Song thrush
- Aggressive Encounter
- Nest
- Flight Lines BoCC Red Species

0 50 100 200 300 M

Drawing title: Breeding Bird Survey Birds of Conservation Concern Red

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 8.2	Rev.01

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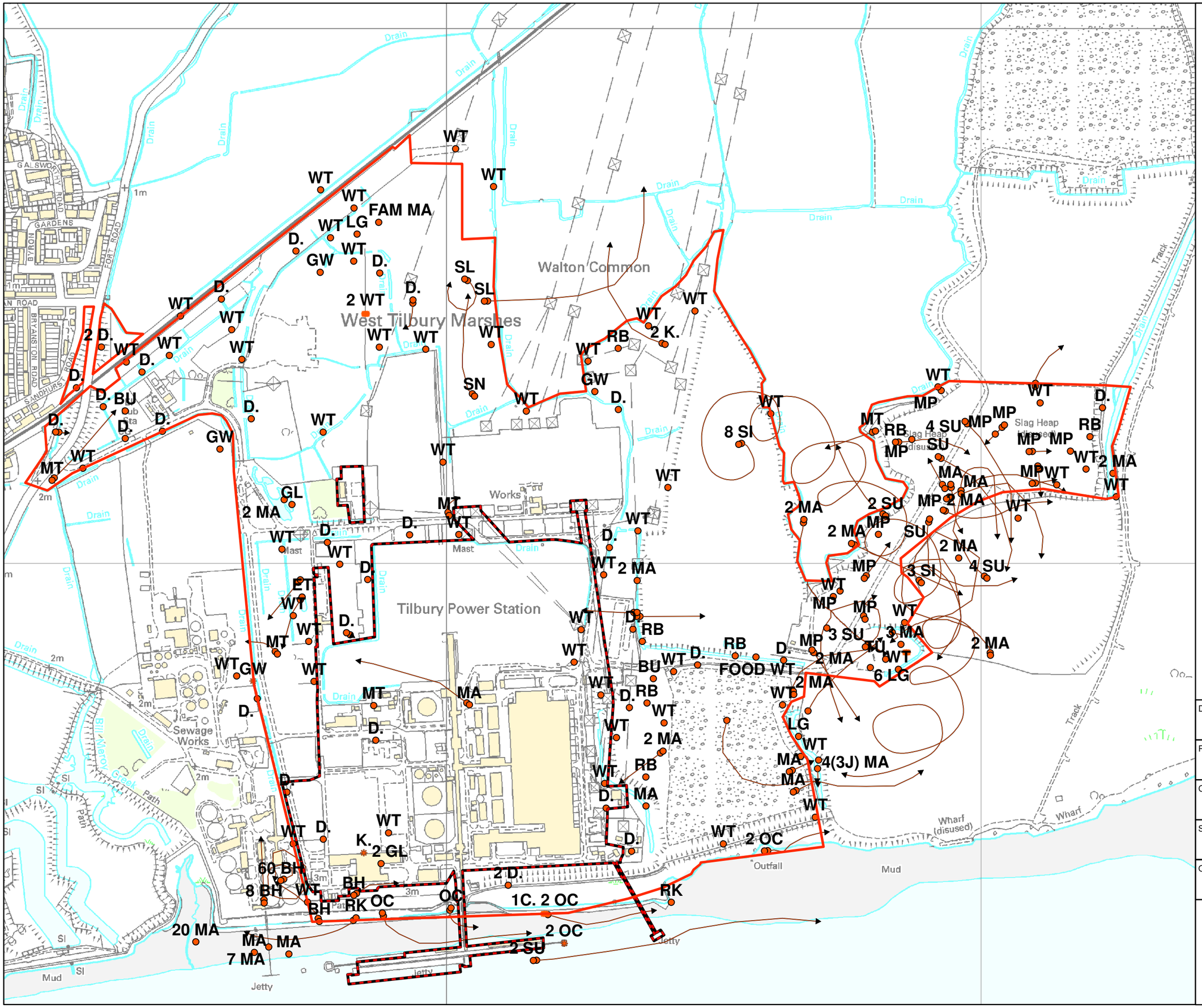

Legend

N

- RWE Ownership Boundary
- Demolition Boundary

Territory locations

- BH Black-headed gull
- BF Bullfinch
- D. Dunnock
- GL Grey wagtail
- GW Green woodpecker
- K. Kestrel
- ET Little egret
- LG Little grebe
- MA Mallard
- MP Meadow pipit
- MT Mistle thrush
- OC Oystercatcher
- RB Reed bunting
- RK Redshank
- SI Swift
- SL Swallow
- SN Snipe
- SU Shellduck
- TU Tufted duck
- WT Whitethroat
- Aggressive encounter
- Nest
- Flight lines BoCC Amber Species

0 50 100 200 300 M

Drawing title: Breeding Bird Survey Birds of Conservation Concern Amber

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 8.3	Rev.01

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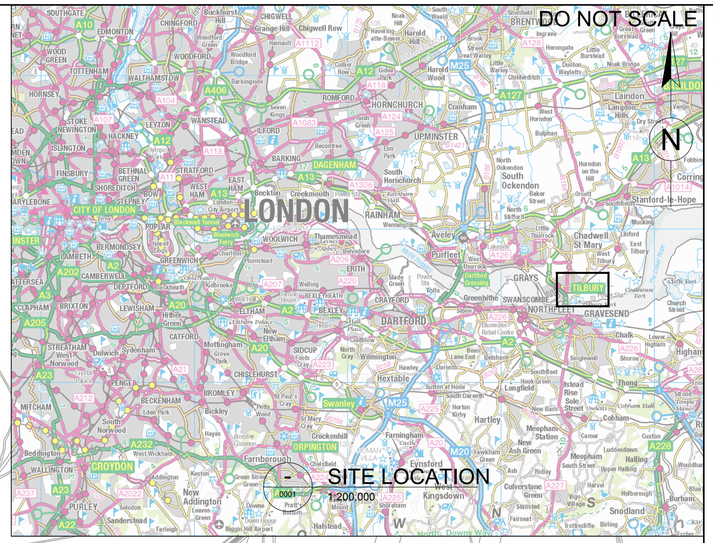
Millimetres 0 10 100

DO NOT SCALE

KEY:

PROVISIONAL ORDER LIMITS

PUBLIC FOOTPATH



ASDA ROUNDABOUT

TILBURY

FORT ROAD RAIL BRIDGE

ST ANDREWS ROAD

FERRY ROAD

FORT ROAD

PORT OF TILBURY

TILBURY FORT

TILBURY POWER STATION

RIVER THAMES

DRAFT

Rev.	Date	Description	By	Chk'd	App'd
P4	23/03/17	SCOPING REPORT	JS	SR	SR
P3	07/03/17	UPDATES TO ORDER LIMITS BOUNDARY	JS	SR	SR
P2	23/02/17	SCOPING REPORT	JS	SR	SR
P1	16/02/17	DRAFT FOR COMMENT	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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Lynch Wood
Peterborough
PE2 6FZ
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Fax: +44 (0)1733 366999
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Client: PORT OF TILBURY LONDON

