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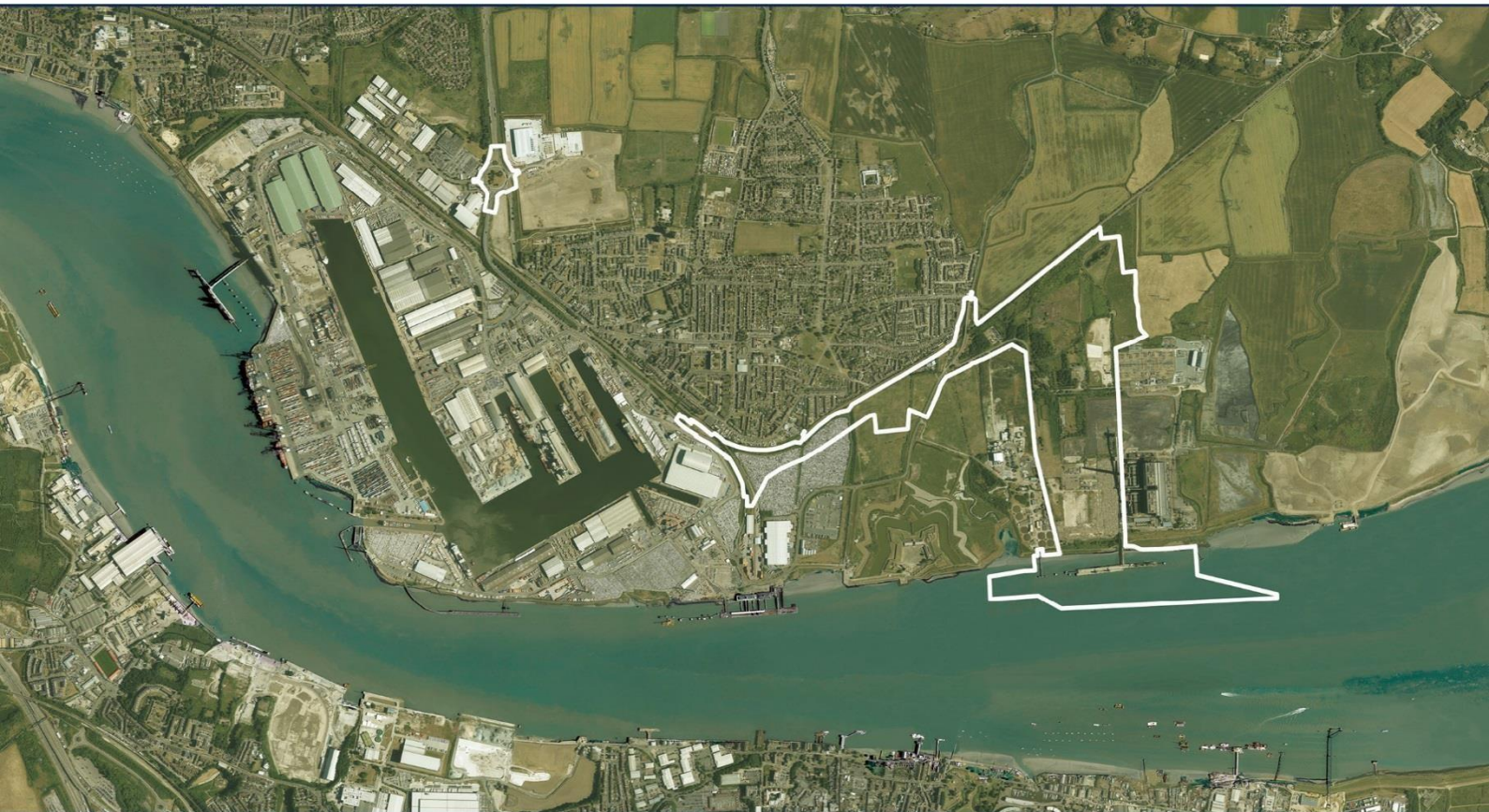
PROPOSED PORT TERMINAL AT
FORMER TILBURY POWER STATION

TILBURY2

TR030003

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN
V2 – TRACK CHANGES

TILBURY2 DOCUMENT REF: POTLL/T2/EX/43



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Figure 1 (March 2018 revision):

Management Compartments

Appendix E:

**Technical Note on Tilbury2
Landscape Mitigation Proposals**

1.0 INTRODUCTION

SCHEME OVERVIEW

- 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 former 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 ("RoRo") 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. The CMAT will include stockpiling of construction materials and some processing of aggregates for the production of asphalt and concrete products. An 'infrastructure corridor' is proposed that will accommodate road and rail links to the existing rail and road network and an enhanced connection with the existing Port.
- 1.3 The project will require works including, but not limited to:
- creation of hard surfaced pavements;
 - improvement of and extensions to the existing river jetty including creation of a new RoRo berth;
 - associated dredging of berth pockets around the proposed and extended jetty and dredging of the approaches to these berth pockets;
 - new and improved conveyors;
 - erection of welfare buildings;
 - erection of a single 10,200sq.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; and
 - formation of a rail spur and sidings.
- 1.4 The proposed volumes of import/export of RoRo 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).
- 1.5 The scheme also includes elements of retained habitat, proposed habitat creation and soft-landscaping, the management of which during operation is the subject of this Landscape and Ecology Management Plan (LEMP) document.

SCOPE AND PURPOSE

- 1.6 The LEMP covers the terrestrial areas of the site. ~~No management is proposed or necessary for the intertidal or marine habitats falling within the Order Limits as it is predicted that their current and future condition will continue to be maintained by ongoing hydrogeomorphological processes. These processes are not anticipated to be disrupted by the proposals (see Environmental Statement Chapter 10 Terrestrial Ecology, and Chapter 11 Marine Ecology, document reference 6.1).~~ The purpose of the LEMP is to set out the general principles for management during operation of both existing terrestrial habitats and retained established planting and that which will be newly created within the Order Limits, in order that these perform their intended ecological and landscape functions during operation of the development. These functions are in part ameliorative (e.g. to screen views from sensitive receptors) and in part mitigation/compensation (e.g. to provide alternative habitat for species displaced by the development). Further information is provided in ES Chapters 9 and 10. Details of the construction of created habitats, including those within the Order Limits, are set out in the Ecological Mitigation and Compensation Plan (EMCP).
- 1.7 Compliance with the LEMP will be a requirement of the DCO. As such, the Port operator must comply with all measures within it.

2.0 RETAINED ECOLOGICAL & LANDSCAPE FEATURES

- 2.1 The baseline condition of the retained features of ecological interest is described in detail within ES Chapter 10: Terrestrial Ecology, and set out in the associated Figures and Appendices. Features of landscape interest are defined within the ES Chapter 9: Landscape Character and Visual Amenity and associated Figures and Appendices.
- 2.2 This LEMP is concerned only with the management of those ecological and landscape features that will remain on completion of construction. These are as illustrated on ~~Figure 10.13 (On-Site Ecological Mitigation and Compensation)~~ and Figure 9.9 (Landscape Strategy) of the Environmental Statement and at Figure 10.13 is reproduced at Figure 1 (On-Site Ecological Mitigation and Compensation) of this LEMP and annotated with the boundaries of the various management compartments discussed at Section 4 of this document.

RETAINED PARTS OF EXISTING ECOLOGICAL AND LANDSCAPE DESIGNATIONS

- 2.3 The Order Limits encompass a number of non-statutory ecological designations. The 'Tilbury Marshes' Local Wildlife Site (LoWS) is a 39.8ha designation which overlaps with the infrastructure corridor but is in large part located to the south of it. Of the 6.2ha of this LoWS within the Order Limits, up to 3.42.7ha will be subject to permanent DCO use, with a further 1.03.5ha to be used only temporarily during construction and restored for wildlife¹ post-development. The restored area will revert to common land and be subject to associated reinstated grazing rights, and therefore falls outside the scope of this LEMP.
- 2.4 The 'Tilbury Centre' LoWS will be removed during construction. Most of the 'Lyttag Brownfield' LoWS will also be removed but a small (0.7ha) area will be retained in the northern edge of the Green Belt land. This comprises management compartment 7 as described in Section 4 of this LEMP.
- 2.5 An area of approximately 7.8ha of designated Green Belt land north-east of the CMAT and rail spur will also be encompassed within the Order Limits. This comprises compartments 5, 6 and 7 as described in Section 4 of this LEMP.

RETAINED HABITATS / LANDSCAPE FEATURES

- 2.6 Terrestrial habitat and landscape features that will be retained through the construction and operation of the development include the following Section 41 (S41) Habitats², as described further within Chapter 10 of the ES:
- Open Mosaic Habitats on Previously Developed Land (0.3 ha);
 - Hedgerows (c.180m); and

¹ Specifically restored to Coastal and Floodplain Grazing Marsh priority habitat type.

² Species and habitats of principal importance in England pursuant to the obligations levied by the Natural Environment & Rural Communities Act, 2006 (section 40-42).

- Ponds (1 no.).

2.7 Other non-S41 retained habitat features include:

- Drainage ditches (c.1005m)
- Tree lines (c.950m)
- Scrub (0.1-0.5ha)
- Other grassland (c.2.5ha)

3.0 NEWLY CREATED HABITATS / LANDSCAPE FEATURES

NEW HABITATS / LANDSCAPE FEATURES

- 3.1 New habitat creation forms part of both the On-Site Ecological Mitigation and Compensation Strategy (see Figure 10.13 of the ES, and also Figure 1 of this document) and the Landscape Strategy (see Figure 9.9 of the ES, which is further explained by the Technical Note presented at Appendix E). It is a condition of this LEMP that these features are constructed and managed in accordance with this LEMP and as indicated on Figure 1. Further details of the processes of construction of these new habitats are set out in the EMCP. This LEMP deals only with their aftercare and management.
- 3.2 Newly created or restored habitat features include the following S41 Habitats (Habitats of Principal Importance further to section 41 of the NERC Act 2006) or ecologically similar equivalents:
- Open Mosaic Habitat on Previously Developed Land;
 - Coastal and Floodplain Grazing Marsh;
 - Lowland Mixed Deciduous Woodland / Hedgerows³;
 - Ponds (2 no.); ~~and~~
 - Reedbed; and
 - Intertidal habitats (saltmarsh / mudflat)⁴.
- 3.3 Other newly created habitat and landscape features will include the following:
- Wet ditches (suitable for water voles);
 - Dry ditches (including surface water / highway drainage attenuation); and
 - Scrub and woodland planting.