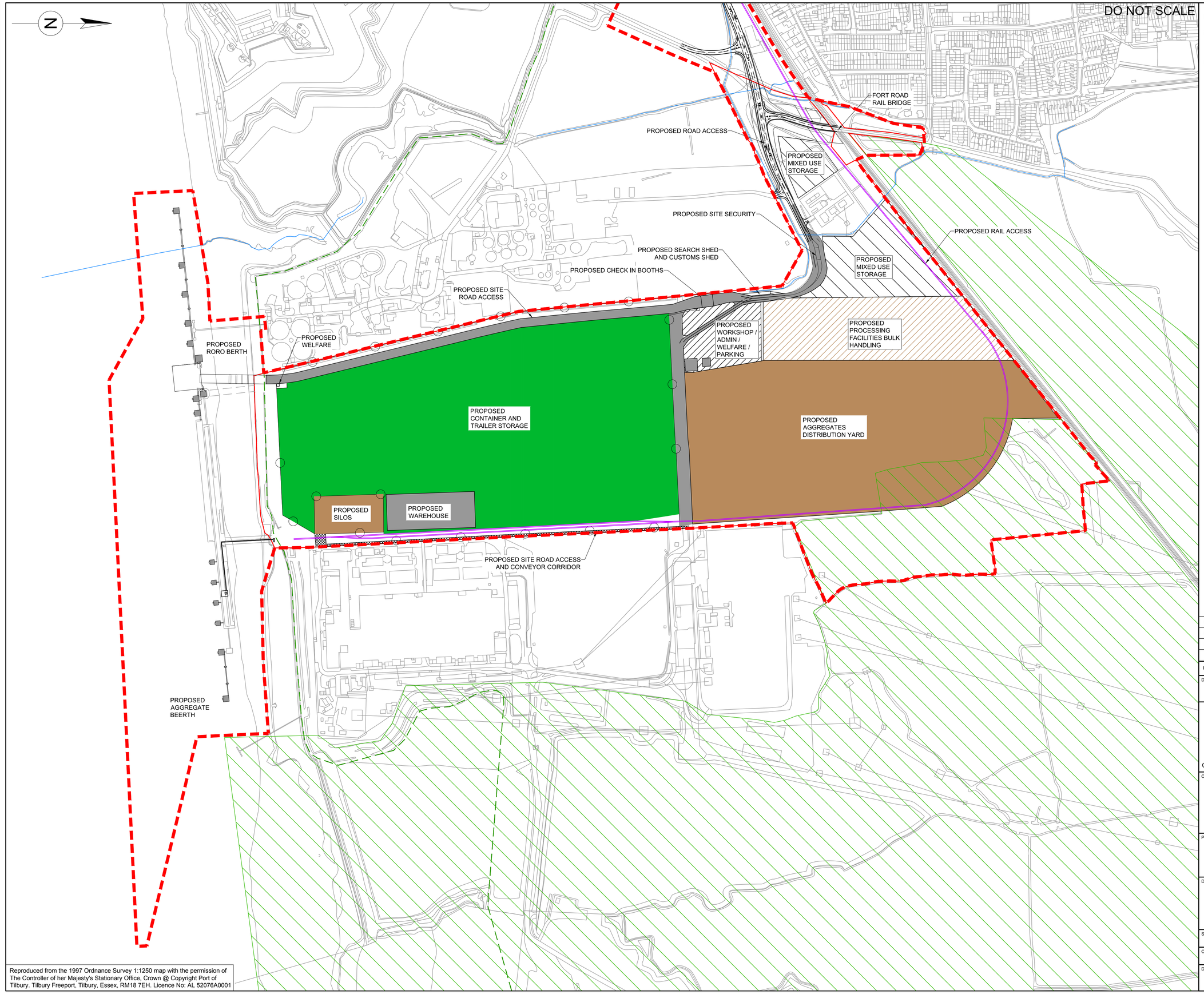
Project Title: TILBURY 2

Drawing Title: SCOPING REPORT LOCATION PLAN

Scale	Designed	Drawn	Checked	Authorised
1:6,000	SR	JS	SR	SR
Original Size: A1	Date: 16/02/17	Date: 16/02/17	Date: 16/02/17	Date: 16/02/17

Drawing Number: 5153187-ATK-ZZ-ZZ-SK-ZZ-0001

Revision: P 4



NOTES:

1. LOCATION OF PROPOSED BUILDINGS AND INFRASTRUCTURE SHOWN INDICATIVELY

KEY:

- DETAILED RIVER NETWORK
- PROPOSED SECURITY FENCE
- PoTLL OWNERSHIP BOUNDARY
- PROVISIONAL ORDER LIMITS
- PUBLIC FOOTPATH
- GREEN BELT

DRAFT

Rev.	Date	Description	By	Chk'd	App'd
P4	23/03/17	SCOPING REPORT	JS	SR	SR
P3	07/03/17	ORDER LIMITS BOUNDARY ADDED	JS	SR	SR
P2	23/02/17	SCOPING REPORT	JS	SR	SR
P1	16/02/17	DRAFT FOR COMMENT	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

ATKINS
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Peterborough
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Fax: +44 (0)1733 366999
www.atkinsglobal.com

Client: PORT OF TILBURY LONDON

Project Title: TILBURY 2

Drawing Title: SCOPING REPORT
GENERAL ARRANGEMENT
SHEET 1 OF 2

Scale	Designed	Drawn	Checked	Authorised
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Original Size: A1	Date: 16/02/17	Date: 16/02/17	Date: 16/02/17	Date: 16/02/17

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Revision: P 4

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Millimetres 100 10 0

N

DO NOT SCALE

PROPOSED RAIL ACCESS

PROPOSED ROAD ACCESS

NOTES:

1. LOCATION OF PROPOSED BUILDINGS AND INFRASTRUCTURE SHOWN INDICATIVELY

KEY:

- DETAILED RIVER NETWORK
- PoTLL OWNERSHIP BOUNDARY
- PROVISIONAL ORDER LIMITS
- PUBLIC FOOTPATH

DRAFT

Rev.	Date	Description	By	Chk'd	App'd
P4	23/03/17	SCOPING REPORT	JS	SR	SR
P3	07/03/17	ORDER LIMITS BOUNDARY ADDED	JS	SR	SR
P2	23/02/17	SCOPING REPORT	JS	SR	SR
P1	16/02/17	DRAFT FOR COMMENT	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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www.atkinsglobal.com

Client: PORT OF TILBURY LONDON

Project Title: TILBURY 2

Drawing Title: SCOPING REPORT
GENERAL ARRANGEMENT
SHEET 2 OF 2

Scale	Designed	Drawn	Checked	Authorised
1:2,000	SR	JS	SR	SR
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Drawing Number: 5153187-ATK-ZZ-XX-DR-ZZ-1001

Revision: P 4

DO NOT SCALE

KEY:

BUILDINGS REMOVED

RETAINED BUILDINGS

MAIN GATE HOUSE

CLUB HOUSE BUILDING

SEWAGE PUMP HOUSE

JUNCTION TOWERS AND CONVEYOR

JETTY WORKSHOP

Tilbury Power Station

DRAFT

Rev.	Date	Description	By	Chk'd	App'd
P1	20/10/16	FOR CLIENT REVIEW	JS	SR	

Drawing Status: WORK IN PROGRESS

Suitability: S0

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Tel: +44 (0)1733 366900
Fax: +44 (0)1733 366999
www.atkinsglobal.com

Client: PORT OF TILBURY LONDON — PORT OF TILBURY LONDON LTD, PORT ENGINEERING DEPARTMENT

Project Title: T2 TILBURY

Drawing Title: RETAINED BUILDINGS

Scale	Designed	Drawn	Checked	Authorised
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Original Size	**Date**	**Date**	**Date**	**Date**
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Revision: P 1

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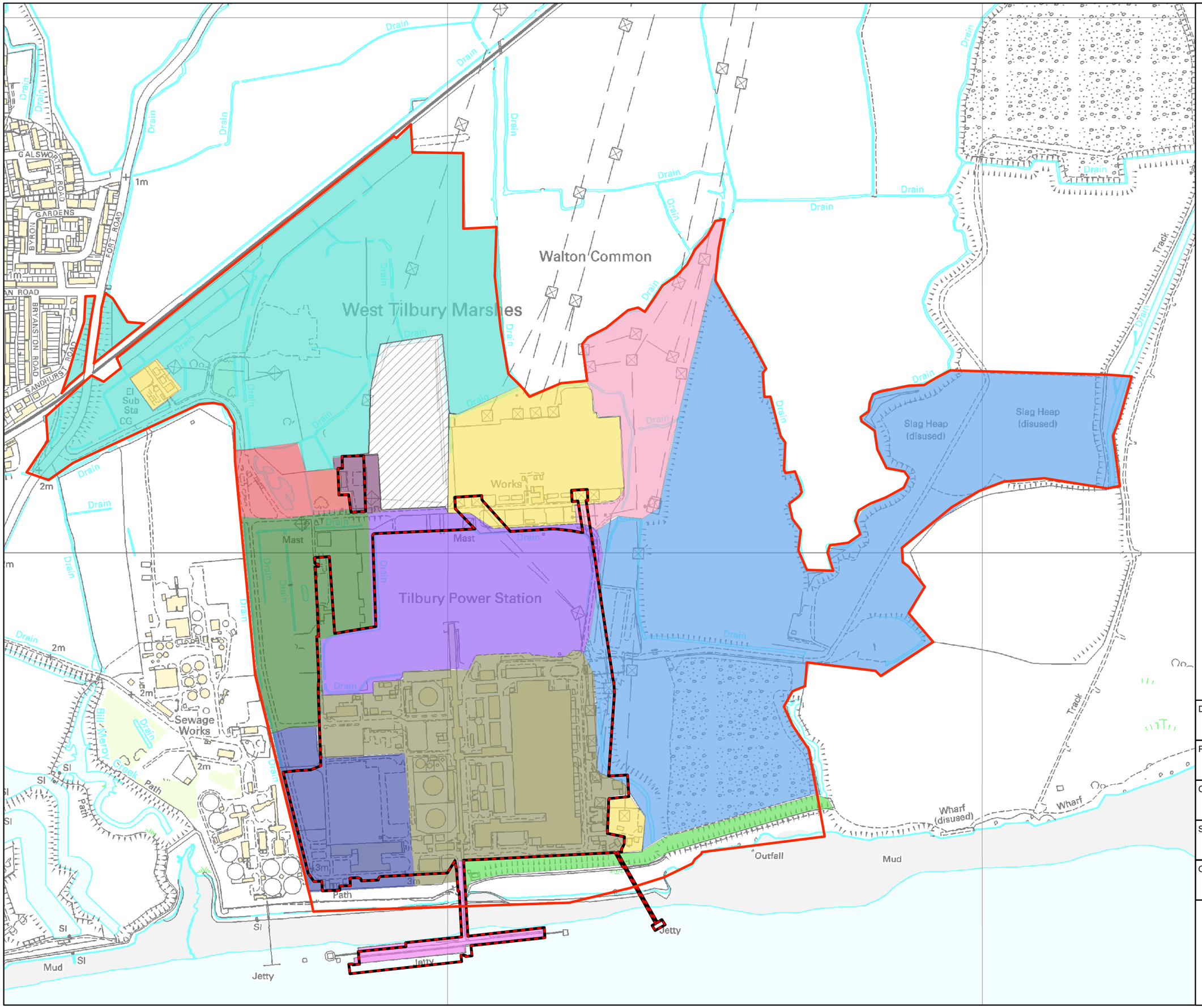

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- A-Station
- Tilbury Energy and Environment Centre (TEEC) Wildlife Site
- Coal Fields
- Tilbury Riverside Project Community Meadow
- Ashfields
- Northern Area
- Owl House
- National Grid compounds
- Sub Station
- Jetty
- B-Station
- Gatehouse
- SEESA Compound

0 50 100 200 300 M

Drawing title:
Tilbuy Site Areas

Project:
A088550 Tilbury Powerstation

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/15	CW 11/11/15

Office:	Drawing number:	Revision:
4594	Figure 1.2	Rev.01

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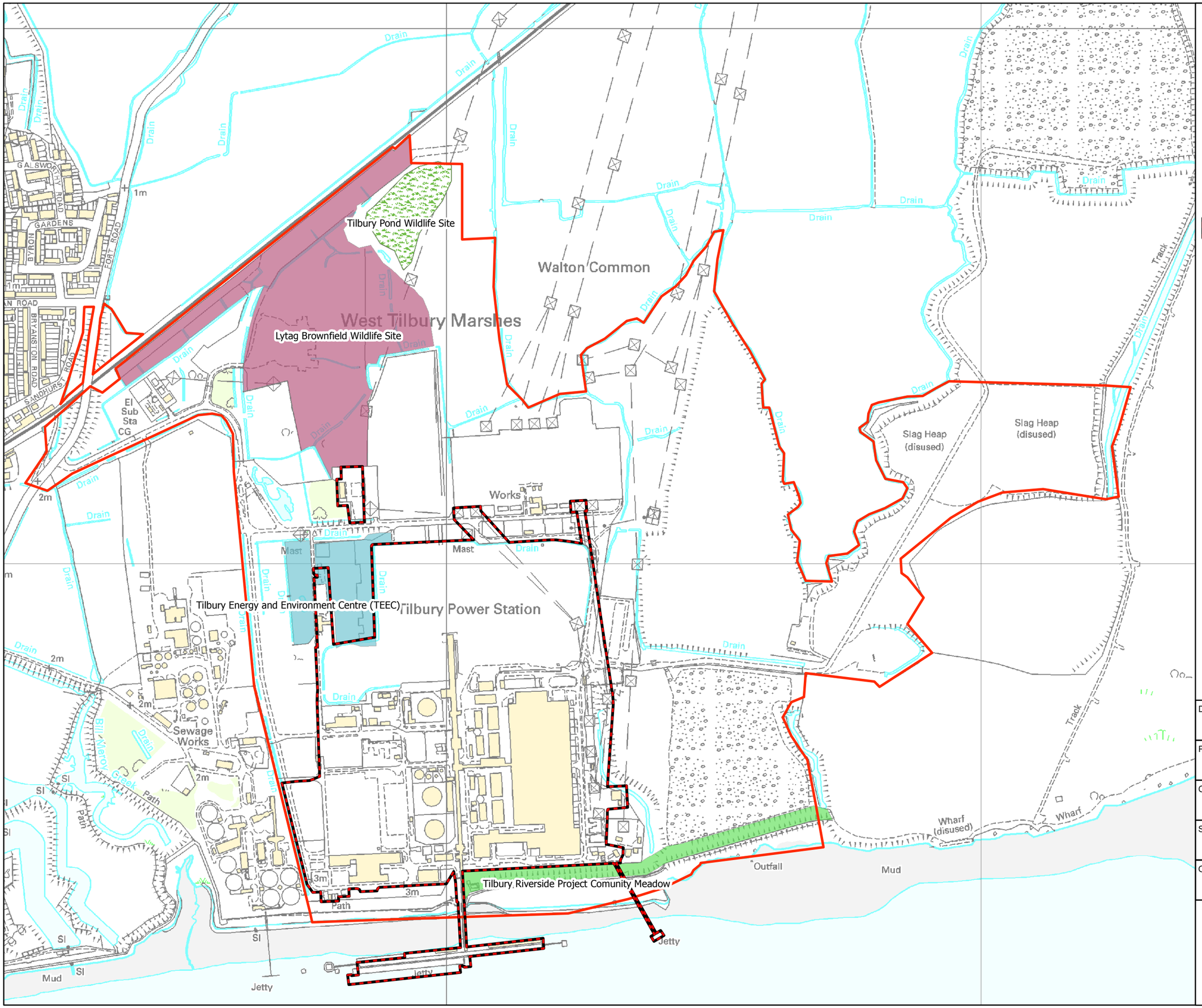

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Tilbury Pond Wildlife Site
- Lytag Brownfield Wildlife Site
- Tilbury Energy and Environment Centre (TEEC) Wildlife Site
- Tilbury Riverside Project Community Meadow

0 50 100 200 300 M

Drawing title:
Tilbury Wildlife Areas

Project:
A088550 Tilbury Powerstation

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/15	CW 11/11/15

Office:	Drawing number:	Revision:
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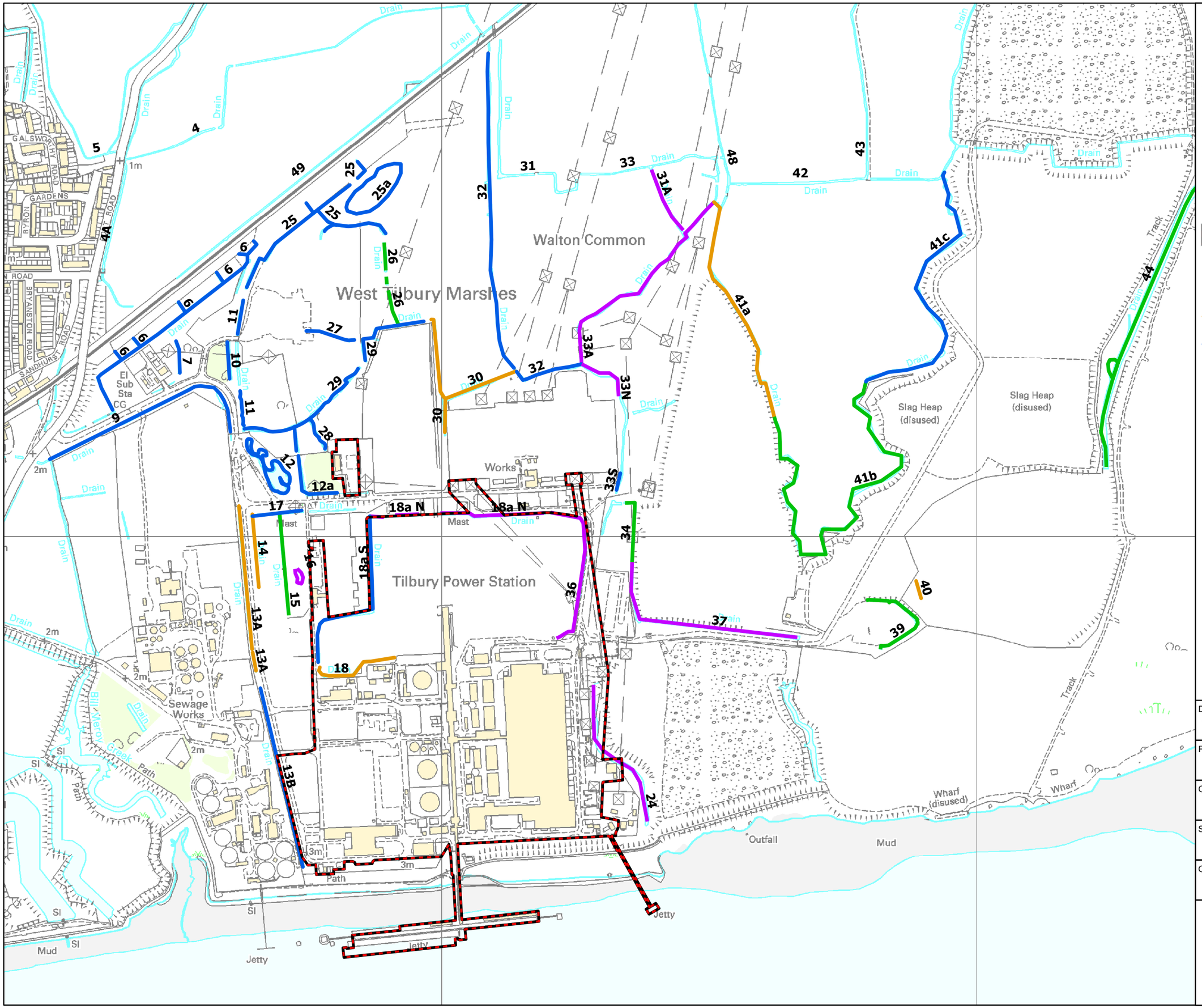