NEWLY CREATED FEATURES FOR PROTECTED SPECIES

- 3.4 The species of ecological interest identified in the assessment of baseline conditions are described in detail within the ES Chapter 10: Terrestrial Ecology, and associated Figures and Appendices.
- 3.5 In addition to the ditches and ponds above, which will provide habitat for water voles, and scrub intended to provide some measure of replacement habitat for displaced nesting birds, a number of other species will require specific provision of new ecological features as follows:

- Artificial sett creation for badger;

³ Non-S41 but ecologically very similar habitats will be created through screen planting and other scrub creation

⁴ This is dealt with in the EMCP. No on-going management of these habitats is deemed necessary due to their being maintained by hydrogeomorphological processes and thus intertidal habitats do not form a management compartment within the LEMP.

- Suitable grassland habitat for translocated reptiles, and;
- Replacement bat roosts (bat boxes).

4.0 HABITAT & LANDSCAPE MANAGEMENT MEASURES

GENERAL MEASURES

- 4.1 The following measures apply to all management prescriptions outlined in Section 4.

Works to retained trees

- 4.2 All tree inspections and arboricultural works indicated in the following sections of this LEMP are to be carried out by an approved member of the Arboricultural Association. The results of inspections and interventions should be documented in writing.
- 4.3 Where and to the extent that materials and workmanship are not fully specified they are to be in accordance with good prevailing arboricultural practice or the current British Standard with reference to:
- BS 3998: Recommendations for tree work;
 - BS 4428: Code of practice for general landscape operations.

New planting

- 4.4 Aftercare and establishment works are to be carried out by an approved landscape contractor in accordance with good horticultural practice or the current British Standard with reference to:
- BS 4428: Code of practice for general landscape operations;
 - BS 7370: Grounds maintenance;
 - BS 8545: Trees: from nursery to independence in the landscape – recommendations.
- 4.5 Three broad aftercare and establishment periods for new planting are identified below, these are not mutually exclusive and a programme of monitoring will be necessary to ensure the landscape objectives are met.

Short term (1-5 years). The initial establishment period will require more frequent maintenance operations. Replacement planting and remedial works will be carried out and planting sundries maintained in good condition.

Medium term (5-10 years). As the planting establishes during this period, less frequent maintenance will be required. Initial thinning may be necessary to ensure planting thrives without competition.

Long term (10-25 + years). As the planting matures, continual monitoring (see Section 5) will inform a rolling maintenance programme, to ensure that effective maintenance is carried out at the appropriate time to meet health and safety requirements.

- 4.6 During the Short Term (initial establishment) period, inspections shall take place annually in October/November to determine the effectiveness of the

establishment and aftercare provisions to that point, paying particular attention to:

1. Planting disease, damage or death;
 2. Vandalism;
 3. General appearance and condition;
 4. Any invasive or non-native species;
 5. Any evidence of protected species (such as nesting birds).
- 4.7 If required, the LEMP will be revised and forthcoming maintenance operations adjusted accordingly.
- 4.8 Reviews will continue to take place beyond the initial 5 year period subject to an assessment of the prevailing conditions on site as part of the 5 year LEMP review (see Section 5). These shall also identify any necessary remedial works on planting affecting publicly accessible areas. Safety issues reported by the public shall also be investigated as soon as practically possible and remedial works undertaken as necessary.

Works to ditches and ponds

- 4.9 Maintenance works to adopted highways drains, including the swales proposed to run adjacent to the link road along the infrastructure corridor, are anticipated to fall within the responsibility of the adopting authority. They are thus not addressed here, albeit that some of the same principles will apply, and they are expected to form some degree of mitigation and compensation function (e.g. against losses of dry grassed ditch within current grazing land).
- 4.10 Management works to controlled watercourses, including diverted sections of the 'main rivers' of Pincock's Trough, Chadwell Sewer, Chadwell Cross Sewer and East Dock Sewer will need to be carried out in accordance with approvals from the Environment Agency pursuant to their protective provisions in the DCO.
- 4.11 Management of ditches created with ecological or landscape objectives overriding in the design can be carried out without recourse to permitting regimes and thus fall fully within the ambit of this LEMP. Standard best practice procedures shall apply to such activities^{5,6}, and species-specific guidance shall be taken into account where relevant, such as for water vole^{7,8}.

⁵ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

⁶ Buisson *et al.* (2008). *The Drainage Channel Biodiversity Manual: Integrating Wildlife and Flood Risk Management*. Association of Drainage Authorities and Natural England, Peterborough.

⁷ Strachan, Moorhouse & Gelling, (2011). *Water Vole Conservation Handbook*, 3rd edition. WildCRU.