Drawing title:
Water vole survey map

Project:
A088550 Tilbury Powerstation

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 11/11/2015	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 3.1	Rev.01

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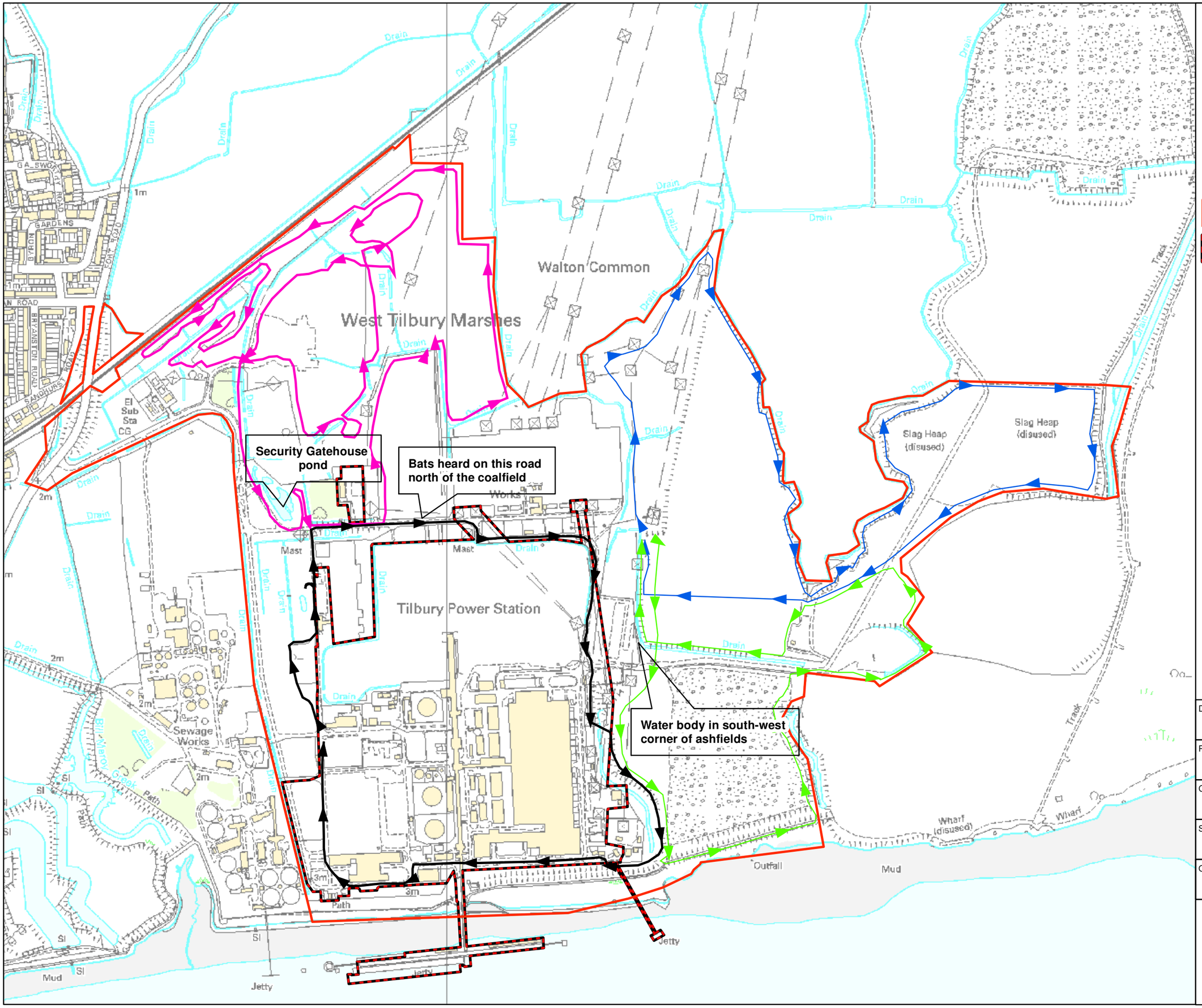

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Transect 1
- Transect 2
- Transect 3
- Transect 4

0 50 100 200 300 m

Drawing title: Bat Transects

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	TB 11/11/15	JS 11/11/15	CW 11/11/15

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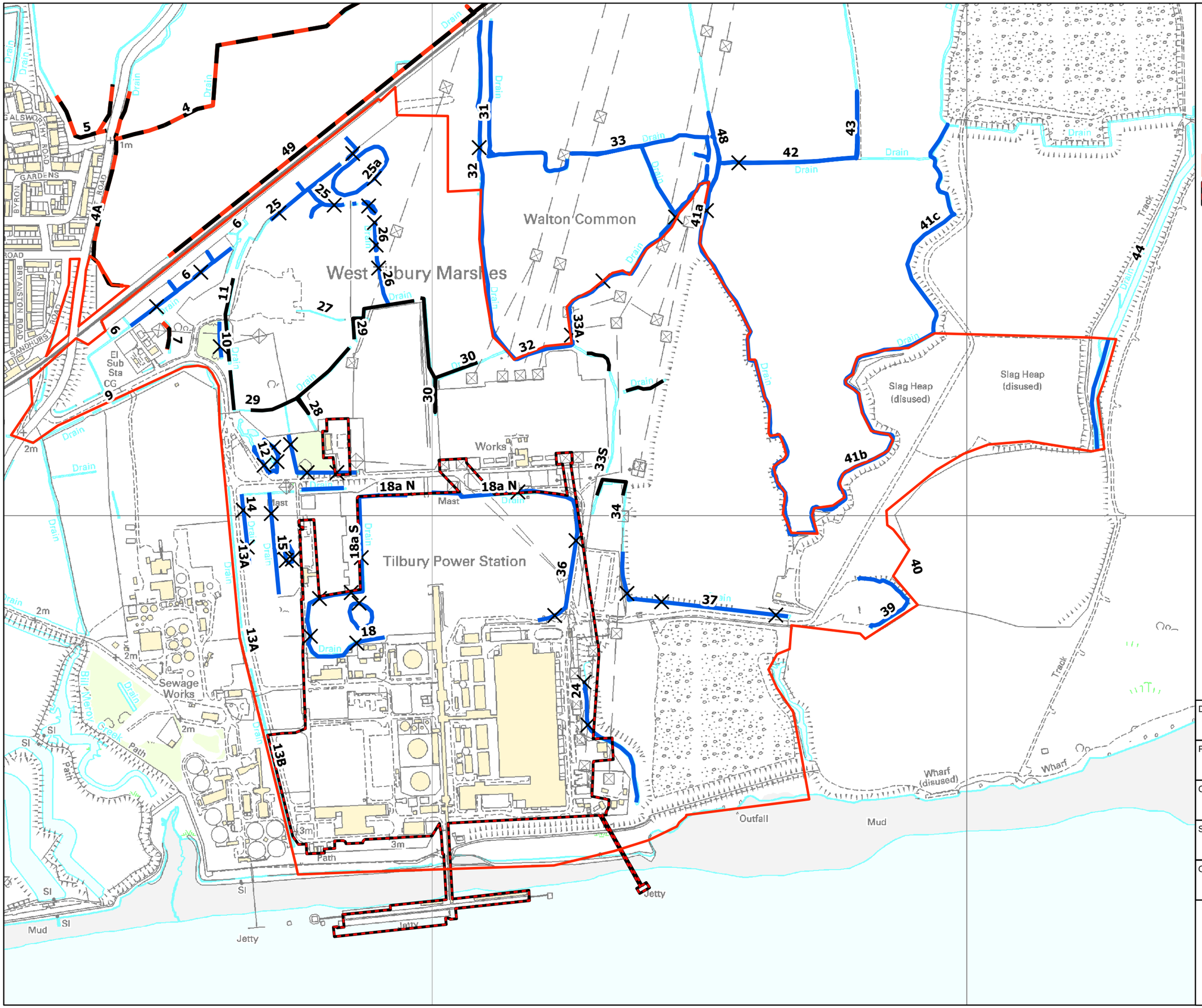

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Bottle Locations
- Dry
- Waterbodies Surveyed
- Polluted

Drawing title: Waterbodies surveyed for GCN's

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 11/11/15	DS 11/11/15	CW 11/11/15

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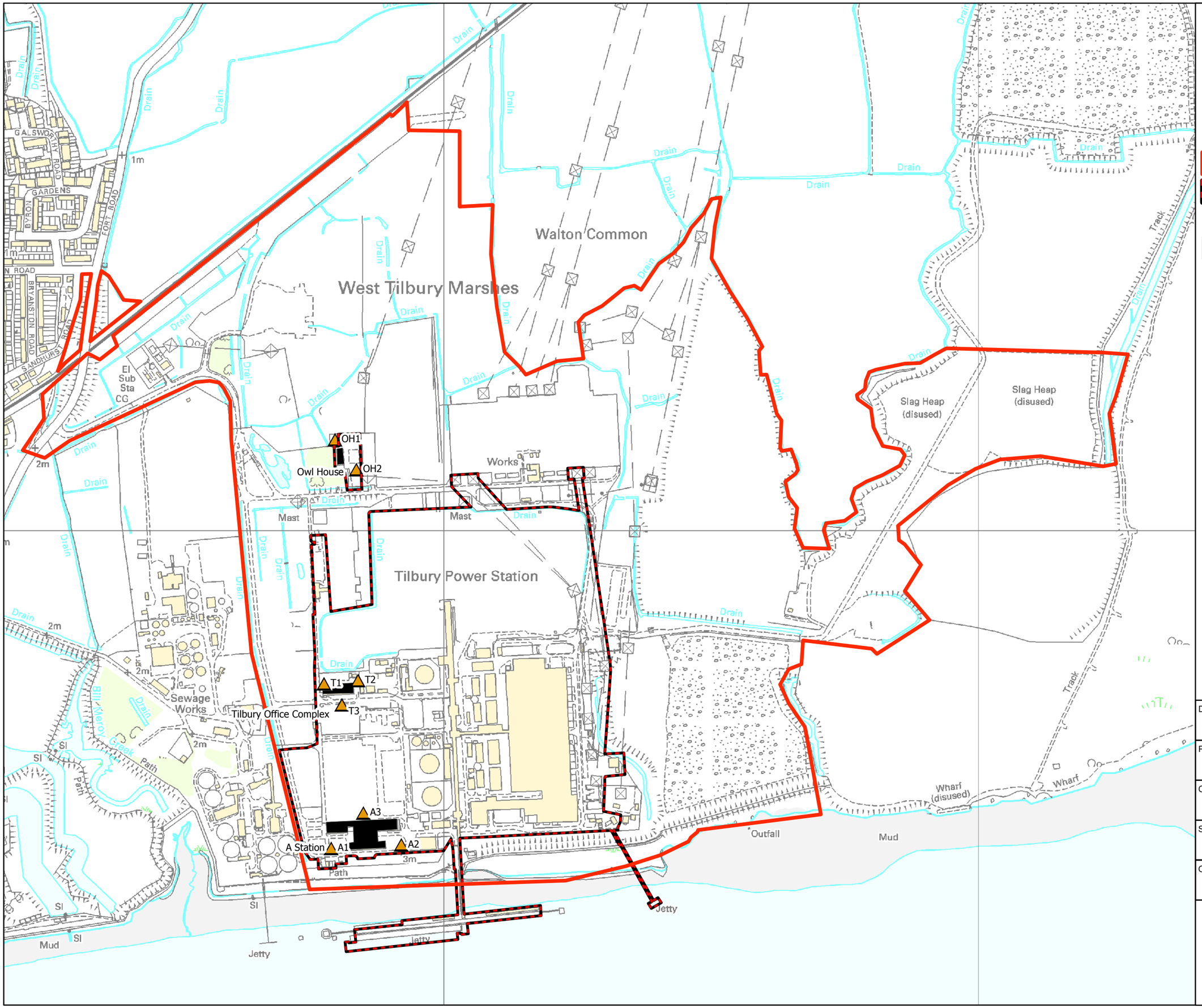

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Surveyor Locations
- Buildings

0 50 100 200 300 m

Drawing title:
Surveyor Locations For Bat Emergence

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 09/11/2015	DS 09/11/2015	CW 09/11/2015

Office:	Drawing number:	Revision:
4594	Figure 4.2	Rev.01

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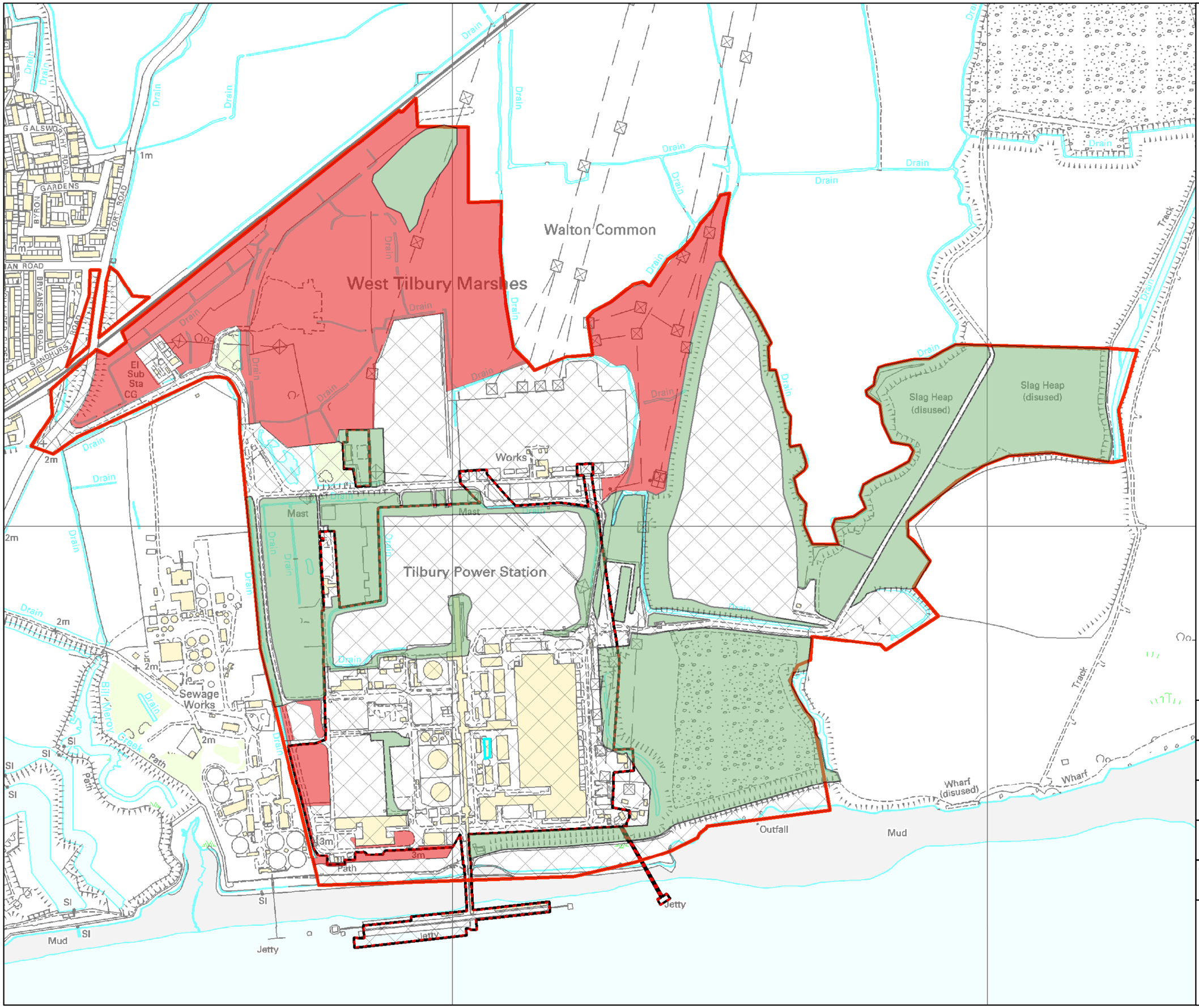

N

Legend

- RWE Ownership Boundary
- Demolition Boundary

Population Sizes

- Exceptional
- Low
- Unsuitable habitat

0 50 100 200 300 M

Drawing title:
Reptile Population Size Class Map

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JAS 10/11/2015	DS 10/11/2015	CW 10/11/2015