⁸ Dean, Strachan, Gow and Andrews, (2016). *The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series)*. Eds. F Mathews & P Chanin. The Mammal Society, London.

Maintenance of operational mitigation measures

- 4.12 The success of on-site mitigation and compensation for both landscape effects and ecological effects will be dependent not just on aftercare and management, but also on ensuring the value of retained and created habitats is not compromised by negative influences arising due to proximity to the operational Tilbury2 development.
- 4.13 Chapter 10 of the ES includes assessments of the impacts of noise, dust and lighting on retained and new habitat features, taking into account outputs from the studies reported on in Chapters 15-18 and the embedded mitigation proposed in those chapters.
- 4.14 The Operational Management Plan (OMP) submitted with the DCO application sets out measures to ensure the embedded mitigation commitments referred to in the ES, and relied upon in the Chapter 10 assessment, are upheld in respect of ground and surface water quality, noise and dust. These measures are assumed to be in place for the purpose of this document and are not repeated here. The requirement for non-obtrusive lighting and minimal overspill into retained areas adjoining the operational site is also set out in Chapters 9 and 10 of the ES and similarly reflected in the lighting designs included in the Preliminary Lighting Strategy at Appendix 9.J of the ES. Again, for the purpose of this document it is assumed that a lighting scheme in general accordance with the Preliminary Lighting Strategy is in place as required by the DCO and that maintenance of embedded mitigation (such as cowls) will fall within standard operational management of the site.

Invasive Non-native Species (INNS)

- 4.15 Chapter 10 of the ES, and the CEMP, set out the baseline position as regards INNS and the measures that will be taken to identify and control INNS through the construction phase. In the post-construction phase, vigilance for INNS will form part of the annual walkover surveys set out in section 5 of this LEMP, and where identified, appropriate controls will be put in place to ensure control and eradication, in line with prevailing best practice standards and legal requirements.

MANAGEMENT BY COMPARTMENT

- 4.16 Figure 1 attached shows the location of the retained and newly created habitats relative to the development, and also indicates the boundaries of the nine compartments under which management measures are grouped. Each management compartment is briefly described below and the prescriptions for it outlined:

Compartment 1

Summary Description

- 4.17 This comprises a belt of retained mixed deciduous and coniferous trees forming a visually ~~n~~ important screen at the western edge of the development. Key tree species are Monterrey pine, white poplar, London plane, weeping willow and ash. The compartment also includes an adjoining drainage ditch which is to be re-profiled in much of its southern section to meet surface water drainage requirements. In the northern part of the compartment, adjoining

Station Approach Road, this ditch comprises a retained section of established watercourse (Pincock's Trough) that supports water voles, although the westernmost end of this will be affected by diversion and culverting works. Contained within this compartment will be bat boxes on mature trees installed as compensatory provision for the loss of a minor common pipistrelle roost in an existing building ([Building B7 as referred to in ES Chapter 10](#)).

Management Objectives

- 4.18 Maintain structure as a screen of mature mixed deciduous/coniferous trees and shrubs to ameliorate visual effects, in particular on views towards the Tilbury2 site from the west. This will serve the complementary function of maintaining a sheltered tree-line for bat foraging, with mature and over-mature trees being likely to develop features suitable for bat roosting, and dense vegetation offering suitable habitat for bird nesting. Retain existing macrophyte vegetation in ditch/Pincocks Trough and encourage its expansion along re-profiled channel to encourage water voles and other species. Ensure bat roosting provision is maintained.

Management Prescriptions

- i) Inspect retained mature trees annually in autumn and after major storms to identify structural defects, including dead or broken branches, cracks, decay and root decay. Where representing a potential health and safety hazard or a significant risk to tree health, remove any dead, dying or diseased wood, broken branches and stubs at the earliest opportunity ensuring due regard is had to the possibility of bat roosts and nesting birds, and seeking specialist ecologist advice where in any doubt and aiming at all times to ensure no net reduction in nesting/roosting opportunities. All pruning/cutting of mature trees to be carried out in accordance with Arboricultural Association leaflet 'Mature Tree Management'⁹.
- ii) Maintain and/or enhance screening function of existing vegetation through periodic (e.g. biannual) and targeted autumn/winter coppicing and pruning interventions by a qualified arboriculturalist, ensuring due regard is had to the possibility of bat roosts when working with mature/over-mature trees and seeking specialist ecologist advice where necessary.
- iii) During operation (i), identify and mark sapling or young trees for recruitment and undertake any measures necessary to promote their vigorous growth (e.g. 'haloing'). Consider planting of some coniferous species if no seedling recruitment observed.
- iv) Prevent excessive overshadowing of retained/re-profiled ditch systems by cutting back over-hanging woody vegetation annually each autumn.
- v) Assess development of macrophyte vegetation in ditches at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles and/or affecting surface water drainage function. All maintenance to be carried out in accordance with current best practice to minimise

⁹ Arboricultural Association (2005). LEAFLET 8 Mature Tree Management.

effects on ecology and ensure legal compliance in respect of protected species such as water vole^{10,11}.

- vi) Check bat boxes at least annually in accordance with the terms of any prevailing licence and related monitoring requirements. Thereafter, ground-based checks will be sufficient to ensure they remain *in-situ* with any replacements put into effect to ensure continued compensatory provision.

Compartment 2

Summary Description

- 4.19 This comprises a length of retained wet ditch and some adjacent verge and planted trees immediately to the south of Substation Road and at the northern edge of the Ro-Ro terminal. The ditch supports water voles (at least at times) and the verges have some botanical interest (e.g. bee orchid).

Management Objectives

- 4.20 Ensure retention of existing interest as far as possible through maintaining current mowing regime and ensuring ditch management continues to provide habitat suitable for water voles. Work towards enhancing value of this compartment as providing an east-west conduit across the Tilbury2 site for bats.

Management Prescriptions

- i) Maintain and/or enhance existing tree planting via targeted interventions by a qualified arboriculturalist, ensuring due regard is had to the possibility of bat roosts when working with mature/over-mature trees and seeking specialist ecologist advice where necessary.
- ii) Prevent excessive overshadowing of retained/re-profiled ditch systems by cutting back over-hanging woody vegetation annually each autumn.
- iii) Mow verge grasslands annually in February and again in October, with all arisings removed to encourage low fertility species-rich grassland and maintain conditions favourable to species such as bee orchid.
- iv) Assess development of macrophyte vegetation in ditches at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles and/or affecting surface water drainage function. All maintenance to be carried out in accordance with current best practice to minimise

¹⁰ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

¹¹ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

effects on ecology and ensure legal compliance in respect of protected species such as water vole^{12,13}.

Compartment 3

Summary Description

- 4.21 This comprises a strip of land between the new rail siding and the Tilbury2 site boundary with Network Rail land to the north. Other than provision for a 3m access track adjoining the siding (which also encompasses an easement for buried infrastructure) and a noise-attenuation barrier, the rest of this land will be given over to dense scrub planting to provide a visual screen, and a length of wet ditch designed to provide habitat for water voles and other wetland flora and fauna. Pockets of the S41 habitat 'open mosaic habitat on previously developed land' are also anticipated to survive closer to the Network Rail boundary.

Management Objectives

- 4.22 Encourage development of a dense screen of mature deciduous scrub to ameliorate visual effects, in particular on views towards the Tilbury2 site from the north and north-west. This will serve the complementary function of maintaining a linear scrub belt with lee-sides and edges for bat foraging, and a dense structure suitable for nesting birds such as linnet and possibly nightingale. Steer maturation of the created ditch habitat towards a condition favourable for water voles, with scrub/ditch interface suitable for Cetti's warbler.

Management Prescriptions

- i) Encourage development of dense impenetrable scrub through interventions during establishment period to replace failures and encourage dense growth down to ground level, including through periodic pruning and coppicing in autumn/winter, whilst being mindful to minimise scrub growth and related leaf-fall issues close the London-Southend railway, in line with Network Rail guidance¹⁴.
- ii) Encourage the development of dense macrophyte vegetation in ditch, including common reed, but also species such as *Glyceria* to encourage water voles and other wetland species. Thereafter assess development of macrophyte vegetation at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles. All maintenance to be carried out in accordance with current best practice

¹² For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

¹³ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

¹⁴ Network Rail. *Vegetation Management Explained*. (PEIR consultation response document).

to minimise effects on ecology and ensure legal compliance in respect of protected species such as water vole^{15,16}.

- iii) Prevent excessive overshadowing of retained/re-profiled ditch systems and open mosaic habitats by cutting back over-hanging/colonising woody vegetation annually each autumn, except where conflicting with landscape screening objective.

Compartment 4

Summary Description

- 4.23 This comprises a strip of land on the outer radius of the new rail siding and separating the CMAT from the habitat compensation area and Green Belt land within the Order Limits to the north-east. Parts of this land will be given over to scrub planting to provide a visual screen and also to combat airborne transport of fugitive dust emissions from stockpiled aggregates. Other areas are likely to comprise retained, translocated or newly created representations of the S41 habitat 'open mosaic habitat on previously developed land'.

Management Objectives

- 4.24 Encourage development of a mixed boundary strip of hedgerow, scattered scrub and early-succession habitats to provide a buffer between the CMAT and the compensation habitats to the north-east, while also offering some bird nesting habitat. In other areas, encourage the development of sparsely vegetated artificial substrates including rail clinker, sands and gravels from marine dredged origin and possibly elements of PFA and/or Lytag to replicate brownfield conditions and secure representations of open-mosaic habitats on previously developed land

Management Prescriptions

- i) Encourage development of continuous linear representations of dense scrub or hedgerow reflecting finalisation of uses on the adjoining CMAT in order that such vegetation can perform a useful function in capturing airborne dust, should that be necessary.
- ii) In other areas, assess brownfield substrates annually and ensure maintenance as sparse vegetation with a high proportion of lichens, annual plants and low cover of grasses or woody vegetation, including by cutting back of overshadowing/colonising woody vegetation. Where necessary to arrest processes of succession, periodic mechanical disturbance and compaction should be employed on no more than 25% of the extent of such habitats within the compartment.