Office:	Drawing number:	Revision:
4594	Figure 6.3	Rev.01

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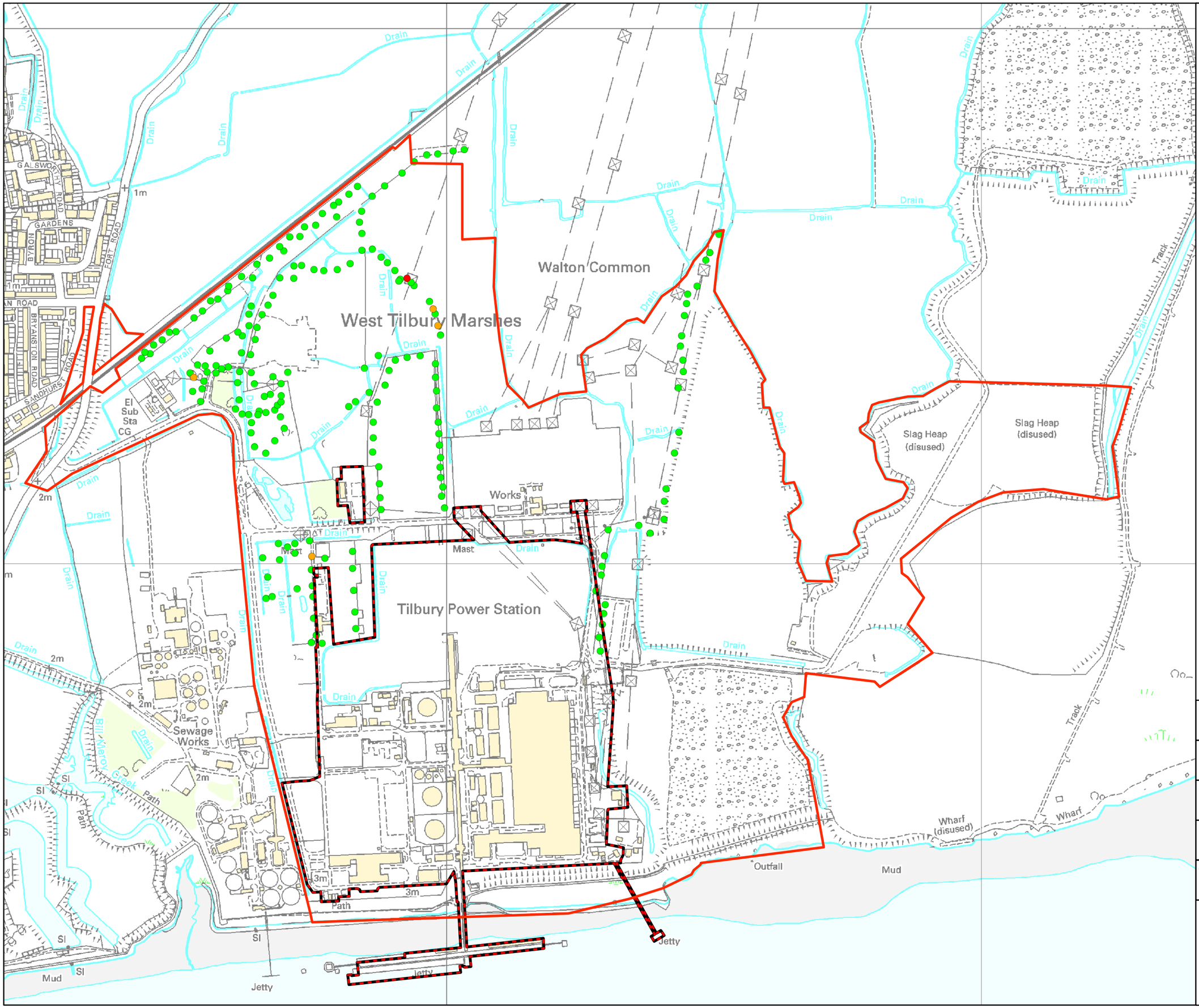

N

Legend

- RWE Ownership Boundary
- Demolition Boundary
- Dormouse Tube Locations
- Dormouse Signs
- Dormouse Nest

0 50 100 200 300 M

Drawing title:
Dormouse Tube Locations

Project:
A088550 Tilbury Power Station

Client:
RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/2015	DS 11/11/2015	CW 11/11/2015

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4594	Figure 7.1	Rev.01

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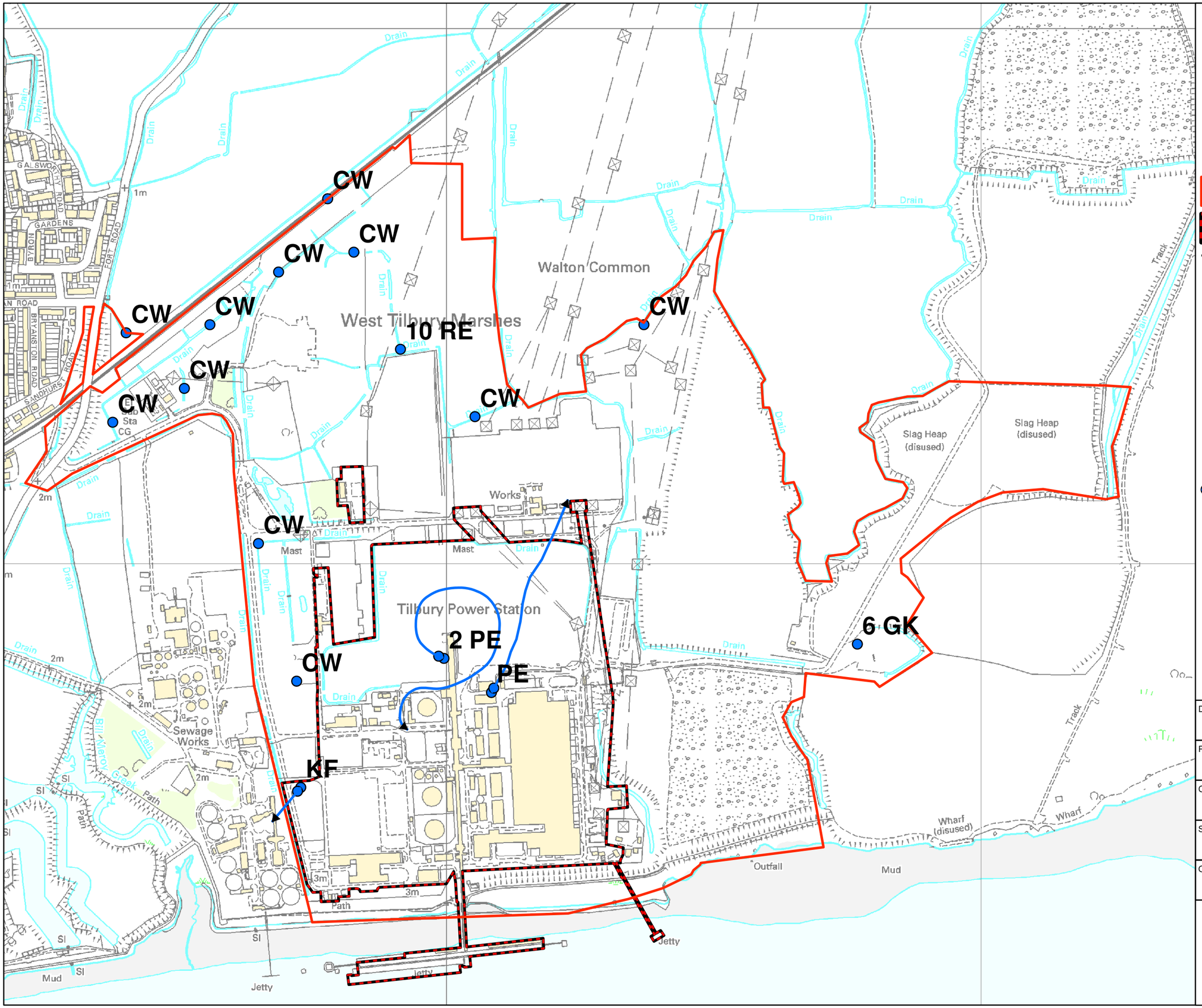

N

Legend

- RWE Ownership Boundary
- Demolition Boundary

Territory locations

- CW Cettis warbler
- GK Greenshank
- KF Kingfisher
- PE Peregrine
- RE Redwing
- Flight lines of Schedule 1 Species

0 50 100 200 300 M

Drawing title: Breeding Bird Schedule 1 Species

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
1:6,500	JS 11/11/15	DS 11/11/2015	CW 11/11/2015