¹⁵ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

¹⁶ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

Compartment 5

Summary Description

- 4.25 This compartment contains the majority of the compensatory wetland habitat installed in advance or under the DCO as a ready receptor for water voles, including concentric rings of multiple ditch channel extending in total to around 2.8km of ditch and two new ponds with surrounding reedbed. Small representations of open mosaic habitat may also be created in the central area (between the ponds and the innermost rings of ditch), possibly using substrates translocated from the Lytag Site. Retained ditch, hedgerow/scrub and coarse grassland habitats along the eastern and southern boundaries are also included. The land lies within the Green Belt.

Management Objectives

- 4.26 Much of the habitat in this area is planned to be established in advance of construction by means of a separate but parallel planning consent, in order that adequate size and maturity of receptor habitat for water voles will be available prior to the translocation of animals from development areas. If advanced construction is not possible, it will be constructed as a requirement of the DCO. Further details will be set out in the EMCP. The management objectives falling under this LEMP are to continue the development of the created habitats to optimise their value and carrying capacity for water voles (and other species using the same habitats), and to work towards complete replication of lost reedbed habitat.

Management Prescriptions

- i) Encourage the development of dense macrophyte vegetation in ditches, this to be rich in foodplant species such as *Glyceria* to maximise value to water voles. Thereafter assess development of macrophyte vegetation at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles. Particular attention to be paid to the potential presence of INNS, and if present then measures taken to remove/control them. All maintenance to be carried out in accordance with prevailing best practice to minimise effects on ecology and ensure legal compliance in respect of protected species¹⁷.
- ii) Encourage the development of dense reedbed around ponds and in the central part of the compartment aiming to achieve 0.5ha cover (consistent with anticipated extent of losses to the proposals). Thereafter assess development at five-yearly intervals and put into effect staggered cut-back/clearance operations where reed thatch is adjudged to be too dense. All maintenance to be carried out in accordance with prevailing best practice to minimise effects on

¹⁷ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

ecology¹⁸ and ensure legal compliance in respect of protected species such as water vole¹⁹.

- iii) Assess brownfield substrates annually and ensure maintenance as sparse vegetation with a high proportion of lichens, annual plants and low cover of grasses or woody vegetation, including by cutting back of overshadowing/colonising woody vegetation. Where necessary to arrest processes of succession, periodic mechanical disturbance and compaction should be employed on no more than 25% of the extent of such habitats within the compartment.

Compartment 6

Summary Description

- 4.27 This compartment comprises the previously installed and now maturing compensatory wetland habitat constructed by RWE for water voles, as well as the surrounding terrestrial area that was intended by them to serve as receptor habitat for reptiles from part of the former power station site. The recent grazing of this area has ceased and following repair of the surrounding reptile fencing, this grassland will be allowed to continue to develop an appropriate structure in order that it can accommodate a proportion of the reptile population needing to be moved from the Tilbury2 development. Further details are set out in the EMCP. The wetland habitat will be left as existing as it can no longer be used to receive water voles having already been colonised. The land lies within the Green Belt.

Management Objectives

- 4.28 Encourage development of suitable tussocky grassland structure in the land areas to maximise reptile carrying capacity, and thereafter maintain in optimum condition, allowing some limited development of bramble or woody scrub to provide shelter, scrub-interface conditions and sun-traps. Maintain waterbody as an open water feature with broad and dense bands of emergent vegetation around the margins.

Management Prescriptions

- i) Inspect grassland areas every three to five years to assess sward structure and scrub development and address excess of either with management interventions, to include localised hand strimming in relation to the former and hand cutting in relation to the latter. Operations to be carried out in accordance with prevailing best practice at all times to avoid impacts on reptiles or nesting birds and ensure legal compliance.
- ii) Assess development and condition of macrophyte vegetation around pond at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles. Particular attention to be paid to the potential presence of INNS, and if present then measures taken to

¹⁸ Hawke, C. J. & Jose, P. V. (1996). *Reedbed Management for Commercial and Wildlife Interests*. RSPB, Sandy.

¹⁹ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

remove/control them. All maintenance to be carried out in accordance with prevailing best practice to minimise effects on ecology and ensure legal compliance in respect of protected species²⁰, particularly water vole²¹.

Compartment 7

Summary Description

- 4.29 This compartment comprises an area of open mosaic habitat adjoining the existing London-Southend railway and a strip of existing dense scrub to the south of it. The open mosaic habitat forms the only part of the Lytag Brownfield Local Wildlife Site (LoWS) that will be retained. The scrub harbours the intended location for the artificial badger sett and this LEMP assumes that this has become occupied in the course of mitigation activities as set out in the EMCP and pursuant to a licence from Natural England, should it be required.

Management Objectives

- 4.30 Maintain dense scrub as an element of continuity of this habitat and its associated interest for nesting passerine birds, including species of conservation concern such as linnet. Encourage maturation of scrub planting around and on top of artificial badger sett to continue to integrate this with its surroundings.

Management Prescriptions

- i) Assess open mosaic habitat resource annually and ensure maintenance as sparse vegetation with a high proportion of lichens, annual plants and low cover of grasses or woody vegetation, including by cutting back of overshading/colonising woody vegetation. Where necessary to arrest processes of succession, periodic mechanical disturbance and compaction should be employed on no more than 25% of the extent of the habitat within the compartment.
- ii) Maintain scrub belt on a no (or low) intervention basis, albeit whilst being mindful to minimise excessive growth close to and potential leaf fall onto the London-Southend railway, in line with Network Rail guidance²². Assess condition at five-yearly intervals and put into effect staggered cut-back/coppicing operations where necessary to prevent succession to secondary woodland and shading out of dense structure near ground-level.
- iii) Ensure establishment of scrub on and around artificial badger sett, including replacement of planting failures if required and appropriate and/or coppicing to encourage dense growth habit and structure. All work to be carried out in cognisance of legal provisions related to an

²⁰ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

²¹ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

²² Network Rail. *Vegetation Management Explained*. (PEIR consultation response document).

occupied sett, in accordance with best practice^{23,24} and taking advice from specialist ecologists where in any doubt.

Compartment 8

Summary Description

- 4.31 This compartment comprises the eastern part of the infrastructure corridor between Chadwell Cross Sewer and Fort Road and which is currently part of the Tilbury Marshes LoWS. For reasons of logic and convenience, the compartment as shown on Figure 1 encompasses land anticipated to be adopted and managed by the highways authority ([Thurrock Council](#)), ~~but for which the responsibility for management fall elsewhere and~~ the prescriptions below do not apply to that [adopted](#) land. A variety of habitats will be created [in this compartment](#), some ancillary to other functions (e.g. highways drainage) and some in order to serve a specific landscape and/or ecology function (e.g. dense planting to screen views of the road and rail infrastructure from Tilbury Fort). Representations of scrub, dry ditches (grassed swales), wet ditches, and sparsely vegetated habitats of an essentially brownfield nature will be created. [Further details relating to planting are given at Appendix E.](#)

Management Objectives

- 4.32 Encourage development of a dense and broad screen of mature deciduous scrub to ameliorate visual effects, in particular on views towards the infrastructure corridor from the open common land and the heritage asset of Tilbury Fort to the south. This will serve the complementary function of maintaining a linear scrub belt with lee-sides and edges for bat foraging, and a dense structure suitable for nesting birds such as linnet and possibly nightingale. Steer maturation of the created ditch habitat towards a condition favourable for water voles, with scrub/ditch interface suitable for nightingale and Cetti's warbler.

Management Prescriptions

- i) Encourage development of dense impenetrable scrub through interventions during establishment period to replace failures and encourage dense growth down to ground level, including through periodic pruning and coppicing in autumn/winter, whilst being mindful to minimise excessive growth close to and leaf fall onto the London-Southend railway, in line with Network Rail guidance²⁵.
- ii) Encourage the development of dense macrophyte vegetation in ditch, including common reed, but also species such as *Glyceria* to encourage water voles and other wetland species. Thereafter assess development of macrophyte vegetation at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles. All maintenance to be carried out in accordance with current best practice

²³ Natural England (June 2009). *Interpretation of 'Disturbance' in relation to badgers occupying a sett.*

²⁴ Natural England and DEFRA (29 March 2015). *Badgers: protection and licences. What you must do to avoid harming badgers and when you'll need a licence.* [Accessed from: <https://www.gov.uk/guidance/badgers-protection-surveys-and-licences>]

²⁵ Network Rail. *Vegetation Management Explained.* (PEIR consultation response document).

to minimise effects on ecology and ensure legal compliance in respect of protected species such as water vole^{26,27}.

- iii) Prevent excessive overshadowing of retained/re-profiled ditch systems and open mosaic habitats by cutting back over-hanging/colonising woody vegetation annually each autumn, except where conflicting with landscape screening objective.

Compartment 9

Summary Description

- 4.33 This compartment comprises the western part of the infrastructure corridor between Ferry Road and Chadwell Cross Sewer and north of the Fortland Distribution Park. For reasons of logic and convenience, the compartment as shown on Figure 1 includes some land anticipated to be adopted and managed by the highways authority (Thurrock Council), and ~~as such the responsibility for management of that land falls elsewhere and~~ the prescriptions below do not apply to that adopted land. The compartment encompasses the retained landscape screening bund at the northern edge, which has associated interest for reptiles and brownfield invertebrates, as well as new habitat created to the south of it, including lengths of wet ditch, dry ditches (grassed swales), pockets of brownfield habitat and woodland and scrub screen planting.

Management Objectives

- 4.34 Encourage development of a dense and broad screen of mature deciduous scrub transitional to woodland to ameliorate visual effects, in particular on views from the infrastructure corridor southwards over the Fortland Distribution Park. This will serve the complementary function of maintaining a linear scrub/woodland belt with lee-sides and edges for bat foraging, and a structure suitable for nesting birds. Steer maturation of the created ditch habitat towards a condition favourable for water voles, with brownfield habitats to represent an extension of the interest found at the edges of and on the pre-existing bund.