Office:	Drawing number:	Revision:
4594	Figure 8.1	Rev.01

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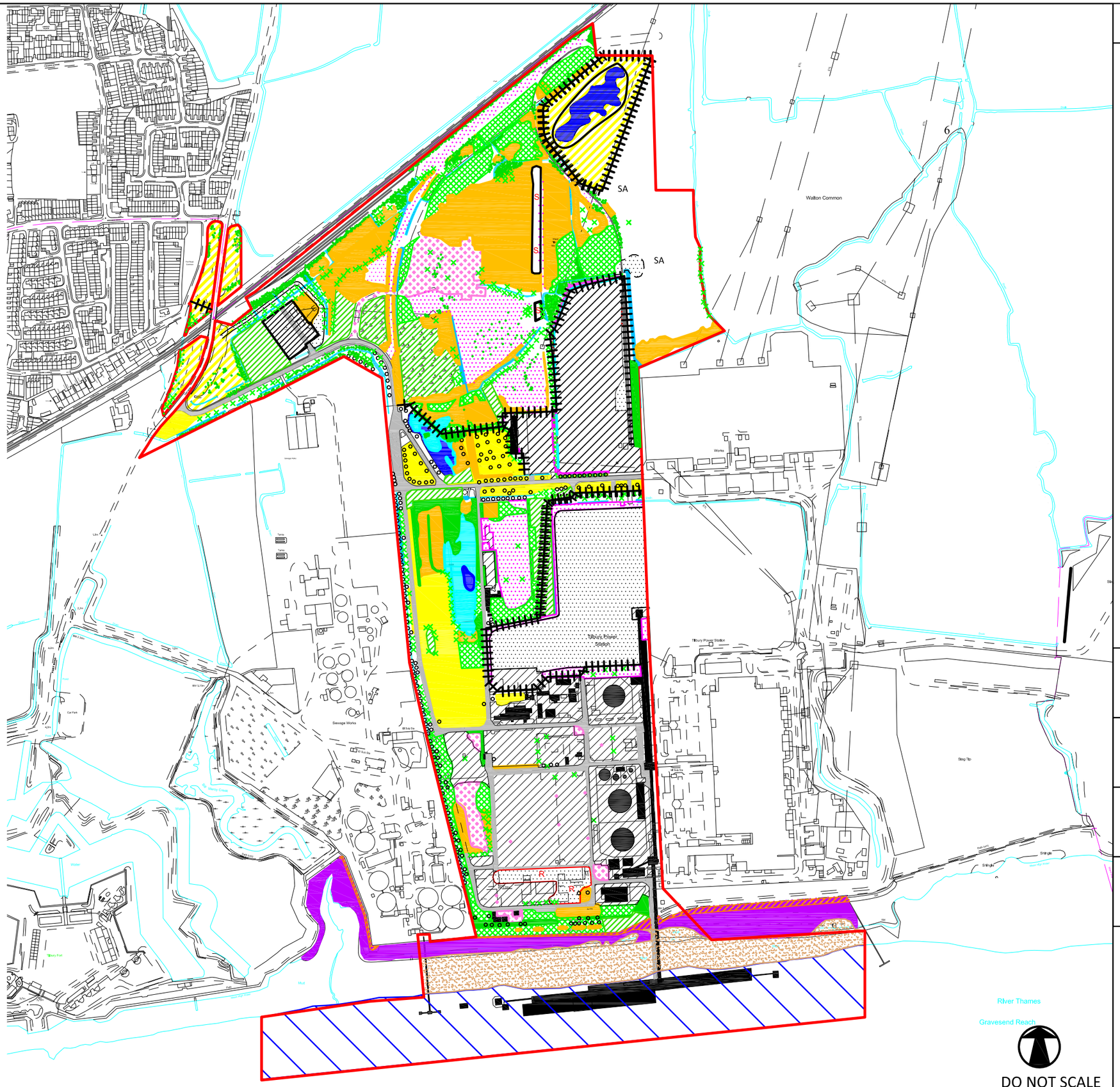

DO NOT SCALE

Key

- Survey area (main site)
- Coarse Neutral Grassland
- Drainage Ditch
- Ephemeral/ Short Perennial +Skeletal Grassland
- Palisade fence
- Grazed Grassland
- Hardstanding/Artificial Surfaces
- Immature Scrub/ Dense Bramble
- Mature Scrub and hedgerow
- Mown grassland
- Plantation
- Recently Disturbed Ground
- Semi Mature Plantation Trees
- SA — Set-aside Type Habitats
- Standing Water
- Swamp + Fen
- Target Note + Text Reference
- Tarmac Road
- Vegetated Hard-Standing
- Buildings
- S — Spoil/PFA heap
- R — Demolition rubble mound
- Saltmarsh vegetation
- Intertidal mud
- Tidal river
- Maritime grassland + ruderal

Title

Habitat Map - Main site and Thames foreshore

Project	Client
Tilbury 2	POTLL

Drawing No.	Revision	Project No.
Figure 1a	B	E1862

Drawn	Checked	Date
KP, MF	DW	February 2017

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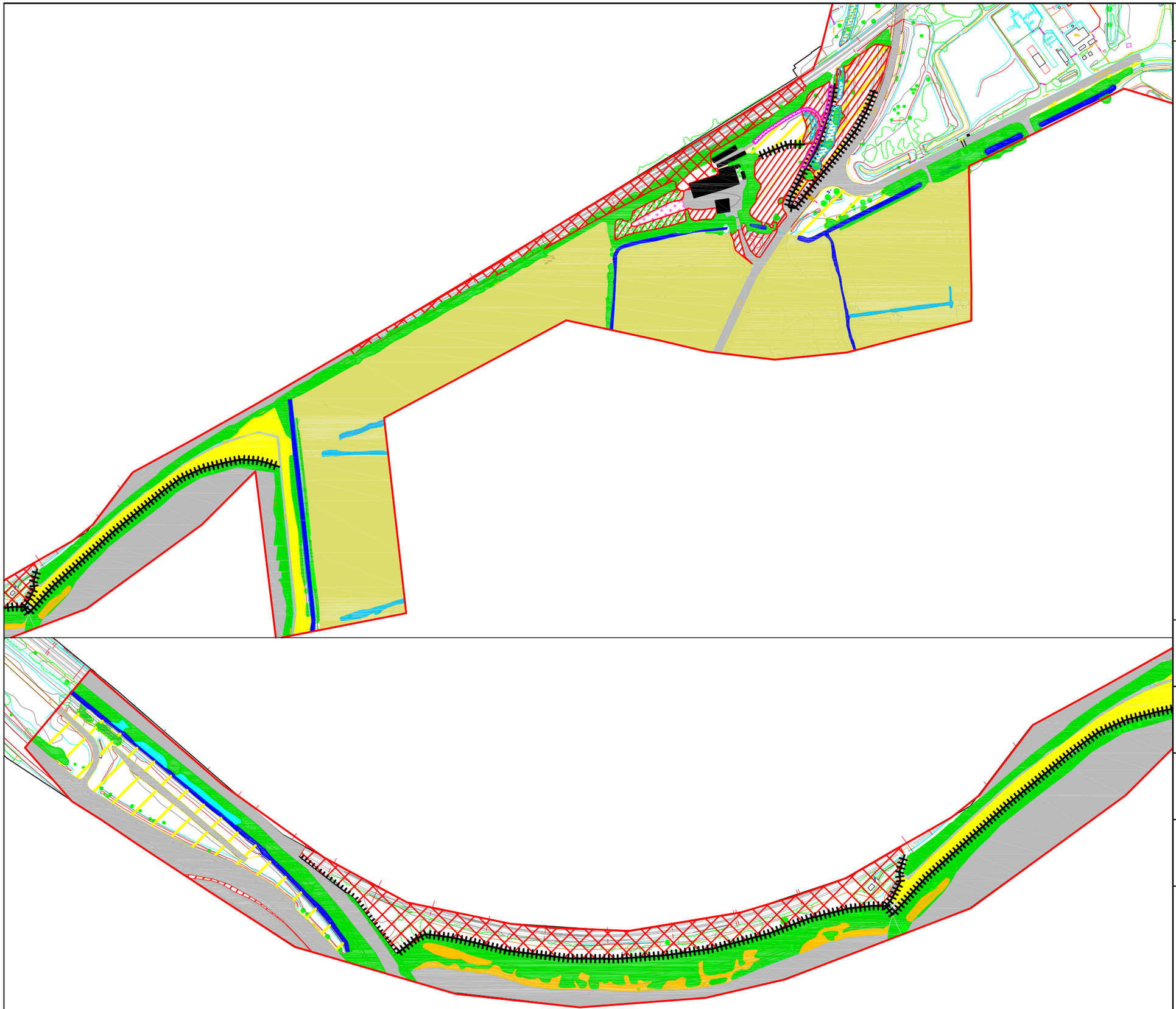

Key

- Survey area
- Coarse Neutral Grassland
- Dry ditch
- Ephemeral/ Short Perennial +Skeletal Grassland
- Fence
- Grazed Grassland
- Immature Scrub/ Dense Bramble
- Tall ruderal vegetation
- Mown grassland
- Mature Scrub
- Coastal and floodplain grazing marsh
- Standing Water (occasional channel flow)
- Swamp + Fen
- Tarmac Road/hardstanding
- Vegetated Hard-Standing
- Area not accessible for survey