Management Prescriptions

- i) Encourage development of dense woodland/scrub screen through interventions during establishment period to replace failures, encourage dense growth down to ground level and select standards for growing on to maturity, including through periodic pruning and coppicing in autumn/winter, and being mindful to minimise excessive growth close to and leaf fall onto the London-Southend railway, in line with Network Rail guidance²⁸.
- ii) Encourage the development of dense macrophyte vegetation in ditch, including common reed, but also species such as *Glyceria* to encourage water voles and other wetland species. Thereafter assess

²⁶ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

²⁷ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

²⁸ Network Rail. *Vegetation Management Explained*. (PEIR consultation response document).

development of macrophyte vegetation at five-yearly intervals and put into effect staggered cut-back/clearance operations where vegetation deemed to be too dense than optimum for water voles. All maintenance to be carried out in accordance with current best practice to minimise effects on ecology and ensure legal compliance in respect of protected species such as water vole^{29,30}.

- iii) Prevent excessive overshadowing of retained/re-profiled ditch systems and open mosaic habitats by cutting back over-hanging/colonising woody vegetation annually each autumn, except where conflicting with landscape screening objective.
- iv) Assess brownfield substrates annually and ensure maintenance as sparse vegetation with a high proportion of lichens, annual plants and low cover of grasses or woody vegetation, including by cutting back of overshadowing/colonising woody vegetation. Where necessary to arrest processes of succession, periodic mechanical disturbance and compaction should be employed on no more than 25% of the extent of such habitats within the compartment.

²⁹ For example: Essex County Council Flood and Water Management Team, (November 2014). *Guide to Ordinary Watercourse Maintenance*. [Accessed from: <https://www.essex.gov.uk/Environment%20Planning/Environment/local-environment/flooding/Watercourse-regulation/Documents/ditch-maintenance.pdf>]

³⁰ Natural England and DEFRA (28 March 2015). *Water voles: surveys and mitigation for development projects*. [Accessed from: <https://www.gov.uk/guidance/water-voles-protection-surveys-and-licences>]

5.0 MONITORING & REVIEW

GENERAL

- 5.1 Management of the areas covered by this LEMP will continue for the life of the development, unless and as agreed otherwise by Thurrock Borough Council in consultation with Natural England. As the habitats develop, the LEMP will need to be reviewed. This will be informed by the results of regular monitoring of the condition of the habitats, and by relevant species monitoring. Details of this are set out below.

ANNUAL WALKOVER

- 5.2 All management compartments and their constituent habitats will be subject to an annual walkover inspection by a suitably qualified ecologist. This inspection will be additional to those discussed under the previous sections (e.g. as required to ensure establishment of tree and shrub planting and the maintenance of appropriate condition in retained mature trees at Sections 4.2 - 4.8 above) and in addition to any follow-up monitoring surveys or inspections required by the applicable protected species licences (i.e. for bats, water voles or badgers) and/or further to the agreed post-translocation protocols for reptiles.

- 5.3 The objective of the annual walkover will be to assess the condition of retained and created habitats against target objectives, including those for the individual management compartment and (where relevant) the requirements of protected species licences and approved translocation strategies.

- 5.4 Following the walkover inspection, an annual monitoring report will be produced detailing any remedial actions or interventions determined to be necessary in order to meet the relevant species or habitat objectives. Examples may include:

- Scrub control or cutting back of adjoining scrub where threatening to overshadow open mosaic habitats;
- Cutting and removal of reed or other dense macrophyte vegetation to prevent build up of thatch and drying out of watercourses/waterbodies;
- Disturbance interventions to create or maintain bare ground for annual plants, other early succession species and thermophilic invertebrates;
- Addressing any INNS noted to have colonised the site.

FIVE-YEARLY SURVEY AND REVIEW

- 5.5 The performance of the retained and created habitats in relation to their target objectives, including in providing alternative habitat for key species impacted by the development, will be assessed by means of more involved surveys at five-yearly intervals, the first to be undertaken five years after the cessation of construction or habitat creation activities in all management compartments.

- 5.6 The following surveys, at minimum, will be included in the five-year reviews:

- Protected species surveys: bats, badger, water vole, reptiles;
- Breeding birds survey, with particular focus on any use of the management compartments by nightingale, Cetti's warbler and barn owl;
- Botanical surveys, focusing on early season surveys of open mosaic habitats on previously developed land and including sampling of lichens;
- Invertebrate surveys.

5.7 The results of the surveys will be analysed in order to identify any revisions to the management prescriptions deemed to be required in order to meet the objectives for each compartment and/or address any problems. Revised prescriptions would then be produced to guide the next five years. This information would be presented as a 'Five Year Monitoring Report' to be shared with relevant stakeholders, including Thurrock Council, Natural England, the Environment Agency and any others deemed relevant. Feedback and suggestions from these stakeholders would be used to guide the next five-year plan.

5.8 Nothing in paragraphs 5.5 to 5.7 precludes PoTLL seeking to change the prescriptions set out in this LEMP prior to the end of each five year period. Such changes would be able to take place with the approval of Thurrock Council, in consultation with Natural England.

FIGURE 1

APPENDIX E