DO NOT SCALE

Title

Habitat Map - Surface Access Corridor

Project	Client
Tilbury 2	POTLL

Drawing No.	Revision	Project No.
Figure 1b	B	E1862

Drawn	Checked	Date
FM	DW	February 2017

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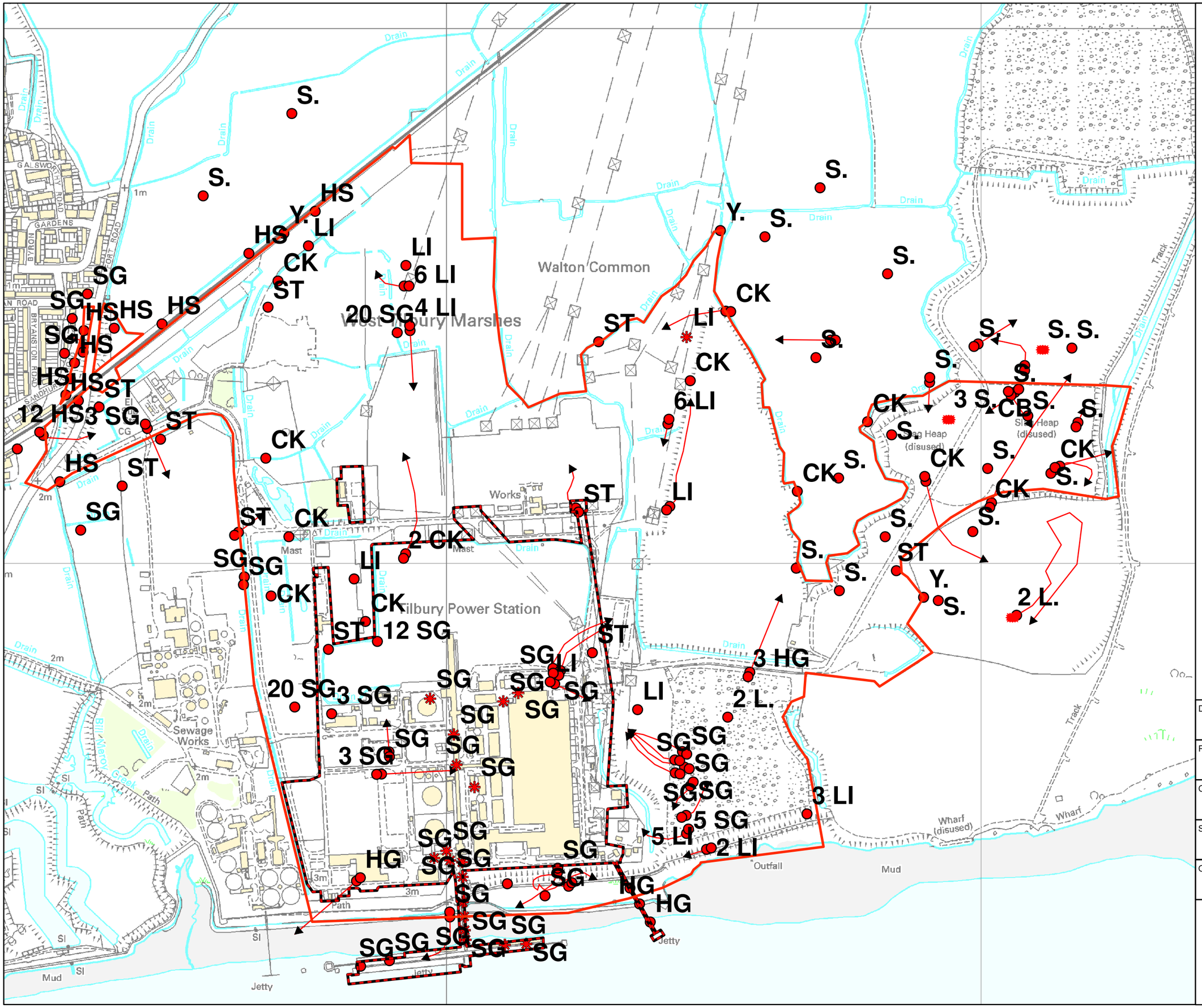

N

Legend

- RWE Ownership Boundary
- Demolition Boundary

Territory locations

- CB Corn bunting
- Y. Yellowhammer
- CK Cuckoo
- HG Herring Gull
- HS House Sparrow
- L. Lapwing
- LI Linnet
- S. Skylark
- SG Starling
- ST Song thrush
- Aggressive Encounter
- Nest
- Flight Lines BoCC Red Species

0 50 100 200 300 M

Drawing title: Breeding Bird Survey Birds of Conservation Concern Red

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
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Office:	Drawing number:	Revision:
4594	Figure 8.2	Rev.01

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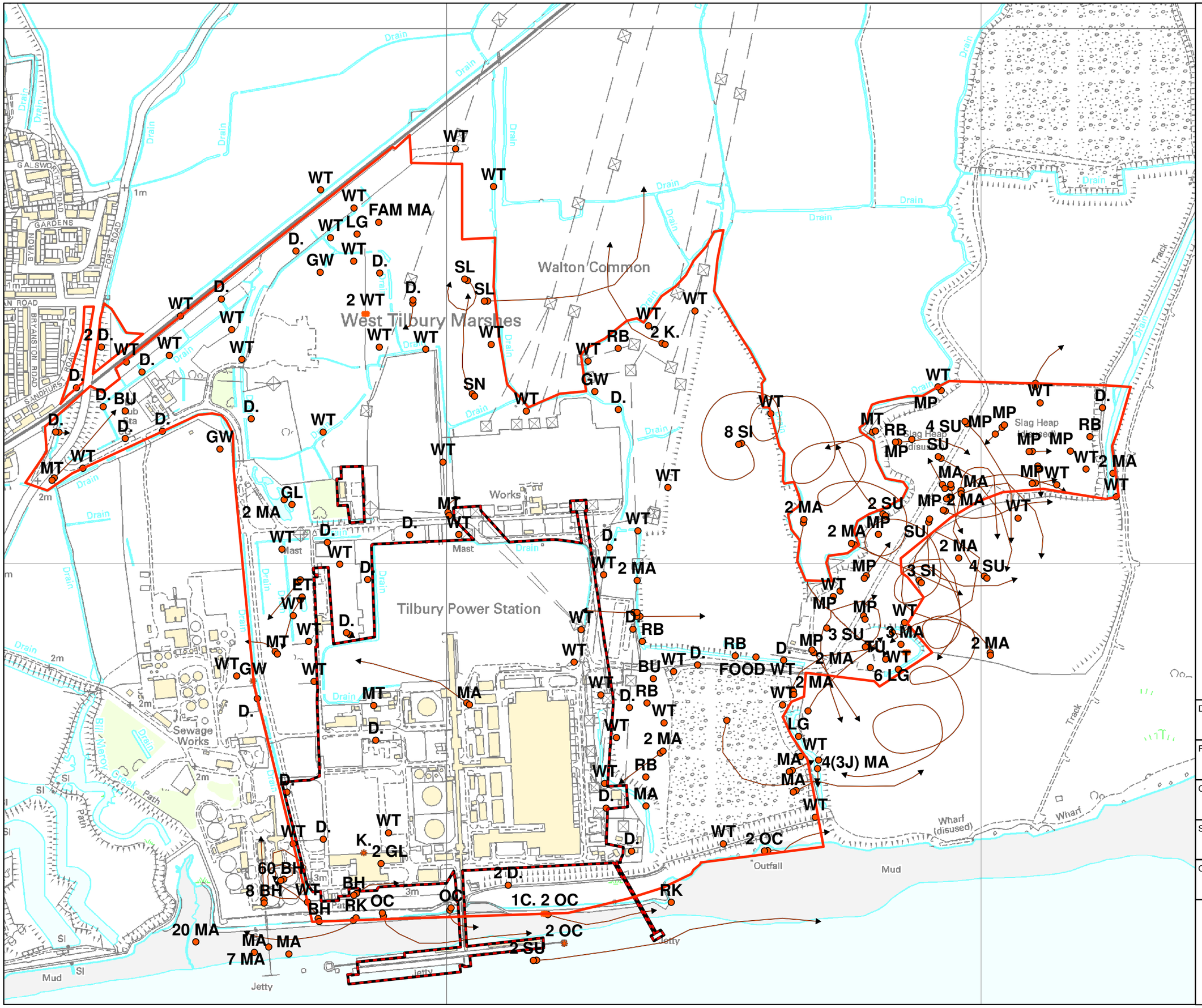

Legend

N

- RWE Ownership Boundary
- Demolition Boundary

Territory locations

- BH Black-headed gull
- BF Bullfinch
- D. Dunnock
- GL Grey wagtail
- GW Green woodpecker
- K. Kestrel
- ET Little egret
- LG Little grebe
- MA Mallard
- MP Meadow pipit
- MT Mistle thrush
- OC Oystercatcher
- RB Reed bunting
- RK Redshank
- SI Swift
- SL Swallow
- SN Snipe
- SU Shellduck
- TU Tufted duck
- WT Whitethroat
- Aggressive encounter
- Nest
- Flight lines BoCC Amber Species

0 50 100 200 300 M

Drawing title: Breeding Bird Survey Birds of Conservation Concern Amber

Project: A088550 Tilbury Power Station

Client: RWE nPower

Scale (A3):	Created by:	Reviewed by:	Verified by:
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